

Pregnancy Outcomes

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Abstract

Live births, induced abortions, and miscarriages/stillbirths are usually examined separately. This article combines the three outcomes to focus on pregnancy in Canada from 1974 to 1992.

An estimated 525,100 pregnancies ended in Canada during 1992. While this was a substantial increase from 438,300 in 1974, the pregnancy rate in 1992—77 pregnancies per 1,000 women aged 15 to 44—was actually lower than in 1974, when it had been 85 per 1,000.

As the pregnancy rate declined, there was a shift in outcomes. The share of pregnancies that ended in live births fell from 79% to 76%, and the proportion ending in miscarriages/stillbirths went from 9% to 5%. A growing proportion of pregnancies ended in abortions: 19% in 1992, compared with 12% in 1974.

Trends in pregnancies varied with the age of the women. Pregnancy rates rose among those in their thirties, but dropped at all other ages. Consequently, older women accounted for a larger share of pregnancies at the end of the period than they had at the beginning.

Pregnancy outcomes also differed depending on the women's age. The proportion that ended in an abortion was relatively high among women under age 25 and age 40 and over. Throughout the 1974-1992 period, the proportion of pregnancies ending in miscarriages or stillbirths fell among women of all ages.

Keywords: pregnancy, pregnancy complications, pregnancy in adolescence, abortion, miscarriage, fetal death

Introduction

Analyses of vital statistics have traditionally examined births, induced abortions, and miscarriages/stillbirths separately. In recent years, however, the broader issue of pregnancy has received increasing attention.¹⁻³ Data on pregnancies offer a more comprehensive, and often different, picture of reproductive behaviour. Combining the three outcomes—live births, abortions, and miscarriages/stillbirths—yields previously unavailable information on trends in childbearing among Canadian women (see *Methods*).

Since 1974, not only has the pregnancy rate declined, but this downturn was also accompanied by a shift in outcomes. Overall, the proportion of pregnancies ending in a live birth or in a miscarriage/stillbirth fell, while the proportion ending in an abortion rose. However, trends in pregnancy rates and outcomes varied with the age of the women.

Data on pregnancy rates and outcomes are important for planning, implementing, and evaluating maternal and child health and family planning programs. Such information also has implications for the provision of facilities and treatment now and in the future.

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Methods

Data source

The data in this article come from Statistics Canada's published reports on births, induced abortions, and hospital morbidity, and from Statistics Canada's data files on birth registrations (live births and stillbirths), induced abortions, and inpatients treated in general and allied hospitals.

Data on births and stillbirths are collected by the registries of vital statistics in the ten provinces and the two territories. Copies of registration documents of vital events are made available to Statistics Canada by the provincial and territorial registrars for compilation of national vital statistics. Because of legal requirements, the registration of live births and information on stillbirths are almost complete. Thus, the live birth and stillbirth data are not estimates; rather, they are counts tabulated from the vital statistics registration system in each province and territory.

Data on induced abortions performed in general and allied hospitals are based on individual patient admission/separation records that the hospitals submit to their provincial governments, who, in turn, forward annual abstracts to Statistics Canada.⁴⁻⁸ Information on abortions performed in clinics in Quebec, Ontario, and Alberta is provided to Statistics Canada by the health or social services ministries in those provinces. Statistics Canada receives information on clinic abortions performed in Newfoundland, Nova Scotia, Manitoba, and British Columbia directly from the clinics. In the remaining provinces, clinic abortions are not performed. The existence of provincial and territorial hospital insurance commissions to pay for medical services provided by doctors and hospitals leads to nearly complete reporting of induced abortions performed in hospitals and abortion clinics. Data on abortions obtained by Canadian women in the United States are mainly reported by the border states.

Definitions

The number of pregnancies is the sum of live births, induced (therapeutic) abortions, and miscarriages/stillbirths.

