



# Epidemiology Scan

A Review of Tobacco Indicators

February 2012

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## Abbreviations

CCHS	Canadian Community Health Survey
CI	Confidence Interval
COPD	Chronic Obstructive Pulmonary Disease
DAD	Discharge Abstract Database
MOHLTC	Ministry of Health and Long Term Care
OPH	Ottawa Public Health
OSDUHS	Ontario Student Drug Use and Health Survey
PSAH	Passive Smoking Attributable Hospitalization
PSAM	Passive Smoking Attributable Mortality
RRFSS	Rapid Risk Factor Surveillance System
SAH	Smoking Attributable Hospitalizations
SAM	Smoking Attributable Mortality
SHS	Second Hand Smoke

## Introduction

### Purpose

The purpose of this report is to highlight important trends in tobacco in the population to support Ottawa Public Health (OPH) and its partners address strategic and operation decisions. The report portrays a current view of the prevalence of tobacco-related behaviours and the inevitable morbidity and mortality and cost attributable to tobacco use and exposure to second-hand smoke. OPH Board of Health, program staff, other City departments, community partners, members of Council and concerned citizens can benefit from the findings of this report.

### Content

The following topics are included in this report:

- Smoking prevalence
- Youth smoking
- Minors' access to tobacco
- Smoking attributable mortality
- Smoking attributable hospitalizations and hospitalization costs
- Tobacco dependence
- Smoking cessation
- Exposure to second-hand smoke in public places
- Smoke-free homes
- Smoke-free vehicles

### Data Notes

Point estimates are provided with 95% confidence intervals(CI). The 95% CI includes the true value 95 times out of 100. E.g. If the point estimate for the percentage of current smokers among Ottawa residents is 14% ( $\pm 4\%$ ), then the range from 10% to 18% will contain the true population value 95% of the time. The smaller the confidence interval, the more precise the estimate.

To protect the confidentiality of all Ottawa residents, small numbers that would make it possible to identify any individual are suppressed.

Some point estimates should be interpreted with caution due to their high sampling variability. An asterisk (\*) signifies these point estimates.

### **Please use the following citation when referencing this document**

Ottawa Public Health. Epidemiology Scan: A Review of Tobacco Indicators. Ottawa (ON): Ottawa Public Health; 2012.

## Data Sources

The following data sources are used in this report:

Data source and description	Topics
<p>The Rapid Risk Factor Surveillance System (RRFSS) is an ongoing random-digit-dialled telephone survey of adults 18 years and older, conducted by the Institute of Social Research at York University, on behalf of various public health units in Ontario. Data collection for Ottawa began in 2001. A sample of 1,200 residents each year are surveyed regarding health risk behaviours, knowledge, attitudes and awareness about health related topics of importance to public health such as smoking, immunization, etc.</p>	<ul style="list-style-type: none"> <li>• Smoking prevalence</li> <li>• Minor's access to tobacco</li> <li>• Tobacco dependence</li> <li>• Tobacco cessation</li> <li>• Smoke-free homes</li> <li>• Smoke-free vehicles</li> </ul>
<p>The Canadian Community Health Survey (CCHS) is a national population household survey. The survey collects information on the health of the Canadian population aged 12 years and older as well as socio-economic data. Data collection commenced in 2000. A broad range of topics are examined in this survey on health status, determinants of health and health system utilization. Data are available for Ottawa from 2000 to 2010. The CCHS is conducted by Statistics Canada.</p>	<ul style="list-style-type: none"> <li>• Smoking prevalence</li> <li>• Smoking attributable mortality and hospitalizations</li> <li>• Smoking cessation</li> <li>• Exposure to second-hand smoke in public places</li> </ul>
<p>The 2011 Public Health Monitoring of Risk Factors in Ontario-Ontario Student Drug Use and Health Survey (OSDUHS) surveys students in grades 7 through 12, enrolled in both the English and French public and Catholic school systems through random selection of schools and active parental consent. In 2011, 1,015 Ottawa students completed the survey.</p>	<ul style="list-style-type: none"> <li>• Youth smoking</li> </ul>
<p>The Discharge Abstract Database (DAD) contains data on hospital discharges. Data are collected on a fiscal year basis (April 1 to March 30). Data from fiscal years 1996/97 to 2001/02 are available and coded using the ICD-9 classification system. Data for fiscal years 2002/03 to 2010/2011 are available and coded using the ICD-10-CA classification system.</p>	<ul style="list-style-type: none"> <li>• Smoking attributable hospitalization</li> </ul>
<p>The Vital Statistics Database contains all registered live births, stillbirths and deaths for Ontario from the Office of the Registrar General. Current death data for Ottawa are available from 1986 to 2007.</p>	<ul style="list-style-type: none"> <li>• Smoking attributable mortality</li> </ul>

## Data Gaps

This report includes the most up-to-date local data on a variety of tobacco related indicators, nevertheless, there are still important gaps in local data that are not easily filled. Some of these gaps may be addressed by developing new questions for existing surveys or undertaking special surveys in particular populations, however, there are some gaps that present challenges to data collection using standard survey methods.

Some of the key existing tobacco data gaps important to public health programs include data on:

- Child exposure to second hand smoke (home, vehicle, public places)
- Maternal smoking prevalence (reliability and access to data are pending)
- Exposure to second hand smoke for particular locations (restaurant and bar patios, other outdoor spaces)
- Neighbourhood level smoking prevalence and exposure to SHS (pending additional years of data collection)
- Water-pipe use
- Social smoking behaviours
- Attitudes towards tobacco industry and social denormalization of tobacco use
- Contraband tobacco use for adults

## Summary

Each year in Ottawa, almost 1,000 smokers and non-smokers die prematurely of tobacco related illness and nearly 3,000 are acutely hospitalized for tobacco related illness. Smoking and second-hand smoke have a financial cost, for Ottawa residents hospitalizations costs due to smoking-related illness are almost \$40 million per year. Fortunately, public policy and health promotion programs have been helping to reverse this pattern. Ottawa implemented a smoking ban in work and public places in 2001 and by 2005, the City's adult daily smoking rate had decreased from 19% to 11%. A decrease in current and daily youth smokers also occurred between 2003 and 2005, coinciding with the City's 2002 introduction of the *exposé Smoke Free Youth Project*<sup>1</sup>. In addition, the proportions of smoke-free homes and vehicles in Ottawa have drastically increased from 19% to 86% for homes and 10% to 88% for vehicles, likely having a profound impact on indoor second-hand smoke exposure. While indoor second-hand smoke exposure has decreased, non-smokers in Ottawa are still regularly exposed to second-hand smoke in public places, calling for further efforts to reduce outdoor second-hand smoke exposure in public places. These changes will take time to be reflected in the smoking attributable morbidity and mortality estimates; however continued public health efforts around tobacco control activities will lead to decreases in tobacco related illness in the future.

## Highlights

- Current adult smoking prevalence declined significantly from 24% in 2001 to 15% in 2005 and have remained steady since then. In 2011, the proportion of current smokers was 15% and the daily smoking rate was 12%.
- In the last ten years, the proportions of current and daily smokers have been significantly higher among adults in the lowest household income bracket compared to those in the highest income bracket
- Young adults (19-24 years) consistently report the highest rates of current and occasional smoking. In 2010, 27%\* of young adults were current smokers (13% daily and 13% occasional).
- In 2011, the proportion of students in grades 7-12 who had ever smoked in their lifetime was similar between Ottawa and the rest of Ontario at 16%\* and 22%, respectively. Further, the majority of students (84%) in Ottawa reported that they had never smoked a cigarette in their lifetime. The proportion of students in grades 7-12 who reported that they were current smokers was similar in Ottawa and the rest of Ontario at 7% and 9%, respectively.

