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Winter 1997 Volume 9 No. 3

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Note to Readers

This issue lists two Editors-in-Chief on the masthead: Jane Gentleman and Marie P. Beaudet. Jane, who was responsible for guiding most of the articles in this issue through the publication process, has accepted a new position at Statistics Canada as Assistant Director, Social Survey Methods Division. Marie, a senior researcher with the National Population Health Survey, has been appointed Editor-in-Chief of Health Reports and Chief of the Health and Vital Statistics Studies Section of the Health Statistics Division.

Research Articles

This section presents in-depth research and analysis in the fields of health and vital statistics.

Teenage pregnancies, 1974 to 1994

Surinder Wadhera and Wayne J. Millar

Abstract

Objectives

This article provides an overview of trends from 1974 to 1994 in pregnancies among women aged 15 to 19.

Data sources

Vital statistics, abortion data, and hospital morbidity files maintained by Statistics Canada were used to develop estimates of pregnancies, live births, abortions, and stillbirths/miscarriages.

Analytical techniques

Rates of pregnancy, live birth, abortion and stillbirth/miscarriage are based on the female population aged 15 to 19.

Main results

In 1994, there were an estimated 46,800 teenage pregnancies. This marked the continuation of an almost steady rise from 1987, when the number was 39,300. As well, there has been an increase in the percentage of teenage pregnancies ending in an abortion.

Key words

pregnancy in adolescence, pregnancy outcome, abortion, miscarriage

Authors

Surinder Wadhera (613-951-3415) and Wayne J. Millar (613-951-1631) are with the Health Statistics Division at Statistics Canada, Ottawa K1A 0T6.

In 1994, close to 24,700 babies were born to teenage women aged 15 to 19. However, these births represented only about half the 47,800 teenage pregnancies that ended that year, as an estimated 21,000 women in this age range had an abortion, while about 2,000 had a stillbirth or a miscarriage that required hospitalization. Although the 1994 teenage pregnancy rate was lower than it was two decades earlier, the rate has been increasing since 1987.

Pregnancy before age 20 entails a number of medical risks for both the mother and her child. Teenage mothers have a greater risk of having a preterm baby or a baby with an immediately identifiable congenital abnormality.[1] Teenagers also have a slightly higher risk of having low birthweight infants[2] (see **Infant mortality and low birthweight, 1975 to 1995** in this issue).

It could be argued that the social and economic consequences of teenage births are as important as the health implications. Previous studies have suggested that teenage motherhood may result in a loss of educational

Methods

Data source

The data used to estimate teenage pregnancies come from Statistics Canada's published reports [3-7] and data files on birth registrations (live births and stillbirths), abortions, and inpatients treated in general and allied hospitals. The live birth and stillbirth data are from the Canadian Vital Statistics Data Base, which is compiled from information collected from the vital statistics registries in the ten provinces and two territories. Because of legal reporting requirements, the registration of live births and stillbirths is considered to be virtually complete. As well, the existence of provincial and territorial health insurance commissions to pay for medical services provided by doctors and hospitals leads to nearly complete reporting of the number of abortions performed in hospitals and abortion clinics, as well as spontaneous abortions (referred to as miscarriages in this article) and other abortion cases treated in inpatient departments of hospitals. Data on abortions obtained by Canadian residents in the United States are reported by the states where they occurred.

Analytical techniques

Rates of pregnancy, live birth, abortion, and stillbirth/miscarriage are based on the female population aged 15 to 19 during the years 1974 to 1994.

Complete information on residence, age, and other demographic characteristics of women who obtained clinic abortions in Canada and abortions in the United States was not available. The age distribution of these cases was assumed to approximate the age distribution of women obtaining hospital abortions. Canadian clinic abortions and all abortions obtained in the United States were included in the Canada totals only. Provincial data on therapeutic abortions, and thus, the corresponding pregnancies, include only hospital abortions.

Teenage pregnancy rates were derived for selected countries by adding the teenage fertility rates to legal abortion rates. The countries selected have a level of economic development similar to Canada's and reliable birth and abortion statistics. The most recent year for which comparable data were available was 1988.

Limitations

Clinic abortions had to be excluded from the calculations of provincial abortion and pregnancy rates because of incomplete data on place of residence. By 1994, clinics accounted for about one-third of all abortions performed in Canada. The omission of these abortions from the provincial calculations means that provincial pregnancy rates are underestimated, and that provincial comparisons must be made with caution. The rates are presented to indicate the relative ranking of the provinces rather than specific values.

Legal abortions obtained in the United States were also excluded from provincial rates. However, since abortions outside Canada have constituted a progressively smaller proportion of all abortions, the effect of their omission, particularly in recent years, is likely to be minimal.

A number of miscarriages occur without the need for hospitalization, and therefore, are not included in the data. As well, no information is available on illegal abortions. Estimates of non-hospitalized miscarriages and illegal abortions range widely from 3% to 30% of pregnancies in western industrialized countries.[8-11] For Canada, the figure has been estimated to be as high as 17%, well above the annual rate of 3% to 7% used for the calculations in this article. Therefore, the figures reported here may underestimate the total number of teenage pregnancies that actually occur. Moreover, the calculations are based on the year in which pregnancies ended, and so do not take into account women who became pregnant at age 19 and ended their pregnancy at age 20.

Information on hospitalized cases of miscarriages/stillbirths and other and unspecified abortions was not available for Yukon. For the Northwest Territories, this information was unavailable, except for 1994.

For live births in Newfoundland, the age of the mother was missing from vital registration data for 1974 to 1985. However, Newfoundland hospital data provide information on the age of women who gave birth. For this analysis, it was assumed that the age distribution of all Newfoundland women who gave birth closely matched that of women who had given birth in Newfoundland hospitals.

The most recent year for which comparable international teenage pregnancy rates were available, 1988, was near the low point for Canada's rate; since then, teenage pregnancy rates have risen substantially. Likewise, the situation in the other countries may now differ considerably from what it was in 1988. Consequently, as with provincial comparisons, the importance of the international figures lies more in the ranking than in the specific rates.

and occupational opportunities and increase the likelihood of diminished socioeconomic status.[12] Compared with older women who give birth, teenagers are more likely to be single, and therefore, to be financially dependent on family support and social assistance.[13]

Drawing upon data from a number of sources, this article reviews teenage pregnancy in Canada for the period 1974 to 1994 (see *Methods* and *Definitions*).

Long-term trends

The 46,800 teenage pregnancies that ended in 1994 were up from 39,300 in 1987, but well short of the total of 61,200 that ended in 1974 (Table 1).

Compared with women in their twenties or early thirties, teenagers have a low pregnancy rate (Chart 1). But while the 1974 to 1994 period saw an overall drop in the rate from 53.7 to 48.8 per 1,000, since 1987, it increased almost every year (Chart 2).

Table 1
Estimated number of pregnancies and pregnancy rates, women aged 15 to 19 at end of pregnancy, Canada, 1974 to 1994

	Pregnancies	Pregnancy rate			Female population aged 15-19
		Total 15-19	15-17	18-19	
	Number	Pregnancies per 1,000			'000
1974	61,242	53.7	33.8	83.7	1,141
1975	61,964	53.6	34.3	82.9	1,156
1976	61,267	52.2	33.1	81.4	1,175
1977	59,923	50.6	32.2	78.5	1,184
1978	59,210	49.6	31.4	76.8	1,194
1979	57,423	48.0	30.6	73.4	1,196
1980	56,784	47.7	30.5	72.6	1,189
1981	53,782	46.2	29.4	69.6	1,163
1982	52,163	46.4	29.6	68.5	1,123
1983	46,190	43.1	27.2	63.1	1,073
1984	43,233	42.2	27.0	61.8	1,024
1985	40,892	41.5	26.3	62.3	986
1986	40,000	41.2	25.8	63.7	970
1987	39,340	41.1	25.3	64.3	958
1988	39,636	41.6	25.7	64.4	952
1989	42,133	44.4	26.9	68.3	949
1990	44,750	47.3	29.6	72.1	947
1991	44,745	47.6	29.8	73.8	941
1992	45,323	48.1	30.2	74.9	943
1993	45,412	47.8	29.9	74.4	950
1994	46,753	48.8	30.2	76.2	957

Data sources: *Statistics Canada (reference 7), Health Statistics Division, and Canadian Vital Statistics Data Base*

Definitions

Teenage pregnancy is defined in this article as a pregnancy of a woman who was aged 15 to 19 when her pregnancy ended. Pregnancies equal the sum of live births, therapeutic abortions, and miscarriages/stillbirths. The *teenage pregnancy rate* is the number of pregnancies per 1,000 women aged 15 to 19.

A *live birth* is the complete expulsion or extraction from its mother of a product of conception, which, after such separation, breathes or shows any sign of life. The *teenage live birth rate* is the number of live births per 1,000 women aged 15 to 19.

Therapeutic (induced) abortions include:

- Abortions authorized under the 1969 Abortion Law and performed in accredited and/or approved hospitals from 1974 to 1987. A hospital abortion committee could authorize a pregnancy termination, if, in its opinion, continuation of the pregnancy would endanger the life or health of the woman.
- Abortions performed in hospitals between 1988 and 1993, classified as "legally induced abortions" (ICD-9 635).[14]
- Abortions performed in abortion clinics between 1978 and 1994.
- Legal abortions obtained by Canadian women in the United States.

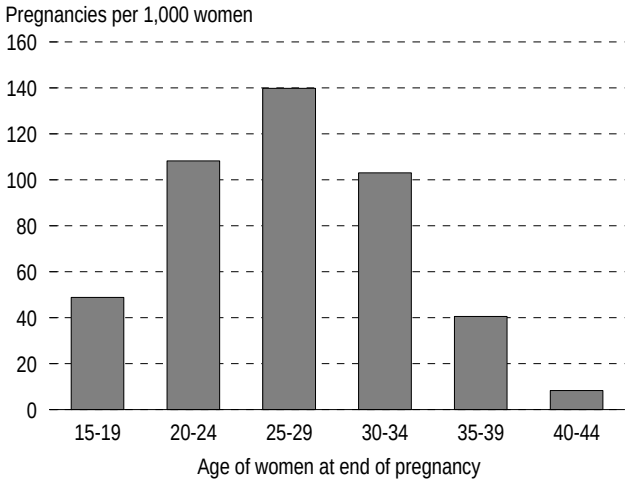
Unless otherwise indicated, the term "abortion" is used in this article to refer to therapeutic abortions. The *teenage abortion rate* is the number of therapeutic abortions per 1,000 women aged 15 to 19.

A *stillbirth* is a product of conception of 20 or more weeks' gestation or fetal weight of 500 grams or more, which has issued from its mother, but did not breathe or show other signs of life. The stillbirth/miscarriage category includes stillbirths registered under the vital registration system and hospitalized cases of spontaneous abortions, illegal abortions, and unspecified abortions. The ICD codes are spontaneous abortion (ICD-9 634, ICD-8 643), illegally induced abortion (ICD-9 636, ICD-8 642), and unspecified abortion (ICD-9 637, ICD-8 644).[14] The *stillbirth/miscarriage rate* is the number of stillbirths, plus spontaneous and other abortions per 1,000 women aged 15 to 19.

In this analysis, the expression to "end" a pregnancy covers the three outcomes: live birth, abortion, or stillbirth/hospitalized miscarriage.

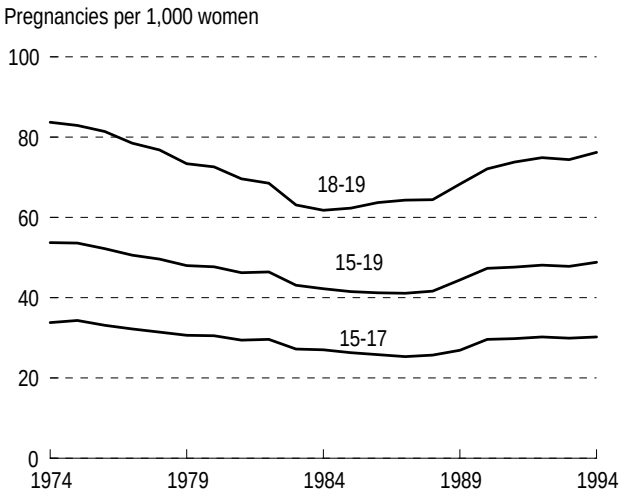
There has also been a major shift in the outcomes of teenage pregnancies. In 1974, 66% of such pregnancies had ended in a live birth, 26% in a therapeutic abortion, and 8% in a stillbirth/miscarriage (Chart 3 and Appendix, Table A). By 1994, while the majority (51%) of teenage pregnancies ended in a live birth, almost as many (45%) ended in an abortion.

Chart 1
Pregnancy rate, by age of women at end of pregnancy, Canada, 1994



Data source: *Health Statistics Division and Canadian Vital Statistics Data Base*

Chart 2
Teenage pregnancy rates, by age of women at end of pregnancy, Canada, 1974-1994



Data source: *Statistics Canada (reference 7), Health Statistics Division, and Canadian Vital Statistics Data Base*

Births slightly exceed abortions

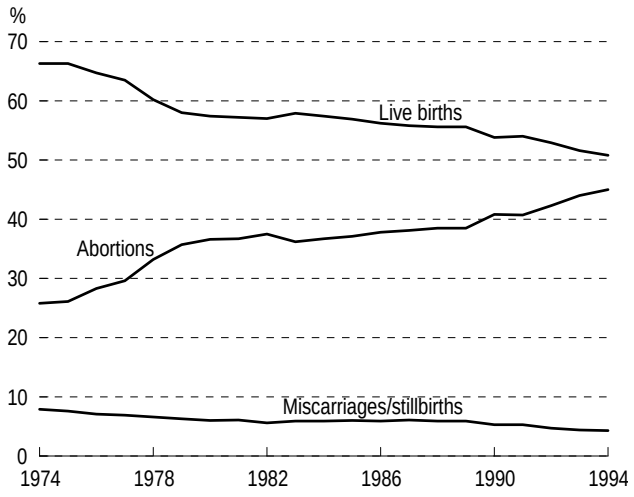
The total of 23,700 live births to teenage mothers in 1994 was down sharply from 40,600 in 1974. However, after falling to about 22,000 in the late 1980s, the annual number of births levelled out at about 24,000 (see *International*). The absolute decline in births is attributable to the lower pregnancy rate, a decrease in the size of the teenage population, and the growing share of teenage pregnancies that end in abortion.

In 1994, 21,000 teenagers had abortions, the highest annual number during the previous two decades. The teenage abortion rate in 1994 was 22.0 abortions per 1,000 women aged 15 to 19, continuing the upturn that began in the mid-1980s. Teenagers accounted for almost 20% of all abortions performed in 1994, compared with just 6% of live births.

Mid-teens

In 1994, the pregnancy rate among 15- to 17-year-olds was 30.2 per 1,000. While this was lower than in 1974 (33.8), the rate has been rising since 1987. These rates mirrored the annual number of pregnancies among mid-teens. In 1994, almost

Chart 3
Percentage distribution of outcomes of teenage pregnancy, Canada, 1974 to 1994



Data sources: *Statistics Canada (reference 7), Health Statistics Division, and Canadian Vital Statistics Data Base*

17,200 women aged 15 to 17 ended a pregnancy, down substantially from 23,200 in 1974, but a considerable rise from the low of 14,400 in 1988.

By 1994, more pregnancies among women aged 15 to 17 ended in an abortion than in a live birth, whereas in 1974, the majority had ended in a live birth (Table 2). This shift is reflected in the abortion rate for 15- to 17-year-olds, which now exceeds their live birth rate: 14.9 abortions versus 13.9 live births per 1,000.

Nonetheless, close to 8,000 women aged 15 to 17 gave birth in 1994, and for about 700 of them, it was at least the second time.[3]

Older teens

Pregnancy rates at ages 18 to 19 were more than double those for younger teens, although trends were similar. The pregnancy rate of 18 to 19-year-olds fell from 83.7 per 1,000 in 1974 to 61.8 in 1984 and then rose to 76.2 in 1994. The annual number of pregnancies declined from around 38,000 at the beginning of the period to about 25,000 in the mid-1980s. A subsequent upturn brought the 1994 total to 29,600.

The abortion rate among 18- to 19-year-olds was the highest of any age group: 32.3 abortions per 1,000 in 1994. Since 1974, the share of pregnancies at ages 18 to 19 that ended in an abortion had doubled from 21% to 42%.

The annual number of live births to women aged 18 to 19 now fluctuates around 16,000, a considerable drop from 27,100 in 1974. Even so, in 1994, approximately one in five births to women in this age range was a second or later birth.[3]

Table 2
Percentage distribution of outcomes of teenage pregnancy, by age, Canada, 1974 and 1994

Age group	Year	Pregnancies	Outcome			
			Total	Live birth	Abortion	Miscarriage/ stillbirth
		Number		% distribution		
Total 15-19	1974	61,242	100.0	66.3	25.8	7.9
	1994	46,753	100.0	50.7	45.0	4.3
15-17	1974	23,180	100.0	58.3	34.2	7.5
	1994	17,153	100.0	46.1	49.5	4.4
18-19	1974	38,062	100.0	71.2	20.7	8.1
	1994	29,600	100.0	53.4	42.4	4.2

Data sources: *Statistics Canada (reference 7), Health Statistics Division, and Canadian Vital Statistics Data Base*

Table 3
Teenage pregnancy rate and component rates, provinces and territories, 1974 and 1994

	Pregnancy rate†		Birth rate		Hospital abortion rate‡		Miscarriage/ stillbirth rate	
	1974	1994	1974	1994	1974	1994	1974	1994
	Pregnancies per 1,000 women aged 15-19		Live births per 1,000 women aged 15-19		Abortions per 1,000 women aged 15-19		Miscarriages/stillbirths per 1,000 women aged 15-19	
Newfoundland	85.3	32.1	76.6	25.8	1.4	4.0	7.3	2.3
Prince Edward Island	59.0	31.5	51.0	29.1	2.7	0.2	5.3	2.2
Nova Scotia	69.2	44.1	54.7	30.2	9.0	12.8	5.5	1.1
New Brunswick	63.6	40.3	54.6	32.7	4.4	4.9	4.6	2.7
Quebec	21.2	33.1	16.2	17.4	2.8	14.1	2.2	1.7
Ontario	60.4	39.6	37.2	22.4	18.6	15.7	4.6	1.5
Manitoba	66.9	64.4	51.6	43.0	9.9	17.1	5.4	4.3
Saskatchewan	69.4	63.0	52.8	46.3	11.1	12.9	5.5	3.8
Alberta	68.4	54.2	45.0	33.0	17.6	17.4	5.8	3.8
British Columbia	70.3	40.7	38.8	22.2	26.7	16.6	4.8	1.9
Yukon	113.7	88.0	88.0	44.0	22.5	44.0	3.2	0.0
Northwest Territories	130.4	136.7	114.6	104.5	13.7	22.6	2.1	9.6

Data sources: *Statistics Canada (reference 7), Health Statistics Division, and Canadian Vital Statistics Data Base*

† Total of live birth, abortion, and miscarriage/stillbirth rates

‡ Excludes clinic abortions.

