ONTARIO ATLAS OF ADULT MORTALITY

1992-2015

VERSION 2.0:

TRENDS IN PUBLIC HEALTH UNITS

Population Health Analytics Laboratory

UNIVERSITY OF TORONTO
DALLA LANA SCHOOL OF PUBLIC HEALTH

AUTHORS

This atlas was developed through the Ontario Population Trends in Improved Mortality: Informing Sustainability and Equity of the health care system (OPTIMISE) research program, an initiative of the Population Health Analytics Laboratory at the Dalla Lana School of Public Health (DLSPH), University of Toronto. OPTIMISE aims to develop measures of health system functioning and inform health system planning in Ontario.

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CITING THIS REPORT

Cite as:
Buajitti E, Chiodo S, Watson T, Kornas K, Bornbaum C, Henry D, Rosella LC. Ontario atlas of adult mortality, 1992-2015, Version 2.0: Trends in Public Health Units. Toronto, ON: Population Health Analytics Lab; 2018.

ISBN 978-0-7727-8775-0

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ACKNOWLEDGEMENTS

This study was funded by the Canadian Institutes for Health Research Operating Grant (FRN-142498). Laura Rosella is supported by a Canada Research Chair in Population Health Analytics. This study was supported by the Institute for Clinical Evaluative Sciences (ICES), which is funded by an annual grant from the Ontario Ministry of Health and Long-Term Care (MOHLTC). The opinions, results and conclusions reported in this paper are those of the authors and are independent from the funding sources. No endorsement by ICES or the Ontario MOHLTC is intended or should be inferred. Parts of this material are based on data and information compiled and provided by MOHLTC, the Canadian Institute for Health Information (CIHI), Cancer Care Ontario (CCO), Immigration, Refugees, and Citizenship Canada (IRCC), and the Office of the Registrar General (ORG). However, the analyses, conclusions, opinions and statements expressed herein are those of the authors, and not necessarily those of MOHLTC, CIHI, CCO, IRCC, or ORG. The study team is grateful for the guidance provided by the OPTIMISE Scientific Committee, chaired by Dr. John Frank, Scottish Collaboration for Public Health Research & Policy, University of Edinburgh.

VERSION 1.0 OF THIS REPORT

In February 2018, our team published the first version of this report, titled *Ontario Atlas of Adult Mortality, 1992 – 2015: Trends in Local Health Integration Networks*. This second version is an effort to reproduce the analyses presented in our initial report using the geographic boundaries of Ontario's 36 Public Health Unit regions. However, we also intended for this report to stand alone for those who have not read the first report. For this reason, we have intentionally retained content from the original report, including background information regarding the mortality indicators used and any province-level mortality trends reported. This report does not include Population Profiles to describe the sociodemographic and behavioural makeup of the Public Health Units. Readers with an interest in the geographic distribution of those characteristics across Ontario, as well as those with an interest in Local Health Integration Network geography, should refer to the first version of this report. It is available at www.pophealthanalytics.com in the 'Reports' section.

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OVERVIEW

As shown in Ontario Atlas of Adult Mortality, 1992 – 2015: Trends in Local Health Integration Networks, adult mortality rates in Ontario fell significantly between 1992 and 2015. However, mortality and its declines are not homogenous across the province. There are significant geographic, socioeconomic, and sex differences in mortality within Ontario's population. In this report, we highlight those differences according to Ontario's Public Health Units. Overall, men, those living in low socioeconomic status neighbourhoods, and residents of Public Health Units in northeastern Ontario (i.e. Porcupine, Timiskaming and Algoma PHUs) experience the highest mortality rates. These groups are also more likely to die prematurely and from treatable or preventable causes. Furthermore, socioeconomic and geographic groups with the highest mortality rates in 1992 also made the least improvements between 1992 and 2015. As a result, differences in mortality between Public Health Units and socioeconomic groups have grown larger since 1992.

HIGHLIGHTS

- This report is based on the linkage of the Ontario Registrar General's death certification file (ORG-D) to a range of routinely collected health data held at the Institute for Clinical Evaluative Sciences. From the linked data we analysed trends in several mortality measures over time, by sex, by socio-economic group and by location (Public Health Unit).

- All-cause mortality rates declined in Ontario between 1992 and 2015 by 40% in males and 30% in females; premature mortality (deaths before age 75) declined by 28% in males and 20% in females.

- The largest declines in all-cause and premature mortality took place in Public Health Units in the Greater Toronto Area (Toronto, York Region, Peel, and Halton Region); the smallest declines were in northern and southwestern Ontario (Lambton, Northwestern, Porcupine, Thunder Bay, Haldimand-Norfolk, and Algoma)

- Cancer and cardiovascular disease were the most common causes of death between 1992 and 2012, accounting for 60% of all deaths in Ontario.

- Between 2006 and 2012, half of premature deaths were from causes considered amenable to medical care and public health intervention; the lowest decreases in amenable mortality rates were found in Porcupine, Algoma, Lambton, and Northwestern PHUs, and the highest decreases were found in Toronto and Halton Region PHUs.

- The relative socioeconomic gradient (low vs. high socioeconomic status) in premature mortality increased in Ontario between 1992 and 2015. The largest socioeconomic disparities, measured by the relative index of inequality, were found in both sexes living in Thunder Bay District, Hamilton, and Durham Region PHUs.

- Identifying and understanding the complex relationship between the key factors that are driving the geographic variations in mortality across Ontario's thirty-six PHUs requires more detailed analyses of the roles of health behavioural patterns, relationships between socioeconomic disadvantage and geographic location, and additional information on living conditions and access to health and social services.

Further collaboration between the health care and public health sectors of the health system may help address the growing impact of social and economic inequities on premature and avoidable deaths in Ontario.

EXECUTIVE SUMMARY

BACKGROUND

This atlas is a product of the **OPTIMISE research program,** an initiative of the Population Health Analytics Laboratory at the Dalla Lana School of Public Health, University of Toronto. OPTIMISE aims to develop mortality-based measures of health system functioning to inform health system planning in Ontario. To serve that goal, the project used the power generated by linkage of the Ontario Registrar General's death records (**ORG-D**) to a range of routinely collected health data held at the Institute for Clinical Evaluative Sciences. The OPTIMISE program is co-led by Dr. Laura Rosella and Dr. David Henry out of the Population Health Analytics Laboratory and guided by a steering committee of health system leaders chaired by Dr. Adalsteinn Brown, Dalla Lana School of Public Health, University of Toronto and a scientific committee chaired by Dr. John Frank, Scottish Collaboration for Public Health Research & Policy, University of Edinburgh.

This version of the atlas contributes to our comprehensive, descriptive summary of adult mortality trends in Ontario between 1992 and 2015. In this version, trends and patterns in mortality are described by sex, by Public Health Unit (PHU) region, and over time. A summary of the same trends in Local Health Integration Network (LHIN) regions is provided in the previous version (available at www.pophealthanalytics.com in the 'Reports' section). Five distinct mortality-based indicators are used: all-cause mortality, cause-specific mortality, premature mortality, amenable mortality (deaths considered amenable to medical care or public health intervention), and the Relative Index of Inequality (a measure of socioeconomic inequality).

Each of the mortality-based indicators put forward by this atlas offers important insights into population health and health system performance in Ontario. Taken together, the reports offer information useful to both health care and public health sectors in Ontario.

KEY FINDINGS

All-cause mortality

All-cause mortality in this report includes all deaths registered in Ontario between 1992 and 2015 among adults aged 18 or older, regardless of cause of death. The Ontario population expanded and aged substantially during this time, resulting in an increase in the crude number of deaths recorded year-over-year. After accounting for age through age-standardization (to adjust for population size and age structure), a clear and sizeable reduction in mortality between 1992 and 2015 was observed.

Age-standardized all-cause mortality rates were higher in males than in females throughout the study period. However, males also experienced a more significant decline in all-cause mortality than females, resulting in a narrowing of the sex gap between 1992 and 2015.

Among geographic regions, rates of all-cause mortality were consistently highest in northeastern Ontario, including Timiskaming, Sudbury and District, and Algoma PHUs. These regions also experienced the smallest overall improvements in all-cause mortality between 1992 and 2015. In the Greater Toronto Area (York,

Peel, and Toronto PHUs) and in Ottawa, all-cause mortality rates were consistently lower and improved substantially more over our observation period. Generally, geographic disparities in all-cause mortality in Ontario increased between 1992 and 2015.

Cause-specific mortality

Cause-specific mortality in this report included all deaths registered in Ontario between 1992 and 2012, among adults aged 18 or older, with valid cause of death information. Deaths were then grouped according to ICES-derived ICD-9 codes for the following cause of death categories: diseases of the cardiovascular and circulatory system, cancers, diseases of the respiratory system, and external causes of injury and poisoning.

Cause-specific mortality rates for cardiovascular and circulatory mortality, cancer mortality and respiratory mortality all declined in Ontario between 1992 and 2012. The improvements were most pronounced among diseases of the cardiovascular and circulatory systems, which were overtaken by cancer as the leading cause of death in Ontario in 2008. As with all-cause mortality, improvements in cause-specific mortality rates were larger in men than in women. External cause mortality (injury and poisoning), which did not decline significantly between 1992 and 2012, had the largest sex differential of all the major cause of death groupings considered with higher rates observed in men.

The geographic patterns of cardiovascular, cancer, and respiratory mortality were similar to those seen in all-cause mortality, with the highest rates in northeast Ontario health units. The geographic pattern of external cause mortality was substantially different, with the highest mortality rates seen in health units in the northwest Ontario of the province. Consistently across causes (including external cause mortality), mortality rates were lowest in the Greater Toronto Area health units (i.e. York, Peel and Toronto PHUs) and in Ottawa PHU. Rates of improvement were also greatest in the Greater Toronto Area.

Premature mortality

Premature mortality was reported for all deaths registered in Ontario between 1992 and 2015 among decedents aged 18 to 74. Like all-cause mortality, premature mortality rates declined between 1992 and 2015 across Ontario's health units.

The geographic pattern of premature mortality was similar to that seen in other mortality measures. Those living in health units near Toronto had the lowest overall premature mortality rates, and also experienced the largest overall improvements in those rates. Premature mortality was comparatively higher throughout health units in northern Ontario, particularly in the northeast (i.e. Porcupine, Timiskaming and Algoma), and also improved the least in those regions between 1992 and 2015.

Premature mortality by socioeconomic status

This report used material deprivation quintiles from the Ontario Marginalization Index (ON-MARG) as a proxy measure of socioeconomic status for all Ontario residents (for details, see Matheson et al., 2012). Premature mortality rates show a clear, graded association between socioeconomic status and premature mortality across health units and for both sexes.

Additionally, Relative Index of Inequality (RII)[1] measures were calculated to assess socioeconomic inequalities in premature mortality, within PHUs and over time. These calculations show that the effect of socioeconomic status on premature mortality varies across Ontario's PHUs and experience socioeconomic disadvantage uniquely according to where they live. Furthermore, the RII data show that relative socioeconomic disparities in adult premature mortality are expanding over time.

Amenable mortality

Amenable mortality is a subset of premature mortality, made up of all deaths attributed to causes that are considered amenable to medical and/or public health intervention. Amenable mortality in this report considered all amenable deaths (based on an established classification system) registered in Ontario between 1992 and 2012, among decedents aged 18 to 74. We defined amenable mortality using an established classification system proposed by Nolte and McKee (2008).

Amenable mortality rates were higher in males than in females for all Ontario PHUs. The geographic pattern of amenable mortality was similar to that seen in most other mortality indicators, with the highest rates in northeast Ontario and the lowest rates in PHUs surrounding Toronto and Ottawa.

IMPLICATIONS

All-cause, premature, circulatory, cancer, and respiratory mortality rates all declined substantially between 1992 and 2015. However, there is evidence of PHU variability appearing repeatedly in both males and females, over time and for different mortality measures. Several mortality indicators showed elevated risk in PHUs located in northeastern Ontario (Algoma, Porcupine and Timiskaming), and lower mortality risk in PHUs around the Greater Toronto Area. Furthermore, RII measures for premature mortality show that relative socioeconomic inequalities also grew between 1992 and 2015, while absolute inequalities were largely static.

Despite large improvements in population mortality in Ontario, certain subpopulations across and within PHUs are not experiencing the benefit equally. Ongoing monitoring of mortality-based indicators across the various health sectors in Ontario, is needed to further support collaboration to improve population health.

[1] Relative Index of Inequality (RII) is a regression-based indicator describing the relative inequality for a specified outcome in a given population. Our approach was based on work by Moreno-Betancur et al. (2015), which uses the definition of RII proposed by Kunst and Mackenbach (1995).

1 INTRODUCTION

PUBLIC HEALTH UNITS IN ONTARIO

Ontario's public health system is managed by thirty-six official health agencies, known as **Public Health Units (PHUs)** (1). Each public health unit is governed by a board of health and by a medical officer of health, the operations of which are dictated by the *Health Protection and Promotion Act* (2). Each public health unit is responsible for overseeing the delivery of programs for disease prevention and health promotion to a prescribed region of Ontario (1). The regional boundaries for Ontario's 36 PHUs are shown in Figure 1.1.

All of the mortality indicators used in this atlas are described for all of Ontario and for each of the 36 PHUs. Additionally, sex-specific mortality rates are presented for males and females within each region. Considering these distinct subpopulations separately allows for greater delineation of group-specific mortality trends, and more nuanced assessment of disparities in population health.

MORTALITY INDICATORS

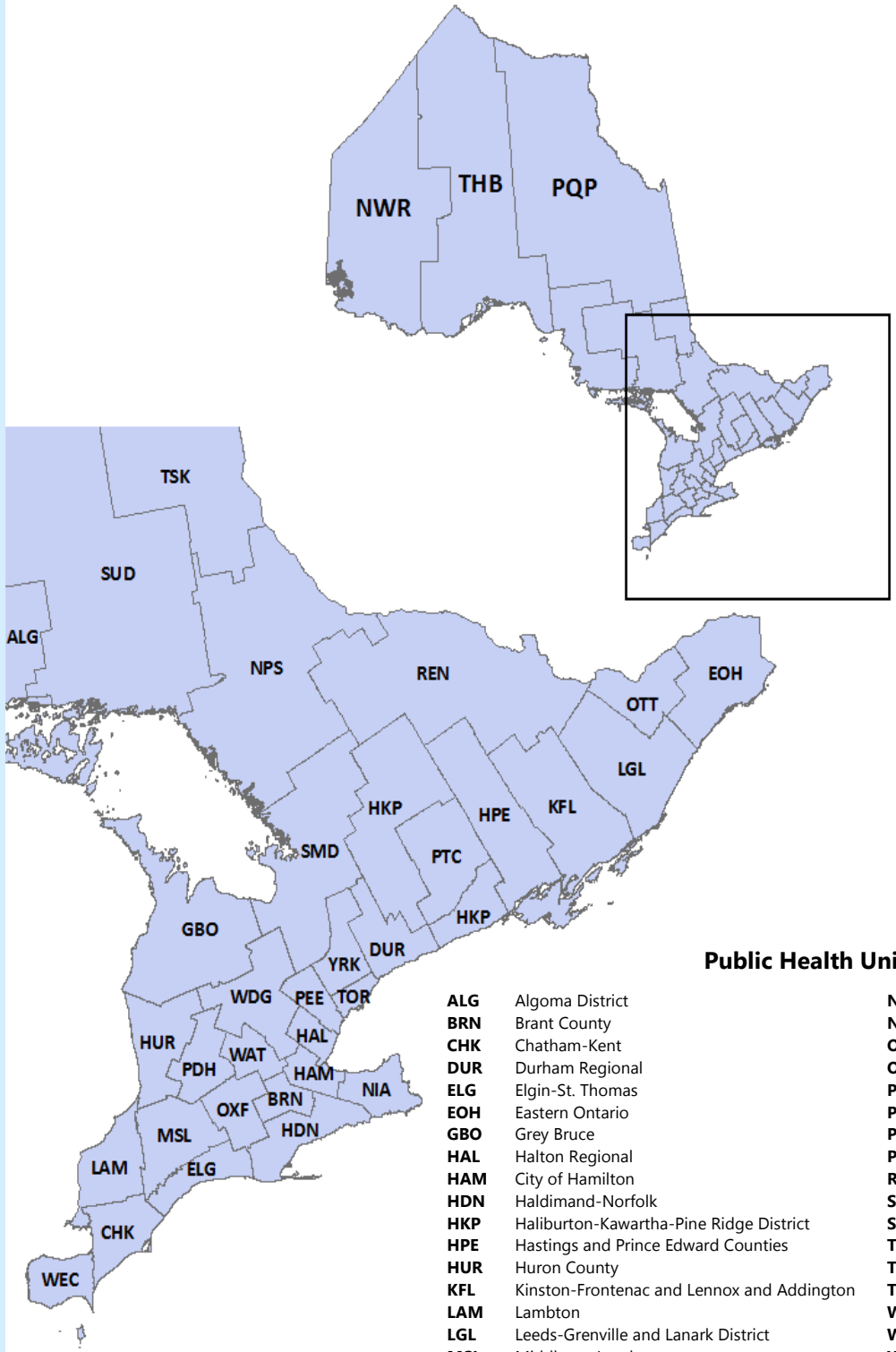
Population mortality rates are robust indicators of population health (3, 4) and are useful for understanding the distribution of health across population groups (5). Mortality rates, including rates of all-cause, cause-specific, premature and amenable mortality, are frequently used in Canada (6); and within regions of the province.

As a measure of both population health and system performance, mortality-based indicators can be of considerable value to health system planning and evaluation; and thus useful to examine at both PHU and LHIN levels.

Consistent with version 1, this report examines adult mortality trends in Ontario between 1992 and 2015 using four mortality-based indicators:

1. **All-cause mortality:** Includes all adult deaths, regardless of age or cause of death.
2. **Cause-specific mortality:** Includes all adult deaths, regardless of age. Deaths are then grouped according to their underlying cause: circulatory & cardiovascular diseases, cancers, respiratory diseases, and external causes of injury and poisoning.
3. **Premature mortality:** Includes all adult deaths before age 75, regardless of cause of death.
4. **Amenable mortality:** Includes all premature deaths from causes that are considered amenable to medical care or public health intervention.

Additionally, this report uses **Relative Index of Inequality (RII)** to describe socioeconomic inequalities in premature mortality.



Public Health Units

ALG	Algoma District	**NPS**	North Bay Parry Sound District
BRN	Brant County	**NWR**	Northwestern
CHK	Chatham-Kent	**OTT**	City of Ottawa
DUR	Durham Regional	**OXF**	Oxford County
ELG	Elgin-St. Thomas	**PDH**	Perth District
EOH	Eastern Ontario	**PEE**	Peel Regional
GBO	Grey Bruce	**PQP**	Porcupine
HAL	Halton Regional	**PTC**	Peterborough County-City
HAM	City of Hamilton	**REN**	Renfrew County and District
HDN	Haldimand-Norfolk	**SMD**	Simcoe Muskoka District
HKP	Haliburton-Kawartha-Pine Ridge District	**SUD**	Sudbury and District
HPE	Hastings and Prince Edward Counties	**THB**	Thunder Bay District
HUR	Huron County	**TOR**	City of Toronto
KFL	Kinston-Frontenac and Lennox and Addington	**TSK**	Timiskaming
LAM	Lambton	**WAT**	Waterloo
LGL	Leeds-Grenville and Lanark District	**WDG**	Wellington-Dufferin-Guelph
MSL	Middlesex-London	**WEC**	Windsor-Essex County
NIA	Niagara Regional Area	**YRK**	York Regional

Figure 1.1 Public Health Unit boundaries, Ontario.

PURPOSE OF THIS ATLAS

This document is a comprehensive report on mortality trends in Ontario at the PHU level. It offers a descriptive summary of geographic trends in Ontario adult mortality between 1992 and 2015. An earlier version of this report, titled *Ontario Atlas of Adult Mortality, 1992 – 2015: Trends in Local Health Integration Networks*, was published in February 2018. This report is an effort to reproduce the analyses presented in our first version using the geographic boundaries of Ontario's 36 Public Health Unit regions. However, we also intended for this report to stand alone for those who have not read the first report. For this reason, we have descriptions from the original report, including information regarding the mortality indicators used and any province-level mortality trends reported. As a result, similar text appears in both versions of the report. The original report is available at www.pophealthanalytics.com in the 'Reports' section.

Specifically, this atlas provides a detailed look at how population health in Ontario has evolved since the early 1990s, based on several robust mortality-based indicators by PHUs. The findings of this report have important implications for Ontario's health system. Large variations in mortality between and within PHUs can signal improvement that are needed across the public health and health care system access and delivery.

2 MORTALITY TRENDS

2.1 ALL-CAUSE MORTALITY

Scope

All-cause mortality includes all adult deaths that were registered in Ontario between 1992 and 2015, regardless of cause of death. All-cause mortality rates have been **age-standardized** to the 2000 adult Canadian standard population. Age-standardization of all-cause mortality rates accounts for underlying differences in age structure between populations, and allows for comparisons between groups (9, 10).

For methodological details regarding the calculation of age-standardized all-cause mortality rates in this report, refer to the technical appendix. For mapping purposes, all-cause mortality rates have been reported as aggregated (i.e. cumulative) rates for the following eras: 1992-1999, 2000-2007, and 2008-2015.

Use

All-cause mortality is an important indicator of overall population health (9). Decreasing population mortality and increasing survival are core responsibilities of local and regional health systems. All-cause mortality rates are therefore a meaningful indicator of health system functioning (11). Furthermore, evaluating trends in all-cause mortality over time can highlight long-term changes in population health.

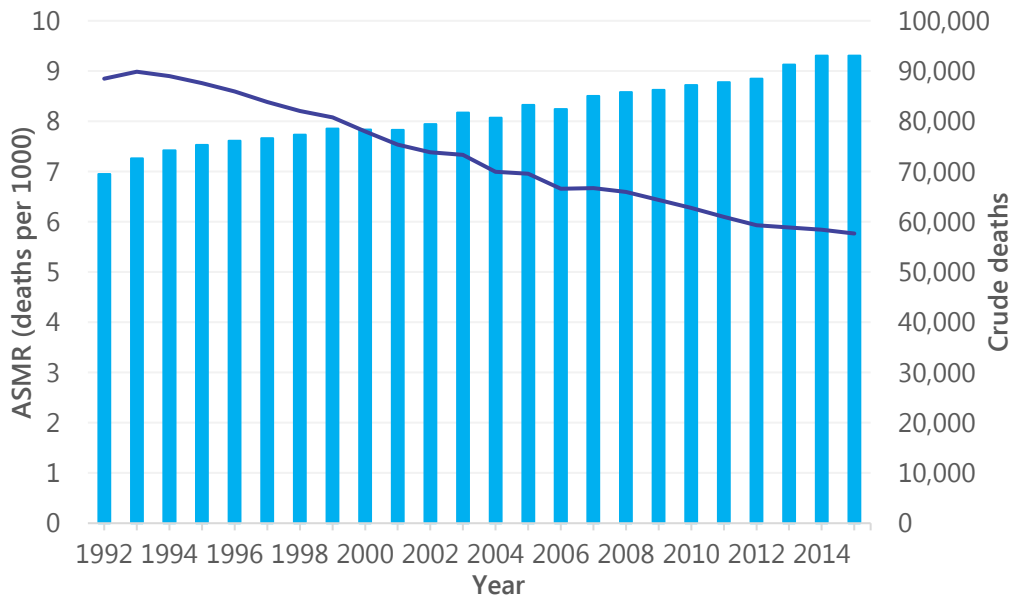


Figure 2.1.1. Age-standardized all-cause mortality rates (line graph) with crude death counts (bar graph), all Ontario, 1992-2015

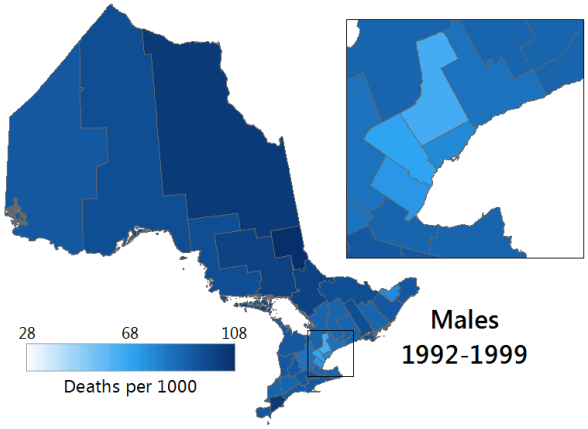


Figure 2.1.2 Cumulative all-cause mortality (total deaths per 1000), males, 1992-1999.

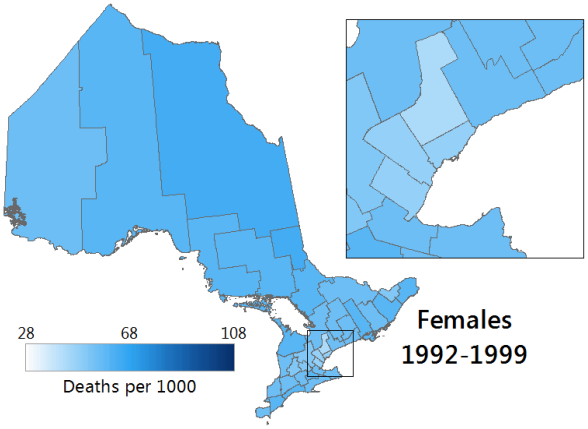


Figure 2.1.3 Cumulative all-cause mortality (total deaths per 1000), females, 1992-1999.

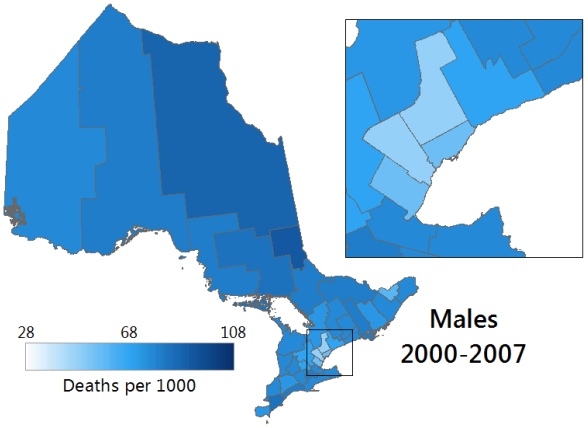


Figure 2.1.4 Cumulative all-cause mortality (total deaths per 1000), males, 2000-2007.

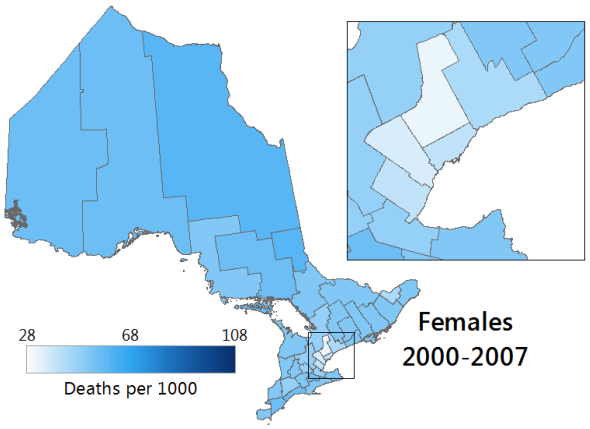


Figure 2.1.5 Cumulative all-cause mortality (total deaths per 1000), females, 2000-2007.

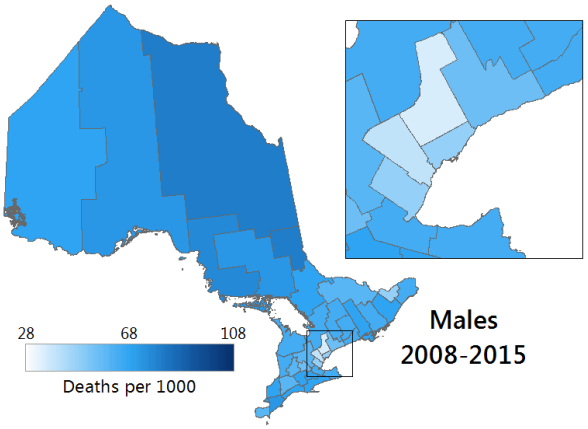


Figure 2.1.6 Cumulative all-cause mortality (total deaths per 1000), males, 2008-2015.

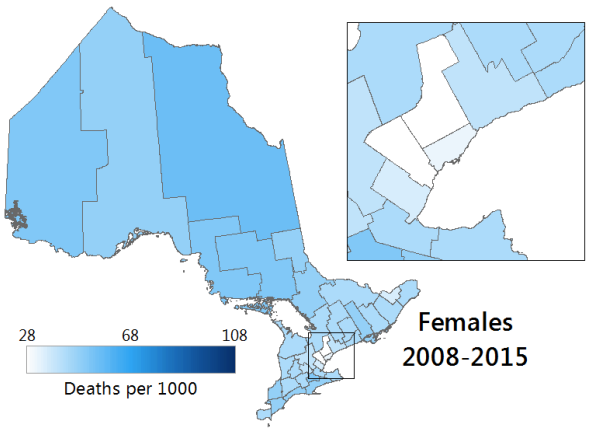


Figure 2.1.7 Cumulative all-cause mortality (total deaths per 1000), females, 2008-2015.

Because they have been adjusted for underlying population age differences, age-standardized all-cause mortality rates are useful for comparing between groups or over time. These rates can also be used to identify PHU-level patterns in mortality over time. All-cause mortality is best used in combination with other, more granular, mortality rates or health indicators (12).

Findings

Age-standardized all-cause mortality rates in Ontario between 1992 and 2015 are shown in Figure 2.1.1. PHU- and sex-specific all-cause mortality rates are mapped by era in Figures 2.1.2 – 2.1.7. These era mortality rates, with corresponding mortality risk ratios, are available in Table 2.1.1 and 2.1.2 in the data appendix.

Across Ontario, the total number of deaths recorded annually rose steadily between 1992 and 2015 (Figure 2.1.1). However, this was a function of Ontario's growing population and changing population age structures (13). Age-standardized mortality rates (adjusted for population size and age differences) declined consistently over the same period across Ontario (Figure 2.1.1). Figures 2.1.2 – 2.1.8 show the extent of decline in all-cause mortality rates by PHU and sex between 1992 and 2015.

Although females have lower all-cause mortality rates compared to males in all 36 of the Ontario Public Health Units (Figures 2.1.2 – 2.1.7; Table 2.1.2), the all-cause mortality gap between the sexes has begun to diminish over-time. This is a result of the improvement of male all-cause mortality through the years (Tables 2.1.1 and 2.1.2). This finding is consistent with research, both from Canada and other high-income countries, that has repeatedly shown a narrowing gap between men and women in the late 1990s and early 2000s (14-17).

In males, the greatest decline in all-cause mortality arose in the York Region PHU, in which all-cause mortality declined 43%; from 67.7 deaths per 1000 in 1992-1999, to 38.8 deaths per 1000 in 2008-2015 (Table 2.1.1). In the same period, similar large percentage declines also occurred in the Peel PHU, at a 39% decline, and in the Toronto PHU, at a 36% decline (Table 2.1.1). The smallest decline in all-cause mortality among males appeared in the Algoma PHU, where rates declined 21%; from 96.4 deaths per 1000 in 1992-1999, to 76.2 deaths per 1000 in 2008-2015 (Table 2.1.1). Similar small percentage declines also occurred in the Haldimand-Norfolk, Lambton, and Thunder Bay District PHUs, all ranging from a 23-25% decline in all-cause mortality, during the same period (Table 2.1.1).

In females, the greatest declines in all-cause mortality are consistent with the pattern among males. The greatest decline was observed in the York Region PHU, in which all-cause mortality declined 40%; from 47.8 deaths per 1000 in 1992-1999, to 28.6 deaths per 1000 in 2008-2015 (Table 2.1.1). In the same period, similar large percentage declines also occurred in the Peel PHU, at a 35% decline, and in the Toronto PHU, at a 32% decline (Table 2.1.1). The smallest decline in all-cause mortality among females appeared in the Northwestern PHU, in which all-cause mortality declined 8%; from 57.9 deaths per 1000 in 1992-1999, to 53.2 deaths per 1000 in 2008-2015 (Table 2.1.1). Similar small percentage declines also occurred in the Porcupine PHU, at an 11% decline, and in the Lambton PHU, at a 13% decline, both in the same period (Table 2.1.1).

Notably, the general pattern of all-cause mortality seems to indicate that mortality is lowest in the GTA, with the highest declines in mortality, and that mortality is highest in the Southeast and Northern PHUs of

Ontario, with the lowest declines in mortality observed between 1992 and 2015 (Table 2.1.1). This PHU-specific trend suggests that the geographic disparities between the PHUs in all-cause mortality are increasing over time.

2.2 CAUSE-SPECIFIC MORTALITY

Scope

Cause-specific mortality includes all adult deaths registered in Ontario between 1992 and 2012 with valid cause of death information.[2] Additionally, deaths have been stratified by cause of death, according to the following four code groups in ICD-9: Diseases of the cardiovascular and circulatory system, cancers, diseases of the respiratory system, and external causes of injury and poisoning (18).

Cause of death is an ICES-derived variable based on the underlying cause of death recorded on the decedent's Medical Certificate of Death (19). All deaths that fall outside of the codes assigned to the cause of death groupings have been assigned a cause of death of 'Other.' Across the study period, the four major cause of death groupings accounted for approximately 78% of all deaths reported in Ontario (see Table 2.2.1 in the data appendix).

Cause-specific mortality rates have been age-standardized to the 2000 adult Canadian standard population. As before, age-standardization corrects for underlying differences in population age structures, and allows for comparisons between groups (9, 10). For details regarding calculation of cause-specific mortality rates, refer to the technical appendix.

Cause-specific mortality rates are reported as aggregated rates for the following eras: 1992-1998, 1999-2005, and 2006-2012.

Use

Cause-specific mortality rates are important for understanding the factors underlying the trends in all-cause mortality. Furthermore, understanding how leading causes of death have changed over time is important for a health system aiming to improve population health.

In interpreting these findings, consider that each of the cause-specific mortality rates presented in this report are aggregated to include a group of individual underlying causes. For example, respiratory mortality includes deaths from acute respiratory infections, pneumonia, influenza, chronic obstructive pulmonary

[2] Cause-specific mortality rates use a shorter data collection period than all-cause and premature mortality rates. This is due to administrative delays in reporting of cause of death information from ORG-D. Valid cause of death information is only available for deaths registered before December 2012; deaths occurring after this time have been excluded from this section.

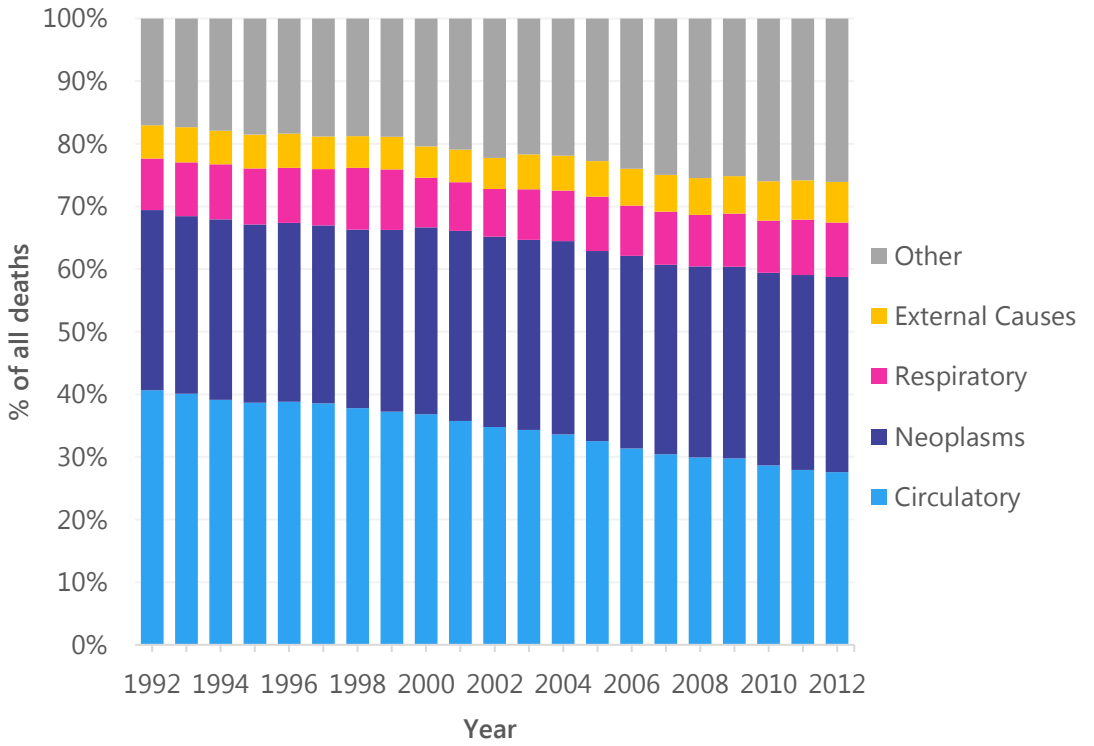


Figure 2.2.1 Percent of all deaths by cause, all Ontario, 1992-2012.

