

Halton Mortality Report

2011-2015 Combined

Mortality (death) is an important indicator of population health. Life expectancy, mortality rate, potential years of life lost, potentially avoidable mortality, as well as causes of death are all explored in this report for mortalities occurring between 2011 and 2015 among Halton residents. It does not capture deaths of Halton residents that occurred outside of Ontario.

In general, Halton residents had a longer life expectancy, lower mortality rates, lower potentially avoidable mortality rates, and lower potential years of life lost compared to Ontario. Many of the top causes of death are similar between Halton and Ontario.

Halton males and those living in lower income neighbourhoods in Halton had worse mortality outcomes than females and those living in higher income neighbourhoods in Halton.

Counts

From 2011 to 2015, there were 15,168 deaths among Halton residents, for an average of 3,034 deaths per year. The number of deaths per year increased with age, with 1 in 5 deaths occurring in adults aged 90 and over.

Table 1: Average number of deaths per year, by municipality, Halton Region, 2011-2015 combined

	Average # of deaths/year
Burlington	1,385
Oakville	991
Halton Hills	352
Milton	305
Halton Total	3,034

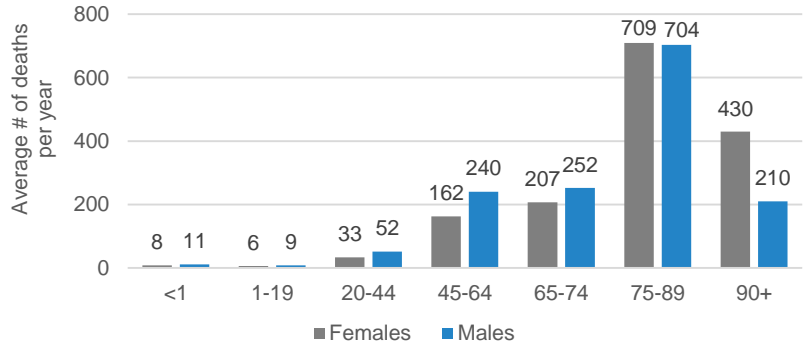


Figure 1: Average number of deaths per year, by age group and sex, Halton Region, 2011-2015 combined

From 2011 to 2015, Burlington had the most number of deaths per year, followed by Oakville, Halton Hills and Milton. The total population, age distribution and other demographic factors in each municipality has a large influence on the number of deaths in that specific population.

Life Expectancy

Life expectancy is the average length of time that an individual is expected to live from birth, if the age- and sex-specific mortality rates for the given observation period are constant over their life span.

The most recent life expectancy calculations available are for 2015-2017 combined. The life expectancies of males and females in Halton is statistically significantly longer than that of males and females in all of Ontario.



Mortality Rates

Mortality rate is a measure of the number of deaths that occur in a year, per 100,000 people in the population. The crude mortality rate represents the true mortality rate in that population; however, it is influenced by the age structure of a population (an older population would likely have a higher mortality rate compared to a younger population). Therefore, when analyzing the mortality rate of a population it is important to consider the crude rate, the age-standardized rate (which accounts for age differences in a population) and the age-specific mortality rates.

Crude Mortality Rates

From 2011-2015 combined, the crude mortality rates were similar for Halton males and Halton females.

When comparing Halton to Ontario, Halton males and females had lower crude mortality rates than Ontario males and females and these differences were statistically significant.

