Report on the Demographic Situation in Canada

Mortality: Overview, 2014 to 2016

by Rufteen Shumanty, Demography Division

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Mortality: Overview, 2014 to 2016

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Highlights

- The number of deaths recorded in Canada in a single year reached its highest level in 2016: 267,213.

- In 2016, the number of deaths in winter was 11% higher than the number of deaths during the summer.

- In 2016, the infant mortality rate in Canada established to 4.5 deaths per 1,000 live births, the same value as in 2015. It's the lowest rate on record in Canada.

- More than half (52%) of the infants (children less than one year old) who died in Canada in 2016 died within 24 hours of birth.

- Life expectancy at birth has improved significantly since the early 20th century, peaking in the 2014/2016 period (79.9 years for men and 84.0 years for women).

Key statistics in Canada

Number of deaths in 2016:
Total:	267,213
Men:	135,772
Women:	131,441

Infant mortality rate in 2016:
4.5 deaths per 1,000 live births

Life expectancy at birth in 2014/2016:
Both sexes:	82.0 years
Men:	79.9 years
Women:	84.0 years

Life expectancy at age 65 in 2014/2016:
Both sexes:	20.8 years
Men:	19.3 years
Women:	22.1 years

This article presents data on deaths in Canada and analyzes recent trends in mortality, including variations at the provincial and territorial levels. Data from Statistics Canada's Demographic Estimates Program (DEP) were used as denominators to calculate various indicators. As numerators, data on the number of deaths come from the Canadian Vital Statistics Deaths Database (Survey 3233).[1] The life tables for the periods from 1980/1982 to 2014/2016 are found in the publication *Life Tables, Canada, Provinces and Territories* (catalogue no. 84-537).

The overview of mortality in Canada is developed using several indicators, including the number of deaths, crude and standardized mortality rates, life expectancy at different ages, probabilities of dying, infant mortality rates and seasonality of deaths. Where relevant, the data are also analyzed by province and territory, as well as by age and sex.

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1. The number of deaths in Ontario for 2016 is considered preliminary.

Number of deaths, crude and standardized mortality rates

There were 267,213 deaths in Canada in 2016. This is the highest level since the Vital Statistics registration system was introduced in the 1920s. The number of deaths recorded each year in Canada is generally trending upward (Figure 1).

Figure 1

Number of deaths, crude and standardized mortality rates, Canada, 2007 to 2016
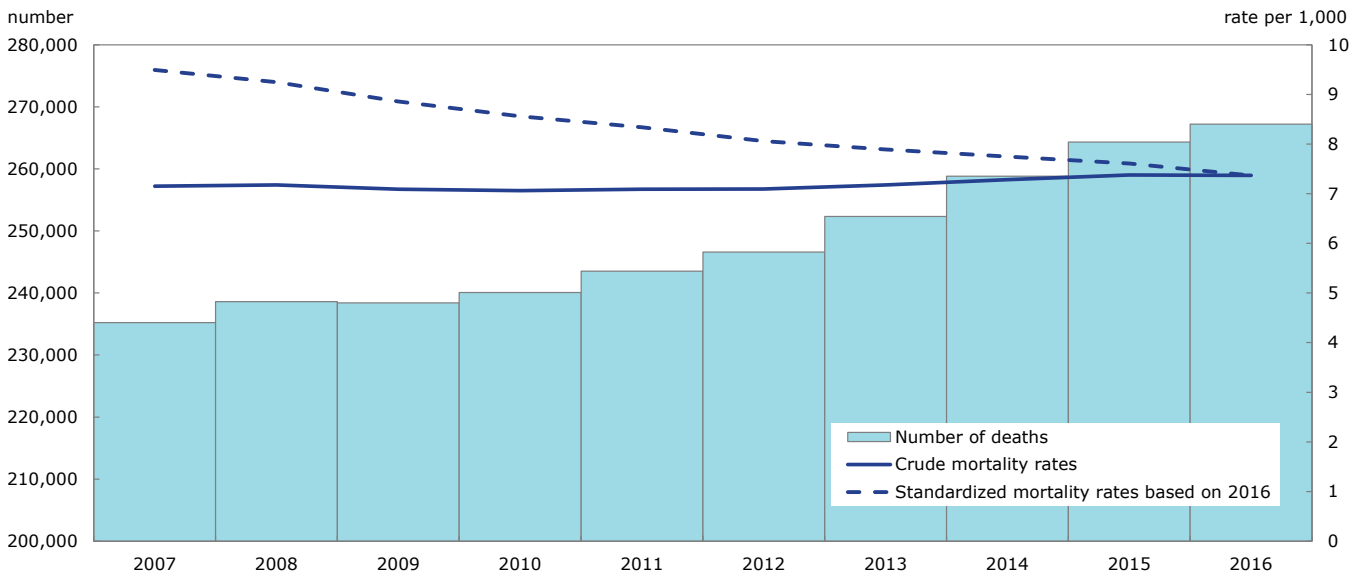
Note: Data used was the most recent available at time of dissemination.
Sources: Statistics Canada, Canadian Vital Statistics, Deaths Database, 2007 to 2016, Survey 3233 and Demography Division, Demographic Estimates Program (DEP).

The increase in the number of deaths can mostly be explained by two factors: population growth (a larger population generates a higher number of deaths) and population aging, which tends to increase the concentration of people at advanced ages, where the mortality is higher. This concentration should increase in the coming years because of the aging of the baby-boom cohort, i.e., those born between 1946 and 1965, and its sizable demographic weight in the Canadian population.

The crude mortality rate (number of deaths per 1,000 population) was 7.4 per 1,000 in 2016. It has been relatively stable since 2007, averaging 7.2 per 1,000. The aging population age structure puts strong upward pressure on this rate. Conversely, the evolution of the age-standardized mortality rate,[2] irrespective of the changes in the population age structure, shows that the intensity of mortality has gradually declined over time. And so, over the last 10 years, the standardized rate fell from 9.5 per 1,000 in 2007 to 7.4 per 1,000 in 2016, a 22% decrease (Figure 1).