Few stillbirths/miscarriages

Few teenagers have stillbirths or hospitalized miscarriages. As a proportion of all teenage pregnancies, stillbirths and miscarriages declined from 8% to 4% between 1974 and 1994, reflecting a drop in both the annual number and the rate per 1,000. In 1994, 2,000 teenage pregnancies ended in stillbirth/miscarriage, less than half the number (4,800) in 1974. During this period, the stillbirth/miscarriage rate fell from 4.2 to 2.1 per 1,000 women aged 15 to 19.

Marital status

The vast majority (81%) of the teenage women who had a baby in 1994 were single. This was a change from 1974, when just 25% of teenagers giving birth were single.[a] The shift in the marital status of teenage mothers likely reflects changing societal values. Single motherhood may now be perceived as preferable to a marriage based solely on a pregnancy.

Throughout the period, virtually all teenagers who had an abortion were single (96% in 1994, 95% in 1974).

Provincial variations

Teenage pregnancy rates varied substantially by province and territory (Table 3). In 1994, the rate was highest in the Northwest Territories at 137 pregnancies per 1,000 women aged 15 to 19, followed by Yukon, at 88 pregnancies per 1,000. Provincial pregnancy rates ranged from over 60 per 1,000 in Manitoba and Saskatchewan to just over 30 in Newfoundland, Prince Edward Island, and Quebec.

These rates must be interpreted with considerable caution, as they exclude clinic abortions. Clinic abortion data were omitted because the client's age was not always reported. As well, her home province may not have been reported. (Residents of provinces where few abortions, hospital or clinic, are performed may travel to other provinces to obtain one.)

[a] *Excludes Newfoundland.*

International

In 1988, the most recent year for which comparable international figures are available, Canada's teenage pregnancy rate[b] was 40 pregnancies per 1,000 women aged 15 to 19. This was higher than in Sweden, Finland, Denmark, the Netherlands and Japan, but fell short of rates in the United States, Czechoslovakia, Hungary, New Zealand, England and Wales, and Iceland.[15]

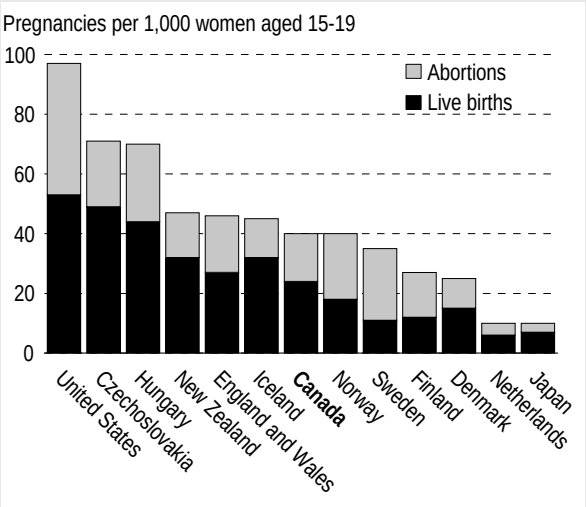
Canada's teenage pregnancy rate was the same as Norway's, but the outcomes differed: abortions accounted for a larger percentage of Norway's teenage pregnancies than was the case in Canada. Abortions also exceeded births among teenagers in Sweden and Finland. However, of the countries examined, the United States had the highest teenage abortion rate: 44 legal abortions per 1,000 women aged 15 to 19.

Canada's 1988 teenage birth rate (24 live births per 1,000) was much lower than those of the United States (53 per 1,000), Czechoslovakia (49), and Hungary (44). On the other hand, Norway, Finland, Denmark, the Netherlands, and Japan had lower teenage birth rates than did Canada.[14]

More recent data for the United States show a slow but steady decline in teenage pregnancy, birth, and abortion rates in the early 1990s. This contrasts with appreciable increases in Canada during the same period.[16,17]

[b] *In contrast to the teenage pregnancy rates presented in this article, calculations of international pregnancy rates shown here exclude stillbirth/miscarriages.*

Teenage pregnancy rates,† by outcome, selected countries, 1988



Source: *Reference 15*

† Pregnancy rates exclude miscarriages/stillbirths.

Birth rates, which are based on more complete data than are pregnancy rates, yield more reliable provincial comparisons. Since 1974, live birth rates among teenagers have fallen substantially in all provinces and territories except Quebec, where there was a slight rise. Nonetheless, Quebec's teenage birth rate remains the lowest in the country (17 per 1,000 in 1994). The highest teenage birth rate was 105 per 1,000 in the Northwest Territories. Rates in Yukon, Saskatchewan, and Manitoba were also relatively high (over 40 births per 1,000).

Concluding remarks

The decline since 1974 in Canada's teenage pregnancy rate reversed after 1987. Thereafter, the rate rose, although a growing share of teenage pregnancies ended in an abortion. Moreover, recent data suggest that teenagers have not only a high abortion rate, but also a high repeat abortion rate.[18]

To reduce teenage pregnancies, public health efforts in some jurisdictions have attempted to address the issue of the early onset of sexual activity and prevent pregnancy among those teenagers who are sexually active. Based on the experience of the Netherlands (one of the countries with the lowest teenage pregnancy rates), strategies that have effected a reduction of teenage pregnancies include sex education, open discussion of human sexuality in the mass media, easier access to contraceptives, education programs, and active participation of parents and teenagers in such programs. [19]

In Canada, too, family planning services and sex education have become more available to teenagers through the mass media, drop-in clinics, and youth-oriented agencies. And in reaction to the AIDS epidemic, awareness of and communication about human sexuality have increased. The rise in the teenage pregnancy rate, despite the availability of family planning information and an array of contraceptives, suggests that teenagers have not fully benefited from these improvements in services.

National and provincial surveys of teenage sexual health and behaviour also indicate that this may have been the case. The 1987 *Canada Youth and AIDS Study*[20] surveyed 38,000 students in Grades 7, 9, and 11 and in first-year college and university. According to that study, by Grade 9, 31% of boys and 21% of girls had had sexual intercourse; by Grade 11, the figures were 49% and 46%, respectively.

A 1992 British Columbia survey of 15,549 students in Grades 7 though 12 reported similar results.[21] Overall, approximately 33% of male students and 28% of female students had had sexual intercourse at least once. By Grade 12, 55% of boys and 52% of girls reported that they were sexually active.

Contraceptive use is a special concern for teenagers.[15, 22,23] About one-quarter of sexually active students in the B.C. survey did not use any form of birth control. Not surprisingly, 10% of sexually active boys had caused at least one pregnancy, and 11% of sexually active girls had been pregnant at least once.

To some extent, the contrast in teenage pregnancy rates between Canada and countries with substantially lower rates may reflect differences in the availability of educational programs and the adoption of health practices by teenagers.

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Appendix

Table A

Outcomes of teenage pregnancy, by age at end of pregnancy, Canada, 1974 to 1994

	Total 15-19	15-17	18-19	Total 15-19	15-17	18-19
	Number			Per 1,000 women		
Total pregnancies						
1974	61,242	23,180	38,062	53.7	33.8	83.7
1975	61,964	23,899	38,065	53.6	34.3	82.9
1976	61,267	23,467	37,800	52.2	33.1	81.4
1977	59,923	22,985	36,938	50.6	32.2	78.5
1978	59,210	22,417	36,793	49.6	31.4	76.8
1979	57,423	21,629	35,794	48.0	30.6	73.4
1980	56,784	21,374	35,410	47.7	30.5	72.6
1981	53,782	19,865	33,917	46.2	29.4	69.6
1982	52,163	18,874	33,289	46.4	29.6	68.5
1983	46,190	16,251	29,939	43.1	27.2	63.1
1984	43,233	15,553	27,680	42.2	27.0	61.8
1985	40,892	15,020	25,872	41.5	26.3	62.3
1986	40,000	14,813	25,187	41.2	25.8	63.7
1987	39,340	14,449	24,891	41.1	25.3	64.3
1988	39,636	14,368	25,268	41.6	25.7	64.4
1989	42,133	14,744	27,389	44.4	26.9	68.3
1990	44,750	16,354	28,396	47.3	29.6	72.1
1991	44,745	16,725	28,020	47.6	29.8	73.8
1992	45,323	17,154	28,169	48.1	30.2	74.9
1993	45,412	16,986	28,426	47.8	29.9	74.4
1994	46,753	17,153	29,600	48.8	30.2	76.2
Live births						
1974	40,623	13,513	27,110	35.6	19.7	59.6
1975	41,074	13,999	27,075	35.5	20.1	58.9
1976	39,612	13,323	26,289	33.7	18.8	56.6
1977	38,048	12,805	25,243	32.1	17.9	53.7
1978	35,630	11,756	23,874	29.9	16.5	49.8
1979	33,324	10,643	22,681	27.9	15.0	46.5
1980	32,596	10,546	22,050	27.4	15.0	45.2
1981	30,745	9,760	20,985	26.4	14.4	43.1
1982	29,708	9,414	20,294	26.5	14.8	41.7
1983	26,747	8,186	18,561	24.9	13.7	39.2
1984	24,802	7,759	17,043	24.2	13.5	38.1
1985	23,263	7,493	15,770	23.6	13.1	37.9
1986	22,498	7,317	15,181	23.2	12.7	38.4
1987	21,956	7,152	14,808	22.9	12.5	38.2
1988	22,019	7,151	14,868	23.1	12.8	37.9
1989	23,427	7,362	16,065	24.7	13.4	40.1
1990	24,083	7,807	16,276	25.4	14.1	41.3
1991	24,180	8,064	16,116	25.7	14.4	42.4
1992	23,985	8,202	15,783	25.4	14.5	42.0
1993	23,437	7,975	15,462	24.7	14.1	40.4
1994	23,728	7,904	15,824	24.8	13.9	40.7

	Total 15-19	15-17	18-19	Total 15-19	15-17	18-19
	Number			Per 1,000 women		
Abortions						
1974	15,805	7,937	7,868	13.9	11.6	17.3
1975	16,173	8,135	8,038	14.0	11.7	17.5
1976	17,315	8,551	8,764	14.7	12.0	18.9
1977	17,735	8,684	9,051	15.0	12.2	19.2
1978	19,681	9,228	10,453	16.5	12.9	21.8
1979	20,488	9,661	10,827	17.1	13.7	22.2
1980	20,765	9,650	11,115	17.5	13.8	22.8
1981	19,739	8,954	10,785	17.0	13.3	22.1
1982	19,536	8,463	11,073	17.4	13.3	22.8
1983	16,718	7,150	9,568	15.6	11.9	20.2
1984	15,883	6,887	8,996	15.5	12.0	20.1
1985	15,183	6,658	8,525	15.4	11.7	20.5
1986	15,133	6,636	8,497	15.6	11.5	21.5
1987	14,998	6,411	8,587	15.7	11.2	22.2
1988	15,277	6,361	8,916	16.0	11.4	22.7
1989	16,201	6,446	9,755	17.1	11.8	24.3
1990	18,274	7,635	10,639	19.3	13.8	27.0
1991	18,214	7,722	10,492	19.4	13.8	27.6
1992	19,190	8,153	11,037	20.3	14.4	29.4
1993	19,989	8,249	11,740	21.1	14.5	30.7
1994	21,026	8,486	12,540	22.0	14.9	32.3
Miscarriages/stillbirths						
1974	4,814	1,730	3,084	4.2	2.5	6.8
1975	4,717	1,765	2,952	4.1	2.5	6.4
1976	4,340	1,593	2,747	3.7	2.2	5.9
1977	4,140	1,496	2,644	3.5	2.1	5.6
1978	3,899	1,433	2,466	3.3	2.0	5.1
1979	3,611	1,325	2,286	3.0	1.9	4.7
1980	3,423	1,178	2,245	2.9	1.7	4.6
1981	3,298	1,151	2,147	2.8	1.7	4.4
1982	2,919	997	1,922	2.6	1.5	4.0
1983	2,725	915	1,810	2.5	1.5	3.8
1984	2,548	907	1,641	2.5	1.6	3.7
1985	2,446	869	1,577	2.5	1.5	3.8
1986	2,369	860	1,509	2.4	1.5	3.8
1987	2,386	886	1,500	2.5	1.6	3.9
1988	2,340	856	1,484	2.5	1.5	3.8
1989	2,505	936	1,569	2.6	1.7	3.9
1990	2,393	912	1,481	2.5	1.7	3.8
1991	2,351	939	1,412	2.5	1.7	3.7
1992	2,148	799	1,349	2.3	1.4	3.6
1993	1,986	762	1,224	2.1	1.3	3.2
1994	1,999	763	1,236	2.1	1.3	3.2

Data sources: *Statistics Canada (reference 7), Health Statistics Division, and Canadian Vital Statistics Data Base*

Marital status and abortion

Abstract

Objectives

This article examines the marital status of women who obtained abortions between 1974 and 1994, with particular attention to those who were married or in common-law relationships.

Data sources

The data come from Statistics Canada's publications on abortions, in-patient hospital morbidity data, and reports from the United States.

Analytical techniques

Crude and age-standardized abortion rates from 1974 to 1994 were calculated by marital status.

Main results

While abortion rates were highest for single women, those who were married (including common-law and separated) accounted for over one-quarter of all abortions performed in 1994. Since 1974, the age-standardized abortion rate per 1,000 married women aged 15 to 44 almost doubled from 6.6 to 11.2. For most of these women, it was their first abortion, and the majority had taken at least one pregnancy to term.

Key words

pregnancy termination, common-law

Authors

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In Canada, as in most western industrialized countries, abortion patients tend to be single. Nonethelesss, a substantial share of women who obtain abortions are married, and over the past two decades, the abortion rate among this group has been rising.[1,2]

Because abortions are concentrated among single women, relatively little has been written about married women who obtain abortions. This article describes trends in therapeutic abortions by marital status from 1974 to 1994, with particular attention to married women (see *Methods* and *Definitions*). Selected demographic and medical characteristics of the women are examined, and Canadian data are compared with those of other industrialized countries.

Methods

Data sources

This analysis uses published reports[3-5] and data on abortions maintained by Statistics Canada. The agency began collecting therapeutic abortion statistics in 1970 to monitor the effects of the 1969 amendments to the Criminal Code of Canada, which permitted therapeutic abortions under specific circumstances. Between then and January 1988, when the Supreme Court struck down the 1969 abortion law, hospitals were required to report abortions they performed. Thereafter, some hospitals did not provide Statistics Canada with information about the demographic and medical characteristics of women who obtained abortions.

Before the January 1988 Supreme Court decision, abortion clinics operated only in the province of Quebec. By the end of 1994, abortion clinics were operating in every province except Prince Edward Island and Saskatchewan and the two territories. While the number of abortions performed in clinics increased rapidly, very little demographic and medical data were collected about women using these facilities.

From 1974 to 1994, a total of 1,580,591 abortions were reported. Of these, 84.8% were performed in hospitals,12.0% in clinics, and the remaining 3.2% were obtained by Canadian women in the United States.

Analytical techniques

Over the 1974-1994 period, complete demographic and medical data were not available for women who had abortions in Canadian clinics, in any facility in the United States, and for about 65,000 women who had abortions in Canadian hospitals. Thus, abortion records were complete for 95% of the women who had an abortion during this period.

The marital status of women who obtained abortions in clinics and hospitals in Ontario and Alberta is available for 1993 and 1994. According to these data, the demographic characteristics of women who had abortions in clinics were generally similar to those of women who had abortions in hospitals. Consequently, to estimate numbers and rates for all abortions, marital status and age were imputed for clinic abortions and American data, based on the distributions from hospital records.

No adjustment for unknown values was made to estimate individual characteristics (for example, previous abortions, previous deliveries, gestation) within a marital status; these data are shown for hospital abortions only.

Revised population estimates that take into account census undercoverage and non-permanent residents were used in the calculation of total abortion rates.[6] In breakdowns of these population estimates by age and marital status, persons who were separated or living common-law were included in the "married" category. Therefore, calculations of rates by marital status for all abortions also use the same marital status groupings. As a result, abortion rates for women who were separated or living common-law are not available. However, hospital data, which offer more marital status detail, are also shown to indicate the proportions of women obtaining abortions who were separated or in common-law relationships.

The data on prior deliveries, prior abortions, and gestation are based on all abortions that occurred during the 1974-1994 period.

The women's demographic characteristics are as of the date of the abortion.

Limitations

Provincial and territorial health insurance commissions reimburse physicians for performing abortions. Therefore, reporting of the number of abortions from hospitals and clinics is almost complete, although it is possible that a small number were paid for by the patients themselves and may not be included in these records.

