



# Cancer in the **Métis People** of Ontario

*Risk Factors and Screening Behaviours*



Cancer Care Ontario

Métis Nation  
of Ontario 

### **Cancer Care Ontario**

Cancer Care Ontario (CCO) — an Ontario government agency — drives quality and continuous improvement in disease prevention and screening, the delivery of care and the patient experience for cancer, chronic kidney disease and access to care for key health services. Known for its innovation and results-driven approaches, CCO leads multi-year system planning, contracts for services with hospitals and providers, develops and deploys information systems, establishes guidelines and standards, and tracks performance targets to ensure system-wide improvements in cancer, chronic kidney disease and access to care.

CCO's second **Aboriginal Cancer Strategy (ACS II)** was released in 2012. The vision of the strategy is "to improve the performance of the cancer system with and for First Nations, Inuit and Métis (FNIM) peoples in Ontario in a way that honours the Aboriginal Path of Well-being." There are six strategic priorities outlined in the ACS II: building productive relationships, research and surveillance, prevention, screening, palliative and supportive care, and education. The first strategic priority, building strong and productive relationships between CCO and FNIM leadership and communities across the province, is a key support for all strategy work.

### **The Métis Nation of Ontario**

Founded in the early 1990s by the will of the Métis people of Ontario, the Métis Nation of Ontario (MNO) represents the collective aspirations, rights and interests of Métis people and communities throughout the province. These aspirations are embodied in the MNO Statement of Prime Purpose and include creating a Métis-specific governance structure for the implementation of the nation's inherent right to self-government in the province; establishing a credible and recognized identification system for Métis people within the province; focusing on "nation-building" through working together as a collective in order to support Métis citizens and communities; pursuing a rights-based agenda and proudly asserting the Métis existence as a distinct Aboriginal people within Ontario; protecting and preserving the distinct culture and heritage of the Métis Nation in the province; and improving the social and economic well-being of Métis children, families and communities throughout the province. As the recognized elected representative of the Métis people in Ontario, the MNO works closely with government and other partners at both the provincial and federal levels. This work is supported by a series of formalized bilateral and tripartite agreements and processes that have been established over the past two decades, most notably the Ontario-Métis Nation Framework Agreement, initially signed in 2008 and extended in 2014.

The **MNO Healing and Wellness Branch** provides culturally appropriate, wholistic, client-centred services that address the emotional, spiritual, mental and physical needs of Métis individuals, families and communities across the province of Ontario. The approach to Métis health, healing and wellness taken by the MNO is based on respect, compassion, dignity and empowerment of the people it serves. To enhance Métis health and overall well-being, the MNO has established a province-wide infrastructure for the delivery of a range of programs and services to support health, labour market development, education and housing. While focused on the high-priority needs of Métis citizens, all MNO programming is "status-blind" and fully inclusive of all Aboriginal Peoples who wish to access the services and supports it provides. The MNO approach to Métis and Aboriginal health, healing and wellness has been recognized as a leading practice.

### **MNO and CCO Memorandum of Understanding**

In February 2015, and based on their work together over the past several years, the MNO and CCO signed a Memorandum of Understanding to formalize their relationship and guide their future work together in reducing the risk and burden of cancer in the Métis people in Ontario. This report is an important part of this collaborative work.

# ACKNOWLEDGEMENTS

Prepared jointly by staff of the Prevention and Cancer Control portfolio at Cancer Care Ontario (CCO) and of the Healing and Wellness Branch at the Métis Nation of Ontario (MNO):

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MESSAGE FROM  
**GARY LIPINSKI**  
PRESIDENT, MÉTIS NATION OF ONTARIO

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One of the key tenets of the Métis Nation of Ontario (MNO) *Statement of Prime Purpose* is “to promote the improved health and wellness of the individual, the family and the whole Métis community”. For over 20 years, the MNO has been working diligently on behalf of its Métis citizens to achieve this goal.

A major challenge in this important work has been the lack of Métis-specific data to help guide our evidence-based approach to improving health policy and programming, and ultimately, the health status of the Métis people. To address these gaps, and with support from the Public Health Agency of Canada, in 2010 MNO initiated a series of targeted studies to examine rates of key chronic diseases and conditions in the provincial Métis population. Conducted in partnership with the Institute for Clinical Evaluative Sciences, this ground-breaking program of research revealed high rates of chronic disease among our Métis families. As a result, we have since expanded both our research efforts and our network of research partnerships to help build our understanding of the key risk factors and determinants responsible for these health disparities.

This report, *Cancer in the Métis People of Ontario: Risk Factors and Screening Behaviours*, represents an important and essential step in this ongoing process. Developed in collaboration with Cancer Care Ontario, this report brings together data from multiple sources and presents them in a way that substantially increases our knowledge of key cancer risks factors. Because of the known relationships between these risk factors and a host of other chronic conditions, this information will also be invaluable in informing not only cancer prevention and treatment strategies for Métis people, but also our ongoing efforts to reduce the unacceptably high rates of a wide range of other chronic diseases we know are disproportionately affecting our Métis families, including diabetes, heart disease, respiratory disease and musculoskeletal disease. Most importantly, reports such as this will help us target valuable health resources to where they will be most effective in bringing about measurable improvements in the health and well-being of the Métis people of Ontario.

It is therefore with great pleasure we present to you *Cancer in the Métis People of Ontario: Risk Factors and Screening Behaviours*. It represents yet another example of MNO’s commitment to working with its partners to improve health outcomes for the Métis people of Ontario, and to continually strive to achieve the goals and aspirations embodied in the MNO Statement of Prime Purpose. We trust that you will join us in this very worthwhile effort.



MESSAGE FROM  
**MICHAEL SHERAR**  
PRESIDENT AND CEO, CANCER CARE ONTARIO

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Ensuring health equity for all Ontarians across the cancer system is one of six goals identified by Cancer Care Ontario (CCO) in the fourth Ontario Cancer Plan (OCP IV).

Within this goal, Ontario's First Nations, Inuit and Métis (FNIM) people are accorded a priority focus. More specifically, OCP IV commits CCO to the development and implementation of the third Aboriginal Cancer Strategy (ACS III) to be released later in 2015. It will build on the vision of its predecessor, the second Aboriginal Cancer Strategy (ACS II), "to improve the performance of the cancer system with and for First Nations, Inuit and Métis (FNIM) peoples in Ontario in a way that honours the Aboriginal Path of Well-being".

This report is part of the work ACS II set out under its strategic priority areas of prevention and research and surveillance. The prevention priority identified the need for a focus on reducing the prevalence of commercial tobacco use and exposure in FNIM communities, while the research and surveillance priority committed CCO to strengthening capacity to measure FNIM cancer burden, risk factors and screening uptake. This report reflects that broader commitment.

In February 2015, the Métis Nation of Ontario (MNO) and CCO signed an historic Memorandum of Understanding to formalize their relationship and guide their future work together in reducing the risk and burden of cancer in the Métis people of Ontario. This landmark report, *Cancer in the Métis People of Ontario: Risk Factors and Screening Behaviors*, provides an important foundation for this work, highlighting inequalities in cancer risk factors and cancer screening uptake, and building the knowledge base required for establishing strategic health priorities and implementing effective health policies and programming related to chronic disease prevention for Métis people. It will support the collective efforts of MNO, CCO and our respective partners at the Ontario Ministry of Health and Long-Term Care and other organizations who are working to improve the health and well-being of the Métis people of Ontario.

This important report is the result of a shared MNO-CCO vision and our unique and very productive collaboration, and I am delighted to join with MNO in its release.

## EXECUTIVE SUMMARY

The purpose of this report is to enhance our knowledge of cancer risk in the Métis people of Ontario in support of informed decision-making and policy actions to reduce cancer burden. The report presents the prevalence of key, evidence-based factors that impact cancer risk, including tobacco, alcohol and cancer screening uptake.

In 2011, 451,795 Canadians self-identified as Métis.<sup>1</sup> In fact, Métis currently comprise almost one-third of the over 1.4 million Aboriginal people in Canada. The Métis population is also one of the fastest growing populations in Canada, having nearly doubled in size between 1996 and 2006.<sup>2</sup>

Ontario has one of the largest provincial Métis populations in Canada with 86,015 people, second only to Alberta. This represents almost one-fifth of all Métis living in Canada.<sup>1</sup> About two-thirds (nearly 70%) of the Métis population in Canada live in urban areas. However, Métis people are twice as likely as their non-Aboriginal urban counterparts to reside in smaller urban centres with populations of fewer than 100,000 people (41% vs. 20%).<sup>3</sup>

The Métis people are often under-identified or under-represented in Indigenous health research and statistics. Too often, when Métis data are included in research studies, the results are combined with those of other Aboriginal identity groups and do not provide a Métis-specific breakdown of findings.<sup>4</sup> As a result, we do not know enough about Métis-specific health status or the determinants of health in Métis populations. We know, however, that Métis people, including the Métis people of Ontario, are experiencing disproportionately high rates of chronic disease and other conditions. It is this lack of information and our growing awareness of the health challenges experienced by the Métis people of Ontario that has prompted this report.

### KEY FINDINGS: RISK FACTORS

***Tobacco use** is the single most important known modifiable cause of cancer, responsible for an estimated 15% of all cancers diagnosed in Ontario each year, or about 10,000 cases. Many of the types of cancer closely linked with smoking have poor prognoses.*

#### **Métis people in Ontario have higher exposure to tobacco smoke than their non-Aboriginal counterparts, although their rate of smoking has declined over time.**

- A greater proportion of Métis adults smoke. Forty per cent of Ontario Métis adult males and 34% of Métis adult females smoke cigarettes daily or occasionally, compared to 26% of non-Aboriginal men and 18% of non-Aboriginal women.
- Although the percentage of Métis adults who smoke has been declining over time, from 44% in 2007 to 32% in 2012, it is still too high.
- Métis have more exposure to second-hand smoke. Non-smoking Métis — adults and teens — are more likely than their non-Aboriginal peers to be exposed regularly to second-hand smoke in the home, car or public places.
- More Métis teens and young adults smoke. Seventeen per cent of Métis teens (aged 12–19 years) compared to 8% of non-Aboriginal teens smoke cigarettes daily or occasionally. Nearly half (47%) of Métis aged 20–29 years smoke, compared to 27% of non-Aboriginal Ontarians of the same age.

**Smoking rates are greater among Métis in more disadvantaged sectors of society.**

Smoking is more common among Métis adults with less education and lower income. Fifty-five per cent of Métis adults who did not complete secondary school and 59% of those in the lowest income group smoke. These rates are at least double the smoking rates found in the highest education and income groups.

*Alcohol is under-recognized as a cancer-causing agent. Consuming even moderate amounts of alcohol increases the risk of a number of cancers, including mouth and throat, liver, breast and bowel cancers. Those who smoke and drink are at particularly high risk for developing cancer. About 1,000 to 3,000 cancer cases per year (2%-4%) in Ontario can be attributed to alcohol consumption.*

**More Métis adults exceed cancer prevention guidelines for drinking alcohol (fewer than two drinks each day for males and less than one per day for females), especially Métis males, and more both smoke and drink.**

- Fifteen per cent of Métis men drink more than recommended amounts for cancer prevention, compared to 10% of non-Aboriginal men in Ontario, and the majority of them also smoke.
- Seven per cent of Métis adults both smoke and drink, compared to less than 4% of their non-Aboriginal peers.

*Overweight and obesity are responsible for about 4% of cancers diagnosed in Ontarians — more than 2,500 every year. The majority of these arise in the bowel, breast or kidneys. The greater the excess weight the higher the cancer risk, making obesity a particular concern.*

**Métis adults are more likely to be obese than their non-Aboriginal peers and obesity is becoming more common.**

- More than one-quarter of Métis adults are obese (27% of males and 27% of females), significantly exceeding obesity rates in non-Aboriginal Ontarians (19% of males and 16% of females).
- Obesity has risen by 5% between 2007–8 and 2011–12, from 24% to 29% of Métis adults.

*A healthy diet includes plenty of plant foods (non-starchy vegetables and fruit, grains and legumes) and limited consumption of red and processed meats and salty foods. An unhealthy diet increases risk of bowel cancer and probably other gastrointestinal cancers.*

**Most adult Ontarians, Métis and non-Aboriginal, consume fewer than the recommended five daily servings of non-starchy vegetables and fruit.**

- Over 70% of Métis males and about 60% of females do not eat enough vegetables and fruit. Rates are similar for Métis and non-Aboriginal Ontarians.
- Métis people with lower incomes and less education are most likely to eat insufficient vegetables and fruit.

*Moderate to vigorous physical activity decreases the risk of two of the most common cancers — breast and bowel — as well as uterine cancer. A sedentary lifestyle (lots of time in front of a screen) seems to increase cancer risk, independent of lack of physical activity, although evidence is still accruing.*

### **Many Métis adults get too little physical activity and spend too much time in front of a screen.**

- About half of Métis people are inactive, similar to non-Aboriginal Ontario adults.
- Métis adults with less education or lower incomes are most likely to be inactive.
- Nearly three-quarters of Métis adults spend more than 14 hours per week in front of a screen during leisure time, compared to 62% of non-Aboriginal Ontarians.

### **KEY FINDINGS: CANCER SCREENING**

*Population-based screening is recommended for colorectal, breast and cervical cancers because there is strong scientific evidence showing that it reduces mortality. Screening detects cancers early, before there are symptoms, when treatment is most effective. For cervical cancer, screening with the Pap test can even identify pre-cancers, which can then be removed so cancer doesn't develop. To maximize effectiveness, Cancer Care Ontario operates organized screening programs for these three cancers. The newest screening program is for colorectal cancer, so population screening rates are lowest.*

#### **Métis Ontarians are less likely to be up-to-date with cancer screening tests compared to non-Aboriginal Ontarians.**

- Half of Métis adults aged 50–74 are in need of a screening test for colorectal cancer because they have not had a recent fecal occult blood test, sigmoidoscopy or colonoscopy.
- Métis aged 50–54 are particularly under-screened, with over 60% in need of a test, as are those with the least income.
- Only 49% of Métis women aged 50–74 have had a recent mammogram for breast cancer, compared to over 60% of non-Aboriginal women.
- Métis women with less education or lower incomes have especially low rates of mammography screening.
- Most Métis women (81%) have had a recent Pap test to screen for cervical cancer, similar to non-Aboriginal women (80%).
- Métis women with the lowest incomes are less likely to be screened (68%).

### **CONCLUSIONS AND IMPLICATIONS**

These data clearly demonstrate that the Métis community would benefit from interventions that educate and help raise awareness of the broader risk factors for cancer, especially smoking, and from culture-based programming that supports and encourages healthy behaviour and lifestyle changes to reduce cancer risk.

#### **Tobacco Use**

The high rates of smoking and exposures to second-hand smoke in the provincial Métis population are especially disturbing. Because it generally takes 20 or more years for tobacco-related cancers to develop and because many of these cancers are hard to treat effectively, the impact of current smoking will continue well into the future, and we can expect increasing numbers of new diagnoses and deaths.

Immediate action is therefore required to break this pattern and should include: culture-based interventions to prevent the uptake of smoking, especially among Métis children and youth; system supports for

smoking cessation programming for Métis populations; and, targeted policies and programs to foster and increase smoke-free environments, including in public and private spaces. When enacted together as part of a comprehensive smoke-free strategy, this will have the largest positive impact on cancer burden for Métis people. Successful actions will almost certainly result in measurable benefits well beyond reduced cancer by decreasing cardiovascular and chronic respiratory diseases. Given that the risk of cancer declines over time after quitting, and that many of the other health benefits are more immediate, interventions that target individuals and families at all stages along the smoking continuum — from those who have never smoked but who are at increased risk, to those who have smoked for many years and who wish to quit and are looking for support to do so — are needed. All have the potential to benefit from such interventions, as does the health care system overall.

### **Other Cancer Risk Factors and Cancer Screening**

With respect to alcohol, internationally-recognized cancer prevention guidelines advocate avoiding alcohol as the best strategy, especially for women. However, for those who decide to consume alcoholic beverages, the guidelines recommend that males consume fewer than two and females less than one drink per day, on average. Métis adults are more likely to exceed these guidelines and are more likely to smoke and drink, compared to non-Aboriginal Ontarians. This pattern is of particular concern.

Excess weight, diet and physical activity are interrelated. When energy intake from diet routinely exceeds energy expenditure from physical activity and other processes, excess body fat will result. They therefore must be considered together in intervention strategies. Certainly the high rates of obesity among Métis adults — rates that continue to increase over time — are of major concern, and wholistic interventions targeting changes to diet and physical activity and promoting healthy active living should be a priority.

Screening for breast, colorectal and cervical cancer can save lives. Strategies to improve uptake of screening in Métis men and women will improve future cancer outcomes through earlier diagnosis. Promoting cancer prevention and early detection and diagnosis would seem to be especially important for Métis populations who appear to be entering the health care system later in the progress of many chronic diseases and conditions, and thereby are at increased risk of worse health outcomes over the longer term.<sup>5,6</sup>

### **A Systemic, Multifactorial, and Culturally Sensitive Approach to Prevention**

A systemic approach to risk reduction — one which includes culture-based strategies to increase rates of cancer screening in the Métis provincial population — is likely to be the most effective in reducing cancer risk and incidence. Targeting individual behaviour change without providing the required supports to enable that change is unlikely to have any real or long-lasting impact on risk and future health outcomes. Specific social, cultural, geographical and other determinants need to be better understood in the Métis population. Because all risk factors occur with greater frequency in more socio-economically disadvantaged sectors of society — for example, Métis with lower incomes, fewer resources, and limited access to educational and employment opportunities — these individuals and families will be more adversely affected by the future burden of cancer. These disadvantaged sectors are also less likely to get the recommended cancer screening. Therefore, social and economic factors need to be proactively identified and taken into full account when designing and implementing interventions to reduce individual risk behaviours, such as smoking, alcohol consumption and poor dietary habits, and to increase uptake of screening.

Geography is another important issue for the many Métis people living in smaller urban centres or rural environments in Ontario. Recent research on chronic disease in the Ontario Métis population showed

that Métis citizens are less likely than non-Aboriginal Ontarians to access family physicians and specialist care. They are also more likely to use emergency care services for the treatment of chronic diseases and conditions.<sup>5-7</sup> These findings are consistent with verbal reports from Métis cancer patients of challenges experienced in accessing treatment and other services locally. Improving access to upstream resources and services such as prevention supports, diagnostics, screening and local access to treatments will be critical in any system-level intervention designed to reduce cancer risk and improve Métis health outcomes.

Multi-stage interventions that are wholistic in nature and which target multiple risk factors (e.g. smoking and alcohol consumption) may also be required to effectively reduce cancer risk. Family-based interventions that are framed within the very community and family-centred Métis way of life are those that will be most likely to resonate with the Métis people.

### **The Need for Data**

The lack of Métis health data remains an ongoing challenge in our attempts to better understand and reduce cancer risk and burden in the Ontario Métis population. Métis-specific data are needed for tracking and monitoring cancer disease rates and outcomes, improving our understanding of key health determinants, and in assessing the impacts of interventions designed to reduce risk and disease rates in this vulnerable population. In this context, we recommend the inclusion of Métis identifiers and ensuring sufficient Métis samples in any research pertaining to Aboriginal health, become standard practice. These cultural distinctions also need to be reflected in the design of health policy and programming for Métis, First Nations and Inuit populations.