Similar to Canada, an upward trend in the number of deaths was observed in the provinces and territories (Table 1), although some regions, most of which have smaller populations, have recorded a decline in certain years. The number of recorded deaths in 2016 reached unprecedented levels in 5 out of the 10 provinces, that is, Ontario, Manitoba, Saskatchewan, Alberta and British Columbia.

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2.   Age-specific mortality rates for each year were also applied to the 2016 reference population.

Table 1
Number of deaths and crude mortality rate, Canada, provinces and territories, 2007 to 2016

Year	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.	Nvt.	Canada
							number							
2007	4,505	1,147	8,353	6,324	56,521	87,340	9,958	9,062	20,202	31,308	192	174	129	235,217
2008	4,539	1,201	8,220	6,450	57,106	88,041	10,073	9,243	21,079	32,095	198	201	147	238,617
2009	4,391	1,268	8,227	6,366	57,769	88,468	9,972	8,972	20,987	31,440	201	186	162	238,418
2010	4,481	1,116	8,295	6,312	58,806	89,282	9,985	9,205	20,755	31,324	198	184	132	240,075
2011	4,527	1,253	8,533	6,411	59,539	89,976	10,250	9,262	21,242	31,966	193	188	171	243,511
2012	4,635	1,231	8,415	6,443	60,774	90,740	10,062	9,204	22,001	32,524	206	200	161	246,596
2013	4,837	1,284	8,878	6,627	61,289	93,343	10,095	9,333	22,844	33,200	215	199	194	252,338
2014	4,986	1,286	8,746	6,822	63,195	95,939	10,709	9,393	23,360	33,791	206	213	175	258,821
2015	5,239	1,261	9,371	7,226	64,159	97,322	10,684	9,394	23,846	35,246	217	208	160	264,333
2016	5,002	1,148	8,994	7,165	63,515	99,419	10,743	9,414	24,548	36,627	218	237	183	267,213
							rate per 1,000							
2007	8.9	8.3	8.9	8.5	7.3	6.8	8.4	9.0	5.7	7.3	5.9	4.0	4.1	7.2
2008	8.9	8.7	8.8	8.6	7.4	6.8	8.4	9.1	5.9	7.4	6.0	4.6	4.6	7.2
2009	8.5	9.1	8.8	8.5	7.4	6.8	8.3	8.7	5.7	7.1	6.0	4.3	5.0	7.1
2010	8.6	7.9	8.8	8.4	7.4	6.8	8.2	8.8	5.6	7.0	5.7	4.3	4.0	7.1
2011	8.6	8.7	9.0	8.5	7.4	6.8	8.3	8.7	5.6	7.1	5.5	4.3	5.0	7.1
2012	8.8	8.5	8.9	8.5	7.5	6.8	8.0	8.5	5.7	7.2	5.7	4.6	4.6	7.1
2013	9.2	8.8	9.4	8.8	7.5	6.9	8.0	8.4	5.7	7.2	5.9	4.5	5.5	7.2
2014	9.4	8.8	9.3	9.0	7.7	7.0	8.4	8.4	5.7	7.3	5.6	4.9	4.9	7.3
2015	9.9	8.6	10.0	9.6	7.8	7.1	8.2	8.3	5.7	7.5	5.8	4.7	4.4	7.4
2016	9.4	7.7	9.5	9.5	7.6	7.1	8.2	8.2	5.8	7.7	5.7	5.3	4.9	7.4

Notes: The number of deaths in Ontario for 2016 is considered preliminary. Deaths for which the province is unknown were prorated using the observed distribution to calculate the rates. The total number of deaths for Canada includes unknown provinces. Data used was the most recent available at time of dissemination.
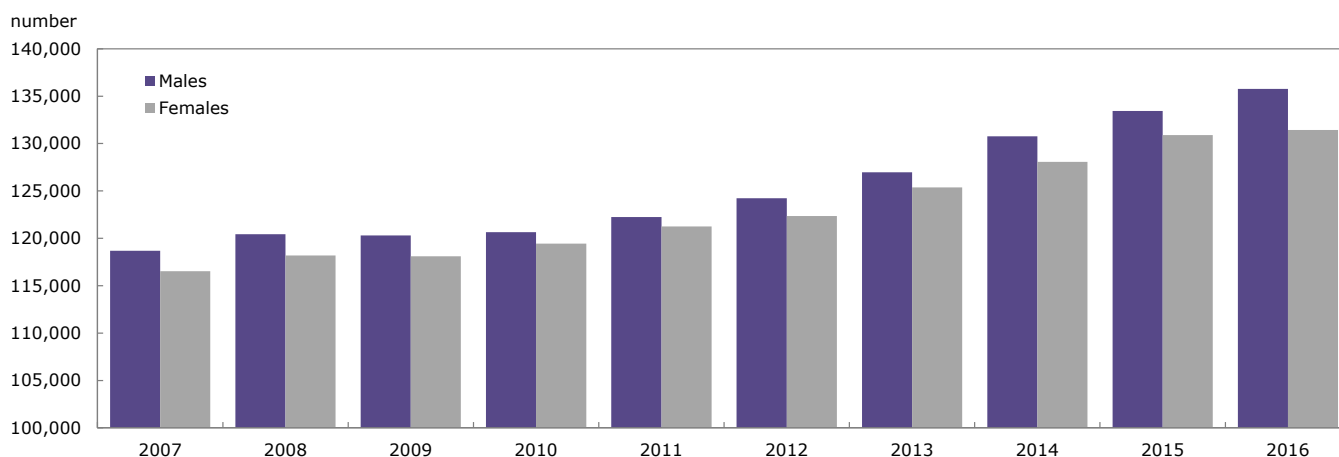**Sources**: Statistics Canada, Canadian Vital Statistics, Deaths Database, 2007 to 2016, Survey 3233 and Demography Division, Demographic Estimates Program (DEP).

Number of deaths by sex

In 2016, there were more male deaths (135,772) than female deaths (131,441) (Figure 2). The gap between sexes has narrowed over the last three decades because female deaths have been increasing faster than male deaths. This trend is partly explained by women's lifestyles becoming similar to men's, such as labor market participation.

