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# Health Reports

Autumn 1996 Volume 8 No. 2

- Dementia
- Smoking and Education
- Male Nurses
- Breast Cancer
- Marriages



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# Health Reports

Autumn 1996 Volume 8 No. 2

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# Dementia among Seniors

Gerry Hill, William Forbes, Jean-Marie Berthelot, Joan Lindsay and Ian McDowell\*

## Abstract

The prevalence of dementia increases sharply in old age and is higher among women than men. Alzheimer's disease, the most common form of dementia, affects a greater proportion of women. On average, the number of years lived with dementia is longer for women, and women with dementia are more likely to be living in institutions than men with the condition.

This article examines age-standardized rates of dementia among men and women aged 65 and over. The data are from the 1991 Canadian Study of Health and Aging (CSHA), a joint effort of the Department of Epidemiology and Community Medicine at the University of Ottawa and the federal government's Laboratory Centre for Disease Control. Life expectancy estimates from Statistics Canada were combined with CSHA data to estimate the average proportions of life that are lived with and without dementia, in the community and in institutions.

**Key words:** Alzheimer's disease, mental health, life expectancy, aging

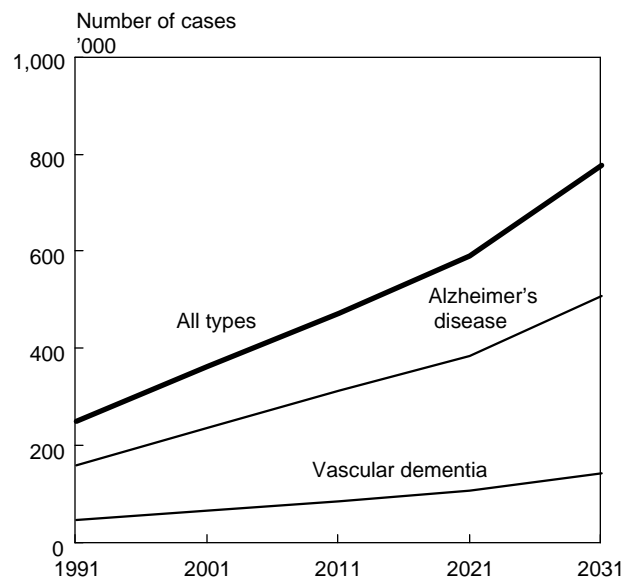
\* Gerry Hill (613-951-4113) and Jean-Marie Berthelot (613-951-3760) are with the Social and Economic Studies Division at Statistics Canada, Ottawa, K1A 0T6. William Forbes and Ian McDowell are with the Department of Epidemiology and Community Medicine at the University of Ottawa. Joan Lindsay is with the Cancer Bureau of the Laboratory Centre for Disease Control, Ottawa.

To reach old age may be a blessing, but a number of difficulties tend to accompany advanced years. One of the potential problems associated with aging is dementia, a condition that includes Alzheimer's disease, vascular dementia, and a variety of rarer diseases. "Dementia is a clinical syndrome characterized by acquired losses of cognitive and emotional abilities severe enough to interfere with daily functioning and the quality of life" (see **Methods** and **Types of dementia** ).<sup>1</sup>

Dementia is likely to be an increasingly important health concern in Canada (Chart 1). A trend toward longer life expectancy, combined with a reduction in fertility, has resulted in a growing proportion of seniors in the population. This article examines dementia in

Chart 1

Projected prevalence of dementia, Canada, 1991 to 2031



Source: Adapted from Canadian Study of Health and Aging: Study methods and prevalence of dementia

the context of the life expectancy of men and women aged 65 and over, living in the community and in institutions. The data are from the 1991 Canadian Study of Health and Aging (CSHA).<sup>2</sup>

**Dementia affects one in three seniors 85 and over**

In 1991, just over a quarter of a million (252,600) elderly Canadians were afflicted with some form of dementia. Nearly two-thirds (64%) of those with dementia were diagnosed as having Alzheimer's disease, the remainder being almost equally divided between vascular (19%) and other forms of dementia (17%).

Because women tend to outlive men, the majority of seniors with dementia were women (68%). However, even when age-standardized, women's rates remain

higher. The prevalence of dementia increases sharply in old age, and the difference between the sexes is widest in the most senior years. For example, at age 65 to 74, the rates were 28 cases per 1,000 for women and 19 for men (Chart 2). At age 85 and over, the rates were 371 and 287 cases, respectively.

Of the various forms of dementia, Alzheimer's disease is more common in women than men. Among those with dementia, 69% of women versus 53% of men had Alzheimer's disease (Chart 3). On the other hand, the proportion with vascular dementia was greater for men: 30% compared with 14% for women.

**Women live longer but carry a heavier burden**

Life expectancy estimates from Statistics Canada were combined with CSHA data to estimate the

<p><b>Methods</b></p> <p><b>Data source</b></p> <p>The Canadian Study of Health and Aging (CSHA) is a joint effort of the Department of Epidemiology and Community Medicine at the University of Ottawa and the federal government's Laboratory Centre for Disease Control. The CSHA working group conducted a study of the elderly in 18 centres across Canada, excluding the Yukon, Northwest Territories, Indian reserves and military bases. The first phase occurred from February 1991 to May 1992. A representative sample of people aged 65 and over was chosen randomly: 14,091 living in the community and 1,586 in institutions. Participation rates in the CSHA were 72% (9,008) for residents of the community and 82% (1,255) for those in institutions. It is likely that the prevalence of dementia would be higher among those who did not participate.</p> <p>One of the objectives of the study is to determine the prevalence of dementia in these two populations. Respondents living in the community were interviewed at home and were screened for the likely presence of dementia using a simple psychometric test. Those who failed the test and all residents of the institutions were offered a standardized clinical examination, which classified them into one of four categories: without dementia, with Alzheimer's disease, with vascular dementia, or with another type of dementia.</p>	<p><b>Analytical techniques</b></p> <p>Prevalence rates were age-standardized using 1991 Census counts as the base population. To estimate years of life with and without dementia, in and out of institutions, age-adjusted prevalence rates were calculated by the direct method, with the life table population as the standard population.<sup>3</sup> For example, the expected years lived by hypothetical cohorts of 100,000 men and women aged 65 were divided into three groups: years lived from 65 to 74, from 75 to 84, and 85 and over. To calculate the expected number of years this cohort would live with Alzheimer's disease while living in the community, the percentage of people with the disease and in the community by age group was multiplied by the expected number of years lived by age group. The resulting figures were then summed.</p> <p><b>Limitations</b></p> <p>There are no definitive tests for the presence of dementia or for determining the type of dementia while an individual is alive. Thus, the data are clinical judgements, and although every effort was made to standardize them using established criteria, it is possible that some cases were misdiagnosed. The method of converting age-specific prevalence rates to expectations of life, though widely used in this and similar contexts, is only valid if age-specific rates of incidence of dementia, rates of admission to institutions, and rates of mortality remain constant over time.</p>
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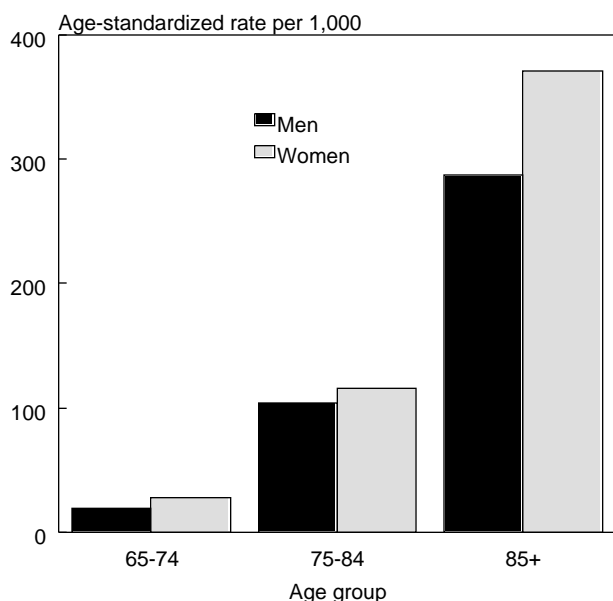
average proportions of life that are lived with and without dementia, in the community and in institutions. These statistics are averages and do not reflect an individual's probability of being in these circumstances over time. Moreover, it is unlikely that one person would experience all four states.

In 1990-92, at age 65, women could expect to live 20.0 more years, and men, 15.8 more years (Table 1). On average, the majority of these years are spent without dementia and in the community. Typically, 88% of senior women's life expectancy is without dementia, with 16.6 of these years lived in the community and 0.9 of a year in institutions. For senior men, the percentage of life expectancy without dementia is 92%, with 14.1 years lived in the community and 0.4 of a year in institutions.

The remaining years are lived with dementia: 2.4 for women and 1.2 for men. These years represent a greater proportion of elderly women's life expectancy (12%) than men's (8%).