#### **CALL TO ACTION**

- Immediate action must be taken to reduce commercial tobacco use among Métis Ontarians. Current rates of smoking constitute a major threat to the future health of the Métis people in this province.
- Reducing the high — and rising — rates of obesity in Métis adults must be a priority. Obesity increases the risk not only of cancer but also of several other serious chronic diseases, such as diabetes and cardiovascular disease.
- Obesity cannot be treated in isolation. Interventions must acknowledge the complex interrelationships between excess body weight, diet, physical activity and other lifestyle behaviours, such as smoking, as well as social determinants.
- Interventions must include system-level supports that take into account the increased risks evident among the more economically disadvantaged sectors of society. Individuals in these sectors are the most likely to experience high rates of risk factors and of the associated chronic diseases, and at the same time, are typically less likely to have the supports in place required for healthy living and sustainable behaviour change.
- Much more information on the health of the Métis people of Ontario is needed. The lack of Métis-specific health data continues to hamper our collective ability to accurately determine and effectively address chronic disease prevention priorities in this at-risk population.



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## ABOUT THIS REPORT

The focus of this report is the prevalence of selected factors that impact risk of cancer in Ontario's Métis people. Specifically, it includes:

- Information about Ontario's Métis people and their health status
- Information about cancer in Ontario and the main factors known to impact cancer risk
- Prevalence estimates among Métis populations for selected modifiable factors impacting cancer risk or burden organized into the following sections:
  - Tobacco Smoking
  - Alcohol
  - Healthy Eating, Body Weight and Active Living
  - Cancer Screening
- Implications of results for future cancer burden and for policies and programs to reduce the cancer burden among the Métis people of Ontario

**The primary source of data** for this report is *Statistics Canada's Canadian Community Health Survey (CCHS)*, which includes responses from a random sample of Canadians aged 12 and over (see **APPENDIX B: Data Sources** for details).

- Estimates for Métis people are based on survey participants who self-identified as Métis.
- The annual CCHS sample for Ontario is approximately 20,000 respondents; however, the number of self-identified Métis people is only about 200 per year. This report therefore combines six years of data (2007-2012) to ensure sufficient numbers for subgroup analysis (e.g. by sex, age). When subgroup numbers are very small, a caution in interpretation is indicated in the graphs by hatched lines.

**Cancer risk factors** included in this report are those that:

- have convincing or probable evidence of an association with cancer
- are potentially modifiable
- are included in the CCHS

**Prevalence** is estimated as the percentage of individuals with a risk factor and is shown graphically for the following:

- Métis adults living in Ontario (adults are generally defined as those aged 20+; see **APPENDIX C: Risk Factor and Screening Indicator Definitions** for details)
- Non-Aboriginal Ontario adults, for comparison purposes
- Métis and non-Aboriginal teens, where possible

Because age distributions differ for Métis people and non-Aboriginal Ontarians, most estimates are adjusted for these age differences (i.e., age-standardized; see **APPENDIX D: Analytic Definitions and Methods** for details). Differences in prevalence between the two populations are therefore not due to age differences.

A display of 95% confidence limits allows the reader to assess the degree of statistical variation in the estimates.

# CONTEXT

## TRENDS IN CANCER INCIDENCE AND RISK IN ONTARIO

### Cancer in Ontario

The word “cancer” refers to a collection of diseases characterized by the uncontrolled growth of unhealthy cells in the body. There are more than 200 types of cancer, typically named after the organ where the disease originates (e.g. breast cancer). Each type of cancer is treated differently and has a unique prognosis. Treatment and prognosis are also affected by characteristics other than organ of origin, such as stage and specific type of cell.

In Ontario, an estimated 73,700 cancers were diagnosed in 2014 (excluding non-melanoma skin cancers).<sup>1</sup> Cancers arising in the prostate, breast, large bowel (colon and rectum) and lung were the most common types, representing about 50% of all diagnosed cases. An estimated 28,100 Ontarians died of cancer in 2014.<sup>1</sup>

Although the incidence rate of cancer changed little in the 25 years between 1985 and 2009, the absolute number of cancers diagnosed in Ontarians nearly doubled from approximately 34,000 in 1985 to just over 65,000 new cases in 2009 (see figure on page 13). This increase is largely due to the rising number of Ontario residents and the fact that the population is getting older (cancer is generally a disease of aging, with a greater risk of diagnosis at older ages). A very small proportion of the growth in numbers is due to increased risk of being diagnosed.

### Factors affecting the risk of cancer

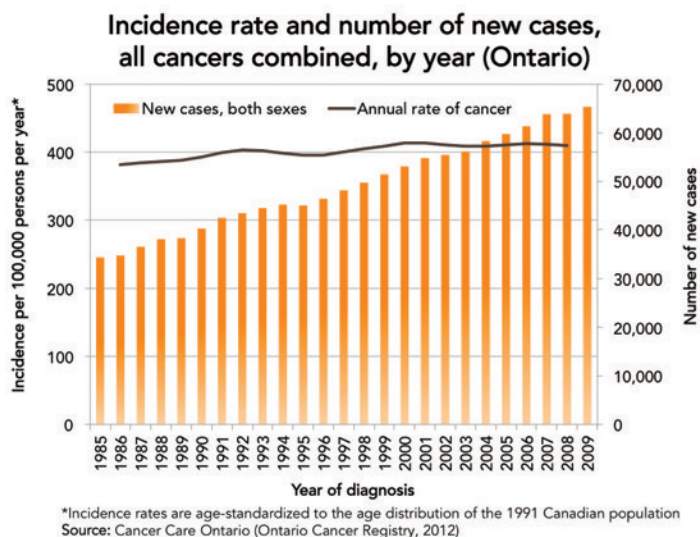
Risk factors for cancer are exposures, behaviours or other characteristics that affect someone’s risk of getting the disease. Age and sex are the strongest predictors of cancer risk. Other risk factors with strong scientific evidence linking them to cancer are listed in the table found on page 14. Together, sub-optimal levels of these factors are responsible for nearly half of all cancers.<sup>2</sup> Other than age and sex, factors that are

associated with lifestyle – tobacco, alcoholic drinks, diet, body composition and physical activity – play the largest role in the risk of getting cancer.<sup>2,3</sup>

Over the past several years, Cancer Care Ontario has conducted a series of analyses to try to better understand the specific impacts of individual risk factors. This work indicates that cigarette smoking is primarily responsible for 9,800 cases, or 15%, of new cancers diagnosed annually.<sup>4</sup> Excessive alcohol intake is a key factor in 1,000-3,000 new cases.

Overweight and obesity play a primary role in 2,600 cases diagnosed each year, including nearly a quarter of all kidney and esophageal cancers, and a third of all endometrial cancers.<sup>5,6</sup> These results are important in helping highlight the significant impacts of each of these risk factors on cancer rates in the population. They also help target interventions to where they are most needed, recognizing that risk factors can and often do act together in complex ways to impact cancer rates.

The Canadian Task Force on Preventive Health Care has concluded that there is sufficient evidence of reduced cancer burden to recommend screening for early detection of breast, cervical and colorectal cancers in asymptomatic individuals in certain population groups.<sup>7-9</sup>



## Select Risk Factors Associated with Cancer

Lifestyle	
<b>Tobacco use</b>	Active smoking, second-hand smoke, preconception/pregnancy exposure, smokeless tobacco
<b>Alcoholic drinks</b>	Alcoholic beverage consumption
<b>Diet</b>	Red meat, processed meat, salt and salty/salted foods, dietary fibre, vegetables and fruit
<b>Body composition</b>	Body fatness, abdominal fatness, adult weight gain, adult attained height
<b>Physical activity</b>	Physical activity
<b>Sedentary behaviour</b>	Prolonged periods of sitting or lying down, e.g. while watching television, playing videogames or using a computer
Occupational and Environmental	
<b>Ultraviolet (UV) radiation</b>	Solar ultraviolet radiation, UV-emitting indoor tanning devices
<b>Other radiation</b>	Radon-222 and its decay products, X- and gamma radiation
<b>Dusts and fibres</b>	Asbestos (all forms), silica dust (crystalline), wood dust
<b>Metals</b>	Arsenic and inorganic arsenic compounds, nickel compounds, beryllium and beryllium compounds, cadmium and cadmium compounds, chromium (VI) and chromium compounds
<b>Industrial chemicals</b>	Acid mists (strong, inorganic), benzene, 1,3-butadiene, formaldehyde, mineral oils (untreated or mildly treated)
<b>Complex mixtures</b>	Diesel engine exhaust, polycyclic aromatic hydrocarbons (PAHs), particulate matter <2.5µm in diameter (PM2.5)
Other	
<b>Reproductive and hormonal factors (female)</b>	Parity, breastfeeding, age at first birth, age at menarche, age at menopause, oral contraceptive use, hormone replacement therapy for menopause
<b>Infectious agents</b>	Epstein-Barr virus, hepatitis B virus, hepatitis C virus, human herpes virus 8, human immunodeficiency virus type 1, human papillomavirus, human T-cell lymphotropic virus type 1, Helicobacter pylori, liver flukes, schistosomes
<b>Genetic susceptibility</b>	Major familial susceptibility syndromes for cancers of the breast, ovary, colon and rectum, and prostate, as well as for leukemia/lymphoma and pediatric cancers
<b>Medical conditions and treatments</b>	Inflammatory and autoimmune conditions, diabetes, gastroesophageal reflux disease and Barrett esophagus, cryptorchidism, benign breast disease, medical radiation (therapy and diagnostics), antineoplastic drugs, other medications

\* Adapted from: *Cancer Risk Factors in Ontario, Evidence Summary*<sup>10</sup>



## MÉTIS IN ONTARIO

The genesis of the Métis culture and nation dates back to the 1600s when early European settlers first came into contact with local Indigenous communities. Early unions between these predominantly male fur-trading European settlers and local Indigenous women led to the emergence of a new and highly distinctive Aboriginal people with a unique identity and consciousness. Distinct Métis settlements began to appear throughout what was then called “the Northwest” and subsequently spread throughout Ontario, as Métis settlements sprung up along the rivers and watersheds surrounding the Great Lakes and to the northwest of the province.

Historical Métis communities were closely connected through the highly mobile fur-trade network, seasonal rounds, extensive kinship connections, and a collective identity characterized by a common culture, language and unique way of life that was influenced by a complex blend of traditions from both sides of the Atlantic. These strong family connections and the unique Métis way of life that characterized these original Métis settlements form the foundation of the Métis nation we know today and remain strongly evident in contemporary Métis life.

**The Métis people of Canada are one of three Aboriginal groups named in Canada’s constitution, which recognizes “existing aboriginal and treaty rights of the aboriginal peoples of Canada,” who are explicitly defined as “Indian, Inuit and Métis”.**

### **The Métis people today**

In 2011, 451,795 Canadians self-identified as Métis.<sup>11</sup> Métis currently comprise almost one-third of the over 1.4 million Aboriginal people in Canada. The Métis population is one of the fastest growing populations in Canada, having nearly doubled in size between 1996 and 2006.<sup>12</sup>

The Métis population of Canada is relatively young, with a median age of 31 years compared to 41 years among non-Aboriginal Canadians. The majority (85%) of Métis people live in either the western provinces or in Ontario. Alberta is the province with the largest population of Métis people, numbering 96,865. Ontario has the second largest number of Métis, with 86,015 people, or 19% of all Métis living in Canada.<sup>11</sup>

In 2006, about two-thirds (nearly 70%) of the Métis population in Canada lived in urban areas, slightly less than the non-Aboriginal population (81%). However, it is important to note that Métis people living in urban areas are twice as likely as their urban non-Aboriginal counterparts to reside in smaller urban centres with populations of fewer than 100,000 residents (41% vs. 20%).<sup>13</sup>

### **The health of Métis people in Ontario**

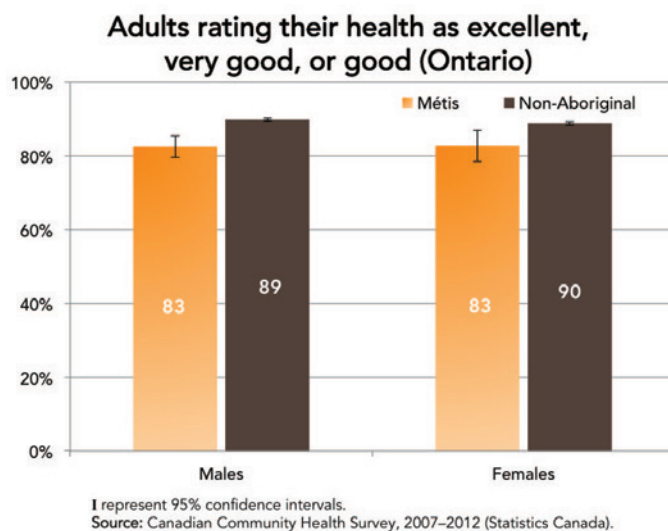
The Métis people are often under-identified or under-represented in Indigenous health research and statistics. This is somewhat surprising given that they represent nearly one-third of the Aboriginal population in Canada.<sup>14</sup> Too often, when Métis data are included in research studies, the results are combined with those of other Aboriginal identity groups and do not provide a Métis-specific breakdown of findings.<sup>15</sup> As a result, we do not know enough about Métis-specific health status or the determinants of health in Métis populations. In this section, we summarize what we do know about the health of Métis in Canada and in Ontario, particularly in relation to cancer and cancer risk factors.

Across several metrics, we now know that the health of Métis people is on average poorer than that of their non-Aboriginal peers. At a national level, Métis men and women have life expectancies that are, respectively, three and five-and-a-half years lower than non-Aboriginal men and women.<sup>16</sup>

Despite the fact that the majority of Ontario Métis and non-Aboriginal people (83% and 90%, respectively) rate their own health as being excellent, very good or good, Métis are more likely than non-Aboriginal people at a national level to also report having at least one chronic condition and are at greater risk of arthritis or rheumatism, high blood pressure and asthma, among other conditions.<sup>17,18</sup> Consistent with this finding, a significantly larger proportion of Métis in the province (nearly 20%) rate their health as only fair or poor, compared to about 11% of non-Aboriginal Ontarians (data not shown).

In Ontario, research conducted by the Métis Nation of Ontario in partnership with the Institute for Clinical Evaluative Sciences that linked data from the MNO Citizenship Registry (about 14,000 records) to administrative health records found that MNO registrants are significantly more likely than their non-Aboriginal peers to experience a heart attack, pre-heart attack, congestive heart failure, diabetes, asthma and chronic obstructive pulmonary disease.<sup>19-21</sup>

Other research has shown that two groups of chronic diseases, circulatory system diseases and cancers, are the most common causes of death among Métis and non-Aboriginal people. Together, these diseases account for just under 60% of all Métis deaths.<sup>16</sup>



**The MNO Citizenship Registry is the only recognized Métis registry in Ontario, formed in 1994. Registration is voluntary and requires genealogical evidence of a Métis ancestor. Only a subset of self-identified Métis will belong to the MNO registry.**

### Cancer in Métis people in Ontario

Very little is known about the patterns of cancer risk factors, rates and types among the Métis people. While Ontario maintains a cancer registry with basic information on cancers diagnosed in its residents, the Ontario Cancer Registry does not include race or ethnicity data, which means that information about cancer in population subgroups, such as the Métis, are not available and must be produced by special research studies. One study on cancer rates has been conducted in Ontario and two other studies have elucidated cancer patterns among Métis elsewhere:

- The Ontario study linked 14,000 Métis citizens included in the MNO's Citizenship Registry to the Ontario Cancer Registry for the period 2005–2007. However, the sample size was too small to provide any definitive conclusions.<sup>22</sup>
- An older study looked at cancer mortality across Canada and found that, between 1991 and 2001, compared to non-Aboriginal women, Métis women had significantly higher rates of death due to cancer overall, and specifically for cancers of the lung and uterus; the latter is probably due to more cancers of the cervix among Métis women. Métis men had

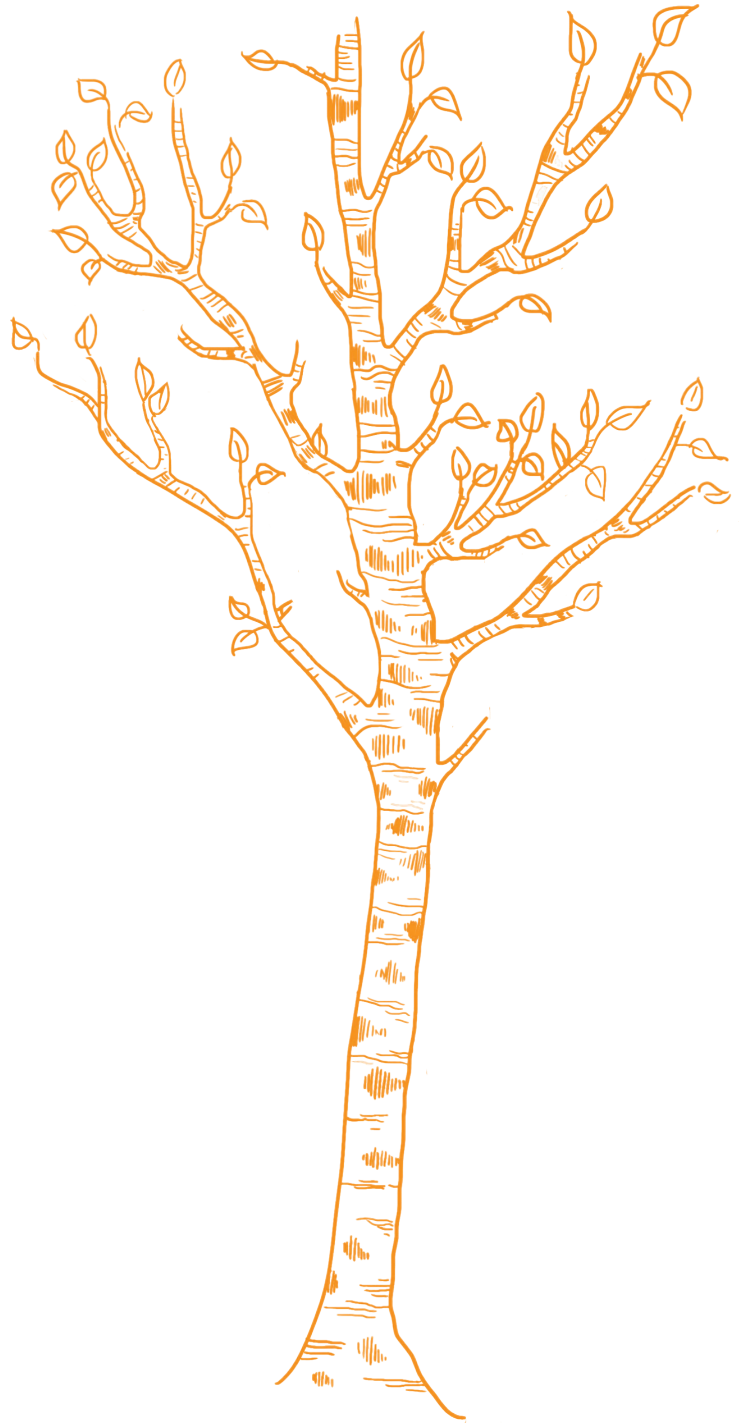
similar rates of death due to cancer when compared to non-Aboriginal men.<sup>16</sup>

- A Manitoba study revealed that, during 1998–2007, Métis had similar overall cancer incidence rates to other Manitobans, but a higher incidence of lung cancer (87 vs. 67 cases per 100,000).<sup>23</sup>

In the absence of larger, more methodologically robust studies of cancer incidence among Ontario Métis, information about the prevalence of cancer risk factors and screening uptake offers perhaps the best approach for determining where cancer prevention resources can be most effectively directed to reduce the future burden of cancer.

Data on the prevalence of cancer risk factors and screening uptake in Métis people are also sparse, especially for those living in Ontario. A Cancer Care Ontario study found that between 2007 and 2011, Métis adults in Ontario were more likely to smoke cigarettes and to be obese than non-Aboriginal Ontarians. The same study also found that Métis and non-Aboriginal Ontarians had comparable participation rates in breast, cervical and colorectal cancer screening.<sup>24</sup> Similar results have recently been reported for Métis living elsewhere in Canada.<sup>25,26</sup>

Several of the factors that impact cancer risk (e.g. smoking, obesity) are common to other chronic diseases, such as cardiovascular disease, diabetes and respiratory disease. Thus, prevalence estimates for factors that impact the risk of cancer are generally relevant to the risk of these other conditions and can be used to support the development of strategies (e.g. enhanced supports to increase smoking cessation) that will reduce not only the risk of cancer, but also the risk of other common and costly chronic conditions.