Note: leading groups of death in "Other" category include mental disorders, endocrine disorders, and diseases of the digestive and genitourinary system.

disease (COPD), and other diseases of the respiratory system. Trends observed at this level may not fully represent individual disease-level trends.

Findings

Table 2.2.1 in the data appendix lists the total number of deaths in Ontario for each of the major cause of death categories, by year, between 1992 and 2012. Figure 2.2.1 shows the proportion of all deaths attributed to each cause of death category for each of those years for all of Ontario. (Figure 2.2.1).

DISEASES OF THE CARDIOVASCULAR & CIRCULATORY SYSTEM

Scope

Circulatory mortality includes all deaths registered in Ontario adults between 1992 and 2012 and attributed to a disease of the circulatory or cardiovascular system according to ICES-derived cause of death records. This category includes ICD-9 codes between 390 and 459.9. It includes all forms of heart disease,

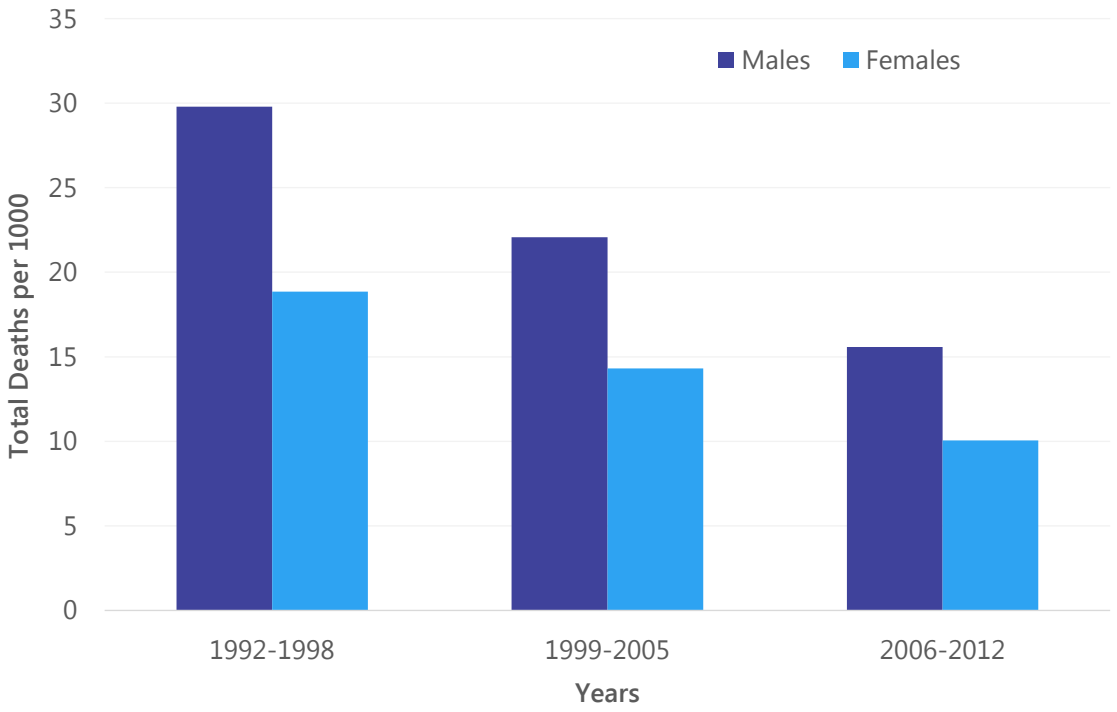


Figure 2.2.2 Age standardized circulatory mortality rates (total deaths per 1000) by era, males and females, all Ontario.

hypertensive disease, and all other circulatory disorders (18). A majority of circulatory mortality is caused by arteriosclerosis ("hardening of the arteries"), particularly acute myocardial infarction and acute stroke (21).

Findings

Age-standardized circulatory mortality rates for all Ontarians between 1992 and 2012 are shown by sex and era in Figure 2.2.2. PHU-specific rates are mapped by sex and era in Figures 2.2.3 – 2.2.8. All circulatory mortality rates are available in Table 2.2.2 in the data appendix.

Circulatory mortality rates steadily declined between the years of 1992 and 2012. (Figure 2.2.2; Table 2.2.2). Throughout the study period, circulatory mortality rates were higher in males than in females (Figures 2.2.2 – 2.2.8; Table 2.2.2). However, declines in these mortality rates were more prominent in males than in females, thus resulting in a reduced mortality gap between the sexes. Among the PHUs, the largest decline in circulatory mortality for both males and females occurred in the York Region PHU, with a 54% decrease in males (22.9 deaths per 1000 in 1992-1998, to 10.6 deaths per 1000 in 2006-2012), and a 57% decrease for females (16.5 deaths per 1000 in 1992-1998, to 7.0 deaths per 1000 in 2006-2012) (Table 2.2.2). Other PHUs with large declines for both males and females include the Durham Region, Peel, and the Halton Region, ranging from 51-52% declines. Unique to males, the Renfrew County and District PHU also had a considerable decline, at 51% (Table 2.2.2).

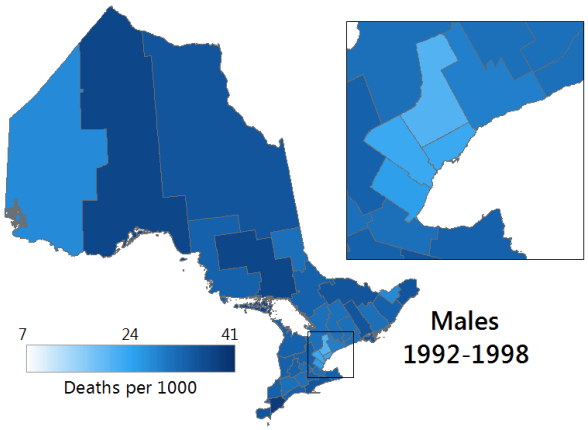


Figure 2.2.3 Cumulative age-standardized circulatory mortality (total deaths per 1000), females, 1992-1998.

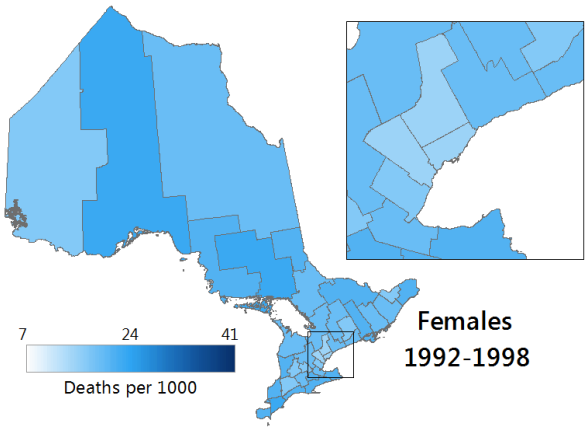


Figure 2.2.4 Cumulative age-standardized circulatory mortality (total deaths per 1000), males, 1992-1998.

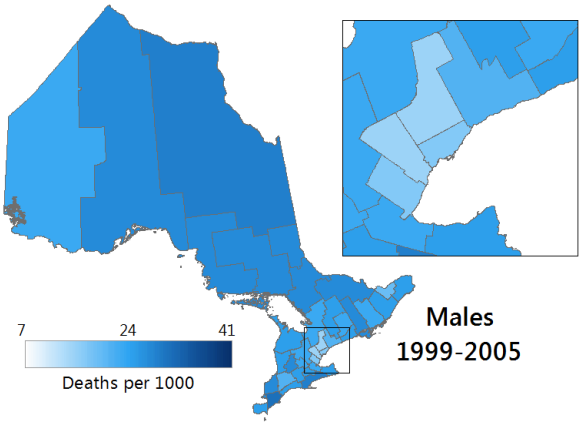


Figure 2.2.5 Cumulative age-standardized circulatory mortality (total deaths per 1000), males, 1999-2005.

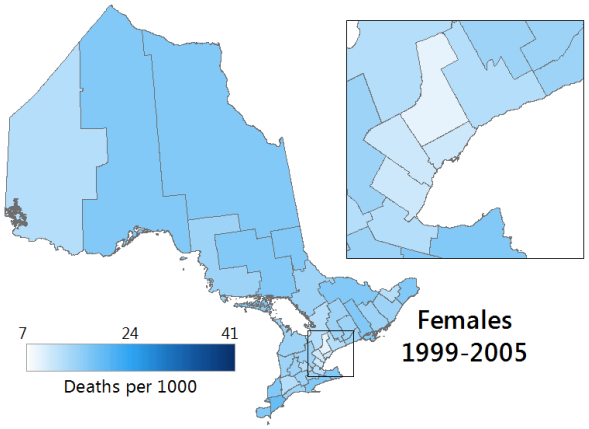


Figure 2.2.6 Cumulative age-standardized circulatory mortality (total deaths per 1000), females, 1999-2005.

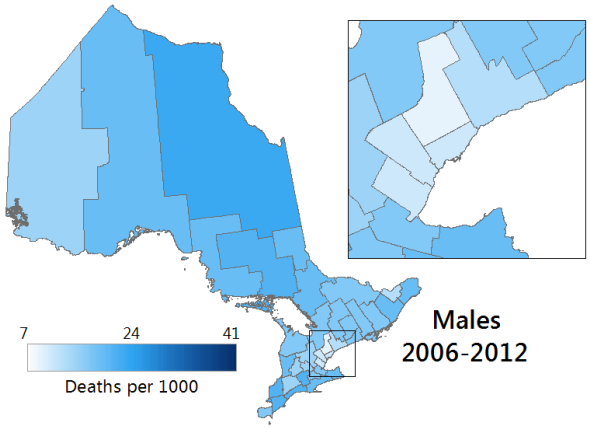


Figure 2.2.7 Cumulative age-standardized circulatory mortality (total deaths per 1000), males, 2006-2012.

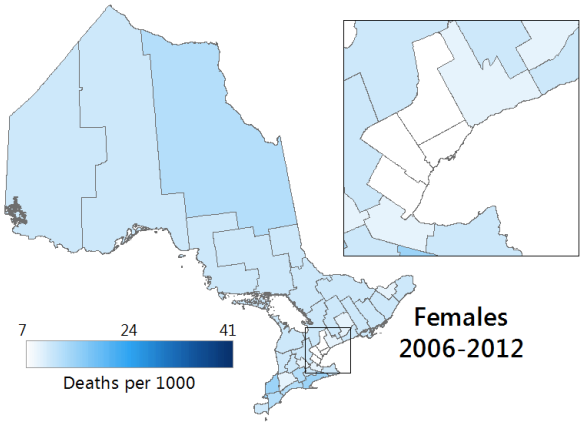


Figure 2.2.8 Cumulative age-standardized circulatory mortality (total deaths per 1000), females, 2008-2012.

The smallest decline in circulatory mortality among males appeared in the Oxford County PHU, where rates declined 34%; from 32.7 deaths per 1000 in 1992-1998, to 21.7 deaths per 1000 in 2006-2012 (Table 2.2.2). In females, the smallest decline in mortality can be seen in the Porcupine PHU, at a 30% decline; from 20.7 deaths per 1000 in 1992-1998, to 14.5 deaths per 1000 in 2006-2012 (Table 2.2.2). Smaller declines in circulatory mortality for females over this time period were also seen in the Northwestern (31% reduction) and Haldimand-Norfolk PHUs (33% decline).

CANCERS

Scope

Cancer mortality includes all adult deaths registered in Ontario between 1992 and 2012 with an assigned cause of death between ICD-9 codes 140 and 239.9 (18). This category includes both benign and malignant neoplasms occurring in any part of the body, including non-melanoma skin cancer. Diseases with the largest contribution to cancer mortality include lung, colorectal and prostate cancers among men, and breast and colorectal cancers among women (22).

Findings

Age-standardized cancer mortality rates in Ontario between 1992 and 2012 are mapped by PHU, sex and era in Figures 2.2.10 – 2.2.15. Rates for all of Ontario are shown by sex and era in Figure 2.2.9. All cancer mortality rates are available in Table 2.2.3 in the data appendix.

Cancer mortality rates have decreased significantly in males between 1992 and 2012, whereas the declines in females are much less prominent. In the majority of PHUs, the cancer mortality rates for males have

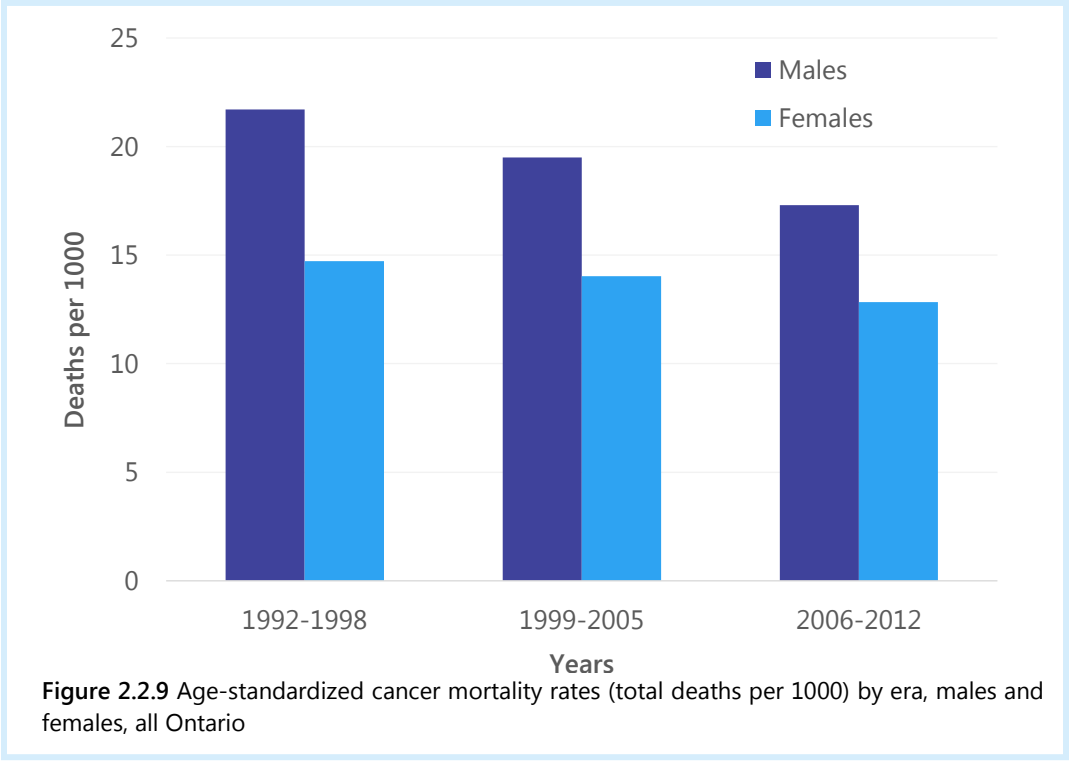


Figure 2.2.9 Age-standardized cancer mortality rates (total deaths per 1000) by era, males and females, all Ontario

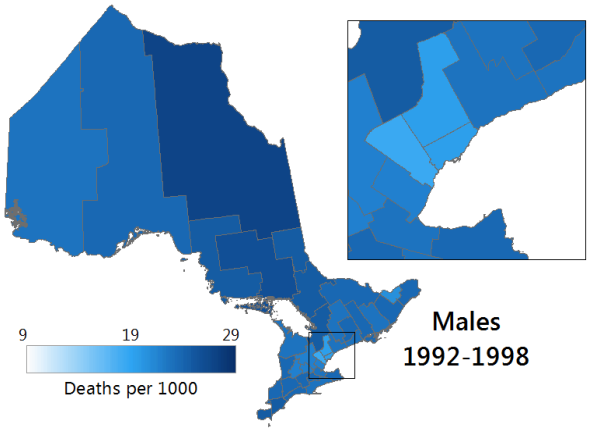


Figure 2.2.10 Cumulative age-standardized cancer mortality (total deaths per 1000), males, 1992-1998

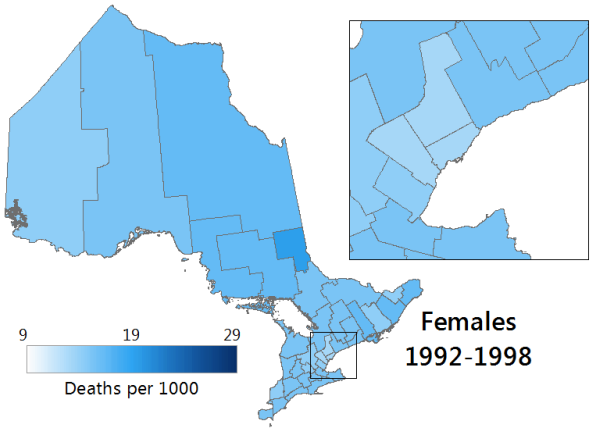


Figure 2.2.11 Cumulative age-standardized cancer mortality (total deaths per 1000), females, 1992-1998

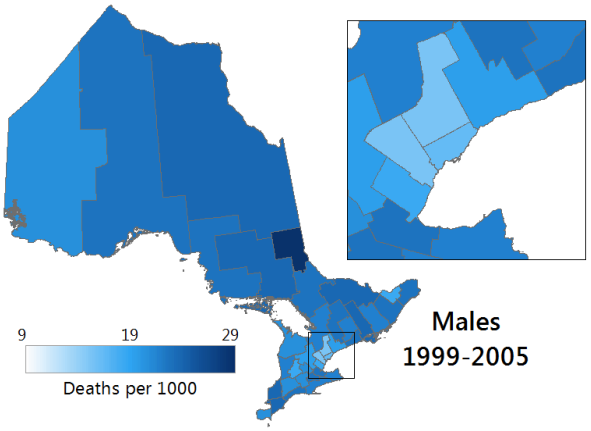


Figure 2.2.12 Cumulative age-standardized cancer mortality (total deaths per 1000), females, 1999-2005

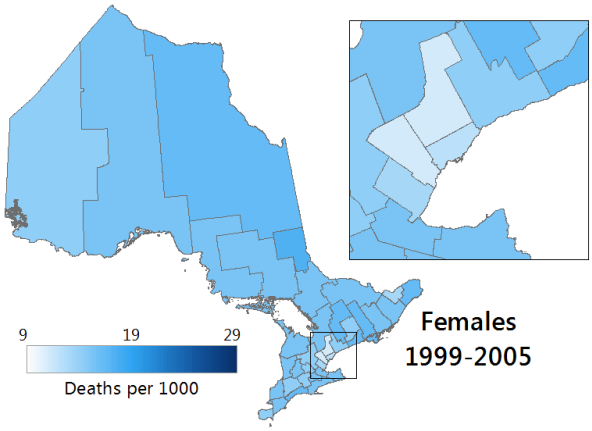


Figure 2.2.13 Cumulative age-standardized cancer mortality (total deaths per 1000), females, 1999-2005

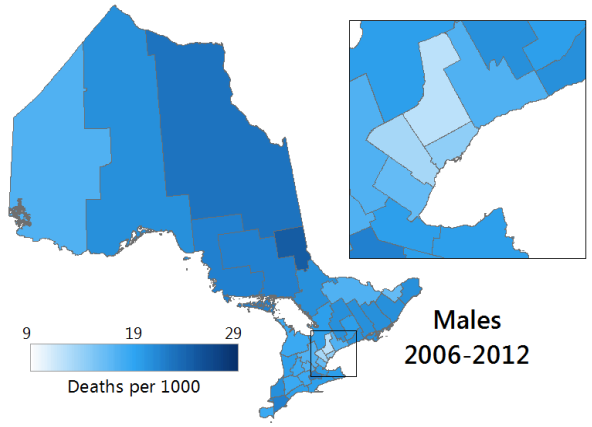


Figure 2.2.14 Cumulative age-standardized cancer mortality (total deaths per 1000), males, 2006-2012

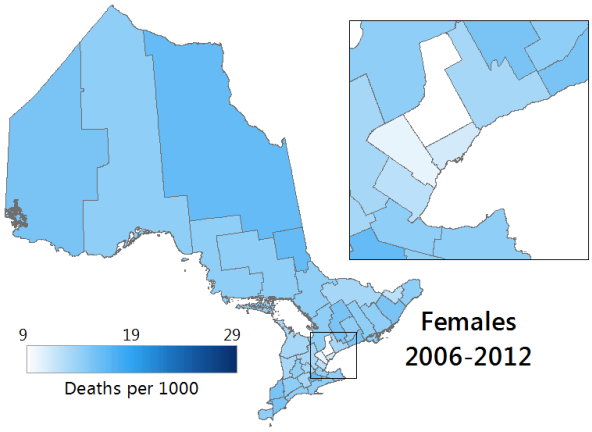


Figure 2.2.15 Cumulative age-standardized cancer mortality (total deaths per 1000), females, 2006-2012

declined by at least 10% (with the exception of Kingston, Frontenac, Lennox & Addington and Timiskaming PHUs) (Table 2.2.3). In contrast, in the majority of PHUs, the largest total decline in cancer mortality rates for females was 15% (with exceptions in the Peel, York Region, and Toronto PHUs where declines were larger) (Table 2.2.3).

These findings indicate clear sex differences in cancer mortality trends throughout the PHUs. Although males have experienced higher cancer mortality rates from 1992-2012 compared to females, the rapid narrowing of the mortality gap cannot go unnoticed (Figure 2.2.9). For examples, in all of Ontario between 1992 and 1998, cancers in males resulted in 21.7 deaths per 1000, compared to 14.7 deaths per 1000 in females – a difference of 7 deaths per 1000 (Table 2.2.3). In 2005-2012, cancers in males caused 17.3 deaths per 1000, compared to 12.8 deaths per 1000 in females – a greatly reduced gap of 4.5 deaths per 1000 (Table 2.2.3).

Among the PHUs, the largest decline in cancer mortality for both males and females occurred in the York Region PHU, with a 33% decrease in males (19.4 deaths per 1000 in 1992-1998, to 12.9 deaths per 1000 in 2006-2012) (Table 2.2.3), and a 26% decrease for females (13.2 deaths per 1000 in 1992-1998, to 9.8 deaths per 1000 in 2006-2012) (Table 2.2.3). Similar declines in cancer mortality rates occurred in males and females in the Peel PHU (26% and 25%, respectively). A large decrease in cancer mortality unique to each sex was observed in the Halton Region PHU for males, with a 25% decrease, and the Toronto PHU for females, with a 19% decrease (Table 2.2.3).

The smallest decline in cancer mortality among males appeared in the Timiskaming PHU, where the rates slightly increased 0.2%; from 24.20 deaths per 1000 in 1992-1998, to 24.25 deaths per 1000 in 2006-2012 (Table 2.2.3). Small declines in mortality rates for males were also seen in the Hastings and Prince Edward Counties and Kingston, Frontenac, Lennox & Addington PHUs at -10.5% and -8.3%, respectively (Table 2.2.3). In females, the smallest decline in cancer mortality was observed in the Brant County PHU, with a 6% ***increase*** in mortality; from 15.3 deaths per 1000 in 1992-1998, to 16.3 deaths per 1000 in 2006-2012 (Table 2.2.3). Increased mortality rates in females were also seen in the Lambton PHU (4% increase) and in the Northwestern PHU (5% increase) (Table 2.2.3). These increases are in contrast to overall decreases in Ontario.

DISEASES OF THE RESPIRATORY SYSTEM

Scope

Respiratory mortality includes all adult deaths registered in Ontario between 1992 and 2012 caused by diseases of the respiratory system. This corresponds to ICD-9 codes 460 to 519.9 (18). Causes include both acute and chronic respiratory illnesses, such as acute respiratory infections, pneumonia, influenza, and chronic obstructive pulmonary disease (COPD). Note that lung cancer, which is sometimes considered a respiratory disease in other contexts, is not included in respiratory mortality in this report. A majority of respiratory mortality in Canada is attributable to either influenza, pneumonia, or COPD (21).

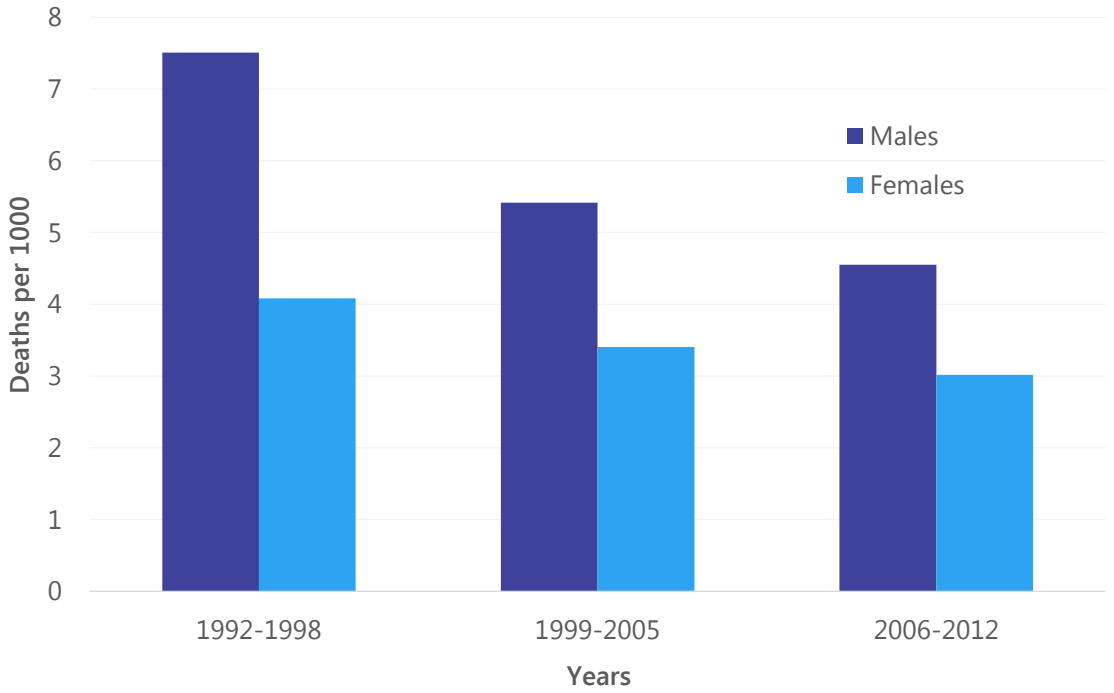


Figure 2.2.16 Age-standardized cancer mortality rates (total deaths per 1000) by era, males and females, all Ontario

Findings

Age-standardized cancer mortality rates in Ontario between 1992 and 2012 are mapped by PHU, sex and era in Figures 2.2.17 – 2.2.22. Rates for all of Ontario are shown by sex and era in Figure 2.2.16. All respiratory mortality rates are available in Table 2.2.4 in the data appendix.

In males across the province, respiratory rates declined significantly, narrowing the mortality gap between sexes (Figure 2.2.16; Table 2.2.4). However, females did not experience the same magnitude of decline as males. For instance, the lowest mortality decline for males was 18%, in the Haldimand-Norfolk PHU. For females, respiratory mortality actually increased by 4%, in the Oxford County PHU (Table 2.2.4). An exception to the pattern of differences between males and females in respiratory mortality is shown in the Haldimand-Norfolk PHU. In this Public Health Unit, females had one of the highest decreases in mortality, at 44%. In contrast, the males in this region had one of their lowest decreases in mortality, at 18% (Table 2.2.4). Likewise, in the Elgin-St. Thomas PHU, males demonstrated a decline of 33% in mortality, and females only 7% (Table 2.2.4). This is a considerable variance between the sexes, and the disparities were consistent throughout the study period.

Another important note on respiratory mortality across Ontario were the inconsistencies not only between sexes, but also between the PHUs. For instance, one of the largest decreases in mortality is seen in the Peel Region PHU, where males and females both have large declines in mortality, at 50% and 36%, respectively (Table 2.2.4). This is in contrast with the Algoma PHU, where the mortality declines for males and females were 20% and 7%, respectively (Table 2.2.4). The pattern of respiratory mortality rates across the Ontario PHUs was persistent throughout the study period.

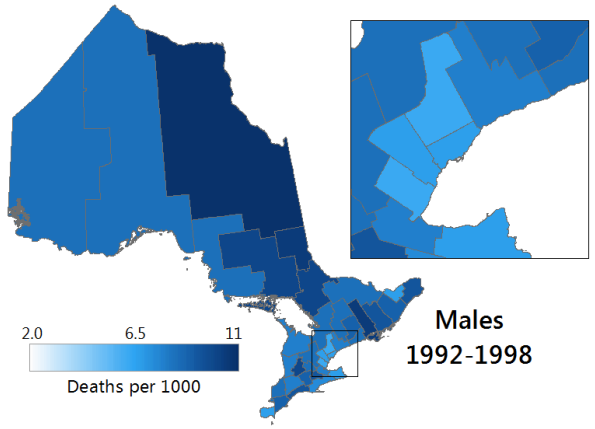


Figure 2.2.17 Cumulative age-standardized respiratory mortality (total deaths per 1000), males, 1992-1998.

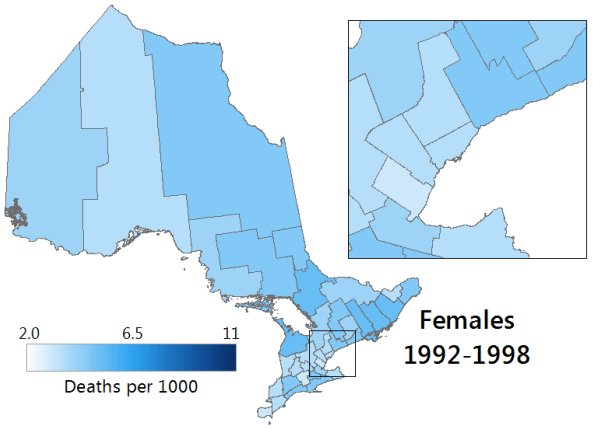


Figure 2.2.18 Cumulative age-standardized respiratory mortality (total deaths per 1000), females, 1992-1998.

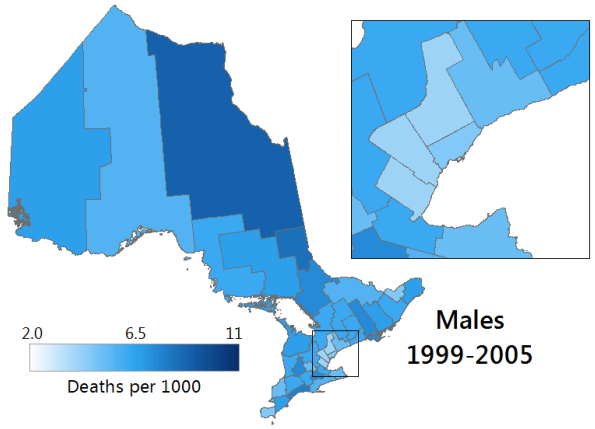


Figure 2.2.19 Cumulative age-standardized respiratory mortality (total deaths per 1000), males, 1999-2005.

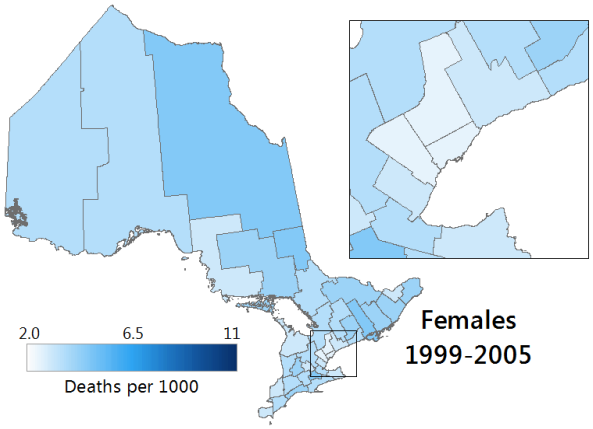


Figure 2.2.20 Cumulative age-standardized respiratory mortality (total deaths per 1000), females, 1999-2005.

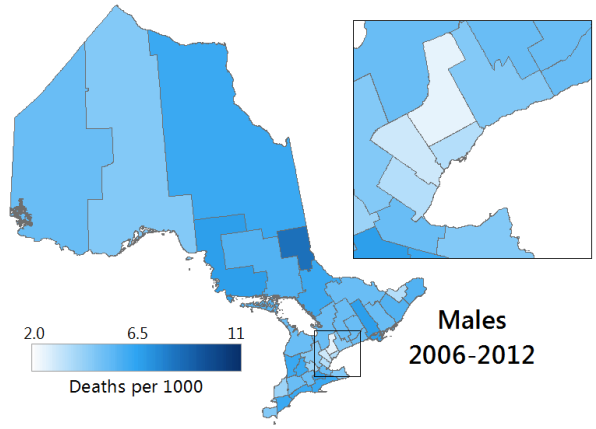


Figure 2.2.21 Cumulative age-standardized respiratory mortality (total deaths per 1000), males, 2006-2012.

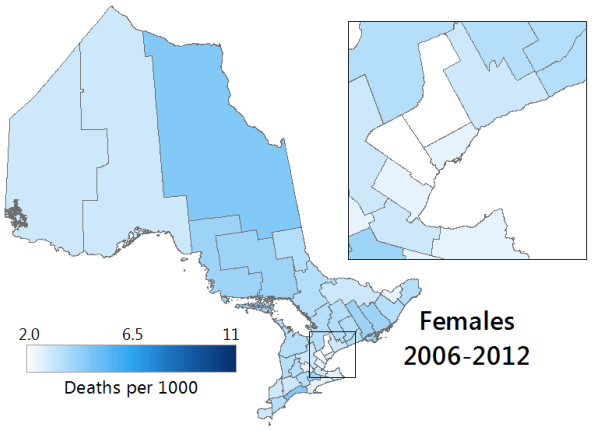


Figure 2.2.22 Cumulative age-standardized respiratory mortality (total deaths per 1000), females, 2006-2012.

As mentioned, among the PHUs, the largest decline in respiratory mortality for both males and females occurred in the York Region PHU, with a 54% decrease in males (6.5 deaths per 1000 in 1992-1998, to 3.0 deaths per 1000 in 2006-2012), and a 44% decrease for females (3.9 deaths per 1000 in 1992-1998, to 2.2 deaths per 1000 in 2006-2012) (Table 2.2.4). Improvements in respiratory mortality among males also occurred in the Peel PHU (reduction of 50%), and for females in the Haldimand-Norfolk PHU (reduction of 44%).

The smallest decline in respiratory mortality among males appeared in the Haldimand-Norfolk PHU, where the mortality rate decreased 18%; from 7.3 deaths per 1000 in 1992-1998, to 6.0 deaths per 1000 in 2006-2012 (Table 2.2.4). Small declines in mortality rates for males were also seen in the Algoma and Timiskaming PHUs, with declines of 20% and 19%, respectively (Table 2.2.4). In females, the smallest decline in mortality can be seen in the Oxford County PHU, with a 4% increase in mortality; from 3.4 deaths per 1000 in 1992-1998, to 3.6 deaths per 1000 in 2006-2012 (Table 2.2.4). Small declines in mortality rates in females are also seen in the Perth District (3% decline) and Porcupine PHUs (2% decline).