Reporting of abortions from the United States is voluntary. However, the fact that there have not been large year-to-year fluctuations in the number suggests that these counts are complete.

About 261,000 cases treated in hospital that were coded "abortion unspecified," including 295 labeled as illegally induced,[7] are excluded. The majority of these were spontaneous abortions (miscarriages).

The number of women who have had an abortion may be slightly underestimated, because some of the "unspecified" abortions reported by hospitals may have been induced, and some clinic abortions are missing from the calculations. The number of women who have had a prior abortion will be underestimated to the extent that they fail to report their abortion histories to their physicians.

The analysis is restricted in that it is confined to an examination of trends in abortion numbers and rates. The administrative sources from which the data were derived contain no information on the factors that may have influenced women's decisions to terminate a pregnancy. Similarly, these sources provide no information about the birth control practices of women who obtain abortions.

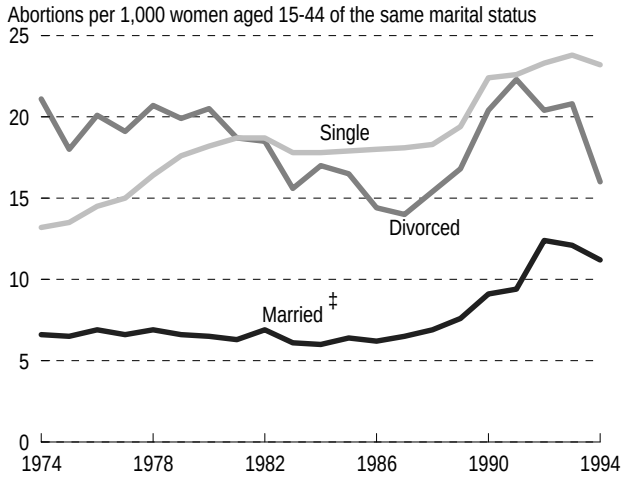
Married rate almost doubles

Not surprisingly, over the past two decades, the majority of women who obtained abortions were single. Hospital data, however, indicate that in 1994, about one in four women who had an abortion was married or in a common-law relationship (Table 1).

Canada is not unique in this regard. For instance, in Norway (1993) and France (1988), almost 40% of abortions were obtained by women who were married or living common-law; the figures in the Netherlands (1992) and New Zealand (1994) were close to one-third (Table 2).

In Canada, the percentage of abortions that were obtained by married women has declined between 1974 and 1994. To a certain extent, this reflects a decrease in the percentage of women aged 15 to 44 who are married. When this change in the marital status distribution is taken into account, the age-standardized abortion rate of married women almost doubled (Chart 1). (Crude abortion rates and age-standardized abortion rates by marital status are shown in Appendix, Tables A and B.)

Chart 1
Age-standardized abortion rates,† by marital status of women, Canada, 1974 to 1994



Data source: *Health Statistics Division*
Note: *Consists of abortions performed in Canadian hospitals and clinics plus abortions obtained by Canadian women in the United States.*
† Standardized to female population aged 15- 44 as of July 1, 1991.
‡ Includes separated and common-law.

Table 1
Percentage distribution of marital status of women having abortions, Canada, 1974 to 1994

		Marital status						
	Abortions	Total	Married	Common-law	Separated	Single	Divorced	Widow
	Number†				%			
1974	41,227	100.0	31.3	0.9	6.1	58.2	2.9	0.6
1975	49,033	100.0	31.4	0.9	5.9	58.3	3.0	0.5
1976	54,097	100.0	30.7	1.1	6.1	58.4	3.2	0.5
1977	57,131	100.0	29.0	1.1	5.9	60.2	3.3	0.5
1978	61,806	100.0	27.3	1.1	6.3	61.4	3.4	0.5
1979	64,569	100.0	24.7	1.3	6.0	64.1	3.5	0.4
1980	65,243	100.0	23.8	1.3	5.9	65.2	3.4	0.4
1981	64,554	100.0	23.0	1.6	5.8	65.8	3.4	0.4
1982	65,812	100.0	23.0	2.0	5.9	65.3	3.4	0.4
1983	61,326	100.0	22.4	2.0	5.6	66.1	3.5	0.4
1984	61,822	100.0	22.0	1.9	5.6	66.6	3.5	0.4
1985	60,518	100.0	21.8	2.3	5.4	66.9	3.3	0.3
1986	62,406	100.0	21.4	2.5	5.1	67.5	3.1	0.4
1987	61,635	100.0	21.8	2.7	4.9	67.3	3.0	0.3
1988	60,653	100.0	22.2	2.6	4.6	67.2	3.1	0.3
1989	65,414	100.0	23.0	3.0	4.2	66.5	3.1	0.3
1990	66,384	100.0	23.1	3.4	4.3	65.9	3.1	0.2
1991	65,384	100.0	23.0	3.7	4.3	65.4	3.2	0.3
1992	59,694	100.0	23.1	4.2	4.5	64.6	3.3	0.3
1993	54,444	100.0	23.0	4.1	4.1	65.6	2.9	0.3
1994	55,949	100.0	22.2	4.5	3.5	66.9	2.7	0.3

Data source: *Health Statistics Division*
Note: *Estimates based on records for abortions performed in hospitals only. Because of rounding, detail may not add to totals.*
† Includes marital status unknown.

Table 2
Percentage distribution of marital status of women having abortions, selected countries and years

Country (year)	Marital status						
	Total	Married	De facto married	Separated	Single	Divorced	Widow
	%						
Canada (1994)	100.0	22.2	4.5	3.5	66.9	2.7	0.3
England and Wales (1994)	100.0	23.0	..	3.9	68.0	4.9	0.3
France (1988)	100.0	38.4	..	2.3	52.3	6.3	0.7
Netherlands† (1992)	100.0	32.6	..	1.8	57.4	8.2‡	..
New Zealand (1994)	100.0	19.3	9.7	8.7	59.3	2.6	0.4
Norway (1993)	100.0	22.7	16.5	..	54.8	6.0§	..
United States (1992)	100.0	16.8	..	..	83.2††	..	..

Data sources: *The Alan Guttmacher Institute and Health Statistics Division, Statistics Canada*
† 15.8% never married and living with partner; 1.8% widowed or divorced and living with partner
‡ Includes widowed.
§ Previously married; not clear where separated are counted.
†† Includes separated, divorced, widowed.
.. Data not available

Definitions

In this analysis, the term *abortion* refers to a therapeutic abortion, which is a pregnancy termination induced to avoid risk to the woman's health, performed by qualified physicians in hospitals or clinics in Canada. Legal abortions obtained by Canadian women in the United States are also included.

The *abortion rate by marital status* is the number of abortions per 1,000 women aged 15 to 44 of a given marital status.

The *age- and marital status-specific abortion rate* is the number of abortions per 1,000 women of a given age and marital status.

The *gestation period* is the interval (in weeks) between the first day of the last normal menses and the date of the abortion. When the date of the last normal menses is unknown, the attending physician estimates the length of gestation.

In 1994, the abortion rate per 1,000 married women aged 15 to 44 was 11.2. This was much lower than the rate for single women (23.2), but both rates had risen steeply since. By contrast, among divorced women, rates fluctuated.

Sharp increases among young women

Increases in abortion rates were particularly pronounced among young women. At ages 15 to 19, few women are married. However, since 1974, the abortion rate for this group more than doubled so that by 1994, it almost matched the rate for their single counterparts (Table 3).

The rising abortion rate among young married women may be partially attributable to the inclusion among the married group of women who were

Table 3
Abortion rates among married, single and divorced women, by age group, Canada, selected years, 1974 to 1994

	Age at time of abortion					
	15-19	20-24	25-29	30-34	35-39	40-44
	Per 1,000 women of the same marital status					
Married†						
1974	9.2	8.5	7.5	6.5	5.3	2.7
1979	9.5	9.2	8.3	6.4	4.3	2.2
1984	9.4	8.4	7.1	5.8	4.1	1.6
1989	14.6	11.3	8.2	6.5	4.5	1.6
1993	18.1	18.3	11.9	9.4	6.3	2.3
1994	18.3	20.4	12.5	9.0	6.4	2.5
Single						
1974	14.3	21.4	21.1	13.1	6.1	2.1
1979	17.7	27.5	27.7	19.4	9.5	2.0
1984	15.9	25.8	26.7	20.5	12.1	3.8
1989	17.6	28.6	28.0	21.2	14.9	4.1
1993	20.6	34.8	34.5	27.2	16.6	6.2
1994	22.0	34.9	33.9	27.8	18.2	5.8
Divorced						
1974	34.4	35.3	25.6	16.8	12.3	4.7
1979	19.7	42.5	27.4	17.0	10.1	3.5
1984	23.0	36.8	21.2	13.1	7.3	2.8
1989	25.4	34.3	24.5	12.8	6.7	2.4
1993	23.7	38.7	23.0	14.6	7.7	2.2
1994	23.8	31.6	21.7	13.1	7.2	1.9

Data source: *Health Statistics Division*
Note: *Consists of abortions performed in Canadian hospitals and clinics plus abortions obtained by Canadian women in the United States.*
† Includes separated and common-law.

living common-law. In recent years, the number of common-law couples, especially at younger ages, has increased substantially. Premarital cohabitation has a transitory element, and is associated with a higher risk of first marriage dissolution.[8-11] The prospect of a birth in a relationship that is unstable may be a factor in the decision to terminate the pregnancy.

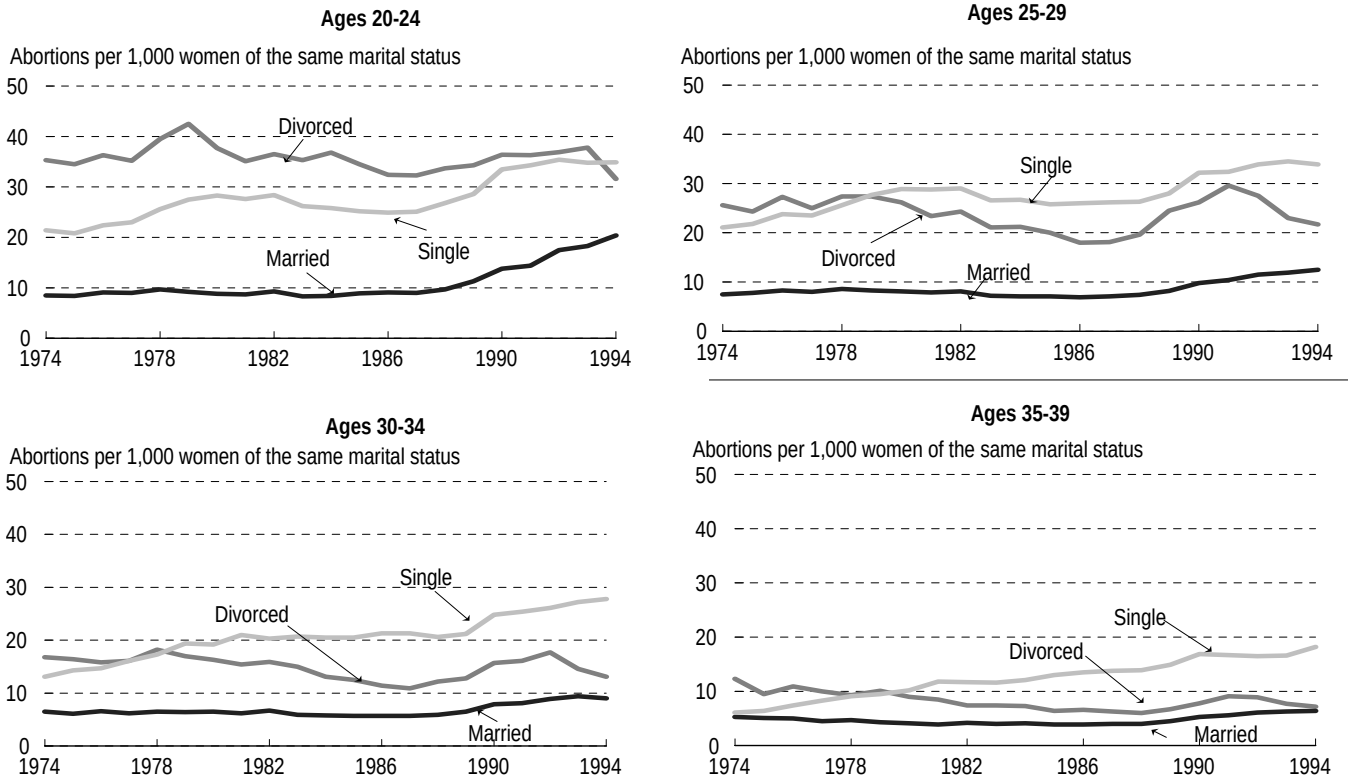
The increase in married women's abortion rate was even steeper at ages 20 to 24. Despite this rise, the rate remained well below that of single women in the same age range (Chart 2). Even at ages 25 to 29, married women's abortion rate rose considerably, although it was only about a third of that of single women. At older ages, married women's abortion rates were much lower, and increases since 1974 were relatively modest.

Reproductive history

A substantial share of the women who had abortions did not do so for the first time. Over the entire 1974-1994 period, the percentages of married and single women who had had a previous abortion were almost the same (20% and 19%), but below the figure for divorced women (26%). However, the married category includes women who were separated or living common-law. Hospital data, which provide finer marital status breakdowns, show that a relatively high percentage (32% by 1994) of abortions obtained by women who were separated or living common-law were repeat abortions (Chart 3).

Almost 80% of the married women who had abortions in the 1974-1994 period had had at least one previous delivery (Table 4). This was also true for divorced and widowed women. By contrast, the

Chart 2
Abortion rates, by marital status† and age group, Canada, 1974 to 1994



Data source: *Health Statistics Division*
† Married category includes separated and common-law.

majority of single women who obtained abortions had never given birth. These percentages, of course, largely reflect the age distributions of the various groups, with most of the single women being relatively young.

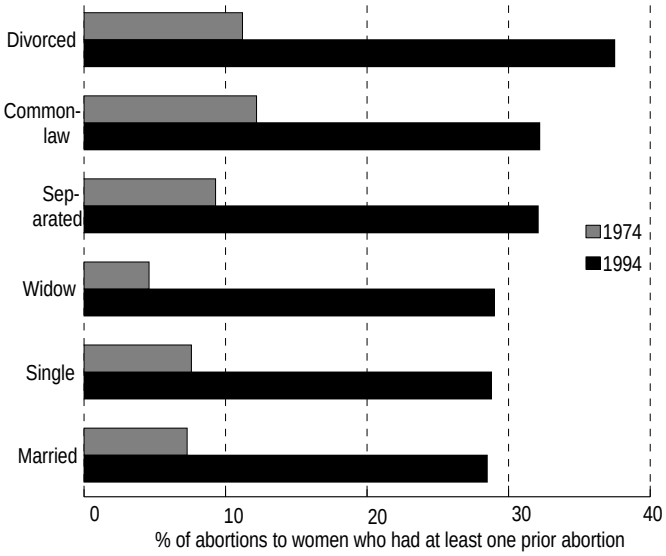
Married women were slightly less likely than single women to have an abortion after their first trimester of pregnancy. Just 10% of married women who had an abortion did so after 12 weeks of pregnancy, compared with 14% of single women.

Economic and lifestyle factors

Other reports have shown that economic factors may be important in the decision to terminate a pregnancy, regardless of marital status. An Australian study found that a majority of women who had abortions, particularly those younger than 30, cited financial concerns.[12]

The rising abortion rate among young married women may reflect the desire to delay childbearing until the family is more financially secure. It is also consistent with decreased fertility rates among young women.[11,13]

Chart 3
Percent of abortions to women who had at least one prior abortion, by marital status of women, Canada, 1974 and 1994



Data source: *Health Statistics Division*
Note: *Estimates based on records for abortions performed in hospitals only.*

The desire to achieve education and career goals may also be a factor, as young women in favourable economic circumstances are more likely than others to abort a pregnancy.[14,15] In fact, the likelihood of pregnancy termination has been shown to increase with educational attainment, although this relationship tends to be stronger for unmarried than married women.[16]

As well, disposable personal income per capita and unemployment rates in specific areas have been significantly associated with local abortion rates.[17]

Table 4
Percentage distribution of abortions performed from 1974 to 1994, by selected characteristics of women, Canada

	Marital status				
	Total	Married†	Single	Divorced	Widow
			Number		
Total hospital abortions	1,250,152	397,162	808,212	40,222	4,556
			%		
Age of patient					
15+	100.0	100.0	100.0	100.0	100.0
15-19‡	25.1	3.2	37.2	0.5	1.0
20-24	31.3	20.9	37.5	12.7	11.8
25-29	21.1	29.9	16.2	31.4	25.4
30-34	13.1	24.9	6.4	30.8	26.8
35-39	7.0	15.3	2.3	18.8	21.6
40+	2.4	5.7	0.5	5.8	13.3
Previous deliveries					
Total	100.0	100.0	100.0	100.0	100.0
0	57.1	20.4	77.2	21.2	16.0
1	17.7	24.8	13.4	33.4	26.3
2	14.6	33.7	4.4	28.5	31.4
≥3	7.5	18.5	1.7	14.7	23.9
Unknown	3.0	2.6	3.3	2.3	2.4
Previous therapeutic abortions					
Total	100.0	100.0	100.0	100.0	100.0
0	77.2	76.7	77.8	71.0	79.3
1	15.3	15.2	15.2	19.6	13.6
≥2	3.9	4.5	3.5	6.4	4.1
Unknown	3.5	3.5	3.6	3.0	2.9
Gestation (weeks)					
Total	100.0	100.0	100.0	100.0	100.0
Under 13	86.8	89.0	85.5	89.4	86.8
13-20	12.3	9.7	13.6	10.0	12.5
21+	0.3	0.5	0.2	0.1	0.2
Unknown	0.7	0.8	0.7	0.5	0.5

Data source: *Health Statistics Division*
Note: *Estimates based on records for abortions performed in hospitals only. Because of rounding, detail may not add to totals.*
† Includes separated and common-law.
‡ Includes girls younger than 15.

