Health Quality Ontario

The provincial advisor on the quality of health care in Ontario

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Health in the North: A report on geography and the health of people in Ontario's two northern regions

Technical Appendix

Contents

1. Introduction

This report includes indicators primarily from the Common Quality Agenda which serve to highlight inequities in health outcomes and access to health care services between residents of the North West and North East LHIN regions compared to Ontario overall. The technical appendix provides general information on the data source, analytical methods, limitations, as well as detailed information for each indicator presented in the report.

2. Analysis

a) Adjustment

To enable appropriate and fair comparisons of performance, some of the indicators were age- or age- and sex-adjusted to a reference population.

Survey data were weighted to reflect the design characteristics of the survey and the population of Ontario. For further details on which indicators were adjusted, which were weighted, and the methodology used, please see the individual indicator templates in section 4, Indicator Templates.

b) Significance testing

Statistical significance was determined by comparing the 95% confidence intervals for the values for the North East or the North West LHIN against the Ontario value. A value is said to be significantly different from another if the confidence intervals for the two values do not overlap. The report states an increase/decrease or higher/lower result only when the results are significantly different from the Ontario rate based on this method of testing. For indicators using population level data, no significance testing was completed as this does not apply.

c) Limitations

There are certain limitations of the analysis that should be considered when interpreting the results. A few general limitations when considering the results presented in this report are:

- Findings in this report are associative. Causal links cannot be drawn based on the analyses used in this report.
- While many of the results presented in this report are adjusted for age and sex, other factors which may confound results are not accounted for.
- The Canadian Community Health Survey excludes specific sub-populations including individuals living on-reserve. Therefore, indicators based on data from this survey do not represent the experience of on-reserve First Nations peoples.
- The indicator results for Ontario do not exclude the North East and North West LHINs. Therefore, an analysis of the indicator results that compares the North East and North West LHINs to the *rest* of Ontario may show even greater variation than what is presented in this report.

Some limitations are specific to the data source, the indicator and the methodology used to calculate it. For details on indicator-specific limitations, please see the individual indicator templates in section 4, Indicator Templates.

3. Data sources

The indicator results presented in this report were provided to Health Quality Ontario (HQO) by a variety of data providers, including the Ontario Ministry of Health and Long-Term Care (MOHLTC), the Institute for Clinical Evaluative Sciences (ICES) and Statistics Canada.

The data source(s) for each indicator are listed within the individual templates. More details on the specific data sources that HQO used to produce the indicators are noted below.

Health Care Experience Survey (HCES) – Ministry of Health and Long-Term Care (MOHLTC)

The HCES is a voluntary telephone survey aimed at Ontarians aged 16 and older, conducted on a quarterly basis. The Health Care Experience Survey asks randomly selected Ontarians for their views about their health care system, how healthy they are, if they have chronic conditions, if they have a primary care provider (family doctor, nurse practitioner or other health care provider), how long it takes to see their provider, their experience using the health care system, if they have been to an emergency room or a walk-in clinic, and their household and demographic characteristics. People living in institutions, in households without telephones, and those with invalid/missing household addresses in the Registered Persons Database (RPDB) are excluded. The Ministry of Health and Long-Term Care uses the information from the survey to understand the experience of Ontarians with respect to primary care.

Canadian Community Health Survey (CCHS) – Statistics Canada

The CCHS is a nationally representative, cross-sectional survey of the Canadian community-dwelling population conducted by Statistics Canada. It collects information related to health status, health care utilization and health determinants of the Canadian population. It covers the population 12 years of age and older. Residents living on Indian Reserves and Crown Lands, institutional residents, full-time members of the Canadian Armed Forces, and residents of certain remote regions are excluded from the survey. The Ontario share files for the CCHS survey are used for all analyses and were prepared by the Institute for Clinical Evaluative Sciences (ICES). The CCHS is offered in English and French. To remove language as a barrier in conducting interviews, each of the Statistics Canada Regional Offices recruits interviewers with a wide range of language competencies. In addition, the survey questions are translated into Chinese, Punjabi and Inuktitut. As of 2007, data are now collected on an ongoing basis with annual releases rather than every two years, as was the case prior to 2007.