EXTERNAL CAUSES OF INJURY & POISONING

Scope

External cause mortality includes adult deaths registered in Ontario between 1992 and 2012 resulting from any form of injury or poisoning, including deaths from violence, suicide and accidental trauma (20). Specifically, this refers to ICD-9 codes between 800 and 999.9 (18). Notably, poisoning includes both intentional and unintentional toxic effects of prescription and non-prescription drugs. By far the most common deaths from external causes are related to unintentional injury, predominantly from motor vehicle collisions and unintentional falls, with a much smaller number of deaths attributed to intentional injury by another person (i.e., homicide or assault), suicide, or self-harm (23, 24).

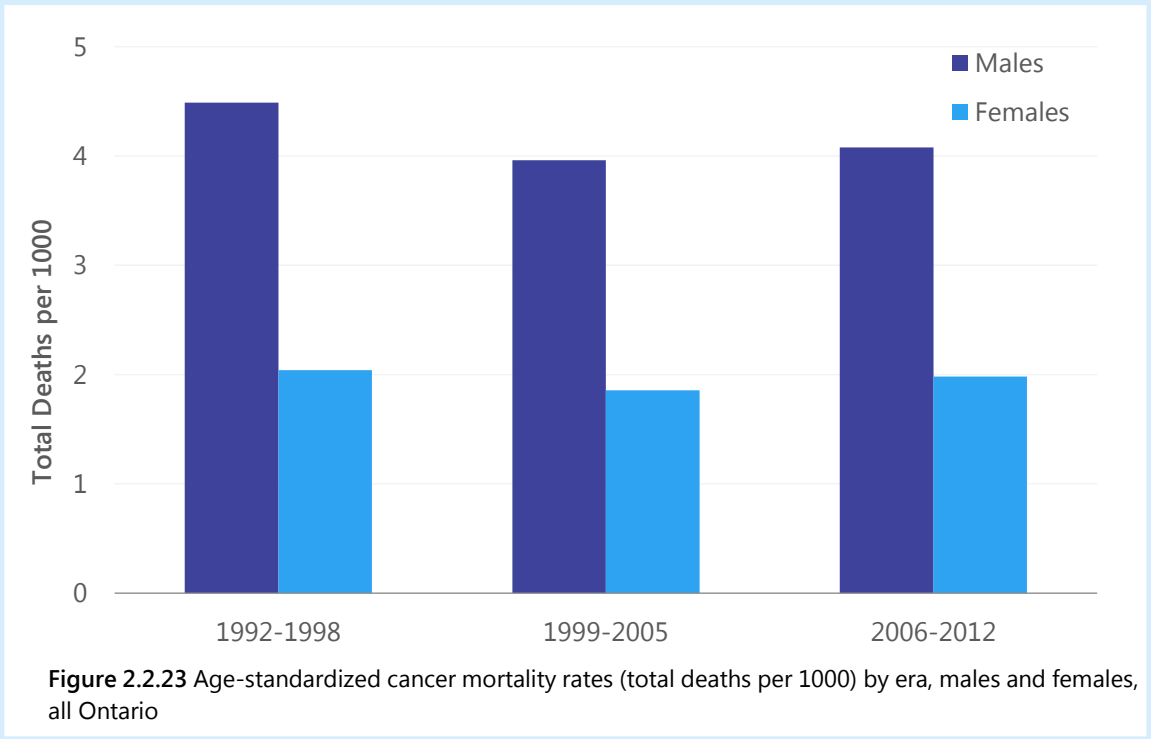


Figure 2.2.23 Age-standardized cancer mortality rates (total deaths per 1000) by era, males and females, all Ontario

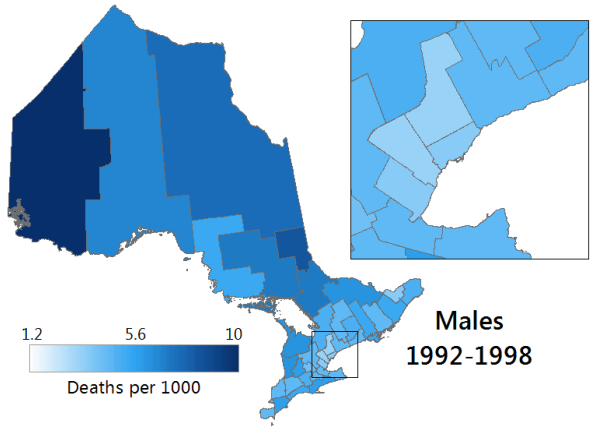


Figure 2.2.24 Cumulative age-standardized external cause mortality (total deaths per 1000), males, 1992-1998.

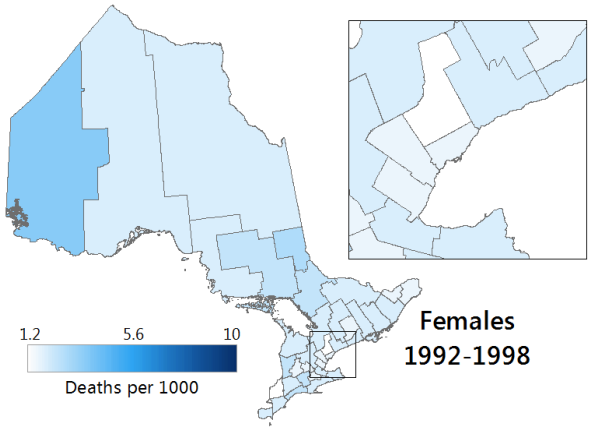


Figure 2.2.25 Cumulative age-standardized external cause mortality (total deaths per 1000), females, 1992-1998.

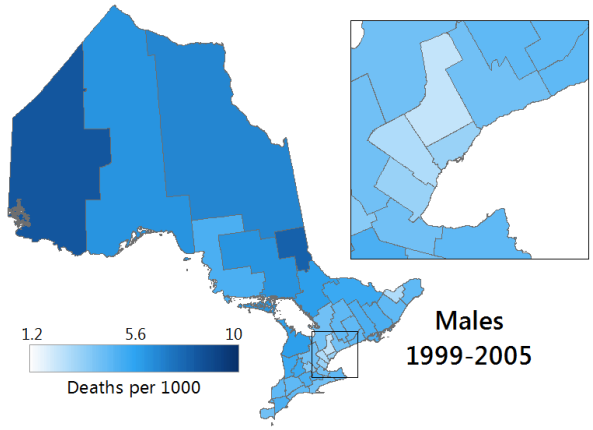


Figure 2.2.26 Cumulative age-standardized external cause mortality (total deaths per 1000), males, 1999-2005.

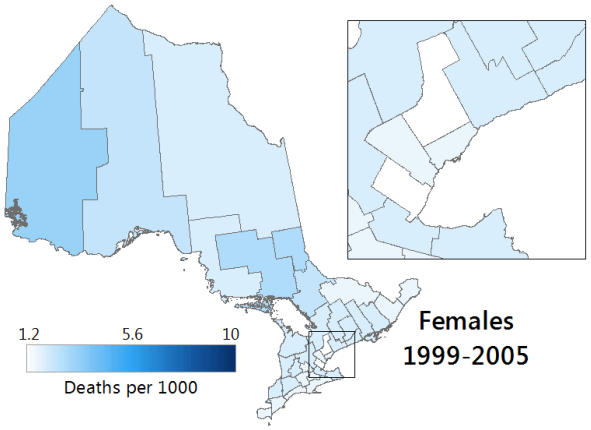


Figure 2.2.27 Cumulative age-standardized external cause mortality (total deaths per 1000), females, 1999-2005.

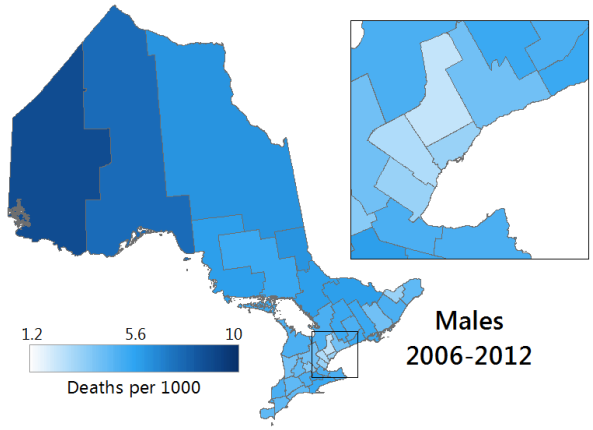


Figure 2.2.28 Cumulative age-standardized external cause mortality (total deaths per 1000), males, 2006-2012.

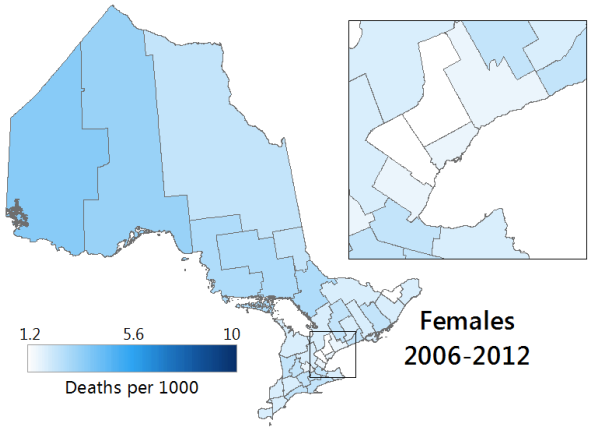


Figure 2.2.29 Cumulative age-standardized external cause mortality (total deaths per 1000), females, 2006-2012.

Findings

Age-standardized cancer mortality rates in Ontario between 1992 and 2012 are mapped by PHU, sex and era in Figures 2.2.24 – 2.2.29. Rates for all of Ontario are shown by sex and era in Figure 2.2.23. All injury mortality rates are available in Table 2.2.5 in the data appendix.

External cause mortality rates are higher in males than in females (Figures 2.2.23 – 2.2.29; Table 3.2.5); however, the gap between the sexes narrowed between 1992 and 2012, due to the fact that external cause mortality rates for men.

Among the PHUs, the largest decline in external cause mortality for males occurred in the Huron County PHU, with a 29% decrease in males; 6.1 deaths per 1000 in 1992-1998, to 4.4 deaths per 1000 in 2006-2012 (Table 2.2.5). The largest decline in external cause mortality for females was in Peel and Timiskaming PHUs, both declining by 20%; 1.9 deaths per 1000 in 1992-1998, to 1.5 deaths per 1000 in 2006-2012 for the Peel PHU, and 3.0 deaths per 1000 in 1992-1998, to 2.4 deaths per 1000 in 2006-2012 for the Timiskaming PHU (Table 2.2.5). Males also had large declines in these regions, at 19% (Peel PHU) and 25% (Timiskaming PHU) declines. Large decreases in mortality unique to each sex were observed in the Sudbury and District PHU for males, with a 23% decrease, and the Toronto PHU for females, with a 14% decrease (Table 2.2.5).

Declines in external cause mortality were not seen among males appeared in the Brant County and the Haliburton, Kawartha, Pine Ridge District PHUs, where the rates both increased 19%; both regions had 4.7 deaths per 1000 in 1992-1998, which increased to 5.6 deaths per 1000 in 2006-2012 (Table 2.2.5). Increases in mortality rates for males were also seen in the Niagara Region PHU, at 15%. In females, the smallest decline in mortality was observed in the Lambton Region PHU, with a 45% increase in mortality; from 1.5 deaths per 1000 in 1992-1998, to 2.2 deaths per 1000 in 2006-2012 (Table 2.2.5). Increases of 41% in female mortality rates in females were also seen in the Algoma and Thunder Bay District PHUs.

2.3 PREMATURE MORTALITY

Scope

Premature mortality includes all deaths registered in Ontario between 1992 and 2015 among decedents who were between 18 and 74 years old at the time of their death. The age cut-off of 75 years is consistent with the upper age limit used by CIHI when using premature mortality as a health indicator (12), and with definitions of premature mortality in practice in other countries (25-27).

Premature mortality rates discussed in this section, unlike the all-cause and cause-specific mortality rates presented earlier in this report have not been age-standardized[3]. Age-standardized premature mortality rates have also been calculated, and are included in the data appendix in Tables 2.3.3 and 2.3.4.

[3] The decision not to age-standardize premature mortality rates was made in recognition of the core purpose of this atlas – which is to describe, rather than explain, geographic differences in adult mortality trends. The authors felt that while age-standardizing is an appropriate and standard practice in the context of all-cause mortality, to do so with

For detailed methodology regarding calculation of the premature mortality rates in this report, and for discussion of age-standardized premature mortality rates, refer to the technical appendix. For mapping purposes, premature mortality rates have been reported as aggregated (i.e. cumulative) rates for the following eras: 1992-1999, 2000-2007 and 2008-2015.

Use

Premature mortality is a subset of all-cause mortality, including only the deaths of those who die before age 75. In general, premature mortality rates are more likely than all-cause mortality rates to be reducible via medical or public health intervention (see 'Amenable Mortality' in this report). They are thus highly meaningful for population health assessment and for PHUs (28).

Premature mortality rates also offer valuable insights into trends over time, since premature mortality directly reflects the life expectancy of a population (29). For example, decreasing premature mortality rates

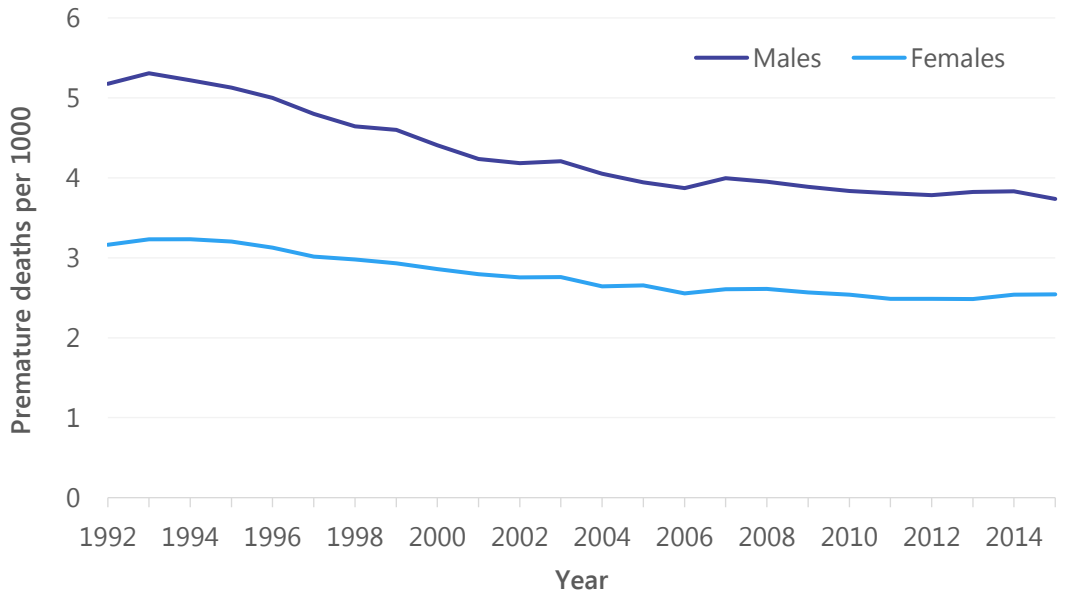


Figure 2.3.1. Annual premature mortality (deaths per 1000 per year), all Ontario, males and females, 1992-2015.

over time indicate that a larger proportion of the population is living past age 75, which in turn implies a growing population life expectancy. However, it is important to note that premature mortality rates are sensitive to differences in the age structure of populations between PHUs or over time.

premature mortality rates would remove valuable information about what is actually taking place in Ontario. This decision was supported by a supplementary analysis of age-standardized premature mortality rates, which showed the same geographic pattern as non-age-standardized rates. Discussion of age-standardized premature mortality rates can be found in the technical appendix. The data are available in Tables 2.3.1 and 2.3.2 of the data appendix.

Findings

Yearly premature mortality rates for all Ontario males and females between 1992 and 2015 are shown in Figure 2.3.1, and available in Table 2.3.2 in the data appendix. PHU-specific premature mortality rates are mapped by era and sex in Figures 2.3.3 – 2.3.8. The aggregated mortality rates are also available in Table 2.3.1 in the data appendix.

Across the province, premature mortality rates have decreased significantly between 1992 and 2012, meaning that a large proportion of Ontario residents are living past age 75 (Figures 2.3.1-2.3.8). Declines in premature mortality developed in both sexes, and in the majority of the PHUs, with exceptions in the Algoma PHU for both sexes, and in the Lambton, Northwestern, and Porcupine PHUs for females. Although premature mortality rates were higher among males than females, declines in mortality rates were much more pronounced in males than in females, shrinking the mortality gap between the sexes (Figures 2.3.1-2.3.8; Table 2.3.2). For example, in the Northwestern PHU, where the male mortality rate decreased 7% between 1992-1999 and 2008-2015, the female mortality rate increased 8% over the same period (Table 2.3.1).

Among the PHUs, the largest decline in premature mortality for both males and females occurred in the Toronto PHU, with a 33% decrease in males (37.0 deaths per 1000 in 1992-1998, to 24.9 deaths per 1000 in

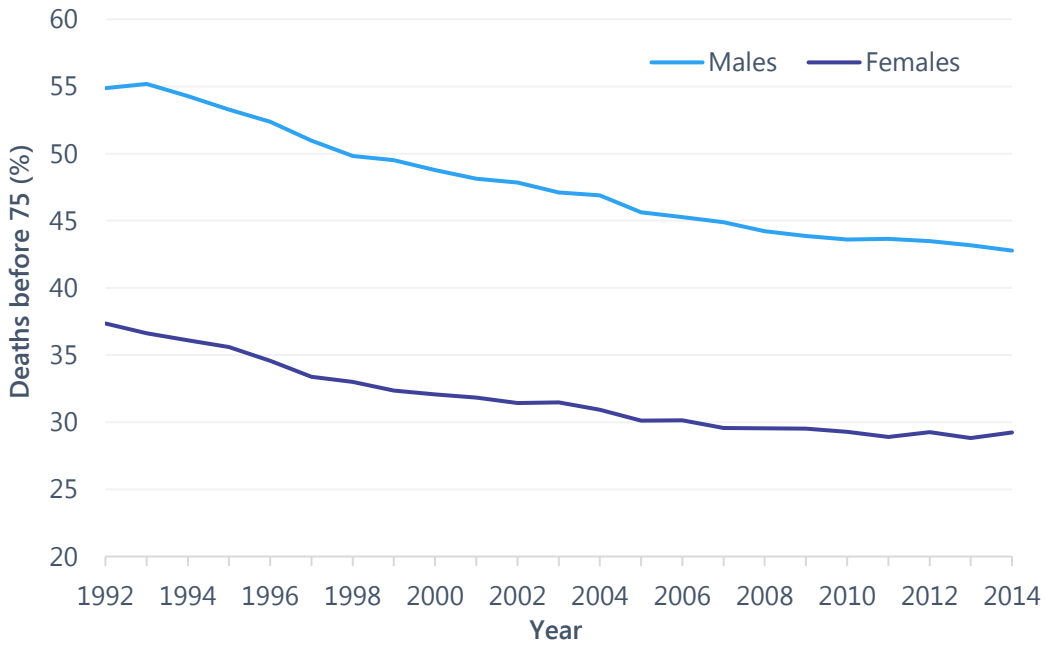


Figure 2.3.2 Premature deaths (before age 75) as a proportion of all deaths, all Ontario, males and females, 1992-2015.

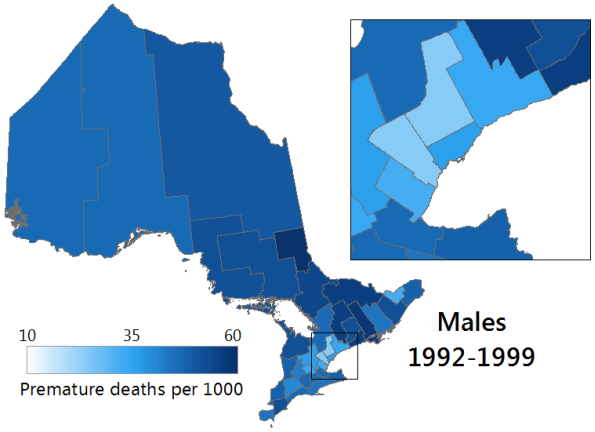


Figure 2.3.3 Cumulative premature mortality (total deaths per 1000), males, 1992-1999.

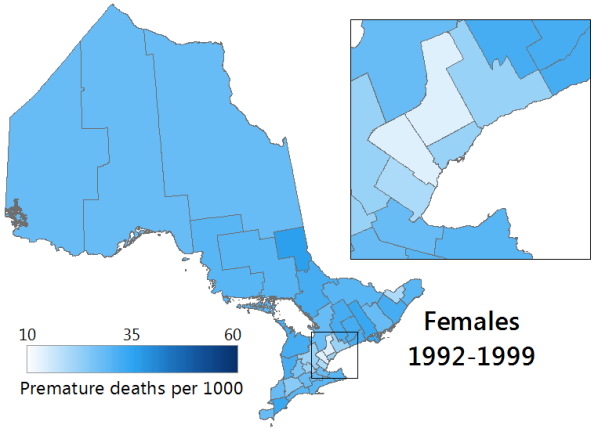


Figure 2.3.4 Cumulative premature mortality (total deaths per 1000), females, 1992-1999.

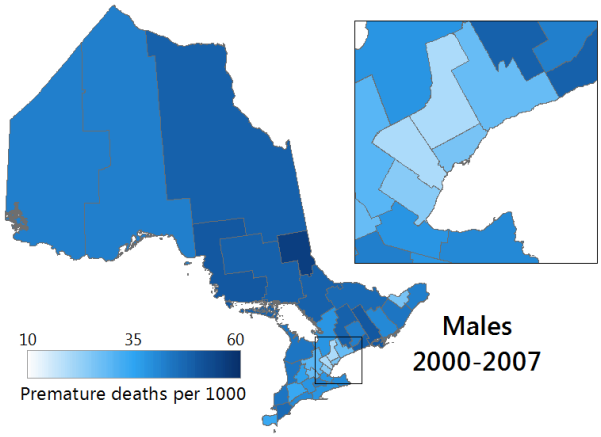


Figure 2.3.5 Cumulative premature mortality (total deaths per 1000), males, 2000-2007

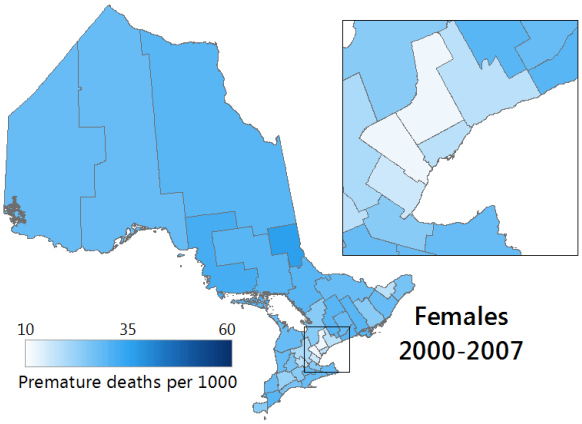


Figure 2.3.6 Cumulative premature mortality (total deaths per 1000), males, 2000-2007

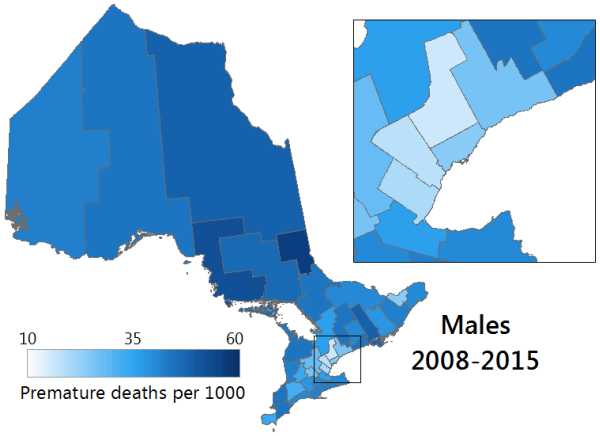


Figure 2.3.7 Cumulative premature mortality (total deaths per 1000), males, 2008-2015

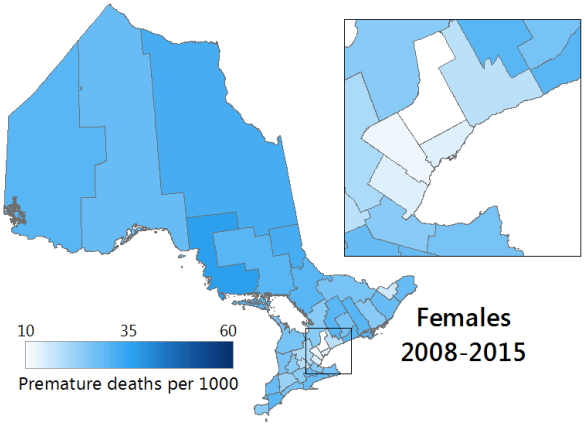


Figure 2.3.8 Cumulative premature mortality (total deaths per 1000), females, 2008-2015

2006-2012), and a 30% decrease for females (22.5 deaths per 1000 in 1992-1998, to 15.8 deaths per 1000 in 2006-2012) (Table 2.3.1). Significant decreases in mortality also occurred at the York Region PHU, where a 30% decrease occurred for males and a 25% decrease occurred for females, and at the Halton Region PHU, with a 32% decrease for males, and a 25% decrease for females (Table 2.3.1).

No declines in premature mortality were noted in the Algoma PHU. For males, premature mortality increased 2%; from 52.6 deaths per 1000 in 1992-1998 to 53.4 deaths per 1000 in 2006-2012 (Table 2.3.1). For females, premature mortality increased 15%; from 31.8 deaths per 1000 in 1992-1998 to 36.4 deaths per 1000 in 2006-2012 (Table 2.3.1). Similar small decreases in mortality for both males and females also occurred in the Porcupine PHU, with a 2% decrease for males, and a 13% increase in mortality for women (Table 2.3.1). Unique to males was the small decline in premature mortality rate in the Timiskaming PHU (6.3% decline) and the increase observed the Northwestern PHU for women (7.5% increase) (Table 2.3.1).

Because the all-cause mortality rates presented in this report have been age-standardized while premature mortality rates have not, we cannot compare directly between the two. However, it may be useful to consider the proportion of all deaths that occurred among individuals aged 74 or younger. Figure 2.3.2 shows the total number of premature deaths as a proportion of all deaths in Ontario between 1992 and 2015. The figure shows that from 1992 to 2015, there was a consistent trend of decline in the proportion of deaths occurring before age 75 (Figure 2.3.2). This trend implies that over time, a greater number of Ontario residents survived into old age, which is consistent with a gradually expanding life expectancy noted both in Ontario and across Canada (30).

2.4 PREMATURE MORTALITY BY SOCIOECONOMIC STATUS

Scope

Premature mortality, as before, includes all deaths registered in Ontario between 1992 and 2015 among individuals between 18 and 74 years old at the time of their death. Additionally, this section stratifies premature deaths into quintiles of socioeconomic status. This is achieved by subdividing the population of Ontario into five ranked groups, each containing 20% of the population, according to their relative social and economic position (i.e. the best-off 20% are assigned quintile 1, the next best-off group form quintile 2, and so on).

Specifically, socioeconomic status quintiles in this report have been assigned using a proxy measure of material deprivation, from the Ontario Marginalization Index (ON-MARG) (31). ON-MARG material deprivation scores are based on census reporting, and describe the likelihood that an individual is unable to afford or attain essential goods and services (32). These scores are assigned to individuals based on the dissemination area in which they live, using a number of census indicators including education, income, receipt of government transfer payments, and unemployment (31, 33).

After stratifying the Ontario population into socioeconomic status quintiles, premature mortality rates were calculated for each quintile, on two time scales: yearly rates, and aggregated (i.e. cumulative) rates for the following eras: 1992-1999, 2000-2007, and 2008-2015. For detailed methodology regarding assessment of

socioeconomic status and calculation of stratified premature mortality rates in this report, refer to the technical appendix.

Use

Large disparities in mortality have been noted between high- and low-socioeconomic status groups, in Canada and world-wide, and time trend data suggest that the gap is widening over time (34-37). Such inequalities have important implications for health systems, since they suggest that those living low-socioeconomic status areas may not be accessing, utilizing or benefiting from health services to their fullest potential (38).

Reducing health inequalities is a core responsibility and goal of Ontario's health system and a key focus of Ontario's PHUs. Understanding how these inequalities have manifested and changed over time across PHUs is fundamental to that goal.

Findings

Yearly premature mortality rates by socioeconomic status quintile are shown for all of Ontario in Figure 2.4.1. PHU- and sex-specific rates by era for the relative index of inequality, are available in Table 2.4.2 in the data appendix.

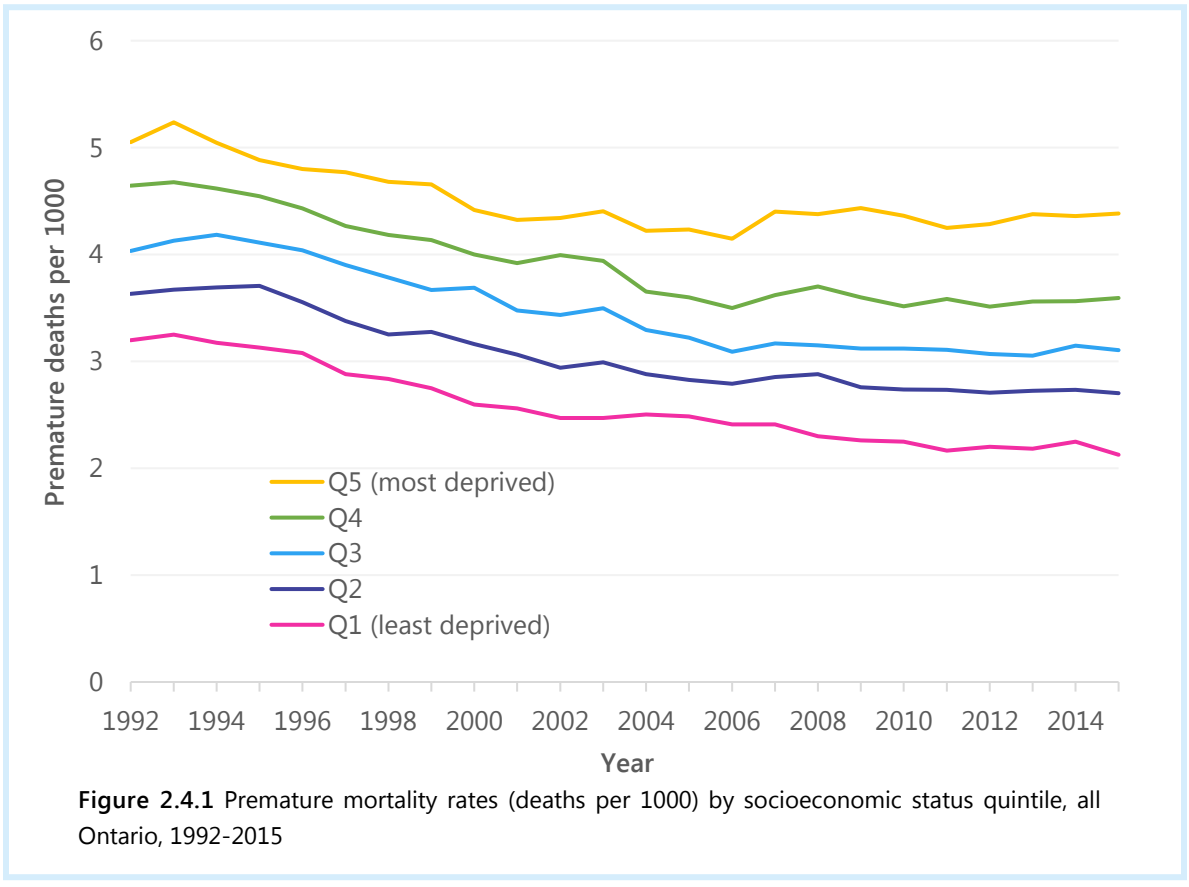


Figure 2.4.1 Premature mortality rates (deaths per 1000) by socioeconomic status quintile, all Ontario, 1992-2015

As was established earlier in this report, premature mortality rates declined substantially across Ontario between 1992 and 2015 (Tables 2.3.1 and 2.3.2; see also 'Premature Mortality').). Figure 2.4.1 shows that declines in premature mortality were achieved in all five quintiles of socioeconomic status. Through this entire period, there was still a clear and sustained relationship between socioeconomic status and premature mortality, across the Ontario PHUs. Premature mortality rates increased in successive quintiles of material deprivation (Figure 2.4.1, Tables 2.3.1-2.3.2). This suggests that as one's socioeconomic status decreases, premature mortality simultaneously increases. This trend is consistent with socioeconomic gradients in health seen around the world (39, 40).

Although this socioeconomic gradient is observed in Ontario as a whole, it is only seen separately in ten PHUs: Durham Region, Hamilton, Middlesex-London, Niagara Region, Ottawa, Peel, Simcoe Muskoka District, Windsor-Essex County, York Region, and Toronto. Still, the complexity and quality of the socioeconomic gradient is distinct to each region (Tables 3.4.1. and 3.4.2).

The stratified mortality rates can reveal patterns of socioeconomic inequality in premature mortality, between PHUs or over time. For example, the rates plotted in Figure 2.4.1 show that despite substantial reductions in group-specific premature mortality between 1992 and 2015, there has been no accompanying narrowing of the absolute[4] mortality gap between deprivation quintiles. The results support the finding that absolute (arithmetic difference) socioeconomic inequalities have remained largely stable over time. However, the gap between quintiles 4 and 5 (the two most deprived groups) has grown much wider since the early 2000s than the other inter-quintile gaps (Figure 2.4.1). This confirms a trend identified in Canadian life expectancy estimates (41).

For example, between the years 2008 and 2015, the least deprived group (Q1) in the Porcupine PHU experienced some of the highest mortality rates: For males, mortality increased 22%; 28.7 deaths per 1000 in 1992-1999, to 34.9 deaths per 1000 in 2008-2015 (Table 2.4.1). For females, mortality increased 3%; 19.3 deaths per 1000 in 1992-1999, to 19.9 deaths per 1000 in 2008-2015 (Table 2.4.2). This is in sharp contrast with the most deprived group (Q5) in the York Region PHU: For males, mortality decreased 33%; from 39.9 deaths per 1000 in 1992-1999, to 26.9 deaths per 1000 in 2008-2015. For females, mortality decreased 31%; from 26.2 deaths per 1000 in 1992-1999, to 18.2 deaths per 1000 in 2008-2015 (Table 2.4.1). This shows that the effect of the socioeconomic status on premature mortality varies with other characteristics of each PHU population.

The gap between mortality rates in the least (Q1) and most (Q5) deprived group in each individual PHU also varied geographically. In general, the Northern and Southwest PHUs showed large differences between their most and least deprived groups, while PHUs in the GTA showed smaller differences. Improvements in premature mortality in the most deprived group were also much smaller in the Northern and Southeast PHUs compared to those in the GTA. As a result, the gaps between socioeconomic quintiles in GTA PHUs have narrowed, while the same gaps in Northern and Southeast PHUs have stayed the same, or widened. (Figure 2.4.1; Tables 2.4.1 and 2.4.2).

[4] For a discussion of the relationship between absolute and relative inequalities, see Mackenbach, J. P. (2015). "Should we aim to reduce relative or absolute inequalities in mortality?" European Journal of Public Health 25(2): 185-185.