The data on abortions consist of: therapeutic abortions authorized under the 1969 abortion law and performed in accredited and/or approved hospitals from 1974 to 1987; therapeutic abortions performed in hospitals from 1988 to 1992 (ICD-9 code 635) after the 1969 abortion law was struck down; clinic abortions performed from 1978 to 1992; and counts of legal abortions obtained by Canadian women in the United States, reported for 1974 to 1992. For ease of reference, in this article the term "abortion" is used instead of "induced" or "therapeutic" abortion.

The category miscarriages/stillbirths is comprised of stillbirths of at least 20 weeks' gestation or fetal weight of at least 500 grams registered under vital statistics registration systems, and hospitalized cases of spontaneous abortions or miscarriages (ICD-9 code 634 and ICDA-8 code 643), illegally induced abortions (ICD-9 code 636 and ICDA-8 code 642), and other unspecified abortions that occurred in hospitals (ICD-9 code 637 and ICDA-8 code 644).

Data on pregnancy outcomes are presented for the calendar year in which the events occurred, not the year in

which the conceptions took place. Age refers to a woman's age in completed years when her pregnancy ended, not her age when she became pregnant. This approach may have reduced the numbers and rates for teenage pregnancies. For example, a woman who became pregnant at 19, but whose pregnancy ended when she was 20, was included in the 20 to 24 age group.

Limitations

For a number of years, the age of the mother was not recorded for live births in Newfoundland, and detailed hospital information was not available for the Yukon and Northwest Territories. Thus, age-specific pregnancy rates for Canada exclude pregnancies that ended in Newfoundland and the territories. Age breakdowns were also not available for clinic abortions in Canada and for abortions obtained by Canadian women in the United States. Together, these exclusions accounted for about 5% of the total pregnancies in Canada during the 1974-1992 period, and the impact of this omission from age-specific rates is small.

Age-specific pregnancy rates among women aged 15 to 44 are expressed by five-year age groups per 1,000 women in each age group. The denominators for the rates are revised population estimates that take into account the non-resident population as well as census undercounts.^{9,10} While the denominators pertain to the female population in the indicated age group, the numerators may include pregnancies among women whose age lies outside that age group. Thus, the numerators of rates for women aged 15 to 17 or 15 to 19 include pregnancies among women under age 15; the numerators of rates for women aged 40 to 44 include women over age 44. This procedure is followed because of the small number of pregnancies occurring among women younger than 15 or older than 44.

The time series in this article starts in 1974, the first year in which national coverage of the demographic characteristics of women who had abortions was available. However, while data on abortions obtained in Canada are now fairly complete, there may be undercounting in the years before abortion clinics were established in most provinces following the 1988 Supreme Court decision that struck down the 1969 abortion law. (The exception is Quebec, where clinics have operated since 1978.)

Data on miscarriages are not complete, as many occur outside of hospital, and consequently, are not recorded. Estimates of miscarriages in Canada, the United States, England and Wales, and other industrialized countries have ranged from 3% to 33% of known pregnancies.¹¹⁻¹⁵ An American study calculated miscarriages by multiplying the number of live births by 0.20 and the number of induced abortions by 0.10.¹¹ Using this approach, the estimated number of pregnancies in Canada would have been 580,664 in 1992, and the pregnancy rate would have been 86 per 1,000 women aged 15 to 44. The method used in this article, which includes only hospitalized cases of miscarriage, yields estimates about 10% lower: 525,056 pregnancies and a rate of 77 per 1,000 women aged 15 to 44.