- Smoking is responsible for an estimated 990 deaths per year in Ottawa, 930 deaths (19% of all deaths) are attributable to current or former cigarette smoking among adults aged 35 years and older and 60 deaths (1% of all deaths) are attributable to passive smoking exposure in residents aged 15 years and older.
- Cancer accounts for 48% of smoking-attributable mortality (SAM) among current or former smokers, while cardiovascular disease accounts for 32% of SAM, and respiratory disease accounts for 20% of SAM.
- There are an estimated 2,900 acute hospitalizations per year in Ottawa attributable to smoking, 2,800 hospitalizations attributable to current or former cigarette smoking and 100 hospitalizations attributable to passive smoking exposure among residents.
- Hospitalization costs amounted to an average of \$38.2 million per year for smoking attributable hospitalizations of Ottawa residents from 2008 to 2010 (\$36.6 million for current or former smokers and \$1.6 million for non-smokers regularly exposed to second-hand smoke).
- Respiratory disease (chronic obstructive pulmonary disease, pneumonia, influenza) accounts for 43% of smoking-attributable acute hospitalizations among current or former smokers, while cardiovascular disease accounted for 34% and cancer accounted for 19% of smoking attributable hospitalizations.
- In Ottawa in 2007/08, three out of five current adult smokers reported that they were seriously considering quitting smoking in the next six months. One-quarter of current smokers reported that they were seriously considering smoking within the next 30 days. Two out of five current smokers in Ottawa stopped smoking for at least 24 hours because they were trying to quit.
- In 2009, 46% of daily smokers scored low on the heaviness of smoking index, indicating low tobacco dependence. This proportion has not changed since 2005. This group may be more amenable to cessation programs due to their low level of dependence.
- The proportion of non-smokers in Ottawa who report regular exposure to second hand smoke in public places decreased from 15% in 2003 to 8% 2009 but rose significantly to 19% in 2010 and was significantly higher than the rest of the province in 2010 (13%).
- Ottawa non-smoking youth aged 12 to 19 years report the highest levels of exposure to SHS in public places. In 2009/10, 29% of youth non-smokers reported regular exposure to SHS in public places, a significant increase from 2007/08, when 13% reported being regularly exposed.
- The proportion of completely smoke-free homes in Ottawa has increased significantly since 2001, when 57% were smoke-free compared to 86% in 2011.
- The proportion of smoke-free vehicles in Ottawa has increased significantly since 2001, when 72% were smoke-free compared to 88% in 2011.

## Adult Smoking Prevalence

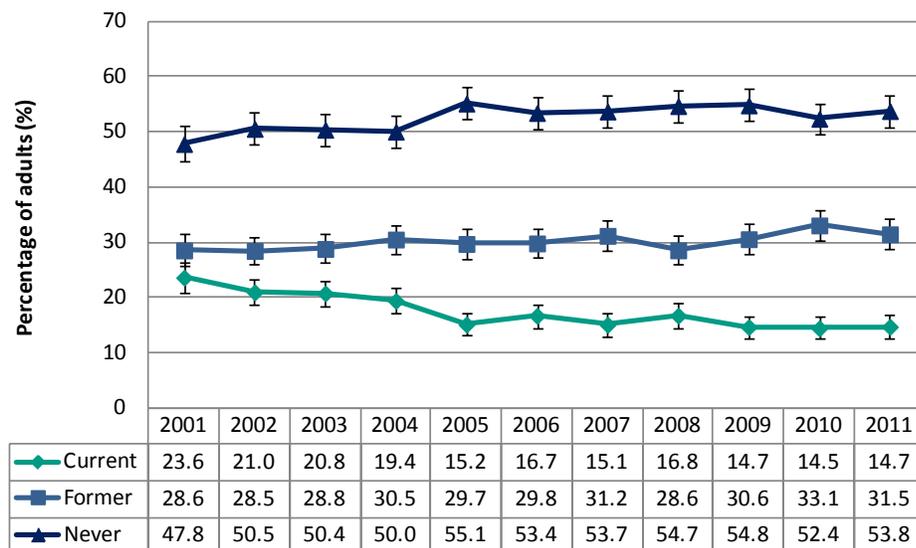
Smoking prevalence is the number of smokers in a population divided by the total population. It may also be referred to as a “smoking rate”. Smoking prevalence is measured using a standard set of questions on a health survey – two surveys in Ottawa measure smoking prevalence, the Rapid Risk Factor Surveillance System (RRFSS) and the Canadian Community Health Survey (CCHS).

### Type of Smoker

- Current smokers are those who were smoking at the time of interview and include both daily and occasional smoking.
  - Daily smoking refers to smoking everyday and occasional smoking includes those who report smoking some days or occasionally.
- Former smokers are those who were not smoking at the time of interview, however had smoked at least 100 cigarettes (approximately four packs) in their lifetime.
- Never smokers for RRFSS include those who are not smoking at the time of the interview and have not smoked at least 100 cigarettes in their lifetime. Never smokers for CCHS include those who have never smoked a whole cigarette.

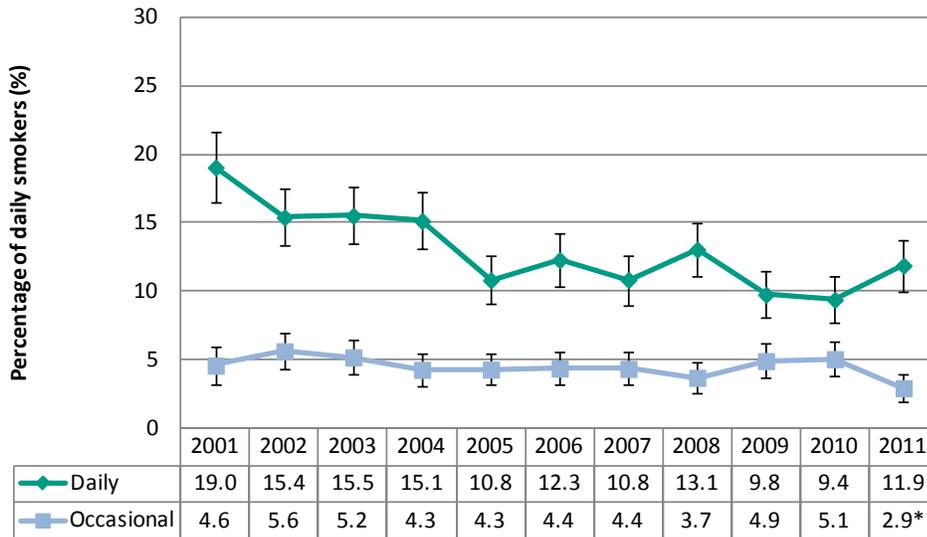
According to the RRFSS, the proportion of current adult smokers declined significantly from 23.6% in 2001 to 15.2% in 2005 and has remained stable since then. In 2011, 14.7% of Ottawa residents were current smokers (approximately 105,500 people) (Figure 1) and 11.9% were daily smokers (Figure 2).

**Figure 1. Smoking prevalence among adults (≥19 years) in the City of Ottawa, 2001 – 2011**



**Data source:** Rapid Risk Factor Surveillance System, Ottawa Public Health, 2001-2011.  
Vertical bars represent 95% confidence intervals.