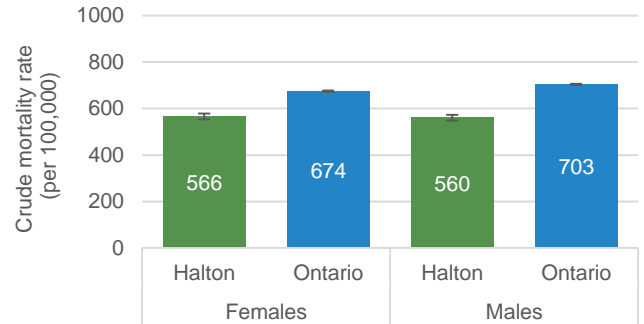


Figure 2: Crude mortality rate (per 100,000), by sex, Halton Region and Ontario 2011-2015 combined

Age-Standardized Mortality Rates

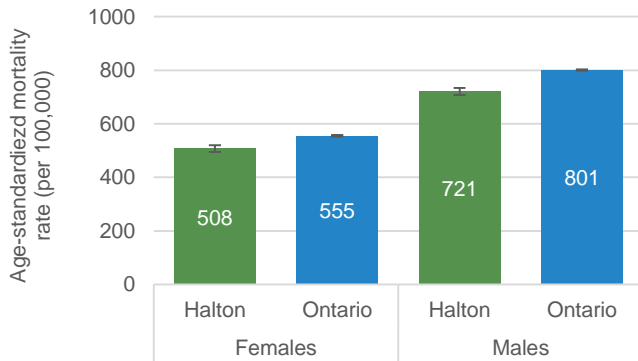


Figure 3: Age-standardized mortality rate (per 100,000), by sex, Halton Region and Ontario 2011-2015 combined

From 2011-2015 combined, Halton males had a higher age-standardized mortality rate than Halton females, and this difference was statistically significant.

When comparing Halton to Ontario, Halton males and females had lower age-standardized mortality rates than Ontario males and females and these differences were statistically significant.

Age-specific Mortality Rates

From 2011-2015 combined, in general, the age-specific mortality rate increased with age, except for 0-4 year olds who had a slightly higher mortality rate than other children and young adults. Halton males generally had higher age-specific mortality rates than females, however there was no statistically significant difference in the overall age-specific mortality rate between Halton males and females.

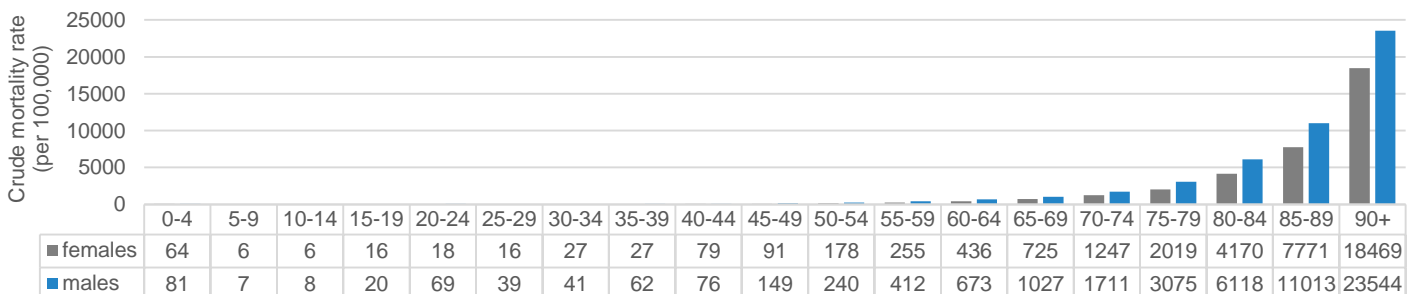


Figure 4: Age-specific mortality rate (per 100,000), by age and sex, Halton Region 2011-2015 combined

Causes of Death

Causes of death can be grouped based on chapter classification, which are broad categories (e.g. cancer, circulatory system, respiratory system) based on ICD-10 chapters (International Statistical Classification of Disease and Related Health Problems), or by more specific causes of death (e.g. heart disease, lung cancer, influenza and pneumonia), based on the APHEO lead cause groups. While it is important to try to reduce deaths that are preventable and treatable, the longer people live, the more likely they will die from such causes as cancer, chronic illnesses and falls.