In 2016, the age at which the highest number of deaths was registered was 84 years for males and 90 years for females. For males, three-quarters (75%) of deaths occurred at age 65 or older, compared with 84% for females.

Figure 2
**Number of deaths by sex, Canada, 2007 to 2016**

Note: Deaths for which the sex is unknown were prorated using the observed distribution.
Source: Statistics Canada, Canadian Vital Statistics, Deaths Database, 2007 to 2016, Survey 3233.

Seasonality of deaths

In 2016, there were on average 22,268 deaths in Canada per month and 730 deaths on average per day (Figure 3). The highest daily average was registered in December, with 788 deaths per day.

Average daily number of deaths by month, Canada, 2016
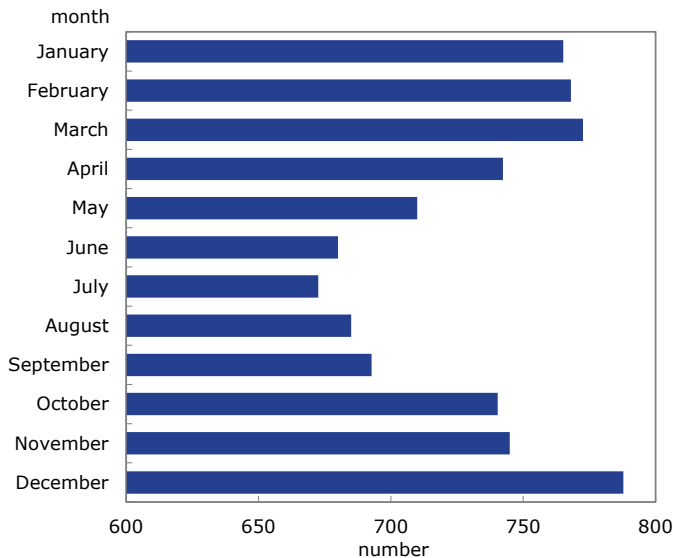
Source: Statistics Canada, Canadian Vital Statistics, Deaths Database, 2016, Survey 3233.

In 2016, the second-highest daily average was in March, at 773 deaths.[3] October, November, December, January, February, March and April each had an average daily number of deaths higher than the annual average. The lowest daily average number of deaths was recorded in July (673 deaths per day).

According to Rau (2007), the death peaks in the winter are linked to three main causes of death which are cardiovascular, cerebrovascular, and respiratory diseases. The latter group has the strongest seasonal pattern among all major groups of causes of death (Rau 2007). Cold temperatures have a physiological impact on the human body, and cold temperatures combined with low relative humidity rates are ideal for influenza virus transmission (Lowen et al. 2007). Furthermore, winter brings about behavioural changes that exacerbate respiratory ailments. People are more likely to congregate in heated houses, which increases the risk of droplet transmission of infectious agents (Evans 1991; Glezen and Couch 1997).

The winter/summer ratio, as proposed by Rau (2017), is the number of winter deaths (January to March) divided by the number of summer deaths (July to September). A value of one indicates no seasonal difference in total deaths. In 2016, the ratio for Canada was 1.11, meaning that there were 11% more deaths in the winter than in the summer (Figure 4). From 2007 to 2016, the winter/summer ratio for all deaths in Canada averaged 1.13, ranging from a low of 1.06 in 2010 to a high of 1.20 in 2015.

Figure 4

Winter to summer death ratio, Canada, 2007 to 2016

Source: Statistics Canada, Canadian Vital Statistics, Deaths Database, 2007 to 2016, Survey 3233.

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3. The average number of deaths per day each month takes into account the different number of days per month, including leap years.

Life expectancy in Canada

Period life expectancy

Period life expectancy is the average number of years individuals of a given population would live if, throughout their lives, they experienced the age-specific probabilities of dying observed during a given calendar year or a given period. Although crude and standardized mortality rates provide insight into changes in mortality, experts often prefer period life expectancy.

Period life expectancy provides a snapshot of mortality irrespective of the age structure. Life expectancy at a given age is the average number of years someone of that age can expect to live. At Statistics Canada, life expectancy is based on age-specific mortality rates calculated using three-year data. It can be used to track mortality changes in Canada in provinces and territories while minimizing fluctuations related to small populations.

Period life expectancy must be distinguished from cohort life expectancy, which is the actual average number of years lived by a group of individuals born in a given year. The life expectancy of a specific cohort can only be calculated once that cohort is almost or totally extinct.

In Canada, life expectancy at birth has risen significantly over the years and reached a peak in 2014/2016 at 82.0 years for both sexes (Table 2). In 2014/2016, life expectancy at birth has reached 84.0 years for women and 79.9 years for men. It's an increase of 0.1 year, for each sex, compared to the values recorded for the period 2013/2015.