**Figure 2. Daily smoking prevalence among adults (≥19 years) in the City of Ottawa, 2001 – 2011**

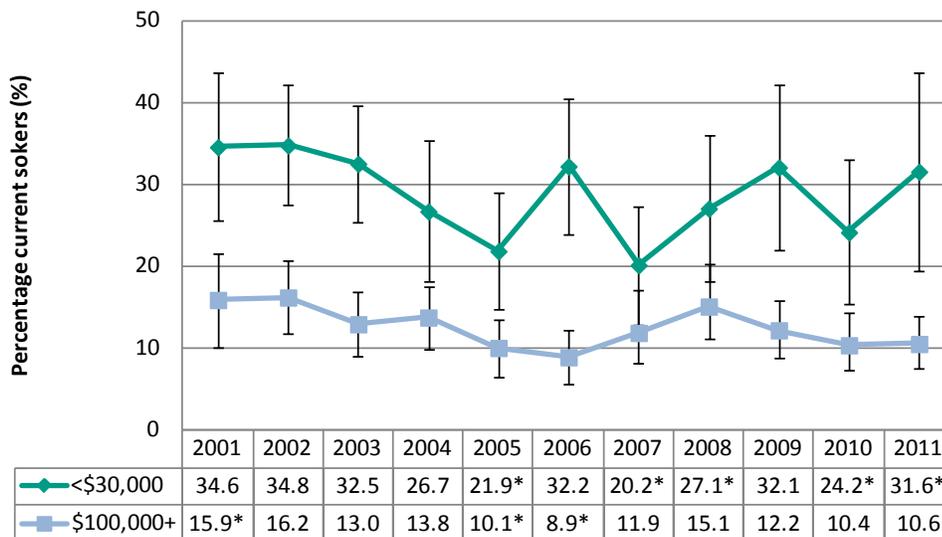


**Data source:** Rapid Risk Factor Surveillance System, Ottawa Public Health, 2001-2011.

\*=Interpret with caution due to high sampling variability. Vertical bars represent 95% confidence intervals.

- Since 2001, the smoking prevalence among residents with French mother tongue has typically been higher compared to those with English mother tongue.
- In the last ten years, the proportions of current and daily smokers have been significantly higher among adults in the lowest household income bracket compared to those in the highest income bracket (Figure 4). No apparent gradient exists by household income (i.e. no difference between middle income groups).
- Since 2001, young adults (19-24 years) typically reported the highest proportions of current smokers. In 2011, 18.2%\* ( $\pm$  8.6%) of young adults were current smokers.

**Figure 3. Current smoking prevalence among adults (≥ 19 years) in the City of Ottawa by income level, 2001 – 2011**



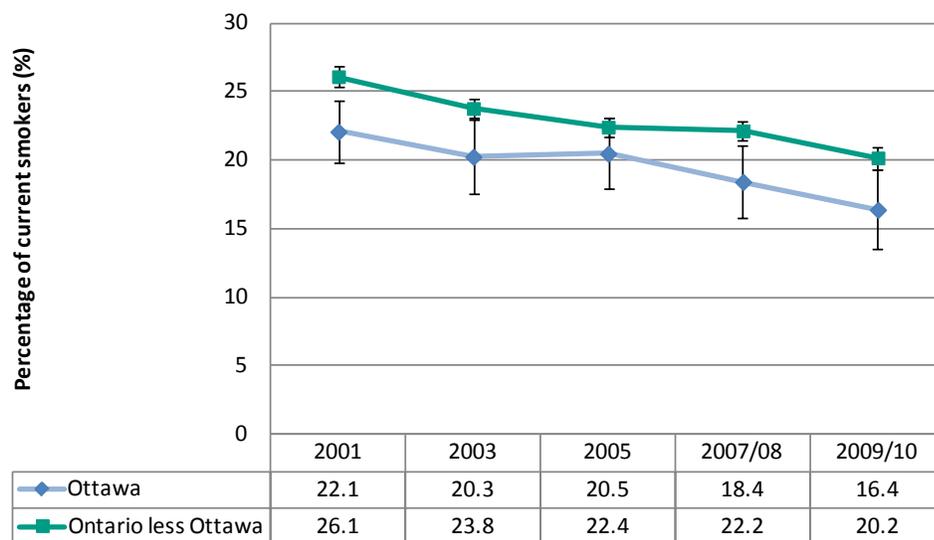
**Data source:** Rapid Risk Factor Surveillance System, Ottawa Public Health, 2001-2011.

\*=Interpret with caution due to high sampling variability. Vertical bars represent 95% confidence intervals.

The Canadian Community Health Survey (CCHS) provides an alternate data source for the prevalence of smoking in the City of Ottawa. Smoking prevalence from the CCHS may be higher than data from the Rapid Risk Factor Surveillance System (RRFSS) as the CCHS includes respondents who have smoked at least one whole cigarette in the past month as current smokers whereas RRFSS includes respondents who have smoked 100 or more cigarettes (4 packs) in their lifetime.

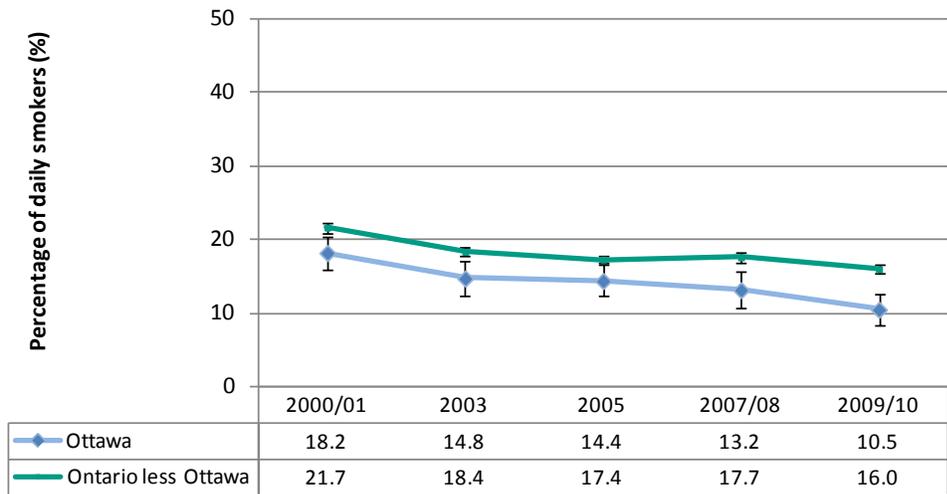
- According to the CCHS, smoking prevalence (both current and daily) declined over the past 10 years in Ottawa from 2000/01 to 2009/10.
- In 2009/10, the proportion of current smokers among adults ( $\geq 19$  years) was 16.4% ( $\pm 2.9\%$ ), significantly lower than the smoking prevalence in the rest of the province (20.2%  $\pm 0.8\%$ ) (Figure 4).
- In 2009/10, the proportion of daily smokers was 10.5% ( $\pm 2.2\%$ ), which was also significantly lower than the proportion in the rest of the province (16%  $\pm 0.6\%$ ) (Figure 5).
- Adult current smoking prevalence was not significantly different between urban and rural areas of Ottawa (2007/08: Urban 18.2%  $\pm 2.7\%$ , Rural 21.9%  $\pm 9.9\%$  | 2009/10: Urban 16.6%  $\pm 3.2\%$ , Rural 14.7%  $\pm 5.8\%$ ).

**Figure 4. Current smoking prevalence among adults ( $\geq 19$  years) in the City of Ottawa and the rest of Ontario, 2000/01 – 2009/10**



**Data source:** Canadian Community Health Survey, 2000/01-2009/10, Ontario Share File, Statistics Canada  
 \*=*interpret with caution due to high sampling variability. Vertical bars represent 95% confidence intervals.*

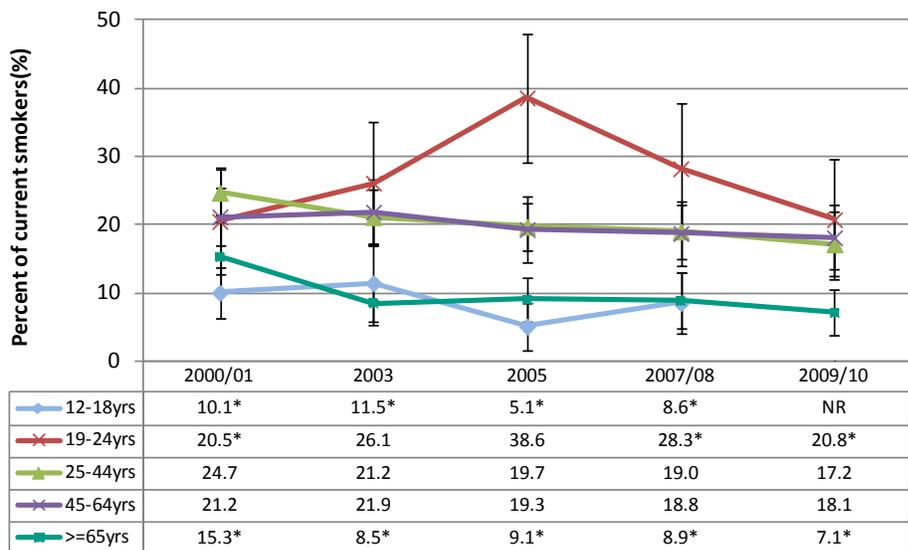
**Figure 5. Daily smoking prevalence among adults (≥ 19 years) in the City of Ottawa and the rest of Ontario, 2000/01 – 2009/10**



**Data source:** Canadian Community Health Survey, 2000/01-2009/10, Ontario Share File, Statistics Canada  
Vertical bars represent 95% confidence intervals.