# TOBACCO SMOKING

## Historical use of tobacco in Métis culture

Tobacco use among Métis has been influenced by two strong cultural traditions: a First Nations tradition in which tobacco is regarded as a medicinal plant with both ceremonial and social uses (such as smudging and in the giving or exchanging of tobacco as a sign of respect),<sup>29</sup> and the more specific role and use of tobacco in Métis historical traditions. For example, many Métis who lived around the Great Lakes were Voyageurs. Voyageurs typically worked 14 hours a day for many weeks at a time, paddling large canoes laden with goods for many thousands of kilometres. During these long and arduous journeys, a stop was made for a few minutes each hour, to allow the men to rest and have a pipe. This event was so important among the early Voyageurs that distances came to be measured in pipes: three pipes might equal 20 km of travel or a 30 km lake might be described as a four-pipe journey.

While this report examines the contemporary use of tobacco among Ontario's Métis peoples, the historical role that tobacco has played in the Métis way of life over many hundreds of years is an important consideration in designing smoking cessation interventions for this group.

## Tobacco smoking and the impact on health

It is well known that smoking tobacco increases the risk of lung cancer and chronic respiratory diseases. Of all the cancers associated with smoking, lung cancer is the most closely linked, and smoking is the strongest predictor for the disease. Smokers are nine times more likely than non-smokers to get lung cancer.<sup>28</sup> Globally, smoking is the main cause for approximately 80% of all lung cancers in developed countries.<sup>27</sup>

It is perhaps less well-known that smoking also increases the risk of many other types of cancer (see table). In addition to the cancers listed in the table, there is also evidence to suggest that smoking may cause breast cancer, although this is not yet conclusive.<sup>10,30</sup>

## Tobacco-associated cancers

	CANCER
Smoking	Mouth and throat*, lung, stomach, colon and rectum, pancreas, liver, cervix uteri and ovary, kidney and bladder, leukemia
Second-hand smoke	Lung
Smokeless tobacco	Oral cavity, esophagus, pancreas

\*Mouth and throat cancers include oral cavity and pharynx, nasopharynx, nasal cavity and paranasal sinuses, esophagus and larynx. **Source:** World Cancer Research Fund, 2007<sup>31</sup>

Smoking also increases the risk of other serious chronic conditions, including cardiovascular disease and possibly diabetes.<sup>4,27</sup>

**Approximately 9,800 new cases of cancer diagnosed in Ontario in 2009 were estimated to be attributable to cigarette smoking (15% of new cancers).**

### Other forms of tobacco exposure

Cigarettes constitute the main form of tobacco used worldwide. Other forms — such as cigars, spit or smokeless, snus (moist powder tobacco placed in the mouth for absorption) and dissolvable tobacco — also increase the risk of some cancers and are being increasingly used by youth (see table on page 18).<sup>10,30</sup> Over the past 10 years, the use of e-cigarettes has increased in popularity, as well.

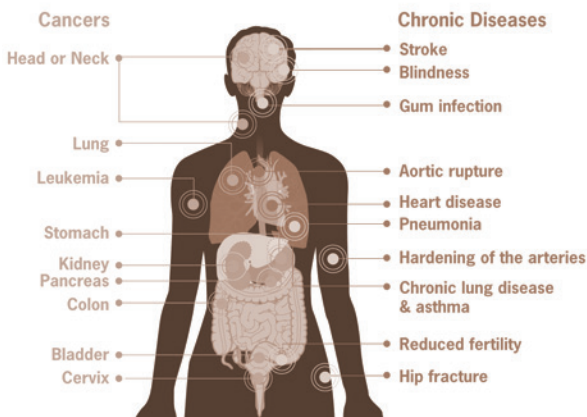
Even among non-smokers, the risk of lung cancer is increased two to four times by exposure to the cigarette smoke of others (second-hand smoke). Some evidence has shown an association of second-hand smoke exposure to cancers of the pharynx and larynx.<sup>10,30</sup>

### The benefits of quitting

Quitting smoking reduces the risk of cancer, with risk gradually decreasing as time since quitting progresses. Stopping smoking also reduces the risk of other chronic diseases, such as cardiovascular disease, respiratory symptoms (e.g. coughing and shortness of breath) and chronic obstructive pulmonary disease.<sup>32</sup>

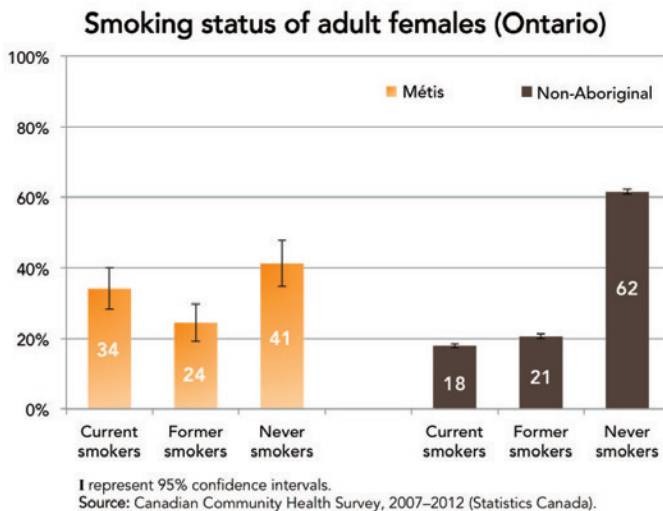
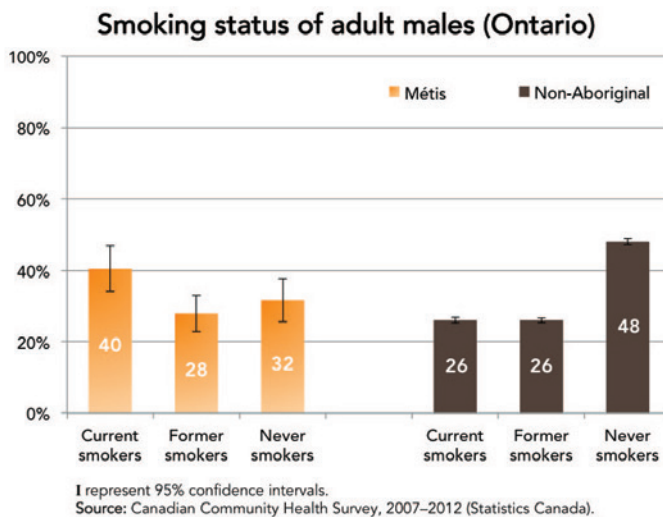
## Risks from Smoking

Smoking can damage every part of the body



Source: Centers for Disease Control and Prevention. *Vital Signs: Tobacco Use, Smoking & Secondhand Smoke*. Sept 2010. Available at: <http://www.cdc.gov/vital-signs/pdf/2010-09-vitalsigns.pdf>. Accessed on September 8, 2014.

## SMOKING STATUS



### Current smokers

A statistically significantly larger proportion of Métis males and females smoke compared to non-Aboriginal Ontarians.

A larger proportion of males smoke compared to females; however, the difference is only significant between non-Aboriginal males and females.

### Never smokers

Between 30% and 40% of Métis males and females have never smoked; however, this percentage varies by geography. In northern Ontario, fewer than 20% of Métis adults have never smoked (81% report having been a smoker at some point in their lifetime) (data not shown). This is less than the one-third (33%) of Métis adults in southern Ontario who have never smoked.

### Former smokers

There is no difference in the percentage of Métis and non-Aboriginal males and females reporting that they formerly smoked: approximately one in four is a former smoker, meaning they have successfully quit smoking. Individuals who quit smoking gradually reduce their risk of tobacco-associated cancers each year since quitting. The risk of dying from lung cancer is cut in half within 10 years of quitting and oral cancer risk decreases to nearly the same level as that of someone who never smoked.

Quitting smoking also reduces the risk of other chronic conditions. Within one year of quitting, the risk of having a heart attack drops by 50% and within 10–15 years, the risk of heart disease is the same as someone who has never smoked.<sup>33,34</sup>

Although health risks remain higher for ex-smokers than for those who have never smoked, quitting is beneficial at any age.<sup>32</sup>



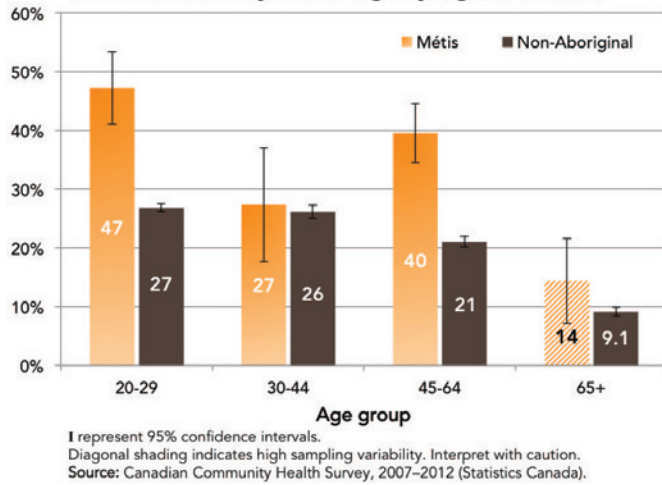
# CURRENT SMOKERS

## Age differences

The highest rates of smoking are found among Métis adults in the 20–29 and 45–64 age groups. Smoking rates for Métis people in these age groups are particularly high, and among those aged 45–64, the rates are nearly double those found in the non-Aboriginal population.

For Métis and non-Aboriginal Ontarians, rates of smoking drop significantly at age 65 and older. The reason for the lower prevalence of smoking found in older adults is not clear. It may be due to increased tobacco-related deaths within this age group or it could reflect higher rates of successful quitting; for example, many older adults quit smoking for health reasons or following their doctor's advice.<sup>35</sup>

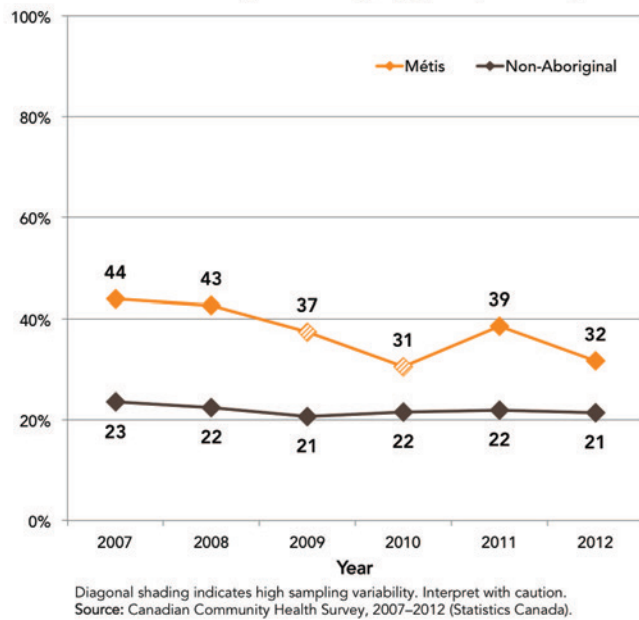
Adults currently smoking, by age (Ontario)



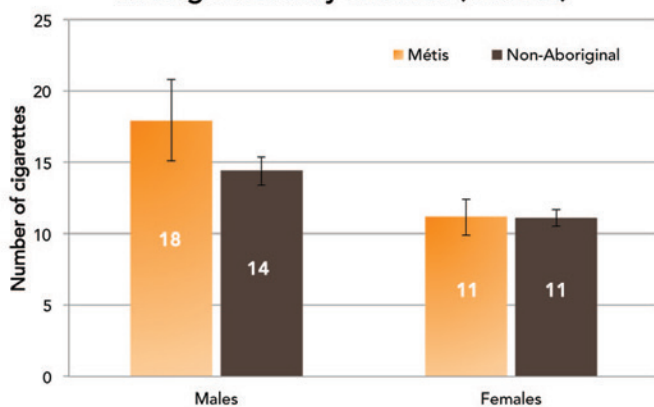
## Changes over time

The percentage of Métis adults smoking declined significantly between 2007 and 2012 (44% in 2007 compared to 32% in 2012). Even in 2012, however, smoking rates among Métis were much higher than in the non-Aboriginal population. The smoking prevalence among non-Aboriginal adults remained consistent over time.

Adults currently smoking, by year (Ontario)



### Median number of cigarettes smoked per day among adult daily smokers (Ontario)

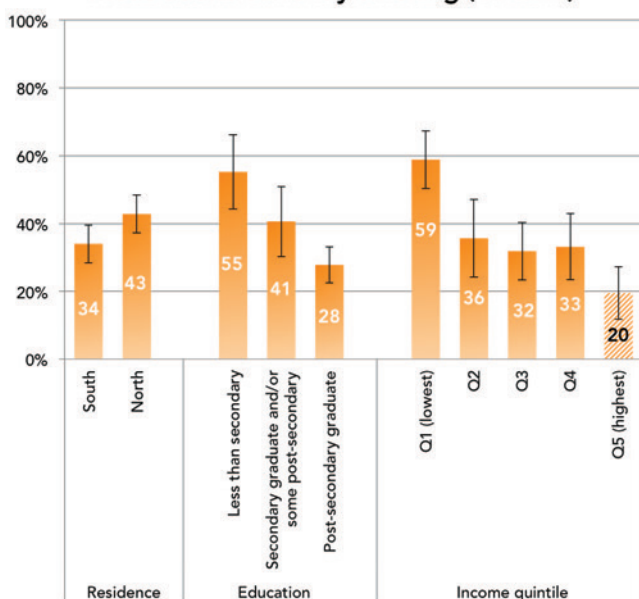


I represent 95% confidence intervals.  
Source: Canadian Community Health Survey, 2007–2012 (Statistics Canada).

### Cigarettes smoked daily

There are also gender differences in the number of cigarettes smoked per day. Males smoke more than females, a pattern seen among Métis and non-Aboriginal Ontarians. When comparing cultural groups, Métis males smoke more cigarettes per day than non-Aboriginal males, but the difference is not significant. No difference is found between Métis and non-Aboriginal females.

### Métis adults currently smoking (Ontario)



I represent 95% confidence intervals.  
Diagonal shading indicates high sampling variability. Interpret with caution.  
Source: Canadian Community Health Survey, 2007–2012 (Statistics Canada).

### Geography, education, income

There is a relationship between geography and smoking status. More Métis adults living in northern Ontario are smokers than those living in southern Ontario, but the difference is not statistically significant.

Higher rates of smoking are also seen among Métis adults with lower levels of educational attainment and among those with lower household incomes.

These findings are similar to those for the general population (data not shown).

## QUITTING SMOKING

Successful quitting typically involves a cyclical progression through a number of stages of behaviour change, which includes periods of relapse. Commonly referred to as the Transtheoretical Model of Behaviour Change (see adjacent table),<sup>36</sup> this conceptualization provides the foundation for many of our current approaches to smoking cessation programs. Importantly, the model proposes that each stage of change requires a different type of intervention in order to maximize the likelihood of eventual quitting. From a public health perspective, knowing the proportion of the smoking population that falls within each stage at any given time allows us to effectively target valuable resources and tailor cessation interventions to optimize overall success rates.

### Stages of change for smoking cessation as defined in the Canadian Community Health Survey

STAGE	DEFINITION
Pre-contemplation	The person has no intention of quitting smoking in the next six months.
Contemplation	The person is seriously thinking of quitting smoking: <ul style="list-style-type: none"> <li>• in the next six months but not in the next 30 days or,</li> <li>• in the next 30 days but did not try to quit for at least 24 hours in the past 12 months.</li> </ul>
Preparation	The person is seriously thinking of quitting smoking in the next 30 days and has already stopped smoking at least once for 24 hours during the past 12 months.
Action	The person has quit smoking less than six months ago.
Maintenance	The person has quit smoking at least six months ago.

Adapted from Prochaska and DiClemente (1983) Transtheoretical Model of Behaviour Change<sup>36</sup>

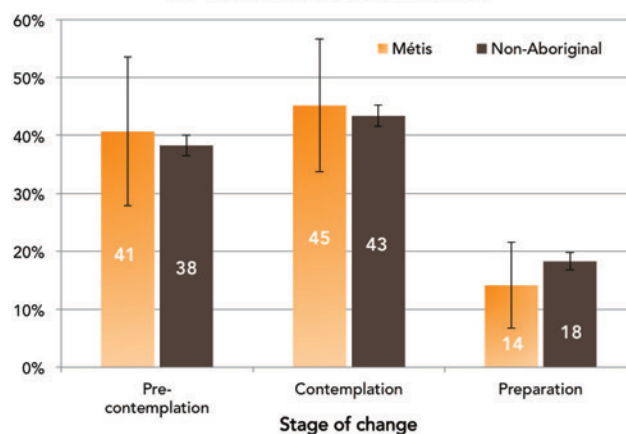
### Stages of change

Data permitted an examination of the percentage of Métis and non-Aboriginal smokers falling within the first three stages of change, but not the “Action” stage. Those in the “Maintenance” stage essentially reflect the population of former smokers, as previously discussed in the *Smoking Status* section.

The data show that 45% of Métis smokers are contemplating quitting within the next six months, while a further 14% are in the preparation stage, and are preparing to quit within the next 30 days.

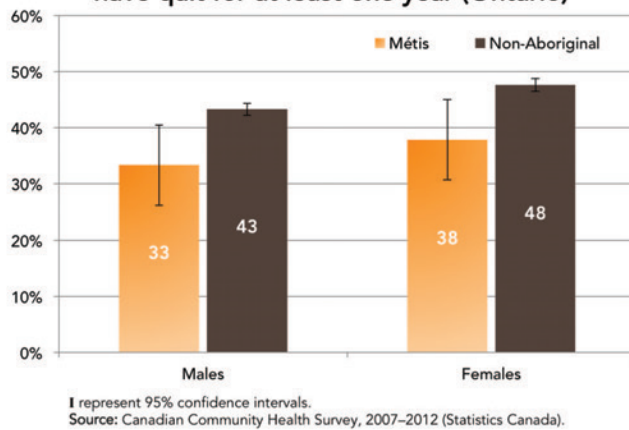
Forty-one per cent of Métis smokers have no intention of quitting within the next six months, and are categorized as being in the “Pre-contemplation” stage. A similar pattern is seen for non-Aboriginal smokers.

### Stages of change for quitting smoking for adult smokers (Ontario)



■ represent 95% confidence intervals.  
Source: Canadian Community Health Survey, 2007–2008 (Statistics Canada).

### Percentage of adult ever smokers who have quit for at least one year (Ontario)



### Quitters

Among Métis males and females who have ever smoked, less than 40% have successfully quit for at least a year (33% and 38%, respectively). This is significantly less than the percentage of non-Aboriginal smokers who have quit (43% and 48%, respectively). A slightly larger proportion of Métis females have successfully quit compared to Métis males, although this difference is not statistically significant. A similar pattern is found in the non-Aboriginal population.

Smokers in the lowest income quintile are the least likely to have quit smoking for at least one year (24% for Métis smokers and 36% for non-Aboriginal Ontarians) (data not shown).

## SECOND-HAND SMOKE

Second-hand smoke is what smokers breathe out or what comes from a burning cigarette, pipe or cigar.<sup>37</sup> No amount of second-hand smoke is safe.

People can breathe in second-hand smoke in public places or in what we consider more private spaces, such as in a home or in a vehicle.