Canadian Vital Statistics, Death Database – Statistics Canada

The Vital Statistics Death Database is based on an administrative survey that collects demographic and medical information annually from all provincial and territorial vital statistics registries on all deaths in Canada. The cause of death variable in the death database is classified according to the World Health Organization "International Statistical Classification of Diseases and Related Health Problems" (ICD). The central Vital Statistics Registry in each province and territory provides data from death registrations to Statistics Canada, including the

following data: age, sex, marital status, place of residence and birthplace of the deceased; date of death; underlying cause of death; province or territory of occurrence of death; place of accident; and autopsy information.

The registration of births and deaths is a legal requirement in each Canadian province and territory and as such, reporting is virtually complete. Though under-coverage may occur as a result of late or incomplete registration, non-registration or over-coverage are minimal.[i]

Registered Persons Data Base (RPDB) – Ministry of Health and Long-Term Care (MOHLTC)

The RPDB provides basic demographic information about anyone who has ever received an Ontario health card number. The RPDB is a historical listing of the unique health numbers issued to each person eligible for Ontario health services. This listing includes corresponding demographic information such as date of birth, sex, address, date of death (where applicable) and changes in eligibility status. Data from the RPDB are enhanced with available information through other administrative data sources at the Institute for Clinical Evaluative Sciences (ICES); however, even the enhanced dataset overestimates the number of people living in Ontario for several reasons, including the source of death information and record linkage issues. Although improvements have been made in recent years, the RPDB still contains a substantial number of individuals who are deceased or no longer living in Ontario. As such, the RPDB will underestimate mortality. To ensure that rates and estimates are correct, a methodology has been developed to adjust the RPDB so that regional population counts by age and sex match estimates from Statistics Canada.

Ontario Registrar General's Death (ORG-D) File – Institute for Clinical and Evaluative Sciences (ICES)

The ORG-D file captures all death events registered in Ontario from January 1st 1992 onwards and includes information on the cause of death.

4. Indicator Templates

Age-standardized Mortality Rate	
Description	This indicator reports the age-standardized all-cause mortality rate in Ontario A lower number is better
Relevance/Rationale	Mortality indicators reveal information about the health of a population and can serve to inform where the health system has made gains and point to where more work is needed.
HQO reporting tool	Not reported
Reporting tools external to HQO	• Statistics Canada • Organization for Economic Cooperation and Development • World Health Organization • Association of Public Health Epidemiologists of Ontario
Unit of analysis	Deaths per 1,000 population
Calculation	**Numerator** Total number of deaths (all-cause) in the year being studied (sourced from ORG-D and linked to RPDB)
	Denominator Total number of Ontario residents in the year being studied (Statistics Canada population census files) **Exclusions:** • Invalid Ontario health care number • Non-residents of Canada • Less than 18 years old
	Methods Total number of deaths (all-cause) in the year being studied divided by the total number of Ontario residents in the year being studied .
	Adjustment Age-standardized to the 1991 Canadian Census
Data source / data elements	Office of the Registrar General-Deaths (ORG-D), Registered Persons Database (RPDB); provided by ICES
Levels of comparability/stratification descriptions	Compared by Local Health Integration Network
Limitations / Caveats	This indicator does not provide information on the individual causes of deaths or on quality of life.

Life Expectancy at Birth	
Description	Life expectancy is the number of years a person would be expected to live, starting at birth (for life expectancy at birth) if the age- and sex-specific mortality rates for a given observation period (such as a calendar year) were held constant over his/her life span. [1] A higher number is better
Relevance/Rationale	Life expectancy at birth is used worldwide and it tells us about the general health of a population. [1] Life expectancy at birth reflects the overall mortality level of a population.[2] It measures the number of years rather than the quality of life, so it does not reflect the number of years spent in a good health. Life expectancy at birth has been increasing for many decades. In Canada it has increased substantially going up from about 60 years in 1920 to more than 80 in 2009.[3, 4] Examining life expectancy by income allows us to examine that impact of inequity on this important health outcome.
HQO reporting tool	Measuring Up 2015
Reporting tools external to HQO	• Statistics Canada • Organization for Economic Cooperation and Development • Canadian Institute for Health Information • Association of Public Health Epidemiologists of Ontario
Unit of analysis	Years
Calculation	**Numerator** Cumulative number of person-years lived, for a cohort of 100,000 persons
	Denominator Number of persons in an initial cohort of 100,000 live births **Exclusion:** Rates used by Statistics Canada to calculate life expectancy are calculated with data that excludes the following: • Births to mothers who are not residents of Canada • Births to mothers who are residents of Canada whose province or territory of residence was unknown • Deaths of non-residents of Canada • Deaths of residents of Canada whose province or territory of residence was unknown • Deaths for which age or sex of the decedent was unknown
	Methods Cumulative number of person-years lived, divided by the number of live births or people aged 65 in the initial cohort.