- Youth (12-18 years) and seniors (≥65 years) typically report the lowest prevalence of current smokers. In 2009/10, there was no difference in the smoking prevalence between residents aged 19 to 24 years, 25 to 44 years and 45 to 64 years (Figure 6).

**Figure 6. Current smoking prevalence in the City of Ottawa by age, 2000/01 – 2009/10**



**Data source:** Canadian Community Health Survey, 2000/01-2009/10, Ontario Share File, Statistics Canada  
\* = Interpret with caution due to high sampling variability. Vertical bars represent 95% confidence intervals.

## Youth Smoking

The Ontario Student Drug Use and Health Survey (OSDUHS) provides data for students between grades 7 and 12 on topics related to drug and substance use and health and well-being. All OSDUHS data are presented for 2011 unless otherwise stated. No significant differences were found for any youth smoking indicators in Ottawa between 2009 and 2011.

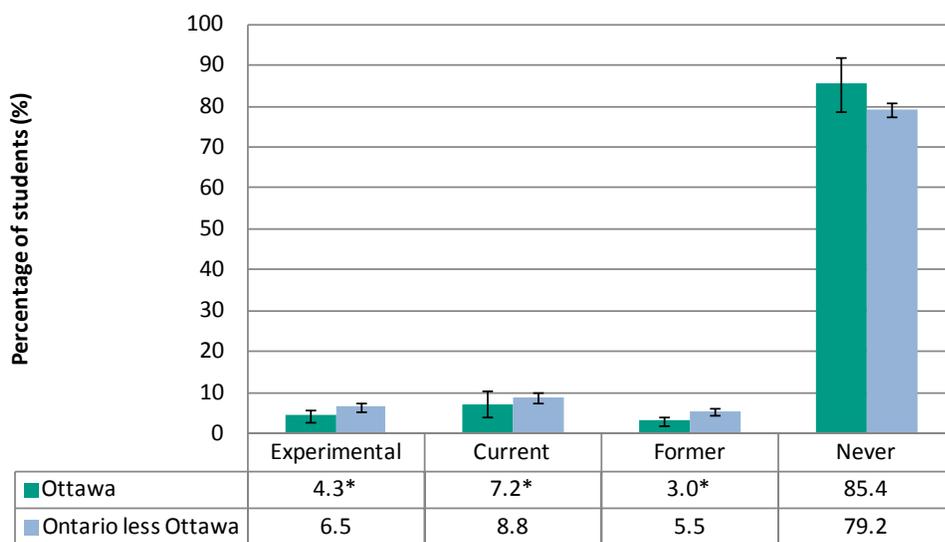
### Lifetime Use of Cigarettes

- The OSDUHS asked students about their lifetime use of cigarettes. **Lifetime use** is defined as smoking a few puffs or more over a lifetime. In 2011, the proportion of students in grades 7-12 who reported that they had ever smoked in their lifetime was similar between Ottawa and the rest of Ontario at 15.8%\* (95% CI: 10.6, 23.0) and 22.3% (95% CI: 20.6, 24.1), respectively. Further, the majority of students (84.2%) in Ottawa reported that they had never smoked a cigarette in their lifetime. There were no significant differences between males and females for lifetime use of cigarettes.
- Similarly, 80.2% ( $\pm$  8.4%) of Ottawa youth aged 12 to 18 years report that they have never smoked a whole cigarette (CCHS 2009/2010).

### Smoking (Past Year)

- The OSDUHS asked students how often in the last 12 months they smoked cigarettes. **Current smoking** is defined as smoking a cigarette more than once in the past 12 months. In 2011, the proportion of students in grades 7-12 who reported that they were current smokers was similar in Ottawa and the rest of Ontario at 7.2% and 8.8%, respectively. Further, the majority of students (85.4%) in Ottawa reported that they had not smoked a cigarette over the past year (Figure 7).

**Figure 7. Student tobacco use in the past year in Ottawa and the rest of Ontario, 2011**



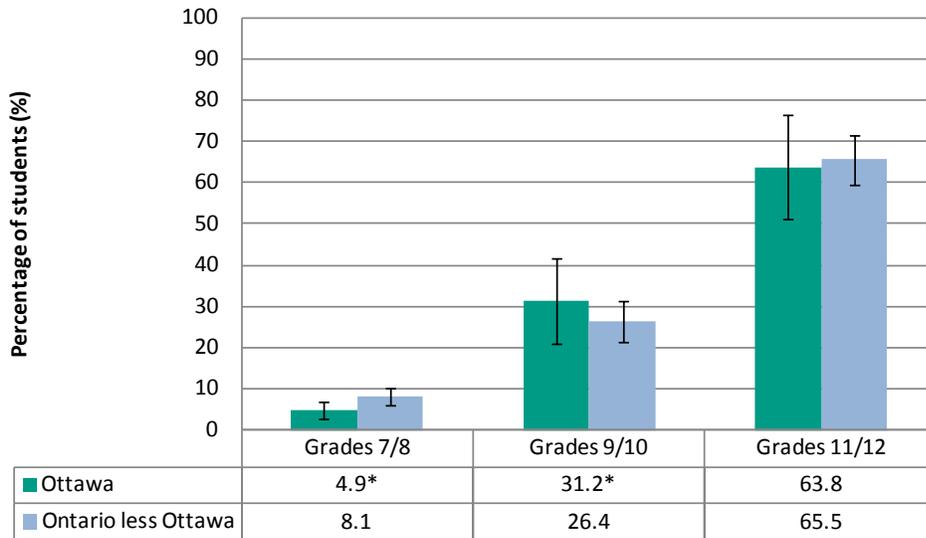
**Data source:** Public Health Monitoring of Risk Factors in Ontario-OSDUHS (2011), Centre for Addiction & Mental Health.

\* = Interpret with caution due to high sampling variability. Vertical bars represent 95% confidence intervals.

- In Ottawa, there are no significant sex differences for smoking status over the past year. In the rest of Ontario, significantly more females than males reported that they never smoked (81.8% versus 76.8%).
- In Ottawa, elementary students in grades 7 and 8 were significantly more likely to report having never used cigarettes in the past year compared to students in high school (97.5% versus 80.5%).

- In 2011, the number of smokers (experimental<sup>1</sup> and current) increased by grade, from 5% in 7/8th graders to 64% in 11/12th graders. Across grades there were no significant differences between Ottawa and the rest of Ontario (Figure 8).

**Figure 8. Student cigarette use in the past year by grade in Ottawa and the rest of Ontario, 2011**



**Data source:** Public Health Monitoring of Risk Factors in Ontario-OSDUHS (2011), Centre for Addiction & Mental Health.

\* = Interpret with caution due to high sampling variability. Vertical bars represent 95% confidence intervals.

### Daily Smoking (Past Year)

- In 2011, very few Ottawa students in grades 7-12 smoked at least one cigarette a day over the previous year (proportion not reportable). There were no significant differences between Ottawa and the rest of Ontario or between sexes.

