

LIFE EXPECTANCY

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Life expectancy is an estimate of the number of years a person would be expected to live, based on age- and sex-specific mortality rates for a given period, under the assumption that these mortality rates would stay constant over subsequent years. Life expectancy, which can be used to compare groups across years, geographical areas or characteristics, is a common indicator of population health.

Life expectancy differs from “average length of life,” which is based on multiple years of mortality data for persons born in the same year.¹ As well, life expectancy must be distinguished from “disability-free life expectancy,” which refers to years lived outside a health institution or without major activity limitations.² While increased life expectancy does not necessarily result in improved quality of life or better health, a long life generally implies better health.

Male-female gap narrowing

In 2002, average life expectancy at birth in Canada was 79.7 years: 77.2 years for men and 82.1 years for women. Half a century earlier in 1951, men’s life expectancy had been 66.3 years, and women’s, 70.8 years, or about 11 years less for each sex.

Although women maintained an advantage over men throughout the period, two opposing trends can be observed in the male-female differences in life expectancy. From 1951 to 1976, the gap

widened from 4.5 to 7.3 years, owing to faster gains for women. The next quarter century saw the gap narrow, as life expectancy increased more rapidly for men than for women. In 2002, the difference was 4.9 years, only slightly wider than it had been 50 years earlier.

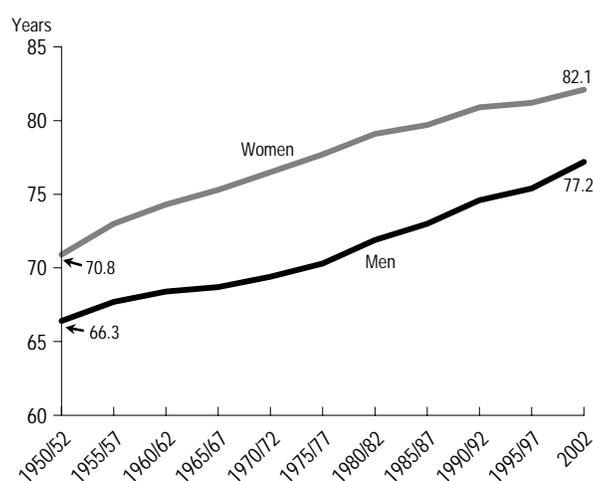
Mortality rates drop for leading causes of death

Since the end of the 1970s, the leading causes of death in Canada have been diseases of the circulatory system (mainly cardiovascular disease and stroke) and cancer. Mortality rates for diseases of the circulatory system remained higher among men than women, although reductions in mortality rates for specific circulatory system diseases were substantial for both sexes. As well, the pace of the decline varied. For example, the drop in mortality rates

for acute myocardial infarction (heart attack) was slightly more pronounced among men: down 67.4% compared with a 63.7% decrease among women. For both sexes, stroke mortality rates fell by about 50%.

From 1979 through 2002, cancer mortality rates were higher among men than among women. During this period, women’s mortality rate from cancers of the colon, rectum and anus fell much more sharply than did men’s, and the decline in female breast cancer mortality was greater than the

Life expectancy at birth, by sex, Canada, 1950-1952 to 2002



Data sources: Vital Statistics Birth and Death Databases; estimates of population by age and sex for Canada, the provinces and the territories, Statistics Canada
Notes: Calculations for 1950-1952 to 1995-1997 are based on complete life tables; calculations for 2002 are based on an abridged life table.

drop in prostate cancer mortality. However, while men's mortality rate for cancers of the trachea, bronchus and lung decreased, the rate for women more than doubled.

The improvement in men's life expectancy since the end of the 1970s reflects, among other things, the declining mortality rates for these major causes of death. Women's smaller gain indicates a more complex process: the reduction in mortality rates for acute myocardial infarction, stroke and some cancers, along with the striking rise in lung cancer mortality.

Age-standardized mortality rates, by sex, selected causes of death, Canada, 1979 and 2002

	Age-standardized deaths per 100,000 standard population					
	Men			Women		
	1979	2002	% change	1979	2002	% change
Acute myocardial infarction	214.6	70.0	-67.4	94.1	34.2	-63.7
Cerebrovascular disease	87.8	43.7	-50.2	73.4	36.3	-50.5
Cancers of trachea, bronchus and lung	71.7	65.6	-8.5	16.3	35.3	+116.6
Cancers of colon, rectum and anus	28.6	24.1	-15.7	23.3	15.2	-34.8
Prostate cancer	26.7	25.2	-5.6
Female breast cancer	29.8	24.4	-18.1