In this report, we looked at exposures to second hand smoke overall, as well as exposure in public vs. private spaces in order to identify potential areas for targeted intervention.

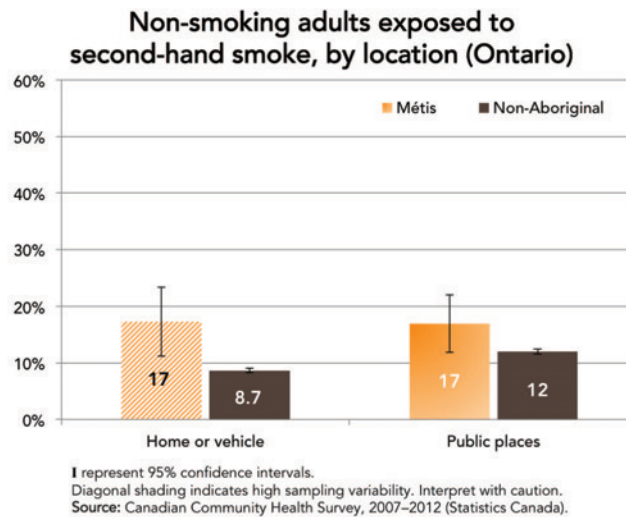
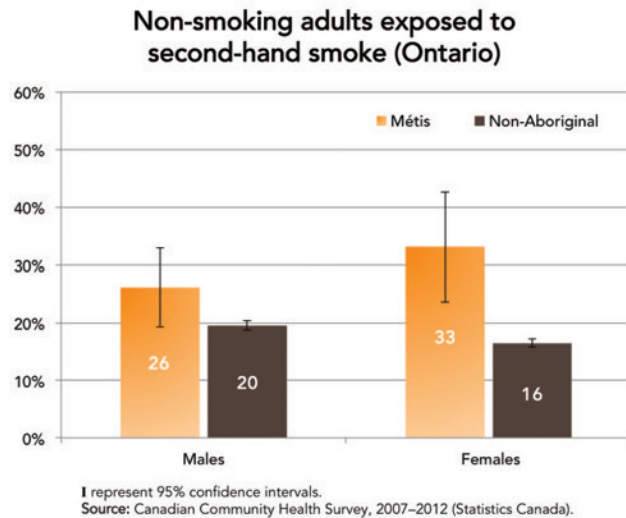
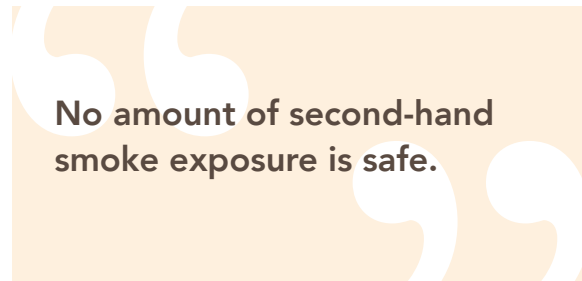
### Exposure to second-hand smoke

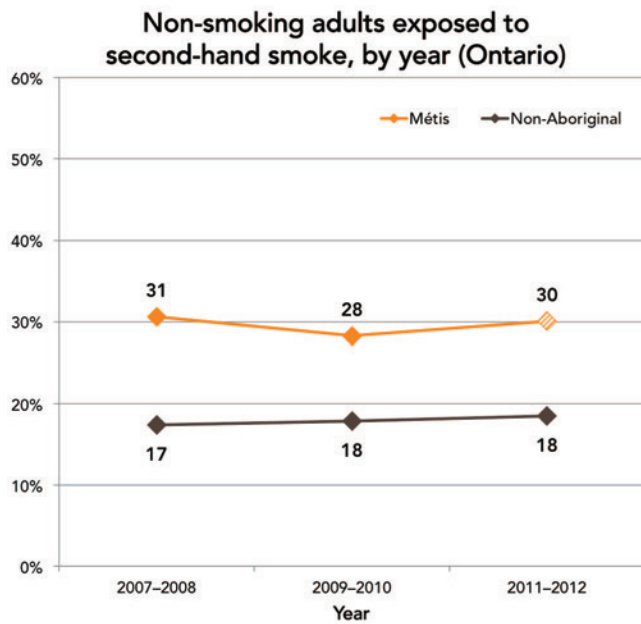
In examining second-hand smoke exposure overall, Métis females appear to be at particular risk. One in three (33%) non-smoking Métis females are exposed to second-hand smoke in the home, car or public places. This figure is significantly higher than the rates for non-Aboriginal males and females (20% and 16%, respectively).

Métis females are also more exposed to second-hand smoke than are Métis men, but the difference is not significant. Métis males are more exposed to second-hand smoke than non-Aboriginal males, although this difference is also not significant.

### Public vs. private spaces

While non-Aboriginal non-smokers are significantly less likely to experience second-hand smoke in private spaces than in public places, Métis non-smokers are equally as likely to be exposed to second-hand smoke in private spaces as they are in public settings.





Diagonal shading indicates high sampling variability. Interpret with caution.  
 Source: Canadian Community Health Survey, 2007-2012 (Statistics Canada).

### Changes over time

There was no change in second-hand smoke exposure between 2007 and 2012 for Métis and non-Aboriginal Ontarians. Previous research showing declines in second-hand smoke exposure prior to 2006,<sup>4</sup> followed by stability in more recent years, may reflect the implementation of the *Smoke-Free Ontario Act* in 2006, which banned smoking in workplaces, enclosed public spaces and in vehicles with children under 16.

Past research has shown for the general population that changes over time in second-hand smoke exposure in private vs. public places yield a similar pattern to that for second-hand smoke overall: declines in second-hand smoke exposure in the home, vehicle and public places are seen prior to 2006, followed by more stability.<sup>4</sup>

## TEENS

### Smoking status

Smoking among young people leads to short-term health issues, such as respiratory effects and risk of other drug use. Long-term effects from regular smoking only reinforce health effects occurring in adulthood.

Similar to adults, Métis teens are more likely to smoke compared to non-Aboriginal teens (17% vs. 8%, respectively). Métis male teens are much more likely to smoke than non-Aboriginal male teens (22% vs. 8.5%). While a similar pattern is seen for female teens, the difference is smaller (13% vs. 6.5%) and not statistically significant (data not shown).

Consistent with the above results, fewer Métis teens report never having smoked (referred to as smoking abstinence) compared to non-Aboriginal teens (about 73% vs. 85%, respectively).

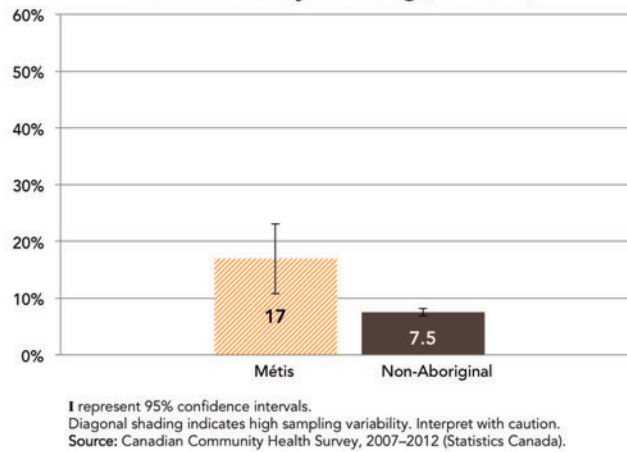
### Second-hand smoking

Between 50% and 60% of non-smoking Métis teens are exposed to second-hand smoke compared to approximately one-third (33%) of non-Aboriginal non-smoking teens (data not shown).

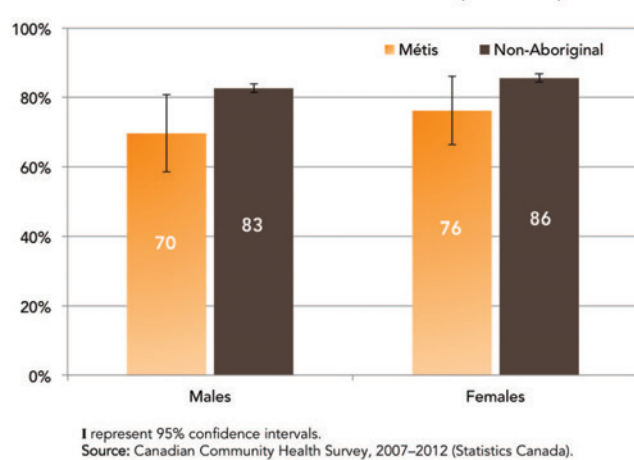
Greater percentages of Métis teens compared to non-Aboriginal teens are exposed to second-hand smoke in private spaces (38% vs. 18%) and public locations (31% vs. 22%). The latter difference (public locations) is not statistically significant, however.

More Métis teens are exposed to second-hand smoke in private vs. public locations (38% vs. 31%, respectively), although the difference is not significant, while the reverse is true for non-Aboriginal teens (i.e., more exposed in public places).

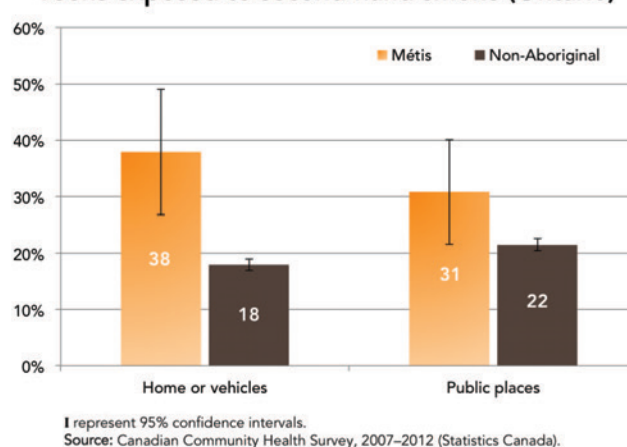
Teens currently smoking (Ontario)



Teens who have never smoked (Ontario)



Teens exposed to second-hand smoke (Ontario)





# ALCOHOL

Data regarding alcohol use among Ontario's Métis population are very limited. Narrative reports suggest that alcohol abuse (pattern of drinking harmful to one's health, relationships and ability to work) may be an issue in some Métis communities, particularly those in the north where factors such as colonization, isolation and poverty may have an especially adverse effect on the health and well-being of community members.<sup>38</sup>

## Drinking alcohol and the impact on health

Alcohol is a major cause of serious health problems and conditions, such as stroke, heart disease, depression, fetal alcohol syndrome, unintentional and intentional injuries, and some types of cancer.<sup>39</sup>

Drinking alcohol can cause cancers of the mouth and throat, colon and rectum, female breast and liver.<sup>10,40,41</sup> There is also some evidence linking alcohol to cancer of the pancreas.<sup>30</sup>

## Alcohol-associated cancers

CANCER
Mouth and throat*
Colon and rectum
Breast (female)
Liver

\* Mouth and throat cancers include oral cavity and pharynx, esophagus and larynx. Source: International Agency for Research on Cancer, 2012.<sup>30</sup>

Although light to moderate alcohol intake (no more than one drink per day for women; no more than two drinks per day for men) may provide some protection against chronic diseases, such as cardiovascular disease, there is no "safe limit" of alcohol intake to prevent an increased risk of cancer.<sup>40</sup> All types of alcoholic beverages consumed (e.g. beer, wine, spirits) increase the risk of cancer.

For mouth and throat cancers, alcohol and smoking operate synergistically; in other words, the risk of developing these cancers is higher than expected among those who both drink AND smoke, making the combined effect greater than the sum of the individual risks.

## Cancer prevention guidelines

In this report, alcohol consumption is measured using the World Cancer Research Fund/American Institute for Cancer Research (WCRF/AICR) *Alcohol Consumption Recommendations for Cancer Prevention* (see below table).<sup>31</sup> The Canadian Partnership Against Cancer refers to the WCRF/AICR drinking guidelines for reducing the risk of cancer.<sup>41</sup> It is estimated that approximately 1,000-3,000 new cases of cancer diagnosed in Ontario during 2010 (2-4% of all new cancer cases) can be attributed to alcohol consumption.<sup>5</sup>

## Cancer prevention guidelines for alcohol intake

SEX	CANCER PREVENTION GUIDELINES
Both sexes	No safe limit of alcohol intake is recommended
Men	If you do drink, limit to no more than two alcoholic drinks per day
Women	If you do drink, limit to no more than one alcoholic drink per day

Source: WCRF<sup>31</sup>

## PATTERNS OF DRINKING

### No drinking in the past year

Only 12% of Métis males and 16% of non-Aboriginal males reported no drinking in the past year. When compared to males, numbers are significantly higher for non-Aboriginal females (25%), but similar for Métis females (13%).

### Drinking within the guidelines for cancer prevention

A similar proportion of Métis and non-Aboriginal males consume alcohol within the cancer prevention guidelines (i.e., consume two or less drinks per day). Métis females, however, are significantly more likely to drink within the guidelines than non-Aboriginal females (77% vs. 67%).

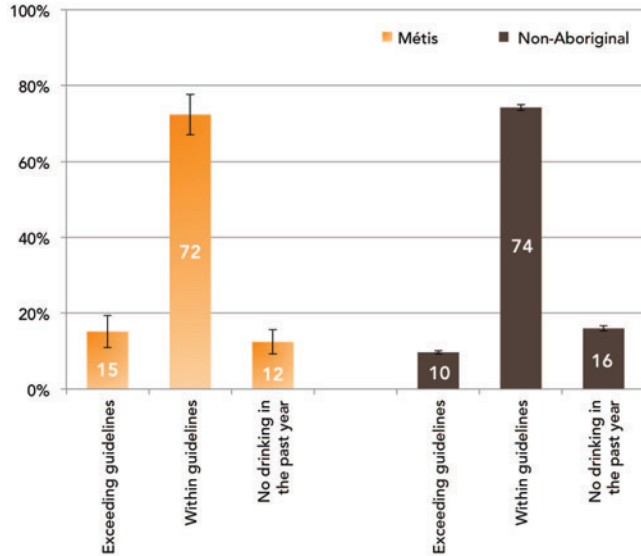
There is no “safe limit” of alcohol intake to prevent an increased risk of cancer. Even small amounts of alcohol increase the risk of some cancers.

## EXCEEDING DRINKING GUIDELINES FOR CANCER PREVENTION

Métis males are more likely than non-Aboriginal males to exceed the cancer prevention guideline of no more than two alcoholic drinks per day (15% vs. 10%, respectively). A similar proportion of Métis and non-Aboriginal females exceed the cancer prevention guideline.

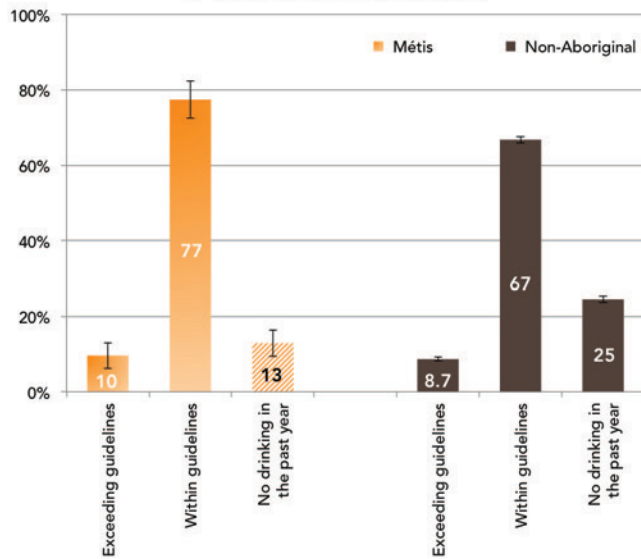
Despite a more conservative drinking guideline for women than men (no more than one vs. no more than two alcoholic drinks per day, respectively), a smaller proportion of Métis females (10%) than Métis males (15%) exceed the recommended drinking limit, although not significantly.

Alcohol drinking patterns of adult males (Ontario)



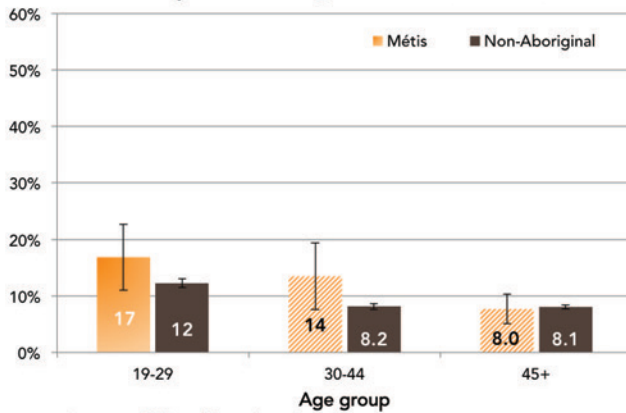
I represent 95% confidence intervals.  
Source: Canadian Community Health Survey, 2007–2012 (Statistics Canada).

Alcohol drinking patterns of adult females (Ontario)



I represent 95% confidence intervals.  
Diagonal shading indicates high sampling variability. Interpret with caution.  
Source: Canadian Community Health Survey, 2007–2012 (Statistics Canada).

### Adults drinking alcohol in excess of cancer prevention guidelines (Ontario)



I represent 95% confidence intervals.  
 Diagonal shading indicates high sampling variability. Interpret with caution.  
 Source: Canadian Community Health Survey, 2007–2012 (Statistics Canada).

### Age differences and changes over time

Young Métis adults (aged 19–29 years) are more likely to exceed recommended limits for alcohol consumption than Métis adults aged 45 and older (17% vs. 8%, respectively). This pattern is similar to that seen in the general population, although those aged 19–29 are also more likely than those aged 30–44 to exceed drinking limits among non-Aboriginal adults. Between 2007 and 2012, there was no change in the percentage of Métis or non-Aboriginal adults exceeding the drinking guidelines for cancer prevention (data not shown).

It is estimated that between 1,000 and 3,000 cases of cancer in 2010 can be attributed to excessive alcohol intake (2% to 4% of all new cases).

### CANCER PREVENTION GUIDELINES

**Men:**

No more than two drinks daily

**Women:**

No more than one drink daily

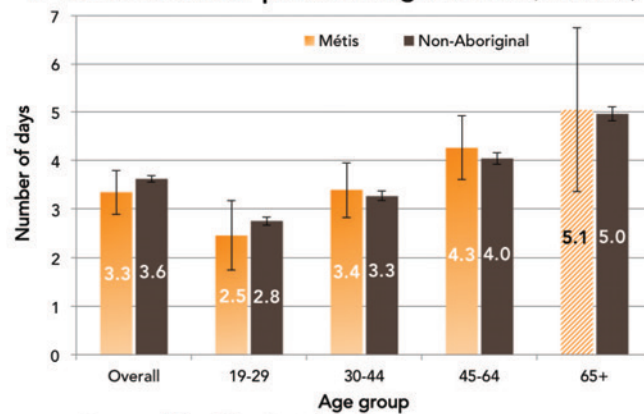
### Days per week drinking more than the recommended limit among adults exceeding guidelines

On average, Métis adults drink more than the recommended limit on about three days per week. The average number of days exceeding recommendations is similar between Métis and non-Aboriginal adults. Although Métis adults aged 45 years and older are the least likely to exceed drinking guidelines (approximately 8%), those who do exceed the limits, report a higher number of days drinking more than the recommended limit (average of five days per week for ages 65+).

Together, these findings suggest that younger Métis adults drink on fewer occasions during the week compared to their older Métis peers, but they may drink more alcohol on each occasion. Conversely, older Métis appear to drink more often, but consume relatively less on each occasion.

The average number of days that Métis males drink more than the recommended limits is higher than for females (3.7 vs. 2.9), a pattern also observed in the non-Aboriginal population (data not shown).

Average number of days per week drinking alcohol in excess of cancer prevention guidelines (Ontario)



I represent 95% confidence intervals. Diagonal shading indicates high sampling variability. Interpret with caution. Source: Canadian Community Health Survey, 2007–2012 (Statistics Canada).