### Quit Attempts (Past Year)

- Among students who smoked (1+ cigarettes, not including experimental smokers over previous year), 50.3%\* (95% CI: 27.9, 72.5) reported they had attempted to quit over the previous year. There were no significant differences between Ottawa and the rest of Ontario.

### Lifetime Use of Smokeless or Chewing Tobacco

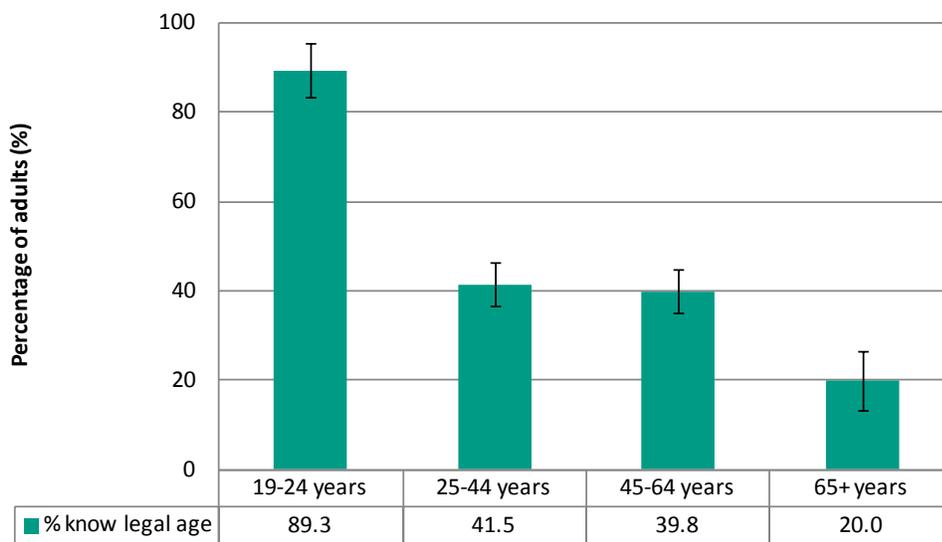
- In 2011, the proportion of students in grades 7-12 who reported that they had ever used smokeless or chewing tobacco in their lifetime was similar between Ottawa and the rest of Ontario at 6.7%\* (95% CI: 4.1, 11.0) and 5.9% (95% CI: 5.0, 7.1), respectively. In Ottawa, significantly more female students (98.6%, 95% CI: 96.8, 99.3) than male students (88.3%, 95% CI: 81.7, 92.8) reported they had never used smokeless or chewing tobacco in their lifetime.

<sup>1</sup> Experimental smoker = student who has tried a few puffs to one whole cigarette in the past year.

## Minors Access to Tobacco

- According to Ontario’s Tobacco Control Act, it is illegal to sell or supply tobacco to anyone under 19 years of age<sup>2</sup>.
- In 2004, 43% (± 3.0%) of adults (19 and older) living in Ottawa knew the legal age limit for selling or supplying tobacco products. In the same year, about 44% thought the legal age was 18, which is the legal age under federal law.
- Knowledge of the correct legal age for selling tobacco decreased significantly with increasing age between several age groups. There is a significant decrease in the proportion that know between the 19 to 24 year and 24 to 44 year age groups and between the 45 to 64 and ≥65 year age groups (Figure 9).

**Figure 9: Proportion of adults (≥ 19 years) who know the legal age for selling tobacco products in Ontario, City of Ottawa, 2004.**



**Data source:** Rapid Risk Factor Surveillance System (RRFSS), Ottawa Public Health, 2004.  
Vertical bars represent 95% confidence intervals.

- In 2004, 11.8% (± 5.6%\*) of adults (≥19 years) living in Ottawa self-reported that they gave cigarettes to minors when asked to do so by a minor.
- In 2004, 22.7% (± 10.1%\*) of adults (≥19 years) living in Ottawa self-reported that they bought cigarettes for minors when asked to do so by a minor.
- In 2004, 87.1% of adults (≥19 years) reported they would support withdrawing tobacco sale rights from retailers who violate the law which prohibits the sale or distribution of tobacco to minors.

## Smoking Attributable Mortality

### What is SAM?

Smoking attributable mortality (SAM) is a measure that describes how much disease occurs in a population that can be attributed to smoking. Passive smoking attributable mortality (PSAM) describes deaths associated with non-smoker exposure to second-hand smoke.

Smoking related diseases are typically slow to develop, often not resulting in death until several decades after first exposure<sup>3</sup>. In Canada, cigarette smoking was a common habit for many decades that has decreased in the past few decades. While the smoking rates in Canada declined, smoking attributable mortality (SAM) has not followed this trend due to the latent period between smoking exposure and disease outcomes<sup>4</sup>.

### How is it calculated?

Smoking has been identified as a cause of death for several types of cancer, cardiovascular disease, respiratory disease, infant mortality and injury<sup>3</sup>. Smoking attributable fractions, which are the disease-specific proportions attributable to smoking (e.g. 84% of lung cancer deaths are attributable to smoking), were calculated for 19 of these diseases using age-sex specific smoking prevalence data and age-sex specific relative risks (RR) of death data for current and former smokers aged 35 years and older. The smoking prevalence data are for Ottawa from the Canadian Community Health Survey 2003 to 2007. The relative risks are from unpublished estimates provided by the American Cancer Society's Cancer Prevention Studies I and II<sup>5</sup>. SAM is calculated by multiplying the number of deaths for these diseases by the disease-specific smoking attributable fractions<sup>6</sup>.

Passive smoking attributable mortality were estimated by applying relative risks of lung cancer and ischaemic heart disease<sup>4,7</sup> and mortality to the nonsmoking Ottawa population (>=15 years) who report being regularly exposed to second hand smoke in the home, vehicle or public places. Ottawa data on exposure to second hand smoke data in the home, vehicle or public places are from the Canadian Community Health Survey 2003 to 2007.

Since smoking prevalence and death counts can fluctuate from year to year regardless of the overall trend that occurs over longer time periods, it is recommended that SAM and PSAM not be used as an annual surveillance tool and five year estimates are used instead. While this method is well-studied, one major weakness to is that it ignores the latency period by using recent smoking prevalence data, resulting in conservative estimates of SAM.

It is important to note that these statistics only represent deaths from cigarette use, but not cigar, pipe, chewing or other types of tobacco. Deaths from maternal smoke exposure as well as cigarette initiated fires are also not included in these calculations. Therefore, the SAM and PSAM numbers presented here are only a portion of the far-reaching effects of tobacco in Ottawa.

### What is the impact of smoking on the deaths in the population?

A 2007 study estimated that in 2002, 16.6% of all deaths in Canada were attributable to smoking<sup>8</sup>. Fortunately, public policy has been helping to reverse this pattern. Ottawa implemented a smoking ban in work and public places in 2001 and by 2005, the City's adult daily smoking rate had decreased from 19.0% to 10.8%. A significant decrease in current and daily youth smokers also occurred between 2003 and 2005, coinciding with the City's 2002 introduction of the *exposé Smoke Free Youth Project*<sup>1</sup>. In addition, the proportions of smoke-free homes and vehicles in Ottawa have drastically increased from 18.8% to 85.9% for homes and 10.2% to 87.5% for vehicles, likely having a profound impact on second-hand smoke exposure. These changes will take time to be reflected in the smoking attributable mortality estimates; however continued public health efforts around tobacco control activities will lead to decreases in SAM estimates in the future.

- From 2003 to 2007, there were an estimated 990 deaths per year in Ottawa attributable to smoking, 930 deaths (536 male and 394 female) attributable to current or former cigarette smoking among adults aged 35 years and older and 60 deaths attributable to passive smoking exposure in residents aged 15 years and older (Table 1).
- From 2004-2007, 18.6% of deaths to Ottawa residents aged 35 years and older were attributable to current or former cigarette smoking and 1.2% of deaths to Ottawa residents aged 15 years and older were attributable to passive exposure to smoke.
- Cancer accounted for 48% of smoking-attributable mortality (SAM) among current or former smokers, while cardiovascular disease accounted for 32% of SAM, and respiratory disease accounted for 20% of SAM.
- For some individual causes of death, smoking was responsible for more than 80% of deaths: bronchitis and emphysema (89%), lung cancer (84%), laryngeal cancer (84%), chronic airway obstruction (83%).