	Age- and sex-specific mortality rates corresponding to the reference period are applied to a hypothetical cohort, typically of 100,000 people. Starting at birth, the probability of dying at each age or age interval is applied to the number of people surviving to that age or the beginning of the age interval, respectively.
	Adjustment N/A
Data source / data elements	Vital Statistics, Death database and demography division, sourced from Statistics Canada (CANSIM table 102-4307)
Levels of comparability/stratification descriptions	Compared by Local Health Integration Network
Limitations / Caveats	This indicator does not provide information on the individual causes of deaths or on quality of life. Life expectancy does not provide information about the quality of life which might be a more meaningful measure of years lived. Other measures have been developed using a composite of morbidity and mortality data. For example, health-adjusted life expectancy (HALE) is the average number of years that an individual is expected to live in a healthy state.[8]

1. http://www5.statcan.gc.ca/cansim/a26?lang=eng&retrLang=eng&id=1020512&tabMode=dataTable&srchLan=-1&p1=-1&p2=9
2. World Health Organization: http://apps.who.int/gho/indicatorregistry/App_Main/view_indicator.aspx?iid=65 accessed on May 5 2014
3. Statistics Canada. http://www.statcan.gc.ca/pub/82-624-x/2011001/article/chart/11427-02-chart2-eng.htm
4. Statistics Canada. *Table 102-0512 - Life expectancy, at birth and at age 65, by sex, Canada, provinces and territories, annual (years),* CANSIM (database).

Potential Years of Life Lost due to avoidable causes	
Description	The average number of years a person would have lived if he or she had not died prematurely (i.e. before age 75) due to avoidable causes A lower rate is better
Relevance/Rationale	Mortality indicators reveal information about the health of a population and can serve to inform where the health system has made gains and point to where more work is needed.
HQO reporting tool	Not reported
Reporting tools external to HQO	Canadian Institute for Health Information Statistics Canada Pan-Canadian Health Inequalities Data Cube
Unit of analysis	Years of life lost per 100,000 population
Calculation	**Numerator** The sum of differences between age 75 and age of death from avoidable causes* *Premature deaths that could potentially have been avoided through all levels of prevention (primary, secondary, tertiary). Canadian Institute for Health Information, Health Indicators 2013 (Ottawa, Ont.: CIHI, 2013).
	Denominator Total mid-year population younger than age 75
	Methods

	(The sum of differences between 75 and age of death from avoidable causes ÷ Total mid-year population younger than age 75) × 100,000
	Adjustment Age-standardized using the 2011 Canadian Census population
Data source / data elements	Vital Statistics, Death Database and Demography Division, sourced from Statistics Canada (CANSIM table 102-4309)
Levels of comparability/stratification descriptions	Compared by Local Health Integration Network
Limitations / Caveats	It is generally acknowledged that not all premature deaths can actually be avoided. For example, some deaths from treatable causes may be unavoidable due to late diagnosis or concurrent health problems, while some deaths from preventable causes could be due to unpredictable events against which no protective measures could have been taken. An upper age limit of 75 should not imply that some deaths in the population older than 75 could not be avoided. However, multiple comorbidities are common among older adults, making the assignment of a single cause of death challenging.