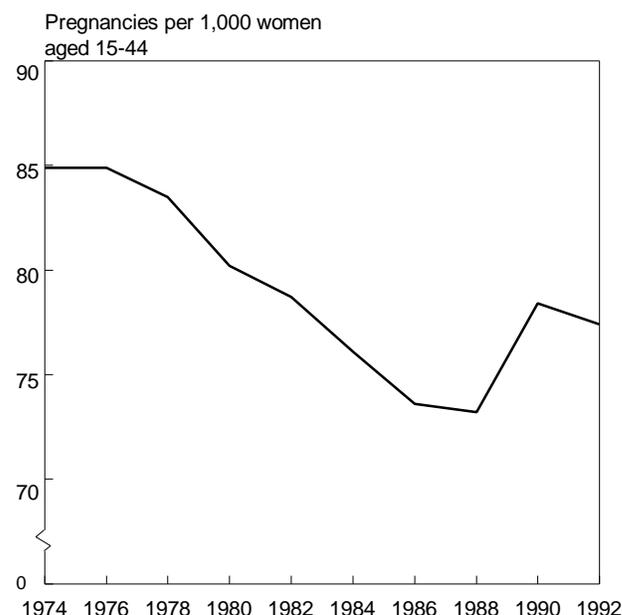
Pregnancy rate down

In 1992, an estimated 525,100 pregnancies ended in Canada, a substantial increase from 438,300 in 1974, but down slightly from a high of 526,900 in 1990 (Table 1). To a considerable degree, the overall increase in the number of pregnancies was attributable to the steady rise in the female population of childbearing age. In fact, when expressed per 1,000 women aged 15 to 44, the number of pregnancies that ended in 1992 was actually lower than in 1974: 77 versus 85 pregnancies per 1,000 (Chart 1). Nonetheless, the 1992 figure was up from 1987, when the rate had bottomed out at just over 72 pregnancies per 1,000 women of childbearing age.

Conventionally, stillbirths/miscarriages and abortions are also discussed in terms of rates per 1,000 women in particular age groups. While these rates indicate the prevalence of stillbirths/miscarriages and abortions, they mask important differences in pregnancy outcomes at certain ages. Therefore, this analysis examines outcomes as a proportion of total pregnancies. For example, the abortion rate per 1,000 is lowest for women aged 40 to 44, but this is because few of them become pregnant. As a share of pregnancy outcomes, women in this age range have the second highest percentage of abortions.

Chart 1

Pregnancy rate, Canada, 1974-1992



Source: Health Statistics Division

Note: Numerator includes pregnancies among women of all ages; denominator comprised of women aged 15 to 44.

Table 1

Pregnancies and outcomes, Canada, 1974-1992

Year	Total pregnancies	Live births	Abortions [†]	Miscarriages/ stillbirths [‡]	Women aged 15-44 [§]	Total pregnancies	Live births	Abortions [†]	Miscarriages/ stillbirths [‡]
						' 000	Rate per 1,000 women aged 15-44		
1974	438,321	346,913	52,435	38,973	5,161	84.9	67.2	10.2	7.6
1975	450,381	359,323	53,705	37,353	5,306	84.9	67.7	10.1	7.0
1976	454,721	359,994	58,712	36,015	5,444	83.5	66.1	10.8	6.6
1977	458,314	362,909	59,864	35,541	5,570	82.3	65.2	10.7	6.4
1978	461,605	359,365	66,710	35,530	5,688	81.2	63.2	11.7	6.2
1979	469,946	366,064	69,745	34,137	5,808	80.9	63.0	12.0	5.9
1980	476,828	370,709	72,099	34,020	5,943	80.2	62.4	12.1	5.7
1981	476,313	371,346	71,911	33,056	6,056	78.7	61.3	11.9	5.5
1982	480,582	373,082	75,071	32,429	6,147	78.2	60.7	12.2	5.3
1983	475,160	373,689	69,368	32,103	6,216	76.4	60.1	11.2	5.2
1984	477,910	377,031	69,449	31,430	6,276	76.1	60.1	11.1	5.0
1985	475,156	375,727	69,216	30,213	6,338	75.0	59.3	10.9	4.8
1986	471,777	372,811	69,572	29,394	6,407	73.6	58.2	10.9	4.6
1987	468,954	369,704	70,023	29,227	6,474	72.4	57.1	10.8	4.5
1988	478,571	376,735	72,693	29,143	6,535	73.2	57.6	11.1	4.5
1989	501,345	392,661	79,315	29,369	6,641	75.5	59.1	11.9	4.4
1990	526,887	405,486	92,901	28,500	6,717	78.4	60.4	13.8	4.2
1991	523,943	402,528	95,059	26,356	6,748	77.6	59.6	14.1	3.9
1992	525,056	398,642	102,085	24,329	6,787	77.4	58.7	15.0	3.6