**Table 1: Smoking Attributable Mortality in the City of Ottawa, 2003-2007**

	Average # of deaths attributable to smoking cigarettes	% of all deaths attributable to smoking cigarettes
<b>Cancers</b>		
Trachea, Lung, Bronchus	329	84%
Oesophagus	24	73%
Pancreas	23	28%
Lip, Oral Cavity, Pharynx	20	69%
Urinary Bladder	19	47%
Stomach	10	25%
Kidney and Renal Pelvis	9	30%
Larynx	8	84%
Acute Myeloid Leukemia	<5	22%
Cervix Uteri	<5	13%
<b>Total Cancer</b>	<b>448</b>	
<b>Cardiovascular Disease</b>		
Ischemic Heart Disease	169	19%
Cerebrovascular Disease	53	16%
Other Heart Disease	35	16%
Aortic Aneurysm	28	64%
Atherosclerosis	11	20%
Other Arterial Disease	<5	18%
<b>Total Cardiovascular disease</b>	<b>300</b>	
<b>Respiratory Disease</b>		
Chronic Airway Obstruction	144	83%
Pneumonia, Influenza	26	22%
Bronchitis, Emphysema	13	89%
<b>Total Respiratory Disease</b>	<b>183</b>	
<b>TOTAL (ACTIVE SMOKERS, Age&gt;=35yrs)</b>	<b>930</b>	
<b>PASSIVE SMOKING ATTRIBUTABLE MORTALITY</b>		
Lung Cancer	17	
Ischemic Heart Disease	45	
<b>TOTAL (PASSIVE SMOKERS, Age &gt;=15yrs)</b>	<b>63</b>	
<b>ALL SMOKING-ATTRIBUTABLE DEATHS</b>	<b>993</b>	

Data source: CCHS 2003, 2005, 2007-08, Mortality data: Intellihealth, MOHLTC 2003-2007

## Smoking Attributable Hospitalization and Cost

### What is SAH?

Smoking attributable hospitalization (SAH) is a measure that describes how many hospitalizations can be attributed to smoking. Passive smoking attributable hospitalization (PSAH) describes hospitalizations associated with non-smoker exposure to second-hand smoke.

### How is it calculated?

Smoking causes increased risk of several types of cancer, cardiovascular disease, respiratory disease, low-birth weight, short-term gestation and injury<sup>3</sup>. Smoking attributable fractions, which are the disease-specific proportions attributable to smoking (e.g. 83% of COPD hospitalizations are attributable to smoking), were calculated for 21 of these conditions using age-sex specific smoking prevalence data and age-sex specific relative risks (RR) for current and former smokers aged 15 years and older. The smoking prevalence data are for Ottawa from the Canadian Community Health Survey 2007/2008 to 2009/2010. The relative risks are from a Canadian meta-analysis<sup>9</sup>. SAH is calculated by multiplying the number of acute care hospitalizations for these conditions by the condition-specific smoking attributable fractions.

Passive smoking attributable hospitalizations were estimated by applying relative risks of lung cancer and ischaemic heart disease<sup>7,8</sup> and acute care hospitalizations to the nonsmoking Ottawa population (>=15 years) who report being regularly exposed to second hand smoke in the home, vehicle or public places. Ottawa data on exposure to second hand smoke data in the home, vehicle or public places are from the Canadian Community Health Survey 2007/2008 to 2009/2010.

It is important to note that these statistics only represent hospitalizations from cigarette use, but not cigar, pipe, chewing or other types of tobacco. Hospitalizations from cigarette initiated fires are also not included in these calculations. Therefore, the SAM and PSAM numbers presented here are only a portion of the far-reaching effects of tobacco in Ottawa.

### Costs calculations

The costs presented in this report are the cost per weighted case for each hospitalization of the 21 conditions discussed above. They are year and hospital specific. The total cost for each condition were multiplied by the smoking attributable fraction for that condition and then summed to get a total cost for all conditions by year<sup>10</sup>.

### What is the impact of smoking on acute care hospitalizations?

- From 2008 to 2010, there were an estimated 2,900 acute hospitalizations per year in Ottawa attributable to smoking, 2,800 hospitalizations attributable to current or former cigarette smoking and 100 hospitalizations attributable to passive smoking exposure in residents (Table 2).
- Hospitalization costs amounted to an average of \$38.2 million per year for smoking attributable conditions from 2008 to 2010 (\$36.6 million for current or former smokers and \$1.6 million for non-smokers regularly exposed to SHS).
- From 2008-2010, 2% of hospitalizations to Ottawa residents aged 15 years and older were attributable to cigarette smoking (active and passive exposure).
- Respiratory disease (chronic obstructive pulmonary disorder ((COPD), pneumonia, influenza) accounted for 43% of active smoking-attributable acute hospitalizations, while cardiovascular disease accounted for 34% and cancer accounted for 19% .

**Table 2: Smoking Attributable Hospitalizations in the City of Ottawa, 2008-2010**

	Average # of hospitalizations attributable to smoking cigarettes	% of hospitalizations attributable to smoking cigarettes
<b>Cancers</b>		
Lip, Oral Cavity, Pharynx	31	54.7%
Oesophagus	20	52.1%
Stomach	12	19.8%
Pancreas	16	26.8%
Larynx	12	69.3%
Trachea, Lung, Bronchus	259	81.7%
Cervix Uteri	14	46.6%
Urinary Tract	170	54.0%
Acute Myeloid Leukemia	12	25.5%
<b>Total Cancer</b>	<b>546</b>	
<b>Cardiovascular disease</b>		
Ischemic Heart Disease	375	15.9%
Cardiac Arrhythmia	65	12.1%
Heart Failure, Complications, and ill-defined heart disease descriptions	70	6.8%
Pulmonary Circulatory Disease	163	82.6%
Cerebrovascular all ages	133	15.4%
Atherosclerosis	156	43.8%
<b>Total Cardiovascular disease</b>	<b>963</b>	
<b>Respiratory Disease</b>		
Pneumonia, Influenza	211	24.4%
COPD	1016	82.6%
<b>Total Respiratory Disease</b>	<b>1227</b>	

**Table 2 continued.**

	<b>Average # of hospitalizations attributable to smoking cigarettes</b>	<b>% of hospitalizations attributable to smoking cigarettes</b>
<b>Other</b>		
Ulcers	86	46.2%
Mental and behavioural disorders due to tobacco use	0	100.0%
Toxic effect of tobacco and nicotine	0	100.0%
Low Birth Weight or Short Gestation	6	6.0%
<b>TOTAL (ACTIVE SMOKERS)</b>	<b>2828</b>	
<b>PASSIVE SMOKING ATTRIBUTABLE HOSPITALIZATIONS</b>		
Lung Cancer	12	4.1%
Ischemic Heart Disease	99	4.1%
<b>TOTAL (PASSIVE SMOKERS)</b>	<b>111</b>	
<b>ALL SMOKING-ATTRIBUTABLE HOSPITALIZATIONS</b>		
	<b>2939</b>	

**Data source:** CCHS 2007/2008, 2009/2010; Hospitalization data: Intellihealth, MOHLTC 2008/2009-2010/2011

## Smoking Cessation

- In Ottawa in 2007/08, 58.5% ( $\pm 8.1\%$ ) of current smokers ( $\geq 20$  years) reported that they were seriously considering quitting smoking in the next six months. One-quarter ( $25\% \pm 6.2\%$ ) of current smokers (aged  $\geq 20$  years) reported that they were seriously considering smoking within the next 30 days. This is not statistically different from the rest of Ontario, where 63.1% ( $+ 1.8\%$ ) of current smokers reported seriously considering quitting smoking in the next six months and 26.7% ( $+1.7\%$ ) of current smokers considering quitting in the next 30 days.
- In 2007/08, 43.4% ( $+9.1\%$ ) of current smokers in Ottawa stopped smoking for at least 24 hours because they were trying to quit. This is not statistically different than the rest of Ontario, where 48.8% ( $\pm 1.8\%$ ) of current smokers stopped smoking for at least 24 hours because they were trying to quit.