Potential Years of Life Lost Due to Selected Conditions	
Description	The average number of years a person would have lived if he or she had not died prematurely (i.e., before age 75) due to respiratory diseases, circulatory diseases and self-inflicted injury. A lower rate is better
Relevance/Rationale	Mortality indicators reveal information about the health of a population and can serve to inform where the health system has made gains and point to where more work is needed.
HQO reporting tool	Not reported
Reporting tools external to HQO	Statistics Canada
Unit of analysis	Years of life lost per 100,000 population
Calculation	**Numerator** The sum of differences between age 75 and age of death from the following causes*: - Respiratory diseases [J00-J99] - Circulatory diseases [I00-I99] - Suicides and self-inflicted injury [X60-X84, Y87.0] *Reported separately
	Denominator Total mid-year population younger than age 75
	Methods (The sum of differences between 75 and age of death from avoidable causes ÷ Total mid-year population younger than age 75) × 100,000
	Adjustment Age-standardized using the 2011 Canadian Census population
Data source / data elements	Vital Statistics, Death Database and Demography Division, sourced from Statistics Canada (CANSIM table 102-4313)

Levels of comparability/stratification descriptions	Compared by Local Health Integration Network
Limitations / Caveats	It is generally acknowledged that not all premature deaths can actually be avoided. For example, some deaths from treatable causes may be unavoidable due to late diagnosis or concurrent health problems, while some deaths from preventable causes could be due to unpredictable events against which no protective measures could have been taken. An upper age limit of 75 should not imply that some deaths in the population older than 75 could not be avoided. However, multiple comorbidities are common among older adults, making the assignment of a single cause of death challenging.

Cigarette Smoking (Daily or Occasional)	
Description	This indicator measures the proportion of the population aged 12 and older who report smoking cigarettes (daily or occasionally). A lower percentage is better.
Relevance/Rationale	Tobacco is a leading preventable cause of premature death in Canada and is the main risk factor for four of the leading causes of death in Canada- cancer, heart disease, stroke, and lung disease.[1] Tobacco is responsible for over 85% of deaths from lung cancer; over 70% of deaths from cancers of the mouth, oropharynx and esophagus; and significant proportions of deaths from some others cancers.[2] Approximately 37,000 Canadians die each year as a result of tobacco use.[1] Smoking cigarettes is the most common method of tobacco use and in 2010, it was estimated that approximately 16.7% of the Canadian population, or 4.7 million persons, smoked.[3] Approximately half of those smokers are expected to become ill or die from continued tobacco use.[3] In addition, tobacco-related illnesses cost the Ontario economy $1.6 billion in health care costs and $4.4 billion in productivity losses, while contributing an estimated 500,000 hospital patient days annually.[4]
HQO reporting tool	Measuring Up, 2016
Reporting tools external to HQO	Statistics Canada CANSIM tables and Health Fact Sheets Other indicators in the same family: • Cancer Care Ontario Cancer System Quality Index (CSQI):Daily/occasional smoking for those aged 20+ • Ontario Tobacco Research Unit (OTRU): Use of tobacco (cigarettes, cigars, pipes) in past 30 days for those aged 12+; and those aged 12+ who have smoked cigarettes in the past 30 days and had smoked at least 100 cigarettes in their lifetime
Unit of analysis	Percentage
Calculation	**Numerator** The number of respondents who reported current daily or occasional smoking of cigarettes.

	Inclusions: • if SMKDSTY = 1, 2, 3 Based on CCHS variable SMKDSTY which indicates the type of smoker the respondent is, based on their smoking habits: 1 = Daily 2 = Occasional smoker (former daily smoker) 3 = Occasional smoker (never a daily smoker or has smoked less than 100 cigarettes in lifetime) 4 = Former daily smoker (non-smoker now) 5 = Former occasional smoker (at least 1 whole cigarette, non-smoker now) 6 = Never smoked (a whole cigarette) 99 = At least one required question was not answered (don't know, refusal, not stated)
	Denominator All CCHS respondents aged 12 or above **Exclusions:** • Age < 12 at the time of interview • Invalid indication/Missing Values
	Methods Numerator/Denominator*100
	Adjustment *(risk, including age/sex standardization)* Direct adjustment (age) using 2011 Canadian Census population Sampling weights are used for calculating all estimates.
Data source / data elements	Canadian community health survey (CCHS) conducted by Statistics Canada provided by the Institute for Clinical Evaluative Sciences
Levels of comparability/stratification descriptions	Compared by Local Health Integration Network
Limitations / Caveats	As this indicator relies on self-reported data, the true rate might in fact be higher or lower. In addition, this survey excludes individuals living on Indian Reserves and on Crown Lands, institutional residents, full-time members of the Canadian Forces, and residents of certain remote regions, which will affect the representativeness of the sample and underestimation of the true rates. Altogether, these exclusions represent <3% of the target population. Cell phones were not allowed for interviewing in the CCHS up to and including 2014. If an interviewer discovers that the phone the respondent is on is cellular, they ask if there is another number to call back on. This is also the case if they discover that the respondent answered on a cell that was forwarded to by a landline. The interviewer would not be able to enter the case once they determined the phone was a cell. As of 2015 cell phones are allowed. While, this will help increase number of respondents and avoid biasing against the increasing trend for households to only have cell phones, it may result in differences in comparability of survey samples over time.