Family formation

Among women who are in a marital relationship, the decision to abort a pregnancy may be related to the stability of the relationship. Other research has shown the expectation of single parenthood to be the strongest determinant for choosing abortion, independent of age and parity.[2]

As a percentage of all couples, those living common-law more than doubled from 6.3% to 14.3% between 1981 and 1995. The number of common-law couples increased during this period from 355,000 to more than a million.[18] The high rate of second and subsequent abortions among women living common-law (Chart 3) may reflect instability in those relationships.

Of course, marriages, too, are subject to instability. If 1991 divorce rates prevail, an estimated 31% of couples who married that year will ultimately divorce.[19] Divorce is most likely in the early years of marriage, and for women, divorce rates are highest among those in their twenties. The fact that the abortion rate among married women also peaks at ages 20 to 24 suggests that marital instability may have been a factor in the decision to terminate their pregnancies.

Family size and contraceptive failure

Some married women who had an abortion may have done so because they had already attained their desired family size.[12] This is reflected in the finding that around 80% of married women who had an abortion had taken at least one pregnancy to term. On the other hand, comparatively low abortion rates for women in their thirties may reflect delayed childbearing. In fact, the fertility rate of women in their thirties, unlike women in their twenties, has risen steadily since 1980.[13]

The decision to abort a pregnancy may also indicate the lack of use or improper use of contraceptives, or contraceptive failure.[20,21]

Concluding remarks

While single women accounted for the majority of abortion patients in 1994, a substantial share (more than a quarter) were women who were married or in common-law relationships. For both groups, abortion rates were highest in the early twenties.

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Appendix

Table A
Crude abortion rates, by marital status of women, Canada, 1974 to 1994

	Marital status			
	Married†	Single	Divorced	Widow
	Per 1,000 women aged 15-44 of the same marital status			
1974	6.3	16.6	16.7	7.6
1975	6.3	16.6	15.3	6.3
1976	6.6	17.8	16.4	8.2
1977	6.3	18.1	15.4	7.9
1978	6.7	20.0	16.5	8.2
1979	6.3	21.3	16.1	8.0
1980	6.2	21.9	14.9	8.0
1981	6.0	21.7	13.5	8.1
1982	6.3	22.2	13.2	8.0
1983	5.6	20.6	11.7	7.1
1984	5.4	20.6	11.1	7.5
1985	5.4	20.4	9.9	6.0
1986	5.3	20.4	8.9	7.0
1987	5.3	20.4	8.5	6.0
1988	5.4	21.0	8.8	6.1
1989	6.0	22.4	9.3	6.3
1990	7.1	25.7	10.7	6.4
1991	7.3	25.9	11.2	8.8
1992	8.1	26.7	11.4	8.1
1993	8.3	26.9	9.8	9.0
1994	8.3	27.3	8.8	8.7

Data source: *Health Statistics Division*
Note: *Consists of abortions performed in Canadian hospitals and clinics plus abortions obtained by Canadian women in the United States.*
† Includes common-law and separated.

Table B
Age-standardized abortion rates,† by marital status of women, Canada, 1974 to 1994

	Marital status			
	Married‡	Single	Divorced	Widow
	Per 1,000 women aged 15-44 of the same marital status			
1974	6.6	13.2	21.1	10.8
1975	6.5	13.5	18.0	9.0
1976	6.9	14.5	20.1	11.6
1977	6.6	15.0	19.1	11.5
1978	6.9	16.4	20.7	12.7
1979	6.6	17.6	19.9	12.3
1980	6.5	18.2	20.5	12.3
1981	6.3	18.7	18.7	12.0
1982	6.9	18.7	18.5	13.4
1983	6.1	17.8	15.6	11.5
1984	6.0	17.8	17.0	12.1
1985	6.4	17.9	16.5	10.0
1986	6.2	18.0	14.4	11.3
1987	6.5	18.1	14.0	10.3
1988	6.9	18.3	15.4	9.3
1989	7.6	19.4	16.8	9.6
1990	9.1	22.4	20.4	9.7
1991	9.4	22.6	22.3	15.5
1992	12.4	23.3	20.4	12.4
1993	10.8	23.8	20.8	15.8
1994	11.2	23.2	16.0	14.2

Data source: *Health Statistics Division*
Note: *Consists of abortions performed in Canadian hospitals and clinics plus abortions obtained by Canadian women in the United States.*
† Standardized to July 1, 1991 female population aged 15-44.
‡ Includes common-law and separated.

Characteristics of hospital users

Kathryn Wilkins and Evelyn Park

Abstract

Objectives

For people living in the community, this article explores selected health problems and personal characteristics that are associated with having been hospitalized.

Data source

The data, collected from a sample of people aged 15 and over living in 27,263 households in the 10 provinces, are from the household component of the 1994/95 National Population Health Survey.

Analytical techniques

Bivariate and multiple regression analyses were used to determine associations between hospitalization and chronic health problems, demographic characteristics, health-related behaviours, and socioeconomic status.

Main results

Having cancer or a long-term disability was strongly associated with hospitalization throughout adulthood. Among women under age 65, the odds of hospitalization were higher among those with inadequate income than among those with adequate income, even after controlling for differences in health status.

Key words

hospitalization, health services needs, chronic disease, socioeconomic status, health surveys

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In recent years, fiscal restraint at all levels of government, coupled with health reform measures, has changed the way health care is provided to the Canadian public. Tighter health care budgets have meant a steady decline in rates of hospitalization and shorter hospital stays.[1,2] Nonetheless, the hospital sector continues to consume a considerable proportion of total health care expenditures. In 1993, an estimated $26.1 billion was spent on hospital care. This represented 36% of the total direct costs of health care that year.[3]

According to the 1994/95 National Population Health Survey (NPHS), 2.2 million Canadians aged 15 and older (who do not reside in institutions) spent at least one night in a hospital, nursing home, or convalescent home during the 12-month period before the NPHS. (For ease of reference, hospitals, nursing homes, and convalescent homes are referred to collectively as "hospitals" in this article.) If the characteristics of people who are most at risk of being hospitalized are identified, programs that seek to reduce the demand for hospitalization can be rationally directed toward them. This article explores selected health problems and personal characteristics that are associated with hospitalization.

Methods

Data source

The data used in this article are from the household component of the 1994/95 National Population Health Survey (NPHS).[4] The NPHS non-institutional sample comprised 27,263 households. Within each household, a knowledgeable person provided information regarding the health of each household member. In addition, a randomly selected household member provided in-depth information on their own health. (The individual providing the latter information may not have been the same person who provided the information about each household member.) The survey response rate (the proportion of selected households in which agreement to participate was obtained, including households later rejected for sampling reasons) was 88.7%. Among the randomly selected household members, the response rate was 96.1%.

NPHS data on hospitalization were collected by the following yes/no question, "In the past 12 months, has . . . been a patient overnight in a hospital, nursing home or convalescent home?" The reason for hospitalization was not asked.

Informed by the framework of Andersen and Newman, the variables selected in relation to hospitalization included indicators of illness such as self-perceived general health, chronic diseases, long-term disability, the occurrence of injury serious enough to limit regular activities, and body mass index. The selected variables considered to predispose people to hospitalization included age, sex and marital status. In addition, specific health-related behaviours, including smoking, alcohol use and recreational physical activity, were considered as predisposing factors. The selected enabling factors included educational attainment and household income adequacy (see *Definitions*).

According to Andersen and Newman, having a high income enables health services use. This view of income as an enabling factor is more appropriate in the context of the American health care system than it is for Canada. Nonetheless, income remains strongly and inversely linked to the health *status* of Canadians, and health care is a determinant of health status. Therefore, a key issue in this analysis is the relationship between income and hospitalization—an aspect of health care.

Information on hospitalization, chronic diseases, disability, living arrangements, educational attainment, and income was provided by one respondent on behalf of all household members. The more in-depth, health-related data pertaining to the occurrence of disabling injury within the 12-month period before the survey— general health, recreational physical activity, height and weight, tobacco and alcohol use—were usually provided by non-proxy interview from a randomly selected household member only.

Analytical techniques

Logistic regression was used to determine the direction and strength of association between hospitalization during the previous 12 months and the selected variables. Preliminary investigations indicated that the variables associated with hospitalization differ between the sexes and at different ages. Therefore, separate analyses were performed for men and women and for the age groups 15 to 39, 40 to 64, and 65 and older. Each regression was weighted using survey weights rescaled to sum to the sample size.

All prevalence estimates are based on data that were weighted to the age- and sex-structure of the 1994/95 population.

Limitations

The data analyzed in this study are cross-sectional. Consequently, causality cannot be inferred from the relationships observed between variables.

The data that were collected by self- or proxy-report are subject to reporting error. In an effort to minimize this error in data related to chronic conditions, respondents were instructed to report only those conditions that were "diagnosed by a health professional."

The NPHS data used in this analysis were collected from people residing in the community. Although the percentage of the population living in institutions such as long-term care facilities is quite small (1% overall, and 5% of people aged 65 and older),[5] the characteristics of the institutionalized population may differ from those of the community-dwelling population in ways that would affect the outcomes of the analysis if the former were included. Therefore, the findings are generalizable only to people living in the community.

The results reported in this article are somewhat limited by selection bias. For example, information about some hospital users was not collected because they live alone and were hospitalized at the time of the survey. Others had been in hospital during the previous 12 months but had since died. To the extent that the characteristics associated with hospitalization differ between the people who were surveyed and the entire population of hospital users, the results of the regression analyses are biased.

To identify these characteristics, some previous research has focused on the impact of specific health problems, such as headaches and musculoskeletal disorders.[6,7] Other researchers studied the independent effects of age and illness severity on hospital admission.[8]

This article employs an approach to the determinants of hospitalization based on a framework specified by Andersen and Newman.[9] Their framework is comprised of societal, systemic (in relation to the organization of health care), and individual dimensions. The individual dimension, the area of investigation in this article, is divided into three groups of determinants: illness, predisposing factors (e.g., age), and enabling factors (e.g., education).

Using data from the 1994/95 NPHS, this article examines the contribution of specific illness factors, including chronic diseases and other health problems, to hospitalization, as well as the extent to which selected predisposing and enabling factors, particularly socieconomic status, are associated with hospitalization once differences in health status are taken into account (see *Methods*).

In addition to the NPHS, information on hospital utilization is available from other data bases developed and maintained by Statistics Canada (see *Administrative data*). Research based on these sources has previously been published in **Health Reports**. For example, administrative data were used to examine hospital separations attributed to specific diagnoses.[10] Person-oriented data—sets of administrative records that are linked by patient—were used to investigate the number of people hospitalized by diagnosis.[11]

One of the strengths of these administrative data bases is their completeness, but they provide little information about the personal attributes of patients. The NPHS, however, includes wide-ranging data on the characteristics of respondents, and thus, makes possible the research presented in this article.

Administrative data

Hospital separation statistics derived from Statistics Canada's Hospital Morbidity Data Base offer a different view of hospital utilization from the one presented in this article. For example, according to NPHS data, of selected self-reported chronic conditions, odds ratios for having been hospitalized were consistently high for people with cancer relative to those without. However, according to administrative data, of the leading diagnoses responsible for hospital stays, neoplasms (cancer) ranked fifth for men and for women (see table below). This difference is partly explained by the nature of administrative data, which include statistics on all conditions (acute as well as chronic) for which people are hospitalized.

Although the NPHS and the Hospital Morbidity Data Base both contain information on hospital utilization, there are several notable differences. For instance, each record in the administrative data base pertains to a hospital separation, but each record in the NPHS refers to an individual. Also, hospital separation records include the diagnosis responsible for the hospital stay, whereas this information was not collected by the NPHS. Information on the health of NPHS respondents, including the presence of selected chronic conditions and injuries, was collected, but it is unknown whether these conditions were directly associated with a reported hospital stay. The Hospital Morbidity Data Base is considered complete, whereas the NPHS collected data from randomly selected households. In addition, data from administrative records contain information about all people hospitalized regardless of their place of residence. Thus, the Hospital Morbidity Data Base covers people living in the community and in long-term care institutions. By contrast, the household component of the NPHS pertains exclusively to people living in households.

Hospital separations, by sex and responsible diagnosis, population aged 15 and older, Canada, 1994

Males – all diagnoses	**1,242,404**
Diseases of the circulatory system	259,805
Diseases of the digestive system	172,763
Injury and poisoning	126,633
Diseases of the respiratory system	109,326
Neoplasms	106,701
Mental disorders	78,222
All other diagnoses	388,954
Females – all diagnoses	**1,855,969**
Complications of pregnancy, childbirth, and the puerperium	500,074
Diseases of the circulatory system	205,324
Diseases of the digestive system	185,856
Diseases of the genitourinary system	138,088
Neoplasms	127,991
Injury and poisoning	114,385
All other diagnoses	584,251

Data source: *Hospital Morbidity Data Base*
Note: *The diagnosis categories used correspond to ICD-9 chapters.*

Strong links with cancer

Not surprisingly, being in fair or poor health (as reported to the NPHS by self-assessment) was significantly associated with hospitalization in all age groups and for both sexes. Not only does this result attest to the value of this single questionnaire item as an effective and efficient means of assessing health, it is also consistent with the findings of other studies that have shown self-rated health to be associated with various measures of health status.[12,13]

Among the selected illness factors, the relationship between hospitalization and cancer was particularly strong. Nearly four out of every ten people who reported they had cancer had spent at least one night in the hospital during the 12 months before the NPHS (Table 1). For those with cancer relative to those without, the odds ratios for having been hospitalized (after the effects of other variables were controlled) were consistently elevated among all sex and age groups except young men (Table 2).

For men aged 15 to 39, the highest odds ratio was for those who reported having diabetes compared with those without. The odds of having been hospitalized for young men with diabetes were six times the odds for young men without this disorder, a finding that perhaps reflects the difficulty of controlling diabetes in this age group.

A relatively high percentage of people with heart disease were hospitalized: 24% for men and 33% for women aged 15 and older. While controlling for other factors, multivariate analysis revealed significantly high odds for hospitalization among men aged 40 to 64 with heart disease and for those with high blood pressure, compared with their counterparts without these diseases. High odds ratios for heart disease and for high blood pressure were also found among women aged 65 and older.

Allergies were significantly associated with hospitalization only among young adults (aged 15 to 39). Food allergies conferred odds of hospitalization that were about twice as high as among people in this age group without food allergies. Non-food allergies were statistically associated with hospitalization only in women.

For the effects of stroke and urinary incontinence, the proportions of affected people who were hospitalized were high. Because of the small numbers of affected people still living in the community, reliable estimates of the proportions of people with these conditions who were hospitalized could only be calculated for women aged 15 and older. For urinary incontinence, the odds ratio was high among men aged 40 to 64. For effects of stroke, the odds ratio was significantly high among men 65 and older.

Small numbers also precluded the calculation of reliable estimates of the proportions of people with epilepsy who were hospitalized. Multivariate analysis, however, indicates that the odds of hospitalization were three times as high among women aged 15 to 39 and 40 to 64 who reported having epilepsy, compared with their counterparts without this condition.

The burden of arthritis/rheumatism, as a leading cause of disability, pain, activity restriction, dependency, diminished quality of life, and medical consultations is well documented.[6,14,15] Despite its impact on other health care sectors, arthritis is usually not associated with admission to hospital. As expected, the proportions of people with arthritis/rheumatism who were hospitalized were lower than for many other chronic diseases. Multivariate analyses showed that arthritis/rheumatism was not significantly associated with hospitalization after controlling for the effects of other variables.

Among people aged 65 and over living in nursing homes and chronic care hospitals, arthritis/rheumatism is slightly *less* prevalent than it is among people the same age living in the community.[5] It would appear that the health care needs of people with arthritis are being satisfied by informal and ambulatory care systems to the extent that they are largely able to continue living in the community and avoid hospitalization.

Hospitalization was positively and significantly related to activity-limiting injury and long-term disability for men and women in most age groups. However, despite some collinearity between the dichotomous variables (long-term disability and arthritis/rheumatism), exclusion of long-term disability from the regression analysis resulted in only

a slight increase in the odds ratio for arthritis/rheumatism, and not to the level of significance.

The association of body mass index (BMI) with hospitalization varied by sex and age group (see *Definitions*). In men aged 40 to 64 and women aged 65 and older, low BMI was positively related to overnight stay in hospital. This association may reflect the effects of illness or poor nutritional status in lowering body weight. As well, in older women, the odds of being hospitalized might be higher among those who are underweight because of a greater risk of bone fracture due to osteoporosis.[16]

An examination of the association between hospitalization and some predisposing factors, including sex, living arrangements and smoking, revealed surprisingly few patterns. Except in the childbearing age group (15 to 39), the percentages of women and men hospitalized were the same (Chart 1).[a] Because the prevalence of many chronic diseases is higher in women than in men, this finding was unexpected.[12,15]

Large differences in hospitalization rates were generally not observed by living arrangements (that is, living with or without a partner). The exception was women aged 15 to 39: of those who were living with a partner, 18% were hospitalized, compared with 10% of those living without a partner. The odds ratio for hospitalization among women living without a partner was also significantly low, presumably due to the greater frequency of hospital stays related to childbearing among women living with a spouse or partner.

No consistent association emerged in relation to smoking except in older adolescents and young adults. In the age group 15 to 39, higher proportions of current regular smokers were hospitalized than non-smokers or former and occasional smokers.