Every year over the past 10 years, life expectancy at birth has increased an average of 2.4 months for men and 1.7 months for women (Figure 5). However, the recent gains have been smaller, for example, from 2011/2013, its 1.2 months among men and 0.8 months among female. After peaking at 7.4 years at the end of the 1970s, the gap in life expectancy at birth between men and women decreased to 4.1 years in 2014/2016. Men have caught up with women mostly because the gaps in mortality associated with cardiovascular disease between men and women narrowed (Waldron 1993; Trovato and Lalu 1995; Pampel 2002; Meslé 2004; Trovato and Heyen 2006; Trovato 2007, cited in Bourbeau and Ouellet 2016). Among women, cardiovascular disease is often associated with them adopting similar lifestyles to men, such as labour market participation, smoking levels and alcohol consumption (Pampel 2002; Trovato and Heyen 2006; Trovato 2007).
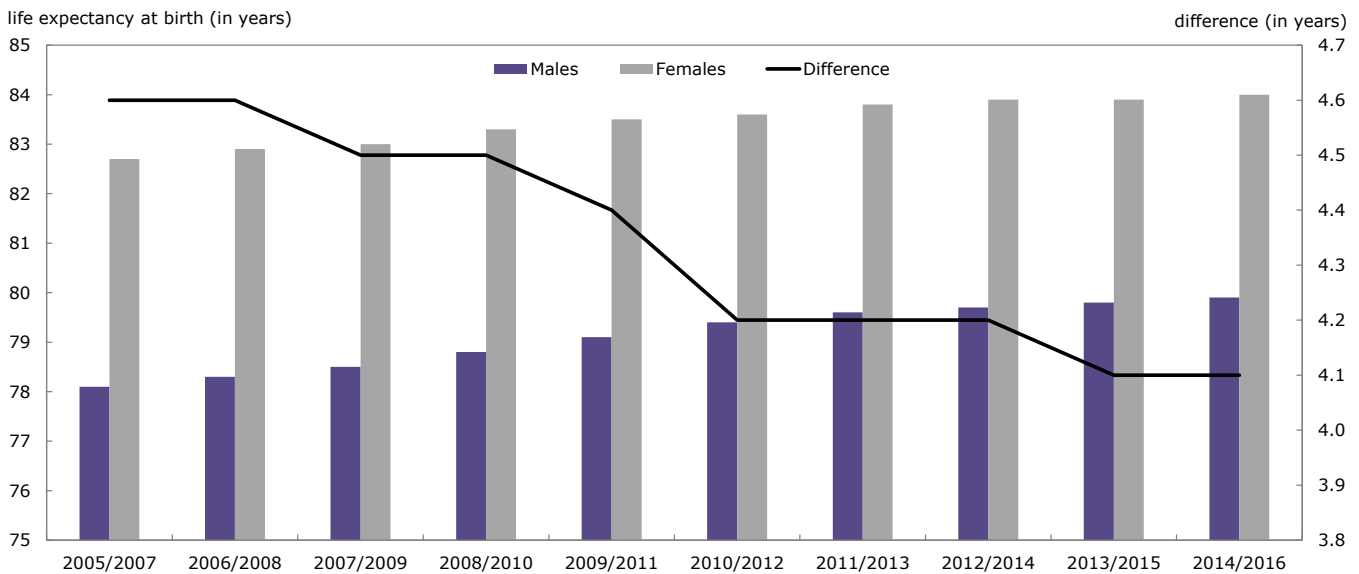
Table 2
Life expectancy at birth, at age 65 and at age 85, males, females and both sexes, Canada, 2005/2007 to 2014/2016

Period	At birth			At age 65			At age 85		
	Males	**Females**	**Both sexes**	**Males**	**Females**	**Both sexes**	**Males**	**Females**	**Both sexes**
					in years				
2005/2007	78.1	82.7	80.5	17.9	21.0	19.6	5.7	7.1	6.6
2006/2008	78.3	82.9	80.7	18.0	21.2	19.7	5.8	7.2	6.7
2007/2009	78.5	83.0	80.8	18.2	21.3	19.9	5.8	7.2	6.7
2008/2010	78.8	83.3	81.1	18.4	21.5	20.1	6.0	7.3	6.8
2009/2011	79.1	83.5	81.4	18.6	21.6	20.3	6.1	7.4	6.9
2010/2012	79.4	83.6	81.6	18.8	21.8	20.4	6.2	7.5	7.0
2011/2013	79.6	83.8	81.7	19.0	21.9	20.5	6.3	7.5	7.1
2012/2014	79.7	83.9	81.8	19.1	22.0	20.6	6.3	7.6	7.1
2013/2015	79.8	83.9	81.9	19.2	22.0	20.7	6.4	7.6	7.2
2014/2016	79.9	84.0	82.0	19.3	22.1	20.8	6.5	7.7	7.3

Note: Data used was the most recent available at time of dissemination.
Source: Statistics Canada. *Life Tables, Canada, Provinces and Territories*, catalogue no. 84-537-X.

Figure 5

Life expectancy at birth by sex and difference between sexes, Canada, 2005/2007 to 2014/2016

life expectancy at birth (in years)

difference (in years)

Note: Data used was the most recent available at time of dissemination.
Source: Statistics Canada. *Life Tables, Canada, Provinces and Territories*, catalogue no. 84-537-X.

Life expectancy at age 65 has also increased over the last 10 years, reaching 19.3 years for men and 22.1 years for women (Table 2). By way of comparison, in 2005/2007, it was 17.9 years for men and 21.0 years for women. Since 2005/2007, declining mortality rates beyond age 65 has accounted for roughly 78% of the gains in life expectancy at birth for men (1.4 year of the 1.8-year gain) and for 85% for women (1.1 year of the 1.3-year gain). The 2014/2016 period life table shows that 90% of newborns would survive to age 65 if, throughout their lives, they were exposed to the mortality risks observed during this period. Since 2004/2006, the probability of surviving between ages 65 and 85 has increased from 51% to 57%.

Based on data from the Organisation for Economic Co-operation and Development (OECD), Canada ranked 16th among OECD countries, with a life expectancy at birth of 81.7 years for both sexes combined. The highest life expectancies at birth in 2015 were in Japan (83.9 years), Spain and Switzerland (83.0 years) and Italy (82.6 years) (OECD 2017).

Life expectancy in the provinces and territories

The highest life expectancies at birth among provinces and territories for 2014/2016 were in British Columbia and Ontario at 82.5 years for both sexes combined. For the first time since 1992/1994, life expectancy at birth among men in British Columbia has been exceeded by another province which is Ontario (Figure 6). However, British Columbia has led the other provinces and territories since the 1994/1996 period for women (84.6 years in 2014/2016).

In 2014/2016, the lowest life expectancies are in the territories. The lowest life expectancy in the country was in Nunavut, where men could expect to live 70.3 years and women 73.1 years. The difference in life expectancy at birth with Canada was 9.6 years for men and 10.9 years for women.