1. Canadian Cancer Society. (2015). Tobacco. Retrieved from: http://www.cancer.ca/en/cancer-information/cancer-101/what-is-a-risk-factor/tobacco/?region=on
2. Danaei G, Vander Hoorn S, Lopez AD, Murray CJL, Ezzati M. Causes of cancer in the world: comparative risk assessment of nine behavioural and environmental risk factors. Lancet 2005; 366 1784-93.
3. Reid J, Hammond D, and Burkhalter R. Tobacco Use in Canada: Patterns and Trends, 2012 Edition. Waterloo, ON: Propel Centre for Population Health Impact, University of Waterloo; 2012.

4. Ministry of Health Promotion. (2006). Fact Sheet- Costs of Tobacco Use and Tax Revenues. Retrieved from: http://www.mhp.gov.on.ca/en/smoke-free/factsheets/Tobacco_Revenue-120208.pdf

Chronic Conditions	
Description	This indicator reports the percentage of the overall population aged 12 and over who report the presence of one or two or more chronic conditions. A lower percentage is better.
Relevance/Rationale	Understanding the prevalence of chronic conditions within the population provides context for the public, policy makers and providers. This is especially relevant from a health equity perspective as the rate of chronic conditions and the number of chronic conditions may vary depending on the socioeconomic status, health risk factors and health care access of a population. The included chronic conditions were selected by a panel of physicians who have expertise in caring for marginalized populations.
HQO reporting tool	Measuring Up, 2016 Income and Health: Opportunities to achieve health equity in Ontario
Reporting tools external to HQO	A similar indicator which measures the prevalence of chronic conditions has been reported by Statistics Canada, Canadian Institute of Health Information and the Public Health Agency of Canada.
Unit of analysis	Percentage
Calculation	**Numerator** Respondents with: • 1 of any of the listed chronic conditions • 2 or more of any of the listed chronic conditions Based on responses to the following set of questions (count responses = 1) CCHS variables of interest: • CCC_Q290 (anxiety disorder), • CCC_Q051 (arthritis), • CCC_Q031 (asthma), • CCC_Q091 (chronic bronchitis, emphysema, COPD), • CCC_Q101 (diabetes), • CCC_Q121 (heart disease), • CCC_Q071 (hypertension), • CCC_Q280 (mood disorders)
	Denominator All respondents aged 12* or above **Exclusion:** For CCC_Q290, CCC_Q051, CCC_Q031, CCC_Q091, CCC_Q101, CCC_Q121, CCC_Q071, CCC_Q280, exclude: • 8: RF • 9: DK *The CCHS question pertaining to arthritis was only asked in respondents 14 years or older.

	Methods Numerator/Denominator*100
	Adjustment Direct adjustment (age) using 2011 Canadian Census population
Data source / data elements	Canadian community health survey (CCHS) conducted by Statistics Canada provided by the Institute for Clinical Evaluative Sciences
Levels of comparability/stratification descriptions	Compared by Local Health Integration Network
Limitations / Caveats Timing and frequency of Release	As this indicator relies on self-reported data (diagnosis of the specific chronic condition) the true rate might in fact be higher or lower. The chronic conditions included in the definition of this indicator were determined by a panel of physicians and are not an exhaustive list of all chronic conditions available through the CCHS. The rate of chronic conditions reported based on this indicator may differ from other similar indicators. In addition, this survey excludes individuals living on Indian Reserves and on Crown Lands, institutional residents, full-time members of the Canadian Forces, and residents of certain remote regions, which will affect the representativeness of the sample and underestimation of the true rates. Altogether, these exclusions represent <3% of the target population. Cell phones were not allowed for interviewing in the CCHS up to and including 2014. If an interviewer discovers that the phone the respondent is on is cellular, they ask if there is another number to call back on. This is also the case if they discover that the respondent answered on a cell that was forwarded to by a landline. The interviewer would not be able to enter the case once they determined the phone was a cell. As of 2015 cell phones are allowed. While this will help increase number of respondents and avoid biasing against the increasing trend for households to only have cell phones, it may result in differences in comparability of survey samples over time.