**Chart 2**

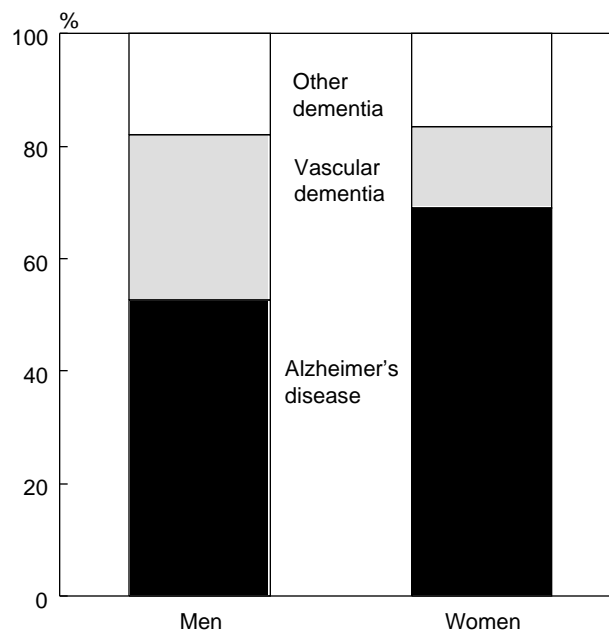
**Rate of dementia, by age group and sex, Canada, 1991**



Source: Canadian Study of Health and Aging Working Group, 1994

**Chart 3**

**Population aged 65 and over with dementia, by type of dementia and sex, Canada, 1991**



Source: Canadian Study on Health and Aging Working Group, 1994

Note: Based on age-standardized rates.

**Types of dementia**

A recent article published in the *New England Journal of Medicine* discusses the common types of dementia.<sup>1</sup> The descriptions of dementia presented here are based on that article.

Alzheimer's disease, the most prevalent form of dementia in Canada, is a primary degenerative disease of the brain. Progressive memory impairment, particularly loss of short-term memory, is the main cognitive feature of this disease. The typical Alzheimer's patient experiences a progressive decline, sometimes mitigated by short plateaus. Language impairment is a symptom, particularly a reduced ability to name people and things (anomia). Complex reductions in visual and spatial abilities occur resulting in difficulty recognizing people or having misperceptions such as mistaking a shrub for a person.

Vascular dementia is a permanent cognitive impairment resulting from cerebrovascular disease (such as stroke). Typically, vascular dementia has a fluctuating course. The rate and severity of decline are contingent on the underlying cerebrovascular disease and the patient's response to treatment. Signs of vascular dementia include movement disturbances that are similar to symptoms of Parkinson's disease. An irregularity in the patient's usual manner of walking is suggested as an early marker of vascular dementia.

## Women with dementia more likely than men to live in institutions

Understandably, dementia is associated with disability and subsequent institutionalization.<sup>4</sup> In 1991, about half of those with dementia (51%) were living in institutions. Whether an individual with dementia lives in the community or in an institution is influenced, in part, by the availability of a care-giver. And it is women who are most unprotected. Since wives, on average, outlive their husbands, older women are less likely to have a spouse to care for them when they are ill.<sup>5</sup> "Because older married couples can usually rely on each other, they tend to receive much less assistance from other sources.... Such highly concentrated support, however, makes them vulnerable if that support is lost."<sup>6</sup> In 1991, 54% of women with dementia were living in institutions, compared with 44% of men.

Not only are senior women with dementia more likely to live in institutions, but they generally spend more time there than do men with the condition. Of the years senior women live with dementia, 1.4 on average are spent in institutions, compared with only 0.6 of a year for men. Thus, women spend a greater proportion of their years with dementia living in institutions (58%) than do men (50%).

## Concluding remarks

The consequences of dementia affect not only individuals with the condition, but also their care-givers.<sup>5</sup> As the number of seniors rises in the near future, so will the prevalence of dementia, and the demands on care-givers will increase.

## Acknowledgments

The Canadian Study of Health and Aging is supported by the Seniors' Independence Research Program, with funds administered by the National Health Research and Development Program (project 6606-3954-MC[S]). The first phase of the study involved 51 investigators in 18 centres, with guidance from a group of experts from the United States. The study was co-ordinated by a team led by Barbara Helliwell. These contributions are gratefully acknowledged.

**Table 1**

### Life expectancy at age 65, by presence of dementia, place of residence and sex, Canada, 1991

	Men		Women	
	Years	%	Years	%
<b>Total</b>	<b>15.8</b>	<b>100</b>	<b>20.0</b>	<b>100</b>
<b>Without dementia</b>	<b>14.6</b>	<b>92</b>	<b>17.5</b>	<b>88</b>
<b>Living in:</b>				
Community	14.1	90	16.6	83
Institutions	0.4	3	0.9	5
<b>With dementia</b>	<b>1.2</b>	<b>8</b>	<b>2.4</b>	<b>12</b>
<b>Living in:</b>				
Community	0.7	4	1.0	5
Institutions	0.6	4	1.4	7

Source: Canadian Study of Health and Aging Working Group, 1994

Note: Numbers may not sum because of rounding.

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# Reaching Smokers with Lower Educational Attainment

Wayne J. Millar\*

## Abstract

Between 1977 and 1994, smoking rates declined among men and women, but the decline was steeper for men. While smoking rates fell among people at all levels of education, the smallest drop was among those with high school graduation or less, particularly women. For those who had stopped smoking, health concerns had been the overriding factor.

Smokers with lower education reported encountering fewer smoking restrictions in their daily activities than did those with higher education. All smokers cited the mass media as their major source of information about smoking, but those with lower education reported the mass media less often than did smokers with higher levels of attainment, and were less likely to obtain information from books, pamphlets or magazines. In addition, smaller percentages of smokers with lower education recalled printed warnings about heart disease on cigarette packages.

Variations in the decline of smoking suggest that health promotion and smoking cessation programs should consider sex and educational differences when targeting the smoking population.

Differences in rates of smoking among people aged 20 and over were examined by educational attainment using selected health surveys conducted between 1977 and 1994. A Health Canada-sponsored supplement to Statistics Canada's National Population Health Survey was used for data on other aspects of smoking such as cutting back or attempting to quit, sources of health information, and awareness of smoking restrictions and cigarette package warnings.

**Key words:** cigarette smoking, smoking cessation, educational status, tobacco, health promotion, mass media

While the last few decades have seen an overall decline in smoking among Canadians, some smokers have been particularly resistant to this trend. Individuals with lower levels of formal schooling tend to have higher smoking rates. Moreover, smoking rates are not the only aspect of tobacco use associated with education. The percentages of smokers attempting to quit or cutting down, reasons for quitting, and sources of information about smoking also varied with their education.

Because cigarette smoking is one of the most important, but also preventable, causes of illness and death, the factors that influence smoking rates have implications for public health programs and health care expenditures.<sup>1,2</sup> In this article, data from a Health Canada-sponsored supplement to Statistics Canada's 1994-95 National Population Health Survey (NPHS) are used to show that a wide range of smoking-related behaviours and attitudes are associated with educational attainment (see **Methods** and **Health Canada supplementary questions** ).

## Smoking rates down

From 1977 to 1994, smoking rates declined among both men and women aged 20 and over, though the decline was more pronounced among men (Table 1). The age-standardized percentage of men who smoked cigarettes daily or occasionally fell from 46% to 33%, an average annual percent change (AAPC) in rates of -2.22%. The age-standardized smoking rate among women fell more slowly from 35% to 29%, an AAPC in rates of -1.05%. Despite the sharper decline in men's smoking rates, they remained above those of women, although the difference narrowed from 11 to 4 percentage points.

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## Methods

### Data sources

Trends in smoking rates are based on data from a number of surveys conducted from 1977 to 1994: the Labour Force Survey smoking supplements (1977, 1979, 1981, 1983, 1986), the 1978-79 Canada Health Survey, the 1985 and 1990 Health Promotion Surveys, the 1989 National Alcohol and Drug Survey, the 1991 General Social Survey, and the longitudinal 1994-95 National Population Health Survey (NPHS) (see **Appendix**).<sup>3-12</sup>

Detailed data on smoking-related behaviour and attitudes are based on a Health Canada-sponsored supplement to the NPHS. The sample size of this supplement was 13,400 respondents (12,010 aged 20 and over). The response rate was 90.6% of eligible persons in the households.

All the estimates were weighted to represent the population at the date of the survey, so that the results can be generalized to the Canadian population. The sample sizes in each survey were large, so the variances associated with the estimates tend to be low.

### Analytical techniques

Because this analysis examines the association between smoking and educational attainment, it focuses on the population aged 20 and over, an age at which most people who are going to do so have graduated from high school. The age distributions of the populations in the education categories vary substantially. Therefore, age-standardized smoking rates were calculated using the total 1994 population of Canada.

Changes in annual age-standardized smoking rates were examined by calculating the average annual percent change (AAPC) for the rates over 1977-1994. The AAPC is  $(e^{\beta} - 1)100$ , where  $\beta$  is the slope from a regression of log rates on year.

The time series data come from several different surveys. As much as possible, the educational

categories used in this analysis were grouped to be consistent with the classification in the Labour Force Survey. It was not possible to derive the population with elementary education for the Canada Health Survey (CHS). Therefore, the regression analysis for elementary education excludes the CHS.

Smokers were defined as persons who smoked cigarettes either daily or occasionally at the time of each survey.

### Limitations

Because the data are based on cross-sectional surveys, observed differences in smoking behaviour may reflect differences between cohorts, age groups, or a combination of the two.

The Labour Force Survey smoking supplements allowed proxy responses. Recent surveys, however, have attempted to reduce proxy reporting. In the National Alcohol and Drug Survey and in the 1990 Health Promotion Survey, proxy responses were not allowed. The 1991 General Social Survey allowed proxy responses only in cases where the selected respondent was either too ill to participate or did not speak either official language; there was little proxy reporting. The 1994-95 NPHS allowed some proxy reporting, but this did not apply to the modules pertaining to preventive health behaviour.