Smoking enhances the effect of drinking on the risk of mouth and throat cancer, so people who drink and smoke are at especially high risk.

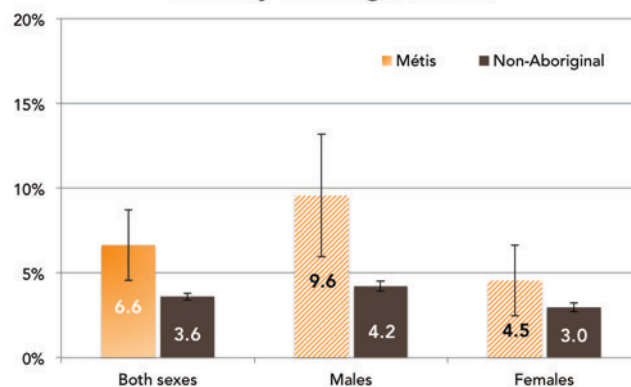
### Exceeding drinking guidelines and smoking

About 7% of Métis adults drink more than the recommended limit and also smoke, which is nearly double the rate reported for non-Aboriginal Ontarians (3.6%).

This significant difference is primarily attributable to the difference seen between Métis and non-Aboriginal males.

As previously discussed, alcohol and smoking operate synergistically, causing the risk of developing mouth and throat cancers to be higher than expected among those who both drink AND smoke, making the combined effect greater than the sum of the individual risks.

Adults exceeding alcohol guidelines and currently smoking (Ontario)



I represent 95% confidence intervals. Diagonal shading indicates high sampling variability. Interpret with caution. Source: Canadian Community Health Survey, 2007–2012 (Statistics Canada).

# HEALTHY EATING, BODY WEIGHT AND ACTIVE LIVING

Maximizing physical activity, minimizing sedentary behaviour, and maintaining a healthy diet and body weight can improve health and reduce the risk of chronic diseases, including cancer. Weight gain, overweight and obesity are caused by an energy imbalance where energy intake (diet) exceeds energy

expenditure (physical activity).<sup>42</sup> While being overweight or obese increases the risk of many cancers, the lifestyle determinants of obesity (physical activity, sedentary behaviour and diet) also independently affect cancer risk.

## Cancers associated with diet, overweight and obesity, physical activity and sedentary behaviour (Darker shading indicates a protective effect)

	CANCER
Plant foods ‡	Colon and rectum Mouth and throat*§ Esophagus* Stomach* Lung*∞
Red and processed meat	Colon and rectum
Salt and salted/salty foods	Stomach*
Overweight and obesity	Esophagus Colon and rectum Pancreas Breast (post-menopausal) Endometrium Kidney Gallbladder* Ovary* Breast (pre-menopausal)* Prostate (advanced)* Liver
Physical activity	Colon Breast (post-menopausal)* Endometrium*
Sedentary behaviour	Colon and rectum* Ovary* Prostate*

\* Evidence is probable rather than convincing.

‡ Dietary fibre has been established as a protective factor for cancers of the colon and rectum.

§ Mouth and throat cancers include oral cavity and pharynx, nasopharynx, nasal cavity and paranasal sinuses, esophagus and larynx.

∞ Probable evidence supports only fruit (not vegetables) as protective for lung cancer.

## HEALTHY EATING

### **Métis traditions**

The collective growing, preparing, gathering and sharing of food is an integral part of the Métis way of life. Métis families and communities have a long history of coming together for feasts and family gatherings, where visitors are welcomed. Dancing, jigging, fiddle-playing and singing are common at these large family and community gatherings.

Historically, Métis diets were largely composed of foods grown, harvested and hunted from the land and water. Wild game, fish, seasonal plants and bannock were staples.

Increasingly, “convenience” foods that are higher in fat and lower in nutritional value are being integrated into the Métis diet, in part because they are less expensive and in part out of necessity because access to traditional food from the land has become more limited.<sup>43</sup>

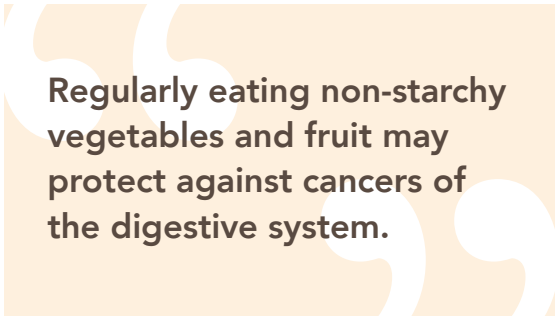
### **Diet and cancer risk**

Several components of diet contribute to the risk of certain cancers. Plant-based foods, such as non-starchy vegetables and fruit, and dietary fibre have a protective effect, while red and processed meats, and salted/salty foods increase cancer risk. Of these foods, vegetable and fruit intake is the only component of diet routinely captured by the Canadian Community Health Survey (CCHS) and, accordingly, is what we report on here.

It is unclear whether all vegetables and fruit confer a protective effect against cancer and to what extent different mechanisms contribute to this effect. It is likely a combination of the dietary fibre and micronutrients they contain, and their protective effect against overweight and obesity that result in a reduced risk of cancer.<sup>31,44</sup>

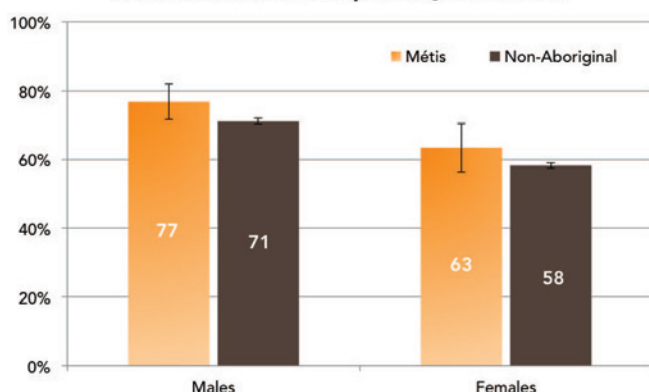
Dietary fibre, found mostly in whole grains, legumes, vegetables and fruit, is protective against colon cancer. Non-starchy vegetables and fruit are probably protective against cancers of the mouth, throat and stomach. Fruit intake in particular is probably protective against lung cancer.<sup>33</sup> Compared to lower intake, higher intake of vegetables and fruit is estimated to reduce the risk of cancers of the mouth and throat by 30%–50%.<sup>31,45,46</sup>

The World Cancer Research Fund (WCRF) recommends eating at least five servings of non-starchy vegetables and fruit daily.<sup>31,47</sup> Rather than servings, the CCHS asks respondents how many times they ate particular vegetables and fruit, which has been shown to be a valid proxy for daily servings in Ontario.<sup>48</sup> In this report, individuals consuming vegetables and fruit (excluding potatoes) fewer than five times per day are considered below the recommended level of intake.



**Regularly eating non-starchy vegetables and fruit may protect against cancers of the digestive system.**

### Adults eating vegetables and fruit less than five times per day (Ontario)



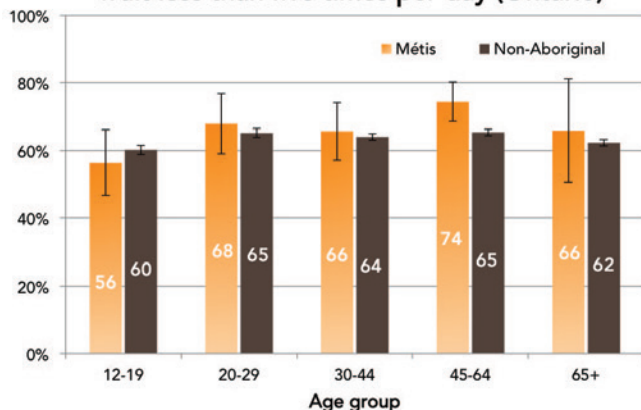
I represent 95% confidence intervals.  
Source: Canadian Community Health Survey, 2007–2012 (Statistics Canada).

### Frequency of eating vegetables and fruit

It appears that more Métis adults (77% of males and 63% of females) eat less than the recommended amount of vegetables and fruit each day compared to non-Aboriginal adults (71% of males and 58% of females), although the differences are not significant.

Métis males are more likely to consume an inadequate amount of vegetables and fruit compared to Métis females, a pattern also found in the non-Aboriginal population.

### Teens and adults eating vegetables and fruit less than five times per day (Ontario)



I represent 95% confidence intervals.  
Source: Canadian Community Health Survey, 2007–2012 (Statistics Canada).

### Age differences

There is no clear association between age and vegetable and fruit intake for Métis adults. Teens appear to be less likely than adults to report eating vegetables and fruit fewer than five times daily, although this difference is not statistically significant for Métis.

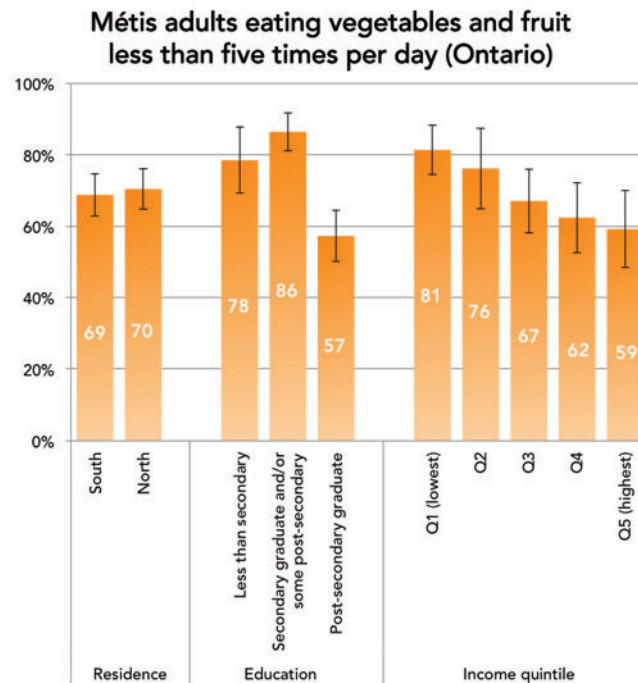


### Geography, education, income

The proportion of the Métis population eating fewer than five servings of vegetables and fruit daily is the same for Métis adults living in northern and southern Ontario — 70% and 69% respectively.

Métis adults who have graduated from a post-secondary program are significantly more likely than their peers with lower levels of education to eat at least five servings of vegetables and fruit daily.

Across quintiles of income, Métis who have the lowest levels of income are the most likely to eat an inadequate number of vegetables and fruit.



I represent 95% confidence intervals.  
 Source: Canadian Community Health Survey, 2007–2012 (Statistics Canada).

## BODY WEIGHT: OVERWEIGHT AND OBESITY

Individuals become overweight or obese when energy intake (diet) exceeds energy expenditure (physical activity), resulting in an accumulation of excess body fat that can be harmful to health. Body fatness is typically measured using a metric called the body mass index (BMI) that is calculated by dividing weight in kilograms by height in metres squared. BMIs are classified into four broad categories using the following cut-offs:<sup>49</sup>

BMI	CATEGORY
< 18.00	Underweight
18.00-24.99	Normal
25.00-29.99	Overweight
30.00	Obese

Studies have shown that, when surveyed, teens and adults tend to overestimate their height and underestimate their weight.<sup>50-53</sup> As a result, BMI calculated from self-reported height and weight is likely to be underestimated. Therefore, prevalence estimates for overweight and obesity presented in this report may be less than the true values.

Being overweight and/or obese increases the risk of cancers of the esophagus, colon, rectum, pancreas, breast (post-menopausal), endometrium and kidney, and probably increases the risk of cancers of the gallbladder, ovary and prostate.<sup>31,40,47</sup> Risk of cancer rises with increasing BMI, even within the normal range.<sup>31,40,47</sup> Accordingly, experts recommend that one should “be as lean as possible within the normal range of body weight” to reduce cancer risk.<sup>31</sup>

**Over 2,500 new cases of cancer diagnosed in Ontario in 2010 were estimated to be attributed to being overweight or obese (4% of all new cases).**

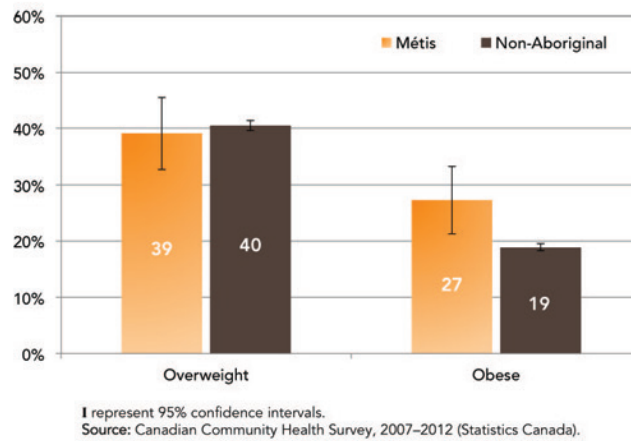
### Overweight and obesity in adults

Métis and non-Aboriginal Ontarians (both males and females) are equally likely to be classified as overweight. In both groups, approximately 40% of males and nearly 30% of females are considered overweight.

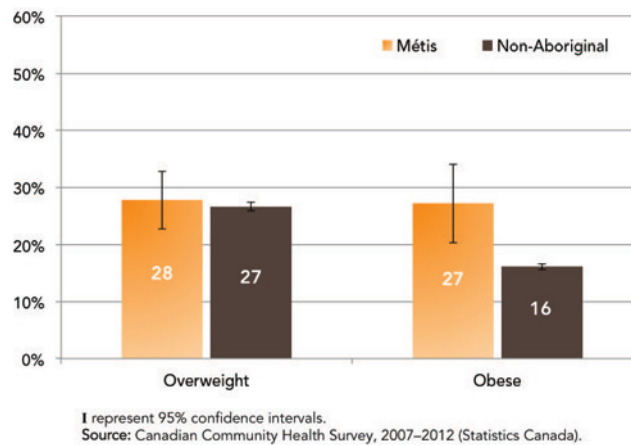
Métis males and females, however, are significantly more likely than their non-Aboriginal peers to be classified as obese.

Métis males, non-Aboriginal males and non-Aboriginal females are more likely to be overweight than obese. Similar proportions of Métis females are overweight (28%) or obese (27%).

### Overweight or obese adult males (Ontario)



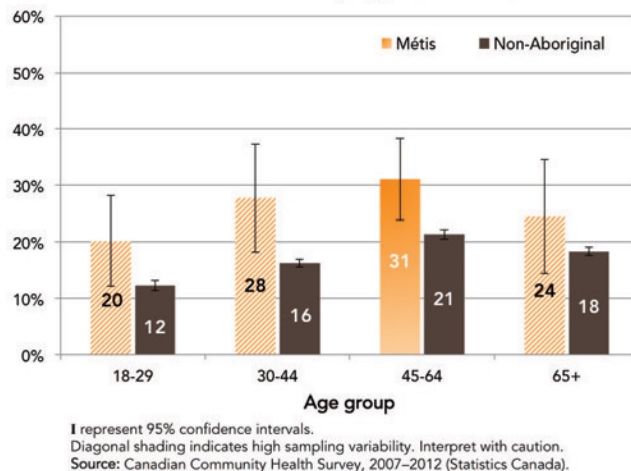
### Overweight or obese adult females (Ontario)



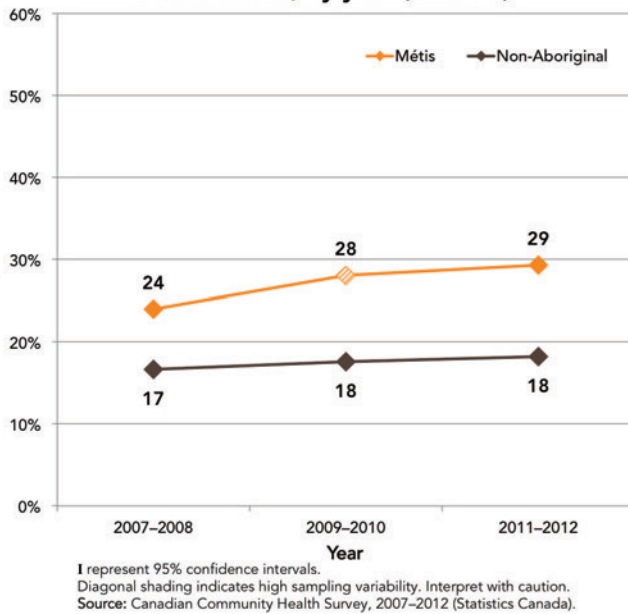
### Age differences

Métis adults are more obese than non-Aboriginal adults across all age groups. The percentage of Métis and non-Aboriginal adults who are classified as obese varies by age. Those aged 45–64 years appear to have the highest prevalence of obesity, with nearly one-third (31%) of Métis adults in this age group classified as obese. Age-specific estimates for Métis adults should, however, be interpreted with caution because of small sample sizes.

### Obese adults, by age (Ontario)



### Obese adults, by year (Ontario)

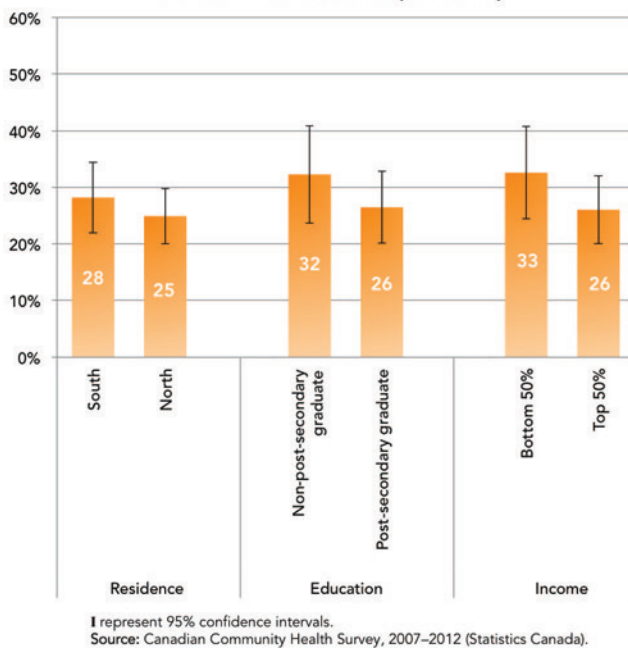


### Changes over time

While the trend among Métis shown here is not statistically significant and should be interpreted with caution due to high sampling variability, it appears that the prevalence of obesity is increasing at a faster rate among the Métis population compared to the general population.

Looking over a longer time period, there has been a steadily increasing prevalence of obesity in the general Ontario population.<sup>6,54</sup>

### Obese Métis adults (Ontario)



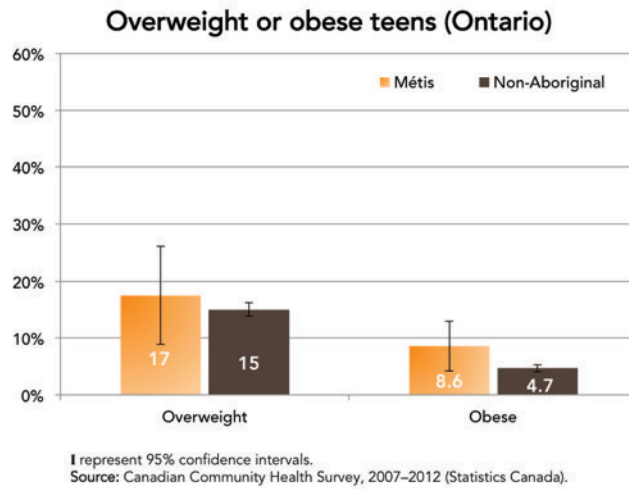
### Geography, education, income

The prevalence of obesity among Métis adults appears to be slightly higher among those with secondary education or less, and among those with lower incomes.