Figure 6

Life expectancy at birth by sex, Canada, provinces and territories, 2014/2016
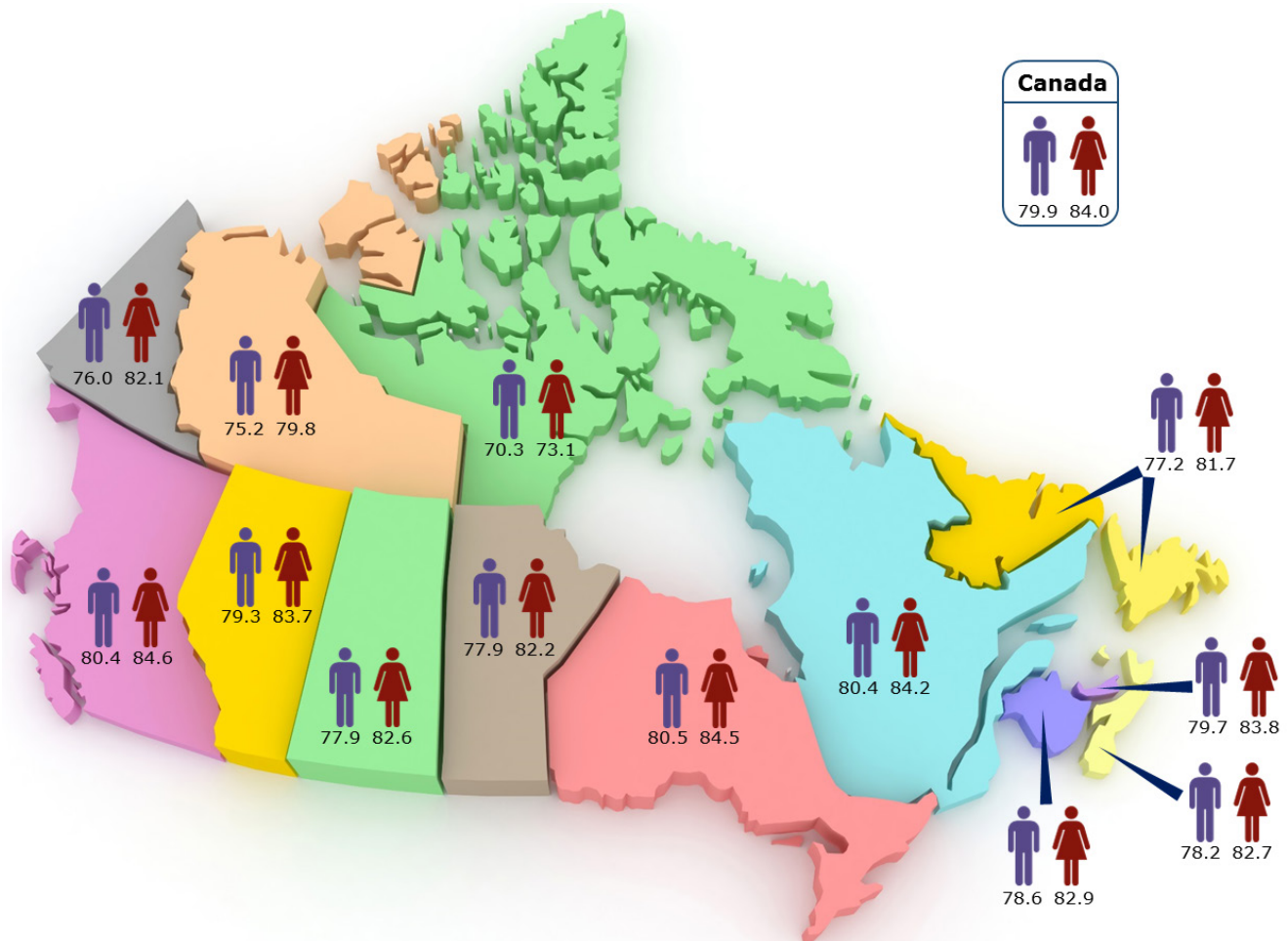
Notes: The number of deaths in Ontario for 2016 is considered preliminary. Data used was the most recent available at time of dissemination.
Source: Statistics Canada. *Life tables, Canada, provinces and territories*, catalogue no. 84-537-X.

Mortality gaps between men and women by age

Over a lifespan, the probabilities of death, representing the probability of an individual dying at each age, follow a pattern similar to a checkmark: the probability of death is higher in the first year of life, then quickly decreases to the lowest level between ages 1 and 14 (Figure 7). The probability then reaches a higher level between approximately 15 and 24 years of age (especially among males), mainly because of violent deaths such as accidents and suicides. After that, probability of death increases steadily with age.

Probabilities of dying are generally higher for males than for females. In 2014/2016, excess male mortality was more pronounced among those aged 16 to 80, with ratios of 1.5 and higher (Figure 8). The gap was highest among young men 19 to 31 years, whose probability of dying was 2.3 times higher on average than women of the same age.

However, over the last 10 years, excess male mortality has decreased at all ages, particularly between 9 and 29 years of age. For example, the probability of dying for males in their early twenties was 2.6 times higher than that of females in 2005/2007, compared with 2.2 times higher in 2014/2016.

Figure 7

Death probabilities by age and sex, Canada, 2014/2016

death probability (logarithmic scale)
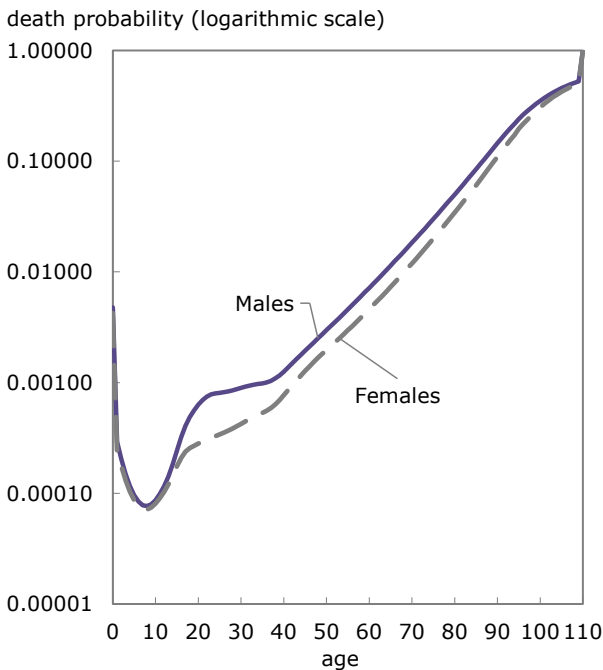
Notes: The death probability at age 110 is equal to 1 and represents the probability for the open age group of 110 and over. Data used was the most recent available at time of dissemination.
Source: Statistics Canada. *Life tables, Canada, provinces and territories*, catalogue no. 84-537-X.