The effect of proxy response on smoking rates depends on the proportion of responses that are proxy and the degree to which proxy responses diverge from self-reported smoking behaviour. While it is not possible to determine the influence of proxy response on smoking rates in the early years of the time series, such reporting tends to be more of a problem for estimates of smoking among adolescents.<sup>13</sup> Since this analysis is restricted to people aged 20 and over, the bias introduced by proxy reporting may have been minimized.

People with lower levels of formal schooling are generally more likely to be smokers. And while smoking rates fell among men and women regardless of education, the pace of decline varied. For men, there was a downturn in smoking rates at all education levels. By contrast, for women, the decline was primarily among the university-educated, whose AAPC (-3.18%) indicated a sharper drop than that for any other group.

Women in the two lowest educational attainment groups had the smallest declines in smoking rates. The AAPC among those with elementary education or less was -0.21%, and among those with some or completed high school, -0.31%. In fact, women with some or completed high school had the highest smoking rates: 38% in 1977; 36% in 1994. Similarly, the men with the highest smoking rates—those whose education had not extended beyond elementary school—also had the smallest decline in rates.

**Table 1**

**Average annual percent change (AAPC) in smoking rates, by sex and educational attainment, Canada, 1977 to 1994**

Educational attainment	Smoking rate		AAPC in rate 1977 to 1994
	1977	1994	
	%		%
<b>Both sexes</b>	<b>40</b>	<b>31</b>	<b>-1.66</b>
Elementary or less	44	37	-0.70
Some/completed high school	43	38	-0.88
Some postsecondary	37	31	-1.20
Certificate/diploma	36	30	-1.20
University degree	27	16	-2.81
<b>Men</b>	<b>46</b>	<b>33</b>	<b>-2.22</b>
Elementary or less	54	47	-0.93
Some/completed high school	50	40	-1.47
Some postsecondary	39	34	-1.43
Certificate/diploma	37	31	-1.58
University degree	28	18	-2.48
<b>Women</b>	<b>35</b>	<b>29</b>	<b>-1.05</b>
Elementary or less	33	30	-0.21
Some/completed high school	38	36	-0.31
Some postsecondary	34	29	-0.73
Certificate/diploma	35	29	-0.97
University degree	27	14	-3.18

**Source:** Labour Force Survey smoking supplements, Canada Health Survey, Health Promotion Surveys, General Social Survey, National Alcohol and Drug Survey, National Population Health Survey

**Note:** Based on weighted and age-standardized rates, population aged 20 and over; data from 1977, 1978-79, 1979, 1981, 1983, 1985, 1986, 1989, 1990, 1991, 1994-95.

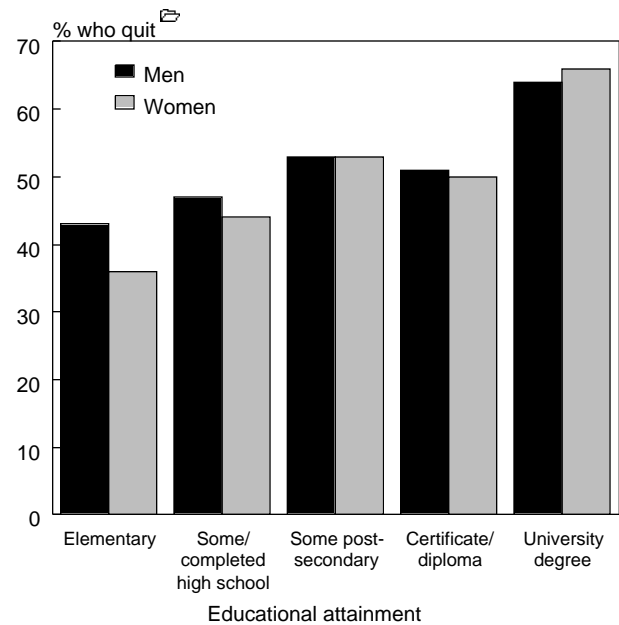
Variations in the decline of smoking since the mid-1970s widened the gap in smoking rates by educational attainment. For men, the difference between the highest and the lowest smoking rates rose from 26 to 29 percentage points; for women, the difference doubled from 11 to 22 percentage points. This pattern is not unique to Canada—in other countries, too, people with less education are more likely to smoke than are the highly educated.<sup>14,15</sup>

**Quitting**

A downturn in smoking rates over time can come about in two ways: if people do not start smoking or if smokers quit. Much of the overall decline in rates since 1977 was attributable to smokers kicking the habit. By 1994, around half the population aged 20 and over who had ever smoked had quit: 50% of women and 52% of men. The percentages of former smokers among people who had ever smoked mirrored the pattern of decline in rates by level of education. Smokers who had not gone beyond high school, particularly women, were the most resistant to quitting

**Chart 1**

**Ever smokers who quit, by sex and educational attainment, Canada, 1994-95**



**Source:** National Population Health Survey, 1994-95

**Note:** Based on population aged 20 and over. Percentages are age-standardized.

<sup>†</sup> Percentage of people who have ever smoked who have quit.

(Chart 1). Among people who had ever smoked, just 36% of women and 43% of men with elementary school or less had quit by 1994; the comparable figures for those with some or completed high school were 44% and 47%. By contrast, 66% of female and 64% of male university graduates who had ever smoked had quit.

**Table 2**

**Former smokers' reasons for quitting, by sex and educational attainment, Canada, 1994-95**

Reasons for quitting <sup>†</sup>	Educational attainment					
	Total	Elementary or less	Some/ completed high school	Some post-secondary	Certificate/ diploma	Degree
<b>Both sexes</b>						
Former smokers <sup>‡</sup>	6,651	544	2,272	1,704	1,164	948
			'000			
			%			
Future health	48	47	46	46	48	53
Cost	12	12	13	12	15	10
Present health	11	9	11	12	12	12
Social/family pressure	10	6	8	10	9	14
Physician advice	6	5	6	5	4	3
Restrictions	2	—	1	2	2	2
<b>Men</b>						
Former smokers <sup>‡</sup>	3,647	343	1,254	877	612	548
			'000			
			%			
Future health	51	50	51	48	51	56
Cost	13	13	11	14	17	11
Present health	12	8	13	13	10	11
Social/family pressure	10	2	8	11	9	14
Physician advice	6	6	7	5	6	3
Restrictions	2	—	1	2	2	2
<b>Women</b>						
Former smokers <sup>‡</sup>	3,003	201	1,017	828	552	400
			'000			
			%			
Future health	44	43	41	43	45	47
Cost	12	10	15	10	14	8
Present health	11	10	8	10	13	13
Pregnancy	11	3	13	13	11	8
Social/family pressure	11	13	9	10	10	14
Physician advice	5	2	5	5	2	3
Restrictions	1	—	2	1	2	1

**Source:** National Population Health Survey, 1994-95  
**Notes:** Based on population aged 20 and over. Because the estimated male and female populations were independently rounded to the nearest 1,000, the sum may not equal the estimate for both sexes. Percentages are age-standardized.

<sup>†</sup> Respondents could specify more than one reason.  
<sup>‡</sup> Row counts do not sum to total because educational attainment was not stated by some respondents.

The leading reason why they had stopped smoking, cited by 51% of men and 44% of women, was concern for their future health (Table 2). Cost ranked a distant second (13% of men and 12% of women). There was no clear-cut pattern in reasons for quitting by educational attainment. However, at higher levels of education, former smokers were generally more likely to cite social and family pressure as a factor in their decision.

**Encountering restrictions**

To the extent that smoking is discouraged or prohibited in various settings, its prevalence can be expected to decline. For example, although few former smokers reported that smoking restrictions had affected their decision to quit, previous research has demonstrated that when restrictions are introduced in a workplace, the number of cigarettes smoked per day

**Health Canada supplementary questions**

The 1994-95 National Population Health Survey contained a set of supplementary questions, which were sponsored by Health Canada. Included among them were a number of open-ended questions on smoking and tobacco use.

All respondents, both smokers and non-smokers, were asked, "What are your most important sources of information about health risks from smoking and tobacco use?" The interviewers recorded all sources of information that the respondents mentioned.

All respondents were asked, "Have you ever seen health warning messages on cigarette packages?" Those who replied affirmatively were asked, "What are the health warning messages you have seen?" The interviewers recorded all messages that the respondents recalled.

Former smokers were asked, "Why did you quit smoking?" The interviewers recorded all reasons mentioned.

Current smokers were asked, "Have you tried to quit smoking in the last twelve months?" and "Are you smoking less now than you were twelve months ago?" They were also asked where they encountered smoking restrictions: "Nowadays, there are many restrictions on where people are allowed to smoke. In your day-to-day activities, where do you find you have restrictions on your smoking?" The interviewers recorded as many locations as the respondents mentioned.



influence diminished among smokers with more education.