There are similar rates of obesity among Métis in the north and south, unlike among the non-Aboriginal population, where adults in the north are considerably more likely to be obese (data not shown).

### Overweight and obesity in teens

Compared to Métis adults, fewer Métis teens are overweight and obese. However, the higher prevalence of obesity among Métis people persists, with 9% of Métis youth classified as obese compared to 5% of their non-Aboriginal peers. The difference, however, is not statistically significant.



Children and adolescents who are obese are more likely to be obese in adulthood, increasing their risk for adult health problems, including cancer.

## ACTIVE LIVING

A healthy, active lifestyle maximizes physical activity and minimizes sedentary behaviour. Physical activity is defined as any body movement that uses skeletal muscles. Physical activity can occur at work, at home, as a form of transportation and during recreation or leisure. The health benefits of physical activity will depend on the frequency, duration and intensity of the activity.<sup>31</sup>

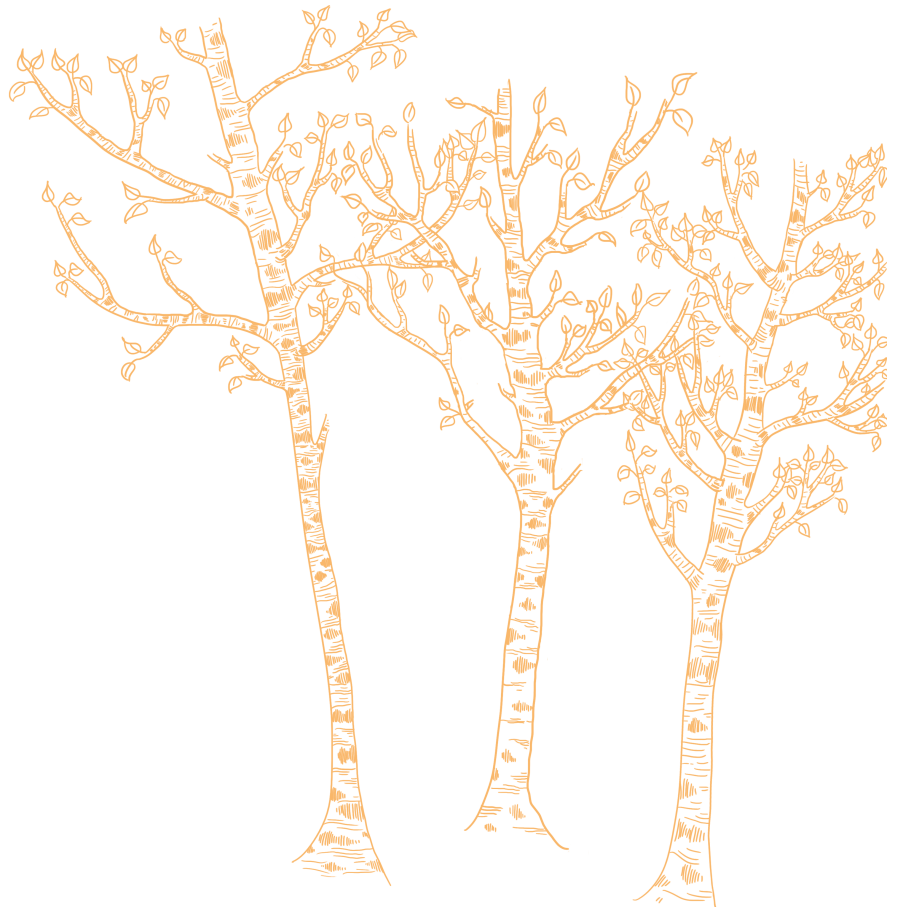
Sedentary activities are those involving prolonged sitting, reclining or lying down (e.g. watching television or using a computer). Sedentary behaviour and physical activity are related, since they both concern the presence or absence of body movement, but they are separate behaviours with distinct health consequences. Physically active individuals may also be considered sedentary if the majority of time outside their participation in physical activity is spent in a sedentary state.

### **Physical (in)activity**

Physical activity improves overall health, decreases the risk of many chronic diseases, and helps to maintain a healthy body weight. Regular physical activity reduces the risk of colorectal cancer, and probably reduces the risk of endometrial cancer and post-menopausal breast cancer.<sup>31,40,47,55</sup> Studies show a dose-response relationship between physical activity and cancer risk; the higher the level of physical activity, the lower the risk.<sup>55</sup>

Because this report focuses on risk, data on the inverse of physical activity - i.e. physical inactivity are presented.

The inactivity indicator is derived based on respondents' reports of frequency, duration and intensity of physical activities during their recreation or leisure time in the months preceding the survey. If the energy expended during the reported physical activity was equivalent to 30 minutes or less of light walking per day, respondents are considered inactive.<sup>56</sup>



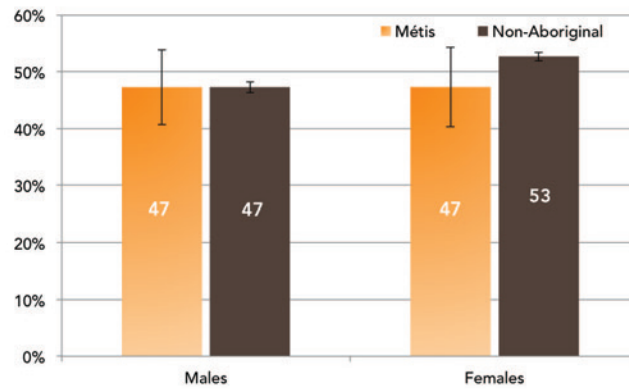
### Prevalence of inactivity

Nearly half of all Métis adults are inactive. A similar proportion of non-Aboriginal Ontarians are inactive.

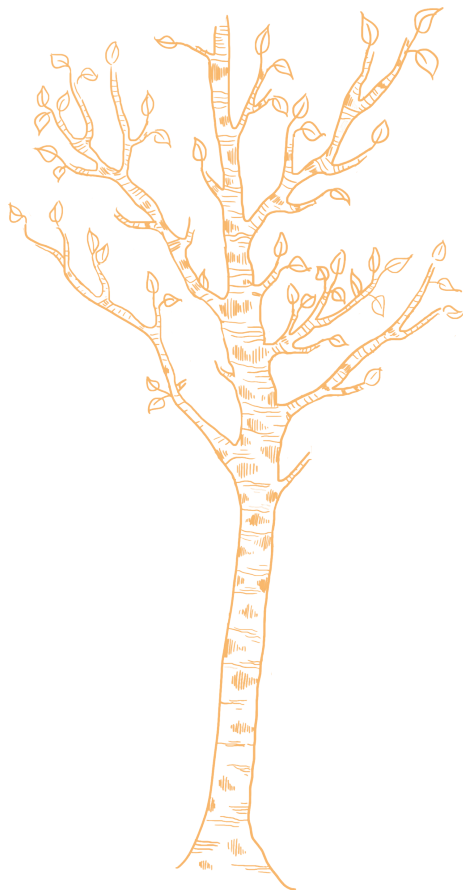
Métis females are just as likely to be inactive as Métis males, whereas in the non-Aboriginal population, females are significantly more likely to be inactive compared to males.

Métis and non-Aboriginal males are equally likely to be inactive – 47% for both – whereas Métis females are less inactive than their non-Aboriginal counterparts (47% compared to 53%, although the difference is not statistically significant).

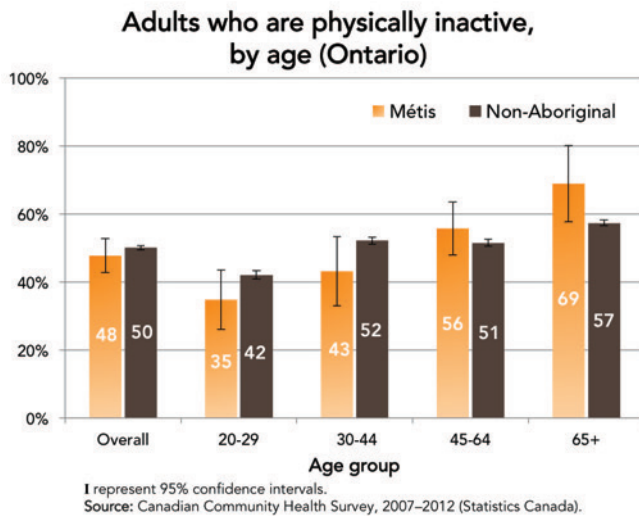
### Adults who are physically inactive (Ontario)



I represent 95% confidence intervals.  
Source: Canadian Community Health Survey, 2007–2012 (Statistics Canada).



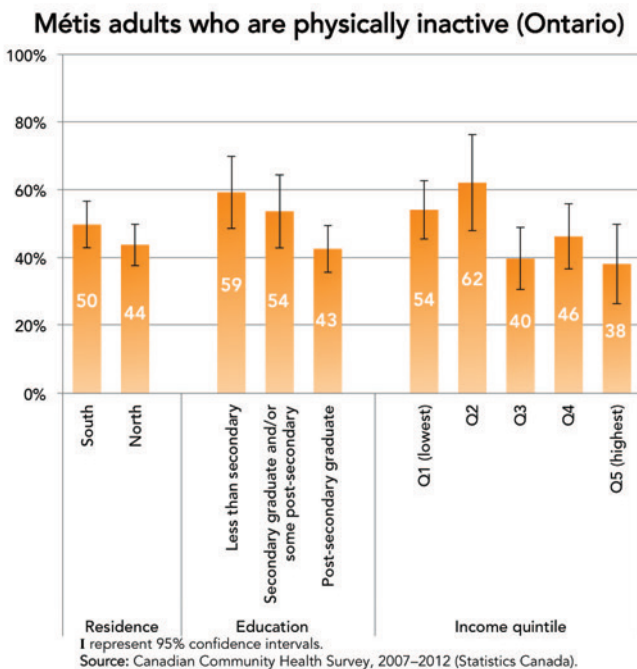




### Age differences

Older Métis adults are more likely to be inactive than their younger counterparts. Only 35% of Métis adults are inactive in their 20s, whereas nearly 69% of Métis aged 65 years and older are inactive. This finding could be related to the debilitating effects of chronic disease, such as diabetes, heart disease and respiratory disease, and the relatively high rates of these diseases and conditions among older adult Métis.

Compared to their non-Aboriginal peers, Métis adults under age 45 are less inactive; however, after age 45, Métis adults appear to be more inactive than non-Aboriginal Ontarians (not statistically significant).



### Geography, education, income

Métis adults with lower levels of education appear to be more inactive than Métis with higher levels of education (not statistically significant).

The pattern is less clear for physical inactivity by income level, but overall, Métis adults with lower incomes are more likely to be inactive than those with higher incomes (not statistically significant). Similar patterns of physical inactivity by education and income are observed among non-Aboriginal adults (data not shown).

## Sedentary Behaviour

Recently, focus in population health research and intervention has included the study of sedentary behaviour, now regarded as a risk factor for many negative health outcomes.<sup>57,58</sup> While the exploration of the specific relationship between sedentary behaviour and cancer risk is relatively new, studies indicate that sedentary behaviour may increase someone's risk of colorectal, ovarian and prostate cancers. Sedentary behaviour is thought to contribute to cancer risk through its effects on body fatness.<sup>61</sup>

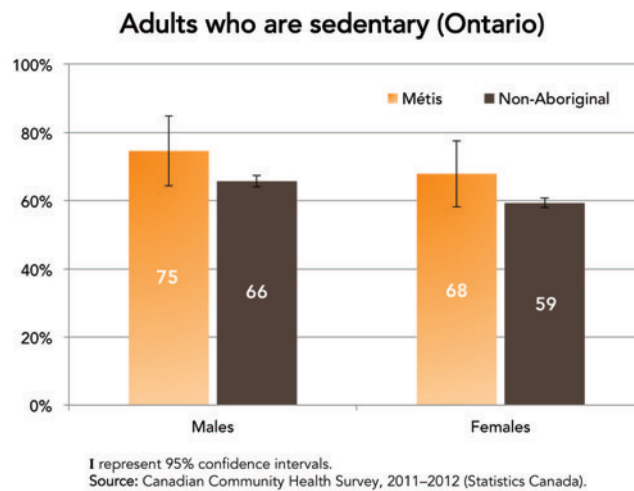
The measure of sedentary behaviour used in this report refers to the amount of time spent in states of low energy use.<sup>59</sup> Respondents are considered sedentary if they spend more than 14 hours per week in front of a screen (e.g. watching television, playing video games or using a computer) outside of school or work. Screen time has been shown to carry more health risks than non-screen sedentary behaviours, such as reading.<sup>60</sup>

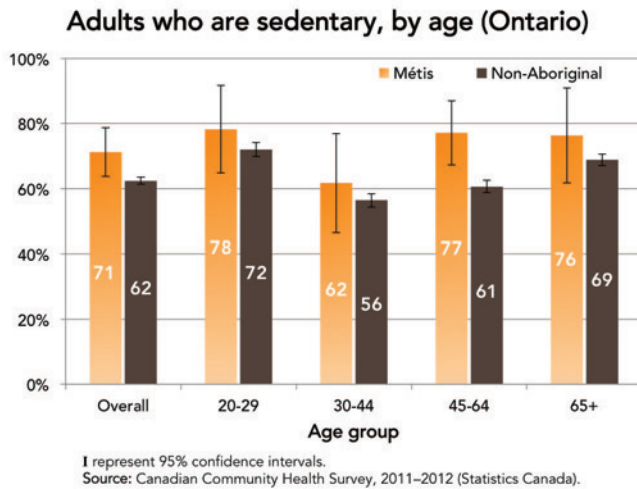
## Prevalence of sedentary behaviour

Nearly three-quarters of Métis adults are considered sedentary, spending more than 14 hours per week in front of a screen during their leisure time. Métis males and females are more sedentary than non-Aboriginal adults; however, the differences are not statistically significant.

For Métis and non-Aboriginal Ontarians, males are more sedentary than females; however, the gender difference is significant only among non-Aboriginal adults.

Being sedentary is distinct from physical inactivity and refers to prolonged periods of sitting or lying down.

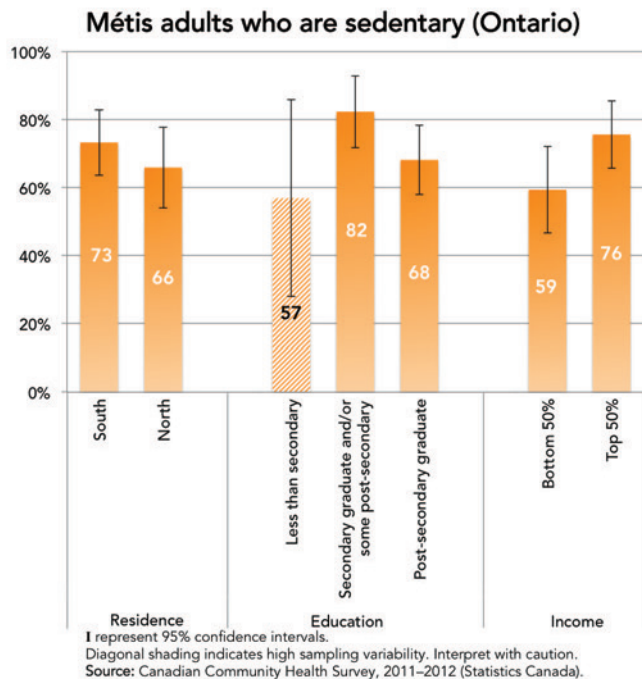




### Age differences

Métis adults aged 20–29 years are the most sedentary, while those aged 30–44 years are the least sedentary, although the difference between the two age groups is not statistically significant for Métis. The prevalence of sedentary behaviour remains relatively constant after aged 45 years for Métis adults. Among non-Aboriginal Ontarians, however, individuals aged 65 years and older are significantly more sedentary than those aged 45–64 years. Métis teens are slightly less sedentary than non-Aboriginal teens (64% vs. 71%); however, the difference is not statistically significant (data not shown).

Unlike the relationship that was seen between physical activity and age, which shows increasing inactivity with increasing age, there is no clear relationship between sedentary behaviour and age. This underscores the complexity of the relationship between sedentary behaviour and physical (in)activity, and that the two concepts do not lie at either end of a single continuum.



### Geography, education, income

Métis individuals with higher income levels appear to be more sedentary than those with lower levels of income (not statistically significant).

# CANCER SCREENING



Evidence currently indicates that population-wide screening for colorectal, breast and cervical cancer saves lives.<sup>61,63</sup> Screening is done on people who do not have any cancer symptoms (asymptomatic). The purpose of cancer screening is to detect pre-cancerous changes or cancer at an early stage when there is a better chance of successful treatment.

Screening tests must be repeated at the recommended intervals to be effective.

## **Ontario's cancer screening programs**

Cancer Care Ontario coordinates province-wide screening for colorectal, breast and cervical cancers, and is moving towards fully organized and integrated screening for all three cancers to improve effectiveness. Organized screening involves activities such as sending letters to eligible Ontarians inviting them to be screened, providing them with their screening results and recommendations, and reminding them when follow-up action is needed; supporting primary care physicians; and monitoring and improving quality across all parts of the screening system.

**Screening for breast, cervical and colorectal cancer saves lives. Cancer screening detects pre-cancerous changes or cancer at an early stage when there is a better chance of treating it successfully.**

## **COLORECTAL CANCER SCREENING**

### **Colorectal cancer in Ontario**

Colorectal cancer was the fourth most commonly diagnosed cancer in Ontario in 2010 and the second leading cause of cancer death.<sup>64</sup> In 2014, an estimated 8,900 Ontarians were diagnosed with colorectal cancer and 3,400 died of the disease.<sup>1</sup>

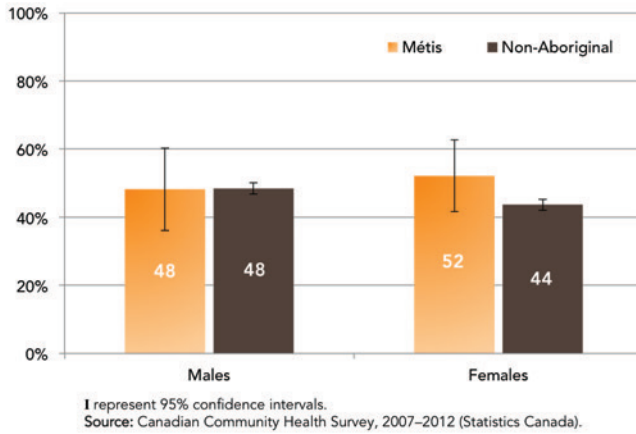
The five-year relative survival for colorectal cancer is about 67% in Ontario,<sup>1</sup> although this varies considerably depending on stage at diagnosis. An individual with colorectal cancer has a 90% chance of being cured if the cancer is caught early. The likelihood of curing colorectal cancer decreases to 12% if detected at later stages.<sup>65</sup>

### **ColonCancerCheck: Ontario's colorectal cancer screening program**

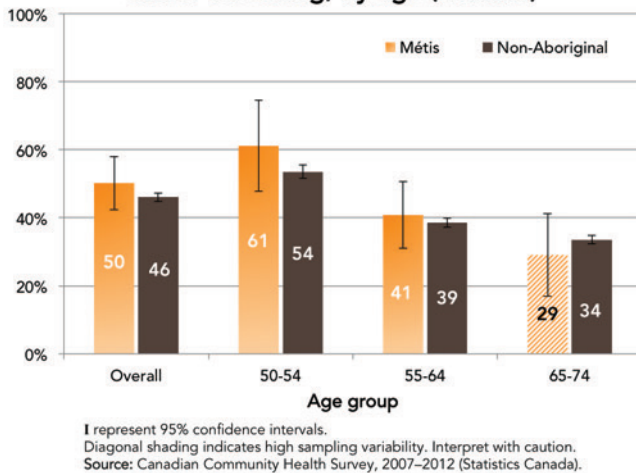
Jointly run by Cancer Care Ontario and the Ontario Ministry of Health and Long-Term Care, ColonCancerCheck was launched in 2008 as a fully organized screening program. Ontario was the first jurisdiction in Canada to introduce a province-wide screening program for colorectal cancer. Colorectal cancer screening can identify a cancer early, when it can usually be successfully treated and chance of survival is good.