Source: Health Statistics Division

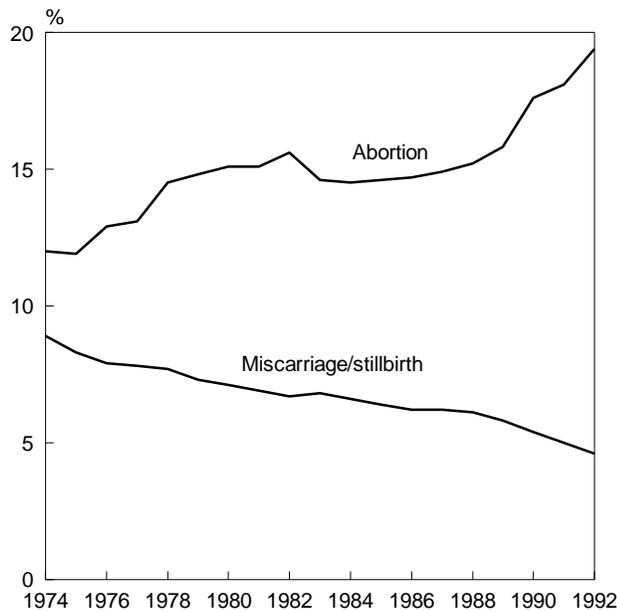
[†] Comprised of abortions performed in hospitals and clinics in Canada and abortions obtained by Canadian women in the United States.

[‡] Comprised of stillbirths of at least 20 weeks' gestation or birthweight of 500 grams or more, and hospitalized cases of spontaneous and other unspecified abortions.

[§] Estimated population on July 1 in the specified year

Chart 2

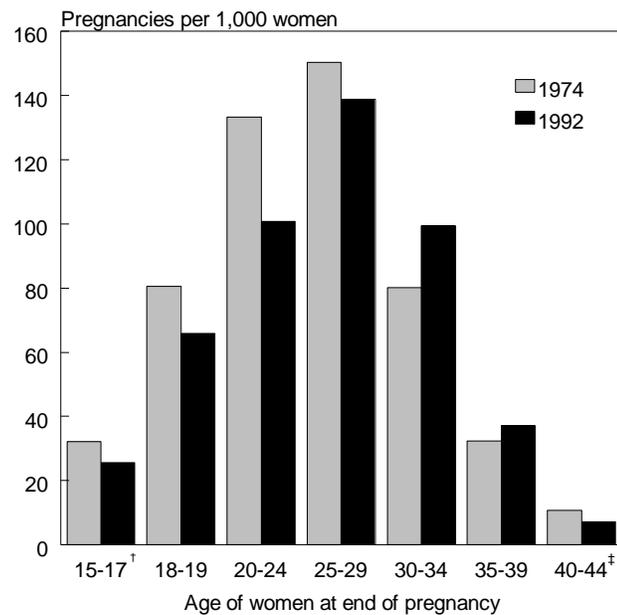
Proportion of pregnancies ending in induced abortion or miscarriage/stillbirth, Canada, 1974-1992



Source: Health Statistics Division

Chart 3

Pregnancy rate, by age of women at end of pregnancy, Canada, 1974 and 1992



Source: Health Statistics Division

Note: Excludes Newfoundland, Yukon, Northwest Territories, clinic abortions, and abortions obtained by Canadian women in the United States.

† Numerator includes women younger than 15.

‡ Numerator includes women older than 44.

Shift in outcomes

From 1974 to 1992, there was a noticeable shift in pregnancy outcomes. While the majority of pregnancies ended in a live birth, this proportion declined from 79% to 76%. The proportion ending in a stillbirth/miscarriage was almost halved, falling from 9% to 5%. On the other hand, the percentage of pregnancies that were ended by an abortion rose from 12% to over 19% (Chart 2).

Pregnancy outcomes and how they have changed over the past two decades differed substantially with the age of the women (Chart 3).