One source of information that smokers can hardly avoid is the health warnings on cigarette packages. Not surprisingly, awareness of these messages was almost universal (Table 5). However, smokers' recollection of specific messages varied with their education. For instance, comparatively few women

**Table 4**  
**Smokers' sources of information about smoking and tobacco use, by sex and educational attainment, Canada, 1994-95**

Sources of information†	Educational attainment					
	Total	Elementary or less	Some/ completed high school	Some post-secondary	Certificate/ diploma	University degree
<b>Both sexes</b>						
Current smokers‡	6,316	406	2,519	1,674	1,180	528
	'000					
	%					
TV/radio/newspapers	57	55	55	59	59	68
Health professionals	32	43	33	33	28	26
Pamphlets/magazines/ books	32	30	30	32	36	45
Family	16	15	16	16	14	15
Friends	10	6	11	10	9	10
<b>Men</b>						
Current smokers‡	3,306	237	1,274	858	622	308
	'000					
	%					
TV/radio/newspapers	58	58	57	60	57	68
Health professionals	27	48	27	28	18	23
Pamphlets/magazines/ books	28	30	26	29	26	45
Family	17	16	17	15	14	16
Friends	10	6	12	10	7	8
<b>Women</b>						
Current smokers‡	3,010	168	1,245	816	558	220
	'000					
	%					
TV/radio/newspapers	57	51	53	58	62	67
Health professionals	38	35	39	38	37	28
Pamphlets/magazines/ books	37	30	34	35	45	44
Family	15	13	14	17	13	14
Friends	10	6	10	9	11	12

**Source:** National Population Health Survey, 1994-95  
**Notes:** Based on population aged 20 and over. Because the estimated male and female populations were independently rounded to the nearest 1,000, the sum may not equal the estimate for both sexes. Percentages are age-standardized.

† Respondents could indicate more than one source.  
‡ Row counts do not sum to total because educational attainment was not stated by some respondents.

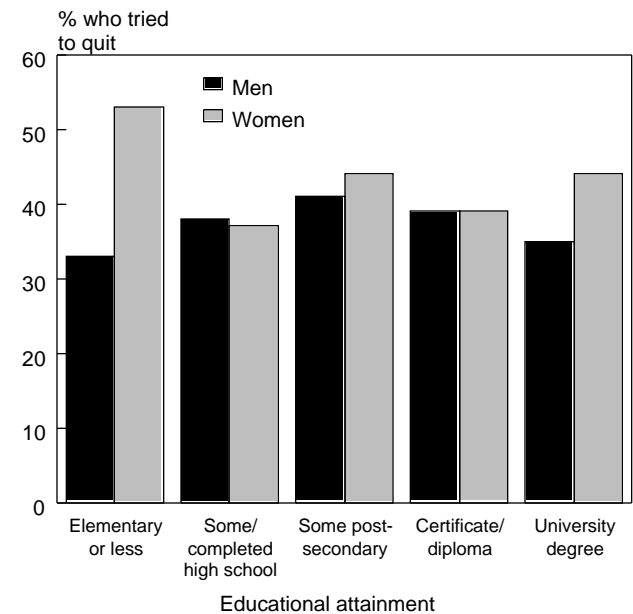
with lower educational attainment were aware of messages about the relationship between smoking and life expectancy, heart disease or pregnancy.

**Attempting to quit and cutting down**

There is some evidence from the NPHS that anti-smoking messages are being heeded. A substantial share of smokers had tried to quit in the year before they were interviewed: 39% of men and 42% of women. An almost equal number reported that they were smoking less than they had 12 months earlier: 39% of men and 41% of women. But again, relatively few of those whose smoking rates were highest—women with some or completed high school—had tried to quit (37%) or had cut down (38%) (Charts 2 and 3).

By contrast, another group of women with a high smoking rate—the small number with elementary education or less—was also the group most likely to have tried to quit (53%) or to have cut down (50%).

**Chart 2**  
**Smokers who tried to quit in last 12 months, by sex and educational attainment, Canada, 1994-95**



**Source:** National Population Health Survey, 1994-95  
**Note:** Based on population aged 20 and over. Percentages are age-standardized.



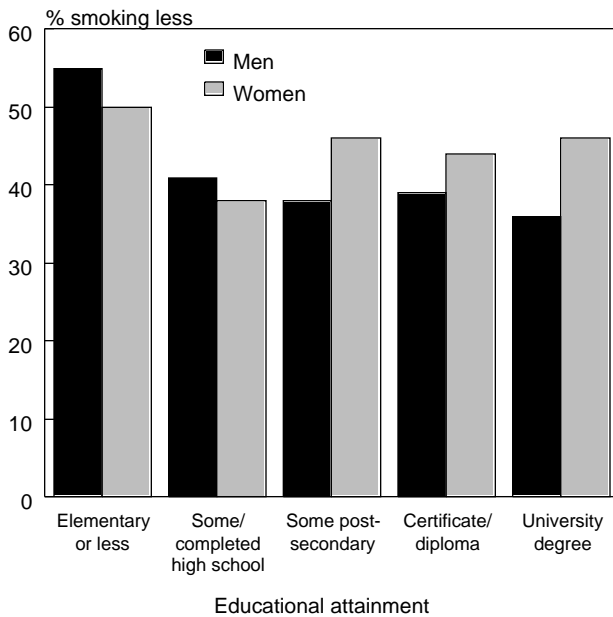
The men least likely to have tried to quit smoking (33%) were those with elementary education or less, and these men also had the highest smoking rate. Yet of all male smokers, they were the most likely to report having cut down (55%).

**Implications**

The decline in smoking rates since 1977 has not affected all groups equally. Smokers with lower levels of education, notably women, have been particularly resistant to this trend. Even so, the results of the NPHS indicate some desire among these smokers to stop, as substantial numbers reported trying to quit or cutting down during the previous year. These smokers may find quitting a particular challenge, as they are more likely to be in environments where smoking is not restricted.

**Chart 3**

**Smokers who smoke less than they did 12 months ago, by sex and educational attainment, Canada, 1994-95**



Source: National Population Health Survey, 1994-95  
 Note: Based on population aged 20 and over. Percentages are age-standardized.

**Table 5**

**Smokers' awareness of health messages on cigarette packages, by sex and educational attainment, Canada, 1994-95**

Health messages on cigarette packages <sup>†</sup>	Educational attainment					
	Total	Elementary or less	Some/completed high school	Some post-secondary	Certificate/diploma	Degree
<b>Both sexes</b>						
Current smokers <sup>‡</sup>	6,316	406	2,519	1,674	1,180	528
Have seen messages	98	94	98	99	98	99
Smoking during pregnancy can harm baby	72	62	70	76	74	77
Smoking is the major cause of lung cancer	69	71	70	68	67	72
Smoking is a major cause of heart disease	49	47	50	50	54	51
Smoking reduces life expectancy	46	44	44	50	43	54
<b>Men</b>						
Current smokers <sup>‡</sup>	3,306	237	1,274	858	622	308
Have seen messages	98	93	97	99	98	98
Smoking during pregnancy can harm baby	67	59	66	70	70	74
Smoking is the major cause of lung cancer	70	77	71	67	66	73
Smoking is a major cause of heart disease	49	56	50	45	46	47
Smoking reduces life expectancy	45	48	43	46	42	56
<b>Women</b>						
Current smokers <sup>‡</sup>	3,010	168	1,245	816	558	220
Have seen messages	98	95	98	99	99	99
Smoking during pregnancy can harm baby	76	66	73	82	76	84
Smoking is the major cause of lung cancer	69	64	70	70	67	73
Smoking is a major cause of heart disease	50	35	51	55	44	54
Smoking reduces life expectancy	48	38	45	53	45	54

Source: National Population Health Survey, 1994-95  
 Notes: Based on population aged 20 and over. Because the estimated male and female populations were independently rounded to the nearest 1,000, the sum may not equal the estimate for both sexes. Percentages are age-standardized.

<sup>†</sup> Based on smokers who had seen the health messages.  
<sup>‡</sup> Row counts do not sum to total because educational attainment was not stated by some respondents.

Variations in the decline of smoking suggest that health promotion and smoking cessation programs should take account of sex and educational differences when targeting the smoking population. There may be a need for alternative approaches to reach smokers with lower levels of education. This could entail designing messages that emphasize the smoking-related issues that most concern these smokers and using channels of communication that are most likely to influence them.

Health concerns are the overriding factor in smokers' decision to quit. However, the most resistant smokers were less likely than others to recall warnings on cigarette packages about the relationship of smoking to heart disease, life expectancy, and potential harm to a baby if the mother smokes when she is pregnant.

While television, radio and newspapers were the major source of information about smoking, a smaller percentage of smokers with less education reported obtaining such information from the mass media. These smokers were also less likely to get information from pamphlets, magazines, or books.

On the other hand, a substantial share of people with lower levels of education reported health professionals as sources of information about smoking and tobacco use. As well, a small proportion of former smokers mentioned physician advice as a reason for quitting. The fact that most people visit physicians regularly provides an opportunity for intervention by the medical profession.<sup>18</sup> In 1994-95, 87% of female and 84% of male smokers had consulted a physician in the previous year, and smokers with less than high school were more likely than those with university degrees to have contacted a physician six or more times.

Prohibitions on smoking in various settings seem to have an effect on its prevalence. The high smoking rates of people with the lowest levels of education may be associated with their milieu—at home, at work, with friends—in which smoking is not discouraged or prohibited. By contrast, low smoking rates among more highly educated individuals may have some relation to the restrictions they encounter. Successful attempts

to quit smoking also vary with education and lend some support to the idea that non-smoking environments may play a role.