**ColonCancerCheck recommends Ontarians aged 50–74 years without a family history of colorectal cancer (average risk) screen for the disease with an at-home test, the fecal occult blood test (FOBT), once every two years.**

### Adults aged 50–74, overdue for colorectal cancer screening (Ontario)



### Adults aged 50–74, overdue for colorectal cancer screening, by age (Ontario)



### Colorectal cancer screening status

Fifty percent of Métis adults aged 50–74 (48% of males and 52% of females) are overdue for (or need) colorectal cancer screening because they have not had a recent test to detect colorectal cancer or pre-cancer — a fecal occult blood test (FOBT), flexible sigmoidoscopy or colonoscopy (done for either screening or diagnostic indications) — compared to 46% of non-Aboriginal Ontarians (not statistically significant).

There is no difference between Métis and non-Aboriginal males (48% for both), but a greater percentage of Métis females compared to non-Aboriginal females are overdue for colorectal cancer screening (52% compared to 44%), although the difference is not statistically significant.

### Age differences

In general, Ontarians aged 50–54 years are more likely to be overdue for screening compared to older adults aged 55 years and older. The proportion of Métis aged 50–54 overdue for colorectal cancer screening is particularly high at 61%.

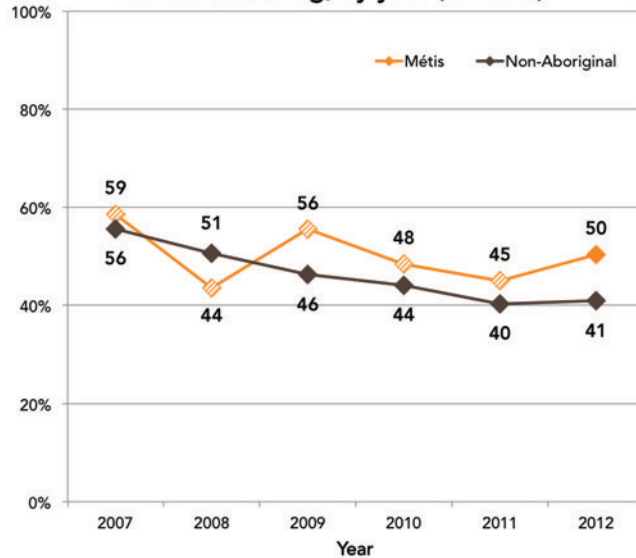
**Colonoscopy is recommended for those at increased risk due to a family history of one or more first-degree relatives (parent, sibling or child) with a diagnosis of colorectal cancer, starting at age 50, or 10 years before the age their relative was when diagnosed, whichever occurs first.**

### Time trends

Fewer Métis adults needed to be screened for colorectal cancer in 2012 than in 2007 (50% vs. 59%), although the difference was not statistically significant). A 15% drop (statistically significant) is found for non-Aboriginal Ontarians over the same time period.

The decline in the percentages of Métis and non-Aboriginal adults who are overdue for colorectal cancer screening may be attributable, at least in part, to the introduction and promotion in 2008 of Colon-CancerCheck, Ontario’s province-wide program for colorectal cancer screening.

Adults aged 50–74, overdue for colorectal cancer screening, by year (Ontario)



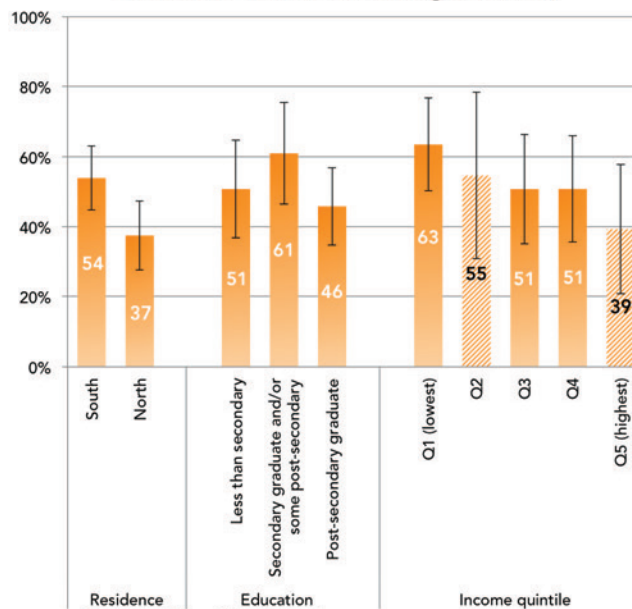
Diagonal shading indicates high sampling variability. Interpret with caution. Source: Canadian Community Health Survey, 2007–2012 (Statistics Canada).

### Geography, education, income

More Métis adults residing in the south need to be screened for colorectal cancer (not statistically significant). The same pattern is seen for non-Aboriginal Ontarians (data not shown).

There is a gradient with income quintile showing that those who have the lowest income are also the most likely to be overdue for screening. This gradient is observed among non-Aboriginal Ontarians, as well (data not shown).

Métis adults aged 50–74, overdue for colorectal cancer screening (Ontario)



I represent 95% confidence intervals. Diagonal shading indicates high sampling variability. Interpret with caution. Source: Canadian Community Health Survey, 2007–2012 (Statistics Canada).



## BREAST CANCER SCREENING

The Ontario Breast Screening Program recommends that women aged 50–74 years who are at average risk for breast cancer have a screening mammogram every two years.

### Breast cancer in Ontario

Breast cancer is the most common cancer in women and is the second leading cause of cancer deaths in females in Ontario. In 2014, an estimated 9,500 Ontario women were diagnosed with breast cancer and 1,950 died of the disease.<sup>1</sup> Most females diagnosed with breast cancer have no family history of the disease.

The five-year relative survival for breast cancer is 88%.<sup>1</sup> When breast cancer is diagnosed at an early stage, there are generally more treatment options available, better treatment outcomes and higher survival rates.<sup>62</sup>

### The Ontario Breast Screening Program

The Ontario Breast Screening Program (OBSP) began in 1990 and through its organized approach, has provided more than five million screens to over 1.4 million Ontario women aged 50 and over. About 75% of screening mammograms in Ontario women aged 50-74 are performed through the OBSP.<sup>64</sup>

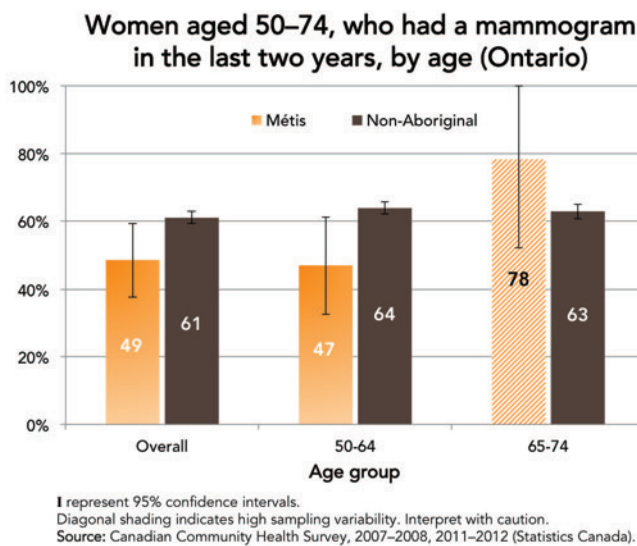
### Breast cancer screening status

Only 49% of Métis women aged 50-74 years have had a mammogram in the previous two years, compared to 61% of non-Aboriginal women. This is a striking difference, but not statistically significant.

### Age differences and time trend

The gap between Métis and non-Aboriginal women is especially large among women aged 50-64, where only 47% of Métis women compared to 64% of non-Aboriginal women were screened. While the opposite is seen for women aged 65-74, where more Métis than non-Aboriginal women had a mammogram in the past two years, the numbers must be interpreted with caution due to high sampling variability.

Breast cancer screening rates did not change between 2007 and 2012 for either population (data not shown).



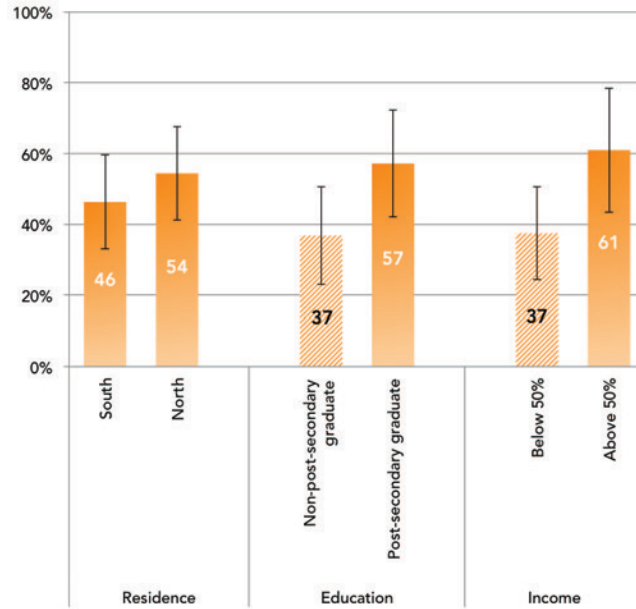


### Geography, education, income

Screening participation is greatest in the north and among women who are more highly educated and have a higher income, although none of these differences are statistically significant. While the same patterns are seen with education and income in non-Aboriginal women, there is no north-south difference (data not shown).

The Ontario Breast Screening Program also recommends that women aged 30–69 years who are at high risk for breast cancer be screened annually with mammography and breast MRI (magnetic resonance imaging).

Métis women aged 50–74, who had a mammogram in the last two years (Ontario)



I represent 95% confidence intervals.  
Diagonal shading indicates high sampling variability. Interpret with caution.  
Source: Canadian Community Health Survey, 2007–2008, 2011–2012 (Statistics Canada).

## CERVICAL CANCER SCREENING

**Cervical cancer is almost entirely preventable with regular screening, appropriate and timely follow-up of abnormal results, and human papillomavirus (HPV) immunization.**

**The Ontario Cervical Screening Program recommends cervical screening for women aged 21–69 every three years if they are or have ever been sexually active.**

### Cervical cancer in Ontario

In 2014, approximately 630 women were diagnosed with cervical cancer in Ontario and about 150 women died from the disease.<sup>1</sup> Worldwide, the cervical cancer burden is high: it is the fourth most common cancer in females and afflicts over half a million women annually. In Ontario, cervical cancer is mainly diagnosed in women in their mid-30s and older, which means that the disease or its precursors may occur before childbearing is complete.

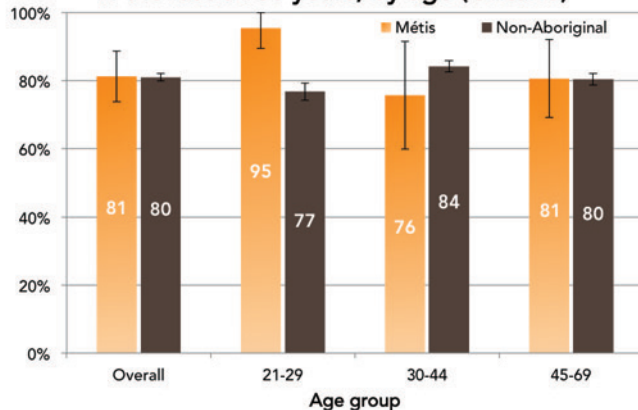
Incidence and mortality rates for cervical cancer have declined substantially over the past 50 years in Ontario, likely in large part due to widespread screening with the Pap test. Most cervical cancers are diagnosed in women who have never been adequately screened.

### The Ontario Cervical Screening Program

The Ontario Cervical Screening Program (OCSP) started in 2000 as a province-wide initiative to reduce the incidence and mortality of cervical cancer.

Because cervical cancer screening detects cancer precursors that can be treated so that cancer does not occur, cervical cancer is almost entirely preventable with regular screening, appropriate and timely follow-up of abnormal Pap test results and, more recently, human papillomavirus (HPV) immunization.

**Women aged 21–69, who had a Pap test in the last three years, by age (Ontario)**



† represent 95% confidence intervals.  
Source: Canadian Community Health Survey, 2008, 2011–2012 (Statistics Canada).

### Cervical cancer screening status

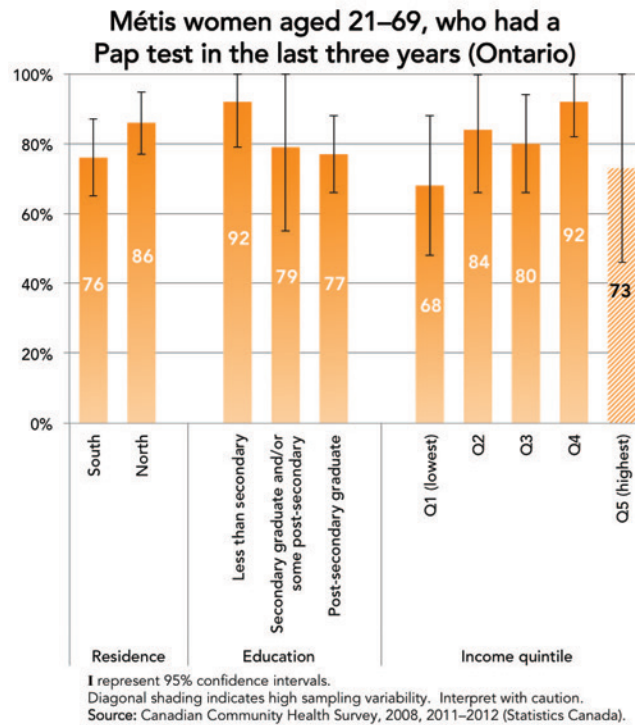
Most Métis women — 81% — have had a Pap test in the last three years, as recommended. There is no difference between Métis and non-Aboriginal women. The highest screening rates are for Métis women aged 21-29 years, with lowest rates in the 30-44 age group. It is important to maintain high levels of screening at older ages when a diagnosis of cervical cancer is more likely.<sup>66</sup>

Screening rates did not change between 2007 and 2012 in either Métis or non-Aboriginal women (data not shown).

### Geography, education, income

Fewer Métis women in the south than those in the north have had a Pap test in the last three years, although the difference is not statistically significant. The lowest screening rate is among Métis women in the lowest income quintile, where only 68% have had a recent Pap test.

Note: Screening rates shown here may differ considerably from those reported elsewhere, such as in the Ontario Cervical Screening Program 2012 Report,<sup>66</sup> likely due to methodological differences. Studies in Ontario have consistently found screening rates to be overestimated using self-reported measures compared to administrative health records, possibly due to a tendency for people to over-report their screening history.<sup>67,68</sup>





# CONCLUSIONS AND IMPLICATIONS

These data clearly demonstrate that the Métis community would benefit from interventions that educate and help raise awareness of the broader risk factors for cancer, especially smoking, and from culture-based programming that supports and encourages healthy behaviour and lifestyle changes to reduce cancer risk.

## TOBACCO USE

The high rates of smoking and exposures to second-hand smoke in the provincial Métis population are especially disturbing. Because it generally takes 20 or more years for tobacco-related cancers to develop and because many of these cancers are hard to treat effectively, the impact of current smoking will continue well into the future, and we can expect increasing numbers of new diagnoses and deaths.

Immediate action is therefore required to break this pattern and should include: culture-based interventions to prevent the uptake of smoking, especially among Métis children and youth; system supports for smoking cessation programming for Métis populations; and, targeted policies and programs to foster and increase smoke-free environments, including in public and private spaces. When enacted together as part of a comprehensive smoke-free strategy, this will have the largest positive impact on cancer burden for Métis people. Successful actions will almost certainly result in measurable benefits well beyond reduced cancer by decreasing cardiovascular and chronic respiratory diseases. Given that the risk of cancer declines over time after quitting, and that many of the other health benefits are more immediate, interventions that target individuals and families at all stages along the smoking continuum — from those who have never smoked but who are at increased risk, to those who have smoked for many years and who wish to quit and are looking for support to do so — are needed. All have the potential to benefit from such interventions, as does the health care system overall.

## OTHER CANCER RISK FACTORS AND CANCER SCREENING

With respect to alcohol, internationally-recognized cancer prevention guidelines advocate avoiding alcohol as the best strategy, especially for women. However, for those who decide to consume alcoholic beverages, the guidelines recommend that males consume fewer than two and females less than one drink per day, on average. Métis adults are more likely to exceed these guidelines and are more likely to smoke and drink, compared to non-Aboriginal Ontarians. This pattern is of particular concern.

Excess weight, diet and physical activity are inter-related. When energy intake from diet routinely exceeds energy expenditure from physical activity and other processes, excess body fat will result. They therefore must be considered together in intervention strategies. Certainly the high rates of obesity among Métis adults — rates that continue to increase over time — are of major concern, and wholistic interventions targeting changes to diet and physical activity and promoting healthy active living should be a priority.

Screening for breast, colorectal and cervical cancer can save lives. Strategies to improve uptake of screening in Métis men and women will improve future cancer outcomes through earlier diagnosis. Promoting cancer prevention and early detection and diagnosis would seem to be especially important for Métis populations who appear to be entering the health care system later in the progress of many chronic diseases and conditions, and thereby are at increased risk of worse health outcomes over the longer term.<sup>20-21</sup>

## A SYSTEMIC, MULTIFACTORIAL, AND CULTURALLY SENSITIVE APPROACH TO PREVENTION

A systemic approach to risk reduction — one which includes culture-based strategies to increase rates of cancer screening in the Métis provincial population — is likely to be the most effective in reducing cancer risk and incidence. Targeting individual behaviour change without providing the required supports to enable that change is unlikely to have any real or long-lasting impact on risk and future health outcomes. Specific social, cultural, geographical and other determinants need to be better understood in the Métis population. Because all risk factors occur with greater frequency in more socio-economically disadvantaged sectors of society — for example, Métis with lower incomes, fewer resources, and limited access to educational and employment opportunities — these individuals and families will be more adversely affected by the future burden of cancer. These disadvantaged sectors are also less likely to get the recommended cancer screening. Therefore, social and economic factors need to be proactively identified and taken into full account when designing and implementing interventions to reduce individual risk behaviours, such as smoking, alcohol consumption and poor dietary habits, and to increase uptake of screening.

Geography is another important issue for the many Métis people living in smaller urban centres or rural environments in Ontario. Recent research on chronic disease in the Ontario Métis population showed that Métis citizens are less likely than non-Aboriginal Ontarians to access family physicians and specialist care. They are also more likely to use emergency care services for the treatment of chronic diseases and conditions.<sup>19-21</sup> These findings are consistent with verbal reports from Métis cancer

patients of challenges experienced in accessing treatment and other services locally. Improving access to upstream resources and services such as prevention supports, diagnostics, screening and local access to treatments will be critical in any system-level intervention designed to reduce cancer risk and improve Métis health outcomes.

Multi-stage interventions that are wholistic in nature and which target multiple risk factors (e.g. smoking and alcohol consumption) may also be required to effectively reduce cancer risk. Family-based interventions that are framed within the very community and family-centred Métis way of life are those that will be most likely to resonate with the Métis people.