For example, between 2008 and 2015, in the Algoma PHU, the males in Q1 experienced a 23% decrease in mortality, whereas in Q5, mortality increased by 14% (Table 2.4.1). For females, the trend is similar; in Q1, there was a 15% decrease in mortality, and in Q1, mortality increased 23% (Table 2.4.1). In contrast, during the same period in the York Region PHU, premature mortality among males declined by 32% in the most deprived group, and by 39% in the least deprived group (Table 2.4.1). Likewise, premature mortality in the most- and least-deprived groups of females declined; 31% and 36%, respectively (Table 2.4.1).

RELATIVE INDEX OF INEQUALITY (RII)

Scope

The **relative index of inequality (RII)** is a measure of socioeconomic inequality developed to be intentionally analogous to, yet more sophisticated than, a **rate ratio** measure (42, 43). A rate ratio describes group differences by dividing rates in a group of interest (numerator) by the equivalent rate in an appropriate comparison group (denominator). In the context of socioeconomic mortality gradients, a rate ratio may be used to show that, for example, individuals in the most deprived quintile experienced two times the mortality rates of those in the least deprived quintile (RR = Q5 ÷ Q1 = 2).

The RII measure expands the functionality of the rate ratio by also incorporating information from all socioeconomic groups in the population (in the given example, adding quintiles 2, 3 and 4) (42). This is commonly accomplished using statistical regression methods[5] (44). By including data from all quintiles, RII is able to reflect the true gradient of premature mortality across the entire population (45, 46).

In this report, RII was calculated for premature mortality using ON-MARG material deprivation quintiles as a proxy for socioeconomic status. For a detailed description of the regression methods used to calculate RII, refer to the technical appendix. RII values were calculated for the following eras: 1992-1999, 2000-2007, and 2008-2015.

Use

RII is used to describe the relative disadvantage associated with low socioeconomic status in a population (44). In this report, RII is used to estimate the effect of socioeconomic status (as measured by proxy of material deprivation) on premature mortality rates within PHUs, as well as how that effect has changed over time. Using RII is preferable to stratified rates in this context because – and unlike absolute measures of health inequalities – it can be compared more directly between groups and across health outcomes (43, 46). It is also preferable to a rate ratio (Q5 ÷ Q1) measure because it considers the entire population's experience, and is sensitive to mortality rates in all socioeconomic strata (45).

The interpretation of an RII measure is closely similar to that of a rate ratio. Whereas the rate ratio example given earlier compared mortality rates in the most deprived quintile to those in the least deprived quintile,

[5] A detailed summary of RII, with standard approaches for calculating it, can be found in Sergeant, J. C. and D. Firth (2006). "Relative index of inequality: definition, estimation, and inference." Biostatistics 7(2): 213-224.

the RII compares the theoretically worst-off individual in a population and the theoretically best-off individual in that same population[6].

Findings

RII values for premature mortality are mapped by sex and era for all Ontario PHUs between 1992 and 2015 in Figures 2.4.2 to 3.4.7. The values are also available in Table 2.4.3 in the data appendix. RII by era for all of Ontario is plotted in Figure 2.4.8 and is included in Table 2.4.3.

Between the PHUs, RII and thus socioeconomic inequality varied across Ontario. For example, in the Thunder Bay District PHU between the years 2008-2015, the RII for males and females was estimated to be 2.9 and 3.5, respectively. During the same period, RII in the Toronto PHU was estimated for males and females to be 1.8 and 1.7, respectively (Table 2.4.3). This is a significant difference between the two groups, reflecting almost two times the relative impact of socioeconomic status on premature mortality in Thunder Bay District versus Toronto, for both sexes.

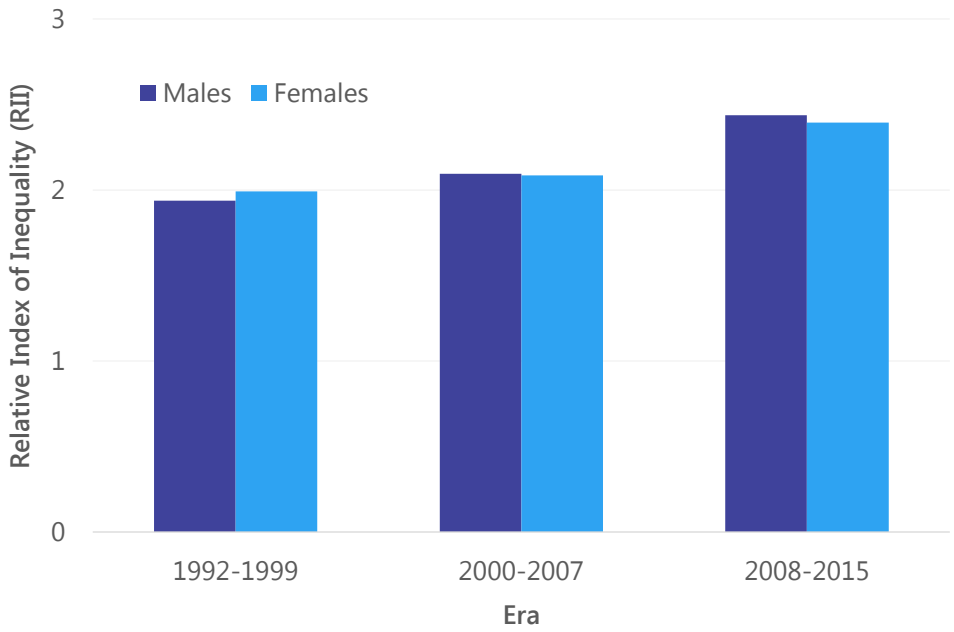


Figure 2.4.2 Relative Index of Inequality (RII, by sex and 7-year era, all Ontario, 1992-2015.

[6] RII was originally defined by Pamuk (1988) as the slope index of inequality (SII, an equivalent measure of absolute inequality) divided by the mean population event rate. This definition was updated by Kunst and Mackenbach (1995) to represent the mortality ratio of the worst-off member of a population (socioeconomic rank = 0) to the best-off member of that same population (socioeconomic rank = 1). The RII analysis in this report, which is based on the approach suggested by Moreno-Betancur et al. (2015), uses the latter definition. For details, refer to the technical appendix.

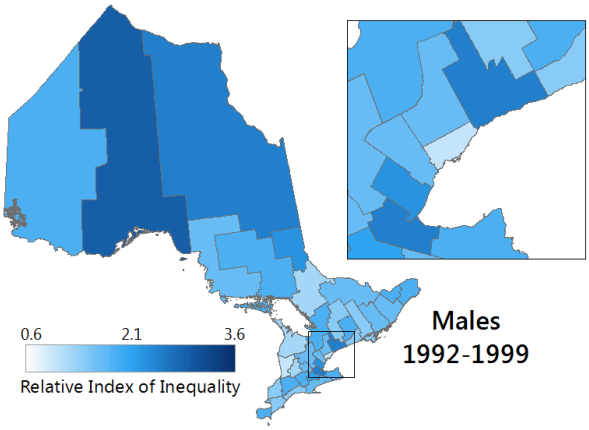


Figure 2.4.3 Relative index of inequality (RII), males, 1992-1999.

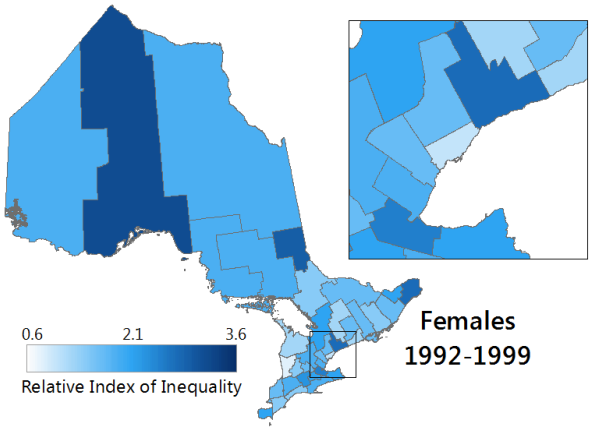


Figure 2.4.4 Relative index of inequality (RII), females, 1992-1999.

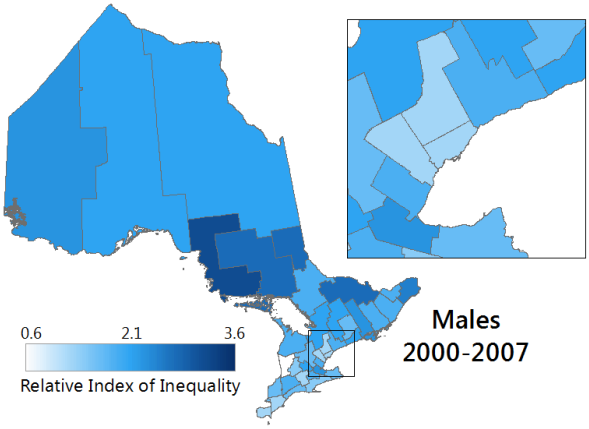


Figure 2.4.5 Relative index of inequality (RII), males, 2000-2007.

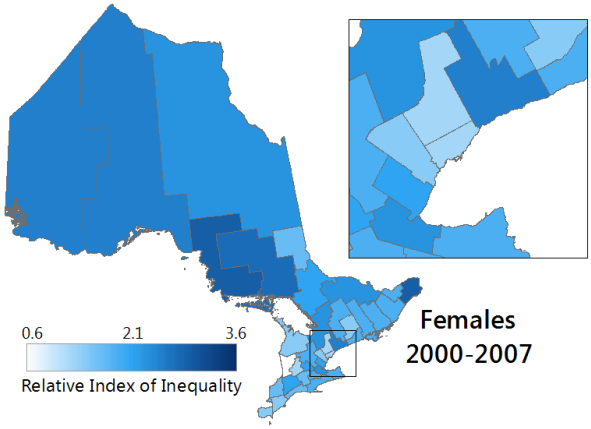


Figure 2.4.6 Relative index of inequality (RII), females, 2000-2007.

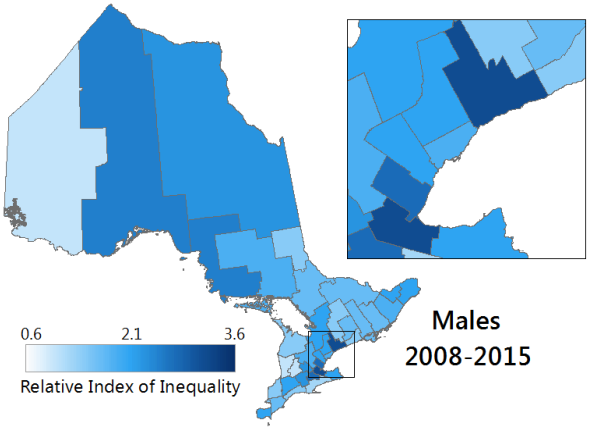


Figure 2.4.7 Relative index of inequality (RII), males, 2008-2015.

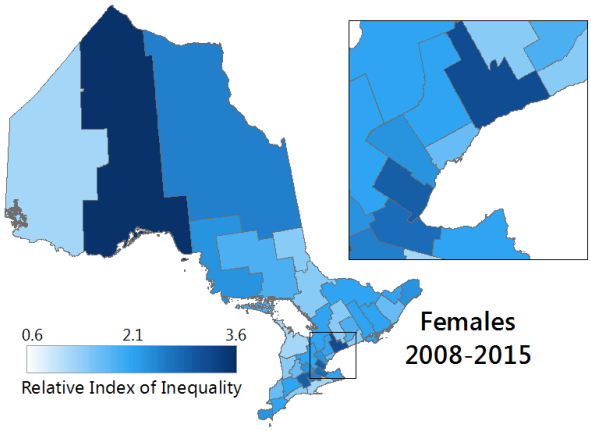


Figure 2.4.8 Relative index of inequality (RII), females, 2008-2015.

RII remains fairly similar between males and females, despite differences in underlying mortality rates (Figures 3.4.2 – 3.4.8).

The highest RII was calculated in Thunder Bay District PHU females between the years 2008-2015, a value of 3.5 (Table 2.4.3). This means that in the Thunder Bay District PHU, women of the lowest socioeconomic status were likely to die prematurely at 3.5 times the rate of women in the highest socioeconomic status group. Males also had a high RII in this region, at a value of 2.9 (Table 2.4.3). Furthermore, throughout the eras in the Thunder Bay District, the RII for males did not drop below 2.3, and for females, not below 2.5 (Table 2.4.3). This suggests a persistent trend of large socioeconomic inequalities in this region. Other regions with large RII's between the years of 2008-2015 for both sexes included the Durham Region PHU (3.1 for both males and females), and the Hamilton PHU (3.0 for males, 2.8 for females) (Table 2.4.3).

The lowest RII calculated between the years 2008-2015 occurred for both sexes in the Northwestern PHU, with 1.1 for males and 1.2 for females (Table 2.4.3). This indicates that Northwestern males and females of the lowest socioeconomic status would be expected to die prematurely about 20% more often than those of the highest socioeconomic status. Although this is a relatively small RII, it still represents a sizeable socioeconomic mortality gap. Another group with small RII's between the years of 2008-2015 for both sexes was the Haldimand-Norfolk PHU (1.3 for both males and females) (Table 2.4.3). Unique to females was the Grey-Bruce PHU, at a value of 1.2, and unique for males was the Huron County PHU, also at a value of 1.2 (Table 2.4.3).

A concerning trend persisted in RII between 1992 and 2015. Among males and females, RII values for all of Ontario increased from 1992-1999 to 2000-2007, and then again from 2000-2007 to 2008-2015. These increases was also seen in nine PHUs across the province: males and females in the Toronto, Region of Waterloo, Middlesex-London PHUs, and females in the Halton Region, Hastings and Prince Edward Counties, Chatham-Kent, Kingston, Frontenac, Lennox & Addington, Lambton, and Porcupine PHUs (Table 2.4.3). Steadily increasing RII implies that relative premature mortality disparities between high and low socioeconomic groups in those PHU populations have continuously expanded over recent years. As premature mortality rates decline across the province, not all socioeconomic groups are improving at the same rate.

Increasing relative inequalities should be considered in the context of decreasing underlying mortality rates. For mathematical reasons, relative measures of inequality such as RII often increase as population mortality rates decline[7] (47, 48). Trends in RII should therefore be interpreted in conjunction with trends in *absolute* inequalities. Figure 3.4.1 (discussed earlier in this chapter) shows that these inequalities remained largely static between 1992 and 2015. However, there has been a noted increase in the absolute premature mortality gap between the worst-off and second-worst-off quintile since the early 2000s.

[7] For more on this phenomenon, see Mackenbach, J. P., et al. (2016). "The arithmetic of reducing relative and absolute inequalities in health: a theoretical analysis illustrated with European mortality data." Journal of Epidemiology and Community Health.

2.5 AMENABLE MORTALITY

Scope

Amenable mortality is a subset of premature mortality, made up of causes of death that may be avoided through appropriate public health intervention and/or medical care (49). Specifically, amenable mortality in this report includes all deaths registered in Ontario between 1992 and 2012[8] for which the age at death is between 18 and 74, and the cause of death is considered amenable to either public health or medical care. The list of amenable causes is based on established classification systems, and includes conditions such as treatable cancers, infections, diabetes and cardiovascular disease (37, 50). The upper age limit of 74 years is based on the assumption that death becomes more difficult to prevent, and therefore less amenable to intervention, at older ages (49). For a full list of amenable causes, see Table TA.1 in the technical appendix.

For methodological details regarding the calculation of amenable mortality rates in this report, refer to the technical appendix. For mapping purposes, amenable mortality rates are grouped into three eras: 1992-1998, 1999-2005, and 2006-2012.

Use

Amenable mortality is a valuable indicator of health system performance, and has been put forward by CIHI for use in a Canadian context (12, 51). It was first developed as an indicator of avoidable mortality, that is, premature deaths which may have been prevented given timely and appropriate intervention (53).

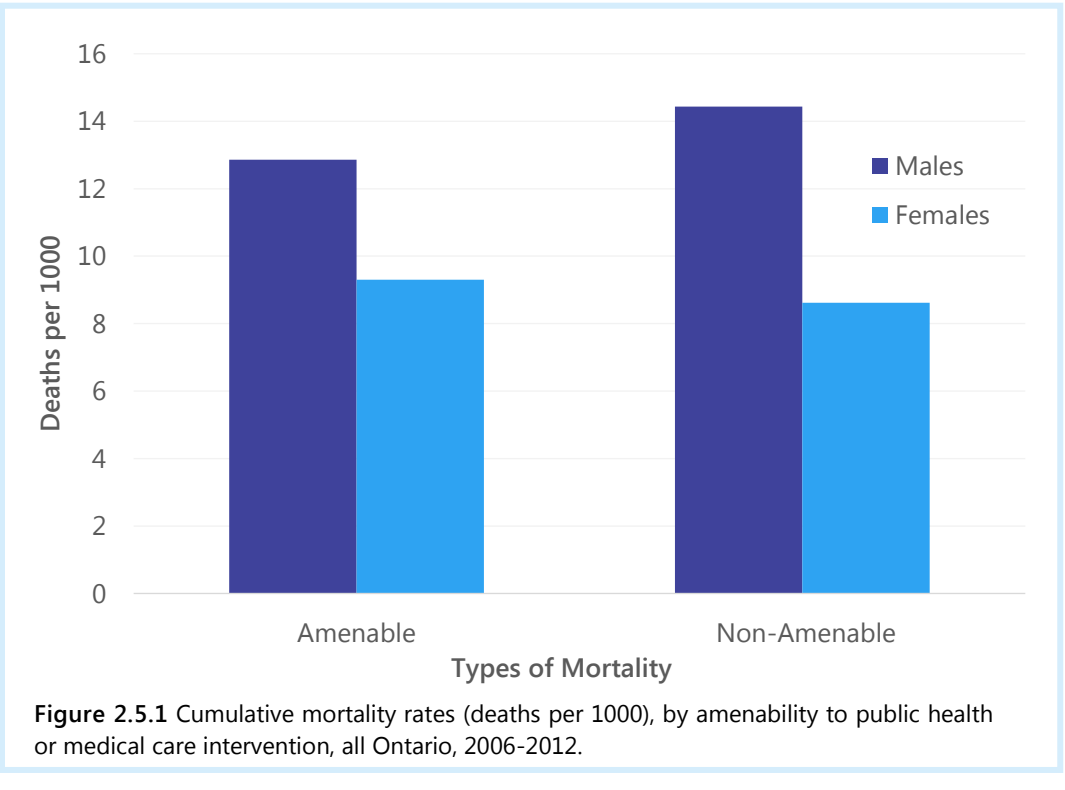


Figure 2.5.1 Cumulative mortality rates (deaths per 1000), by amenability to public health or medical care intervention, all Ontario, 2006-2012.

[8] The previous version of this atlas, which reported LHIN-level mortality trends, measured amenable mortality only in the most recent area (2006-2012). This section has been expanded in the current version.

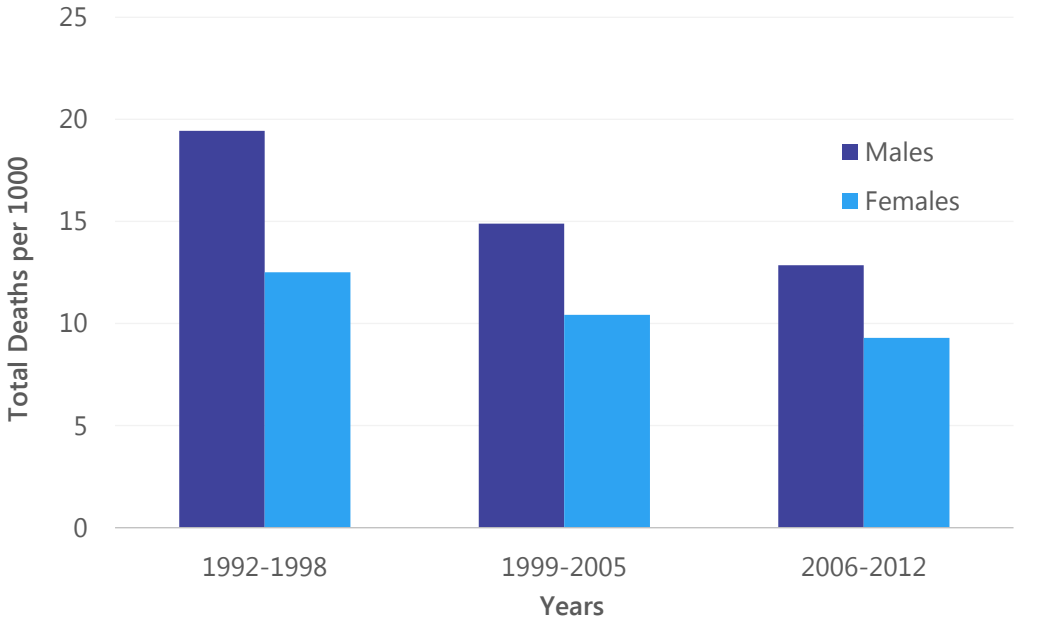


Figure 2.5.2 Age-standardized amenable mortality rates (total deaths per 1000) by era, males and females, all Ontario

Amenable mortality is closely linked to premature mortality, but offers added value in that it responds directly (at least in theory) to improvements in health system performance (52).

Findings

Figure 2.5.1 shows amenable and non-amenable mortality rates, by sex, for all of Ontario. Figure 2.5.2 shows age-standardized amenable mortality rates, by sex, for all of Ontario. Figures 2.5.3 to 2.5.8 show mapped amenable mortality rates by sex and PHU. Data for all figures are available in Table 2.5.1 in the data appendix.

Between the years 2006-2012, 47% of male deaths and 52% of female deaths were associated with causes amenable to public health or medical care intervention (Table 2.5.1). This indicates that there is still room for improvement among the PHUs in Ontario. In females, amenable mortality rates were slightly higher than non-amenable mortality rates in comparison to males. However, the overall number of deaths is still higher in males; so, although the mortality gap is shrinking, the overall burden of amenable mortality in Ontario is still higher in males than in females.

There are considerable differences between the PHUs in regards to amenable mortality rates. Firstly, the Porcupine PHU had one of the lowest declines in amenable mortality rates for both males and females, relative to other PHUs. In this region, between 1992-1998 and 2006-2012, the mortality rate for males decreased 3%, and the rate for females increased 10% (Table 2.5.1). Similarly, in the Algoma PHU during the same period, the male amenable mortality rate decreased by 12%, and the rate for females increased 2% (Table 2.5.1). Notable no decreases were noted for females in the Lambton and Northwestern PHUs, with an increase in mortality of 2% and 7%, respectively (Table 2.5.1). In contrast, other PHUs tended to

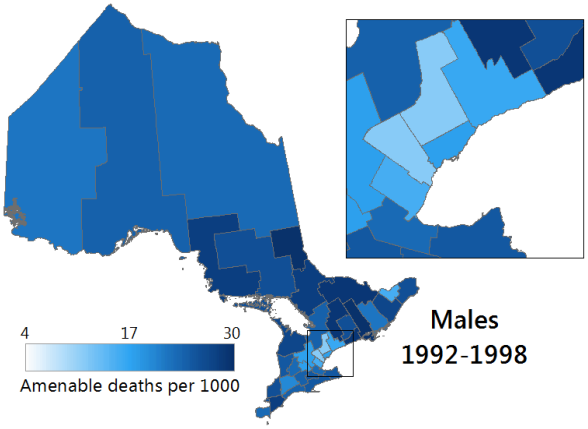


Figure 2.5.3 Cumulative amenable mortality (total deaths per 1000), males, 1992-1998.

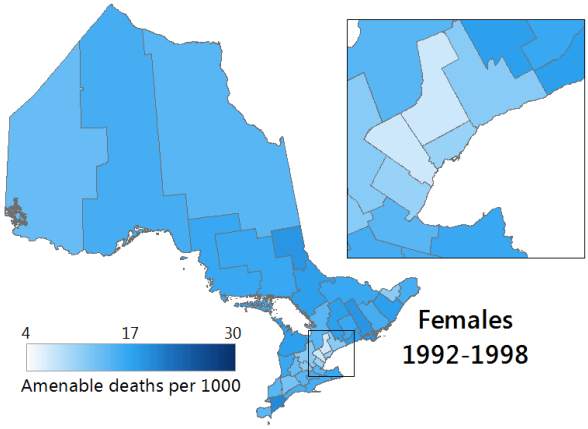


Figure 2.5.4 Cumulative amenable mortality (total deaths per 1000), females, 1992-1998.

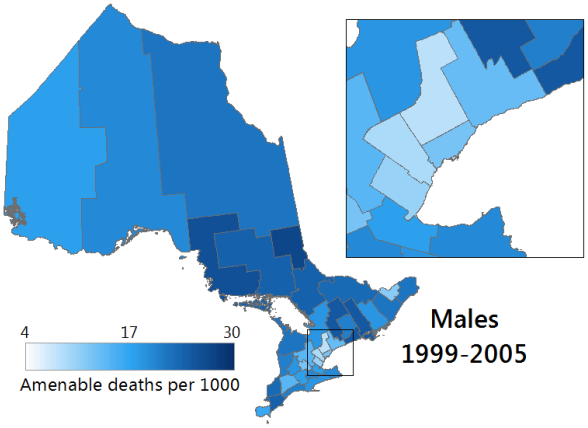


Figure 2.5.5 Cumulative amenable mortality (total deaths per 1000), males, 1999-2005.

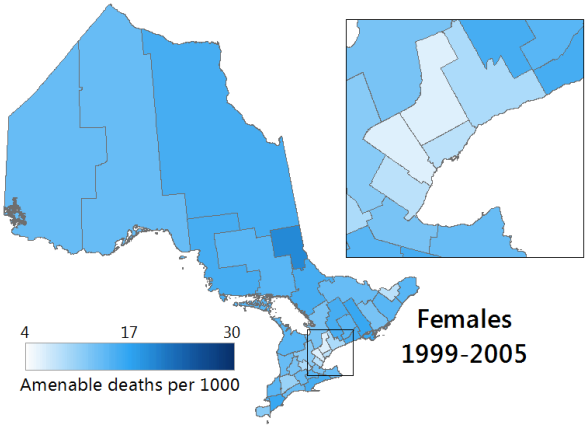


Figure 2.5.6 Cumulative amenable mortality (total deaths per 1000), females, 1999-2005.

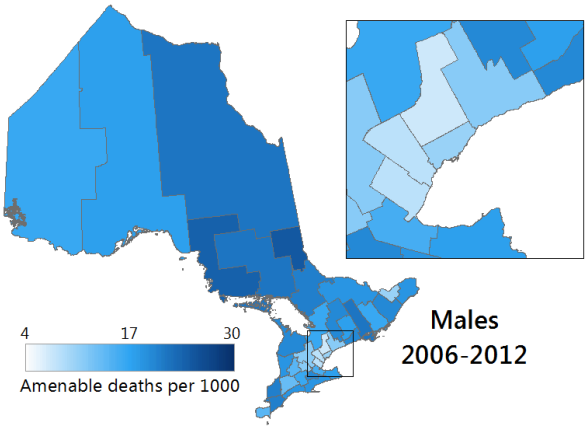


Figure 2.5.7 Cumulative amenable mortality (total deaths per 1000), males, 2006-2012.

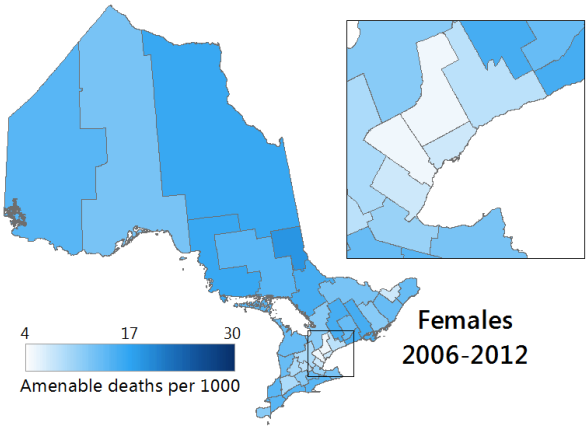


Figure 2.5.8 Cumulative amenable mortality (total deaths per 1000), females, 2006-2012.

have high decreases in mortality. For example, between 1992-1998 and 2006-2012, the Toronto PHU had a 42% decrease in mortality among males, and a 34% decrease in females. Likewise, during the same period, the Halton Region PHU had a 43% decrease in mortality among males, and a 31% decrease in females (Table 2.5.1). The gap between the lowest decrease in mortality and highest decrease in mortality among the PHUs should be considered when evaluating where public health resources should be allocated among the PHUs.

3 CONCLUSION

KEY TRENDS

Overall Trends

Overall mortality trends are described in greater detail in the first version of this report. We note that age-standardized and premature mortality rates both declined substantially across Ontario between 1992 and 2015, among both males and females. This is an indicator that Ontario's health system and broader policies around the determinants of health have been increasingly successful and preventing deaths, particularly early deaths, over time. Improvements in premature and all-cause mortality were greater in males than in females, resulting in a narrowing mortality gap between sexes over time.

Public Health Units

Mortality disparities were observed between PHUs in all of the indicators used in this report. Specifically, PHUs located in central regions of Ontario consistently experienced lower mortality rates than PHUs elsewhere. For instance, both all-cause and premature mortality showed consistently lower mortality rates in Peel, York and Toronto PHUs, and consistently higher rates outside the Greater Toronto Area, throughout the study period. Similar geographic patterns were observed in cardiovascular, cancer, and respiratory mortality as well as premature and amenable mortality rates.

Unlike the narrowing mortality gap seen between males and females, disparities in mortality between the best- and worst-off PHUs did not improve between 1992 and 2015. Progress in reducing mortality rates was greatest in PHUs in the region surrounding Toronto, where mortality rates were close to the Ontario average 1992 and gradually improved in the decades following. Meanwhile, progress in reducing mortality was slower, and even occasionally stagnant, throughout the rest of the province, particularly in the northeast and northwest. This means that geographic disparities in premature mortality and all-cause mortality have expanded over time. This is especially evident when looking at cause-specific rates for cardiovascular and circulatory mortality and cancer mortality, the two largest causes of death in Ontario, where gaps between PHUs have grown between 1992 and 2012.

Amenable mortality rates in PHUs may offer insights into where health system improvements are most needed. Geographic differences in amenable mortality are pronounced, with particularly high rates of amenable mortality in northern PHUs (noted above as having consistently high premature and all-cause mortality rates).

Socioeconomic Status

The findings of this atlas confirm that socioeconomic status is an important determinant of premature mortality in Ontario. The socioeconomic gradient is seen in both males and in females, and in every PHU in Ontario. Importantly, the effect of socioeconomic status is not equal across the province.

Relative socioeconomic disparity in premature mortality is growing over time. Relative Index of Inequality (RII) measures show that for both males and females, relative differences in premature mortality rates across

socioeconomic groups expanded gradually between 1992 and 2015. RII results suggest that relative socioeconomic inequalities in males and females are growing at approximately the same rate. The geographic disparities seen in premature mortality rates are not consistent with geographic patterns of RII. Even PHUs with low overall premature mortality showed evidence of growing RII.

In the same time, absolute inequalities in premature mortality (considered as gaps in mortality rates between five socioeconomic status quintiles) have stayed constant. The one exception is the gap between premature mortality rates in the highest quintile of material deprivation (the worst-off group) and the next highest quintile, which has grown substantially since the early 2000s. This is a worrisome trend. Future work should prioritize determining how and why this increase in inequality has taken place, and how it can best be targeted and addressed.

CONSIDERATIONS

Strengths

These analyses are strengthened by the powerful linkage of ORG-D data. By including nearly all Ontario deaths between 1992 and 2015, this atlas presents a comprehensive population-based profile of mortality trends in Ontario's PHU regions. Furthermore, by leveraging linkages to other provincial data holdings (for enrichment of cause of death coding) and the Ontario Marginalization Index (for assessment of socioeconomic status), the atlas moves beyond simple mortality-based indicators (such as premature and all-cause mortality) to consider mortality trends in finer detail.

By presenting mortality trends using PHU geography, this atlas complements the work that has already been done mapping mortality trends in Ontario's LHINs. Health stakeholders and researchers can use whichever document best suits their individual needs.

Limitations and Interpretive Cautions

Several limitations should be considered when interpreting these findings. We noted many of these limitations previously, but re-iterate here for those reading this report in isolation. Mortality trends which are reported at the PHU level are not necessarily representative of the experience of smaller communities or subpopulations within each PHU (53). For instance, an observation of decreasing mortality in an entire PHU may mask the fact that within that PHU, mortality is increasing among members of a specific subpopulation. Likewise, large declines at the PHU level may not be achieved equally across the entire PHU population (as seen in 'Premature mortality by socioeconomic status').

Similarly, studying mortality across long time periods introduces several challenges. Cause of death coding practices have changed periodically in Ontario since the establishment of ORG-D, resulting in structural differences in data holdings from different time periods. Specifically, between 2002 and 2003 the province moved from ICD-9 to ICD-10 coding, changing cause of death reporting patterns slightly (54). While every effort has been made to appropriately convert the data to ICD-9 codes, there may be some residual inconsistencies in cause of death coding over time.

Analyses for time trends were also limited to the years available in the databases. The date range for data sources varied somewhat, so analyses were conducted using different time frames. For example, at the time

of our original analysis, valid cause of death information from ORG-D was only available until December 2012, so cause-specific mortality analyses were truncated at that year. Furthermore, at the time data was extracted, ON-MARG information was not available for the most current census year (2011). This resulted in 2006 ON-MARG scores being applied for all years between 2004 and 2015.

IMPLICATIONS

This atlas offers extensive empirical evidence about mortality trends in Ontario between 1992 and 2015. The findings confirm trends which had been previously identified in Ontario's LHINs, and add to the evidence base by mapping geographic nuances in the PHU regions (30).

It will be important, moving forward, to continue monitoring mortality trends. The findings in this report show that major changes in mortality took place in Ontario between 1992 and 2015. Integrating mortality-based indicators into ongoing population health surveillance offers a practical means for understanding mortality disparities and inequities. Understanding how the entire health system, public health and health care, can work together will be key to reduce premature mortality in Ontario.

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ONTARIO ATLAS OF ADULT MORTALITY

1992-2015

VERSION 2.0:

TRENDS IN PUBLIC HEALTH UNITS

TECHNICAL AND DATA APPENDICES

Population Health Analytics Laboratory

UNIVERSITY OF TORONTO
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TECHNICAL APPENDIX

DATA SOURCES

This atlas used multiple databases linked at the Institute for Clinical Evaluative Sciences (ICES). They are as follows:

Ontario Registrar General's death certification file (ORG-D)

ORG-D is a mortality database containing records for all deaths registered in Ontario, based on data listed on an individual's Medical Certificate of Death (59). The data are regularly collected by the Ontario Registrar General as part of routine vital statistics reporting, and linked at ICES to the Ontario Registered Persons Database (RPDB). Linkage rates between ORG-D and RPDB are greater than 96%.

ORG-D data holdings include cause of death information from the decedent's Medical Certificate of Death. At ICES, cause of death is enriched through linkage with other provincial data holdings, such as health administrative data. All-cause of death entries are converted to ICD-9 codes using established conversion tables to ensure consistency over time.

Ontario Registered Persons Database (RPDB)

RPDB is the central population registry file in Ontario. RPDB includes records for all individuals that have ever been registered for insured health services in Ontario (59). It allows linkage to other health and demographic databases in Ontario.

Ontario Marginalization Index (ON-MARG)

ON-MARG is a census-derived index, linked at ICES to the RPDB, which measures levels of marginalization across Ontario at the dissemination area level (31). It has been frequently used as a proxy measure for socioeconomic status in the study of socioeconomic gradients in Ontario populations (60-62). Specifically, this atlas used dissemination area-level quintiles of material deprivation, which describe the likelihood that an individual is unable to afford or attain necessary goods and services (31). ON-MARG indices are available for 2006 and 2001; socioeconomic status has been assigned using nearest-census information.

POPULATION

This atlas considered all adult deaths registered in ORG-D between January 1992 and December 2015 which could be linked to a record in the RPDB. Adult deaths included all those with an age at death between 18 and 120 years old. The total number of deaths included is 1,962,634.