Of course, the picture of smoking presented here is incomplete, as by age 20 most people who are going to smoke have already started, and much of the anti-smoking initiative is directed at discouraging young people from becoming smokers. Studies of the smoking behaviour of people younger than age 20, particularly longitudinal studies that the NPHS will make possible, may clarify the process of smoking initiation and cessation.<sup>19</sup>

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## Appendix

### Survey sample sizes for ages 20 and over, by educational attainment, Canada

Survey date	Survey <sup>†</sup>	Educational attainment					
		Total	Elementary	Some/ completed high school	Some post-secondary	Certificate/ diploma	University degree
1977	LFS	34,170	9,983	15,022	2,793	3,761	2,611
1978-79 <sup>‡</sup>	CHS	20,157	..	14,967	1,581	1,997	1,611
1979	LFS	33,709	9,403	15,859	2,197	3,542	2,708
1981	LFS	34,209	8,779	16,357	2,461	3,683	2,929
1983	LFS	33,924	8,358	15,882	2,735	3,959	2,990
1985	HPS	10,188	1,060	5,411	1,168	1,146	1,403
1986	LFS	27,709	5,966	13,126	2,343	3,576	2,698
1989	NADS	10,659	1,216	5,341	1,240	1,286	1,576
1990	HPS	12,236	1,362	5,973	1,416	1,621	1,864
1991	GSS	11,008	1,346	4,372	1,653	2,168	1,469
1994-95	NPHS	12,010	1,033	4,266	2,975	2,112	1,624

<sup>†</sup> LFS - Labour Force Survey, CHS - Canada Health Survey, HPS - Health Promotion Survey, GSS - General Social Survey, NADS - National Alcohol and Drug Survey, NPHS - National Population Health Survey (Health Canada supplement).

<sup>‡</sup> It was not possible to derive counts for those with elementary education.

# Male Registered Nurses, 1995

Richard Trudeau\*

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## Abstract

Men constitute a small minority of registered nurses (RNs) in Canada, but their numbers have risen sharply in the last decade. In 1995, almost 4% of RNs were men, up from just over 2% in 1985. The proportion of male nurses is particularly high in Quebec, where the 1995 figure was 8%. Some areas of nursing are more likely than others to employ male nurses: psychiatry, critical care, emergency care, and administration. By contrast, relatively few male RNs have jobs in maternal/newborn care, pediatrics, or community care. Rising male enrolment in college and university nursing programs suggests that men's representation in nursing will continue to rise. The older age profile of male nurses may indicate that some men are choosing nursing as a second career. As well, a shift in the age distribution of male nurses would seem to suggest that those who enter the profession tend to stay.

This analysis of the demographic and employment characteristics of male nurses is based on information compiled annually in the Registered Nurses Database maintained by Statistics Canada. Figures on enrolment and graduation in nursing are collected by Statistics Canada as part of annual surveys.

**Key words:** male nurses, nursing, nursing education, hospital nursing staff

Over the past decade, women have made considerable inroads into many previously male-dominated professions, notably medicine. For example, today, women account for 26% of physicians and surgeons, compared with 17% in 1985.<sup>1</sup> By contrast, the movement of men into nursing has been gradual, at best. Nursing remains one of the most highly female-dominated occupations, with men making up a very small minority of registered nurses (RNs). While Canada's registered nurses totalled more than a quarter of a million in 1995, just over 10,000 were men.

Registered nurses numbered 262,400 in 1995, a slight decrease from the previous year's 264,932, and the first decline since 1979. Still, the number of male RNs has been growing steadily.

This article examines the demographic and employment characteristics of male registered nurses in Canada. (Registered nurses have successfully completed an approved program for professional nursing, and after meeting preset standards, are currently registered in one of the provinces. These standards include graduation from a school of nursing; passing the written nurse registration examination; demonstration of competence in nursing; and demonstration of competence in one or both official languages.) The analysis is based on data that are collected annually and compiled in Statistics Canada's Registered Nurses Database (see **Methods**). These data are extracted from forms completed each year by nurses who register or re-register and report information including age, sex, education, employment status, and nursing position and responsibilities.

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## Methods

### Data source

Most of the information in this article is taken from the Registered Nurses Database maintained by Statistics Canada.<sup>2</sup> Decisions on data collection, content changes, and output have been made jointly by the Canadian Nurses Association, the provincial/territorial nurses regulating authorities, and Statistics Canada. Beginning in 1996, the Registered Nurses Database will be maintained by the Canadian Institute for Health Information.

Provincial nurses regulating authorities are responsible for data collection, which occurs during annual registration. This process covers new nurses registering for the first time, nurses who are re-registering in the same province, nurses who have moved and are registering in a new province, and immigrant nurses registering in Canada for the first time. Data are derived annually from the provincial/territorial registration (licensing) and re-registration forms. Nine provincial associations and the Yukon capture their own data and forward unedited records to Statistics Canada. The associations in Prince Edward Island and the Northwest Territories send their registration documents to Statistics Canada via the Canadian Nurses Association. Variables collected include age, sex, entry/initial nursing education, year and province of graduation, employment status, full- or part-time employment, hours worked in past 12 months, location of employment, type of employer, primary area of responsibility, and position.

Because of the high response rate (over 95% in all jurisdictions), no attempt is made to account for total non-response by weighting. Missing data are not imputed; rather, all tables contain a "not stated" category.

Data on enrolment in and graduation from nursing programs in universities are from annual surveys of those institutions conducted by the Education, Culture and Tourism Division of Statistics Canada. Community college data are provided by the Canadian Nurses Association.

### Limitations

Since nurses can register in more than one province or territory, duplicates must be removed to present an accurate count of the number of RNs in Canada. To reduce duplicate registrations arising from interprovincial moves, which typically occur in the summer, the information collection period is restricted to the first four months of each jurisdiction's registration year. Because 95% of registrations occur in the early months of the year, this does not cause a significant loss of registrations.

Nonetheless, some duplicates remain as a result of nurses maintaining registration in more than one province/territory. The bulk of these duplicates are removed by matching province of employment or residence to province of registration.

This method of eliminating interprovincial duplicates introduces potential errors. If a nurse lives and registers in one province at the beginning of the year, and one to three months later, moves to and registers in another province, this duplicate will not be detected. On the other hand, a nurse not employed in nursing who is registered only in a province other than the province of residence will erroneously be identified as a duplicate. Similarly, a small number of nurses are employed in a province other than their province of registration; they will erroneously be identified as duplicates.

Data entry errors occur in a small number of records for each province or territory. The estimated error rate for any variable in any jurisdiction is less than 1%.

In recent years, licensing documents from Prince Edward Island have not reported the variable "sex." The sex of P.E.I. nurses is determined by the individual's name or by comparison with a previous year's document in which sex was specified. If sex cannot be ascertained with either method, the individual is considered to be female. Since P.E.I. accounts for 0.5% of all nurses in Canada, this has little effect on overall results.

### Defining employment status

The Labour Force Survey (LFS) classification of full- or part-time employment is objective and allows no self-definition.<sup>3</sup> Full- and part-time employment are determined on the basis of the total number of hours usually worked each week at a **main or sole job**. People employed in the reference week (the week before the LFS) and who usually work less than 30 hours a week at their main or sole job are part-time workers; those who work 30 or more hours a week are full-time workers.

For most jurisdictions that participate in the annual registered nurses data collection, designation of full-time or part-time employment is subjective. Respondents who check the box indicating full-time employment on their registration form are considered full-time, and those who check part-time are considered part-time, regardless of how many hours they worked. Only in Nova Scotia, Alberta, and the Northwest Territories is full-time employment defined as working in nursing an average of 30 or more hours a week. Nonetheless, past reviews of the data show that self-reported part-time employment is similar to the numbers that would have been obtained from a question that specified 30 hours as the cut-off.

## A growing minority

The social and economic inducements for women to enter male-dominated professions are lacking for men who contemplate careers in female-dominated areas. Yet despite the barriers that they may encounter, a small but growing number of men are drawn to nursing.

Although few in absolute number, the population of male registered nurses has increased substantially over the last 10 years. By 1995, there were 10,035 male nurses in Canada, an 84% increase over the 5,449 registered in 1985. At the same time, the number of female nurses increased by only 13%. As a result, men accounted for 3.8% of all RNs in 1995, compared with 2.4% in 1985 (Table 1).

To some extent, national figures are misleading, as they are strongly influenced by the situation in Quebec (Table 2). In 1995, 51% of Canada's male nurses were registered in Quebec, and they made up 7.9% of all RNs in that province. In the other provinces, the percentage of male RNs did not exceed 3.4%. (A relatively large percentage—6.4%—of RNs in the Northwest Territories were men, but the actual number was small.) The high proportion of male nurses in Quebec is not a recent development. Ten years ago, Quebec also had the highest percentage of male nurses (5.3%), and the province accounted for 53.5% of Canada's male RNs.

## Employment status

The employment profile of male nurses differs somewhat from that of female nurses. In 1995, a slightly higher percentage of male than female RNs were employed in nursing: 92% versus 89%. However, this difference may be attributable to retired female nurses maintaining registration. The majority (86%) of RNs who were neither employed in nursing nor seeking such employment were residents of Ontario, where unlike other provinces, retired nurses can continue to be registered.