## THE NEED FOR DATA

The lack of Métis health data remains an ongoing challenge in our attempts to better understand and reduce cancer risk and burden in the Ontario Métis population. Métis-specific data are needed for tracking and monitoring cancer disease rates and outcomes, improving our understanding of key health determinants, and in assessing the impacts of interventions designed to reduce risk and disease rates in this vulnerable population. In this context, we recommend the inclusion of Métis identifiers and ensuring sufficient Métis samples in any research pertaining to Aboriginal health, become standard practice. These cultural distinctions also need to be reflected in the design of health policy and programming for Métis, First Nations and Inuit populations.

## CALL TO ACTION

- Immediate action must be taken to reduce commercial tobacco use among Métis Ontarians. Current rates of smoking constitute a major threat to the future health of the Métis people in this province.
- Reducing the high — and rising — rates of obesity in Métis adults must be a priority. Obesity increases the risk not only of cancer but also of several other serious chronic diseases, such as diabetes and cardiovascular disease.
- Obesity cannot be treated in isolation. Interventions must acknowledge the complex interrelationships between excess body weight, diet, physical activity and other lifestyle behaviours, such as smoking, as well as social determinants.
- Interventions must include system-level supports that take into account the increased risks evident among the more economically disadvantaged sectors of society. Individuals in these sectors are the most likely to experience high rates of risk factors and of the associated chronic diseases, and at the same time, are typically less likely to have the supports in place required for healthy living and sustainable behaviour change.
- Much more information on the health of the Métis people of Ontario is needed. The lack of Métis-specific health data continues to hamper our collective ability to accurately determine and effectively address chronic disease prevention priorities in this at-risk population.

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## APPENDIX A: ACRONYMS

ACS	Aboriginal Cancer Strategy
AICR/WCRF	American Institute for Cancer Research/ World Cancer Research Fund
BMI	Body Mass Index
CCO	Cancer Care Ontario
CCHS	Canadian Community Health Survey
CV	Coefficient of Variation
FNIM	First Nations, Inuit and Métis
FOBT	Fecal Occult Blood Test
IARC	International Agency for Research on Cancer
LHIN	Local Health Integration Networks
MNO	Métis Nation of Ontario
OBSP	Ontario Breast Screening Program
OCSP	Ontario Cervical Screening Program
WHO	World Health Organization

## APPENDIX B: DATA SOURCES

### **Canadian Community Health Survey (CCHS)**

The Canadian Community Health Survey (CCHS), administered by Statistics Canada, is a population-based survey that contains questions on health status, healthcare utilization, and health determinants for the Canadian population aged 12 years and older living in all provinces and territories. People living on Indian Reserves and Crown Lands, institutional residents, full-time members of the Canadian Forces and residents of some remote regions are not surveyed. The CCHS is representative of 98% of the Canadian population aged 12 and older.

The CCHS began in 2000/01. Two survey waves followed in 2003 and 2005. Approximately 39,000 Ontario respondents were sampled in each cycle. Annual survey waves began in 2007 with approximately 20,000 Ontario respondents included in each wave. For this report, only the CCHS 2007-2012 annual waves were used due to the consistency of the Aboriginal identity questions posed during these survey years.

This report uses the CCHS Ontario Share Files, which include all respondents who have agreed to share their data with the Ontario Ministry of Health and Long-Term Care.

### **Ontario Cancer Registry**

The Ontario Cancer Registry (OCR) is operated by Cancer Care Ontario under the authority of the Cancer Act of Ontario and the Personal Health Information Protection Act (PHIPA) of Ontario. Data from the OCR includes information about all newly diagnosed cases of invasive neoplasia, except for basal cell and squamous cell skin cancers, in Ontario residents. Major sources of cancer data are:

- Cancer-related hospital discharge and day surgery records from the Canadian Institute for Health Information
- Cancer-related pathology reports, received mostly electronically from hospital and community laboratories
- Consultation and treatment records of patients referred to one of 14 Regional Cancer Centres
- Death certificates with cancer identified as the underlying cause of death, received from the Ontario Registrar General

The OCR was used to obtain the numbers of new cases of cancer and the annual incidence rates of cancers diagnosed between 1985 and 2009. The annual incidence rate is the number of new cases of cancer diagnosed in a given year per 100,000 Ontarians residing in the province that year.

## APPENDIX C: RISK FACTOR AND SCREENING INDICATOR DEFINITIONS

For all indicators, non-respondents (“don’t know,” “refusal” or “not stated” responses) were excluded from the analysis (i.e., from both numerators and denominators, where appropriate).

### TOBACCO SMOKING

For more detailed descriptions of how most of these indicators were calculated, please refer to *Cancer Risk Factors in Ontario: Tobacco*.<sup>1</sup> All smoking indicators are based on survey years 2007-2012, unless otherwise noted.

#### CURRENT SMOKING

**Definition:** Percentage of adults aged 20 years and older (or teens aged 12–19 years) who report smoking cigarettes daily or occasionally.

Survey Questions:

- At the present time, do you smoke cigarettes daily, occasionally or not at all?

#### FORMER SMOKING

**Definition:** Percentage of adults aged 20 years and older who do not smoke cigarettes at the present time, but have smoked at least 100 cigarettes in their lifetime.

Survey Questions:

- In your lifetime, have you smoked a total of 100 or more cigarettes (about four packs)?
- At the present time, do you smoke cigarettes daily, occasionally or not at all?

#### SMOKING ABSTINENCE

**Definition:** Percentage of teens aged 12–19 years who have never smoked a whole cigarette.

Survey Questions:

- Have you ever smoked a whole cigarette?

#### CIGARETTES SMOKED DAILY

**Definition:** Median number of cigarettes smoked per day among adults aged 20 years and older who are current daily smokers.

Survey Questions:

- At the present time, do you smoke cigarettes daily, occasionally or not at all?
- How many cigarettes do you smoke each day now?

#### STAGES OF CHANGE FOR QUITTING SMOKING

This indicator was not included in *Cancer Risk Factors in Ontario: Tobacco* so a more complete description is provided here. It is based on survey years 2007/08.

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1 Cancer Care Ontario. *Cancer Risk Factors in Ontario: Tobacco*. Toronto, Canada, 2014.

**Definition:** Percentage of adults aged 20 years and older who are current smokers and who report that they are in the 1) Pre-contemplation stage, 2) Contemplation stage or 3) Preparation stage in terms of readiness to quit smoking (see Stages of Change table in Tobacco section for definitions of each stage).

*Survey Questions:*

- At the present time, do you smoke cigarettes daily, occasionally or not at all?
- Are you seriously considering quitting smoking within the next six months?
- Are you seriously considering quitting within the next 30 days?
- In the past 12 months, did you stop smoking for at least 24 hours because you were trying to quit?
- How many times in the past 12 months did you stop smoking for at least 24 hours because you were trying to quit?

### **QUITTERS (LONG-TERM QUIT RATIO)**

**Definition:** Percentage of ever-smoking adults aged 20 years and older who quit smoking at least one year ago.

*Survey Questions:*

- In your lifetime, have you smoked a total of 100 or more cigarettes (about four packs)?
- At the present time, do you smoke cigarettes, daily, occasionally or not at all?
- When did you stop smoking [and] how many years ago was it?

### **SECOND-HAND SMOKE EXPOSURE**

**Definition:** Percentage of non-smoking adults aged 20 years and older (or teens aged 12-19 years) who are regularly exposed to second-hand smoke in their home, in a vehicle or in a public place (e.g. bar, restaurant, shopping mall, arena).

*Survey Questions:*

- Including both household members and regular visitors, does anyone smoke inside your home every day or almost every day?
- In the past month, were you exposed to second-hand smoke every day or almost every day in a car or other private vehicle?
- In the past month, were you exposed to second-hand smoke every day or almost every day in public places (e.g. bars, restaurants, shopping malls, arenas, bingo halls, bowling alleys)?

## **ALCOHOL**

For more detailed descriptions of how these indicators were calculated, please refer to *Cancer Risk Factors in Ontario: Alcohol*.<sup>2</sup> All alcohol indicators are based on survey years 2007–2012.

### **EXCEEDING DRINKING GUIDELINES FOR CANCER PREVENTION**

**Definition:** Percentage of adults aged 19 years and older who consume more alcohol, on average, than specified in the guideline for cancer prevention (no more than two drinks per day for men and one drink per day for women).

*Survey Questions:*

- Thinking back over the past week, did you have a drink of beer, wine, liquor or any other alcoholic beverage?

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2 Cancer Care Ontario. *Cancer Risk Factors in Ontario: Alcohol*. Toronto: Queen's Printer for Ontario; 2014.



- Starting with yesterday, how many drinks did you have?

### **AVERAGE NUMBER OF DAYS PER WEEK EXCEEDING CANCER PREVENTION GUIDELINES**

**Definition:** Average number of days per week adults aged 19 years and older consume more drinks than specified in the cancer prevention guideline, among those whose average consumption exceeded it during the past week.

*Survey Questions:*

- Thinking back over the past week, did you have a drink of beer, wine, liquor or any other alcoholic beverage?
- Starting with yesterday, how many drinks did you have?

### **EXCEEDING DRINKING GUIDELINES FOR CANCER PREVENTION AND CURRENTLY SMOKING**

**Definition:** Percentage of adults aged 19 years and older who consume more alcohol than specified in the guideline for cancer prevention and who report smoking cigarettes daily or occasionally.

*Survey Questions:*

- Thinking back over the past week, did you have a drink of beer, wine, liquor or any other alcoholic beverage?
- Starting with yesterday, how many drinks did you have?
- At the present time, do you smoke cigarettes daily, occasionally or not at all?

## **HEALTHY EATING, BODY WEIGHT AND ACTIVE LIVING**

For more detailed descriptions of how these indicators were calculated, please refer to *Cancer Risk Factors in Ontario: Healthy Weights, Healthy Eating and Active Living*.<sup>3</sup> Note that teens were not included in that report. All healthy eating, body weight and active living indicators are based on survey years 2007–2012, unless otherwise noted.

### **INADEQUATE VEGETABLE AND FRUIT CONSUMPTION**

This indicator does not count potatoes as a vegetable. This indicator counts fruit juice a maximum of once per day.

**Definition:** Percentage of adults aged 20 years and older (or teens aged 12–19 years) who reported consuming vegetables and fruit less than five times per day.

*Survey Questions:*

- How often do you usually consume [a given vegetable or fruit, or fruit juice]?
- How many times per day do you usually consume [this vegetable or fruit, or fruit juice]?

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3 Care Ontario. *Cancer Risk Factors in Ontario: Healthy Weights, Healthy Eating and Active Living*. Toronto: Queen's Printer for Ontario; 2015.

## **OBESITY**

This indicator excludes women who are pregnant.

**Definition:** Percentage of adults aged 18 years and older who, based on self-reported height and weight, have a Body Mass Index (BMI) greater than or equal to 30 kg/m<sup>2</sup>.

*Survey Questions:*

- How tall are you without shoes on?
- How much do you weigh?
- Are you pregnant?

## **OVERWEIGHT**

This indicator excludes women who are pregnant.

**Definition:** Percentage of adults aged 18 years and older who, based on self-reported height and weight, have a BMI between 25 kg/m<sup>2</sup> and 29.99 kg/m<sup>2</sup>.

*Survey Questions:*

- How tall are you without shoes on?
- How much do you weigh?
- Are you pregnant?

## **ADOLESCENT OBESITY AND OVERWEIGHT**

This indicator excludes teens who are pregnant.

**Definition:** Percentage of teens aged 12–17 years who, based on self-reported height and weight, are classified as overweight or obese according to Cole et al.<sup>4</sup> BMI cut-off points for adolescents (see table on page 65).

*Survey Questions:*

- How tall are you without shoes on?
- How much do you weigh?
- Are you pregnant?

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4 Cole TJ, Bellizzi MC, Flegal KM, Dietz WH. *Establishing a standard definition for child overweight and obesity worldwide: international survey.* BMJ 2000;320:1240-3.

## Body Mass Index (BMI) cut-off points for classifying adolescents as overweight or obese

Age (years)	Overweight cut-off BMI greater than or equal to:		Obese cut-off BMI greater than or equal to:	
	Boys	Girls	Boys	Girls
12	21.22	21.68	26.02	26.67
12.5	21.56	22.14	26.43	27.24
13	21.91	22.58	26.84	27.76
13.5	22.27	22.98	27.25	28.2
14	22.62	23.34	27.63	28.57
14.5	22.96	23.66	27.98	28.87
15	23.29	23.94	28.3	29.11
15.5	23.6	24.17	28.6	29.29
16	23.9	24.37	28.88	29.43
16.5	24.19	24.54	29.14	29.56
17	24.46	24.7	29.41	29.69
17.5	24.73	24.85	29.7	29.84
18+	25	25	30	30

*Sources: Cole et al.4*

### PHYSICAL INACTIVITY

**Definition:** Percentage of adults aged 20 years and older (or teens aged 12–19 years) who are physically inactive during their leisure time.

*Survey Questions:*

- In the past three months, did you do any physical activity for leisure?
- What was the activity?
- In the past three months, how many times did you participate in the activity?
- About how much time did you spend on each occasion?

### SEDENTARY BEHAVIOUR

This indicator is based on survey years 2011/12.

**Definition:** Percentage of adults aged 20 years and older who spend more than 14 hours per week in front of a screen (television, computer and video games) during their leisure time.

*Survey Questions:*

- In a typical week in the past three months, how many hours did you usually spend:
- On a computer, including playing computer games and using the Internet?
- Playing video games on a game console or on a hand-held electronic device?
- Watching television or videos?

## CANCER SCREENING

### OVERDUE FOR COLORECTAL CANCER SCREENING

This indicator is based on survey years 2007–2012.

**Definition:** Percentage of adults aged 50–74 years who have not had a fecal occult blood test (FOBT) within the last two years AND have not had a colonoscopy or sigmoidoscopy within the last 10 years.

*Survey Questions:*

- Have you ever had an FOBT?
- When was the last time you had an FOBT?
- Have you ever had either a colonoscopy or sigmoidoscopy?
- When was the last time you had a colonoscopy or sigmoidoscopy?

### BREAST CANCER SCREENING PARTICIPATION

This indicator is based on survey years 2007/08 and 2011/12.

**Definition:** Percentage of women aged 50–74 years who report having a screening mammogram within the last two years.

*Survey Questions:*

- Have you ever had a mammogram, that is, a breast X-ray?
- Why did you have it (women included for the following reasons: family history of breast cancer, part of a regular check-up/routine screening, age and/or on hormone replacement therapy)?
- When was the last time?

### CERVICAL CANCER SCREENING PARTICIPATION

This indicator is based on survey years 2008 and 2011/12 and excludes women who have had a hysterectomy.

**Definition:** Percentage of women aged 21–69 years who have had a Pap test within the last three years.

*Survey Questions:*

- Have you ever had a Pap smear test?
- When was the last time?
- Have you had a hysterectomy?

## APPENDIX D: ANALYTIC DEFINITIONS AND METHODS

### DEFINITION: **ABORIGINAL IDENTITY: MÉTIS PEOPLE AND NON-ABORIGINAL ONTARIANS**

The Canadian Community Health Survey (CCHS) allows respondents to self-identify as Aboriginal. Those who so identify are further asked whether they are First Nations, Inuit or Métis.

As of 2011, the CCHS restricted the question about Aboriginal identity to those born in Canada, the U.S., Germany or Greenland. Therefore, in this report, we consider as “Aboriginal” only those born in one of these countries and self-identifying as Aboriginal for all survey years (2007–2012). Respondents in survey years prior to 2011 who identified as Aboriginal and were born outside these countries are grouped with “non-Aboriginal Ontarians.”

**Métis:** Respondents who were born in Canada, the U.S., Germany or Greenland, and self-identified as Métis only or as Métis plus any other Aboriginal identity.

**Non-Aboriginal Ontarians:** Respondents who did not self-identify as Aboriginal or who identified as Aboriginal but were born outside of Canada, the U.S., Germany or Greenland (in survey years prior to 2011).

### DEFINITION: **SOCIODEMOGRAPHIC CHARACTERISTICS (GEOGRAPHY, EDUCATION, INCOME)**

**Geography of residence:** CCHS respondents are classified as being “south” if their postal code of residence is within the boundaries of Local Health Integration Networks (LHINs) 1 through 12. Those with a postal code of residence in LHINs 13 and 14 (North East and North West, respectively) are considered to be “north.”

**Education:** Respondents are asked to report the highest level of education they have attained. This report generally classifies highest level of education into three categories: less than secondary school graduation, secondary school graduation or some post-secondary school, and post-secondary graduation. When counts are very small, two categories are used: secondary graduation or less and post-secondary graduation. Only respondents aged 25 years and over are included in education analyses, since there is an increased likelihood that younger respondents have yet to complete their education.

**Income:** Reported or derived household income for each respondent is adjusted for household size and community, sorted from highest to lowest and divided into five categories (quintiles) so that about the same number of Ontario households is in each category (about 20% in each). Quintile 1 includes the approximately 20% of households with lowest incomes and quintile 5 includes the approximately 20% of households with highest incomes. When counts are small, income is reported in two categories: the lowest 50% and the highest 50%. Income categories are determined based on all survey respondents. Only respondents aged 25 years and over are included in income analyses.

## METHODS: ESTIMATION FOR RISK FACTORS AND CANCER SCREENING

**Weighting:** All estimates are weighted using the sampling weights provided by Statistics Canada, adjusted to account for combining data across survey cycles. See the CCHS Annual Component User Guide for more details.<sup>5</sup>

**Age standardization:** All estimates of proportion for adults (apart from those for specific age groups) are age-standardized to the age distribution of the Ontario Aboriginal identity population (on- and off-reserve) in the 2006 census, using age groups 20–24, 25–44, 45–64 and 65+. This technique adjusts for the differing age distributions of Métis and non-Aboriginal Ontarians (Métis being younger), allowing us to compare estimates between the two populations without bias. Note that this report uses a different population for standardizing than do other risk factor reports produced by Cancer Care Ontario and therefore age-standardized estimates will differ.<sup>1-3</sup>

**Assessment of sampling variation (coefficient of variation):** The coefficient of variation (CV) is a normalized measure of dispersion or spread estimated as the ratio of the standard deviation to the mean. It is calculated for all estimates using a bootstrap technique. In keeping with Statistics Canada guidelines, estimates with a CV ranging from 16.6% to 33.3% are flagged as having high sampling variability and are to be interpreted with caution. Estimates with a CV greater than 33.3% are not reported because of extreme sampling variability.

Estimates with a CV between 16.6% and 33.3% are indicated in the graphs by hatched shading with a footnote stating that these estimates are to be interpreted with caution due to high sampling variability.

**95% confidence limits:** Confidence limits are another measure of statistical variation and are calculated using a bootstrap technique. In this report we use these to determine whether estimates differ significantly (see information on statistical significance below). Confidence limits indicate our confidence that, based on the number of persons sampled, the true parameter we are trying to estimate has been captured by our observations. Were we to repeat the survey on 100 different samples of respondents, the 95% confidence interval would encompass the true parameter value about 95 times.

We denote the confidence interval for an estimate in the graphs by a vertical bar with horizontal crosses at both ends.

**Statistical significance of differences:** In this report, we declare that a difference in two percentages is statistically significant if the 95% confidence intervals of the two estimates do not overlap. This is a conservative approach to significance testing, but non-overlapping confidence intervals indicate that it is unlikely that the difference observed between the two groups is due to chance alone.

**Statistical significance of time trends:** Trends in percentages over time were analyzed using Joinpoint regression software (v.4.1.1).<sup>6</sup> Statistical significance was determined if the trend (slope of the line) was significantly different from zero using a Monte Carlo permutation method.

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5 Statistics Canada. 2013. User Guide, Canadian Community Health Survey (CCHS) Annual component, 2012 and 2011-2012 (share file). Ottawa: Statistics Canada; 2013 Jun.

6 Joinpoint Regression Program, Version 4.1.1. Statistical Research and Applications Branch, National Cancer Institute. 2014 Aug.





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