[a] *Of women aged 15 to 39, 7% had given birth within the year before the survey, an event for which the vast majority were hospitalized.*

Definitions

Body mass index: body weight (in kilograms) divided by the square of body height (in metres)

- Appropriate: 20 to 27
- Underweight: < 20
- Overweight: > 27

Leisure physical activity level: energy expenditure (in kilcalories) divided by body weight (in kilograms) per day

- Active: > 2.9
- Moderate: 1.5 to 2.9
- Inactive: < 1.5

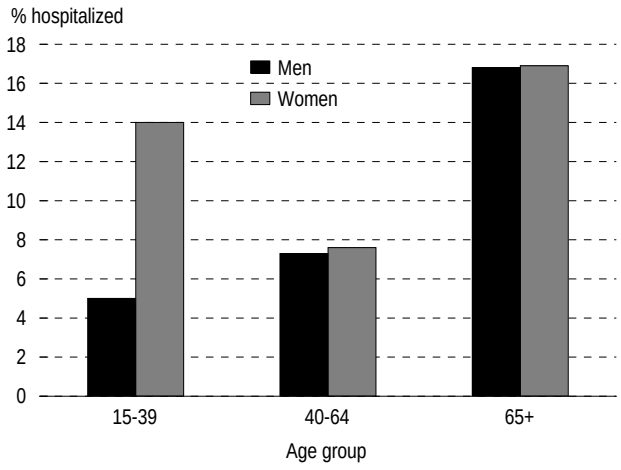
Income adequacy: measure is based on income and household size (Tables 1 and 2)

	Income adequacy	
Household size	**Inadequate**	**Adequate**
1 or 2 people	< $15,000	≥ $15,000
3 or 4 people	< $20,000	≥ $20,000
5 or more people	< $30,000	≥ $30,000

Income groups used in univariate analysis (Chart 2 only)

	Income adequacy group				
Household size	**Lowest**	**Lower-middle**	**Middle**	**Upper-middle**	**Highest**
1 or 2 people	< $10,000	$10,000-$14,999	$15,000-$29,999	$30,000-$59,999	> $60,000
3 or 4 people	< $10,000	$10,000-$19,999	$20,000-$39,999	$40,000-$79,999	> $80,000
5 or more people	< $15,000	$15,000-$29,999	$30,000-$59,999	$60,000-$79,999	> $80,000

Chart 1
Percentage of people hospitalized in previous 12 months, by age group and sex, population aged 15 and older, all provinces, 1994/95



Data source: *1994/95 National Population Health Survey, household component (randomly selected respondents)*
Note: *All patients who stayed overnight in a hospital, nursing home or convalescent home are considered to have been hospitalized.*

Table 1
Percentage of people hospitalized in previous 12 months, by age group, sex and selected characteristics, all provinces, 1994/95

	Age group							
	Total 15+		15-39		40-64		65+	
	Men	Women	Men	Women	Men	Women	Men	Women
				%				
Total	**7.4**	**12.1**	**5.0**	**14.0**	**7.3**	**7.6**	**16.8**	**16.9**
Illness factors								
General health								
Excellent, very good, or good	5.9	10.3	4.6	13.1	5.7	5.4	13.0	12.5
Fair, poor	21.7	25.8	16.2	27.7	19.4	21.8	28.0	28.8
Chronic disease								
Alzheimer disease, other dementia	--	--	--	--	--	--	--	--
Arthritis/rheumatism	13.9	16.5	--	20.3	11.3	11.0	19.6	21.0
Asthma	11.2	17.5	--	18.6	--	13.5	--	--
Back problems excluding arthritis	12.3	17.5	11.0	20.1	11.6	12.1	18.0	23.5
Cancer	39.4	37.0	--	--	--	--	--	38.4
Cataracts	--	25.4	--	--	--	--	--	27.4
Chronic bronchitis, emphysema	16.4	22.3	--	24.1	--	--	--	29.6
Diabetes	20.8	21.0	--	--	--	--	24.5	24.6
Effects of stroke	--	35.0	--	--	--	--	--	--
Epilepsy	--	--	--	--	--	--	--	--
Food allergies	10.7	17.9	--	21.1	--	12.7	--	--
Glaucoma	--	--	--	--	--	--	--	--
Heart disease	24.0	32.6	--	--	25.8	29.6	22.1	35.3
High blood pressure	15.8	18.3	--	--	16.4	11.2	16.9	23.3
Migraine headaches	8.9	16.2	--	19.2	--	11.6	--	--
Non-food allergies	8.0	15.2	6.4	17.7	8.8	9.1	--	21.2
Stomach, intestinal ulcers	19.9	23.6	--	--	--	20.3	--	28.3
Urinary incontinence	--	25.2	--	--	--	--	--	--
Other health problems								
Activity-limiting injury	11.8	14.3	10.1	13.1	13.7	10.9	--	30.5
Long-term disability	18.8	23.8	14.1	24.8	18.9	19.3	24.6	28.9
Body mass index								
Appropriate	6.8	11.7	4.8	14.3	6.5	7.1	17.0	14.0
Underweight	8.4	11.7	--	10.5	--	--	--	26.8
Overweight	8.3	13.6	5.8	17.3	8.0	8.5	17.0	18.7
Unknown	--	--	--	--	--	--	--	--
Predisposing factors								
Living arrangements								
With partner	7.8	12.5	4.8	17.7	7.2	6.8	17.3	14.9
Not with partner	6.5	11.6	5.3	9.7	7.7	9.9	15.2	18.6
Physical activity								
Active	7.1	9.1	7.2	11.3	6.6	5.2	8.0	9.7
Moderate	8.5	10.3	6.4	11.6	9.5	7.2	14.8	14.1
Inactive	7.3	13.3	3.8	15.4	7.3	8.1	20.7	18.3
Unknown	--	--	--	--	--	--	--	--
Alcohol consumption								
≥ 1 drink/week	6.4	9.2	4.5	10.4	6.6	6.3	14.9	15.0
Some, but < 1 drink/week	6.8	12.0	4.5	14.6	6.9	6.2	17.6	15.7
None	11.2	15.3	8.1	16.2	10.5	11.6	18.5	18.5
Smoking								
Never	5.7	10.3	4.3	11.5	4.8	6.7	21.0	14.3
Former/occasional	8.7	13.2	4.5	14.7	8.6	7.9	16.1	20.8
Current regular	7.5	14.1	6.5	16.7	7.6	8.9	14.4	17.9
Enabling factors								
Household income								
Adequate	6.8	10.6	4.6	12.8	6.7	6.0	16.7	15.0
Inadequate	10.9	17.7	7.6	18.0	13.0	14.9	18.0	20.2
Unknown	--	--	--	--	--	--	--	--
Education								
Completed secondary school	6.3	11.7	5.0	14.1	6.4	7.0	14.8	16.3
Did not complete secondary school	9.8	13.2	5.1	13.4	9.8	9.2	18.7	17.4

Data source: *1994/95 National Population Health Survey, household component (randomly selected respondents)*
-- Amount too small to be expressed.

Table 2
Odds ratios relating selected factors to hospitalization in previous 12 months, population aged 15 and older, by age group and sex, all provinces, 1994/95

	Age group					
	15-39		40-64		65+	
	Men	Women	Men	Women	Men	Women
Sample size	3,649	4,236	2,813	3,116	1,230	1,897
Illness factors						
General health						
Excellent, very good, or good	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)
Fair or poor	2.55**	1.73**	1.65*	2.23**	1.87**	1.50*
Chronic disease†						
Arthritis/ rheumatism	0.37	0.94	0.79	0.92	1.00	1.05
Asthma	1.74 *	0.96	0.46	1.12	1.02	0.68
Back problems excluding arthritis	1.57 *	1.25	1.15	1.03	0.98	1.06
Cancer	2.15	3.04**	4.80**	6.98**	4.54**	3.18**
Cataracts	--	--	0.04**	1.15	1.00	1.54*
Chronic bronchitis, emphysema	0.37	1.41	0.51	0.93	1.26	1.34
Diabetes	5.73**	1.23	0.96	1.13	1.22	1.06
Effects of stroke	2.01	0.56	0.97	1.26	1.96*	1.61
Epilepsy	2.56	2.93**	0.75	3.66*	..	0.77
Food allergies	2.22**	1.66**	0.91	1.07	0.50	0.92
Glaucoma	--	--	5.29**	0.55	1.00	0.95
Heart disease	3.18	1.11	2.20**	1.90*	1.13	2.41**
High blood pressure	0.92	1.61	2.39**	0.94	0.87	1.64**
Migraine headaches	0.95	1.05	0.44	1.25	1.48	0.64
Non-food allergies	1.06	1.29*	1.25	1.06	1.05	1.25
Stomach, intestinal ulcers	1.98	1.49	2.80**	2.35**	0.97	1.06
Urinary incontinence	--	--	5.41*	0.81	1.78	1.43
Other health problems†						
Activity-limiting injury	3.00**	0.87	2.26**	1.54*	1.71	2.03**
Long-term disability	2.45**	1.54**	2.99**	2.43**	1.26	1.75**
Body mass index						
Appropriate	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)
Underweight	0.99	0.74*	2.26*	0.97	0.80	1.95**
Overweight	1.33	1.03	0.87	0.87	0.93	1.28
Unknown	0.42	0.63	--	0.65	0.13	0.31
Predisposing factors						
Living arrangements						
With partner	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)
Not with partner	0.98	0.45**	0.84	0.96	0.82	1.03
Physical activity						
Active	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)
Moderate	0.98	0.89	1.53	1.34	2.13*	1.27
Inactive	0.49**	1.18	1.15	1.39	2.38**	1.20
Unknown	0.27**	1.73*	0.51	1.44	1.39	1.49
Alcohol consumption						
≥1 drink/week	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)
Some, but <1 drink/week	1.14	1.41**	0.86	0.86	1.02	0.98
None	2.15**	1.78**	1.46	1.36	0.90	1.02
Smoking						
Never	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)
Former/occasional	0.98	1.35**	1.70*	1.09	0.52**	1.61**
Current regular	1.46	1.46**	1.20	0.91	0.41**	1.41
Enabling factors						
Household income						
Adequate	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)
Inadequate	1.46	1.62**	1.57	1.92**	0.96	1.34
Unknown	1.25	1.49	0.49	1.67	0.99	1.50
Education						
Completed secondary school	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)
Did not complete secondary school	0.78	0.93	1.28	0.81	1.25	0.92

Data source: *1994/95 National Population Health Survey, household component (randomly selected respondents)*
Note: *Odds ratios for the reference categories are shown in parentheses. Because calculations of the standard errors did not account for design effects, the odds ratios were considered significant only if their confidence intervals did not overlap the values 0.955 and 1.055, for odds ratios less than one and greater than one, respectively.*
† The reference category is the absence of the condition.
** $0.01 \leq p < 0.05$*
*** $p < 0.01$*
-- Not included in regression because of low prevalence.

Among people aged 40 and older, however, no regular association between hospitalization and smoking habits was observed. Multivariate analysis revealed similarly inconsistent associations by age and sex between hospitalization and smoking. In women aged 15 to 39, for example, both current tobacco use (smoking at least one cigarette every day) and former or occasional use, in comparison with not smoking, showed highly significant positive associations with hospitalization. However, in men aged 65 and older, current smoking and former or occasional smoking were both negatively associated with hospitalization. Because smoking is known to cause chronic respiratory problems, not to mention numerous cancers, its apparently "protective" relationship with hospitalization in older men is puzzling.

For some variables, the small number of people in some age and sex categories may partly explain these unexpected results. For example, the categories, "former or occasional smoking" and "current smoking," were both negatively and positively associated with hospitalization (in different age and sex categories). However, regression analysis using all the data combined (that is, all ages for both sexes) yielded odds ratios of 1.24 and 1.19 (both significant at the level of $p < 0.05$) for former or occasional smoking and current smoking, respectively (data not shown).

For other predisposing factors, namely age, leisure physical activity level and alcohol use, distinct patterns emerged in relation to hospitalization. Understandably, hospitalization was most common among older people. One in six people aged 65 and older reported spending at least one night in hospital. This is nearly identical to the result derived from Statistics Canada's 1991 General Social Survey.[17]

In general, people whose leisure physical activity was categorized as "active" were hospitalized less frequently than people who were less active. In men aged 15 to 39, however, the opposite pattern was observed; the percentage hospitalized was lowest among those classified as "inactive." Even when all other variables were controlled, the odds ratio for this inactive group of men was 0.49 (Table 2). However, the high odds ratio for inactive men aged 65 and over suggests that the deleterious effects of inactivity may be delayed until later in life.

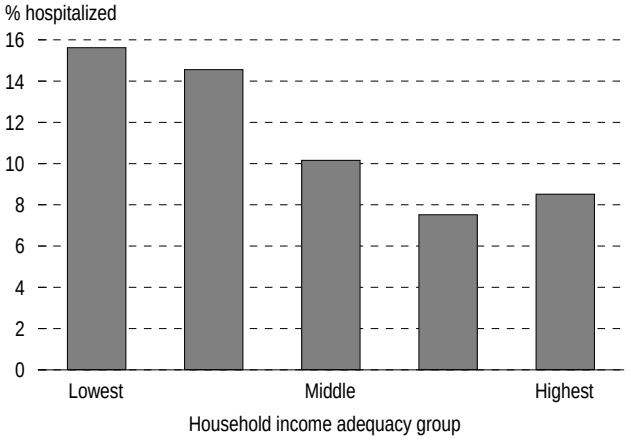
With regard to alcohol use, the proportion of people hospitalized was highest among those who reported that they never drink and lowest among those who reported consuming at least one drink per week. This pattern was quite consistent in both sexes and all age groups, and may reflect the greater likelihood of pre-existing health problems that were not included in this analysis among people who abstain from alcohol use.[17] Multivariate analysis indicated that only in the age group 15 to 39 were the odds ratios for abstinence significantly elevated.

Low income linked to hospitalization

The proportion of people hospitalized was generally inversely related to income adequacy (Table 1 and Chart 2). After adjusting for differences in other health-related variables, the odds ratios for hospitalization among women aged 15 to 39 and 40 to 64 living in households with inadequate income were significantly elevated relative to those with adequate income.[b] Several earlier studies of health

[b] *The odds ratios for inadequate income for men aged 15 to 39 and for women aged 65 and older, although elevated, were only of borderline significance, both with p values of 0.07, probably because of the small cell size.*

Chart 2
Percentage of people hospitalized in previous 12 months, by household income adequacy group, population aged 15 and older, all provinces, 1994/95



Data source: *1994/95 National Population Health Survey, household component (randomly selected respondents)*
Note: *All patients who stayed overnight in a hospital, nursing home or convalescent home are considered to have been hospitalized.*

services use in Canada have reported that low income is nearly as important a determinant as is illness.[18-20]

The association between inadequate income and hospitalization also corroborates the results of a recent study that compared hospital use between residents of Ontario and the United States. This study showed that among people in ill health, admission rates in Ontario, but not in the U.S., are nearly twice as high among poor people as they are among non-poor people.[21] The findings from the NPHS also complement the results of Statistics Canada's 1991 General Social Survey that showed a higher occurrence of hospitalization among people aged 65 and over with inadequate income than among those with adequate income.[17]

Analyses of survey data from 1978/79, however, indicate that although the volume of hospital use (measured in days of stay) was higher among people with low income than among those with high income, family income was not related to the frequency of hospitalization.[20] The absence of an association between income and hospitalization in the 1978/79 survey may have resulted from the use of family income rather than the more refined income adequacy measure that was used in the analyses of the later surveys. Alternatively, the contrasting results may reflect a change over time in the association of income with hospitalization.

Coping with hospital cuts

To curtail hospital services without compromising people's health will partially depend on progress in preventing or alleviating the severity of the particular conditions that are associated with hospitalization. Cancer was strongly linked with hospitalization, and some forms can be prevented. Lung cancer, which leads all others in causing death, is nearly entirely preventable, as are numerous other cancers caused by smoking.

For other diseases, for example, breast and prostate cancer and some kinds of heart disease, relatively little is known about prevention. Surgical intervention — inevitably requiring hospitalization — may offer the best hope. In these cases, it does not seem desirable to shift the burden of postoperative or palliative care to out-patient or community care services without adequate formal supports in place.

For conditions such as injury, the potential for more immediate prevention, and thus reduction of the need for hospitalization may be greater. Motor vehicle-related injury prevention, for example, is an area of public health that has benefited from campaigns and legislation to discourage drinking and driving, as well as advances in automotive engineering and highway design. Fewer resources have been directed to other concerns, such as falls among elderly people, a frequent cause of serious injury and hospitalization.[22]

Although universal access to medical care in Canada has removed the direct financial barriers to physicians' services and hospital care,[c] differences persist in the availability of the social and instrumental circumstances that enhance health. Clearly, people with inadequate incomes have less access to the living conditions, preventive services, diet and other less tangible factors that contribute to good health. The findings of this study show that a larger proportion of people of inadequate means are indeed receiving hospital services; evidence perhaps of the success of universal access to illness care but also evidence of a continuing failure of an equitable distribution of wellness.[23-29]

[c] *Among people with inadequate income, access to health care services may still be hampered by lack of transportation, difficulty obtaining child care, etc.*

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Reports

This section presents descriptive articles in the fields of health and vital statistics.

Infant mortality and low birthweight, 1975 to 1995

François Nault

Abstract

Objectives

This article examines trends in infant mortality and the incidence of low birthweight from 1975 to 1995.

Data sources

The data are from the Canadian Vital Statistics Data Base, compiled from information provided to Statistics Canada by the Vital Statistics Registries in each province and territory.

Analytical techniques

Death rates, stillbirth rates, and the incidence of low birthweight were calculated for Canada, the provinces, and territories from 1975 to 1995. To examine the impact of changes in maternal characteristics during the period, the incidence of low birthweight was standardized by age and marital status of mothers, using the 1985 distributions.