A more pronounced difference in the employment characteristics of male and female RNs was the proportions working part time. In 1995, the rate of part-time employment in nursing was 23% for men, about half the female rate (44%). Both rates, however, were

well above part-time employment rates for the workforce overall. In 1995, 11% of employed men and 28% of employed women had part-time jobs.<sup>3</sup>

Male and female RNs tend to work in different specialties. A large percentage of men are in psychiatric nursing. In 1995, close to 16% of male nurses were in psychiatric/mental health, compared with fewer than 5% of female nurses (Table 3). Several other areas accounted for relatively large shares of male nurses: critical care, emergency care, and administration. By contrast, few male RNs were in maternal/newborn care, pediatrics, or community health.

**Table 1**

### Registered nurses, by sex, Canada, 1985-1995

	Both sexes	Men	% of total	Women
1985	229,345	5,449	2.4	223,896
1986	236,993	5,959	2.5	231,034
1987	241,759	6,346	2.6	235,413
1988	249,673	6,903	2.8	242,770
1989	252,189	7,316	2.9	244,873
1990	256,145	7,992	3.1	248,153
1991	262,288	8,595	3.3	253,693
1992	263,683	9,017	3.4	254,666
1993	264,339	9,621	3.6	254,718
1994	264,932	9,883	3.7	255,049
1995	262,400	10,035	3.8	252,365

Source: Catalogue 83- 243 and Health Statistics Division

**Table 2**

### Registered nurses, by sex and province of registration, 1995

	Both sexes	Men	% of total	Women
<b>Canada</b>	<b>262,400</b>	<b>10,035</b>	<b>3.8</b>	<b>252,365</b>
Newfoundland	5,647	158	2.8	5,489
Prince Edward Island	1,233	8	0.6	1,225
Nova Scotia	9,324	180	1.9	9,144
New Brunswick	8,405	235	2.8	8,170
Quebec	64,855	5,101	7.9	59,754
Ontario	98,295	2,338	2.4	95,957
Manitoba	10,386	357	3.4	10,029
Saskatchewan	8,844	155	1.8	8,689
Alberta	23,594	465	2.0	23,129
British Columbia	31,004	993	3.2	30,011
Yukon	223	7	3.1	216
Northwest Territories	590	38	6.4	552

Source: Catalogue 83-243

**Table 3****Area of responsibility of registered nurses working in nursing, by sex, Canada, 1995**

	RNs working in nursing		
	Both sexes	Men	Women
<b>All areas</b>	<b>232,869</b>	<b>9,247</b>	<b>223,622</b>
	%	%	%
	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
Medical/surgical	19.2	16.7	19.3
Psychiatric/mental health	5.0	15.6	4.6
Geriatric/gerontology	10.6	9.1	10.7
Critical care	7.0	8.1	7.0
Several clinical areas	6.5	8.0	6.5
Emergency care	4.3	6.5	4.3
Other patient care	8.6	6.4	8.7
Administration	4.0	5.8	4.0
Operating room	3.8	3.3	3.8
Education	2.8	1.9	2.9
Home care	3.5	1.6	3.6
Community health	4.7	1.4	4.9
Occupational health	1.4	1.3	1.4
Ambulatory care	1.5	1.3	1.6
Pediatric	3.2	1.1	3.3
Maternal/newborn	5.9	0.4	6.1
Research	0.5	0.2	0.5
Not stated	7.2	11.4	7.0

Source: Catalogue 83-243

**Table 4****Employers of registered nurses working in nursing, by sex, Canada, 1995**

	RNs working in nursing		
	Both sexes	Men	Women
<b>All employers</b>	<b>232,869</b>	<b>9,247</b>	<b>223,622</b>
	%	%	%
	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
General hospital	57.6	52.7	57.8
Psychiatric hospital/mental health centre	3.0	12.1	2.6
Nursing home	10.5	8.9	10.5
Community health agency	5.9	3.2	6.0
Rehabilitation/convalescent centre	1.7	1.9	1.7
Association/government	1.2	1.8	1.2
Educational institution	2.5	1.7	2.5
Business/industry/occupational health	1.0	1.1	1.0
Home care	3.7	1.1	3.9
Private nursing agency/private duty	0.7	0.8	0.7
Self-employed	0.6	0.7	0.6
Nursing station	0.3	0.6	0.3
Physician's office/family practice	2.5	0.2	2.6
Other	3.2	2.9	3.2
Not stated	5.7	10.4	5.5

Source: Catalogue 83-243

These distributions of responsibility reflect historical patterns.<sup>4</sup> For many years, most of the nursing schools that accepted men were connected with mental hospitals, on the belief that men were better able to handle the physical demands of dealing with psychiatric patients. Until the 1960s and 1970s, male nursing students were not permitted to study obstetric and gynecological nursing. Even after these specialties became a required part of their programs, male nurses encountered some resistance from female nursing staff to having them in maternity nursing. The tendency was for male nurses to be assigned primarily to psychiatry and critical care.

Thus, it is not surprising that a much higher percentage of male than female nurses find employment in psychiatric hospitals or mental health centres. In 1995, 12% of male RNs had jobs in such facilities, compared with 3% of female nurses (Table 4). On the other hand, male nurses were much less likely than female nurses to work in community health agencies, educational institutions, home care, or physicians' offices. However, for all nurses, general hospitals were, by far, the leading employer: 53% of men and 58% of women.

In hospitals, 10% of male nurses, compared with 7% of female nurses, held administrative positions in 1995 (directors/assistant directors, supervisors, head nurses). This represented a narrowing of the difference in the proportions of male and female nurses in administration, as a result of a shift in the employment distribution of hospital nursing staff over the last decade. By 1995, there were more than 14 times as many nurses in direct patient care as in administration, whereas in 1985, the ratio had been about 7 to 1. That year, 27% of male nurses and 14% of female nurses had jobs in administration.

### Education

Nursing enrolment and graduation numbers are the forerunners of the future profile of the profession. Men make up a growing share of nursing students and graduates in Canada's community colleges and universities.<sup>5,6</sup>

Between 1984-85 and 1993-94, the male component of full-time enrolment in community college nursing programs rose from 8% to 12%. The proportion of community college nursing graduates who were men was smaller, but it, too, increased from 6% in 1984-85 to 9% in 1991-92.

Male representation in university nursing programs was not as strong as in community colleges, but the trends were similar. In 1984-85, men constituted 4% of full-time nursing undergraduates; by 1993-94, the proportion had doubled to 8%. Men's share of part-time nursing enrolment remained relatively stable, fluctuating between 5% and 6%. The percentage of bachelor's degrees in nursing that were granted to men increased slowly from 3% to 5% between 1984 and 1993.

The high percentage of male RNs in Quebec also prevails in nursing education. For example, in 1993-94, men accounted for 16% of full-time nursing students in Quebec colleges and 13% of full-time undergraduate nursing enrolment in Quebec universities. These men made up 43% and 30%, respectively, of all men enrolled full time in college and university nursing programs in Canada that year.

Men's somewhat lower representation in university programs than in college programs is reflected in the credentials of male and female nurses. Of those RNs employed in nursing in 1995 who reported their educational attainment, a smaller proportion of men than women held a nursing degree: 17% compared with 20% (Table 5). However, male and female nurses were equally likely to have upgraded their credentials since entering the profession. When they began nursing, just 7% of male nurses and 9% of female nurses had held degrees in nursing.

### Younger, but aging

Male nurses tend to be somewhat younger than their female counterparts. In 1995, the median age of a practicing male nurse was 37, compared with 41 for a practicing female nurse. Over half (55%) of male RNs were younger than 40, compared with 42% of female RNs (Chart 1).

However, the population of nurses is aging (Chart 2). From 1985 to 1995, the age distributions of both male and female nurses shifted so that 35- to 44-year-olds, rather than 25- to 34-year-olds, now constitute the largest group. For women, this largely reflected the cohort of nurses who were aged 25 to 34 in 1985 reaching the 35 to 44 age range by 1995. That year,

**Table 5**

### Highest level of nursing education at entry and in 1995 of registered nurses working in nursing, by sex, Canada, 1995

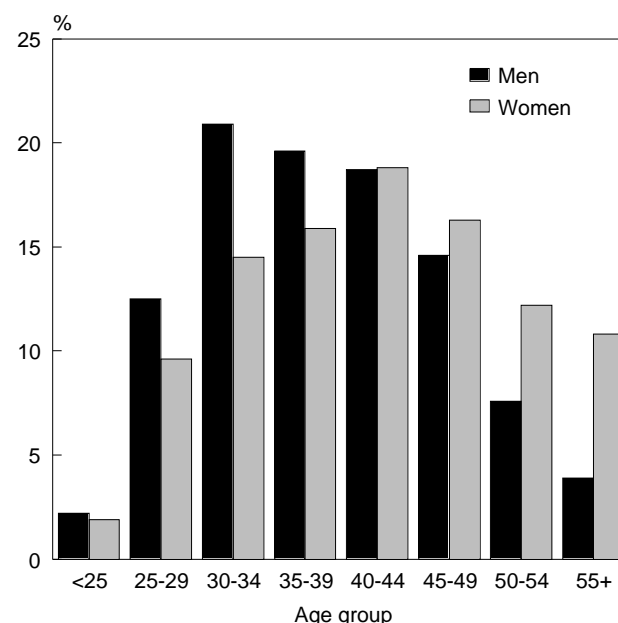
Highest level of nursing education	Both sexes		Men		Women	
	At entry	In 1995	At entry	In 1995	At entry	In 1995
	%					
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
Diploma	90.9	80.5	93.3	82.6	90.9	80.4
Bachelor's degree	8.9	17.9	6.5	16.0	9.0	18.0
Master's degree or doctorate	--	1.5	--	1.3	--	1.5

Source: Catalogue 83-243

Note: Level of education was not stated by 10% of male and 5% of female nurses working in nursing.