Analyses that required cause of death information (i.e., cause-specific and amenable mortality rates) excluded deaths registered after December 2012. Deaths were also excluded from these analyses if they did not have valid cause of death information in ORG-D. The total number of deaths included for cause-specific and amenable mortality analyses is 1,684,203.

The end date of 2012 for cause-specific analyses was used to maintain consistency with the first edition of this report, *Ontario Atlas of Adult Mortality, 1992-2015: Trends in Local Health Integration Networks (63)*. At time of publication for that report, cause of death updating of ORG-D holdings was complete only up to 2013. Additionally, cause-specific deaths that occurred in 2013 were excluded due to changes in ORG-D coding practices between 2012 and 2013.

METHODS

PHU geography

In this report, PHU geography refers to the geographic area, within the province of Ontario, assigned to a given Public Health Unit (PHU). For the purposes of geocoding, PHU geography was assigned at the dissemination area level.

All-cause mortality rates

Age-standardized all-cause mortality rates were calculated using data from ORG-D and RPDB. For each year between 1992 and 2015, age- and sex-specific all-cause mortality rates were calculated as the number of adult (age 18+) deaths registered in ORG-D per 1000 adults. Population counts were based on the number of individuals registered in RPDB. Age-standardized, sex-specific rates were then calculated as a weighted average of the age-specific rates, using the age distribution of the 2000 Canadian standard population.

Aggregated era rates were calculated for the following eras: 1992-1999, 2000-2007, and 2008-2015. For era rates, death counts (numerator) were calculated as the total number of adult deaths registered during the era. Population counts (denominator) used the RPDB population from the median year of each era (1996, 2004, and 2012). Age standardization was conducted as before, and all rates similarly reported as deaths per 1000.

Cause-specific mortality rates

Cause-specific mortality rates were calculated using data from ORG-D and RPDB. Cause of death was assigned using the ICES-derived cause of death variable in ORG-D, which is based on Medical Certificate of Death coding, enhanced via linkages with other provincial data holdings, and converted to ICD-9 codes. Cause-specific mortality rates were calculated for the following four groupings, based on chapters of ICD-9: Diseases of the cardiovascular and circulatory system (ICD-9 codes 309-459), cancers (ICD-9 codes 140-239), diseases of the respiratory system (ICD-9 codes 460-519), and external causes of injury and poisoning (ICD-9 codes 800-999.9). All other deaths with valid cause of death records were assigned the cause of death category of 'Other.'

Mortality rates were calculated using ORG-D death counts (numerator) and RPDB population counts (denominator), and reported, age-standardized to the 2000 Canadian standard population, as deaths per 1000. Cause-specific mortality rates were calculated using the following eras: 1992-1998, 1999-2005, and 2006-2012. Era rate population counts used the RPDB population from the median year of each era (1995, 2002, and 2009). Age standardization of cause-specific mortality rates was carried out as previously described.

Premature mortality rates

Premature mortality rates were calculated using data from ORG-D and RPDB. Death counts were collected from ORG-D and included all deaths among decedents aged 18 to 74. Population counts, based on RPDB holdings, were calculated as the number of Ontario residents aged 18 to 74.

Premature mortality rates are reported as deaths per 1000 for both annual and era rates. Era rates used the same eras (1992-1999, 2000-2007 and 2008-2015) and population denominator years (1996, 2004 and 2012) as all-cause mortality rates.

Premature mortality rates by socioeconomic status

Socioeconomic status was assigned using material deprivation quintiles from ON-MARG, which are assigned to individuals based on their dissemination area of residence at time of death. ON-MARG was developed using 2001 and 2006 Canadian census data, so nearest-census data were used for all other years: 2001 data were applied to deaths between 1992 and 2003, and 2006 data for deaths 2004 – 2015. Individuals were excluded from this analysis if they were missing material deprivation data from their ON-MARG record (N=24,908). Note that ON-MARG quintiles are based on the Ontario-wide distribution of material deprivation.

Stratified premature mortality rates were calculated as detailed above. They are reported as deaths per 1000 for both annual and era rates.

Relative Index of Inequality (RII)

Relative index of inequality measures were calculated using data from ORG-D, RPDB and ON-MARG. The approach used was based on work by Moreno-Betancur, Latouche, Menvielle, Kunst and Rey (2015) (64). In this approach, RII is defined as RII = h(1)/h(0), where h(x) is the premature mortality rate for socioeconomic rank x and 0 and 1 refer to the socioeconomic ranks of the worst- and best-off individuals in a population, respectively. Socioeconomic rankings are assigned as the proportion of the population with higher socioeconomic status. In this case, individuals in the highest population quintile (top 20%) of material deprivation would be assigned a socioeconomic rank of 0.9, with those in the next-highest quintile assigned socioeconomic rank 0.7 and so on.

A Cox proportional hazards model was employed to calculate a hazard rate estimator for RII. The model used time-on-study as the time scale and included no covariates, generating unadjusted RII estimates for each PHU- and sex-specific group.

Amenable mortality rates

Amenable mortality rates were calculated using data from ORG-D and RPDB, including cause of death data from ORG-D. Death counts for all deaths that occurred before age 75 were obtained using ORG-D records. Each death with valid cause of death information was categorized as amenable to medical care, amenable to public health, amenable to both medical care and public health, or amenable to neither. Groupings were based on ICD-9 codes, according to established classification lists for amenable mortality. The full list of amenable ICD-9 cause of death codes is included in Table TA.1 at the end of the technical appendix.

Amenable mortality rates were calculated only for the most recent era of available cause of death information (2006-2012). Population counts were captured from RPDB, using 2009 as the population denominator year. As with premature mortality rates, amenable mortality rates were not age-standardized.

Absolute and relative changes in mortality rates between eras

For mortality rates by era, absolute and relative changes in mortality rates between eras were calculated using era mortality rates. For each era after the reference period (1992-1999 for all-cause and premature mortality, 1992-1998 for cause-specific and amenable mortality), absolute changes in mortality rates between eras were calculated by subtracting the era mortality rate from the rate observed in the reference era. Relative changes in mortality rates between eras were calculated by dividing the era mortality rate by the rate observed in the reference era.

Table TA.1. List of causes of deaths amenable to medical care and public health intervention.

Cause	ICD – 9 Code	Age group (years)
Deaths amenable to both medical care and public health		
Ischaemic heart disease	410 – 414, 429.2	35 – 74
Deaths amenable to medical care		
Intestinal infection	001 – 009	0 – 14
Tuberculosis	010 – 018, 137	0 – 74
Diphtheria	032	0 – 74
Whooping cough	033	0 – 14
Tetanus	037	0 – 74
Septicemia	038	0 – 74
Poliomyelitis	045	0 – 74
Measles	055	1 – 14
Syphilis	090 – 097	0 – 74
Other bacterial infections	019 – 031, 034, 320 – 322, 381 – 383, 390 –392, 680 – 686, 711	0 – 74
Female breast cancer	174	25 – 74
Deaths amenable to medical care (cont.)		
Cervical cancer	180	15 – 74
Other uterine cancers	179, 182	15 – 74
Testicular cancer	186	0 – 74
Hodgkin's disease	201	0 – 74
Leukemia	204 – 208	0 – 14
Diseases of the thyroid	240 – 246	0 – 74
Diabetes mellitus	250	0 – 74
Deficiency anemia	280, 281	0 – 74
Epilepsy	345	0 – 74
Active rheumatic fever	390 – 392	0 – 74
Chronic rheumatic heart disease	393 – 398	0 – 74
Hypertensive disease	401 – 405	35 – 74
Cerebrovascular disease	430 – 438	35 – 74
Influenza	487	0 – 74
Pneumonia	480 – 483, 485 – 486	0 – 74
Other acute respiratory infections	460 – 466	1 – 14
Asthma	493	0 – 49
Peptic ulcer	531 – 534	0 – 74
Appendicitis	540 – 543	0 – 74
Abdominal hernia	550 – 553	0 – 74

Cause	ICD – 9 Code	Age group (years)
Ileus without hernia	560	0 – 74
Cholelithiasis, cholecystitis and cholangitis	574 – 575.1, 576.1	0 – 74
Nephritis and nephrosis	580 – 589	0 – 74
Infections of the urinary system	590, 595	0 – 74
Hyperplasia of the prostate	600	0 – 74
Complications of pregnancy	630 – 676	0 – 74
Osteomyelitis and periostitis	730	0 – 74
Congenital cardiovascular anomalies	745 – 747	0 – 74
Congenital digestive anomalies	750 – 751	0 – 74
Perinatal conditions, excluding still births*	760 – 779	0 – 74
Misadventures to patients during surgical and medical care	E870 – 876, E878 – 879	0 – 74
Deaths amenable to public health		
HIV	042	0 – 74
Lung cancer	162	0 – 74
Skin cancer	173	0 – 74
Chronic obstructive pulmonary disease	490 – 492, 496	0 – 74
Cirrhosis of the liver	571	0 – 74
Motor vehicle accidents	E810 – 825	0 – 74

*No age restriction, other than the one used to define perinatal deaths (first month of life).

DATA APPENDIX

Table 2.1.1: Cumulative age-standarized all-cause mortality rates (total deaths per 1000), with absolute and relative risks, by PHU, sex and era, Ontario, 1992-2015.

		Total deaths per 1000			Absolute change[1]		Relative change[1]	
PHU	Sex	1992-1999	2000-2007	2008-2015	2000-2007	2008-2015	2000-2007	2008-2015
Algoma	M	96.4	82.1	76.2	-14.3	-20.2	-14.8%	-20.9%
	F	62.4	54.9	53.0	-7.4	-9.4	-11.9%	-15.0%
Brant	M	95.6	83.9	70.8	-11.8	-24.8	-12.3%	-25.9%
	F	61.2	56.9	52.2	-4.2	-8.9	-6.9%	-14.6%
Durham	M	85.2	68.5	57.1	-16.7	-28.0	-19.6%	-32.9%
	F	56.9	47.6	40.7	-9.3	-16.2	-16.3%	-28.5%
Elgin-St. Thomas	M	95.9	82.2	70.1	-13.7	-25.7	-14.3%	-26.8%
	F	61.9	56.8	51.2	-5.2	-10.7	-8.4%	-17.4%
Grey-Bruce	M	94.4	77.5	64.7	-16.8	-29.7	-17.8%	-31.5%
	F	60.3	54.2	45.4	-6.0	-14.9	-10.0%	-24.7%
Haldimand-Norfolk	M	92.9	79.2	69.3	-13.7	-23.6	-14.8%	-25.4%
	F	59.4	54.9	49.6	-4.5	-9.8	-7.6%	-16.6%
Haliburton, Kawartha, Pine Ridge	M	90.2	76.8	64.3	-13.4	-25.9	-14.9%	-28.7%
	F	58.1	52.1	46.2	-6.0	-11.9	-10.3%	-20.5%
Halton	M	74.9	59.7	49.7	-15.2	-25.2	-20.4%	-33.6%
	F	50.4	43.5	36.2	-6.9	-14.3	-13.7%	-28.3%
Hamilton	M	91.4	76.3	67.0	-15.1	-24.4	-16.6%	-26.7%
	F	58.4	51.2	45.7	-7.1	-12.6	-12.2%	-21.7%
Hastings and Prince Edward	M	99.2	82.8	71.6	-16.4	-27.6	-16.6%	-27.8%
	F	62.2	55.8	49.6	-6.4	-12.6	-10.3%	-20.3%
Huron	M	93.2	78.9	64.7	-14.3	-28.5	-15.4%	-30.6%
	F	57.2	52.1	45.2	-5.0	-12.0	-8.8%	-20.9%
Chatham-Kent	M	105.5	88.0	72.2	-17.6	-33.3	-16.6%	-31.6%
	F	63.2	58.2	51.6	-5.0	-11.6	-8.0%	-18.4%
Kingston, Frontenac, Lennox & Addington	M	91.3	75.9	66.6	-15.4	-24.7	-16.9%	-27.0%
	F	58.4	53.6	47.7	-4.8	-10.7	-8.3%	-18.3%
Lambton	M	90.6	79.7	69.6	-10.9	-21.0	-12.0%	-23.2%
	F	56.3	54.6	48.9	-1.7	-7.4	-3.1%	-13.1%
Leeds, Grenville, Lanark	M	96.0	78.6	68.3	-17.4	-27.7	-18.1%	-28.8%
	F	61.9	54.7	47.8	-7.1	-14.1	-11.5%	-22.8%
Middlesex-London	M	91.3	72.3	63.9	-19.0	-27.4	-20.8%	-30.0%
	F	56.9	50.5	45.1	-6.4	-11.8	-11.3%	-20.7%
Niagara	M	90.7	76.5	66.3	-14.2	-24.4	-15.6%	-26.9%
	F	58.6	52.1	46.0	-6.5	-12.6	-11.1%	-21.5%

		Total deaths per 1000			Absolute change[1]		Relative change[1]	
PHU	Sex	1992-1999	2000-2007	2008-2015	2000-2007	2008-2015	2000-2007	2008-2015
North Bay-Parry Sound	M	102.2	82.6	71.5	-19.6	-30.7	-19.2%	-30.1%
	F	61.4	54.7	50.8	-6.7	-10.5	-10.9%	-17.2%
Northwestern	M	93.6	79.1	69.7	-14.5	-23.9	-15.5%	-25.5%
	F	57.9	57.5	53.2	-0.4	-4.7	-0.7%	-8.2%
Ottawa	M	77.6	62.7	50.9	-14.8	-26.6	-19.1%	-34.3%
	F	52.1	44.1	37.6	-8.0	-14.5	-15.3%	-27.9%
Oxford	M	94.9	78.3	68.7	-16.6	-26.2	-17.5%	-27.6%
	F	58.2	52.3	46.5	-5.9	-11.7	-10.2%	-20.1%
Peel	M	69.1	51.9	42.3	-17.2	-26.8	-24.9%	-38.8%
	F	48.2	37.0	31.5	-11.2	-16.7	-23.3%	-34.6%
Perth	M	92.9	78.8	62.5	-14.2	-30.4	-15.2%	-32.8%
	F	55.5	54.5	45.7	-1.0	-9.8	-1.8%	-17.7%
Peterborough	M	89.8	76.1	64.5	-13.7	-25.2	-15.2%	-28.1%
	F	57.0	53.6	45.8	-3.4	-11.2	-6.0%	-19.7%
Porcupine	M	106.7	92.0	81.4	-14.7	-25.3	-13.8%	-23.7%
	F	64.8	60.5	57.4	-4.3	-7.3	-6.7%	-11.3%
Renfrew	M	98.5	81.0	63.2	-17.5	-35.3	-17.7%	-35.8%
	F	57.3	54.4	44.3	-2.9	-13.0	-5.1%	-22.7%
Eastern Ontario	M	95.8	78.2	66.2	-17.6	-29.6	-18.3%	-30.9%
	F	60.9	53.3	47.3	-7.6	-13.6	-12.5%	-22.3%
Simcoe Muskoka	M	90.6	74.3	64.2	-16.3	-26.4	-18.0%	-29.2%
	F	58.2	51.1	46.0	-7.1	-12.2	-12.3%	-20.9%
Sudbury	M	102.7	86.0	75.9	-16.7	-26.7	-16.3%	-26.0%
	F	63.9	57.2	52.1	-6.7	-11.7	-10.5%	-18.4%
Thunder Bay	M	98.9	83.6	73.8	-15.3	-25.1	-15.5%	-25.4%
	F	62.0	56.4	50.6	-5.6	-11.4	-9.0%	-18.4%
Timiskaming	M	108.2	94.2	80.5	-14.0	-27.7	-12.9%	-25.6%
	F	67.9	63.0	51.3	-4.9	-16.6	-7.2%	-24.4%
Waterloo	M	87.6	69.1	58.9	-18.5	-28.7	-21.1%	-32.7%
	F	54.0	48.8	43.1	-5.2	-10.9	-9.6%	-20.1%
Wellington-Dufferin-Guelph	M	87.4	68.9	60.6	-18.4	-26.7	-21.1%	-30.6%
	F	55.8	50.5	43.6	-5.3	-12.3	-9.6%	-22.0%
Windsor-Essex	M	95.9	73.3	62.9	-22.5	-32.9	-23.5%	-34.4%
	F	59.7	52.1	44.5	-7.5	-15.1	-12.6%	-25.3%
York	M	67.7	49.6	38.8	-18.1	-28.9	-26.8%	-42.7%
	F	47.8	35.7	28.6	-12.1	-19.1	-25.3%	-40.1%
Toronto	M	77.3	59.6	49.3	-17.7	-28.0	-22.9%	-36.2%
	F	50.1	40.9	34.1	-9.2	-16.0	-18.4%	-32.0%
All Ontario	**M**	**85.2**	**67.9**	**56.7**	**-17.3**	**-28.4**	**-20.3%**	**-33.4%**
	F	**54.8**	**47.0**	**40.3**	**-7.8**	**-14.5**	**-14.2%**	**-26.4%**

[1]For details on how absolute and relative mortality rate changes were calculated, refer to the technical appendix.

Table 2.1.2: Annual age-standardized all-cause mortality rates (deaths per 1000 per year) by PHU and sex, Ontario, 1992 to 2015.

PHU[1] and sex		Deaths per 1000 per year																							
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
ALG	M	12.2	12.7	12.6	12.3	13.1	11.5	11.3	12.2	11.5	11.0	10.6	10.7	10.5	9.6	10.1	9.5	10.5	10.0	9.3	9.8	9.7	8.8	9.6	9.4
	F	7.5	8.2	8.5	7.6	8.2	7.9	7.8	7.6	7.2	7.3	6.6	6.7	6.8	7.5	7.1	6.7	6.9	6.9	6.7	6.8	6.1	6.9	6.6	6.5
BRN	M	13.2	12.6	12.0	11.9	11.8	11.9	11.5	11.7	10.6	11.6	10.5	11.2	10.5	9.9	10.3	9.9	10.0	9.6	9.1	9.3	9.3	8.2	8.4	8.2
	F	7.8	7.7	7.9	7.3	7.7	7.4	7.7	7.7	7.3	7.3	7.6	7.6	7.3	7.0	7.0	6.5	7.0	6.9	7.0	6.7	6.2	6.3	6.1	6.5
DUR	M	11.3	11.3	11.1	11.3	10.8	10.9	10.8	9.6	10.1	9.2	8.9	8.9	8.6	8.4	8.3	8.1	7.8	7.8	7.6	7.3	7.0	7.2	7.1	6.8
	F	7.3	7.3	7.0	7.6	7.5	7.1	7.1	6.9	6.8	6.6	6.5	6.0	6.0	5.9	5.6	5.6	5.6	5.4	5.3	5.2	5.2	5.0	5.0	4.9
ELG	M	12.3	12.2	13.4	12.4	11.8	11.4	10.8	11.5	11.4	9.7	10.9	11.7	10.0	10.6	10.4	9.2	9.6	9.3	9.3	9.0	8.8	8.8	8.4	8.3
	F	7.6	7.7	7.6	7.6	8.1	7.5	8.0	8.1	7.0	7.0	6.8	7.8	6.6	7.5	7.2	7.0	6.4	7.0	6.5	6.3	6.4	6.4	6.1	6.4
EOH	M	12.1	12.6	12.5	12.1	11.5	11.8	11.3	11.4	10.8	11.2	9.8	10.0	9.3	9.3	8.7	9.4	8.1	8.3	8.5	8.6	8.3	8.1	8.0	7.6
	F	7.9	8.3	7.4	8.0	7.6	7.7	6.9	7.3	6.7	7.0	7.2	7.1	6.3	6.9	6.4	6.9	6.3	5.6	5.8	5.7	5.8	5.4	5.8	5.6
GBO	M	11.8	13.3	12.7	11.6	11.9	11.2	10.8	11.2	10.9	9.6	10.3	10.4	10.0	9.5	9.0	9.8	9.2	9.5	9.9	8.1	8.7	8.6	8.8	7.9
	F	8.1	8.0	7.8	7.7	7.7	7.2	7.2	7.0	7.7	7.2	6.8	7.2	6.7	6.8	7.0	6.2	6.3	6.7	6.3	5.8	6.1	6.0	5.9	6.9
HDN	M	11.2	11.9	11.6	11.4	11.1	11.6	11.1	11.4	11.0	10.2	10.0	10.1	9.6	9.4	8.8	8.8	8.7	8.8	8.8	8.0	8.0	8.2	7.5	7.8
	F	7.0	7.2	7.7	7.6	7.5	7.4	7.2	7.1	7.0	6.7	6.6	6.6	6.9	6.8	5.9	6.3	6.5	6.1	6.5	5.9	5.9	5.3	5.4	5.3
HKP	M	9.9	9.6	10.7	9.5	9.6	9.4	9.3	8.5	8.1	8.1	7.6	7.9	7.4	7.8	7.3	7.2	7.0	6.6	6.6	6.5	6.2	6.1	6.2	5.8
	F	6.7	6.4	6.7	6.8	6.5	6.0	6.1	6.0	5.7	5.9	5.8	5.7	5.2	5.4	5.5	5.2	5.0	4.9	4.9	4.7	4.7	4.3	4.3	4.2
HAL	M	12.0	11.8	11.9	11.5	11.6	11.4	10.6	11.1	10.6	10.3	9.9	10.2	9.1	9.3	8.6	9.3	9.3	9.1	8.5	8.4	8.2	8.4	8.3	7.9
	F	7.5	7.1	7.8	7.5	7.2	7.4	7.3	7.0	7.1	6.6	6.4	6.7	6.3	6.6	5.9	6.2	6.0	6.1	5.9	5.9	5.8	5.6	5.5	5.4
HAM	M	12.7	12.4	12.8	12.7	12.2	12.2	12.3	12.5	11.8	11.3	11.1	10.2	10.3	9.7	9.6	10.0	10.7	9.8	9.1	8.8	9.0	8.6	8.9	8.0
	F	8.0	8.0	8.0	8.2	7.5	7.5	7.4	7.8	7.7	7.4	7.1	7.1	6.8	7.4	6.3	6.8	6.6	6.6	6.7	6.0	6.0	6.3	6.1	5.9
HPE	M	11.6	11.6	11.9	11.2	12.3	11.7	11.7	11.2	10.2	10.6	9.5	10.5	10.4	9.3	9.9	9.5	7.6	9.0	9.5	8.0	7.7	7.3	8.2	8.7
	F	7.1	6.7	7.9	7.6	7.5	6.7	6.7	6.9	7.4	6.3	6.8	6.7	6.2	6.5	6.8	5.9	6.2	5.6	5.3	5.8	5.1	5.6	5.8	5.8
HUR	M	12.7	14.4	13.5	13.6	13.3	12.7	12.1	13.3	11.6	11.3	11.2	11.5	10.5	11.1	10.7	10.7	9.4	9.7	9.3	9.7	9.2	8.9	8.8	8.6
	F	7.8	8.3	8.1	8.4	8.4	7.8	7.4	7.7	7.3	7.3	7.4	7.6	7.0	7.3	7.3	7.1	6.9	6.5	6.7	6.4	6.1	7.1	5.9	6.4
CHK	M	12.0	12.0	11.4	11.4	11.5	11.5	10.8	11.9	10.7	10.0	9.4	9.9	9.3	9.6	9.5	9.1	9.0	8.9	9.3	8.3	8.4	8.4	7.4	7.9
	F	7.6	7.2	7.5	7.3	7.4	7.2	7.5	7.5	7.4	7.2	7.3	6.3	6.9	6.3	6.2	6.6	6.6	6.1	6.2	6.1	6.0	6.0	5.7	5.5
KFL	M	12.6	11.9	11.1	11.5	11.3	11.8	11.3	10.7	11.3	10.9	10.4	10.3	9.7	9.9	9.4	8.8	9.0	9.3	9.7	8.7	8.6	8.3	8.2	8.7
	F	7.4	6.6	7.1	7.2	7.1	7.2	7.3	7.3	7.0	7.0	7.1	6.5	6.8	6.9	6.8	7.2	6.3	6.8	6.5	6.2	5.8	5.7	5.5	6.3
LAM	M	12.2	11.6	13.2	13.2	11.7	12.2	10.9	11.4	10.0	10.3	10.6	10.3	9.9	9.4	9.3	9.6	9.4	9.0	9.3	8.3	8.6	8.4	8.1	7.9
	F	8.0	7.8	8.1	8.0	7.7	7.6	7.5	7.3	7.1	7.6	6.9	6.8	6.6	7.0	6.5	6.7	6.2	6.5	6.1	6.4	5.9	5.8	5.9	5.6
LGL	M	12.1	12.0	11.7	11.9	11.0	11.8	10.8	10.7	10.3	9.5	9.4	9.6	8.7	8.8	8.5	8.6	8.3	8.6	8.3	7.9	8.1	8.0	7.9	7.7
	F	7.3	7.5	7.6	7.0	7.0	7.1	7.0	7.0	6.9	6.4	6.7	6.4	6.2	6.3	6.2	6.1	6.2	5.7	5.8	5.7	5.4	5.6	5.5	5.6
NIA	M	11.9	12.0	12.2	11.6	11.0	11.1	10.8	10.8	10.5	9.9	9.7	9.8	9.4	9.5	9.1	9.5	9.2	8.7	8.6	8.8	8.0	8.1	8.0	7.7
	F	7.4	7.4	7.7	7.5	7.3	7.2	7.2	7.3	6.9	7.0	6.7	6.7	6.3	6.7	6.2	6.2	6.1	6.3	5.7	5.7	5.8	5.7	5.6	5.5
NPS	M	13.7	13.4	11.9	14.0	13.4	12.0	12.1	12.0	11.2	11.5	10.2	10.8	10.7	10.0	9.6	9.8	9.7	9.6	9.7	8.7	8.6	8.8	9.2	8.4
	F	7.8	8.5	7.7	8.1	7.9	7.4	7.6	7.2	7.4	7.1	7.1	7.3	6.7	7.1	6.6	6.1	6.8	6.9	6.4	6.7	6.1	5.9	6.2	6.5
NWR	M	12.1	12.0	12.0	12.1	12.7	10.3	11.7	11.1	10.3	10.1	9.4	11.4	10.0	9.7	9.9	8.8	8.0	8.8	9.7	8.5	9.2	9.5	8.5	9.1
	F	7.5	7.6	6.7	7.5	7.5	7.7	6.9	7.3	7.5	7.8	7.1	7.8	6.8	7.1	6.8	6.8	6.4	7.1	6.5	6.6	6.9	6.8	6.7	6.7

PHU[1] and sex		Deaths per 1000 per year																							
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
OTT	M	10.8	10.7	10.3	10.3	9.8	8.9	9.4	9.1	8.9	8.2	8.2	8.2	8.0	7.8	7.4	7.3	7.3	6.9	6.6	6.5	6.4	6.3	6.2	6.0
	F	6.7	7.1	7.0	6.6	6.5	6.5	6.1	6.3	6.1	5.9	5.8	5.7	5.5	5.5	5.1	5.3	5.2	5.2	4.9	4.7	4.6	4.6	4.6	4.4
OXF	M	12.4	13.2	12.5	12.5	11.1	11.8	10.2	11.1	10.8	9.5	10.0	10.9	9.1	9.8	9.0	9.5	9.9	9.1	8.4	8.7	8.6	8.1	7.9	8.7
	F	7.2	7.4	7.6	7.7	7.6	7.4	6.6	7.3	6.3	6.6	7.2	6.9	6.6	6.6	6.4	6.2	5.5	5.8	6.4	6.0	5.6	6.0	6.1	5.5
PEE	M	10.0	10.0	9.5	8.9	8.9	8.4	8.5	7.8	7.3	7.0	7.1	7.0	6.6	6.3	6.2	6.1	6.2	5.8	5.4	5.6	5.3	5.1	5.2	5.2
	F	6.7	6.5	6.4	6.1	6.1	6.1	5.9	5.6	5.3	5.1	4.8	4.9	4.6	4.7	4.4	4.4	4.5	4.3	4.2	4.1	3.8	3.9	3.9	3.8
PDH	M	12.2	11.8	12.3	12.1	11.0	11.9	10.9	10.7	10.6	10.6	10.9	10.2	9.8	9.2	9.7	8.5	8.5	9.3	7.9	7.6	7.8	7.7	7.5	7.3
	F	6.8	7.3	7.4	6.7	6.9	6.2	7.4	6.9	8.0	7.0	6.6	6.7	6.4	7.1	6.4	6.7	5.9	5.8	5.7	5.8	5.6	5.3	5.6	5.9
PTC	M	11.4	11.6	11.9	11.0	12.1	11.0	11.7	10.6	10.3	10.3	9.4	9.8	9.4	9.9	9.0	9.0	8.5	8.8	8.5	7.8	8.0	8.4	7.9	7.7
	F	6.9	7.2	7.1	7.5	7.3	7.3	7.0	7.3	7.0	6.8	6.5	7.5	7.1	6.3	6.2	6.6	6.3	6.0	5.9	5.7	5.7	5.3	5.6	5.7
PQP	M	14.2	13.8	14.2	12.8	13.2	14.1	11.7	13.3	12.5	12.9	11.2	12.1	12.0	11.2	10.0	10.9	10.9	10.4	9.6	10.4	10.9	9.8	10.4	9.8
	F	7.7	8.3	7.9	8.8	8.5	7.9	7.7	8.6	7.9	8.2	7.4	7.5	7.9	7.7	7.2	7.2	7.9	7.4	7.4	6.9	6.9	7.6	6.8	7.1
REN	M	13.1	12.0	12.1	13.0	11.8	11.9	12.4	12.1	11.1	10.8	11.2	10.2	10.3	10.0	9.3	9.3	7.9	7.7	7.8	8.2	7.8	8.7	8.4	7.5
	F	7.5	7.7	7.3	7.3	7.5	7.2	7.1	6.6	6.9	6.6	7.3	6.2	7.4	6.7	6.8	6.9	5.5	5.0	5.3	5.9	5.3	5.6	5.8	6.2
EOH	M	12.8	12.6	12.8	11.7	11.7	11.7	11.8	10.7	10.6	10.2	10.6	10.2	10.1	9.5	8.6	9.5	9.8	8.3	8.4	8.1	8.6	8.2	8.4	7.9
	F	7.7	7.6	8.2	7.7	7.4	7.7	7.2	7.7	7.1	7.0	6.9	6.9	6.4	7.0	6.3	6.2	6.2	6.3	6.5	5.5	5.6	5.8	5.8	6.2
SMD	M	11.7	11.9	12.1	11.6	11.5	11.4	11.1	10.6	10.2	10.0	9.5	9.6	9.1	9.3	9.4	9.0	8.9	8.6	8.5	8.1	8.2	7.8	7.7	7.7
	F	7.2	7.6	7.6	7.4	7.3	7.4	7.3	7.1	6.8	6.9	7.0	6.5	6.0	6.5	6.3	6.3	6.3	6.2	5.9	5.7	5.6	5.7	5.8	5.6
SUD	M	13.9	12.9	14.7	12.7	12.8	12.4	12.0	12.4	12.5	11.1	11.4	10.5	11.3	9.9	9.7	10.6	10.0	10.5	9.5	9.4	9.6	9.6	9.3	8.8
	F	8.3	8.1	8.5	8.4	7.9	8.1	7.8	7.7	7.5	7.1	7.8	7.5	7.3	7.0	7.0	6.8	6.7	6.9	6.4	6.9	6.3	6.9	6.3	6.1
THB	M	13.2	12.8	13.1	11.9	12.6	12.6	11.8	11.7	11.9	11.5	11.2	10.6	10.8	9.5	9.8	9.4	10.0	9.2	9.6	10.0	8.8	8.8	9.3	9.0
	F	7.4	7.4	8.2	8.4	8.4	7.6	7.6	7.6	7.5	7.5	7.6	7.3	7.0	7.0	7.0	6.3	6.7	5.9	6.4	6.9	6.2	6.1	6.5	6.4
TSK	M	14.0	14.3	12.7	13.1	12.9	13.2	13.6	14.3	11.9	12.2	12.8	12.5	11.7	11.0	10.8	10.9	10.7	10.2	10.7	10.4	9.9	10.4	9.5	9.5
	F	8.2	8.0	9.1	8.8	8.2	8.5	8.8	8.4	7.9	8.5	7.4	8.1	7.9	8.6	6.9	7.5	6.7	6.1	6.2	6.8	6.1	6.1	6.4	7.1
WAT	M	11.2	11.6	11.3	11.5	11.5	10.5	10.5	9.9	9.5	9.4	9.2	8.7	8.5	8.8	8.2	8.2	8.0	7.9	7.7	7.4	7.3	7.5	7.2	7.3
	F	6.7	6.9	7.0	7.0	7.0	6.5	6.8	6.9	6.6	6.5	6.4	6.2	5.9	6.4	5.9	5.6	5.6	5.8	5.5	5.6	5.4	5.1	5.3	5.3
WDG	M	12.2	11.9	11.5	10.8	10.5	10.4	10.5	10.4	9.9	9.7	9.1	8.9	8.9	8.6	8.0	8.1	8.4	7.8	8.2	7.5	7.6	7.5	7.4	7.2
	F	7.8	7.5	7.1	6.9	6.9	7.3	6.6	6.6	6.8	7.1	6.5	6.7	6.3	5.8	6.2	6.1	5.9	5.7	5.5	5.6	5.5	5.6	5.0	5.5
WEC	M	12.0	12.6	12.7	12.5	12.3	11.7	11.1	11.3	10.3	9.8	9.5	9.7	9.4	8.6	8.9	8.2	8.6	8.5	7.8	8.2	8.1	7.8	7.9	7.3
	F	7.7	8.0	7.5	7.3	7.7	7.3	7.3	7.2	7.0	6.8	6.9	6.6	6.5	6.2	6.0	6.5	6.1	5.8	5.8	5.7	5.3	5.5	5.5	5.4
YRK	M	10.1	9.6	9.1	8.7	8.6	8.2	8.3	7.5	7.4	6.9	6.8	7.0	6.2	6.0	5.8	5.8	5.6	5.5	5.2	5.0	4.7	4.9	4.7	4.6
	F	6.6	6.7	6.4	6.4	6.2	5.7	5.5	5.4	5.5	5.1	4.7	4.6	4.5	4.5	4.2	4.2	4.0	4.0	4.0	3.7	3.6	3.4	3.5	3.4
TOR	M	10.7	10.6	10.1	10.2	9.9	9.4	9.1	8.7	8.4	8.1	7.9	7.8	7.3	7.1	7.0	7.0	6.8	6.8	6.6	6.2	6.0	6.0	6.0	6.0
	F	6.5	6.8	6.5	6.5	6.3	6.2	6.1	5.9	5.7	5.4	5.4	5.3	5.0	5.0	4.7	4.7	4.9	4.6	4.5	4.2	4.2	4.2	4.0	4.1
ON	**M**	**11.3**	**11.4**	**11.2**	**11.0**	**10.8**	**10.5**	**10.2**	**10.0**	**9.6**	**9.2**	**8.9**	**8.9**	**8.4**	**8.3**	**8.0**	**8.0**	**7.9**	**7.7**	**7.5**	**7.2**	**7.0**	**7.0**	**6.9**	**6.8**
	F	**7.0**	**7.2**	**7.2**	**7.1**	**7.0**	**6.8**	**6.7**	**6.6**	**6.4**	**6.3**	**6.2**	**6.1**	**5.8**	**5.9**	**5.6**	**5.6**	**5.5**	**5.4**	**5.3**	**5.1**	**5.0**	**4.9**	**4.9**	**4.9**

[1]For a legend of Public Health Unit (PHU) abbreviations, see Figure 1.1 (page 13 of main report).

Table 2.2.1: Total Deaths by Cause, Ontario, 1992-2012.