Main results

The pace of decline in infant and perinatal mortality has slowed in recent years. This slowdown may, at least in part, be attributed to the increase in the incidence of low birthweight. In turn, some of the increase in the incidence of low birthweight is explained by the rising proportions of births to women aged 35 and older and to unmarried women.

Key words

fetal death, stillbirths and infant deaths, perinatal mortality, neonatal mortality

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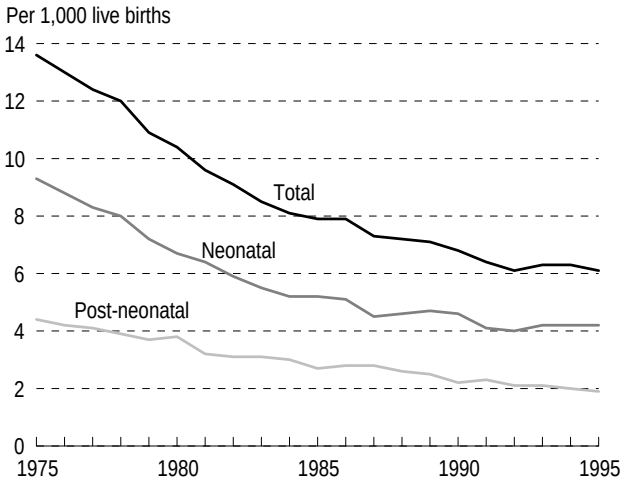
The drastic reduction in infant mortality—deaths of children younger than age one— in Canada and in other industrialized countries is a major medical achievement of this century. With the near-disappearance of infectious diseases among infants, the potential for future reductions in infant mortality lies primarily in improving survival during the first weeks or days of life, and in pre-natal survival. Thus, in low-mortality countries such as Canada, attention has gradually shifted to neonatal mortality (deaths in the first 27 days), or even to perinatal mortality (stillbirths and deaths within the first week).

While infant mortality rates in Canada continue to decline, the pace has slowed during the past decade. This slowdown coincides with an increase in the incidence of low birthweight.

This article describes trends in infant mortality, stillbirths, and the incidence of low birthweight from 1975 to 1995 (see *Methods* and *Definitions*).

Chart 1
Infant mortality rates, Canada, 1975 to 1995



Data source: *Canadian Vital Statistics Data Base*

Infant mortality

The annual number of infant deaths has declined over the past 20 years, but the pace of decline is diminishing (Appendix, Table A and Chart 1). From 4,721 in 1975, the number dropped to 2,982 in 1985 and to 2,321 by 1995.

Between 1975 and 1985, the infant mortality rate fell sharply from 13.6 to 7.9 infant deaths per 1,000 live births. The next ten years saw a comparatively small drop to 6.1. In fact, the infant mortality rate was the same in 1995 as in 1992.

Since 1975, the majority (about 7 in 10) of infant deaths were neonatal, that is, they occurred in the first 27 days of life. Moreover, in 1995, 37% of infant deaths occurred during the first day, and another 19%, during the first week.

Methods

Data sources

Data on live births, stillbirths, deaths, and low birthweight are from the Canadian Vital Statistics Data Base. The data are adapted from information collected by the provincial and territorial registries of vital statistics, which are responsible for the registration of vital events that occur in their jurisdictions.

Analytical techniques

Death rates, stillbirth rates, and the incidence of low birthweight were calculated for Canada, the provinces, and territories. To examine the impact of changes in maternal characteristics, the incidence of low birthweight was standardized by age and marital status of mothers, using the 1985 distributions.

Limitations

Because of legal reporting requirements, the registration of vital events is considered to be virtually complete. However, records received after the "cut-off" date for data release are missing, as are data for Canadians in foreign countries other than the United States. Vital events for non-permanent residents may be excluded if their usual place of residence was not Canada.

There may be some effect of registration practices for very small and immature fetuses. Pregnancy outcomes that were previously registered as spontaneous abortions (if they were registered at all) may now be registered as births, and changes may have occurred in the classification of stillbirth versus live birth. It is noteworthy that between 1985 and 1995, live births of less than 500 grams increased from 4.3 to 8.8 per 10,000, and the proportion of stillbirths that were less than 500 grams increased from 14% to 23% of all stillbirths of known birthweight, even though four provinces do not include stillbirths of less than 500 grams in their statistics.

The small number of stillbirths of unknown weights, which are excluded from all calculations, does not significantly affect the interpretation of trends and interprovincial differences.

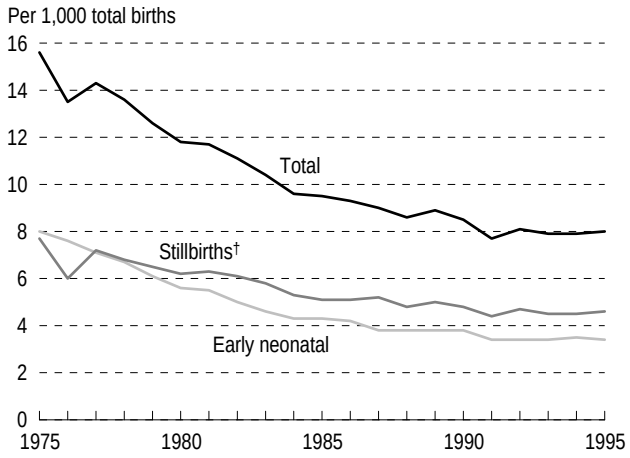
The utility of cause of death and stillbirth statistics depends on how exact and complete they are. Accuracy is governed by factors such as the experience of the certifying physician and the use of post-mortem examination results, when these are performed.

In 1995, the neonatal mortality rate was 4.2 deaths per 1,000 live births. This was a relatively small change from 1985 (5.2), but a considerable drop since 1975 (9.3).

Perinatal mortality

Like infant mortality, perinatal mortality, which comprises stillbirths and early neonatal mortality (less than 7 days), decreased more quickly between 1975 and 1985 than between 1985 and 1995 (Appendix, Table B). In addition, early neonatal deaths declined at a faster pace than stillbirths, so stillbirths represented a growing proportion of perinatal mortality: 49% in 1975; 57% in 1995 (Chart 2). This drop in early neonatal mortality may be indicative of medical advances in caring for very small infants who are born alive.

Chart 2
Perinatal mortality rates, Canada, 1975 to 1995



Data source: *Canadian Vital Statistics Data Base*
† Comprises only stillbirths of at least 500 grams. Stillbirths of unknown weight are excluded.

Causes of death

Causes of infant death differ with the child's age. As well, a substantial share of stillbirths and infant deaths are attributed to unknown causes (Table 1).

In 1995, perinatal complications caused over 85% of stillbirths of known causes and 65% of early neonatal deaths. Perinatal complications comprise respiratory distress syndrome and other respiratory conditions, disorders related to short gestation and low birthweight, maternal complications of pregnancy, and complications of placenta, cord and other membranes. Congenital anomalies caused almost all the remaining stillbirths and early neonatal deaths, and were the main cause of death of infants aged 7 to 27 days. The most common fatal congenital anomalies are anomalies of the circulatory and respiratory systems.

After the first four weeks of life, Sudden Infant Death Syndrome (SIDS) emerges as the leading cause of death, accounting for 34% of post-neonatal deaths of known causes in 1995. Another 25% of post-neonatal deaths were attributed to congenital anomalies, and injuries represented 6%. Five infants died of AIDS that year.

Table 1
Selected causes of stillbirths and infant deaths, Canada, 1995

	Stillbirths		Infant deaths				
		Rate	Total	Early neonatal	Late neonatal	Post-neonatal	Rate
	Number	Per 1,000 total births	Number				Per 1,000 live births
Total (ICD-9)	**1,730**	**4.56**	**2,321**	**1,295**	**289**	**737**	**6.14**
Perinatal complications (760-779)	1,166	3.07	989	839	109	41	2.62
Congenital anomalies (740-759)	181	0.48	684	400	115	169	1.81
SIDS (798.0)	...	...	249	2	17	230	0.66
Injuries (E800-E999)	...	...	54	5	6	43	0.14
All other known causes	3	0.01	269	38	33	198	0.71
Unknown causes, perinatal (779.9)	380	1.00	1	1	0	0	0.00
Unknown causes, general (799.9)	...	...	75	10	9	56	0.20

Data source: *Canadian Vital Statistics Data Base*
... Figures not appropriate

Definitions

Live birth: complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy, which, after such separation, breathes or shows other evidence of life.

Stillbirth: product of conception which has issued from its mother and did not at any time after birth breathe or show other signs of life. The World Health Organization recommends that "national perinatal statistics (which comprise stillbirths plus early neonatal deaths) should include all fetuses and infants delivered weighing at least 500 grams or, when birthweight is unavailable, the corresponding gestational age (22 weeks) or body length (25 cm crown-heel), whether alive or dead."[1] Three different definitions were in use in Canada in 1995: in Newfoundland, New Brunswick, Quebec, and Saskatchewan, only the 500 grams criterion was considered; in Prince Edward Island, only gestational age was considered (fetuses of at least 20 weeks); in all other provinces and territories, either criterion was considered. In this article, to allow for interprovincial comparisons, only stillbirths of 500 grams or more, which are collected in all provinces, were used.

Infant death: death of child under one year of age.

Neonatal death: death of child under 28 days of age.

Early neonatal death: death of child under 7 days of age.

Late neonatal death: death of child aged from 7 days to less than 28 days.

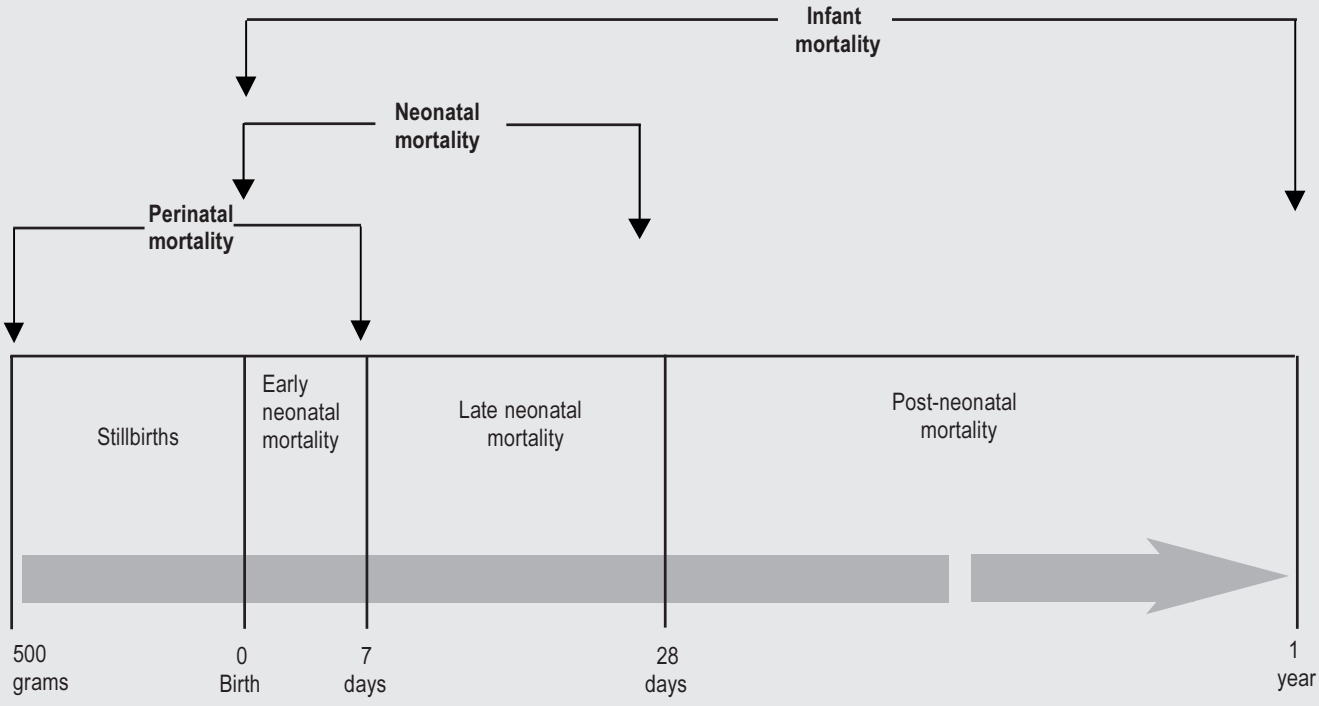
Post-neonatal death: death of child aged from 28 days to less than one year.

The infant, neonatal (early and late), and post-neonatal mortality rates are the number of such deaths per 1,000 live births. The same denominator is used for each rate.

Perinatal mortality rate: number of stillbirths of 500 grams or more and early neonatal deaths per 1,000 total births (live births plus stillbirths).

Stillbirth rate: number of stillbirths of 500 grams or more per 1,000 total births of known weight.

Incidence of low birthweight: live births of 500 to 2,499 grams as a percentage of total live births weighing at least 500 grams (excluding births of unknown weight).



Source: *Statistics Canada (reference 4)*

Low birthweight

Birthweight is generally considered one of the best indicators of a newborn's chances of survival.[2,3] Perinatal and infant mortality are highly correlated with the incidence of low birthweight. Studies that link live births and infant deaths have repeatedly shown extreme differences in survival rates by birthweight.[4-7] From 1975 to 1985, the incidence of low birthweight fell from 6.64% to 5.53%, but by 1995, it had increased to 5.77% (Chart 3).

Characteristics classified as "risk markers" aid in identifying women who may have low birthweight babies.[8,9] These markers include the age and marital status of the mother, length of gestation, and parity (birth order) (Table 2).

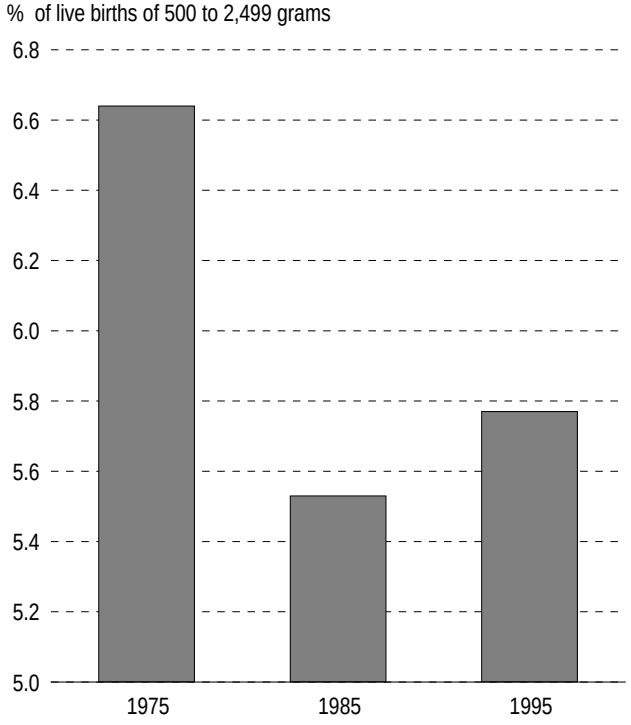
Low birthweight is higher among the youngest and oldest mothers than among those aged 25 to 34.[10] The proportion of low-weight newborns also tends to be higher among unmarried than among married mothers. Therefore, changes since 1985 in the distribution of births by the age and marital status of mothers may explain part of the increase in the incidence of low birthweight. The proportion of births to women aged 35 and over doubled from 6% to 12%, and the proportion of births to unmarried mothers increased from 18% to 30%. If the distribution of births by age and marital status of mothers had remained as it was in 1985, the incidence of low birthweight would have fallen to 5.49% in 1995 instead of rising to 5.77%.

Low birthweight is clearly related to prematurity, as close to half of preterm babies weigh less than 2,500 grams, compared with only about 2% of those born at 37 or more weeks' gestation. As well, low birthweight is more common among first-born children and those that are the mother's fourth or later birth than among second- and third-born children.

Of course, fetal and infant survival depend on the quality and accessibility of health care. Specialized medical centres with intensive care units have much lower neonatal mortality rates than other hospitals.[6,11]

The socioeconomic environment of the mother also plays a role. The importance of socioeconomic conditions is demonstrated by the fact that in urban

Chart 3
Incidence of low birthweight, Canada, 1975, 1985 and 1995



Data source: *Canadian Vital Statistics Data Base*

Table 2
Incidence of low birthweight,† by age of mother and selected characteristics, Canada, 1995

	Age of mother						
	All ages	**<20**	**20-24**	**25-29**	**30-34**	**35-39**	**40+**
				%			
Total	**5.8**	**6.7**	**6.0**	**5.4**	**5.5**	**6.5**	**8.2**
Marital status							
Married	5.1	6.1	5.3	4.8	4.9	5.7	7.4
Not married	6.8	6.7	6.4	6.5	7.2	8.7	10.0
Length of gestation (weeks)							
Less than 37	48.5	50.3	49.2	47.6	48.2	48.8	50.3
37 and over	2.2	2.5	2.4	2.1	2.1	2.4	2.9
Parity							
1	6.1	6.3	5.8	5.5	6.4	7.8	10.5
2	5.1	8.5	5.7	4.6	4.6	5.9	7.6
3	5.9	10.3	7.3	5.8	5.2	6.0	7.4
4+	7.2	11.9	9.9	7.8	6.5	6.8	7.5

Data source: *Canadian Vital Statistics Data Base*
† Live births of 500 to 2,499 grams as a percentage of total live births weighing at least 500 grams

Canada, the incidence of low birthweight and the infant mortality rate are relatively high in the lowest income neighborhoods.[12]

Sex differences

Higher male than female mortality rates, which are observable at all ages, exist even at birth. In 1995, mortality rates were higher among boys than girls: 6.7 versus 5.5 deaths per 1,000 live births for infant mortality, and 8.6 versus 7.3 deaths per 1,000 total births for perinatal mortality. On the other hand, the incidence of low birthweight was higher for girls (6.3%) than for boys (5.4%).