Teenage pregnancy

Compared with women of other ages, teenagers have a relatively low pregnancy rate. Moreover, from 1974 to 1992, the rate dropped substantially from 52 to 42 pregnancies per 1,000 women aged 15 to 19 (Table 2). The 1992 figure, however, was a slight rise from the mid-1980s, when the rate had remained below 40 per 1,000 for four successive years (see *Teenage pregnancy: An international comparison*).

Pregnancy rates among early teens (aged 15 to 17) mirrored this trend, declining from 32 per 1,000 in 1974 to 24 in the late 1980s, then increasing slightly to 26 by 1992. At ages 18 to 19, pregnancy rates were higher, but the pattern was similar. The pregnancy rate of 18- to 19-year-olds fell from 81 per 1,000 in 1974 to 59 in 1984 and then rose to 66 by 1992.

Teenage pregnancy: An international comparison

Canada's teenage pregnancy rate is similar to those in several western European countries. In 1989, the rate in Canada (42 pregnancies per 1,000) was about the same as in France (43) and in England and Wales (45). The Canadian rate, however, was considerably above those of Sweden (35) and the Netherlands (14).

On the other hand, Canada's teenage pregnancy rate is less than half that in the United States. In 1991, the figures were 42 per 1,000 in Canada versus 116 per 1,000 in the United States.^{16,17} The low rates in Canada and other countries compared with the United States may be related to attitudes toward teenage sexuality, teenagers' access to free and confidential family planning services, and national policies on sex education in schools.¹⁸

Of all age groups, teenagers have the highest percentage of pregnancies ending in an abortion (Chart 4 and Table 3). And this proportion has risen substantially in the past two decades. By 1992, 34% of all pregnancies among 15- to 19-year-olds were ended by an abortion, compared with 25% in 1974. At the same time, the share that resulted in a live birth fell from 67% to 60%. Miscarriages/stillbirths also claimed a smaller share of teenage pregnancies, declining from 8% to 5% (Chart 5).

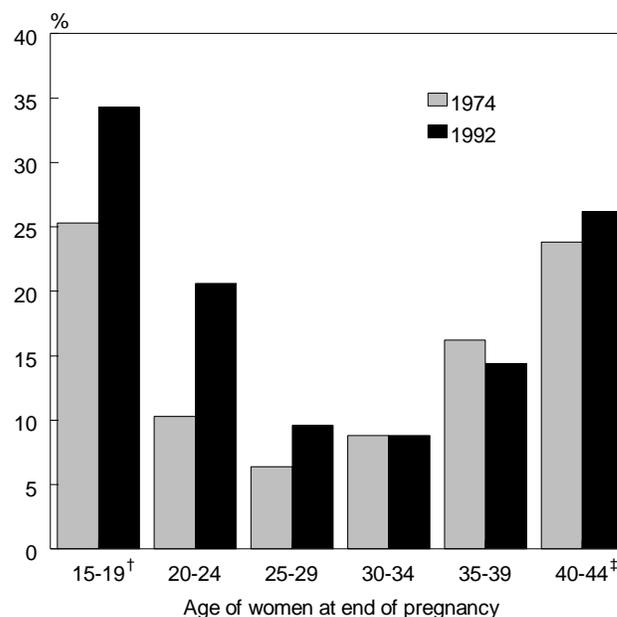
The consequences of teenage pregnancy may be a loss of educational and occupational opportunities, and the likelihood of diminished socioeconomic status.¹⁹ This may account for the high proportion of pregnancies that end in abortion among women under age 20. For teenagers, abortion tends to be associated with socioeconomic rather than biological factors.²⁰⁻²²

Women in their twenties

Women in their twenties have the highest pregnancy rates. However, as was the case for teenagers, pregnancy rates among these women have dropped since 1974.

Chart 4

Proportion of pregnancies ending in abortion, by age of women at end of pregnancy, Canada, 1974 and 1992



Source: Health Statistics Division

Note: Excludes Newfoundland, Yukon, Northwest Territories, clinic abortions, and abortions obtained by Canadian women in the United States.

[†] Includes women younger than 15.

[‡] Includes women older than 44.