By Chapter

Table 2: Age-standardized mortality rate(per 100,000), by ICD-10 Chapter Cause, Halton Region and Ontario, 2011-2015 combined

	Halton		Ontario
Neoplasms (tumours)	190 (±5)	↓	201 (±1)
Circulatory system diseases	144 (±4)	↓	179 (±1)
Respiratory system diseases	50 (±3)	↓	57 (±1)
Mental and behavioural disorders	49 (±3)	↑	46 (±1)
Nervous system diseases	39 (±2)	↑	31 (±0)
External causes of mortality	38 (±2)	↓	44 (±1)
Digestive system diseases	24 (±2)	↓	28 (±0)
Endocrine/nutritional disorders	19 (±2)	↓	26 (±0)
Infectious diseases	15 (±1)	=	15 (±0)
Genitourinary diseases	10 (±1)	↓	13 (±0)
Musculoskeletal diseases	4.5 (±0.8)	=	4 (±0)
Symptoms not elsewhere classified	3.7 (±0.7)	↓	5 (±0)
Diseases of blood	2.5 (±0.6)	=	2 (±0)
Perinatal conditions	2.5 (±0.6)	=	3 (±0)
Congenital abnormalities	2.1 (±0.5)	↓	3 (±0)
Skin diseases	2 (±0.5)	=	2 (±0)
Ear diseases	0.1 (±0.1)	=	0 (±0)
Maternal conditions	0.1 (±0.1)	=	0 (±0)
Eye diseases	0 (±0)	=	0 (±0)
All cause	596 (±9)	↓	660 (±2)

Causes of death presented by ICD-10 chapters for Halton and Ontario are shown in **Table 2**. The top three causes of death in both Halton and Ontario were neoplasms (tumours), diseases of the circulatory system, and diseases of the respiratory system, which combined accounted for about two-thirds of all deaths in Halton and Ontario.

For all causes of death combined, Halton had a significantly lower mortality rate compared to Ontario. Of these 19 chapters, mental and behavioural disorders, and nervous system diseases are the only chapters for which Halton had a significantly higher mortality rate compared to Ontario. Halton had significantly lower mortality rates for nine of the chapters, and there were no statistically significant differences in the remaining chapters.

↓ indicates Halton had a statistically significantly lower rate than Ontario
 ↑ indicates Halton had a statistically significantly higher rate than Ontario
 = indicates no statistically significant difference between Halton and Ontario
 Values in brackets (±) represent the 95% confidence interval

By Lead Cause

Table 3 shows the top 10 causes of death among Halton males and females by lead cause group.

Although there are differences in the order of causes of death between Halton males and Halton females, eight out of the top 10 causes of death are the same. Causes of death that differed between males and females were cancer of the prostate and diabetes for males, and cancer of the breast and influenza and pneumonia for females.

Table 3: Age-standardized mortality rate (per 100,000), by sex and Lead Cause Group, Halton Region, 2011-2015 combined

	Male	Female
1	Ischaemic heart disease	Dementia and Alzheimer disease
2	Dementia and Alzheimer disease	Ischaemic heart disease
3	Cancer of lung and bronchus	Cancer of lung and bronchus
4	Cerebrovascular diseases	Cerebrovascular diseases
5	Chronic lower respiratory diseases	Cancer of breast
6	Cancer of prostate	Chronic lower respiratory diseases
7	Cancer of colon, rectum, anus	Falls
8	Cancer of lymph, blood and related	Cancer of colon, rectum, anus
9	Diabetes	Influenza and pneumonia
10	Falls	Cancer of lymph, blood & related

Potential Years of Life Lost (PYLL)

Potential years of life lost (PYLL) is a measure of premature mortality. Each death that occurs before age 75 is given a value of the age at death subtracted from 75 (for example, someone who died at age 45 would have a PYLL of 30 [75-45=30]). Individuals who died after age 75 are not included when calculating PYLL. PYLL therefore puts more weight on deaths that occur earlier in life than those that occur later in life. Premature mortalities place a larger burden on a population through an increased loss of contributions to society. Almost one-third of all deaths among Halton residents from 2011 to 2015 were considered premature.