Provincial differences

Among the provinces, Saskatchewan, Newfoundland, and Manitoba had the highest infant mortality rates in 1995 (Table 3). Over the previous decade, infant mortality had declined in all provinces except Prince Edward Island (possibly because of fluctuations due to small numbers). Even so, in 1995, Prince Edward Island had the lowest infant mortality rate. Rates were also low in Nova Scotia and New Brunswick, which had experienced the sharpest declines since 1985.

The highest perinatal mortality rate in 1995 was in Prince Edward Island, followed by Saskatchewan, Newfoundland, and Manitoba. The lowest rates were in New Brunswick, Quebec, and British Columbia. Prince Edward Island was the only province where perinatal mortality had risen during the decade.

Among the most populous provinces, declines in both infant and perinatal mortality since 1985 were greater in Quebec and British Columbia than in Ontario. However, the rates in these three provinces did not differ greatly from one another.

The incidence of low birthweight in 1995 was highest in Ontario, Quebec and Alberta, and lowest in Prince Edward Island, New Brunswick and British Columbia. From 1985 to 1995, the incidence of low birthweight declined in only three provinces: Prince Edward Island, New Brunswick, and Quebec.[a] The increase for Canada overall is mainly attributable to an upturn in Ontario.[13]

[a] Trends in Newfoundland are not known because the incidence of low birthweight was not available before 1990.

Table 3
Infant mortality, perinatal mortality and incidence of low birthweight, Canada, provinces and territories, 1975, 1985 and 1995

	Canada	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Yukon	N.W.T.
Infant mortality†						Per 1,000 live births							
1975	13.1	15.7	19.2	16.2	15.5	13.3	12.8	15.0	17.8	14.9	14.4	24.5	35.7
1985	7.9	10.8	4.0	7.9	9.6	7.3	7.3	9.9	11.0	8.0	8.1	10.8	16.7
1995	6.1	7.9	4.6	4.8	4.8	5.5	5.9	7.6	9.1	7.0	6.0	12.8	13.0
Perinatal mortality‡						Per 1,000 total births							
1975	15.6	8.7	25.6	14.8	20.2	15.4	16.3	17.2	17.0	13.6	17.3	24.3	30.2
1985	9.5	10.3	9.9	10.1	9.2	8.8	9.7	10.4	10.5	8.7	10.0	2.2	11.7
1995	8.0	9.5	10.2	8.1	5.6	7.2	8.2	8.7	9.9	8.5	7.5	8.5	9.2
Low birthweight§						%							
1975	6.64	..	5.04	5.48	5.53	7.51	6.44	6.23	6.26	6.93	6.10	7.18	8.50
1985	5.53	..	4.89	5.20	5.21	6.30	5.40	5.14	5.33	5.46	4.92	6.47	4.61
1995	5.77	5.43	4.63	5.85	4.71	5.90	5.98	5.38	5.51	5.88	5.24	4.06	6.95

Data source: *Canadian Vital Statistics Data Base*
† Deaths of infants less than one year old
‡ Stillbirths and deaths of infants less than seven days old
§ Live births of 500 to 2,499 grams as a percentage of total live births weighing at least 500 grams
.. Not available

In the Yukon and the Northwest Territories, infant and perinatal mortality rates have fallen sharply, but because of the small numbers, some of this decline may be due to random fluctuations. While infant mortality rates in the territories are well above provincial rates, in 1995, only the post-neonatal mortality rates were substantially higher; the neonatal mortality rates were comparable to those of the provinces. It is possible, however, that there may be some under-registration of early deaths in the territories.

Concluding remarks

Paradoxically, progress in perinatal care can cause the infant mortality to rise, as pregnancies that formerly would have ended in miscarriages or stillbirths result in low-weight live births with precarious survival chances. In recent years, the pace of decline in infant and perinatal mortality has slowed. At the same time, the incidence of low birthweight increased. To some extent, this rise in the incidence of low birthweight can be partly attributed to the increasing proportion of births to older and to unmarried mothers.

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Appendix

Table A
Infant deaths and mortality rates, Canada, 1975 to 1995

	Total	Neonatal	Post-neonatal	Total	Neonatal	Post-neonatal
		Number			Per 1,000 live births	
1975	4,721	3,144	1,577	13.1	8.7	4.4
1976	4,682	3,178	1,504	13.0	8.8	4.2
1977	4,475	2,984	1,491	12.4	8.3	4.1
1978	4,289	2,888	1,401	12.0	8.0	3.9
1979	3,994	2,652	1,342	10.9	7.2	3.7
1980	3,868	2,470	1,398	10.4	6.7	3.8
1981	3,562	2,359	1,203	9.6	6.4	3.2
1982	3,385	2,219	1,166	9.1	5.9	3.1
1983	3,182	2,040	1,142	8.5	5.5	3.1
1984	3,058	1,942	1,116	8.1	5.2	3.0
1985	2,982	1,954	1,028	7.9	5.2	2.7
1986	2,938	1,909	1,029	7.9	5.1	2.8
1987	2,706	1,679	1,027	7.3	4.5	2.8
1988	2,705	1,719	986	7.2	4.6	2.6
1989	2,795	1,828	967	7.1	4.7	2.5
1990	2,766	1,869	897	6.8	4.6	2.2
1991	2,573	1,638	935	6.4	4.1	2.3
1992	2,431	1,579	852	6.1	4.0	2.1
1993	2,448	1,613	835	6.3	4.2	2.1
1994	2,418	1,634	784	6.3	4.2	2.0
1995	2,321	1,584	737	6.1	4.2	1.9

Data source: *Canadian Vital Statistics Data Base*

Table B
Perinatal deaths and mortality rates, Canada, 1975 to 1995

	Total	Stillbirths†	Early neonatal	Total	Stillbirths	Early neonatal
		Number			Per 1,000 total births	
1975	5,664	2,771	2,893	15.6	7.7	8.0
1976	4,903	2,161	2,742	13.5	6.0	7.6
1977	5,214	2,624	2,590	14.3	7.2	7.1
1978	4,905	2,470	2,435	13.6	6.8	6.7
1979	4,641	2,397	2,244	12.6	6.5	6.1
1980	4,394	2,302	2,092	11.8	6.2	5.6
1981	4,381	2,344	2,037	11.7	6.3	5.5
1982	4,175	2,302	1,873	11.1	6.1	5.0
1983	3,927	2,187	1,740	10.4	5.8	4.6
1984	3,635	2,006	1,629	9.6	5.3	4.3
1985	3,582	1,941	1,641	9.5	5.1	4.3
1986	3,504	1,927	1,577	9.3	5.1	4.2
1987	3,333	1,930	1,403	9.0	5.2	3.8
1988	3,255	1,815	1,440	8.6	4.8	3.8
1989	3,498	1,989	1,509	8.9	5.0	3.8
1990	3,473	1,943	1,530	8.5	4.8	3.8
1991	3,131	1,770	1,361	7.7	4.4	3.4
1992	3,225	1,883	1,342	8.1	4.7	3.4
1993	3,085	1,753	1,332	7.9	4.5	3.4
1994	3,070	1,723	1,347	7.9	4.5	3.5
1995	3,025	1,730	1,295	8.0	4.6	3.4

Data source: *Canadian Vital Statistics Data Base*

† Comprises only stillbirths of at least 500 grams. Stillbirths of unknown weight are excluded.

The health of Canadians with diabetes

Abstract

Objectives

This article focuses on the prevalence of diabetes mellitus among Canadians, the health status of those with the disease, their socioeconomic characteristics, personal health behaviours, and use of health services.

Data source

The data are from the 1994/95 National Population Health Survey.

Analytical techniques

Weighted counts were used in computing the prevalence of diabetes and the proportions of people with the characteristics and health behaviours considered.

Main results

In 1994/95, 3% of Canadians aged 12 and older—over 722,000 people—reported having diabetes that had been diagnosed by a health care professional. The prevalence of diabetes increases with age and is associated with low income. A higher percentage of adults with diabetes were overweight compared to those without the disease.

Key words

diabetes mellitus, cardiovascular disease, ophthalmologic complications, health surveys

Principal release

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According to Statistics Canada's 1994/95 National Population Health Survey (NPHS), 3% of Canadians aged 12 and older—over 722,000 people—reported having diabetes that had been diagnosed by a health care professional. Less than one-quarter (23%) of them reported that they used insulin in the month before their interview. Just over half (51%) indicated that they took pills to control diabetes.[a]

Although diabetes can be managed, the health of people with the disease is often compromised by other major health problems such as hypertension, heart disease, stroke, cataracts, and glaucoma.

Concern has been expressed about the adequacy of information on Canadians with diabetes.[1-3] Using NPHS data, this article reports the main results of a recent study. The analysis focuses on Canadians with diabetes and their socioeconomic characteristics, health status, personal health behaviours, and use of health services (see *Methods*).

[a] *A small proportion reported taking both insulin and pills in the month before their interview.*

Methods

Data sources

The findings reported in this article are based on data from the 1994/95 National Population Health Survey (NPHS). The target population was household residents in all provinces and territories, except persons living on Indian reserves, on Canadian forces bases, or in some remote areas. A total of 27,263 households were selected for the survey. The final response rate was 88.7% of households. An additional institutional component covered long-term residents of hospitals and residential care facilities. Data from the institutional component and the territories are not included in this analysis.

The NPHS has a complex design involving stratified, multiple-staged sampling, with unequal probabilities of selection. The data are weighted to compute prevalence estimates for the total Canadian population.

NPHS data are stored in a General File (130 variables) on all 58,439 members of households sampled and a Health File containing in-depth information (a further 208 variables) on 17,626 randomly selected respondents aged 12 and older, one from each household. The file that was used in each instance is indicated below the tables and charts in this article.

One person in each household provided information for all household members. During the interview, this respondent was asked "Do(es) ... have any of the following long-term conditions that have been diagnosed by a health professional?" A list of conditions was read that included diabetes. The people identified by this question comprise the group considered to be "with diabetes" in this article.

Analytical techniques

Weighted counts were used in computing prevalences. Approximate coefficients of variation were taken from tables provided in documentation that accompanies the NPHS public-use microdata files.

In accordance with the NPHS release guidelines, weighted estimates that are based on sample sizes of less than 30 or that have a coefficient of variation of 25% or greater were not published in this article.

Limitations

The NPHS is not a complete source of epidemiological data. Only through biochemical screening with the oral glucose tolerance test can the true prevalence of diabetes in a population be determined.[4] In Canada, where no such population screening has been done nationally or provincially, the true prevalence of diabetes is thus still uncertain. Data from the U.S. National Health and Nutrition Examination Survey indicate that people with diagnosed diabetes, as captured by the NPHS, may constitute only 50% of all the people who would satisfy the biochemical criteria under screening.[5]

While there are two clinically and etiologically distinct subtypes of diabetes—Type 1 and Type 2—the NPHS does not distinguish between them. However, this article focuses on adults aged 25 and older, among whom the vast majority of people with diabetes have Type 2.

Large national surveys such as the NPHS, despite their limitations, provide useful information on the disease's impact on the health care system and the economy. Nevertheless, individuals with undiagnosed diabetes are at risk for various complications and ultimately also have an impact on the overall health and economic well-being of the Canadian population.

Who has diabetes?

Among adults, the prevalence of the disease rises considerably with age. Just over 1% of 25- to 44-year-olds reported having the disease. For Canadians aged 65 and older, the rate was over 10%—that is, one in ten seniors is diabetic (Chart 1).

Statistics Canada's General Social Surveys (GSS) of 1985 and 1991 also contain self-reported data on diabetes.[6,7] The prevalence of diabetes obtained from the 1994/95 NPHS is generally similar to that obtained from the 1991 GSS.

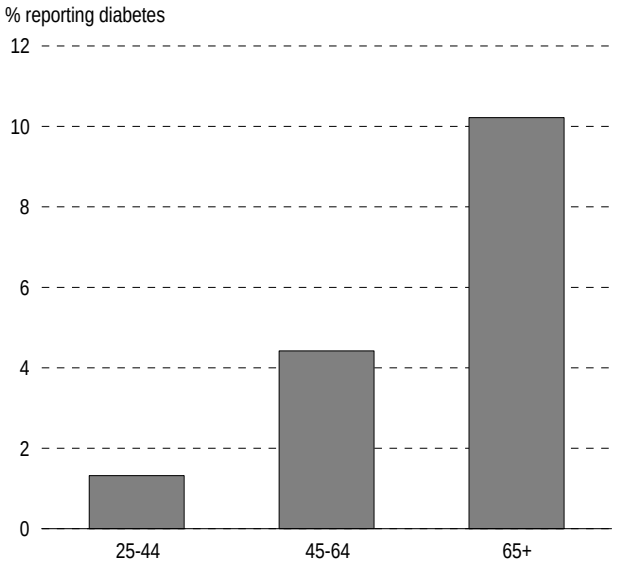
The prevalence of diabetes is higher among Canadians with low income. For example, about 6% of 45- to 64-year-olds with household incomes of $10,000 to $29,000 reported having diabetes. For individuals the same age but with household incomes of $60,000 or more, the prevalence was only about 3% (Chart 2).

There was, however, no substantial difference in the prevalence of diabetes between the sexes, between urban and rural residents, or by marital status.

Health status

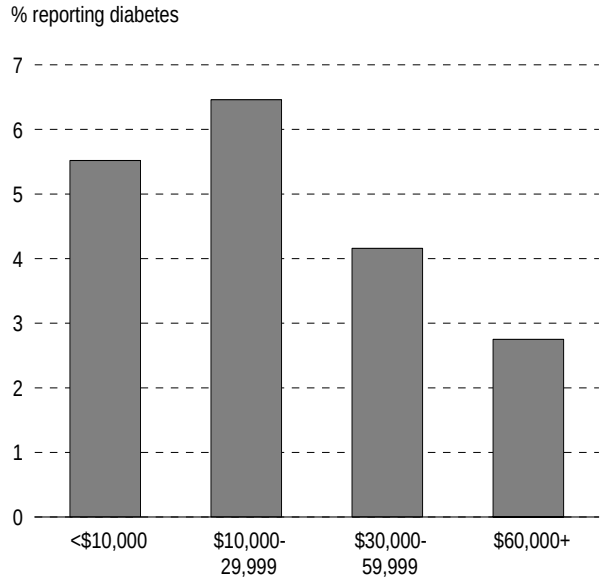
Not surprisingly, a larger proportion of people with diabetes reported that they were only in fair health, compared with those without the disease. While

Chart 1
Prevalence of diabetes, by age group, Canada, 1994/95



***Data source**: 1994/95 National Population Health Survey, General File*

Chart 2
Prevalence of diabetes, by household income, 45- to 64 year-olds, Canada, 1994/95



***Data source**: 1994/95 National Population Health Survey, General File*

Table 1
Selected health status measures, by age group and diabetes status, Canada, 1994/95

	Age group					
	25-44		45-64		65+	
	With diabetes	Without diabetes	With diabetes	Without diabetes	With diabetes	Without diabetes
	%					
Health status						
Total	100.0	100.0	100.0	100.0	100.0	100.0
Excellent	--	30.2	--	22.3	--	13.5
Very good	--	40.5	18.2	35.0	14.5	28.9
Good	46.2	23.8	39.8	29.3	31.2	34.0
Fair	--	4.5	25.4	10.3	37.6	18.4
Poor	--	1.1	--	3.1	12.0	5.3
Disability days in previous two weeks						
Total	100.0	100.0	100.0	100.0	100.0	100.0
None	67.8	85.7	77.2	86.1	73.5	84.1
1-2	--	5.8	5.4	4.1	--	2.8
3-13	14.4	6.1	10.0	5.7	8.8	6.5
14+	--	2.4	7.4	4.1	13.6	6.6

***Data source:** 1994/95 National Population Health Survey; Health File for health status and General File for disability days*
-- Cell size too small to be expressed.

25% of people with diabetes aged 45 to 64 assessed their health as fair, just 10% of those without diabetes did the same (Table 1).

In the two-week-period before the NPHS, a larger proportion of people with diabetes, compared with those without the disease, had been ill to the extent that they had to stay in bed (either at home or in hospital) or had to cut down on usual activities. Among people with diabetes aged 45 to 64, 23% needed one or more "bed-days" during this two-week period; among those without the disease, the proportion was 14%.

Accompanying conditions

Diabetes is often accompanied by cardiovascular, renal, neurologic, and ophthalmologic complications. As expected, NPHS data indicate that the prevalence of diagnosed hypertension, heart disease, stroke, cataracts, and glaucoma is higher among diabetics. For example, 11% of seniors with diabetes suffered the effects of stroke, compared with 3% of seniors without diabetes (Table 2).

Table 2
Prevalence of selected conditions, by age group and diabetes status, Canada, 1994/95

	Age group					
	25-44		45-64		65+	
	With diabetes	Without diabetes	With diabetes	Without diabetes	With diabetes	Without diabetes
	%					
Hypertension						
Both sexes	14.9	2.5	36.1	13.6	40.5	27.2
Men	--	2.6	30.8	12.7	31.1	22.4
Women	--	2.4	42.4	14.5	49.2	30.8
Heart disease						
Both sexes	--	0.7	15.7	4.7	24.4	16.0
Men	--	0.6	18.6	5.7	26.1	18.3
Women	--	0.8	--	3.7	22.9	14.2
Effects of stroke						
Both sexes	--	--	--	0.9	10.6	2.8
Men	--	--	--	1.0	--	2.8
Women	--	--	--	0.7	--	2.8
Cataracts						
Both sexes	--	0.3	5.3	1.4	21.3	13.3
Men	--	--	--	1.2	15.9	9.6
Women	--	--	--	1.6	26.2	16.0
Glaucoma						
Both sexes	--	--	--	1.2	7.5	4.1
Men	--	--	--	0.9	--	3.4
Women	--	--	--	1.4	--	4.6

Data source: *1994/95 National Population Health Survey, General File*
-- Cell size too small to be expressed.