Table 2

Pregnancy rate, by age of women at end of pregnancy, Canada, 1974-1992

	Age group							
	15-17 [†]	18-19	Total [†]	20-24	25-29	30-34	35-39	40-44 [‡]
	Pregnancies per 1,000 women							
1974	32.1	80.6	51.5	133.3	150.4	80.1	32.3	10.7
1975	32.8	79.8	51.5	131.9	150.3	78.1	30.2	9.7
1976	31.4	78.5	50.1	128.4	148.2	77.8	29.5	9.0
1977	30.9	76.5	49.1	127.4	147.3	79.5	28.3	7.9
1978	29.8	74.1	47.6	124.6	145.6	79.9	26.9	7.7
1979	28.9	71.1	46.1	123.5	147.3	81.3	26.7	6.9
1980	28.6	69.8	45.6	120.8	145.9	80.5	26.4	6.7
1981	27.4	66.6	43.9	116.1	144.3	80.3	26.3	6.5
1982	27.4	65.2	43.8	115.6	141.0	81.1	27.2	6.3
1983	25.1	60.3	40.7	111.8	139.7	82.4	27.4	5.9
1984	25.2	59.3	40.2	108.5	140.8	84.9	28.4	5.8
1985	24.6	59.9	39.5	104.8	140.2	85.6	28.7	5.8
1986	24.3	61.5	39.5	101.9	138.4	85.6	29.6	5.8
1987	23.8	61.9	39.2	99.4	135.9	86.3	30.6	6.1
1988	24.0	62.1	39.7	101.3	137.3	88.8	32.2	6.4
1989	25.1	65.5	42.2	104.3	139.8	93.6	34.0	6.5
1990	25.9	65.7	42.4	105.0	142.7	97.6	35.8	6.6
1991	25.9	66.7	42.3	102.7	140.3	98.0	36.5	6.7
1992	25.6	65.9	41.6	100.1	138.8	99.3	37.1	7.1

Source: Health Statistics Division

Note: Excludes Newfoundland, Yukon, Northwest Territories, clinic abortions, and abortions obtained by Canadian women in the United States. The combined undercoverage is about 5% of pregnancies from 1974 to 1992.

[†] Numerator includes women younger than 15.

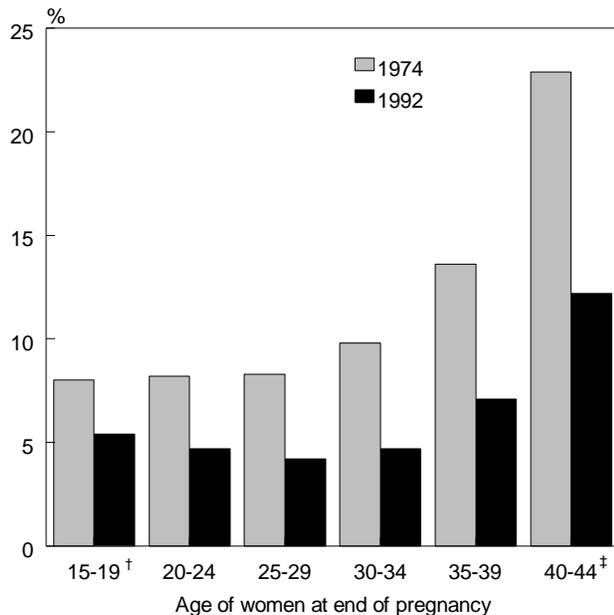
[‡] Numerator includes women older than 44.

In 1992, the pregnancy rate among women aged 20 to 24 was 100 per 1,000, a dramatic decline from 133 in 1974. Along with this drop in rates, the proportion of pregnancies that ended in a live birth fell from 81% to 75%, as the share ending in an abortion more than doubled from 10% to 21%. The proportion ending in a miscarriage/stillbirth fell from 8% to 5%.