Year	Cause of Death				
	Diseases of the Circulatory and Cardiovascular Systems	Diseases of the Respiratory System	Cancers	External Causes (Injury & Poisoning)	Other Causes
1992	28,247	5,702	19,994	3,704	11,851
1993	29,097	6,242	20,588	4,100	12,590
1994	29,035	6,533	21,382	3,966	13,293
1995	29,110	6,728	21,408	4,064	13,959
1996	29,546	6,705	21,717	4,137	13,986
1997	29,555	6,910	21,735	3,978	14,440
1998	29,168	7,593	22,015	3,912	14,500
1999	29,225	7,582	22,778	4,075	14,844
2000	28,811	6,185	23,392	3,925	15,983
2001	27,967	6,084	23,745	4,080	16,359
2002	27,598	6,046	24,120	3,956	17,658
2003	28,030	6,616	24,753	4,561	17,698
2004	27,086	6,519	24,910	4,481	17,653
2005	27,067	7,240	25,230	4,701	18,953
2006	25,841	6,615	25,352	4,848	19,761
2007	25,879	7,194	25,716	4,989	21,224
2008	25,660	7,037	26,173	5,053	21,855
2009	25,670	7,336	26,339	5,159	21,668
2010	24,961	7,261	26,819	5,517	22,642
2011	24,522	7,771	27,273	5,509	22,674
2012	24,404	7,697	27,577	5,706	23,100

Table 2.2.2: Cumulative circulatory mortality rates (total deaths per 1000) by PHU, sex and era, Ontario, 1992-2012.

		Total circulatory deaths per 1000			Absolute change[1]		Relative change[1]	
PHU	Sex	1992-1998	1999-2005	2006-2012	1999-2005	2006-2012	1999-2005	2006-2012
Algoma	M	34.3	27.7	20.0	-6.6	-14.3	-19.1%	-41.7%
	F	22.1	16.4	12.4	-5.7	-9.7	-25.8%	-44.0%
Brant	M	33.1	26.5	18.9	-6.6	-14.2	-19.8%	-43.0%
	F	22.4	16.7	12.3	-5.7	-10.1	-25.6%	-45.2%
Durham	M	30.5	22.6	15.0	-7.9	-15.5	-25.9%	-50.9%
	F	19.4	15.0	9.4	-4.4	-9.9	-22.5%	-51.3%
Elgin-St. Thomas	M	34.2	26.0	21.3	-8.2	-12.9	-23.9%	-37.8%
	F	21.2	16.9	13.7	-4.3	-7.5	-20.5%	-35.3%
Grey-Bruce	M	34.4	25.5	18.9	-9.0	-15.5	-26.1%	-45.0%
	F	20.5	16.8	12.4	-3.6	-8.1	-17.8%	-39.5%
Haldimand-Norfolk	M	36.7	29.0	20.5	-7.7	-16.3	-21.0%	-44.3%
	F	22.8	18.9	15.2	-3.9	-7.6	-17.1%	-33.2%
Haliburton, Kawartha, Pine Ridge	M	32.6	26.1	17.1	-6.5	-15.5	-19.8%	-47.4%
	F	20.7	16.3	11.9	-4.4	-8.7	-21.2%	-42.3%
Halton	M	26.9	19.0	12.8	-7.9	-14.1	-29.4%	-52.4%
	F	17.2	12.9	8.3	-4.3	-8.9	-25.2%	-51.8%
Hamilton	M	31.2	23.9	17.8	-7.3	-13.5	-23.5%	-43.1%
	F	19.4	15.0	10.8	-4.4	-8.5	-22.7%	-44.1%
Hastings and Prince Edward	M	36.1	27.0	18.6	-9.1	-17.5	-25.1%	-48.6%
	F	22.0	17.1	11.8	-4.9	-10.2	-22.4%	-46.5%
Huron	M	34.1	25.7	19.5	-8.4	-14.7	-24.7%	-43.0%
	F	21.3	15.8	11.1	-5.5	-10.2	-25.8%	-47.8%
Chatham-Kent	M	40.6	32.1	22.9	-8.5	-17.7	-21.0%	-43.6%
	F	24.8	20.2	14.5	-4.6	-10.3	-18.7%	-41.6%
Kingston, Frontenac, Lennox & Addington	M	31.1	24.0	17.6	-7.1	-13.5	-23.0%	-43.4%
	F	19.5	15.8	11.1	-3.7	-8.4	-18.8%	-43.2%
Lambton	M	34.5	27.5	21.2	-7.0	-13.4	-20.2%	-38.7%
	F	21.5	18.0	15.0	-3.5	-6.5	-16.4%	-30.1%
Leeds, Grenville, Lanark	M	33.3	25.1	19.5	-8.2	-13.8	-24.6%	-41.4%
	F	20.7	16.7	12.5	-3.9	-8.2	-19.1%	-39.5%
Middlesex-London	M	31.3	22.4	16.5	-8.9	-14.8	-28.3%	-47.3%
	F	18.3	14.2	10.3	-4.2	-8.0	-22.9%	-43.8%
Niagara	M	33.8	25.5	19.2	-8.2	-14.6	-24.4%	-43.3%
	F	21.4	17.3	12.4	-4.1	-9.0	-19.0%	-42.2%
North Bay-Parry Sound	M	34.0	27.2	20.2	-6.8	-13.8	-20.0%	-40.7%
	F	21.0	16.4	12.6	-4.6	-8.4	-22.1%	-40.2%

		Total circulatory deaths per 1000			Absolute change[1]		Relative change[1]	
PHU	Sex	1992-1998	1999-2005	2006-2012	1999-2005	2006-2012	1999-2005	2006-2012
Northwestern	M	28.3	23.1	16.8	-5.2	-11.5	-18.5%	-40.7%
	F	17.4	14.5	11.9	-2.8	-5.4	-16.3%	-31.3%
Ottawa	M	27.7	20.1	14.1	-7.6	-13.6	-27.5%	-49.0%
	F	18.3	13.3	9.3	-5.0	-9.0	-27.1%	-49.4%
Oxford	M	32.7	26.1	21.7	-6.5	-11.0	-20.0%	-33.6%
	F	19.9	16.8	13.2	-3.1	-6.7	-15.8%	-33.6%
Peel	M	23.5	16.5	11.5	-7.0	-12.0	-29.9%	-50.9%
	F	15.9	11.4	7.8	-4.5	-8.1	-28.4%	-51.1%
Perth	M	33.6	27.9	16.8	-5.8	-16.9	-17.1%	-50.2%
	F	18.7	16.3	11.3	-2.4	-7.4	-12.7%	-39.4%
Peterborough	M	31.1	24.2	17.0	-6.9	-14.1	-22.2%	-45.3%
	F	18.3	15.3	10.4	-3.0	-7.9	-16.3%	-43.2%
Porcupine	M	35.2	29.8	23.1	-5.4	-12.1	-15.3%	-34.4%
	F	20.7	18.0	14.5	-2.6	-6.2	-12.6%	-29.9%
Renfrew	M	36.6	28.2	17.8	-8.3	-18.8	-22.8%	-51.4%
	F	21.2	17.2	12.2	-4.0	-9.0	-18.7%	-42.4%
Eastern Ontario	M	35.7	26.8	19.3	-8.9	-16.5	-24.9%	-46.1%
	F	22.0	17.4	12.1	-4.6	-9.9	-21.0%	-45.1%
Simcoe Muskoka	M	32.1	23.7	17.8	-8.4	-14.3	-26.1%	-44.6%
	F	20.4	14.9	11.1	-5.5	-9.3	-27.1%	-45.8%
Sudbury	M	37.7	28.8	21.8	-9.0	-15.9	-23.8%	-42.3%
	F	24.3	17.3	12.4	-7.1	-11.9	-29.0%	-49.0%
Thunder Bay	M	37.0	27.6	20.0	-9.4	-17.0	-25.3%	-46.0%
	F	23.6	17.2	12.9	-6.4	-10.7	-27.0%	-45.2%
Timiskaming	M	32.5	27.8	19.6	-4.8	-12.9	-14.7%	-39.8%
	F	21.8	17.7	12.1	-4.1	-9.7	-18.8%	-44.4%
Waterloo	M	31.8	23.3	16.4	-8.5	-15.4	-26.8%	-48.3%
	F	18.6	14.9	10.8	-3.8	-7.8	-20.3%	-42.0%
Wellington-Dufferin-Guelph	M	33.1	24.3	16.6	-8.8	-16.4	-26.6%	-49.7%
	F	20.2	15.7	11.0	-4.5	-9.1	-22.1%	-45.2%
Windsor-Essex	M	36.1	26.1	18.9	-10.0	-17.2	-27.8%	-47.7%
	F	22.4	17.8	12.3	-4.6	-10.1	-20.5%	-45.2%
York	M	22.9	15.9	10.6	-7.0	-12.3	-30.4%	-53.7%
	F	16.5	10.8	7.0	-5.7	-9.4	-34.6%	-57.3%
Toronto	M	24.7	18.2	12.9	-6.5	-11.8	-26.2%	-47.9%
	F	16.1	11.7	8.1	-4.4	-8.0	-27.3%	-49.6%
All Ontario	**M**	**29.8**	**22.1**	**15.6**	**-7.7**	**-14.2**	**-25.9%**	**-47.7%**
	F	**18.9**	**14.3**	**10.1**	**-4.5**	**-8.8**	**-24.1%**	**-46.7%**

[1]For details on how absolute and relative mortality rate changes were calculated, refer to the technical appendix.

Table 2.2.3: Cumulative cancer mortality rates (total deaths per 1000) by PHU, sex and era, Ontario, 1992-2012.

		Total cancer deaths per 1000			Absolute change[1]		Relative change[1]	
PHU	Sex	1992-1998	1999-2005	2006-2012	1999-2005	2006-2012	1999-2005	2006-2012
Algoma	M	24.0	22.8	21.1	-1.2	-3.0	-5.2%	-12.4%
	F	16.4	15.6	14.7	-0.7	-1.6	-4.5%	-10.1%
Brant	M	23.8	22.2	21.3	-1.5	-2.5	-6.4%	-10.6%
	F	15.3	15.9	16.3	0.6	0.9	3.6%	6.1%
Durham	M	22.4	19.9	17.9	-2.5	-4.5	-11.2%	-20.0%
	F	15.2	14.8	13.4	-0.5	-1.9	-3.0%	-12.2%
Elgin-St. Thomas	M	23.4	22.4	19.7	-1.0	-3.7	-4.4%	-15.9%
	F	15.8	16.5	14.9	0.6	-0.9	4.1%	-5.5%
Grey-Bruce	M	22.1	20.9	18.2	-1.2	-3.9	-5.6%	-17.6%
	F	15.7	15.6	13.7	-0.1	-2.0	-0.9%	-12.7%
Haldimand-Norfolk	M	22.5	21.4	19.3	-1.1	-3.2	-5.0%	-14.4%
	F	15.4	15.8	14.3	0.4	-1.0	2.6%	-6.7%
Haliburton, Kawartha, Pine Ridge	M	22.9	22.5	20.2	-0.4	-2.7	-1.5%	-11.7%
	F	15.7	16.1	15.0	0.4	-0.6	2.8%	-4.0%
Halton	M	21.7	18.8	16.4	-2.9	-5.4	-13.3%	-24.7%
	F	14.9	13.9	12.7	-1.0	-2.2	-6.8%	-15.0%
Hamilton	M	22.7	22.1	19.8	-0.6	-2.9	-2.8%	-12.7%
	F	15.4	15.3	14.4	-0.1	-1.0	-0.7%	-6.8%
Hastings and Prince Edward	M	23.4	23.3	20.9	0.0	-2.4	-0.1%	-10.5%
	F	16.5	16.0	14.8	-0.5	-1.7	-2.9%	-10.5%
Huron	M	23.2	21.2	19.1	-2.0	-4.1	-8.7%	-17.6%
	F	15.0	15.3	14.0	0.3	-1.0	2.0%	-6.8%
Chatham-Kent	M	24.5	23.5	21.4	-0.9	-3.1	-3.8%	-12.6%
	F	15.7	15.8	15.6	0.1	-0.1	0.8%	-0.5%
Kingston, Frontenac, Lennox & Addington	M	22.7	21.5	20.8	-1.2	-1.9	-5.1%	-8.3%
	F	15.0	15.9	14.4	1.0	-0.6	6.4%	-4.1%
Lambton	M	23.5	23.3	20.6	-0.2	-2.9	-0.7%	-12.2%
	F	14.5	15.1	15.1	0.6	0.6	4.1%	3.8%
Leeds, Grenville, Lanark	M	23.9	22.8	20.2	-1.2	-3.8	-4.9%	-15.7%
	F	16.8	15.4	15.3	-1.3	-1.5	-7.8%	-8.9%
Middlesex-London	M	23.4	20.9	18.8	-2.5	-4.5	-10.6%	-19.4%
	F	15.4	14.9	14.4	-0.6	-1.0	-3.6%	-6.2%
Niagara	M	23.6	21.5	19.7	-2.0	-3.9	-8.6%	-16.5%
	F	15.9	15.2	14.2	-0.6	-1.6	-4.0%	-10.2%
North Bay-Parry Sound	M	24.6	22.7	20.5	-2.0	-4.1	-7.9%	-16.7%
	F	16.0	15.9	15.0	-0.1	-1.0	-0.5%	-6.1%

		Total cancer deaths per 1000			Absolute change[1]		Relative change[1]	
PHU	Sex	1992-1998	1999-2005	2006-2012	1999-2005	2006-2012	1999-2005	2006-2012
Northwestern	M	22.2	20.8	17.3	-1.4	-4.9	-6.4%	-21.9%
	F	14.8	14.6	15.5	-0.2	0.7	-1.3%	4.9%
Ottawa	M	20.5	18.9	16.5	-1.6	-4.0	-7.7%	-19.5%
	F	14.9	13.9	12.8	-1.0	-2.1	-6.8%	-14.4%
Oxford	M	23.3	20.8	19.0	-2.5	-4.3	-10.8%	-18.6%
	F	15.1	14.8	13.4	-0.3	-1.7	-2.1%	-11.1%
Peel	M	18.7	15.7	13.9	-3.0	-4.8	-16.0%	-25.9%
	F	13.4	11.4	10.1	-2.1	-3.3	-15.4%	-24.9%
Perth	M	21.1	18.8	18.3	-2.3	-2.8	-11.0%	-13.2%
	F	15.2	16.0	14.3	0.8	-0.8	5.1%	-5.4%
Peterborough	M	23.8	21.1	19.1	-2.7	-4.7	-11.5%	-19.7%
	F	15.6	14.8	14.3	-0.8	-1.2	-5.1%	-8.0%
Porcupine	M	26.4	23.7	22.4	-2.7	-4.0	-10.3%	-15.2%
	F	16.8	16.6	16.1	-0.2	-0.7	-1.0%	-4.3%
Renfrew	M	23.4	23.1	17.8	-0.3	-5.7	-1.4%	-24.2%
	F	15.3	15.3	13.1	0.0	-2.2	0.3%	-14.2%
Eastern Ontario	M	23.7	22.3	20.3	-1.5	-3.4	-6.2%	-14.3%
	F	16.1	16.3	14.6	0.2	-1.5	0.9%	-9.2%
Simcoe Muskoka	M	24.1	21.7	19.5	-2.4	-4.6	-10.0%	-19.0%
	F	15.5	15.6	14.3	0.1	-1.2	0.7%	-7.5%
Sudbury	M	25.1	23.1	21.8	-2.0	-3.3	-7.8%	-13.0%
	F	16.3	15.9	15.0	-0.4	-1.3	-2.2%	-8.0%
Thunder Bay	M	23.3	22.2	20.4	-1.1	-2.9	-4.7%	-12.4%
	F	15.6	15.5	14.6	-0.1	-1.0	-0.7%	-6.6%
Timiskaming	M	24.2	28.5	24.2	4.4	0.0	18.0%	0.2%
	F	19.2	17.4	16.7	-1.8	-2.6	-9.5%	-13.3%
Waterloo	M	21.6	20.1	17.9	-1.5	-3.7	-6.7%	-17.0%
	F	14.3	14.8	13.5	0.6	-0.8	3.9%	-5.6%
Wellington-Dufferin-Guelph	M	21.0	19.6	17.7	-1.5	-3.3	-7.0%	-15.9%
	F	14.1	14.7	13.9	0.6	-0.2	4.2%	-1.4%
Windsor-Essex	M	24.3	21.0	18.4	-3.3	-5.9	-13.8%	-24.4%
	F	15.8	14.9	14.2	-0.9	-1.6	-5.6%	-9.9%
York	M	19.4	15.8	12.9	-3.5	-6.5	-18.2%	-33.4%
	F	13.2	11.5	9.8	-1.7	-3.4	-12.9%	-25.6%
Toronto	M	19.7	16.7	14.9	-3.0	-4.8	-15.2%	-24.3%
	F	13.6	12.3	11.0	-1.3	-2.6	-9.3%	-18.9%
All Ontario	**M**	**21.7**	**19.5**	**17.3**	**-2.2**	**-4.4**	**-10.2%**	**-20.3%**
	F	**14.7**	**14.0**	**12.8**	**-0.7**	**-1.9**	**-4.7%**	**-12.8%**

[1]For details on how absolute and relative mortality rate changes were calculated, refer to the technical appendix.

Table 2.2.4.: Cumulative respiratory mortality rates (total deaths per 1000) by PHU, sex and era, Ontario, 1992-2012.

		Total respiratory deaths per 1000			Absolute mortality rate change[1]		Relative mortality rate change[1]	
PHU	Sex	1992-1998	1999-2005	2006-2012	1999-2005	2006-2012	1999-2005	2006-2012
Algoma	M	8.2	6.3	6.6	-1.9	-1.6	-23.7%	-19.5%
	F	4.3	3.5	4.0	-0.8	-0.3	-19.6%	-6.7%
Brant	M	9.3	7.2	6.7	-2.1	-2.5	-22.5%	-27.2%
	F	4.9	4.8	4.3	-0.1	-0.7	-2.5%	-13.6%
Durham	M	7.7	5.4	4.8	-2.3	-3.0	-29.7%	-38.6%
	F	4.6	3.4	3.2	-1.2	-1.4	-25.6%	-31.0%
Elgin-St. Thomas	M	9.1	7.5	6.1	-1.6	-3.0	-18.0%	-33.0%
	F	4.9	4.4	4.6	-0.5	-0.3	-10.9%	-6.8%
Grey-Bruce	M	7.8	6.7	5.3	-1.2	-2.5	-14.8%	-31.6%
	F	5.1	3.5	3.7	-1.6	-1.4	-31.6%	-28.0%
Haldimand-Norfolk	M	7.3	5.8	6.0	-1.5	-1.3	-20.4%	-17.8%
	F	4.8	3.6	2.7	-1.2	-2.1	-24.8%	-43.9%
Haliburton, Kawartha, Pine Ridge	M	8.4	6.0	5.3	-2.4	-3.1	-28.3%	-37.1%
	F	4.6	4.0	3.6	-0.6	-1.0	-13.4%	-21.7%
Halton	M	6.1	4.2	3.8	-1.9	-2.2	-30.6%	-36.8%
	F	3.4	3.1	2.6	-0.3	-0.9	-9.5%	-25.8%
Hamilton	M	7.9	6.1	5.2	-1.9	-2.7	-23.4%	-34.2%
	F	4.3	3.7	3.3	-0.6	-0.9	-14.7%	-22.0%
Hastings and Prince Edward	M	10.0	7.3	6.6	-2.7	-3.5	-27.2%	-34.5%
	F	5.0	4.6	4.5	-0.4	-0.6	-8.3%	-11.8%
Huron	M	7.8	6.4	6.3	-1.4	-1.5	-18.4%	-19.3%
	F	3.8	3.9	3.6	0.1	-0.2	1.9%	-6.0%
Chatham-Kent	M	8.7	6.7	6.5	-2.0	-2.3	-23.4%	-26.1%
	F	4.0	3.8	3.6	-0.2	-0.4	-6.0%	-10.2%
Kingston, Frontenac, Lennox & Addington	M	9.3	6.6	5.5	-2.7	-3.8	-29.5%	-41.1%
	F	5.4	4.2	4.2	-1.2	-1.2	-22.9%	-23.0%
Lambton	M	8.2	5.2	4.3	-2.9	-3.9	-35.8%	-47.2%
	F	3.6	3.2	3.2	-0.3	-0.4	-9.5%	-9.8%
Leeds, Grenville, Lanark	M	8.7	6.3	5.5	-2.4	-3.2	-27.8%	-36.4%
	F	5.3	4.1	4.0	-1.2	-1.3	-23.0%	-24.8%
Middlesex-London	M	7.9	6.2	5.1	-1.6	-2.7	-20.7%	-34.8%
	F	4.5	3.7	3.3	-0.9	-1.2	-18.7%	-27.0%
Niagara	M	6.7	5.1	4.8	-1.7	-2.0	-24.8%	-29.0%
	F	3.6	3.3	2.9	-0.4	-0.8	-10.1%	-20.8%
North Bay-Parry Sound	M	9.5	7.3	6.1	-2.2	-3.4	-23.3%	-36.1%
	F	5.3	3.9	3.7	-1.4	-1.6	-26.7%	-30.2%

Northwestern	M	8.1	6.7	5.4	-1.4	-2.7	-17.2%	-33.0%
	F	4.1	4.0	3.1	-0.1	-0.9	-2.3%	-22.6%
Ottawa	M	6.6	5.0	3.8	-1.6	-2.7	-24.2%	-41.8%
	F	3.9	3.3	2.7	-0.6	-1.2	-15.8%	-30.0%
Oxford	M	8.7	6.4	5.0	-2.3	-3.6	-26.2%	-42.1%
	F	3.4	3.8	3.6	0.4	0.1	10.9%	4.3%
Peel	M	6.6	4.2	3.3	-2.3	-3.3	-35.5%	-50.0%
	F	3.7	2.9	2.4	-0.8	-1.3	-21.6%	-35.8%
Perth	M	9.6	7.4	6.3	-2.3	-3.3	-23.4%	-34.5%
	F	4.0	4.0	3.9	0.0	-0.1	1.1%	-3.0%
Peterborough	M	8.5	6.2	5.2	-2.4	-3.3	-27.7%	-39.1%
	F	4.4	4.5	3.7	0.1	-0.6	2.0%	-14.2%
Porcupine	M	10.8	8.8	6.5	-2.0	-4.3	-18.9%	-40.1%
	F	4.8	4.9	4.7	0.1	-0.1	1.4%	-2.3%
Renfrew	M	8.5	5.9	5.1	-2.5	-3.3	-30.1%	-39.4%
	F	4.0	4.2	3.4	0.2	-0.6	4.7%	-14.3%
Eastern Ontario	M	9.5	6.5	5.5	-3.0	-4.0	-31.3%	-42.0%
	F	4.7	4.1	3.7	-0.5	-1.0	-11.4%	-20.5%
Simcoe Muskoka	M	8.0	6.3	5.5	-1.7	-2.5	-21.1%	-31.7%
	F	4.5	3.8	3.7	-0.7	-0.8	-15.2%	-17.6%
Sudbury	M	9.8	6.9	5.7	-2.9	-4.1	-29.1%	-42.0%
	F	4.9	4.3	4.3	-0.6	-0.6	-11.9%	-13.1%
Thunder Bay	M	8.3	5.8	4.9	-2.5	-3.4	-30.0%	-40.4%
	F	3.5	3.5	3.1	0.0	-0.4	-0.3%	-12.6%
Timiskaming	M	10.4	8.0	8.4	-2.4	-2.0	-22.7%	-19.2%
	F	4.8	4.7	3.9	-0.1	-0.9	-1.2%	-19.6%
Waterloo	M	8.2	5.1	4.2	-3.1	-4.0	-37.5%	-49.2%
	F	3.8	3.4	2.8	-0.3	-1.0	-9.2%	-26.3%
Wellington-Dufferin-Guelph	M	8.1	6.4	4.8	-1.6	-3.3	-20.4%	-40.7%
	F	4.0	3.6	3.3	-0.4	-0.7	-9.3%	-17.1%
Windsor-Essex	M	6.9	4.9	4.8	-2.0	-2.1	-29.4%	-30.9%
	F	3.5	3.3	3.2	-0.2	-0.3	-4.5%	-7.9%
York	M	6.5	4.2	3.0	-2.2	-3.5	-34.6%	-54.2%
	F	3.9	2.9	2.2	-1.0	-1.7	-25.8%	-44.0%
Toronto	M	6.6	4.6	3.9	-2.0	-2.6	-29.9%	-40.2%
	F	3.8	2.9	2.5	-0.9	-1.3	-23.9%	-33.9%
All Ontario	**M**	**7.5**	**5.4**	**4.6**	**-2.1**	**-3.0**	**-27.8%**	**-39.4%**
	F	**4.1**	**3.4**	**3.0**	**-0.7**	**-1.1**	**-16.6%**	**-26.1%**

[1]For details on how absolute and relative mortality rate changes were calculated, refer to the technical appendix.

Table 2.2.5.: Cumulative injury mortality rates (total deaths per 1000) by PHU, sex and era, Ontario, 1992-2012.

		Total injury deaths per 1000			Absolute change[1]		Relative change[1]	
PHU	Sex	1992-1998	1999-2005	2006-2012	1999-2005	2006-2012	1999-2005	2006-2012
Algoma	M	5.3	5.1	6.0	-0.2	0.7	-3.1%	12.3%
	F	2.1	2.2	3.0	0.1	0.9	2.4%	40.9%
Brant	M	4.7	5.1	5.6	0.4	0.9	8.1%	18.7%
	F	2.0	1.9	2.4	0.0	0.5	-1.5%	23.7%
Durham	M	4.4	4.0	4.2	-0.4	-0.2	-9.2%	-5.3%
	F	2.1	2.0	1.9	-0.1	-0.2	-5.1%	-8.8%
Elgin-St. Thomas	M	5.4	4.7	4.4	-0.7	-1.0	-12.2%	-18.3%
	F	2.5	2.0	2.4	-0.5	0.0	-19.5%	-1.6%
Grey-Bruce	M	6.0	5.8	4.9	-0.3	-1.1	-4.4%	-18.3%
	F	2.4	2.3	2.3	-0.1	-0.1	-2.8%	-2.9%
Haldimand-Norfolk	M	5.8	4.2	5.4	-1.6	-0.4	-27.0%	-6.2%
	F	2.3	1.9	2.5	-0.4	0.2	-19.2%	6.6%
Haliburton, Kawartha, Pine Ridge	M	4.7	4.7	5.6	0.0	0.9	-0.1%	18.6%
	F	2.1	2.3	2.6	0.1	0.4	6.3%	21.0%
Halton	M	3.7	3.3	3.5	-0.4	-0.2	-11.4%	-6.1%
	F	1.9	1.6	2.0	-0.3	0.0	-17.9%	1.8%
Hamilton	M	4.6	4.3	4.9	-0.2	0.3	-5.4%	6.0%
	F	2.3	2.2	2.5	-0.1	0.2	-5.4%	10.2%
Hastings and Prince Edward	M	5.3	5.0	5.2	-0.3	-0.1	-6.0%	-2.2%
	F	2.2	2.0	2.3	-0.1	0.1	-6.3%	6.7%
Huron	M	6.1	5.6	4.4	-0.5	-1.8	-9.0%	-28.7%
	F	2.4	2.3	2.4	-0.1	0.0	-5.6%	0.1%
Chatham-Kent	M	5.6	5.0	4.6	-0.6	-1.0	-10.6%	-17.9%
	F	2.2	1.6	2.0	-0.6	-0.2	-27.1%	-9.1%
Kingston, Frontenac, Lennox & Addington	M	4.6	5.0	4.2	0.3	-0.5	7.2%	-9.9%
	F	2.2	2.3	2.4	0.1	0.2	5.5%	10.9%
Lambton	M	4.8	4.5	5.0	-0.3	0.3	-5.5%	5.6%
	F	1.5	2.1	2.2	0.6	0.7	38.7%	44.6%
Leeds, Grenville, Lanark	M	5.5	4.6	5.0	-0.9	-0.5	-16.1%	-9.2%
	F	2.4	2.0	2.1	-0.4	-0.3	-17.1%	-11.0%
Middlesex-London	M	4.6	4.5	4.7	-0.2	0.0	-3.4%	1.0%
	F	2.2	2.2	2.3	0.0	0.1	0.6%	5.5%
Niagara	M	4.5	4.6	5.1	0.1	0.6	1.6%	14.5%
	F	2.2	2.1	2.3	-0.2	0.1	-6.9%	6.1%
North Bay-Parry Sound	M	7.2	5.9	5.8	-1.3	-1.3	-18.0%	-18.7%
	F	2.7	2.5	3.0	-0.2	0.4	-7.6%	13.4%

		Total injury deaths per 1000			Absolute change[1]		Relative change[1]	
PHU	Sex	1992-1998	1999-2005	2006-2012	1999-2005	2006-2012	1999-2005	2006-2012
Northwestern	M	9.7	8.3	8.6	-1.4	-1.1	-14.8%	-11.5%
	F	3.9	3.4	3.7	-0.5	-0.2	-12.1%	-5.0%
Ottawa	M	3.8	3.0	3.3	-0.8	-0.5	-21.1%	-13.5%
	F	1.7	1.5	1.6	-0.2	-0.2	-13.2%	-10.5%
Oxford	M	4.9	5.1	4.9	0.2	0.0	4.9%	0.5%
	F	2.4	1.7	2.5	-0.7	0.1	-27.9%	4.3%
Peel	M	3.5	3.0	2.9	-0.5	-0.7	-14.1%	-18.6%
	F	1.9	1.6	1.5	-0.2	-0.4	-12.8%	-19.9%
Perth	M	5.8	5.3	4.7	-0.5	-1.0	-8.3%	-18.1%
	F	2.0	2.3	2.7	0.3	0.7	16.4%	33.6%
Peterborough	M	4.8	4.7	4.9	-0.1	0.0	-2.2%	0.9%
	F	2.0	2.1	2.4	0.1	0.4	5.9%	20.0%
Porcupine	M	7.5	6.5	6.3	-1.0	-1.2	-12.9%	-16.6%
	F	2.4	2.1	2.8	-0.3	0.4	-11.9%	17.1%
Renfrew	M	6.2	5.3	5.6	-1.0	-0.6	-15.3%	-10.0%
	F	2.0	1.9	2.2	-0.1	0.2	-6.1%	9.8%
Eastern Ontario	M	5.1	4.5	4.7	-0.7	-0.4	-12.7%	-7.7%
	F	2.0	1.8	2.2	-0.2	0.2	-11.1%	12.1%
Simcoe Muskoka	M	4.8	4.3	5.1	-0.5	0.2	-11.1%	4.6%
	F	2.0	2.0	2.2	0.0	0.2	2.0%	8.9%
Sudbury	M	7.2	6.2	5.6	-1.0	-1.6	-13.4%	-22.8%
	F	2.8	2.8	3.0	0.1	0.2	2.6%	9.0%
Thunder Bay	M	6.5	6.3	7.4	-0.2	0.9	-3.4%	14.0%
	F	2.3	2.5	3.3	0.2	0.9	6.6%	41.1%
Timiskaming	M	8.4	7.7	6.3	-0.7	-2.1	-7.9%	-25.0%
	F	3.0	3.0	2.4	0.0	-0.6	0.3%	-19.6%
Waterloo	M	4.0	3.6	4.0	-0.4	0.0	-9.6%	-1.2%
	F	1.8	1.6	1.8	-0.2	0.0	-9.9%	-0.1%
Wellington-Dufferin-Guelph	M	4.7	4.1	4.1	-0.6	-0.5	-12.7%	-11.3%
	F	2.4	2.0	2.2	-0.4	-0.2	-15.1%	-9.7%
Windsor-Essex	M	4.6	4.0	4.4	-0.5	-0.1	-11.8%	-3.0%
	F	2.1	1.9	2.1	-0.2	0.1	-8.4%	3.2%
York	M	3.4	2.8	2.8	-0.6	-0.6	-19.0%	-18.0%
	F	1.5	1.4	1.5	-0.1	0.0	-9.0%	1.7%
Toronto	M	4.0	3.4	3.5	-0.6	-0.5	-13.9%	-11.6%
	F	2.0	1.7	1.7	-0.3	-0.3	-13.7%	-14.2%
All Ontario	**M**	**4.5**	**4.0**	**4.1**	**-0.5**	**-0.4**	**-11.7%**	**-9.1%**
	F	**2.0**	**1.9**	**2.0**	**-0.2**	**-0.1**	**-9.1%**	**-2.8%**

[1]For details on how absolute and relative mortality rate changes were calculated, refer to the technical appendix.

Table 2.3.1: Cumulative premature mortality rates (total deaths per 1000) by PHU, sex and era, Ontario, 1992-2012.