**Chart 1**

### Age distribution of registered nurses working in nursing, by sex, Canada, 1995

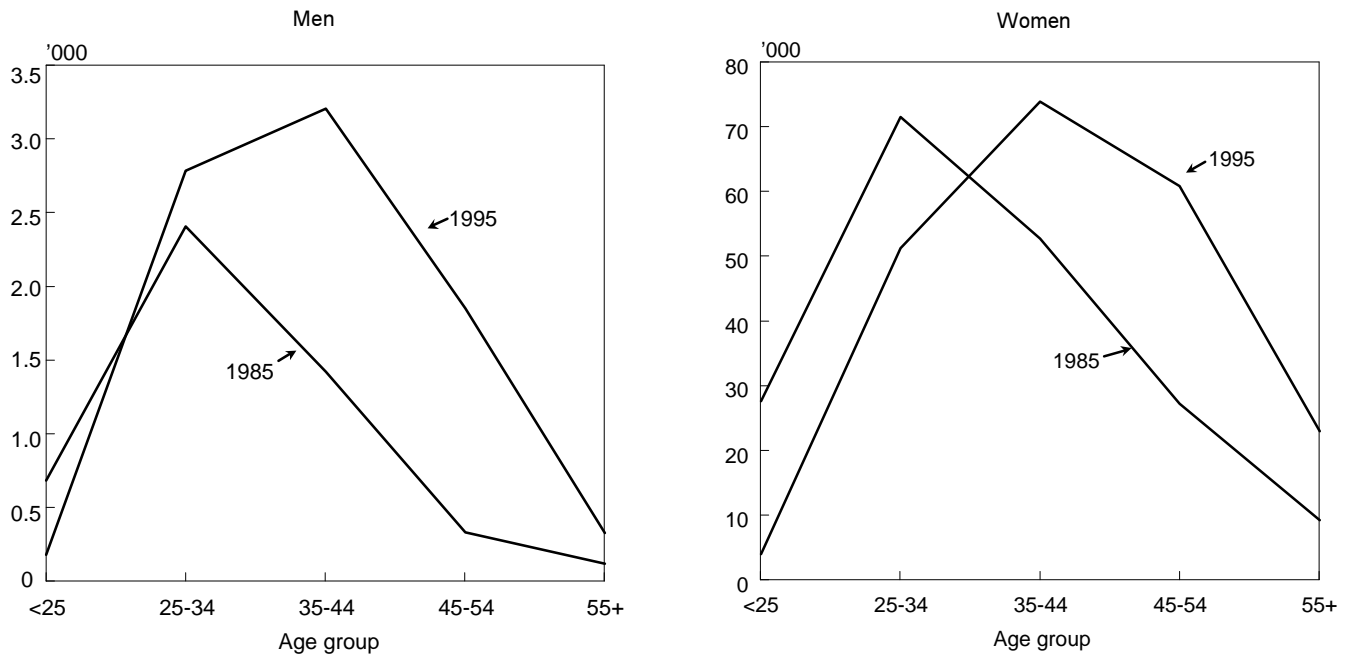


Source: Catalogue 83-243



**Chart 2**

**Number of registered nurses working in nursing, by sex, Canada, 1985 and 1995**



Source: Catalogue 83- 243 and Health Statistics Division

the number of female nurses aged 35 to 44 was just 3% higher than the number aged 25 to 34 in 1985. But among male nurses, the number aged 35 to 44 in 1995 was 34% above the number aged 25 to 34 in 1985. This suggests that a considerable number of men entered nursing in their thirties, perhaps as a second career. It also indicates that a large share of both male and female nurses practicing in 1985 were still in the profession in 1995.

At the same time, the number of both male and female nurses under age 25 actually declined, a decline that could not be explained solely by the decrease in the young population. The drop in the number of nurses under age 25 could mean that both men and women are entering the profession later than was formerly the case. To some extent, this may be attributable to a rising share of nurses earning degrees rather than diplomas. From 1985 to 1991, the percentage of all nursing graduates receiving degrees rose from 22% to 28%.

**A look ahead**

The increase in the number of men enrolled in and graduating from nursing programs indicates that the ranks of male RNs may rise in the near future. More general acceptance of nursing as a viable career for men could also contribute to an increase in numbers. The economic disincentive for men to enter nursing, namely relatively poor pay, was removed some time ago when the profession was unionized.<sup>4</sup> Nurses' salaries are now much higher than in the past. However, cutbacks in health care funding, notably in hospitals, could deter some men who might otherwise have considered a nursing career.

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# Trends in Breast Cancer Incidence and Mortality

Leslie A. Gaudette, Carol Silberberger, Chris A. Altmayer, Ru-Nie Gao\*

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## Abstract

Breast cancer is the leading form of cancer diagnosed in Canadian women (excluding non-melanoma skin cancer), accounting for about 30% of all new cases. After age 30, incidence rates begin to rise, and the highest rates are among women aged 60 and over. Canadian incidence rates have increased slowly and steadily since 1969, rising most rapidly among women aged 50 and over. Canada's rates are among the highest of any country in the world, ranking second only to those in the United States.

After decades of little change, breast cancer mortality rates for all ages combined have declined slightly since 1990. While not dramatic, this decline is statistically significant and is consistent with similar decreases in the United Kingdom, the United States, and Australia.

Breast cancer survival rates are relatively more favourable than those of other forms of cancer. Survival rates are better for younger women and for women whose cancer was detected at an early stage.

This article presents breast cancer data from the Canadian Cancer Registry, the National Cancer Incidence Reporting System, and vital statistics mortality data, all of which are maintained by the Health Statistics Division of Statistics Canada. These data are provided to Statistics Canada by the provincial and territorial cancer and vital statistics registrars.

**Keywords:** breast neoplasms, risk factors, survival rate, international comparisons

Breast cancer is one of the most serious health concerns of Canadian women. Approximately one woman in nine can expect to develop it during her lifetime.<sup>1,a</sup> Although incidence rates are highest for older women, breast cancer can strike women in their prime of life and at the peak of their work and family responsibilities. In 1993, breast cancer was the leading cause of death in women aged 35 to 49.<sup>2</sup>

About one woman in 25 will die of breast cancer. For women of all ages, breast cancer ranked as the fourth leading cause of death (5% of all deaths) after ischaemic heart disease (21%), stroke (9%) and lung cancer (5.4%).<sup>2</sup>

Men can get breast cancer, too, but it occurs far more frequently in women. In 1991, for about every 140 cases that occurred in women, one case of breast cancer was diagnosed in a man.<sup>3</sup>

Controlling the impact of breast cancer has proven difficult. Few risk factors that have been identified lend themselves to preventive action, and current advances in treatment so far appear to have had little effect on overall mortality.<sup>4</sup>

Trends in breast cancer incidence and mortality described in this article are based on data from the Canadian Cancer Registry, the National Cancer Incidence Reporting System, and vital statistics mortality data, all of which are maintained by the Health Statistics Division of Statistics Canada (see **Methods**).

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<sup>a</sup> This analysis excludes non-melanoma skin cancer, which is more commonly diagnosed than breast cancer. These skin cancers are incompletely reported and are seldom fatal.

## Leading form of cancer in women

Breast cancer is by far the leading form of cancer diagnosed in Canadian women, accounting for about 30% of all newly reported cancers (Table 1). The number of new cases diagnosed more than doubled from 6,900 to an estimated 18,600 between 1969 and 1996 (Chart 1). However, much of this increase was attributable to population aging, as age-standardized breast cancer incidence rates rose less rapidly during this period from 78 to an estimated 107 per 100,000 (Chart 2).

Advancing age is the most important risk factor for breast cancer (see **Risk factors**). Incidence rates increase rapidly from age 30 to age 70, level off, and drop after age 84 (Chart 3).

## Incidence rates stable for younger women

With increasing public awareness that breast cancer can develop in relatively young women, concern has been raised that the disease is increasing among women in their forties. And in fact, among women aged 40 to 49, breast cancer is the leading cancer,

**Table 1**

### Estimated new cases and deaths, by cancer site, females, Canada, 1996

Site	New cases	Deaths
<b>All cancers</b>	<b>60,600</b>	<b>28,200</b>
Breast	18,600	5,300
Lung	7,600	6,000
Colorectal	7,500	2,900
Body of uterus	3,000	620
Non-Hodgkin's lymphoma	2,400	1,100
Ovary	2,100	1,350
Pancreas	1,550	1,500
Kidney	1,550	520
Leukemia	1,450	910
Melanoma	1,450	250
All other sites	13,400	7,750

**Source:** National Cancer Institute of Canada, *Canadian Cancer Statistics 1996*.

**Note:** Excludes non-melanoma skin cancer.

## Methods

### Data sources

This analysis is based on information from the Canadian Cancer Registry (CCR) (1992), the National Cancer Incidence Reporting System (NCIRS) (1969 to 1991), and vital statistics mortality data (1969 to 1994), all of which are maintained by the Health Statistics Division of Statistics Canada.<sup>2,3,5</sup> As of the 1992 data collection year, the most recent year for which cancer incidence data were available, the CCR replaced the NCIRS. Both registries are population-based systems that cover the entire Canadian population. They collect information on every case of cancer by compiling information provided by provincial and territorial cancer registries.<sup>3</sup>

Data provided by the Saskatchewan Cancer Registry and the Northern Alberta Breast Cancer Registry were used to calculate survival rates by age at diagnosis and stage of cancer.