Timely Access to a Primary Care Provider	
Description	This indicator reports the percentage of people in Ontario aged 16 and older who reported that in the last 12 months they were able to see their primary care provider (i.e. a family doctor, a general practitioner or GP, or nurse practitioner) or someone else in their office on the same day or the next day, when they were sick or were concerned that they had a health problem A higher percentage is better.
Relevance/Rationale	Access to primary care is key to keeping Ontarians healthy, however simply having a family doctor is not enough. About 20% of those with a regular doctor still make use of walk-in clinics, suggesting that it may be related to less timely access from their regular family doctors.[1,2] If people see their own family health care provider when they need to, it can prevent them from getting sicker and requiring costly hospital and emergency

	room care. It can also help to avoid emergency room visits for conditions that can be addressed by a primary care provider.[3] Timely access also allows patients and providers to better manage exacerbations of chronic diseases like diabetes and to stay up-to-date with preventive care and screenings.[3]
HQO reporting tool	Measuring up. 2016 Primary Care Public Reporting Web Pages Quality in Primary Care, 2015 (HQO Theme Report) Quality Improvement Plans
Reporting tools external to HQO	Similar external indicators which do not align: Commonwealth Fund International Health Policy Survey (The survey has a similar question but the population surveyed is different, therefore the results from the Commonwealth Fund Survey differ from what is reported in Measuring Up, 2015. Furthermore, the results from the Commonwealth Fund Survey are at the country and provincial level only and there are different populations surveyed depending on the survey cycle year.)
Unit of analysis	Percentage
Calculation	**Numerator** Number of respondents who answered "same day" or "next day" to the following question: How many days did it take from when you first tried to see your [name type of provider] to when you actually saw them or someone else in their office? • **Saw doctor same day** • **Saw doctor next day** • 2 to 19 (enter number of days) • Twenty or more days • Don't know • Refused
	Denominator Number of respondents who answered "yes" to the following questions: Not counting yearly check-ups or monitoring of an ongoing health issue, in the last 12 months did you want to see your [name type of provider] because you were sick or were concerned that you had a health problem? • **Yes** • No • Don't know • Refused AND Respondents who answered "yes saw own doctor", "yes saw someone else in office", or "saw both [name type of provider] and someone else (and others)" to the following question: Did you actually see your [name type of provider] or someone else in their office? • **Yes saw own doctor** • **Yes saw someone else in office** • **Saw both [name type of provider] and someone else (others)**

	• No • Don't know • Refused **Exclude:** Respondents who answered don't know or refused to answer either of the above questions
	Methods Numerator/Denominator X100
	Adjustment *(risk, including age/sex standardization)* Weighted to account for the design characteristics of the survey and post-stratified by age and sex to reflect the Ontario population.
Data source / data elements	Health Care Experience Survey (HCES) provided by the Ministry of Health and Long-Term Care (MOHLTC)
Levels of comparability/stratification descriptions	Compared by Local Health Integration Network
Limitations / Caveats	Only people aged 16 years and older can complete the survey. People living in institutions, non-residential phone numbers, and people with invalid/missing household addresses in the Registered Persons Database (RPDB) are not captured. Respondents who were unable to speak English or French or were not healthy enough (physically or mentally) to complete the interview were not surveyed.

1. Szafran O. & Bell N.R. Use of Walk-in Clinics by Rural and Urban Patients. Canadian Family Physician.2000;46(1):114–19.
2. Born K. & Laupacis A. Healthy Debate. September 28, 2011. Available from: http://healthydebate.ca/2011/09/topic/community-long-term-care/accessing-primary-care 12
3. Excellent Care for All. Available from: http://www.health.gov.on.ca/en/pro/programs/ecfa/action/primary/pri_access.aspx].

5. References

i Statistics Canada. Vital Statistics – Birth Database. Accessed March 1, 2016 from: http://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&SDDS=3231