Figure 8

Ratio of probabilities of dying between females and males by age, Canada, 2005/2007 and 2014/2016

ratio
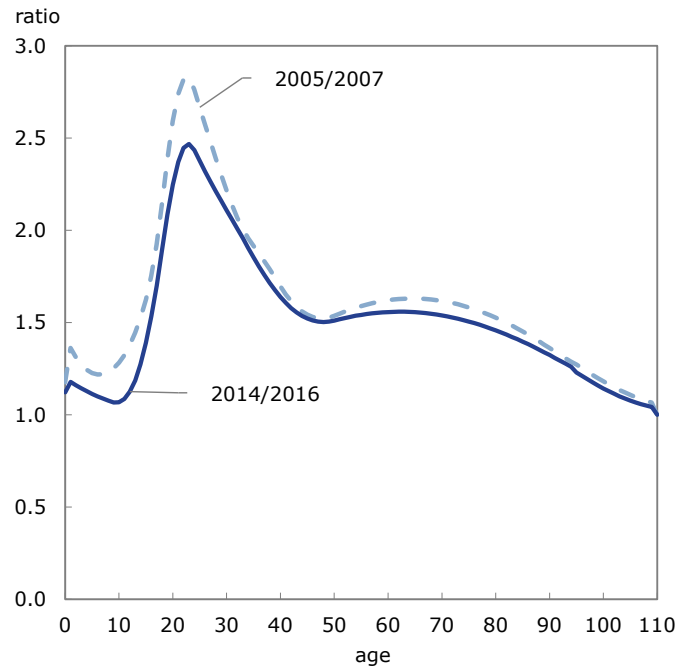
Notes: Deaths for which the age is unknown were prorated using the observed distribution. The probability of dying at age 110 is equal to 1 and represents the probability for the open age group of 110 and over. Data used was the most recent available at time of dissemination.
Source: Statistics Canada. *Life tables, Canada, provinces and territories*, catalogue no. 84-537-X.

Infant mortality

Various infant mortality indicators

Infant mortality (before 1 year of age): death during the first year of life.

Less than one day: death during the first 24 hours of life.

Early neonatal mortality (0 to 6 days): death during the first week of life.

Late neonatal mortality (7 to 27 days): death between the first week and the first month of life.
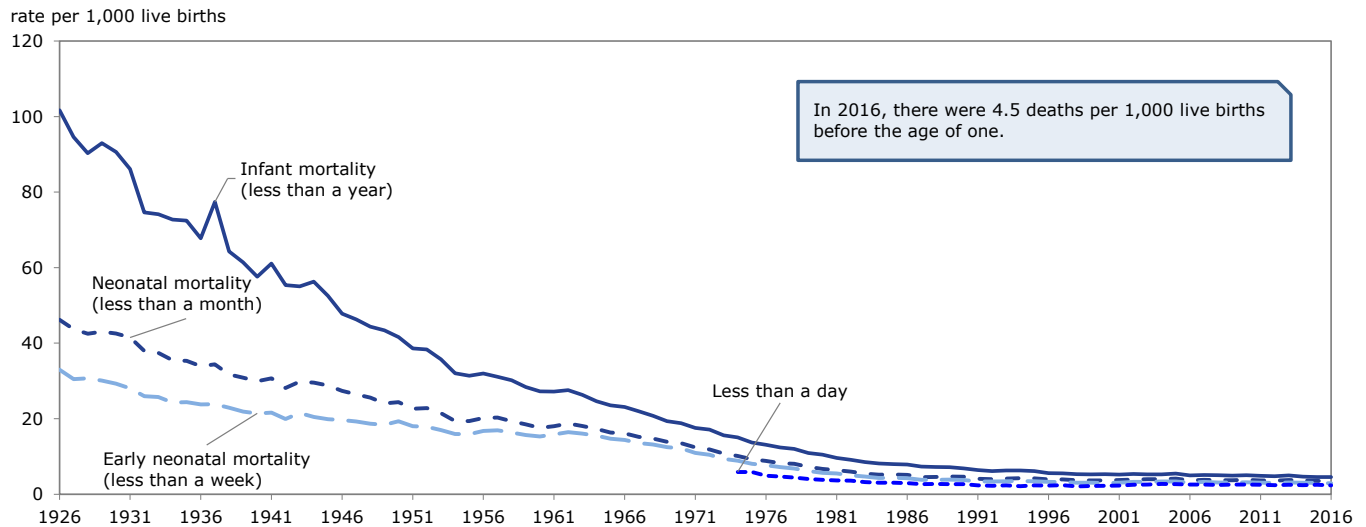
Neonatal mortality (0 to 27 days): death during the first month of life.

Post-neonatal mortality (28 to 364 days): death between the first and twelfth month of life.

In 2016, the infant mortality rate in Canada established to 4.5 deaths per 1,000 live births, the same value as in 2015. It's the lowest rate on record in Canada. Mortality in children younger than one year old has decreased sharply in recent decades; a child born in Canada in 1926 was 22 times more likely to die before his first birthday than a child born in 2016 (Figure 9). Back then, infant mortality was 101.7 per 1,000 live births, meaning that 1 in 10 children did not make it to age one. Over the last 10 years, the infant mortality rate has remained virtually unchanged, averaging 4.8 deaths per 1,000 live births.

Figure 9

Infant, neonatal, early neonatal and less than a day mortality rates, Canada, 1926 to 2016

rate per 1,000 live births

In 2016, there were 4.5 deaths per 1,000 live births before the age of one.