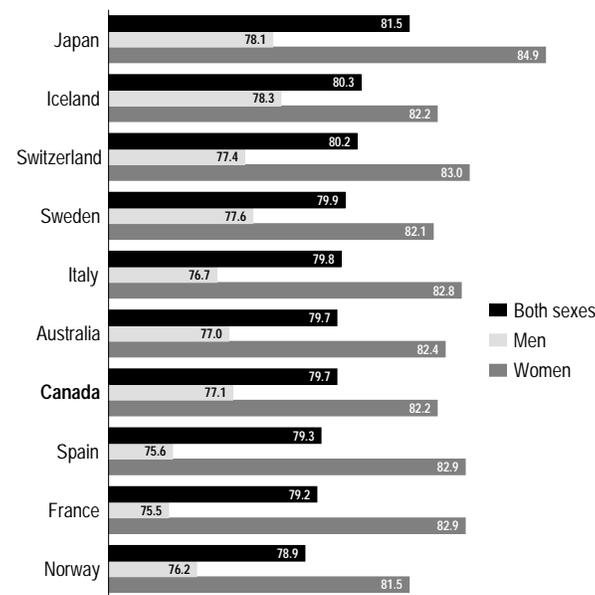
*Data sources: Vital Statistics Death Databases, 1979 and 2002; estimates of population by age and sex for Canada, the provinces and the territories, Statistics Canada
... Not applicable*

Canada sixth among OECD countries

Since the 1960s, Canada has been among the 10 countries in the Organisation for Economic Co-operation and Development (OECD) with the longest life expectancies.³ In 2001, Canada ranked sixth, with life expectancy estimated at 79.7 years for both sexes, on par with Australia.

For women, Canada and Iceland tied in sixth place, with life expectancy at 82.2 years. Japan was first with 84.9 years. In the United States, female life expectancy in 2001 was 79.8 years, too low to place among the top 10.

Life expectancy at birth, by sex, selected OECD countries, 2001



Data source: Organisation for Economic Co-operation and Development

Canadian men's life expectancy ranked fifth, at 77.1 years. Iceland had the longest male life expectancy (78.3 years), closely followed by Japan (78.1 years). As was the case for their female counterparts, American men did not place among the top 10 (74.4 years).

In some countries where life expectancy exceeds that in Canada, the gap between men and women was relatively wide. In fact, among the OECD countries with the longest life expectancies in 2001, Canada had the third-smallest male-female difference: 5.1 years. By contrast, the gap in Japan was 6.8 years.

Provinces and territories

The provinces with the longest life expectancies in 2002 were British Columbia, Ontario and Alberta: 80.6, 80.1 and 79.7 years, respectively. At 78.3 years, Newfoundland and Labrador had the shortest life expectancy. In the remaining provinces, the figure was around 79 years.

When the sexes were examined separately, British Columbia maintained its first-place ranking, with life expectancy of 78.2 years for men and 82.9 years for women—in both cases, about a year more than the national figures. Ontario

Life expectancy at birth, by sex and province/territory, Canada, 2002

	Both sexes		Male/Female difference	
	Men	Women		
Canada	79.7	77.2	82.1	4.9
Newfoundland and Labrador	78.3	75.7	80.9	5.2
Prince Edward Island	78.8	76.2	81.3	5.1
Nova Scotia	79.0	76.4	81.5	5.1
New Brunswick	79.3	76.5	82.0	5.5
Québec	79.4	76.6	82.0	5.4
Ontario	80.1	77.7	82.2	4.5
Manitoba	78.7	76.2	81.1	4.9
Saskatchewan	79.1	76.3	82.0	5.7
Alberta	79.7	77.4	81.9	4.5
British Columbia	80.6	78.2	82.9	4.7
Yukon	76.7	73.9	80.3	6.4
Northwest Territories	75.8	73.2	79.6	6.4
Nunavut	68.5	67.2	69.6	2.4

Data sources: Vital Statistics Birth and Death Databases; estimates of population by age and sex for Canada, the provinces and the territories, Statistics Canada

and Alberta followed British Columbia in male life expectancy, both surpassing the national level. In the other provinces, male life expectancy was less than 77.2 years. Provincial variations in women's life expectancy were less pronounced. With three exceptions (Newfoundland and Labrador, Prince Edward Island and Manitoba), female life expectancy was around 82 years.

Life expectancy in the territories was lower than in the provinces. Nunavut residents' life expectancy in 2002 was 68.5 years, 11.2 years less than the figure for Canadians overall and similar to the national level half a century ago. In Yukon, life expectancy in 2002 was 76.7 years, and in the Northwest Territories, 75.8 years. Estimates for the territories and Prince Edward Island must be interpreted with caution because they are based on small populations and small numbers of deaths.

In each province and territory, women's life expectancy exceeded men's. The difference between the sexes was close to the national level (4.9 years) in most provinces and territories, except Nunavut, where the gap was 2.4 years.

Increase for all age groups

The longer a person lives, the more he/she belongs to a select group. The oldest members of the population have survived the longest period of

exposure to the risk of death. For example, in 2002, a 1-year-old girl could expect to live to age 82.5, while a 50-year-old woman could expect to live to age 83.8.