One of the purposes of the Tobacco Cessation module in RRFSS is to monitor the stages of readiness to quit smoking. There are four stages: contemplation, preparation, action and maintenance.

Each stage is defined as follows:

- **Contemplation stage:** current smokers who are seriously considering quitting in the next months **or** are seriously considering quitting within the next 30 days, but did not try to quit for at least 24 hours during the past year.
- Preparation stage: current smokers who are seriously considering quitting within the next 30 days and have quit for at least 24 hours during the past year.
- Action stage: former smokers who quit smoking within the past 6 months
- Maintenance stage: former smokers who quit smoking at least 6 months ago.

Based on the 2009 RRFSS data,

- 43.5% ( $\pm 7.8\%$ ) of current smokers, aged 18 and older, are in the contemplation stage of quitting smoking and 27.3%\* ( $\pm 7.0\%$ ) of current smokers are not thinking about quitting. 11.0%\* ( $\pm 4.9\%$ ) are thinking about quitting but do not know when.
- 13.6%\* ( $\pm 5.4\%$ ) of current smokers, aged 18 and older, are in the preparation stage of quitting smoking.
- 3.6%\* ( $\pm 2.0\%$ ) of former smokers, aged 18 and older, are in the action stage of quitting smoking.
- 96.4% ( $\pm 2.0\%$ ) of former smokers, aged 18 and older, are in the maintenance stage of behaviour change. So, most former smokers quit smoking at least 3 months ago

## Tobacco Dependence

One of the purposes of the Tobacco Dependence module in RRFSS is to gauge use and level of addiction and to provide further context to the quit attempts and outcomes.

The module measures the Heaviness of Smoking Index (HSI) for daily smokers, which is a scale combining time to first cigarette each morning and the number of cigarettes smoked per day. Daily smokers are scored as having low, moderate or high dependence<sup>11</sup>.

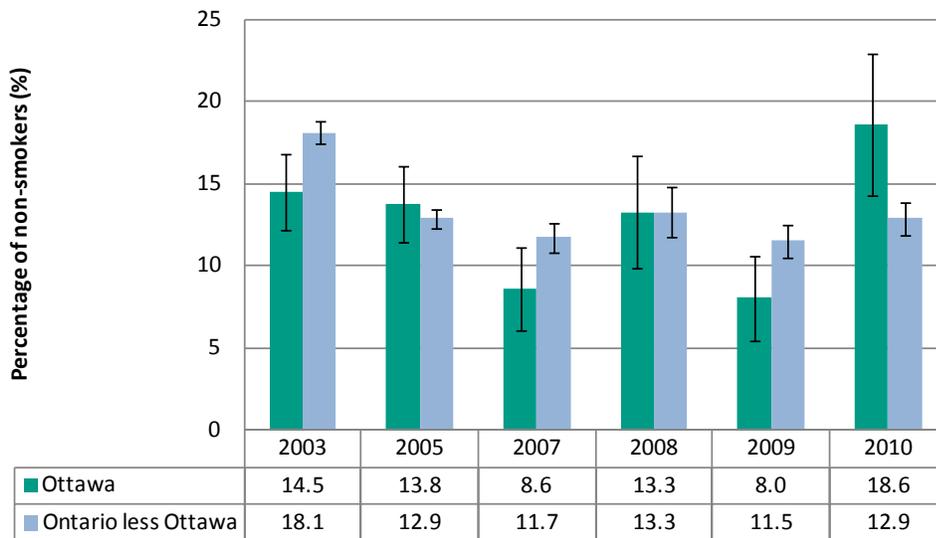
In 2009,

- 45.6% ( $\pm 9.1\%$ ) of daily smokers scored low on the heaviness of smoking index, this proportion has not changed since 2005. This group may be more amenable to cessation programs due to their low level of dependence.
- 35.1% ( $\pm 8.8\%$ ) were moderately dependent.
- 7.9%\* ( $\pm 5.0\%$ ) of daily smokers were highly dependent (HSI >4). These are considered “hard-core” smokers. Higher dependence may indicate more difficulty in quitting. This proportion has not changed since 2005.
- On average, daily smokers smoked 15 cigarettes per day. This remained unchanged since 2005.

## Exposure to Second Hand Smoke in Public Places

- The proportion of non-smokers in Ottawa who report regular exposure to SHS in public places (such as bars, restaurants, shopping malls, arenas, bingo halls, bowling alleys) decreased from 14.5% in 2003 to 8% 2009 but rose significantly to 18.6% in 2010. This proportion was significantly higher than in the rest of Ontario in 2010 (12.9%) (Figure 10).
- The increase in reported exposure to SHS between 2009 and 2010 was not seen at the provincial or National level and with some of Ottawa’s peer health units (Waterloo, York and Halton). Similar to Ottawa, Toronto noted a statistically significant increase in the proportion of non-smokers exposed to SHS in public places between 2009 and 2010<sup>12</sup>.
- A significant decrease in reported exposure between 2005 and 2007 was noted, which coincides with implementation of the *Smoke Free Ontario Act*. The recent increase in reported exposure could be associated with heightened awareness or increased sensitivity to SHS exposure following increased public education, smoke-free policies and media coverage in 2010. Although less likely, some of the reported increase could result from data fluctuation.

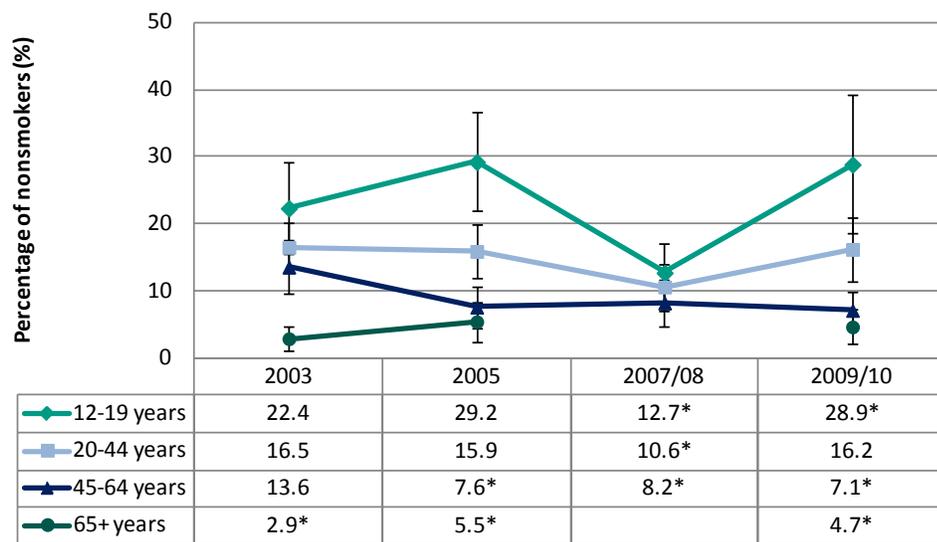
**Figure 10: Proportion of non-smokers (≥12 years of age) who report exposure to second hand smoke in public places, Ottawa and the rest of Ontario, 2003 – 2010**



**Data source:** Canadian Community Health Survey, 2000/01-2009/10, Ontario Share File, Statistics Canada  
Vertical bars represent 95% confidence intervals.

- Ottawa non-smoking youth aged 12 to 19 years, report the highest levels of exposure to SHS in public places and exposure decreases with increasing age (Figure 11). In 2009-2010, 28.9% of non-smoker youth reported regular exposure to SHS in public places, a significant increase from 2007-2008, when 12.7% reported exposure.