Notes: Deaths for which the age is unknown were prorated using the observed distribution. Infant mortality refers to deaths of infants aged 0 to 364 days. Neonatal mortality refers to deaths of infants aged 0 to 27 days. Early neonatal mortality refers to deaths of infants aged 0 to 6 days. Less than a day refers to deaths of infants aged less than 24 hours.
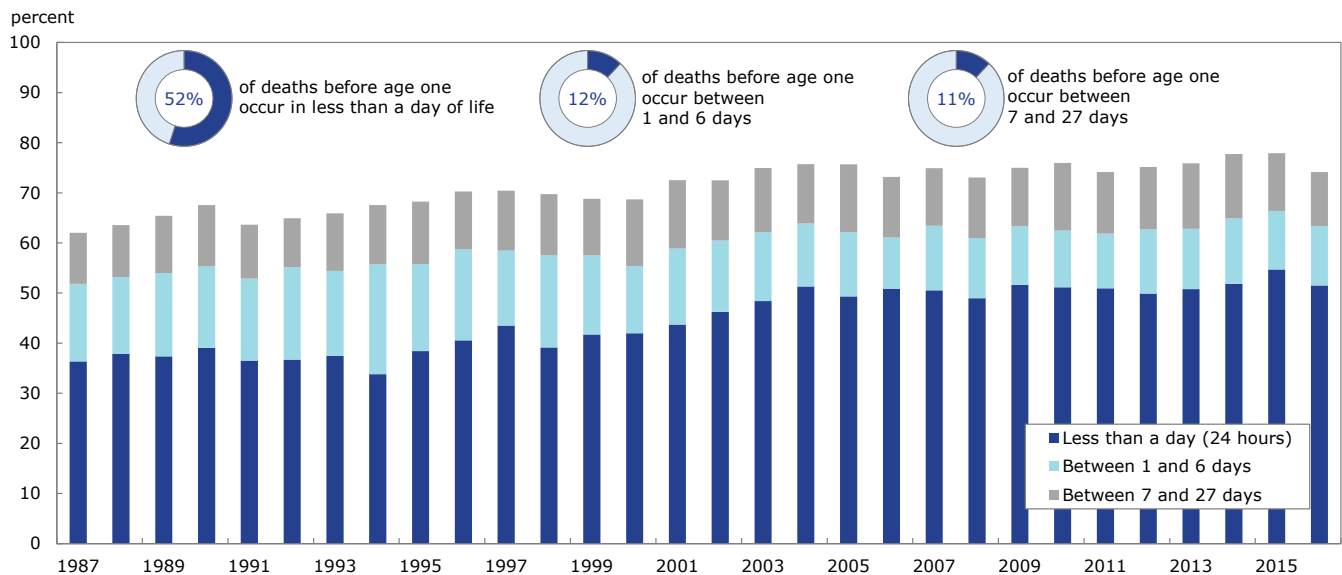**Sources**: Statistics Canada, Canadian Vital Statistics, Deaths Database, 1926 to 2016, Survey 3233 and Births Database, 1926 to 2016, Survey 3231.

Changes in neonatal mortality

Nearly 52% of the 1,741 infants who died in Canada in 2016 died within the first day of life. Roughly 12% of these infants died between 1 and 6 days of life, and 11% between 7 and 27 days of life (Figure 10). Therefore, deaths occurring in the first month of life accounted for 74% of all deaths that occurred in the first year of life in Canada in 2016. In comparison, 30 years earlier, the corresponding proportions were 37% for the first day of life, 17% between 1 and 6 days, and 11% between 7 and 27 days. The proportion of deaths occurring within 24 hours of birth has grown since the 1980s; these deaths are often the result of congenital anomalies or pregnancy complications which are difficult to treat (endogenous mortality).

Figure 10

Component of neonatal mortality (during the first month) in infant mortality, Canada, 1987 to 2016

Notes: Deaths for which the age is unknown were prorated using the observed distribution. Neonatal mortality refers to deaths of infants aged 0 to 27 days.

Sources: Statistics Canada, Canadian Vital Statistics, Deaths Database, 1987 to 2016, Survey 3233.

International comparison of infant mortality in Canada

Because of variations in the methods used to register deaths, special caution should be exercised when interpreting international comparisons of infant mortality. For example, as opposed to the method used in Canada, several countries only register the deaths of babies weighing 500 grams or more; the deaths of babies who weighed very little and stood almost no chance of survival at birth are not counted. Therefore, for most countries, the OECD publishes infant mortality rates covering children with a birth weight of at least 500 grams. For comparison purposes, adjusted infant mortality rates for Canada are used and exclude live births with a birth weight of less than 500 grams.

In 2015, the adjusted infant mortality rate[4] in Canada was lower than the averages for European Union countries (EU) and for OECD countries. The average for the EU[5] was 3.7 and the average for OECD countries[6] was 3.9 deaths per 1,000 live births, compared with 3.4 in Canada.

In 2015, Slovenia ranked first among OECD countries with 1.6 deaths per 1,000 live births, followed by Finland (1.7), Iceland (2.0) and Japan (2.1). Canada ranked 20th with 3.4 deaths per 1,000 live births.

Infant mortality in the provinces and territories

In 2016, infant mortality rates decreased in most provinces and territories. Infant mortality varies considerably from one province or territory to another (Table 3). In 2016, the lowest rate was in British Columbia, at 3.4 deaths per 1,000 live births, while the highest rate was in Nunavut (17.7 deaths per 1,000 live births). From 2007 to 2016, the infant mortality rate in Nunavut was nearly three times the national average. Over the last 10 years, the highest infant mortality rates among the provinces have been, on average, in Manitoba and Saskatchewan.