Health behaviours

Smoking increases the risk of cardiovascular diseases for which people with diabetes already face an increased risk. Among 25- to 44-year-olds, equal proportions of people with and without diabetes were current smokers. At ages 45 to 64, the proportion who smoke was smaller, but fairly similar by diabetes status (Table 3).

Being overweight is a risk factor for diabetes among adults. NPHS data indicate that among 45- to 64-year-olds, 61% of those with diabetes were overweight, compared with 38% of those without diabetes. And in that age group, a slightly larger proportion of people with the disease were inactive, compared with those without diabetes.

Use of health services

NPHS data indicate that a greater proportion of people with diabetes, compared with those without diabetes, had stayed overnight in hospital, nursing home or convalescent home in the 12 months before

Table 3
Health behaviours, by age group and diabetes status, Canada, 1994/95

	Age group					
	25-44		45-64		65+	
	With diabetes	Without diabetes	With diabetes	Without diabetes	With diabetes	Without diabetes
	%					
Smoking						
Total	100.0	100.0	100.0	100.0	100.0	100.0
Current	36.8	36.6	26.5	28.8	9.0	15.3
Non-smoker	63.2	63.4	73.5	71.2	91.0	84.7
Body mass index						
Total	100.0	100.0	100.0	100.0	100.0	100.0
Insufficient	--	9.6	--	4.9	..	..
Acceptable	--	45.9	20.0	35.8	..	..
Some excess	--	18.3	18.3	21.6	..	..
Overweight	49.7	26.2	60.6	37.6	..	..
Physical activity index						
Total	100.0	100.0	100.0	100.0	100.0	100.0
Active	--	16.4	--	16.2	13.5	15.0
Moderate	--	22.0	18.2	21.9	15.1	20.4
Inactive	62.5	61.6	67.9	61.9	71.5	64.5

Data source: *1994/95 National Population Health Survey, Health File*
.. Figures not available
-- Cell size too small to be expressed.

the survey. The difference in overnight hospitalization rates between those with and without diabetes generally increases with age. Nonetheless, 25% of seniors with diabetes had stayed overnight in hospital during this period, compared with 16% of those without the disease (Chart 3).

People with diabetes have specific health care needs, notably eye examinations and blood pressure checks. Although they use health services more frequently than people without diabetes, the frequency still falls short of that recommended by clinical guidelines.

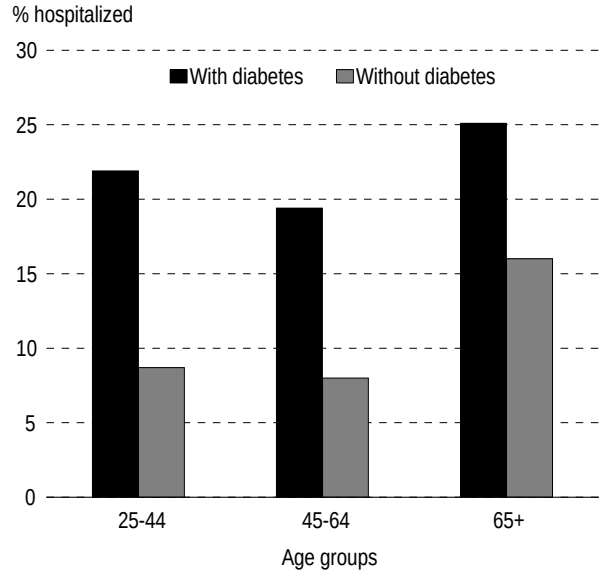
For persons with diabetes, the clinical practice guidelines of the Canadian Diabetes Advisory Board suggest visits for continuing care, including blood pressure checks once every six months and eye examinations at least once annually.[8] A substantial majority (84%) of people with diabetes aged 45 to 64 reported having had their blood pressure checked in the six months before the survey (Table 4). The greatest deficit occurs in eye examinations. More than half (55%) of Canadian with diabetes under age 45 had not consulted an eye specialist in the year before their interview. This figure declines slightly to 49% for those aged 45 to 64, and to 41% at age 65 and older.

Concluding remarks

NPHS data indicate that Canadians with diabetes perceive themselves to be in poorer health than those without the disease. This conclusion is substantiated by measurements of overnight hospitalization and disability days.

The health of people with diabetes is often compromised by other medical problems such as hypertension, heart disease, stroke, cataracts, and glaucoma. While some health-promoting behaviours such as non-smoking and exercise may help to delay the onset of these conditions, efforts to increase these behaviours among people with diabetes appear to have had only limited success at the population level. The markedly higher prevalence of diabetes in low income populations and the constraints that low-income may place on the adoption of efforts to reduce the complications of diabetes are important considerations in health promotion program planning.

Chart 3
Prevalence of overnight hospitalization in past 12 months, by age group and diabetes status, Canada 1994/95



Data source: *1994/95 National Population Health Survey, General File*

Table 4
Health service utilization indicators, by age group and diabetes status, Canada, 1994/95

	Age group					
	25-44		45-64		65+	
	With diabetes	Without diabetes	With diabetes	Without diabetes	With diabetes	Without diabetes
	%					
Doctor consultations in previous 12 months						
Total	100.0	100.0	100.0	100.0	100.0	100.0
0	--	21.4	6.4	20.2	--	11.7
1	--	20.9	5.7	20.2	7.0	14.2
2-3	18.5	25.7	15.8	24.3	11.0	24.0
4-11	46.8	22.6	47.6	25.7	45.7	34.2
12+	26.4	9.4	24.6	10.0	32.6	15.3
Visits to eye doctor in previous 12 months						
Total	100.0	100.0	100.0	100.0	100.0	100.0
0	55.0	72.6	49.0	61.5	40.7	52.4
1	30.2	23.8	36.7	33.3	36.7	34.4
2+	14.9	3.6	14.3	5.2	22.6	13.2
Last blood pressure check						
<6 months	71.2	41.5	84.3	52.9	91.6	72.8

Data source: *1994/95 National Population Health Survey, General File except blood pressure checks data, which are from the Health File*
-- Cell size too small to be expressed.

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8 Canadian Diabetes Advisory Board. Clinical practice guidelines for the treatment of diabetes mellitus. *Canadian Medical Association Journal* 1992; 147: 697-712.

Data Releases

This section presents synopses of recent health information produced by Statistics Canada.

Therapeutic abortions, 1995

Both the number and rate of abortions rose slightly in 1995, reaching record levels. However, these increases were the smallest since 1990.

Canadian women obtained 106,658 abortions in 1995, up only 0.4% from 106,255 in 1994. This was well below increases of 1.8% in 1994, 2.3% in both 1991 and 1993, and 7.4% in 1992.

The national rate rose to 28.2 abortions per 100 live births from 27.6 in 1994.

Two-thirds of all therapeutic abortions in 1995 were performed in hospitals and about a third in clinics. The total includes 459 therapeutic abortions obtained by Canadian women in the United States, up from 338 in 1994.

Part of the increase in the abortion rate in 1995 is due to a decrease in the number of live births that year. However, the rise in the number and rate of abortions since 1989, primarily reflects those performed in clinics.

In 1995, clinics reported 35,650 abortions, up 4% from a year earlier. By 1995, over 33% of all abortions were performed in clinics, compared with 22% in 1990.

Hospital abortions declined for the second consecutive year, after peaking in 1993. A total of 70,549 therapeutic abortions were performed in Canadian hospitals in 1995, down 1.5% from a year earlier.

Selected demographic and medical information for women who obtained abortions was available for 69% of all abortions performed in 1995: 76% of hospital abortions and 54% of clinic abortions. Complete data were not available for Canadian women who had abortions in the United States.

The 1995 therapeutic abortion data were collected by the Canadian Institute for Health Information. For further information on data collection, contact Sherry Kennedy (416-429-0477, ext. 3532; fax: 416-429-1953), Canadian Institute for Health Information.

For further information on this release, contact Surinder Wadhera (613-951-3415). For statistical tables, contact the Custom Services Unit (613-951-1746), Health Statistics Division.

Cancer, 1994

In 1994, 87,950 new cases of cancer were diagnosed. Excluding Quebec, this was an increase of less than 1% over the 87,649 cases diagnosed in 1993.

The 1994 cancer incidence data include information on new cases diagnosed that year, as reported by nine provincial and two territorial cancer registries. Data from Quebec are not yet available.

For further information on this release, contact Judy Lee (613-951-1775), or the Client Custom Services Unit (613-951-1746), Health Statistics Division.

Postcensal Population Estimates

Each issue of *Health Reports* includes current quarterly population estimates. July 1, 1997 (preliminary) estimates are shown on the following page.

Preliminary postcensal population estimates, by sex and age group, Canada, provinces and territories, July 1, 1997

	Canada	Nfld	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta	B.C.	Yukon	N.W.T.
										'000			
Both sexes	**30,286.6**	**563.6**	**137.2**	**947.9**	**762.0**	**7419.9**	**11407.7**	**1145.2**	**1023.5**	**2847.0**	**3933.3**	**31.6**	**67.5**
<1	363.2	5.6	1.7	10.3	8.1	82.9	139.2	15.5	13.0	38.1	46.9	0.5	1.5
1-4	1552.6	24.3	7.1	44.1	35.4	362.2	594.4	65.2	56.3	159.3	196.5	1.9	5.9
5-9	2049.4	35.4	9.9	63.0	48.8	474.0	777.5	83.5	79.3	214.6	253.1	2.4	8.0
10-14	2027.1	41.2	10.1	64.1	51.5	456.8	758.5	81.5	81.8	215.7	257.2	2.4	6.4
15-19	2024.1	43.2	10.0	63.4	52.3	502.0	731.8	78.7	77.3	203.3	254.5	2.3	5.3
20-24	2034.5	43.7	9.7	65.1	55.3	485.5	750.8	79.7	70.5	202.6	264.0	2.2	5.4
25-29	2203.0	44.3	9.7	68.3	57.0	503.9	851.3	81.0	64.0	218.5	296.2	2.4	6.3
30-34	2564.4	45.7	10.7	77.9	62.5	619.3	1003.7	90.0	73.8	243.8	327.4	3.1	6.5
35-39	2706.0	47.5	11.0	82.9	64.6	674.3	1024.0	95.2	82.7	267.1	347.3	3.3	5.9
40-44	2465.9	47.0	10.2	76.3	62.2	626.5	905.8	86.9	78.0	242.2	323.2	2.9	4.8
45-49	2183.8	43.1	9.6	69.4	57.2	560.0	809.3	76.3	63.8	195.1	293.3	2.8	3.8
50-54	1794.1	34.8	8.0	57.7	45.6	478.7	666.0	62.7	51.0	151.4	233.7	2.0	2.5
55-59	1382.6	25.2	6.1	44.3	34.6	365.6	520.5	48.9	42.3	113.9	178.6	1.0	1.8
60-64	1210.0	21.0	5.6	38.6	29.5	310.9	463.2	43.8	40.0	98.6	156.5	0.8	1.4
65-69	1141.3	18.7	5.0	35.0	28.5	294.0	438.0	42.5	39.5	89.1	149.3	0.8	1.0
70-74	986.1	15.9	4.4	30.4	25.0	246.2	381.9	39.5	36.6	73.4	131.9	0.5	0.6
75-79	743.0	13.0	3.7	26.0	20.3	177.8	278.6	32.6	31.2	55.9	103.4	0.2	0.2
80-84	476.6	8.1	2.6	17.3	13.1	111.1	174.3	22.8	22.8	35.9	68.4	0.1	0.2
85-89	251.6	4.1	1.4	9.2	7.1	58.7	92.1	12.2	12.9	18.5	35.3	0.0	0.1
90+	127.1	1.8	0.8	4.7	3.5	29.6	46.8	6.6	6.7	10.0	16.7	0.0	0.1
Males	**14999.7**	**281.3**	**67.8**	**466.7**	**376.9**	**3657.2**	**5636.3**	**567.8**	**508.3**	**1432.5**	**1953.6**	**16.3**	**35.0**
<1	186.0	2.8	0.9	5.2	4.2	42.5	71.4	7.9	6.5	19.5	24.2	0.2	0.7
1-4	795.8	12.5	3.7	22.8	18.1	185.2	304.5	33.4	28.6	81.8	101.3	0.9	3.0
5-9	1049.5	18.2	5.1	32.4	24.9	242.7	398.3	42.9	40.4	109.9	129.2	1.3	4.2
10-14	1035.4	21.0	5.2	32.6	26.2	232.8	388.2	42.0	41.4	110.4	131.0	1.2	3.3
15-19	1037.3	21.7	4.9	31.9	26.9	257.2	375.9	39.9	40.1	104.1	130.8	1.2	2.7
20-24	1032.1	22.3	5.0	33.1	28.1	247.2	380.2	40.8	36.0	103.4	132.2	1.1	2.7
25-29	1110.4	22.7	5.0	34.9	29.0	256.6	425.8	41.2	32.0	110.8	148.0	1.2	3.3
30-34	1298.2	22.7	5.2	39.5	31.6	316.0	507.0	45.7	36.7	124.4	164.5	1.6	3.4
35-39	1364.7	23.7	5.4	40.9	32.3	341.0	516.6	48.6	41.8	136.1	173.6	1.6	3.0
40-44	1231.0	23.3	5.1	37.5	30.8	313.7	449.1	43.6	40.1	123.4	160.5	1.4	2.5
45-49	1096.0	21.7	4.9	34.6	28.9	280.4	402.7	38.5	32.8	99.5	148.4	1.4	2.1
50-54	899.1	17.7	4.1	29.2	23.2	237.5	332.0	31.6	25.7	77.1	118.4	1.1	1.4
55-59	687.3	12.9	3.1	22.1	17.4	180.0	257.5	24.1	20.8	58.2	89.6	0.7	1.0
60-64	593.7	10.6	2.7	19.0	14.5	149.3	226.5	21.7	19.9	49.3	79.1	0.4	0.7
65-69	544.9	9.2	2.5	16.4	13.3	135.8	209.6	20.1	19.2	43.7	74.2	0.5	0.5
70-74	439.0	7.5	2.0	13.4	11.0	106.2	169.5	17.6	16.9	33.9	60.5	0.3	0.3
75-79	305.6	5.7	1.5	10.6	8.5	69.7	114.9	13.4	13.3	23.8	44.1	0.1	0.1
80-84	177.9	3.2	0.9	6.5	5.0	38.7	65.2	8.7	9.1	13.8	26.8	0.0	0.1
85-89	81.9	1.4	0.5	3.0	2.3	17.5	29.6	4.2	4.7	6.4	12.3	0.0	0.1
90+	33.7	0.5	0.2	1.1	0.9	7.2	11.8	1.8	2.1	3.1	5.0	0.0	0.0
Female	**15286.9**	**282.3**	**69.4**	**481.2**	**385.1**	**3762.7**	**5771.4**	**577.4**	**515.2**	**1414.5**	**1979.7**	**15.3**	**32.5**
<1	177.2	2.8	0.8	5.1	3.9	40.5	67.8	7.6	6.5	18.6	22.6	0.2	0.7
1-4	756.8	11.8	3.4	21.3	17.3	177.0	289.9	31.9	27.7	77.5	95.2	1.0	2.8
5-9	999.9	17.2	4.8	30.5	23.9	231.2	379.2	40.6	38.8	104.7	123.9	1.1	3.9
10-14	991.8	20.3	4.9	31.5	25.3	223.9	370.3	39.5	40.4	105.3	126.1	1.2	3.1
15-19	986.8	21.5	5.0	31.5	25.4	244.9	355.9	38.8	37.2	99.3	123.8	1.1	2.6
20-24	1002.4	21.4	4.7	32.1	27.2	238.2	370.6	38.9	34.5	99.2	131.8	1.1	2.7
25-29	1092.6	21.6	4.8	33.5	28.0	247.3	425.5	39.8	32.0	107.7	148.2	1.2	3.1
30-34	1266.2	23.0	5.5	38.5	30.9	303.2	496.7	44.3	37.1	119.4	162.9	1.5	3.1
35-39	1341.3	23.8	5.6	42.0	32.3	333.4	507.4	46.6	40.9	131.0	173.7	1.7	2.9
40-44	1234.9	23.6	5.0	38.8	31.4	312.7	456.6	43.4	38.0	118.8	162.7	1.5	2.3
45-49	1087.8	21.5	4.7	34.7	28.3	279.7	406.6	37.8	31.0	95.6	144.9	1.4	1.6
50-54	895.0	17.1	3.9	28.6	22.4	241.2	333.9	31.1	25.2	74.3	115.3	0.9	1.1
55-59	695.3	12.3	3.0	22.2	17.2	185.6	263.0	24.8	21.5	55.7	89.0	0.4	0.8
60-64	616.2	10.4	2.9	19.6	15.0	161.6	236.7	22.1	20.1	49.3	77.4	0.4	0.7
65-69	596.4	9.5	2.5	18.5	15.2	158.2	228.4	22.3	20.3	45.5	75.2	0.3	0.5
70-74	547.1	8.4	2.3	17.0	14.0	140.0	212.3	21.9	19.7	39.5	71.4	0.2	0.3
75-79	437.4	7.3	2.2	15.3	11.8	108.1	163.7	19.2	17.9	32.1	59.4	0.1	0.2
80-84	298.7	4.9	1.7	10.9	8.1	72.4	109.2	14.1	13.8	22.0	41.5	0.1	0.1
85-89	169.7	2.6	1.0	6.2	4.8	41.2	62.5	8.0	8.2	12.1	23.0	0.0	0.0
90+	93.4	1.3	0.6	3.6	2.6	22.3	35.0	4.8	4.6	6.9	11.7	0.0	0.0

Source: *Demography Division, Population Estimates Section*
Note: *The population estimates are adjusted for net census undercoverage and include non-permanent residents.*

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