By Sex

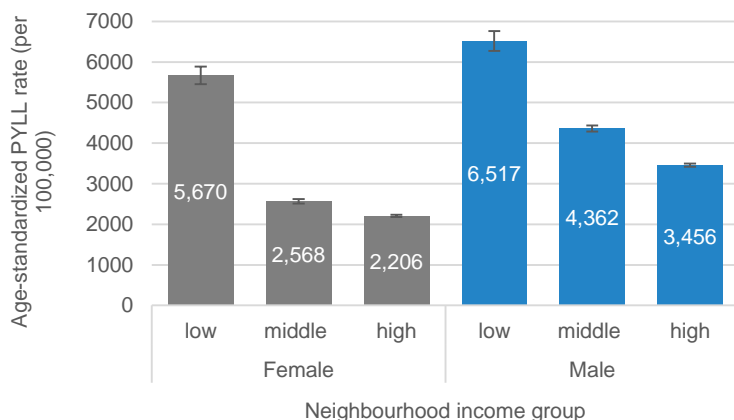
Table 4 shows the top 10 leading causes of premature mortality (before the age of 75) in Halton for males and females. All causes combined, males have an average of 9202 PYLL each year and females have an average of 6323 PYLL each year. Eight of the top 10 causes of PYLL are the same between males and females in Halton, however they may appear in a different order. Unique to males in the top 10 are unintentional poisonings and cirrhosis and other liver diseases. Unique to females in the top 10 are cancer of the breast and cancer of the ovary.

Table 4: PYLL, by sex, Halton Region, 2011-2015 combined

	Male	PYLL/year	Female	PYLL/year
1	Ischaemic heart disease	1070	Cancer of breast	735
2	Intentional self-harm	789	Perinatal conditions	511
3	Cancer of lung and bronchus	544	Cancer of lung and bronchus	482
4	Perinatal conditions	540	Cancer of lymph, blood and related	262
5	Unintentional poisoning	449	Cancer of colon, rectum, anus	255
6	Cancer of colon, rectum, anus	355	Intentional self-harm	246
7	Congenital malformations, deformations, chromosomal	329	Ischaemic heart disease	231
8	Cirrhosis and other liver diseases	291	Congenital malformations, deformations, chromosomal	207
9	Cancer of lymph, blood and related	289	Cancer of brain and nervous system	192
10	Cancer of brain and nervous system	269	Cancer of ovary	177

By Neighbourhood Income

Individual income data is not available for mortality records, so neighbourhood income is used as a proxy to show the relationship between mortality and income. For more information on the income indicator used in the analysis, please see the [Data Notes](#) page.



In Halton, the age-standardized rate of PYLL decreased as neighbourhood income increased, and this difference was statistically significant between all three neighbourhood income groups for both males and females. This means that males and those from neighbourhoods with lower income were more likely to die prematurely (before age 75) than females and those from neighbourhoods with higher income.

Figure 4: Age-standardized PYLL rate (per 100,000), by sex and neighbourhood income group, Halton Region 2011-2015 combined

Potentially Avoidable Mortality

Potentially avoidable mortalities are deaths that occur in people under the age of 75 that could potentially have been avoided. These include deaths that could have been avoided by preventing the disease from developing, or by preventing the event from occurring (e.g., unintentional poisoning) and are often linked to modifiable risk factors such as excessive alcohol consumption, smoking, and inactivity, or effective public health interventions such as vaccinations and traffic safety legislation. It also includes treatable mortalities which could have been avoided or delayed through early detection, screening, or treatment.

Figure 5 shows the breakdown of deaths occurring among Halton residents between 2011 and 2015, including the top three causes of death for each applicable category. Of all deaths that occurred in Halton residents, 32% occurred prematurely (under the age of 75), and 20% were considered to be potentially avoidable, of which 13% were considered to be preventable, and 7% treatable. Potentially avoidable mortality can be seen as a more actionable statistic than premature mortality. This is because potentially avoidable mortality considers the cause of death, whereas premature mortality does not consider cause of death and includes some deaths that may be unavoidable (e.g. deaths due to untreatable birth defects).