Life expectancy for all age groups that were compared in this analysis rose significantly between 1996 and 2002. In 1996, boys aged 15 to 19 could expect to live an additional 61.2 years; in 2002,

Life expectancy, by age group and sex, Canada, 1996 and 2002

	1996	2002	Difference
Men			
0	75.5	77.2	1.8*
1-4	74.9	76.7	1.8*
5-9	71.0	72.8	1.7*
10-14	66.1	67.8	1.7*
15-19	61.2	62.9	1.7*
20-24	56.4	58.1	1.7*
25-29	51.6	53.3	1.6*
30-34	46.9	48.5	1.6*
35-39	42.2	43.7	1.5*
40-44	37.5	38.9	1.5*
45-49	32.9	34.3	1.4*
50-54	28.3	29.7	1.4*
55-59	24.0	25.3	1.3*
60-64	19.9	21.1	1.2*
65-69	16.1	17.2	1.1*
70-74	12.7	13.7	1.0*
75-79	9.8	10.5	0.8*
80-84	7.3	7.9	0.6*
85-89	5.4	5.6	0.3*
90+†	3.9	4.1	0.2
Women			
0	81.2	82.1	0.9*
1-4	80.6	81.5	0.9*
5-9	76.7	77.6	0.9*
10-14	71.8	72.6	0.8*
15-19	66.8	67.7	0.8*
20-24	61.9	62.8	0.8*
25-29	57.0	57.9	0.8*
30-34	52.1	53.0	0.8*
35-39	47.3	48.1	0.8*
40-44	42.4	43.3	0.8*
45-49	37.7	38.5	0.8*
50-54	33.0	33.8	0.8*
55-59	28.5	29.2	0.7*
60-64	24.1	24.8	0.7*
65-69	20.0	20.6	0.6*
70-74	16.1	16.7	0.6*
75-79	12.5	13.0	0.5*
80-84	9.4	9.8	0.4*
85-89	6.8	7.0	0.2*
90+†	4.8	5.0	0.1

Data sources: Vital Statistics Birth and Death Databases; estimates of population by age and sex for Canada, the provinces and the territories, Statistics Canada

Notes: Estimates for 1996 based on an abridged life table for 1995 to 1997; estimates for 2002 based on an abridged life table for 2002. The difference between 1996 and 2002 was calculated from unrounded values.

† Open group, not compared

* $p < 0.001$

Data sources

Data on life expectancy and age-standardized mortality were calculated from the Vital Statistics Birth and Death Databases and estimates of population by age and sex for Canada, the provinces and the territories, Statistics Canada.

Life expectancy estimates for 1996 were calculated using mortality rates for 1995, 1996 and 1997; life expectancy estimates for 2002 were calculated using mortality rates for only that year. Estimates for 1996 and 2002 were calculated using Greville's⁴ method for abridged life tables; life expectancy in such tables is calculated for five-year age groups.

Differences in life expectancy estimates by age group between 1996 and 2002 and the variance of these estimates were calculated using Chiang's method.⁵

Life expectancy estimates for 1950-1952 to 1995-1997 were calculated from complete life tables, using death data for three calendar years to calculate the mortality rates by single-year-of-age and sex.

International data are from the Organisation for Economic Cooperation and Development. International estimates are not strictly comparable, because life expectancy is not calculated by the same method in every country.⁶ As well, the estimates provided by a country and those from the OECD may vary slightly, because the OECD adjusts each estimate to account for differences across countries in the calculation of life expectancy.

Age-standardized mortality rates were calculated to remove the effects of differences in the age structure of the 1979 and 2002 Canadian population. The 1991 Canadian Census of Population was used as the standard population; age-standardized mortality rates show the number of deaths per 100,000 population that would have occurred in a given period if the age structure of the population at that time was the same as the age structure of this standard population.⁷

Cause of death from 1979 to 1999 was classified according to the *International Classification of Diseases, Ninth Revision (ICD-9)*⁸; the *Tenth Revision (ICD-10)*⁹ was used from 2000 on. Causes of death classified according to the two revisions are not strictly comparable. For this analysis, results of a study¹⁰ that classified deaths to both ICD-9 and ICD-10 were used to adjust 1999 mortality data for the four cancers and the two circulatory system causes of death. When these adjustments were applied to the age-standardized mortality rates, the change had little or no effect on the direction or slope of the trend lines for these causes of death. The following codes were used to define the cause of death groups:

Cause of death group	ICD-9 Codes	ICD-10 Codes
Acute myocardial infarction	410	I21-I22
Cerebrovascular disease	430-438	I60-I69
Cancers of trachea, bronchus and lung	162	C33-C34
Cancers of colon, rectum and anus	153-154	C18-C21
Prostate cancer	185	C61
Female breast cancer	174	C50

the figure was 62.9 years. The corresponding estimates for girls were 66.8 and 67.7 years. During the same period, life expectancy at ages 55 to 59 rose from 24.0 to 25.3 years for men, and from 28.5 to 29.2 years for women.

In all age groups, women's life expectancy was longer than that of men. However, from 1996 to 2002, the increase in men's life expectancy surpassed women's in all age groups. For instance, in 2002, a 25-year-old woman could expect to live 0.8 years longer than had been the case in 1996, but for a 25-year-old man, the gain was 1.6 years. Similarly, for a woman aged 60, the increase in life expectancy was 0.7 years, compared with a gain of 1.2 years for a man aged 60.

As a result, the difference between male and female life expectancy for every age group diminished over this period. The male-female life expectancy gap at birth fell from 5.7 years in 1996 to 4.9 years in 2002. At age 65, the gap narrowed from 3.9 to 3.4 years.

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