The highest pregnancy rates throughout the period were among women aged 25 to 29. And although these rates declined, the drop was not as sharp as that for women in their early twenties. By 1992, the pregnancy rate for women aged 25 to 29 was 139 per 1,000, down from 150 in 1974. As well, there was almost no change in the proportion of pregnancies that resulted in a live birth: 86% in 1992; 85% in 1974. The percentage that ended because of a miscarriage/stillbirth was halved, dropping from 8% to 4%. In both 1974 and 1992, relatively small proportions of pregnancies among women aged 25 to 29 were ended by an abortion. This figure, however, had risen from 6% in 1974 to 10% in 1992.

Chart 5

Proportion of pregnancies ending in miscarriage/stillbirth, by age of women at end of pregnancy, Canada, 1974 and 1992



Source: Health Statistics Division
Note: Excludes Newfoundland, Yukon, Northwest Territories, clinic abortions, and abortions obtained by Canadian women in the United States.
[†] Includes women younger than 15.
[‡] Includes women older than 44.

Women in their thirties

From 1974 to 1992, pregnancy trends among women in their thirties ran counter to the national pattern. Unlike younger age groups, these women experienced an overall increase in pregnancy rates. The rate for women aged 30 to 34 rose from 80 to 99 per 1,000. The proportion of these pregnancies resulting in a live birth increased from 81% to 86%, while the proportion ending in an abortion remained at 9%. In fact, by 1992, of all age groups, women aged 30 to 34 had the lowest percentage of pregnancies ending in an abortion. Meanwhile, the share that resulted in a miscarriage/stillbirth fell from 10% to 5%.

After age 34, pregnancy rates are much lower. Among women aged 35 to 39, the 1992 pregnancy rate was just 37 per 1,000. Nonetheless, this figure was up from 32 per 1,000 in 1974 and marked a notable increase from the low—26 per 1,000—in the early 1980s. In addition, the proportion of pregnancies that resulted in a live birth in 1992 was 79%, a rise from 70% in 1974. The proportion ending in a miscarriage/stillbirth fell from 14% to 7%. And women aged 35 to 39 were the only group among whom the proportion of pregnancies ending in an abortion declined: from 16% to 14%.

Women aged 40 and over

Few women aged 40 or over become pregnant, so their pregnancy rate is the lowest of all age groups. Moreover, between 1974 and 1992, the rate declined from 11 to 7 pregnancies per 1,000 women aged 40 to 44.

During that period, however, there was a considerable change in pregnancy outcomes for these women. While 40- to 44-year-olds had the highest proportion of pregnancies ending in a miscarriage/stillbirth, over the past two decades, this became a much less frequent outcome, falling from 23% to 12%. The share ending in a live birth rose substantially from 53% to 62%. The proportion of pregnancies ending in an abortion increased only slightly from 24% to 26%, but after teenagers, women aged 40 to 44 had the highest proportion of pregnancies ending in an abortion. For some women over age 40, the motivation for choosing abortion may have been the desire to reduce the risk of delivering a child with congenital anomalies, such as trisomies.²⁰ An additional reason for the relatively

high percentage of abortions among older women is that the number of unplanned pregnancies also increases at these ages.

Older mothers

From 1974 to 1992, pregnancy rates rose among women in their thirties, but declined at younger ages. Meanwhile, maturing of the baby boom generation shifted the age distribution of the female population of childbearing age. As a result, older women now account for a much larger proportion of pregnancies than was the case in the early 1970s (Chart 6). By 1992, 32% of pregnancies were among women in their thirties, up from just 18% in 1974; the share represented by women under age 25 fell from 44% to 26%. The trend toward older ages for childbearing is evident in other indicators. For example, from 1974 to 1990, the average age of a first-time mother rose from 23.7 to 26.4 years.⁴

Table 3

Pregnancy outcomes, by age of women at end of pregnancy, Canada, 1974 and 1992

	Pregnancies	Pregnancy outcomes			
		Live births	Abortions	Miscarriages/ stillbirths [†]	
		%			
All ages	1974	438,321	79	12	9
	1992	525,056	76	19	5
15-19 [‡]	1974	57,004	67	25	8
	1992	38,055	60	34	5
20-24	1974	136,125	81	10	8
	1992	100,779	75	21	5
25-29	1974	139,284	85	6	8
	1992	165,159	86	10	4
30-34	1974	58,882	81	9	10
	1992	126,543	86	9	5
35-39	1974	20,045	70	16	14
	1992	43,861	79	14	7
40-44 [§]	1974	6,623	53	24	23
	1992	7,439	62	26	12

Source: Health Statistics Division

Note: Age breakdowns exclude Newfoundland, Yukon, Northwest Territories, clinic abortions, and abortions obtained by Canadian women in the United States.