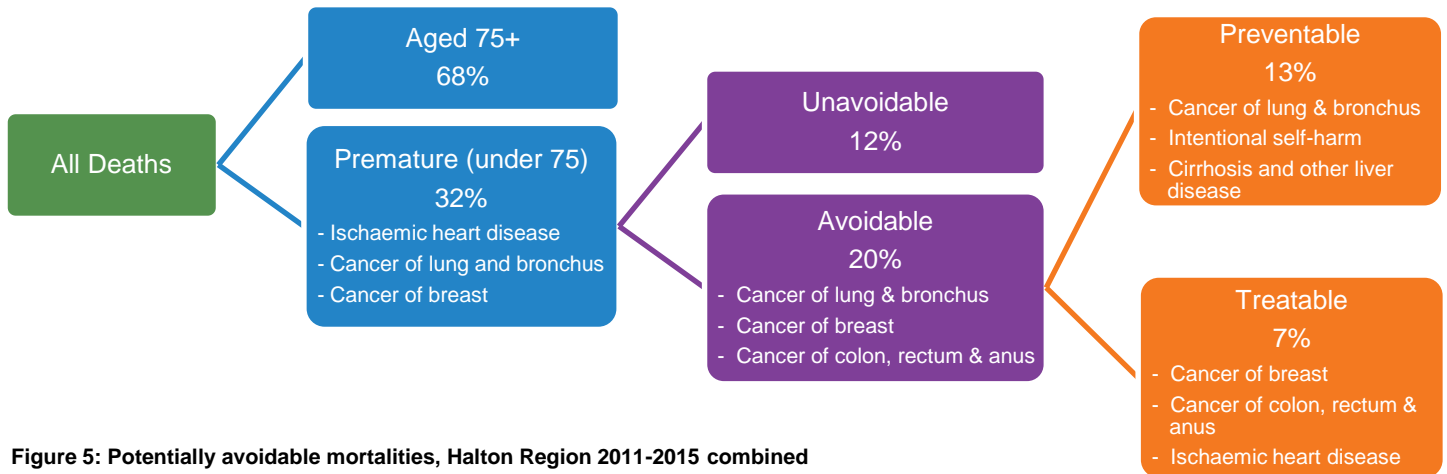


Figure 5: Potentially avoidable mortalities, Halton Region 2011-2015 combined

By Neighbourhood Income

Individual income data is not available for mortality records, so neighbourhood income is used as a proxy to show the relationship with mortality and income. For more information on the income indicator used in the analysis, please see the Data Notes page.

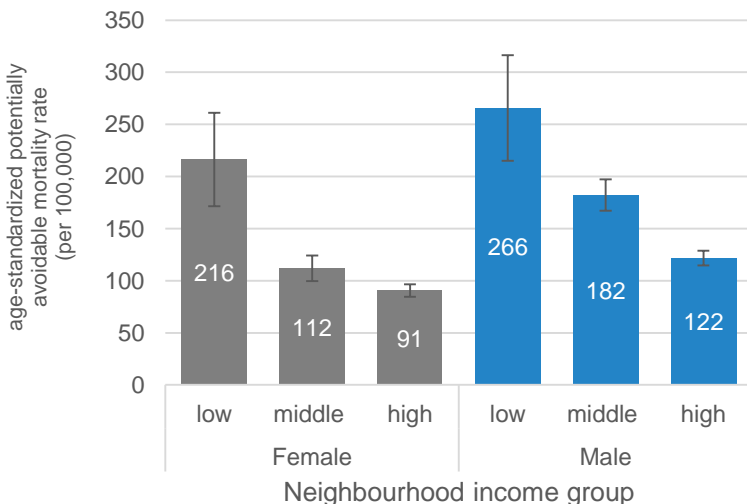


Figure 6: Age-standardized avoidable mortality rate (per 100,000), by sex and neighbourhood income group, Halton Region 2011-2015 combined