**Figure 11: Proportion of non-smokers (≥12 years of age) who report exposure to second hand smoke in public places, Ottawa and the rest of Ontario, 2003 – 2010**

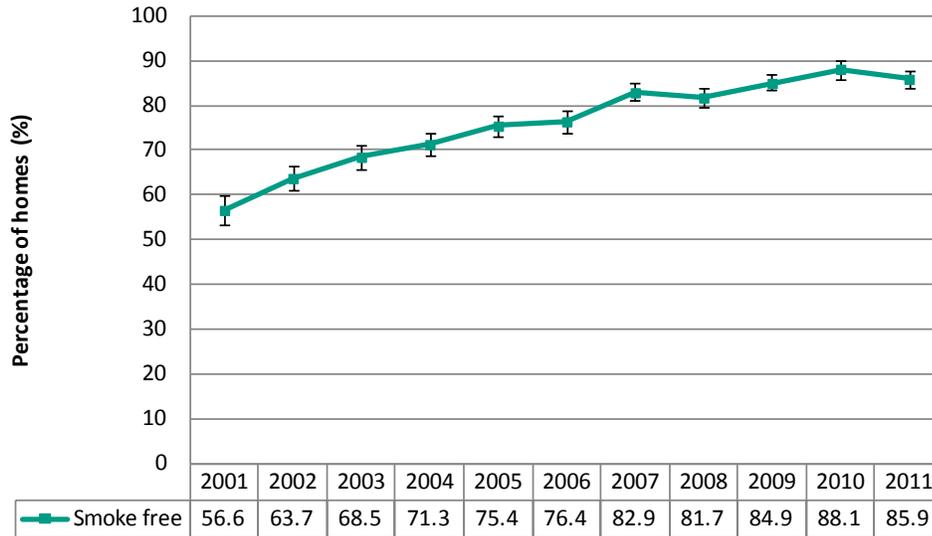


**Data source:** Canadian Community Health Survey, 2000/01-2009/10, Ontario Share File, Statistics Canada  
 \*=Interpret with caution due to high sampling variability. Vertical bars represent 95% confidence intervals.

## Smoke-Free Homes

- The proportion of completely smoke-free homes has increased significantly since 2001, when 57% were smoke-free compared to 86% in 2011 (Figure 12). There were no significant differences in the smoke free homes by mother tongue or by income.

**Figure 12: Proportion of completely smoke free homes in the City of Ottawa, 2001 – 2011**



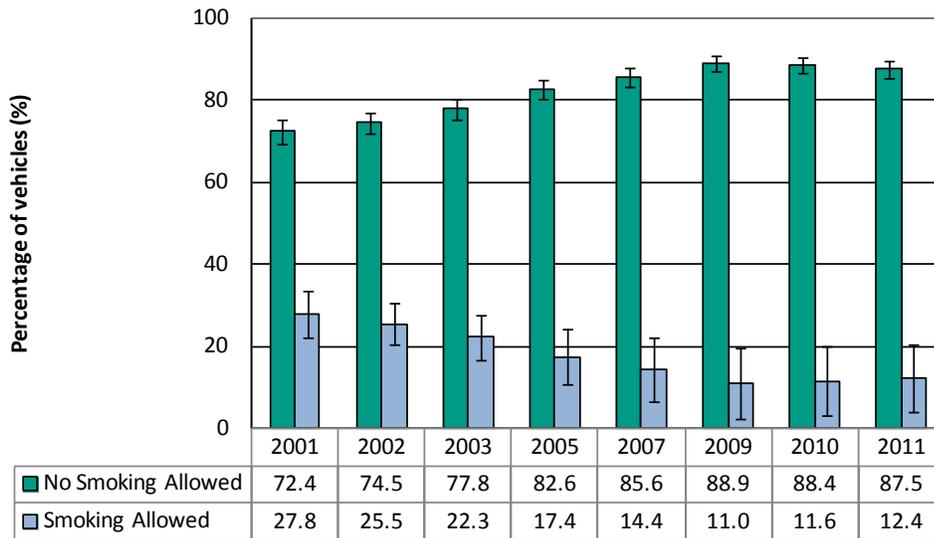
**Data source:** Rapid Risk Factor Surveillance System, Ottawa Public Health, 2001 – 2011

\*=Interpret with caution due to high sampling variability. Vertical bars represent 95% confidence intervals.

## Smoke-Free Vehicles

- The proportion of smoke-free vehicles has increased significantly since 2001, when 72% were smoke-free compared to 88% in 2011) (Figure 13).
- There were no significant differences in the smoke free vehicles by mother tongue or by income.

**Figure 13: Proportion of smoke free vehicles in the City of Ottawa, 2001 – 2011**



**Data source:** Rapid Risk Factor Surveillance System, Ottawa Public Health, 2001 – 2011  
Vertical bars represent 95% confidence intervals.

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- <sup>3</sup>The health consequences of smoking: a report of the Surgeon General. [Atlanta, Ga.]: Dept. of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; Washington, D.C.: For sale by the Supt. of Docs., U.S. G.P.O., 2004. (Electronic resource) Last accessed January 2012. Available at [http://www.cdc.gov/tobacco/data\\_statistics/sgr/sgr\\_2004/chapters.htm](http://www.cdc.gov/tobacco/data_statistics/sgr/sgr_2004/chapters.htm).
- <sup>4</sup> Balinunas D, Patra J, Rehm J, Popova S, Kaiserman M, Taylor B. Smoking-attributable mortality and expected years of life lost in Canada 2002: Conclusions for prevention and policy. *Chronic Diseases in Canada*. 2007; 27(4):154-162.
- <sup>5</sup> Thun MJ et al. Trends in tobacco smoking and mortality from cigarette use in Cancer Prevention Studies I (1959 through 1965) and II (1982 through 1988). In: *Changes in cigarette-related disease risks and their implication for prevention and control. Smoking and tobacco Control Monograph 8*. Bethesda, MD: US Department of Health and Human Services, Public Health Service, National Institutes of Health, National Cancer Institute 1997; 305-382. NIH Publication no. 97-1213.
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- <sup>9</sup> Baliunas D, Patra J, Rehm J, Popova S, Taylor B. Smoking-attributable morbidity: acute care hospital diagnoses and days of treatment in Canada, 2002. *BMC Public Health*. 2007; 7: 247.
- <sup>10</sup> Cost per weighted Case: Hospital and year-specific cost per weighted case of the acute inpatient, newborn and mandated outpatient were obtained from the Ministry of Health and Long-term Care using the Ontario Cost Distribution Methodology. [http://www.mohltcfim.com/cms/upload/ac0a80704000000f74ee2fd568012/OCDM%20Guide\\_10-11YE\\_final%202011-11-16.pdf](http://www.mohltcfim.com/cms/upload/ac0a80704000000f74ee2fd568012/OCDM%20Guide_10-11YE_final%202011-11-16.pdf)
- <sup>11</sup> Ontario Tobacco Research Unit: *Monitoring the Ontario Tobacco Strategy 1999-2000* (Appendix 2-7) Heaviness of Smoking Index (HSI) : [http://www.otru.org/pdf/6mr/6mr\\_eng.pdf?zoom\\_highlight=Heaviness+of+Smoking+Index#search=%22Heaviness%20of%20Smoking%20Index%22](http://www.otru.org/pdf/6mr/6mr_eng.pdf?zoom_highlight=Heaviness+of+Smoking+Index#search=%22Heaviness%20of%20Smoking%20Index%22)
- <sup>12</sup> Statistics Canada. Exposure to second-hand smoke in the past month, in public places. Table 105-0501 – Health indicator profile, annual estimates, by age group and sex, Canada, provinces, territories, health regions (2011 boundaries) and peer groups, occasional, CANSIM (database): <http://www5.statcan.gc.ca/cansim/a01?lang=eng> (Accessed: January 19, 2012)