Table 3
Number and rate of infant mortality, Canada, provinces and territories, 2007 to 2016

Year	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.	Nvt.	Canada
							number							
2007	34	7	29	31	379	723	111	77	296	176	3	3	12	1,881
2008	25	3	32	24	379	753	101	85	317	166	2	7	13	1,911
2009	31	5	31	43	389	705	100	96	284	161	3	11	13	1,872
2010	26	5	41	25	440	695	106	84	299	166	2	1	12	1,902
2011	28	6	43	25	399	664	120	97	267	171	0	5	24	1,849
2012	25	5	40	40	441	684	92	80	223	166	1	3	18	1,818
2013	29	3	29	33	438	681	93	111	285	161	1	5	15	1,884
2014	28	2	38	28	383	641	103	88	275	187	2	4	15	1,794
2015	21	3	34	27	417	618	107	81	262	148	4	4	11	1,737
2016	19	10	41	34	368	659	93	90	248	156	3	4	16	1,741
							rate per 1,000							
2007	7.5	5.0	3.3	4.3	4.5	5.2	7.3	5.8	6.0	4.0	8.5	4.1	15.1	5.1
2008	5.1	2.0	3.5	3.2	4.3	5.4	6.5	6.2	6.2	3.8	5.4	9.7	16.2	5.1
2009	6.3	3.4	3.4	5.8	4.4	5.0	6.3	6.7	5.5	3.6	7.8	15.5	14.8	4.9
2010	5.3	3.6	4.6	3.4	5.0	5.0	6.7	5.9	5.9	3.8	5.2	1.4	14.5	5.0
2011	6.3	4.2	4.9	3.5	4.5	4.7	7.7	6.8	5.2	3.9	0.0	7.2	28.7	4.9
2012	5.7	3.8	4.6	5.7	5.0	4.8	5.6	5.4	4.2	3.8	2.3	4.4	21.4	4.8
2013	6.4	2.1	3.4	4.7	4.9	4.9	5.6	7.5	5.3	3.7	2.5	7.5	16.4	5.0
2014	6.1	1.4	4.4	4.0	4.4	4.6	6.2	5.7	4.9	4.2	4.9	6.0	16.7	4.7
2015	4.7	2.2	4.1	4.1	4.8	4.4	6.4	5.3	4.6	3.3	9.2	5.9	12.8	4.5
2016	4.3	7.1	4.9	5.1	4.3	4.7	5.5	5.8	4.4	3.4	6.8	6.2	17.7	4.5

Notes: The number of deaths and births in Ontario for 2016 is considered preliminary. Deaths for which the province is unknown were prorated using the observed distribution to calculate the rates. The total number for Canada includes unknown provinces. Data used was the most recent available at time of dissemination.
Sources: Statistics Canada, Canadian Vital Statistics, Deaths Database, 2007 to 2016, Survey 3233 and Births Database, 2007 to 2016, Survey 3231.

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4. Infant mortality rates adjusted for borderline viable birth weight are calculated as follows: (subtract the number of live births with a birth weight of less than 500 grams from the unadjusted infant death counts in the same year) and divide by (the number of births for the same year with a known birth weight of greater than 499 grams). Statistics Canada, Table 13-10-0368-01: Infant mortality, by birth weight.

5. Eurostat. 2018. *Statistics Explained: Mortality and life expectancy statistics*.

6. OECD. 2017. *Health at a Glance 2017: OECD Indicators*, OECD Publishing, Paris.

Bibliography

Bourbeau, R. and N. Ouellet. 2016. "Trends, Patterns and Differentials in Canadian Mortality Over Nearly a Century (1921-2011)", *Canadian Studies in Population*, volume 43, no. 1-2, pages 48 to 77.

Eurostat. 2018. *Statistics Explained: Mortality and life expectancy statistics*, http:ec.europa.eu/eurostat/statistics-explained/index.php?title=Mortality_and_life_expectancy_statistics.

Evans, A.S. 1991. "Epidemiological Concepts and Methods", *Viral Infections of Humans: Epidemiology and Control*, 3rd edition, New York, Plenum Medical Book Company, pages 3 to 49.

Glezen, W.P. and R.B. Couch. 1997. "Influenza Viruses", *Viral Infections of Humans: Epidemiology and Control*, 4th edition, New York, Plenum Medical Book Company, pages 473 to 505.

Lowen, A.C., S. Mubareka, J. Steel and P. Palese. 2007. "Influenza Virus Transmission Is Dependent on Relative Humidity and Temperature", *PLoS Pathogens*, volume 3, no. 10, pages 1,470 to 1,476.

Meslé, F. 2004. "Écart d'espérance de vie entre les sexes : les raisons du recul de l'avantage féminin", *Revue d'épidémiologie et de santé publique*, volume 52, no. 4, pages 333 to 352.

OECD. 2017. *Health at a Glance 2017: OECD Indicators*, OECD Editions, Paris, http : //dx.doi.org/10.1787/health_glance-2017-en.

Pampel, F.C. 2002. "Cigarette Use and the Narrowing Sex Differential in Mortality", *Population and Development Review*, volume 25, no. 1, pages 77 to 104.

Rau, R. 2007. *Seasonality in Human Mortality: A Demographic Approach*, New York, Springer, page 41.

Statistics Canada. 2018. Table 13-10-0368-01: Infant mortality, by birth weight, viewed April 30, 2018.

Statistics Canada. 2018. *Life Tables, Canada, Provinces and Territories*, catalogue no. 84-537.

Trovato, F. and N.M. Lalu. 1995. "Narrowing Sex Differential in Life Expectancy in Canada Since 1971", *Canadian Studies in Population*, volume 22, no. 2, pages 145 to 167.

Trovato, F. and N.B. Heyen. 2006. "A Varied Pattern of Change of the Sex Differential in Survival in the G7 Countries", *Journal of Biosocial Science*, volume 38, no. 3, pages 391 to 401.

Trovato, F. 2007. "Narrowing Sex Differential in Life Expectancy in Canada", *The Changing Face of Canada. Essential Reading in Population*, Toronto, CSPI, pages 127 to 140.

Waldron, I. 1993. "Recent Trends in Sex Mortality Ratios for Adults in Developed Countries", *Social Science & Medicine*, volume 36, no. 4, pages 451 to 462.