In Halton, the age-standardized rate of avoidable mortality decreased as neighbourhood income increased, and this difference was statistically significant between all three neighbourhood income groups for both males and females. This means that males and those from neighbourhoods with lower income were more likely to die from potentially avoidable causes than females and those from neighbourhoods with higher income. The most common causes of avoidable mortalities in Halton residents were: cancer of the lung and bronchus; cancer of the breast; cancer of the colon, rectum and anus; ischaemic heart disease; and intentional self-harm.

Data Notes

Data Sources:

Mortality Data: Vital Statistics: Ontario Mortality Data 2011-2015, Ontario Ministry of Health and Long-Term Care: IntelliHEALTH ONTARIO, date extracted: October, 2019.

Life expectancy estimates: Statistics Canada. Table 13-10-0389-01 Life expectancy, at birth and at age 65, by sex, three-year average, Canada, provinces, territories, health regions and peer groups. Date accessed: Dec 2019.

Population estimates for Halton and municipalities: Population Estimates [2011-2015], Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO, Date Extracted: November 2017.

Population estimates by Dissemination Area (DA) for income calculation: Statistics Canada, 2016 Census of Population, Statistics Canada Catalogue no. 98-311-XCB2011018.

Income indicator: Statistics Canada, 2016 Census of Population, Statistics Canada Catalogue no. 98-402-X2016001.

Postal code conversion file (PCCF): Canada Post Corporation, 2018. Postal Code Conversion File (PCCF). Released Dec, 2018.

Statistical Significance

95% confidence intervals were calculated for mortality rates. A 95% confidence interval (CI) refers to the range of values that has a 95% chance of including the true estimate. 95% CIs are reported in brackets or presented as “I” shaped bars in the graphs. When CIs do not overlap between two or more groups (e.g., when comparing Halton and Ontario rates) it means that the differences between the groups are statistically significant and unlikely to be due to chance alone. Rounded estimates and CIs are used for the presentation of data, however, non-rounded CIs were used to determine statistically significant differences.

Limitations

- Ontario residents who died outside of Ontario are not captured in this report.
- The sum of male and female rates may not equal the overall rate, as the overall rate includes those that indicated they were transsexual or did not have their sex listed.
- Halton Region contains two correctional facilities located in Milton: Maplehurst Correctional Complex and Vanier Centre for Women, as well as a number of long-term care facilities throughout the region. Residents living in both the correctional facilities and long-term care facilities are likely not captured in the census population counts for the appropriate DA, as only those who have been living in the facility for six or more months are counted. Therefore rates may appear higher for the DAs which contain these facilities, as deaths among residents in these facilities are captured in the numerator, but not necessarily in the denominator.
- Population counts by Dissemination Area (DA) are only available for census years (2015 in this report), however the analysis uses five years of mortality data combined, so for the income analysis the denominator was the 2015 population multiplied by five even though the population may have varied from year to year (especially in Milton). This may result in an underestimate of mortality rates by income as the denominator would be larger than actual population counts from 2011-2015. For all other rates in this report, population data for all of Halton was used for the years 2011 to 2015 combined.

Neighbourhood Income groups:

The 2016 census indicator “in the bottom half of the Canadian distribution” was used as a basis for the neighbourhood income groups. The term neighbourhood refers to a single Dissemination Area (DA). This indicator provides the percent of households per DA that were in the bottom half of the Canadian distribution based on adjusted household income. Using this value, all of the DAs in Canada were ranked into 10 equal groups (deciles), and then grouped as low (deciles 1-3), middle (deciles 4-7) or high (deciles 8-10). Since the actual income of individuals is not known, and may vary from their neighbourhood income, misclassification of individuals based on their neighbourhood income instead of household income may diminish the association between income and the indicator. Statistical significance between groups was determined using overlapping confidence intervals.

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