		Total premature deaths per 1000			Absolute change[1]		Relative change[1]	
PHU	Sex	1992-1999	2000-2007	2008-2015	2000-2007	2008-2015	2000-2007	2008-2015
Algoma	M	52.6	51.7	53.4	-0.9	0.9	-1.6%	1.7%
	F	31.8	32.4	36.4	0.5	4.6	1.7%	14.5%
Brant	M	47.1	42.4	41.7	-4.8	-5.4	-10.1%	-11.4%
	F	29.9	28.2	28.6	-1.7	-1.3	-5.7%	-4.5%
Durham	M	34.0	29.8	27.4	-4.2	-6.6	-12.3%	-19.5%
	F	22.1	19.8	19.0	-2.4	-3.2	-10.8%	-14.4%
Elgin-St. Thomas	M	46.7	41.4	41.9	-5.3	-4.8	-11.4%	-10.4%
	F	30.1	27.3	27.9	-2.8	-2.2	-9.3%	-7.4%
Grey-Bruce	M	53.4	45.8	44.3	-7.6	-9.1	-14.2%	-17.1%
	F	32.3	29.7	28.0	-2.6	-4.3	-8.2%	-13.4%
Haldimand-Norfolk	M	45.7	39.1	43.0	-6.6	-2.7	-14.4%	-5.9%
	F	31.0	28.7	28.5	-2.3	-2.5	-7.4%	-8.1%
Haliburton, Kawartha, Pine Ridge	M	57.2	48.7	45.9	-8.5	-11.2	-14.8%	-19.6%
	F	33.8	30.6	30.6	-3.2	-3.3	-9.6%	-9.6%
Halton	M	32.1	25.5	21.9	-6.6	-10.2	-20.7%	-31.8%
	F	20.9	17.7	15.6	-3.2	-5.3	-15.2%	-25.3%
Hamilton	M	46.3	38.6	37.6	-7.7	-8.7	-16.5%	-18.7%
	F	29.4	25.7	24.2	-3.7	-5.2	-12.5%	-17.8%
Hastings and Prince Edward	M	58.1	50.6	48.6	-7.5	-9.4	-12.9%	-16.2%
	F	35.3	31.7	31.4	-3.6	-3.9	-10.2%	-11.0%
Huron	M	49.1	44.2	42.4	-4.9	-6.7	-9.9%	-13.6%
	F	32.1	28.8	27.7	-3.3	-4.3	-10.2%	-13.5%
Chatham-Kent	M	52.0	46.8	44.9	-5.2	-7.2	-10.0%	-13.7%
	F	34.2	31.1	31.9	-3.1	-2.2	-9.1%	-6.6%
Kingston, Frontenac, Lennox & Addington	M	46.0	40.5	39.1	-5.4	-6.8	-11.8%	-14.9%
	F	29.7	25.4	25.6	-4.3	-4.0	-14.5%	-13.6%
Lambton	M	49.4	44.7	45.2	-4.8	-4.2	-9.6%	-8.5%
	F	28.8	29.7	28.9	0.9	0.1	3.1%	0.5%
Leeds, Grenville, Lanark	M	52.6	44.7	43.6	-7.9	-9.0	-15.1%	-17.1%
	F	32.7	29.3	28.5	-3.4	-4.2	-10.5%	-12.8%
Middlesex-London	M	41.2	34.1	33.5	-7.1	-7.7	-17.3%	-18.6%
	F	25.3	23.2	22.7	-2.1	-2.6	-8.3%	-10.1%
Niagara	M	48.9	41.6	40.5	-7.3	-8.5	-15.0%	-17.3%
	F	31.7	28.0	27.1	-3.7	-4.6	-11.6%	-14.6%
North Bay-Parry Sound	M	56.0	49.3	45.8	-6.7	-10.2	-11.9%	-18.2%
	F	32.7	31.1	31.7	-1.7	-1.0	-5.1%	-3.0%

		Total premature deaths per 1000			Absolute change[1]		Relative change[1]	
PHU	Sex	1992-1999	2000-2007	2008-2015	2000-2007	2008-2015	2000-2007	2008-2015
Northwestern	M	46.7	44.0	43.3	-2.8	-3.5	-5.9%	-7.4%
	F	28.1	29.0	30.2	0.9	2.1	3.2%	7.5%
Ottawa	M	32.2	26.9	24.6	-5.4	-7.7	-16.6%	-23.8%
	F	21.7	18.3	17.0	-3.4	-4.7	-15.7%	-21.7%
Oxford	M	46.3	38.6	38.8	-7.7	-7.5	-16.6%	-16.2%
	F	29.8	25.9	26.0	-3.9	-3.9	-13.0%	-12.9%
Peel	M	24.2	20.4	20.0	-3.7	-4.2	-15.5%	-17.4%
	F	15.6	13.4	13.2	-2.3	-2.5	-14.5%	-15.9%
Perth	M	43.9	37.8	34.3	-6.1	-9.6	-13.8%	-21.9%
	F	27.3	26.1	24.2	-1.2	-3.1	-4.4%	-11.3%
Peterborough	M	52.5	43.0	40.2	-9.5	-12.3	-18.1%	-23.3%
	F	33.5	29.6	27.4	-3.8	-6.1	-11.4%	-18.1%
Porcupine	M	50.2	49.2	49.2	-1.0	-1.0	-2.0%	-2.0%
	F	28.5	31.2	32.1	2.7	3.7	9.5%	12.9%
Renfrew	M	56.3	47.6	41.0	-8.6	-15.3	-15.3%	-27.2%
	F	30.9	29.8	26.4	-1.1	-4.5	-3.7%	-14.5%
Eastern Ontario	M	48.5	42.5	41.9	-5.9	-6.6	-12.3%	-13.6%
	F	30.2	27.8	28.9	-2.4	-1.3	-7.9%	-4.3%
Simcoe Muskoka	M	47.1	38.2	37.5	-8.9	-9.6	-18.8%	-20.3%
	F	28.6	25.0	24.9	-3.5	-3.7	-12.3%	-12.9%
Sudbury	M	52.5	48.0	47.8	-4.4	-4.6	-8.4%	-8.8%
	F	31.5	30.0	31.3	-1.4	-0.2	-4.6%	-0.5%
Thunder Bay	M	47.6	43.2	45.8	-4.4	-1.8	-9.2%	-3.7%
	F	29.4	28.4	29.3	-0.9	-0.1	-3.1%	-0.3%
Timiskaming	M	60.1	57.8	56.3	-2.3	-3.8	-3.8%	-6.3%
	F	37.7	36.9	33.6	-0.8	-4.1	-2.0%	-10.8%
Waterloo	M	35.4	28.7	27.5	-6.6	-7.8	-18.8%	-22.1%
	F	22.1	19.7	19.2	-2.5	-3.0	-11.1%	-13.5%
Wellington-Dufferin-Guelph	M	36.9	30.1	28.6	-6.8	-8.3	-18.4%	-22.4%
	F	23.2	21.9	20.7	-1.3	-2.5	-5.4%	-10.6%
Windsor-Essex	M	45.3	35.0	34.9	-10.3	-10.4	-22.7%	-23.1%
	F	28.4	24.1	24.1	-4.3	-4.3	-15.3%	-15.1%
York	M	25.1	20.4	17.7	-4.8	-7.4	-19.0%	-29.6%
	F	15.7	13.1	11.7	-2.5	-3.9	-16.1%	-25.0%
Toronto	M	37.0	27.9	24.9	-9.1	-12.0	-24.6%	-32.6%
	F	22.5	18.1	15.8	-4.5	-6.8	-19.8%	-30.0%
All Ontario	**M**	**39.6**	**32.4**	**30.3**	**-7.2**	**-9.3**	**-18.2%**	**-23.5%**
	F	**24.7**	**21.3**	**20.0**	**-3.4**	**-4.7**	**-13.8%**	**-19.0%**

[1]For details on how absolute and relative mortality rate changes were calculated, refer to the technical appendix.

Table 2.3.2: Annual premature mortality rates (deaths per 1000 per year) by PHU and sex, Ontario, 1992 to 2015.

PHU[1] and sex		Premature deaths per 1000 per year																							
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
ALG	M	6.3	6.7	6.7	6.7	7.4	6.2	6.4	6.5	6.8	6.4	6.3	6.4	7.0	6.0	6.2	6.4	7.0	6.8	6.1	6.9	7.1	6.4	7.0	6.3
	F	3.3	4.3	4.1	4.2	4.5	3.9	4.1	3.7	3.9	4.0	3.7	3.7	4.3	4.3	4.3	4.1	4.5	4.5	4.0	4.7	4.4	5.1	4.7	4.6
BRN	M	6.8	7.1	5.8	5.7	5.4	5.9	5.1	5.8	4.9	5.9	5.0	5.6	5.2	5.0	5.5	5.8	5.7	5.4	4.9	5.6	5.7	4.9	4.9	4.8
	F	4.1	3.8	3.8	3.5	3.9	3.3	3.9	3.8	3.3	3.6	3.9	3.9	3.4	3.4	3.5	3.5	3.6	3.9	3.5	3.3	3.4	3.7	3.4	3.9
DUR	M	4.3	4.3	4.4	4.4	4.3	4.2	4.5	4.0	4.0	3.7	3.7	3.9	3.9	3.7	3.7	3.7	3.4	3.5	3.6	3.6	3.3	3.5	3.5	3.4
	F	2.6	2.9	2.7	2.9	2.9	2.7	2.8	2.8	2.6	2.6	2.6	2.6	2.4	2.4	2.4	2.5	2.3	2.5	2.5	2.3	2.4	2.4	2.4	2.5
ELG	M	6.1	6.1	7.0	5.8	5.6	5.4	5.4	5.8	5.7	4.8	5.3	6.1	4.8	5.4	5.0	4.7	5.2	5.2	4.8	5.8	5.2	6.2	4.9	4.9
	F	3.5	3.5	3.4	4.0	3.9	3.8	4.1	4.0	2.9	3.2	3.1	3.7	3.4	3.7	3.7	3.8	3.3	3.6	3.4	3.2	3.6	3.6	3.4	4.0
EOH	M	6.9	7.2	7.0	6.4	6.6	6.5	6.5	6.4	6.1	6.3	5.5	5.9	5.7	5.5	5.1	6.2	5.2	5.4	5.5	5.7	5.3	5.8	5.7	5.7
	F	4.0	4.3	3.7	4.4	4.5	4.0	3.5	4.0	3.4	3.9	3.8	3.7	3.2	3.9	3.7	4.2	3.8	3.2	3.6	3.0	3.4	3.2	4.0	3.8
GBO	M	5.8	7.0	6.8	5.3	5.9	5.9	4.9	5.6	5.0	4.2	4.8	5.3	5.0	5.0	4.9	5.3	5.2	5.2	6.1	5.2	5.0	5.5	5.9	5.2
	F	4.2	4.6	4.4	3.6	3.6	3.5	3.6	3.8	4.0	3.6	3.6	3.6	3.7	3.5	3.8	3.2	3.5	3.7	3.7	3.7	3.4	3.3	3.4	4.1
HDN	M	7.0	7.5	7.4	7.4	6.5	7.1	6.9	7.6	7.0	6.6	6.5	6.1	6.2	6.1	5.6	5.4	5.7	6.1	6.1	5.5	5.6	6.0	5.8	5.6
	F	4.2	4.2	4.5	4.5	4.6	4.2	4.3	3.7	4.3	3.8	4.0	3.6	4.1	4.1	3.6	3.7	4.1	3.3	4.4	3.8	3.9	3.7	3.8	3.6
HKP	M	4.0	4.0	4.6	4.2	4.0	4.2	3.8	3.7	3.5	3.6	3.2	3.2	3.2	3.2	3.0	3.2	3.0	2.9	2.7	2.7	2.9	2.8	2.8	2.6
	F	3.0	2.5	2.9	2.8	2.6	2.4	2.4	2.5	2.4	2.5	2.3	2.5	2.1	2.1	2.2	2.1	2.2	2.0	2.1	2.2	2.0	1.8	2.0	1.8
HAL	M	6.1	5.9	6.2	6.0	5.7	5.8	5.2	5.6	5.3	4.9	4.9	5.1	4.6	4.7	4.4	5.1	4.9	4.9	4.7	4.7	4.5	4.9	4.6	4.7
	F	3.8	3.5	3.9	3.8	3.6	3.8	3.6	3.4	3.8	3.2	3.2	3.3	3.2	3.3	2.9	3.1	3.0	3.2	3.0	3.1	3.0	2.8	3.0	3.2
HAM	M	7.3	7.6	7.6	7.3	7.3	6.9	6.9	7.5	7.0	6.6	6.5	6.6	6.6	5.7	5.8	6.4	6.4	6.4	5.6	6.1	6.2	6.3	6.4	5.7
	F	4.5	4.9	4.7	4.7	4.0	3.9	4.3	4.4	4.3	4.3	3.9	4.0	3.7	4.5	3.5	4.0	3.8	4.0	4.1	3.7	3.8	4.4	4.2	3.7
HPE	M	6.1	6.7	6.7	6.0	7.0	5.6	5.7	5.6	5.6	6.3	5.4	5.9	5.6	4.3	5.3	6.3	4.5	5.8	5.7	5.1	4.8	5.1	5.4	6.2
	F	4.2	4.0	4.7	4.2	4.8	3.6	3.5	3.3	3.9	3.2	3.8	3.9	3.9	3.6	3.2	3.5	4.1	3.5	3.5	3.2	3.2	3.3	3.5	3.4
HUR	M	6.6	7.3	6.3	7.0	7.0	6.4	5.4	6.4	5.8	5.8	6.3	5.7	5.9	6.0	5.2	6.3	5.4	5.6	5.4	5.8	6.1	5.3	5.6	5.6
	F	4.2	4.7	4.2	4.6	4.5	4.1	4.0	4.0	3.6	3.9	4.0	4.5	3.7	3.7	3.9	3.8	3.5	3.8	4.1	3.4	4.3	4.7	4.0	4.2
CHK	M	5.9	6.0	5.6	5.8	5.8	5.8	5.3	6.2	6.1	5.0	5.1	5.0	4.8	5.2	5.1	5.0	4.4	5.1	5.5	5.0	5.0	5.3	4.5	4.9
	F	3.9	3.3	3.7	3.7	3.6	3.7	3.9	3.9	3.5	3.5	3.4	2.9	3.6	2.9	2.8	3.4	3.3	3.1	3.1	3.2	3.4	3.4	3.3	3.2
KFL	M	6.9	6.8	6.2	6.2	5.9	6.0	6.2	5.5	6.4	6.0	5.7	5.7	5.4	5.6	5.0	5.2	5.1	5.5	6.3	5.6	5.9	5.4	5.3	6.3
	F	3.7	3.1	4.0	3.5	3.6	3.7	3.4	3.9	3.6	3.6	3.9	3.5	3.6	3.6	3.9	4.3	3.7	4.0	3.8	3.5	3.2	3.0	3.6	4.2
LAM	M	6.6	6.0	7.4	7.6	6.3	6.5	5.9	6.7	5.2	5.7	5.9	6.0	5.7	5.3	5.7	5.7	6.1	5.5	5.9	5.1	5.4	5.0	5.8	5.3
	F	4.4	4.2	4.6	4.3	4.0	3.7	3.8	3.8	3.8	4.0	3.6	3.4	3.6	3.7	3.7	4.0	3.3	3.7	3.6	3.8	3.5	3.5	4.0	3.5
LGL	M	5.5	5.3	5.4	5.3	5.0	5.3	4.9	4.7	4.4	4.2	4.5	4.6	4.0	4.3	4.3	4.0	4.1	4.4	4.3	4.0	4.3	4.2	4.4	4.3
	F	3.0	3.3	3.5	3.2	3.1	3.0	3.1	3.2	3.1	2.6	3.1	2.9	2.9	2.8	2.8	3.1	3.0	2.8	2.9	2.8	2.8	2.8	2.9	3.0
NIA	M	6.6	6.5	6.4	6.2	5.9	5.9	5.9	5.8	5.4	5.4	5.3	5.1	5.3	5.1	5.0	5.4	5.3	4.9	5.0	5.3	5.0	5.2	5.0	5.0
	F	4.0	4.1	4.0	3.9	3.9	4.2	3.9	3.7	3.7	3.7	3.6	3.7	3.2	3.7	3.4	3.3	3.3	3.5	3.2	3.3	3.6	3.3	3.5	3.4
NPS	M	8.1	7.4	6.6	7.7	7.6	6.0	5.9	6.8	6.4	6.2	5.7	6.6	6.3	6.1	6.2	6.0	5.8	5.7	5.8	5.6	5.2	6.1	5.9	5.9
	F	4.2	4.2	3.9	4.5	4.2	3.9	3.9	3.9	3.7	4.1	3.8	4.1	3.7	4.2	3.8	3.9	3.9	4.5	4.1	3.9	3.5	3.6	3.9	4.6

PHU[1] and sex		Premature deaths per 1000 per year																							
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
NWR	M	5.8	6.2	5.7	6.5	6.5	5.5	5.3	5.6	5.2	5.0	5.2	6.7	5.7	5.7	5.6	5.2	5.0	5.3	5.8	5.0	5.7	5.7	5.4	5.9
	F	3.7	3.3	3.6	3.8	3.9	3.5	3.1	3.6	3.7	4.1	3.1	3.8	3.5	3.5	3.8	3.6	3.7	4.0	3.7	3.7	3.9	3.9	4.0	3.6
OTT	M	4.5	4.3	4.2	4.2	4.1	3.6	3.9	3.7	3.6	3.4	3.5	3.3	3.5	3.4	3.3	3.3	3.4	3.2	3.1	3.0	3.1	3.1	3.1	2.9
	F	2.8	3.0	2.8	3.0	2.6	2.6	2.5	2.5	2.5	2.4	2.4	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.1	2.1	2.1
OXF	M	6.1	6.7	6.3	5.9	5.8	6.0	5.0	4.9	4.9	4.8	5.1	4.8	4.3	5.2	5.0	4.9	5.3	5.4	4.2	4.9	4.8	5.1	4.5	4.8
	F	3.7	3.4	4.3	4.1	3.7	3.6	3.2	3.9	2.9	3.3	3.6	3.4	3.3	3.5	3.2	3.0	2.9	3.0	3.5	3.1	3.4	3.3	3.8	3.1
PEE	M	3.0	3.4	3.2	3.2	3.0	3.0	2.8	2.9	2.7	2.7	2.7	2.7	2.7	2.4	2.5	2.5	2.8	2.5	2.5	2.6	2.5	2.4	2.6	2.5
	F	2.0	2.1	1.9	2.0	1.9	2.0	2.1	1.9	1.8	1.7	1.7	1.9	1.7	1.7	1.6	1.7	1.8	1.7	1.6	1.7	1.7	1.6	1.7	1.6
PDH	M	5.6	5.3	5.8	6.8	4.9	5.6	5.1	5.0	5.1	4.8	5.2	5.0	4.5	4.3	5.0	4.3	4.6	5.2	3.8	4.1	3.8	4.6	4.4	4.1
	F	3.9	3.5	3.4	3.3	3.7	2.7	3.7	3.2	4.1	3.6	2.8	3.3	3.2	3.6	3.1	2.8	3.1	2.8	3.0	3.0	2.7	3.2	3.4	3.2
PTC	M	7.0	6.7	7.3	6.3	6.6	5.9	6.4	6.3	5.8	5.8	5.3	5.1	5.3	5.9	4.9	5.4	4.5	5.3	5.3	4.9	4.9	5.4	5.6	4.8
	F	3.9	4.0	4.2	4.6	4.4	4.3	3.7	4.4	4.1	3.8	3.4	4.3	3.9	3.3	3.5	3.8	3.6	3.4	3.2	3.3	3.5	3.2	3.6	3.8
PQP	M	6.7	6.6	6.4	6.1	6.2	6.1	5.8	6.7	5.5	6.5	6.1	6.4	6.6	5.7	5.7	6.4	6.6	6.1	5.3	6.2	6.4	6.1	6.8	5.9
	F	3.4	3.7	3.0	4.0	4.0	3.7	3.4	3.4	3.6	4.0	4.0	4.0	4.2	3.9	3.4	3.7	4.7	3.6	4.3	3.8	3.7	4.3	3.9	4.0
REN	M	7.7	7.4	6.7	7.1	7.0	7.0	7.2	6.8	6.7	6.2	6.5	5.7	5.9	5.8	5.8	5.7	4.6	4.5	4.6	5.3	5.5	5.4	5.8	5.6
	F	4.4	4.0	3.8	4.0	3.7	3.8	4.0	3.5	3.5	3.0	4.2	3.6	4.2	3.9	3.9	3.8	3.2	2.9	3.0	3.6	3.2	3.5	3.5	3.7
EOH	M	6.5	6.2	6.5	5.7	6.0	6.0	6.1	5.6	5.4	5.3	5.7	5.5	5.3	5.3	5.0	5.8	5.7	4.8	5.0	5.0	5.5	5.2	5.5	5.6
	F	3.7	3.8	4.0	4.0	3.4	4.1	3.6	3.6	3.6	3.6	3.8	3.4	3.3	3.5	3.4	3.5	3.4	4.0	3.9	3.4	3.2	3.2	3.7	4.2
SMD	M	6.1	6.1	6.4	6.2	6.0	5.8	5.6	5.5	5.4	5.2	4.9	5.0	4.6	4.7	4.8	4.8	4.8	4.7	4.8	4.6	4.9	4.6	4.7	4.8
	F	3.5	3.8	3.8	3.7	3.6	3.6	3.4	3.5	3.3	3.4	3.4	3.2	2.8	3.2	3.2	3.1	3.1	3.1	3.2	3.0	3.0	3.1	3.3	3.2
SUD	M	6.9	6.6	7.4	6.4	6.5	6.2	6.4	6.5	6.7	5.9	6.4	5.9	6.4	5.3	5.6	6.0	6.1	6.4	5.8	5.7	6.0	6.2	6.0	6.0
	F	4.2	4.0	4.3	4.1	4.0	3.7	3.8	3.7	3.8	3.7	3.8	4.0	3.6	3.8	3.7	3.8	3.6	3.9	3.9	4.3	3.7	4.3	3.9	3.8
THB	M	6.1	6.3	6.3	5.4	6.0	6.2	5.5	6.0	6.0	5.5	5.3	5.5	5.9	4.9	5.1	5.4	5.3	5.3	6.0	6.4	5.2	5.8	6.2	5.9
	F	3.6	3.5	3.8	3.9	4.0	3.5	3.5	3.8	3.5	3.5	3.8	3.9	3.3	3.6	3.7	3.2	3.4	3.2	3.7	4.0	3.6	3.6	4.1	3.8
TSK	M	7.4	7.7	6.4	7.4	8.0	7.4	7.4	8.6	7.0	6.7	7.9	7.0	8.0	6.8	6.5	7.6	6.9	7.5	7.4	6.5	6.2	8.1	7.2	7.0
	F	4.1	4.5	5.3	5.4	4.6	4.7	4.6	4.3	4.2	4.3	3.9	5.6	4.8	5.0	4.5	4.3	4.0	4.5	4.4	4.9	3.8	3.7	3.3	5.1
WAT	M	4.3	4.8	4.3	4.6	4.8	4.4	4.3	4.1	4.0	3.9	3.9	3.6	3.6	3.4	3.4	3.5	3.4	3.7	3.5	3.6	3.3	3.7	3.4	3.3
	F	2.8	2.7	2.9	3.0	2.7	2.6	2.8	2.8	2.5	2.7	2.6	2.6	2.5	2.5	2.4	2.1	2.4	2.5	2.3	2.5	2.4	2.3	2.4	2.5
WDG	M	4.7	4.9	5.3	4.6	4.4	4.5	4.5	4.3	4.3	4.1	4.0	4.0	3.9	3.5	3.5	3.5	4.0	3.5	3.8	3.3	3.8	3.5	3.5	3.6
	F	3.3	3.2	3.1	2.7	2.7	3.0	2.5	2.9	2.9	3.1	2.9	2.8	2.9	2.4	2.7	2.7	2.5	2.5	2.6	2.5	2.7	2.7	2.4	3.0
WEC	M	5.9	6.5	5.9	5.6	5.7	5.6	5.2	5.3	4.8	4.5	4.4	4.5	4.5	4.2	4.4	4.2	4.6	4.4	4.1	4.4	4.5	4.4	4.4	4.1
	F	3.9	4.0	3.7	3.0	3.8	3.4	3.5	3.3	3.1	3.2	3.1	2.9	3.1	2.9	2.8	3.3	3.1	3.2	3.0	3.1	2.9	3.0	3.1	3.0
YRK	M	3.3	3.3	3.2	3.3	3.2	3.1	3.2	2.9	2.8	2.8	2.6	2.9	2.6	2.6	2.5	2.4	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.2
	F	2.1	2.1	2.2	2.0	2.1	1.9	1.8	1.8	2.0	1.9	1.6	1.5	1.8	1.7	1.6	1.6	1.6	1.5	1.5	1.4	1.5	1.4	1.6	1.5
TOR	M	4.9	5.1	4.9	4.9	4.7	4.3	4.2	3.9	3.8	3.7	3.6	3.6	3.3	3.4	3.3	3.4	3.3	3.2	3.2	3.1	3.1	3.1	3.1	3.0
	F	2.9	3.0	3.0	2.9	2.8	2.7	2.7	2.6	2.5	2.4	2.3	2.3	2.2	2.2	2.1	2.1	2.2	2.1	2.0	1.9	1.9	2.0	1.9	1.9
ON	**M**	**5.2**	**5.3**	**5.2**	**5.1**	**5.0**	**4.8**	**4.6**	**4.6**	**4.4**	**4.2**	**4.2**	**4.2**	**4.1**	**3.9**	**3.9**	**4.0**	**4.0**	**3.9**	**3.8**	**3.8**	**3.8**	**3.8**	**3.8**	**3.7**
	F	**3.2**	**3.2**	**3.2**	**3.2**	**3.1**	**3.0**	**3.0**	**2.9**	**2.9**	**2.8**	**2.8**	**2.8**	**2.6**	**2.7**	**2.6**	**2.6**	**2.6**	**2.6**	**2.5**	**2.5**	**2.5**	**2.5**	**2.5**	**2.5**

[1]For a legend of Public Health Unit (PHU) abbreviations, see Figure 1.1 (page 13 of main report).

Table 2.4.1: Annual premature mortality rates (deaths per 1000 per year) in All Ontario by socioeconomic status quintile, Ontario, 1992 to 2015.

Year	Material deprivation quintile (from Ontario Marginalization Index)				
	1	2	3	4	5
1992	3.20	3.63	4.03	4.64	5.05
1993	3.25	3.67	4.13	4.68	5.24
1994	3.18	3.69	4.18	4.62	5.05
1995	3.13	3.71	4.11	4.55	4.88
1996	3.08	3.56	4.04	4.43	4.80
1997	2.88	3.38	3.90	4.27	4.77
1998	2.84	3.25	3.78	4.18	4.68
1999	2.75	3.27	3.67	4.14	4.66
2000	2.60	3.16	3.69	4.00	4.42
2001	2.56	3.06	3.48	3.92	4.32
2002	2.47	2.94	3.43	3.99	4.34
2003	2.47	2.99	3.50	3.94	4.40
2004	2.50	2.88	3.29	3.65	4.22
2005	2.48	2.83	3.22	3.60	4.23
2006	2.41	2.79	3.09	3.50	4.15
2007	2.41	2.85	3.17	3.62	4.40
2008	2.30	2.88	3.15	3.70	4.38
2009	2.26	2.76	3.12	3.60	4.44
2010	2.25	2.74	3.12	3.52	4.36
2011	2.17	2.73	3.11	3.58	4.25
2012	2.20	2.71	3.07	3.51	4.28
2013	2.18	2.72	3.05	3.56	4.38
2014	2.25	2.73	3.15	3.56	4.36
2015	2.13	2.70	3.11	3.59	4.38

Table 2.4.2. Cumulative premature mortality rates (total deaths per 1000), by PHU, sex, socioeconomic status quintile (Q) and era, Ontario, 1992-2015.

			Total premature deaths per 1000			Absolute change[1]		Relative change[1]	
PHU	Sex	Q	1992-1999	2000-2007	2008-2015	2000-2007	2008-2015	2000-2007	2008-2015
Algoma	M	1	38.3	33.7	29.3	-4.5	-8.9	-11.9%	-23.4%
		2	42.9	26.0	34.7	-16.9	-8.2	-39.3%	-19.1%
		3	48.0	47.9	51.5	-0.1	3.5	-0.2%	7.4%
		4	47.7	44.0	49.8	-3.7	2.1	-7.8%	4.4%
		5	59.2	69.4	67.6	10.2	8.4	17.2%	14.1%
	F	1	26.9	16.2	23.0	-10.8	-3.9	-39.9%	-14.5%
		2	24.2	19.6	25.5	-4.6	1.2	-19.0%	5.1%
		3	25.2	37.9	32.3	12.7	7.1	50.6%	28.3%
		4	26.7	25.8	33.1	-0.8	6.4	-3.1%	23.9%
		5	37.7	42.4	46.3	4.7	8.6	12.5%	22.9%
Brant	M	1	34.6	26.8	26.6	-7.8	-8.0	-22.5%	-23.0%
		2	40.3	48.2	31.5	7.9	-8.8	19.7%	-21.7%
		3	41.9	39.3	36.6	-2.6	-5.3	-6.2%	-12.7%
		4	46.1	34.3	45.7	-11.8	-0.5	-25.6%	-1.0%
		5	59.6	54.1	55.2	-5.5	-4.4	-9.2%	-7.4%
	F	1	20.4	17.0	18.0	-3.4	-2.5	-16.8%	-12.0%
		2	23.9	32.2	26.6	8.3	2.7	34.9%	11.4%
		3	27.5	26.5	23.3	-1.0	-4.2	-3.5%	-15.2%
		4	30.4	26.7	30.1	-3.7	-0.3	-12.1%	-0.9%
		5	36.1	33.0	38.4	-3.1	2.3	-8.6%	6.4%
Durham	M	1	25.2	26.2	19.1	1.0	-6.1	4.0%	-24.2%
		2	28.8	24.7	23.4	-4.1	-5.4	-14.3%	-18.6%
		3	36.3	33.1	30.0	-3.2	-6.3	-8.8%	-17.2%
		4	41.9	30.8	33.4	-11.1	-8.4	-26.5%	-20.2%
		5	49.0	38.8	47.2	-10.3	-1.8	-20.9%	-3.7%
	F	1	17.6	16.6	13.6	-1.0	-4.0	-5.5%	-22.8%
		2	17.1	15.2	15.9	-1.9	-1.2	-11.1%	-7.1%
		3	23.3	21.8	19.9	-1.5	-3.4	-6.3%	-14.6%
		4	27.6	20.5	23.7	-7.1	-3.9	-25.8%	-14.1%
		5	32.8	30.4	34.2	-2.3	1.4	-7.2%	4.2%
Elgin-St. Thomas	M	1	38.1	26.4	32.8	-11.7	-5.3	-30.8%	-13.9%
		2	38.3	42.0	43.4	3.7	5.2	9.7%	13.5%
		3	46.5	47.1	41.6	0.5	-4.9	1.2%	-10.5%
		4	51.0	40.4	43.6	-10.7	-7.4	-20.9%	-14.5%
		5	46.9	44.9	46.4	-2.1	-0.5	-4.4%	-1.1%
	F	1	21.8	18.3	24.7	-3.5	3.0	-16.0%	13.6%
		2	23.2	25.1	22.9	1.9	-0.3	8.2%	-1.3%
		3	31.5	28.5	27.1	-3.0	-4.4	-9.6%	-14.0%
		4	34.8	27.3	30.2	-7.5	-4.5	-21.5%	-13.1%
		5	30.1	31.0	31.1	0.9	0.9	3.1%	3.1%

			Total premature deaths per 1000			Absolute change[1]		Relative change[1]	
PHU	Sex	Q	1992-1999	2000-2007	2008-2015	2000-2007	2008-2015	2000-2007	2008-2015
Grey-Bruce	M	1	44.6	30.0	43.4	-14.6	-1.2	-32.7%	-2.8%
		2	51.9	41.8	39.4	-10.0	-12.5	-19.3%	-24.1%
		3	49.8	38.6	41.1	-11.3	-8.7	-22.6%	-17.4%
		4	55.2	55.6	47.1	0.3	-8.2	0.6%	-14.8%
		5	55.6	51.8	53.0	-3.9	-2.7	-7.0%	-4.8%
	F	1	33.8	24.1	29.6	-9.7	-4.2	-28.6%	-12.5%
		2	30.7	27.5	27.2	-3.2	-3.5	-10.3%	-11.3%
		3	29.2	25.4	24.1	-3.8	-5.1	-13.0%	-17.4%
		4	33.0	34.0	30.2	1.0	-2.9	3.0%	-8.7%
		5	36.7	33.5	31.7	-3.1	-5.0	-8.5%	-13.6%
Haldimand-Norfolk	M	1	29.0	21.4	38.8	-7.5	9.9	-26.0%	34.1%
		2	40.4	29.7	39.9	-10.6	-0.5	-26.4%	-1.2%
		3	45.3	46.1	39.7	0.9	-5.5	2.0%	-12.2%
		4	44.4	44.1	44.4	-0.3	0.1	-0.6%	0.2%
		5	53.8	37.9	49.5	-15.9	-4.3	-29.6%	-8.0%
	F	1	10.1	13.2	22.5	3.1	12.3	30.3%	121.3%
		2	21.9	21.7	27.0	-0.3	5.1	-1.1%	23.4%
		3	31.4	31.5	31.0	0.1	-0.4	0.4%	-1.3%
		4	31.7	34.6	24.6	2.9	-7.1	9.0%	-22.4%
		5	35.0	29.5	33.1	-5.5	-1.9	-15.7%	-5.4%
Haliburton, Kawartha, Pine Ridge	M	1	38.2	31.4	37.9	-6.8	-0.4	-17.7%	-0.9%
		2	51.9	34.1	41.4	-17.8	-10.6	-34.4%	-20.4%
		3	53.6	46.6	43.7	-7.0	-9.9	-13.1%	-18.5%
		4	58.4	58.8	50.8	0.4	-7.5	0.7%	-12.9%
		5	68.0	53.6	51.8	-14.4	-16.2	-21.2%	-23.9%
	F	1	22.3	20.5	28.6	-1.8	6.3	-8.1%	28.5%
		2	28.7	24.3	26.6	-4.4	-2.1	-15.5%	-7.3%
		3	32.7	26.8	28.5	-6.0	-4.3	-18.3%	-13.0%
		4	36.1	37.4	33.7	1.3	-2.4	3.7%	-6.7%
		5	36.2	33.3	35.9	-2.9	-0.3	-8.0%	-0.8%
Halton	M	1	27.2	21.6	17.6	-5.6	-9.6	-20.5%	-35.2%
		2	33.3	28.9	24.7	-4.4	-8.5	-13.2%	-25.6%
		3	39.9	30.5	28.8	-9.4	-11.1	-23.6%	-27.8%
		4	42.8	32.6	34.2	-10.2	-8.6	-23.9%	-20.1%
		5	44.3	26.8	31.8	-17.5	-12.5	-39.5%	-28.2%
	F	1	18.3	15.0	12.7	-3.3	-5.6	-17.8%	-30.5%
		2	20.4	19.8	17.4	-0.6	-3.0	-3.0%	-14.9%
		3	27.0	20.4	19.9	-6.5	-7.1	-24.3%	-26.2%
		4	28.2	23.8	23.1	-4.4	-5.1	-15.7%	-17.9%
		5	22.6	21.6	26.5	-1.0	3.9	-4.6%	17.1%

			Total premature deaths per 1000			Absolute change[1]		Relative change[1]	
PHU	Sex	Q	1992-1999	2000-2007	2008-2015	2000-2007	2008-2015	2000-2007	2008-2015
Hamilton	M	1	30.0	23.6	22.4	-6.4	-7.6	-21.5%	-25.4%
		2	34.1	33.1	29.3	-1.0	-4.9	-3.0%	-14.2%
		3	44.7	36.7	30.7	-8.0	-14.0	-17.8%	-31.4%
		4	50.8	40.5	36.8	-10.3	-14.0	-20.3%	-27.6%
		5	57.1	46.8	52.6	-10.4	-4.5	-18.1%	-7.9%
	F	1	18.6	17.2	14.8	-1.4	-3.7	-7.4%	-20.0%
		2	22.3	20.7	20.7	-1.6	-1.7	-7.2%	-7.5%
		3	26.8	23.8	19.1	-3.0	-7.7	-11.1%	-28.8%
		4	33.9	27.6	24.6	-6.4	-9.3	-18.8%	-27.4%
		5	35.9	30.8	33.0	-5.1	-3.0	-14.2%	-8.2%
Hastings and Prince Edward	M	1	49.8	38.5	35.7	-11.3	-14.1	-22.7%	-28.3%
		2	49.7	37.8	43.5	-12.0	-6.2	-24.1%	-12.5%
		3	50.8	42.5	45.6	-8.3	-5.1	-16.3%	-10.1%
		4	58.7	53.6	48.5	-5.1	-10.2	-8.7%	-17.3%
		5	67.1	63.8	59.3	-3.2	-7.7	-4.8%	-11.5%
	F	1	23.8	24.3	17.4	0.5	-6.4	2.0%	-26.7%
		2	29.4	25.3	27.1	-4.2	-2.3	-14.1%	-7.8%
		3	32.0	26.1	29.9	-5.9	-2.2	-18.4%	-6.8%
		4	34.1	35.3	32.1	1.2	-2.0	3.6%	-6.0%
		5	42.8	37.7	39.3	-5.1	-3.5	-11.9%	-8.1%
Huron	M	1	52.9	42.5	52.1	-10.4	-0.8	-19.6%	-1.4%
		2	50.8	44.3	40.2	-6.5	-10.6	-12.8%	-20.9%
		3	48.5	50.7	42.8	2.2	-5.6	4.6%	-11.6%
		4	47.4	47.8	41.0	0.3	-6.5	0.7%	-13.7%
		5	53.9	24.0	43.3	-29.9	-10.6	-55.4%	-19.6%
	F	1	44.2	32.3	31.5	-11.9	-12.6	-26.9%	-28.6%
		2	30.6	30.3	28.9	-0.3	-1.6	-0.9%	-5.3%
		3	37.0	27.9	25.8	-9.1	-11.2	-24.7%	-30.3%
		4	29.3	32.2	26.8	2.9	-2.5	10.0%	-8.5%
		5	24.9	15.3	30.0	-9.7	5.0	-38.8%	20.2%
Chatham-Kent	M	1	34.9	28.3	31.6	-6.7	-3.4	-19.1%	-9.6%
		2	43.7	37.3	40.0	-6.4	-3.8	-14.7%	-8.6%
		3	52.6	53.1	42.5	0.5	-10.0	1.0%	-19.1%
		4	56.4	53.8	44.4	-2.5	-11.9	-4.5%	-21.2%
		5	52.6	45.5	52.2	-7.1	-0.4	-13.5%	-0.8%
	F	1	30.2	17.9	22.1	-12.3	-8.1	-40.8%	-26.9%
		2	27.9	24.2	22.4	-3.8	-5.5	-13.5%	-19.6%
		3	33.8	35.0	29.4	1.2	-4.4	3.5%	-13.1%
		4	33.2	35.4	33.2	2.2	0.0	6.5%	0.0%
		5	37.7	31.8	38.2	-5.9	0.5	-15.6%	1.4%