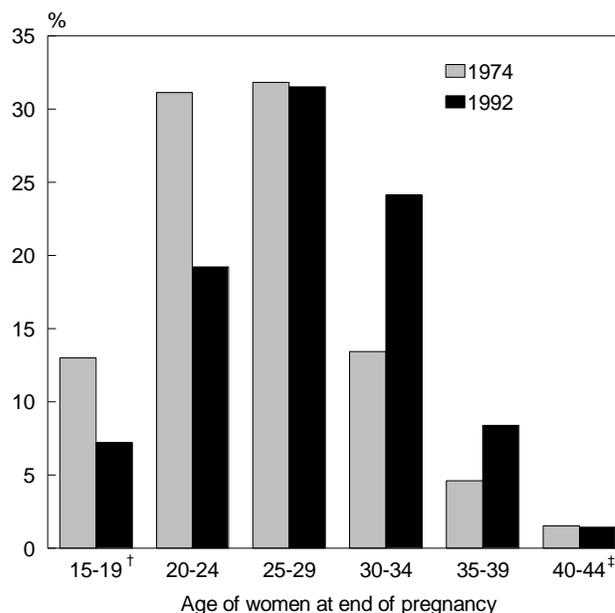
[†] Comprised of stillbirths of at least 20 weeks' gestation or birthweight of 500 grams or more, and hospitalized cases of spontaneous and other unspecified abortions.

[‡] Includes women younger than 15.

[§] Includes women older than 44.

Chart 6

Distribution of pregnancies, by age of women at end of pregnancy, Canada, 1974 and 1992



Source: Health Statistics Division

Note: Excludes Newfoundland, Yukon, Northwest Territories, clinic abortions, and abortions obtained by Canadian women in the United States.

[†] Includes women younger than 15.

[‡] Includes women older than 44.

Implications of pregnancy deferral

To some extent, the drop in pregnancy rates at younger ages reflects women postponing pregnancy and childbirth to pursue education and employment.²³⁻²⁵ But as the rise in pregnancy rates among women in their thirties indicates, motherhood cannot be delayed indefinitely. And despite the sharp downturn in miscarriages/stillbirths, the risk of complications increases at age 30 and over. For instance, while the rate of cesarean sections is falling, it remains highest among older mothers (see **Declining cesarean section rates: A continuing trend?** in this issue).

The deferral of pregnancy also has implications for fertility and fecundity because of age-associated changes in the reproductive and endocrine systems.^a The probability that conception will occur,

^a Fertility refers to the actual number of live births to a woman; fecundity, to the ability to conceive and whether conception results in a live birth.

or that it will lead to pregnancy or live birth, declines at older ages.^{26,27}

In addition, during the period in which she delays childbearing, a woman may be exposed to conditions that could affect her ability to conceive. For instance, sexually active women are potentially exposed to sexually transmitted diseases that may lead to pelvic inflammatory disease and possible infertility because of scarring of the fallopian tubes.²⁸ As well, since the 1940s, smoking rates among women have increased. Female smokers who postpone pregnancy may encounter fertility problems, as smoking has been associated with lengthened time to conception and earlier onset of menopause.^{29,30}

Consequently, as a result of delaying pregnancy, there may now be more women with fertility problems than was the case in the past. To some degree, the recent Royal Commission on New Reproductive Technologies may be viewed as a manifestation of such problems.³¹ Reproductive technology and the medical and ethical issues related to it may have become more visible as growing numbers of women have turned to such means as a solution to infertility.

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