			Total premature deaths per 1000			Absolute change[1]		Relative change[1]	
PHU	Sex	Q	1992-1999	2000-2007	2008-2015	2000-2007	2008-2015	2000-2007	2008-2015
Kingston, Frontenac, Lennox & Addington	M	1	40.2	27.6	33.3	-12.7	-6.9	-31.5%	-17.2%
		2	39.4	39.6	35.6	0.2	-3.9	0.5%	-9.8%
		3	38.2	38.5	37.7	0.3	-0.5	0.7%	-1.2%
		4	52.3	41.8	39.6	-10.6	-12.7	-20.2%	-24.3%
		5	55.7	53.6	51.3	-2.1	-4.4	-3.7%	-7.8%
	F	1	26.9	18.9	20.0	-8.0	-7.0	-29.7%	-25.8%
		2	27.4	24.1	23.2	-3.4	-4.2	-12.3%	-15.5%
		3	23.7	24.1	23.7	0.5	0.1	1.9%	0.3%
		4	29.3	26.2	23.9	-3.1	-5.3	-10.5%	-18.2%
		5	36.1	32.8	39.0	-3.3	2.9	-9.3%	8.1%
Lambton	M	1	40.4	30.6	35.5	-9.7	-4.9	-24.1%	-12.1%
		2	45.7	40.1	45.8	-5.5	0.1	-12.1%	0.2%
		3	53.0	52.9	40.5	-0.1	-12.6	-0.2%	-23.7%
		4	48.1	51.1	50.1	3.0	2.0	6.3%	4.1%
		5	58.1	51.7	53.7	-6.4	-4.3	-11.0%	-7.4%
	F	1	23.9	21.4	25.9	-2.6	1.9	-10.7%	8.1%
		2	25.5	28.7	23.9	3.2	-1.6	12.4%	-6.4%
		3	28.6	32.1	25.1	3.4	-3.5	12.0%	-12.2%
		4	30.0	32.0	31.0	2.1	1.0	6.8%	3.3%
		5	34.0	35.5	38.3	1.5	4.3	4.3%	12.6%
Leeds, Grenville, Lanark	M	1	47.8	28.5	40.4	-19.4	-7.4	-40.5%	-15.5%
		2	45.9	43.1	34.3	-2.9	-11.6	-6.3%	-25.3%
		3	50.2	41.0	43.3	-9.2	-6.9	-18.2%	-13.7%
		4	54.2	55.8	43.4	1.6	-10.8	3.0%	-19.9%
		5	63.4	51.5	59.4	-11.9	-4.0	-18.7%	-6.2%
	F	1	28.6	19.5	23.3	-9.1	-5.3	-31.9%	-18.6%
		2	27.4	27.5	26.9	0.1	-0.5	0.4%	-1.7%
		3	31.6	27.1	29.4	-4.5	-2.2	-14.2%	-7.1%
		4	35.1	39.4	26.6	4.3	-8.6	12.1%	-24.4%
		5	38.0	31.7	36.2	-6.3	-1.8	-16.5%	-4.7%
Middlesex-London	M	1	30.1	24.3	24.5	-5.8	-5.5	-19.1%	-18.4%
		2	36.1	32.9	27.8	-3.3	-8.4	-9.1%	-23.2%
		3	40.9	35.0	34.7	-5.9	-6.2	-14.3%	-15.1%
		4	44.1	35.0	36.2	-9.1	-8.0	-20.7%	-18.1%
		5	47.5	40.8	44.4	-6.8	-3.1	-14.2%	-6.6%
	F	1	18.8	16.9	17.0	-1.8	-1.8	-9.8%	-9.5%
		2	21.1	20.2	19.0	-0.9	-2.1	-4.4%	-9.7%
		3	26.2	24.9	22.7	-1.3	-3.5	-4.9%	-13.3%
		4	29.1	23.9	25.0	-5.2	-4.1	-17.9%	-14.0%
		5	28.8	29.1	30.4	0.3	1.6	1.0%	5.6%

			Total premature deaths per 1000			Absolute change[1]		Relative change[1]	
PHU	Sex	Q	1992-1999	2000-2007	2008-2015	2000-2007	2008-2015	2000-2007	2008-2015
Niagara	M	1	39.1	30.4	29.6	-8.6	-9.5	-22.1%	-24.2%
		2	41.2	38.2	33.0	-3.0	-8.2	-7.3%	-19.9%
		3	46.5	40.9	38.9	-5.5	-7.5	-11.9%	-16.2%
		4	54.2	44.8	43.2	-9.4	-11.0	-17.3%	-20.3%
		5	60.0	49.8	53.5	-10.3	-6.5	-17.1%	-10.8%
	F	1	23.3	19.6	20.4	-3.7	-3.0	-15.9%	-12.7%
		2	26.3	25.5	22.1	-0.8	-4.2	-3.2%	-16.1%
		3	30.7	26.0	25.2	-4.8	-5.5	-15.5%	-17.9%
		4	33.1	31.7	29.7	-1.4	-3.5	-4.2%	-10.4%
		5	41.1	34.4	35.6	-6.7	-5.5	-16.3%	-13.4%
North Bay-Parry Sound	M	1	39.3	39.1	29.6	-0.2	-9.7	-0.6%	-24.7%
		2	45.8	31.9	41.0	-13.9	-4.7	-30.4%	-10.4%
		3	54.6	42.6	38.9	-12.0	-15.7	-21.9%	-28.7%
		4	54.7	44.4	45.6	-10.3	-9.1	-18.8%	-16.6%
		5	58.0	56.8	52.7	-1.2	-5.3	-2.0%	-9.1%
	F	1	22.3	19.0	21.7	-3.3	-0.6	-14.8%	-2.6%
		2	27.5	23.9	30.7	-3.6	3.2	-13.2%	11.6%
		3	35.0	27.7	28.1	-7.3	-6.9	-20.8%	-19.8%
		4	29.9	28.3	30.8	-1.6	1.0	-5.2%	3.3%
		5	35.8	36.3	36.8	0.5	1.0	1.4%	2.9%
Northwestern	M	1	38.0	26.8	28.6	-11.2	-9.4	-29.5%	-24.7%
		2	31.1	25.4	40.7	-5.6	9.7	-18.1%	31.1%
		3	44.6	43.2	42.8	-1.4	-1.9	-3.1%	-4.2%
		4	46.7	44.8	42.7	-2.0	-4.1	-4.2%	-8.7%
		5	55.2	50.4	37.0	-4.8	-18.2	-8.6%	-33.0%
	F	1	21.2	13.0	22.8	-8.2	1.6	-38.6%	7.5%
		2	17.7	18.8	26.9	1.1	9.2	6.1%	51.7%
		3	29.6	27.9	29.1	-1.7	-0.6	-5.9%	-1.9%
		4	26.6	30.1	32.5	3.5	5.9	13.1%	22.0%
		5	32.2	34.5	27.3	2.3	-4.9	7.0%	-15.2%
Ottawa	M	1	25.4	22.1	20.2	-3.3	-5.2	-12.9%	-20.5%
		2	31.0	27.2	22.9	-3.8	-8.1	-12.3%	-26.1%
		3	32.8	26.3	26.2	-6.5	-6.6	-19.9%	-20.1%
		4	37.1	30.2	29.4	-6.9	-7.7	-18.5%	-20.8%
		5	42.2	35.0	34.3	-7.2	-7.9	-17.1%	-18.6%
	F	1	16.8	15.0	14.1	-1.8	-2.7	-10.6%	-16.0%
		2	22.2	18.4	15.6	-3.9	-6.7	-17.3%	-30.0%
		3	19.7	18.2	18.5	-1.4	-1.2	-7.4%	-5.9%
		4	24.3	21.0	20.5	-3.3	-3.8	-13.5%	-15.5%
		5	29.6	23.3	23.5	-6.3	-6.1	-21.4%	-20.7%

			Total premature deaths per 1000			Absolute change[1]		Relative change[1]	
PHU	Sex	Q	1992-1999	2000-2007	2008-2015	2000-2007	2008-2015	2000-2007	2008-2015
Oxford	M	1	40.1	39.8	29.3	-0.3	-10.8	-0.7%	-27.0%
		2	42.8	32.0	35.1	-10.8	-7.8	-25.3%	-18.2%
		3	42.8	48.9	35.8	6.2	-7.0	14.4%	-16.3%
		4	45.7	36.6	39.0	-9.1	-6.8	-19.9%	-14.8%
		5	60.4	40.3	56.9	-20.1	-3.6	-33.3%	-5.9%
	F	1	24.8	22.2	18.2	-2.6	-6.6	-10.6%	-26.7%
		2	25.3	21.1	21.8	-4.3	-3.5	-16.8%	-14.0%
		3	28.0	31.1	21.8	3.1	-6.2	11.0%	-22.2%
		4	30.9	25.8	29.1	-5.0	-1.8	-16.4%	-5.8%
		5	41.0	30.7	41.3	-10.2	0.3	-25.0%	0.7%
Peel	M	1	21.4	22.6	16.2	1.2	-5.2	5.8%	-24.2%
		2	22.8	19.1	17.9	-3.7	-4.9	-16.4%	-21.5%
		3	23.9	18.0	19.6	-5.9	-4.3	-24.7%	-17.9%
		4	29.5	21.6	25.7	-7.9	-3.8	-26.7%	-12.9%
		5	26.1	21.9	25.1	-4.2	-1.0	-16.0%	-3.7%
	F	1	13.9	14.7	10.7	0.8	-3.2	6.0%	-23.1%
		2	14.6	12.2	11.6	-2.5	-3.0	-16.9%	-20.8%
		3	15.6	11.9	12.5	-3.7	-3.1	-23.5%	-19.6%
		4	18.2	13.6	17.2	-4.7	-1.0	-25.5%	-5.7%
		5	18.0	15.9	18.8	-2.2	0.8	-11.9%	4.5%
Perth	M	1	37.8	28.2	28.4	-9.6	-9.3	-25.4%	-24.7%
		2	42.6	32.7	36.1	-9.9	-6.6	-23.2%	-15.4%
		3	42.2	43.9	33.6	1.7	-8.7	4.0%	-20.5%
		4	46.7	36.9	35.5	-9.8	-11.2	-21.0%	-24.0%
		5	52.9	43.9	34.5	-8.9	-18.4	-16.9%	-34.8%
	F	1	23.0	24.9	19.1	1.9	-3.9	8.3%	-16.9%
		2	30.8	22.3	23.2	-8.4	-7.6	-27.4%	-24.7%
		3	23.6	29.0	23.9	5.4	0.3	22.9%	1.1%
		4	29.6	25.1	25.6	-4.4	-4.0	-15.0%	-13.6%
		5	34.1	29.1	31.9	-5.0	-2.2	-14.8%	-6.6%
Peterborough	M	1	38.2	27.7	31.9	-10.5	-6.3	-27.5%	-16.5%
		2	42.2	39.4	39.0	-2.8	-3.3	-6.6%	-7.7%
		3	52.0	43.5	34.4	-8.4	-17.5	-16.2%	-33.8%
		4	56.8	47.8	40.8	-9.0	-15.9	-15.8%	-28.1%
		5	60.7	46.5	51.6	-14.2	-9.1	-23.4%	-15.0%
	F	1	26.7	21.1	21.3	-5.6	-5.4	-21.1%	-20.2%
		2	28.9	28.1	24.8	-0.8	-4.1	-2.6%	-14.1%
		3	29.5	31.2	25.0	1.7	-4.6	5.8%	-15.4%
		4	37.9	30.6	27.4	-7.4	-10.5	-19.4%	-27.7%
		5	37.4	31.3	35.3	-6.2	-2.1	-16.5%	-5.7%

			Total premature deaths per 1000			Absolute change[1]		Relative change[1]	
PHU	Sex	Q	1992-1999	2000-2007	2008-2015	2000-2007	2008-2015	2000-2007	2008-2015
Porcupine	M	1	28.7	28.9	34.9	0.2	6.2	0.8%	21.6%
		2	41.1	22.4	36.5	-18.7	-4.7	-45.4%	-11.3%
		3	37.9	50.3	45.6	12.4	7.7	32.7%	20.3%
		4	48.8	58.1	53.4	9.2	4.6	18.9%	9.4%
		5	56.5	50.8	53.1	-5.7	-3.5	-10.2%	-6.2%
	F	1	19.3	21.4	19.9	2.1	0.6	10.8%	3.1%
		2	25.9	14.1	24.7	-11.8	-1.2	-45.5%	-4.6%
		3	17.3	28.2	31.2	10.9	13.8	62.6%	79.9%
		4	27.1	34.6	31.9	7.5	4.8	27.7%	17.8%
		5	33.5	33.6	37.6	0.1	4.1	0.3%	12.3%
Renfrew	M	1	47.4	27.9	35.5	-19.5	-11.9	-41.1%	-25.0%
		2	46.8	30.0	32.8	-16.8	-14.0	-35.8%	-30.0%
		3	49.7	43.6	41.0	-6.0	-8.7	-12.1%	-17.5%
		4	58.7	56.1	41.5	-2.6	-17.2	-4.4%	-29.3%
		5	63.7	58.1	49.6	-5.6	-14.1	-8.8%	-22.1%
	F	1	33.8	24.0	20.4	-9.8	-13.5	-29.1%	-39.8%
		2	25.3	18.8	19.3	-6.4	-6.0	-25.5%	-23.7%
		3	25.5	26.5	26.0	1.0	0.5	4.1%	2.0%
		4	31.4	35.3	30.1	3.9	-1.3	12.3%	-4.2%
		5	38.1	37.1	32.4	-1.0	-5.8	-2.7%	-15.1%
Eastern Ontario	M	1	35.6	26.8	32.6	-8.8	-3.0	-24.7%	-8.4%
		2	43.0	34.1	36.6	-8.8	-6.3	-20.5%	-14.7%
		3	43.5	39.0	36.4	-4.5	-7.1	-10.3%	-16.3%
		4	48.7	47.5	41.8	-1.3	-6.9	-2.6%	-14.3%
		5	61.0	55.9	57.0	-5.1	-4.0	-8.4%	-6.6%
	F	1	19.9	16.3	20.6	-3.5	0.7	-17.8%	3.4%
		2	24.8	22.0	24.3	-2.8	-0.5	-11.5%	-2.0%
		3	23.2	24.1	24.9	0.9	1.7	3.9%	7.2%
		4	31.5	30.2	29.0	-1.2	-2.5	-3.9%	-8.0%
		5	41.9	39.3	41.3	-2.6	-0.5	-6.1%	-1.3%
Simcoe Muskoka	M	1	37.2	25.3	29.1	-11.9	-8.1	-32.0%	-21.7%
		2	39.7	33.1	34.0	-6.6	-5.7	-16.6%	-14.4%
		3	47.1	39.3	35.5	-7.8	-11.6	-16.6%	-24.6%
		4	50.0	44.2	44.4	-5.9	-5.6	-11.7%	-11.2%
		5	58.7	44.3	50.6	-14.4	-8.0	-24.5%	-13.7%
	F	1	20.5	15.5	18.3	-5.0	-2.2	-24.4%	-10.6%
		2	24.3	21.4	22.1	-2.9	-2.2	-11.8%	-9.0%
		3	29.1	25.7	26.0	-3.4	-3.1	-11.8%	-10.8%
		4	29.8	30.4	28.2	0.6	-1.6	2.1%	-5.5%
		5	37.8	28.5	34.5	-9.3	-3.3	-24.6%	-8.7%

			Total premature deaths per 1000			Absolute change[1]		Relative change[1]	
PHU	Sex	Q	1992-1999	2000-2007	2008-2015	2000-2007	2008-2015	2000-2007	2008-2015
Sudbury	M	1	38.1	32.7	34.2	-5.3	-3.8	-14.0%	-10.0%
		2	37.6	31.8	36.1	-5.8	-1.4	-15.4%	-3.8%
		3	42.8	36.9	39.9	-5.9	-2.9	-13.8%	-6.8%
		4	52.7	47.0	46.6	-5.7	-6.1	-10.8%	-11.5%
		5	59.3	62.2	58.1	2.9	-1.3	4.8%	-2.1%
	F	1	26.3	15.3	22.7	-11.0	-3.6	-42.0%	-13.8%
		2	25.6	22.3	29.4	-3.4	3.8	-13.1%	14.7%
		3	25.1	24.8	24.4	-0.2	-0.7	-0.9%	-2.9%
		4	30.1	29.7	29.9	-0.4	-0.2	-1.4%	-0.6%
		5	36.6	38.2	38.2	1.6	1.6	4.3%	4.4%
Thunder Bay	M	1	30.4	33.1	28.7	2.8	-1.7	9.2%	-5.6%
		2	31.7	31.7	33.3	0.0	1.6	0.1%	5.2%
		3	41.7	39.1	43.2	-2.6	1.5	-6.2%	3.7%
		4	50.0	44.2	43.2	-5.8	-6.8	-11.5%	-13.6%
		5	62.3	51.6	60.0	-10.7	-2.3	-17.2%	-3.7%
	F	1	18.1	16.8	13.2	-1.3	-4.9	-7.1%	-27.3%
		2	20.8	19.0	19.2	-1.9	-1.7	-8.9%	-8.1%
		3	23.6	27.5	26.3	3.9	2.6	16.6%	11.1%
		4	31.4	30.3	30.5	-1.1	-0.9	-3.6%	-3.0%
		5	40.2	33.7	40.2	-6.5	-0.1	-16.3%	-0.2%
Timiskaming	M	1	—[2]	—	—	—	—	—	—
		2	51.5	32.7	35.1	-18.8	-16.4	-36.4%	-31.8%
		3	57.7	97.3	55.6	39.5	-2.2	68.5%	-3.8%
		4	47.4	40.8	53.4	-6.6	6.1	-14.0%	12.8%
		5	63.9	73.6	62.7	9.7	-1.2	15.1%	-1.8%
	F	1	0.0	16.8	32.6	16.8	32.6	#DIV/0!	#DIV/0!
		2	19.6	20.7	24.9	1.2	5.3	6.0%	27.2%
		3	29.1	78.0	34.8	48.9	5.8	168.4%	19.8%
		4	34.2	27.5	29.6	-6.7	-4.5	-19.6%	-13.3%
		5	42.2	43.6	39.1	1.4	-3.2	3.3%	-7.5%
Waterloo	M	1	27.3	21.1	18.3	-6.2	-8.9	-22.6%	-32.7%
		2	33.8	28.5	25.4	-5.3	-8.4	-15.7%	-24.9%
		3	38.2	32.0	33.0	-6.2	-5.1	-16.3%	-13.4%
		4	38.8	31.4	34.5	-7.4	-4.3	-19.0%	-11.0%
		5	40.8	33.8	35.3	-7.0	-5.5	-17.1%	-13.5%
	F	1	17.2	14.4	13.5	-2.8	-3.7	-16.2%	-21.4%
		2	20.9	19.3	17.2	-1.6	-3.7	-7.6%	-17.5%
		3	25.3	21.9	23.1	-3.4	-2.2	-13.3%	-8.8%
		4	23.9	20.8	23.6	-3.0	-0.3	-12.7%	-1.0%
		5	24.4	24.2	24.4	-0.2	0.0	-0.6%	0.1%

			Total premature deaths per 1000			Absolute change[1]		Relative change[1]	
PHU	Sex	Q	1992-1999	2000-2007	2008-2015	2000-2007	2008-2015	2000-2007	2008-2015
Wellington-Dufferin-Guelph	M	1	31.3	23.5	22.9	-7.8	-8.5	-24.9%	-27.0%
		2	33.3	31.2	27.2	-2.1	-6.1	-6.4%	-18.3%
		3	39.9	31.6	33.3	-8.4	-6.6	-21.0%	-16.6%
		4	45.7	37.7	33.5	-8.1	-12.3	-17.6%	-26.8%
		5	43.0	31.9	37.3	-11.1	-5.7	-25.7%	-13.3%
	F	1	19.1	16.3	15.5	-2.8	-3.6	-14.8%	-18.9%
		2	21.3	24.7	20.6	3.4	-0.7	15.7%	-3.3%
		3	24.7	21.0	24.0	-3.7	-0.7	-14.9%	-2.8%
		4	28.5	26.5	25.4	-1.9	-3.0	-6.8%	-10.7%
		5	28.8	26.0	27.9	-2.7	-0.9	-9.4%	-3.0%
Windsor-Essex	M	1	35.1	31.2	24.3	-3.9	-10.8	-11.0%	-30.8%
		2	41.2	31.9	29.5	-9.3	-11.7	-22.6%	-28.4%
		3	42.3	35.7	32.5	-6.7	-9.9	-15.7%	-23.3%
		4	49.9	42.8	39.2	-7.2	-10.8	-14.4%	-21.5%
		5	55.9	33.8	44.9	-22.1	-11.0	-39.6%	-19.7%
	F	1	20.8	19.3	16.7	-1.5	-4.1	-7.1%	-19.8%
		2	24.1	22.9	19.4	-1.1	-4.7	-4.7%	-19.5%
		3	30.1	26.0	22.9	-4.2	-7.2	-13.9%	-24.0%
		4	30.1	29.4	26.8	-0.7	-3.3	-2.3%	-11.0%
		5	34.6	22.5	32.2	-12.1	-2.5	-34.9%	-7.1%
York	M	1	24.2	22.0	14.8	-2.2	-9.4	-9.2%	-38.9%
		2	22.5	17.8	17.5	-4.7	-5.0	-20.8%	-22.2%
		3	25.7	19.6	19.2	-6.2	-6.5	-24.0%	-25.2%
		4	29.4	20.9	21.6	-8.5	-7.8	-28.9%	-26.6%
		5	39.9	27.1	26.9	-12.8	-13.0	-32.1%	-32.6%
	F	1	15.5	14.2	9.9	-1.3	-5.6	-8.4%	-36.4%
		2	13.7	11.7	11.8	-2.1	-2.0	-14.9%	-14.4%
		3	15.2	13.2	12.6	-2.0	-2.6	-13.0%	-16.9%
		4	19.1	12.8	14.0	-6.3	-5.1	-33.0%	-26.6%
		5	26.2	15.6	18.2	-10.6	-8.0	-40.4%	-30.6%
Toronto	M	1	35.5	24.3	18.3	-11.2	-17.2	-31.6%	-48.4%
		2	36.3	25.7	21.7	-10.6	-14.6	-29.2%	-40.3%
		3	36.7	26.9	23.4	-9.7	-13.3	-26.6%	-36.3%
		4	36.3	28.0	24.8	-8.3	-11.5	-22.9%	-31.7%
		5	37.3	29.3	30.1	-8.1	-7.2	-21.6%	-19.4%
	F	1	21.2	16.5	12.3	-4.7	-9.0	-22.3%	-42.3%
		2	22.0	17.0	14.1	-4.9	-7.9	-22.4%	-35.9%
		3	21.9	18.0	15.1	-3.9	-6.8	-17.7%	-31.2%
		4	22.1	18.1	15.8	-4.0	-6.3	-18.1%	-28.6%
		5	23.7	18.7	18.8	-5.0	-4.8	-21.1%	-20.5%

			Total premature deaths per 1000			Absolute change[1]		Relative change[1]	
PHU	Sex	Q	1992-1999	2000-2007	2008-2015	2000-2007	2008-2015	2000-2007	2008-2015
All Ontario	M	1	29.7	24.3	20.9	-5.4	-8.8	-18.2%	-29.6%
		2	34.5	28.0	26.1	-6.5	-8.4	-18.8%	-24.3%
		3	39.2	31.9	29.8	-7.3	-9.4	-18.5%	-24.0%
		4	43.7	35.4	34.2	-8.3	-9.6	-19.0%	-21.9%
		5	47.6	39.1	41.5	-8.5	-6.0	-17.9%	-12.7%
	F	1	18.7	16.2	14.1	-2.5	-4.6	-13.5%	-24.6%
		2	21.4	18.5	17.4	-2.8	-4.0	-13.3%	-18.8%
		3	24.2	21.1	19.6	-3.1	-4.6	-13.0%	-18.8%
		4	27.0	23.3	22.6	-3.6	-4.4	-13.5%	-16.1%
		5	30.3	25.7	27.7	-4.6	-2.6	-15.1%	-8.7%

[1]For details on how absolute and relative mortality rate changes were calculated, refer to the technical appendix.

[2]There is insufficient population in Timiskaming PHU to report premature mortality rates for quintile 1.

Table 2.4.3. Relative index of inequality (RII), by PHU, sex and era, Ontario, 1992-2015.

Public Health Unit	Sex	Relative Index of Inequality (RII)		
		1992-1999	2000-2007	2008-2015
Algoma	M	1.78	2.99	2.49
	F	1.94	2.83	2.38
Brant	M	2.11	1.94	2.58
	F	2.10	1.87	2.46
Durham	M	2.55	2.15	3.08
	F	2.64	2.51	3.09
Elgin-St. Thomas	M	1.51	1.69	1.57
	F	1.54	1.77	1.56
Grey-Bruce	M	1.30	1.68	1.38
	F	1.31	1.46	1.22
Haldimand-Norfolk	M	1.72	1.70	1.31
	F	1.90	1.95	1.26
Haliburton, Kawartha, Pine Ridge	M	1.42	2.06	1.49
	F	1.37	1.87	1.47
Halton	M	2.14	1.97	2.78
	F	2.00	2.05	2.82
Hamilton	M	2.50	2.34	2.98
	F	2.51	2.31	2.79
Hastings and Prince Edward	M	1.60	2.12	1.92
	F	1.78	1.97	2.15
Huron	M	0.98	0.75	1.23
	F	0.82	0.67	1.44
Chatham-Kent	M	1.45	1.43	1.86
	F	1.52	1.54	2.20
Kingston, Frontenac, Lennox & Addington	M	1.66	1.97	1.95
	F	1.58	1.92	2.20
Lambton	M	1.55	1.76	1.66
	F	1.70	1.72	1.78
Leeds, Grenville, Lanark	M	1.77	1.93	1.76
	F	1.76	1.91	1.63
Middlesex-London	M	1.87	2.03	2.22
	F	1.94	2.16	2.20
Niagara	M	1.96	1.84	2.18
	F	2.10	1.96	2.16
North Bay-Parry Sound	M	1.38	1.94	1.62
	F	1.46	2.03	1.55
Northwestern	M	1.98	2.28	1.14
	F	2.00	2.43	1.21

Public Health Unit	Sex	Relative Index of Inequality (RII)		
		1992-1999	2000-2007	2008-2015
Ottawa	M	1.98	1.92	2.13
	F	2.02	1.90	2.11
Oxford	M	1.99	1.43	2.51
	F	2.30	1.69	2.96
Peel	M	1.70	1.40	2.26
	F	1.69	1.46	2.39
Perth	M	1.40	1.43	1.36
	F	1.57	1.25	1.71
Peterborough	M	1.80	1.57	1.77
	F	1.63	1.45	1.81
Porcupine	M	2.24	2.18	2.36
	F	1.86	2.34	2.54
Renfrew	M	1.71	2.61	1.96
	F	1.73	2.33	2.16
Eastern Ontario	M	2.24	2.63	2.09
	F	2.76	2.90	2.21
Simcoe Muskoka	M	1.97	2.20	2.09
	F	2.09	2.30	2.16
Sudbury	M	1.87	2.71	1.88
	F	1.83	2.74	1.81
Thunder Bay	M	2.95	2.29	2.91
	F	3.05	2.53	3.54
Timiskaming	M	2.49	2.23	1.48
	F	2.88	1.78	1.50
Waterloo	M	1.72	2.05	2.34
	F	1.67	2.07	2.25
Wellington-Dufferin-Guelph	M	1.78	1.77	2.04
	F	1.91	1.81	2.14
Windsor-Essex	M	2.00	1.39	2.24
	F	2.15	1.41	2.34
York	M	1.79	1.34	2.09
	F	1.80	1.28	2.04
Toronto	M	1.14	1.33	1.76
	F	1.17	1.27	1.67
All Ontario	**M**	**1.94**	**2.09**	**2.44**
	F	**1.99**	**2.09**	**2.39**

Table 2.5.1. Cumulative amenable mortality rates (total deaths per 1000), by PHU, sex and era, Ontario, 1992-2012.

		Total amenable deaths per 1000			Absolute change[1]		Relative change[1]	
PHU	Sex	1992-1998	1999-2005	2006-2012	1999-2005	2006-2012	1999-2005	2006-2012
Algoma	M	27.2	25.1	23.8	-2.1	-3.4	-7.8%	-12.4%
	F	16.1	15.6	16.5	-0.5	0.4	-3.0%	2.4%
Brant	M	24.1	19.1	19.6	-5.0	-4.5	-20.6%	-18.5%
	F	15.8	14.5	14.0	-1.3	-1.8	-8.2%	-11.5%
Durham	M	16.3	13.1	11.1	-3.2	-5.2	-19.4%	-31.8%
	F	11.5	9.6	8.7	-1.9	-2.7	-16.5%	-23.8%
Elgin-St. Thomas	M	23.2	20.5	18.1	-2.6	-5.1	-11.4%	-21.9%
	F	15.1	13.9	14.5	-1.2	-0.6	-7.9%	-3.8%
Grey-Bruce	M	26.3	21.6	19.6	-4.8	-6.8	-18.1%	-25.7%
	F	17.2	14.5	13.6	-2.6	-3.5	-15.2%	-20.7%
Haldimand-Norfolk	M	24.3	18.6	18.8	-5.7	-5.5	-23.3%	-22.5%
	F	15.8	15.5	14.1	-0.2	-1.7	-1.4%	-10.6%
Haliburton, Kawartha, Pine Ridge	M	28.2	24.5	19.5	-3.7	-8.6	-13.0%	-30.7%
	F	17.7	15.7	15.2	-2.0	-2.6	-11.4%	-14.4%
Halton	M	15.2	10.8	8.7	-4.5	-6.5	-29.3%	-43.0%
	F	10.4	8.5	7.2	-1.9	-3.3	-18.5%	-31.4%
Hamilton	M	22.6	17.6	15.8	-5.0	-6.9	-22.2%	-30.3%
	F	14.9	12.3	10.9	-2.6	-4.0	-17.3%	-26.5%
Hastings and Prince Edward	M	29.3	24.4	21.8	-4.9	-7.4	-16.6%	-25.4%
	F	18.7	16.6	15.0	-2.2	-3.7	-11.5%	-19.9%
Huron	M	24.7	20.4	18.3	-4.3	-6.4	-17.3%	-25.8%
	F	16.1	13.8	13.1	-2.3	-3.0	-14.4%	-18.7%
Chatham-Kent	M	27.5	23.5	20.9	-4.0	-6.6	-14.6%	-23.9%
	F	19.3	16.5	14.6	-2.8	-4.7	-14.6%	-24.4%
Kingston, Frontenac, Lennox & Addington	M	21.9	18.5	16.4	-3.4	-5.5	-15.4%	-25.1%
	F	15.4	12.4	11.8	-3.1	-3.6	-19.8%	-23.3%
Lambton	M	25.1	22.1	20.4	-3.1	-4.8	-12.2%	-19.1%
	F	14.4	14.7	14.6	0.4	0.2	2.5%	1.6%
Leeds, Grenville, Lanark	M	26.4	21.3	19.8	-5.1	-6.6	-19.3%	-25.1%
	F	17.6	14.0	13.9	-3.6	-3.7	-20.5%	-20.9%
Middlesex-London	M	19.8	14.6	13.2	-5.2	-6.7	-26.2%	-33.7%
	F	12.2	10.9	9.9	-1.3	-2.3	-10.3%	-18.7%
Niagara	M	24.5	19.5	17.6	-5.0	-6.9	-20.6%	-28.2%
	F	16.4	14.0	13.0	-2.4	-3.4	-14.7%	-20.8%
North Bay-Parry Sound	M	27.8	23.4	21.0	-4.4	-6.8	-15.9%	-24.5%
	F	17.7	15.2	15.4	-2.5	-2.3	-14.1%	-12.8%

		Total amenable deaths per 1000			Absolute change[1]		Relative change[1]	
PHU	Sex	1992-1998	1999-2005	2006-2012	1999-2005	2006-2012	1999-2005	2006-2012
Northwestern	M	21.4	17.8	16.9	-3.5	-4.5	-16.6%	-21.0%
	F	13.7	13.5	14.7	-0.2	1.0	-1.1%	7.3%
Ottawa	M	15.9	12.0	10.2	-3.9	-5.6	-24.4%	-35.6%
	F	11.1	8.8	7.8	-2.3	-3.3	-20.7%	-29.5%
Oxford	M	23.6	17.2	17.0	-6.5	-6.6	-27.3%	-28.1%
	F	14.5	13.3	11.0	-1.2	-3.4	-8.0%	-23.8%
Peel	M	11.2	9.2	8.1	-2.0	-3.1	-18.1%	-27.5%
	F	7.6	6.3	5.8	-1.3	-1.8	-17.0%	-23.8%
Perth	M	22.4	18.4	14.1	-4.0	-8.2	-17.8%	-36.7%
	F	13.4	12.9	9.9	-0.5	-3.5	-4.0%	-26.1%
Peterborough	M	25.8	20.1	17.0	-5.6	-8.8	-21.8%	-34.0%
	F	17.0	14.8	13.1	-2.2	-3.9	-13.0%	-22.7%
Porcupine	M	22.2	21.1	21.4	-1.1	-0.8	-4.9%	-3.4%
	F	14.7	15.0	16.2	0.3	1.4	2.0%	9.8%
Renfrew	M	28.3	22.6	18.4	-5.8	-9.9	-20.3%	-34.9%
	F	16.4	13.9	13.0	-2.5	-3.4	-15.2%	-20.9%
Eastern Ontario	M	25.8	21.2	18.8	-4.6	-7.0	-17.8%	-27.2%
	F	15.5	14.1	14.0	-1.4	-1.6	-8.9%	-10.0%
Simcoe Muskoka	M	23.9	18.2	16.1	-5.6	-7.8	-23.6%	-32.5%
	F	14.7	12.8	11.7	-1.9	-3.0	-12.7%	-20.3%
Sudbury	M	26.0	23.1	21.5	-2.9	-4.4	-11.3%	-17.1%
	F	16.8	14.6	14.5	-2.2	-2.4	-13.2%	-14.2%
Thunder Bay	M	23.6	19.4	18.0	-4.2	-5.6	-17.7%	-23.9%
	F	15.0	13.5	12.9	-1.5	-2.2	-9.9%	-14.3%
Timiskaming	M	29.4	26.9	24.4	-2.5	-5.0	-8.4%	-17.0%
	F	19.0	19.4	18.8	0.4	-0.2	2.0%	-1.1%
Waterloo	M	17.4	13.0	11.3	-4.4	-6.0	-25.2%	-34.7%
	F	11.0	9.8	8.6	-1.2	-2.4	-10.8%	-21.8%
Wellington-Dufferin-Guelph	M	17.6	14.4	11.8	-3.2	-5.9	-18.3%	-33.2%
	F	11.1	11.2	9.1	0.1	-2.0	0.7%	-17.8%
Windsor-Essex	M	23.0	16.4	14.8	-6.6	-8.2	-28.7%	-35.6%
	F	14.8	11.6	11.1	-3.2	-3.7	-21.4%	-25.0%
York	M	11.4	8.7	7.0	-2.7	-4.4	-24.0%	-38.7%
	F	7.8	6.3	5.1	-1.5	-2.6	-19.0%	-34.0%
Toronto	M	17.9	12.5	10.4	-5.4	-7.4	-30.1%	-41.5%
	F	10.9	8.5	7.2	-2.4	-3.8	-22.1%	-34.4%
All Ontario	**M**	**19.4**	**14.9**	**12.9**	**-4.5**	**-6.6**	**-23.4%**	**-33.8%**
	F	**12.5**	**10.4**	**9.3**	**-2.1**	**-3.2**	**-16.7%**	**-25.7%**

[1]For details on how absolute and relative mortality rate changes were calculated, refer to the technical appendix.