### Analytical techniques

Because of delays in compiling and processing cancer data, estimates for recent years are produced by modelling incidence and mortality data by province for selected cancer sites. Data from 1984 to 1991 or 1992 were used to compute incidence estimates from 1993 to 1996; data from 1984 to 1993 were used to compute 1994 to 1996 mortality estimates. For more information, refer to **Canadian Cancer Statistics 1996**.<sup>1</sup>

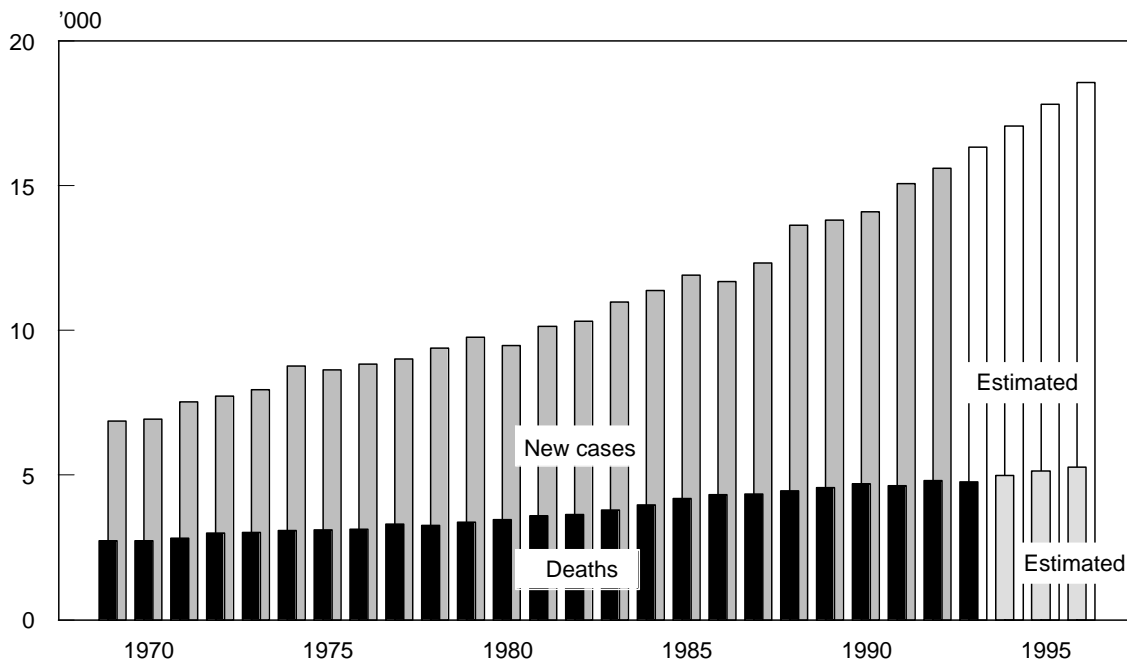
Changes in the annual age-standardized breast cancer incidence and mortality rates were examined by calculating the average annual percent change (AAPC) over a time period. The AAPC is  $(e^{\beta} - 1)100$ , where  $\beta$  is the slope from a regression of log rates on year.

Rates in this article were age-standardized to the 1991 Canadian population to account for changes in the age structure of the population over time. Population estimates were adjusted for net census undercoverage.

Observed survival was calculated using a Kaplan-Meier survival curve. Data provided by the Northern Alberta Breast Cancer Registry and the Saskatchewan Cancer Registry were pooled. Data points calculated for each of the two registries were comparable based on visual comparison and results from the Wilcoxon univariate chi-square test ( $p = 0.2361$ ). The follow-up period used to calculate survival rates was from January 1, 1980 to December 31, 1990.

**Chart 1**

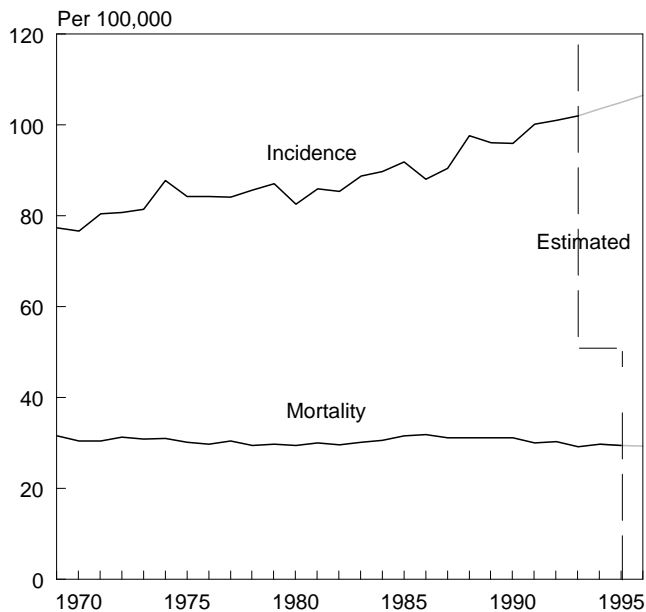
**New cases and deaths from breast cancer, females, Canada, 1969-1996**



Source: Canadian Cancer Registry, National Cancer Incidence Reporting System, and Health Statistics Division

**Chart 2**

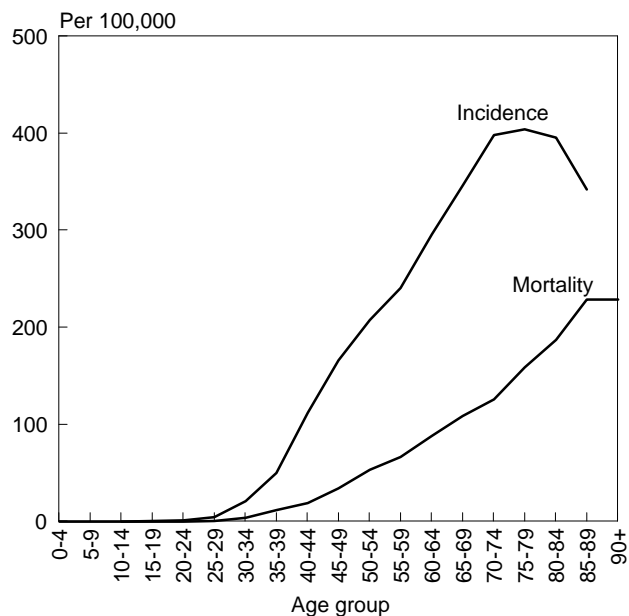
**Age-standardized breast cancer incidence and mortality rates, females, Canada, 1969-1996**



Source: Canadian Cancer Registry, National Cancer Incidence Reporting System, and Health Statistics Division  
 Note: Rates are age-standardized to the 1991 Canadian population adjusted for net census undercoverage.

**Chart 3**

**Breast cancer incidence and mortality rates, by age group, females, Canada, 1992**



Source: Canadian Cancer Registry and Health Statistics Division

**Risk factors**

Over the past 50 years, many studies have attempted to determine risk factors for breast cancer. Yet only 55% of new cases can be explained by known risk factors.<sup>6</sup> Moreover, most of the risk factors identified do not lend themselves to preventive action.<sup>6</sup>

The well-established risk factors associated with a moderate to high relative risk for breast cancer include age, country of birth, family history of breast cancer, and biopsy-confirmed benign proliferative breast disease.<sup>7</sup> Well-established risk factors associated with minor relative risk include a number of factors related to hormonal status and lifestyle factors including socioeconomic status, obesity and religion.<sup>7</sup> Of the hormonally-related factors, age at first full-term pregnancy shows some of the strongest relative risks.

Increased risk is associated with a fourth group of factors in many studies, but the level of association

is still uncertain.<sup>7</sup> Many of these involve or affect exposure to hormones, including oral contraceptives, estrogen replacement therapy and the number of children. Prolonged breast feeding, which has been shown in a number of populations to reduce risk, is thought to explain at least some of the reduced risk in Inuit women. Diet has been long thought to be important, although a strong association between breast cancer and specific dietary components has yet to be confirmed.<sup>6,7</sup>

It has also recently been proposed that most of the risk factors can be explained in terms of either the number of potentially susceptible breast cells, or the susceptibility of these cells to develop breast cancer at different phases of a woman's life.<sup>8</sup>

Overall, few risk factors have any potential to be modified to aid primary prevention of the disease. Secondary prevention through breast screening appears to offer the best hope to control breast cancer.<sup>7</sup>

**Risk factors for breast cancer in women**

Factor	High-risk group	Low-risk group
<b>High relative risk (&gt; 4.0)</b>		
Age	Old	Young
Country of birth	North America, Northern Europe	Asia, Africa
Family history (mother and sister with breast cancer)	Yes	No
<b>Moderate relative risk (2.1-4.0)</b>		
History of cancer in one breast	Yes	No
Family history (mother or sister with breast cancer)	Yes	No
Biopsy - confirmed benign proliferative disease	Yes	No
Chest X-ray (moderate to high doses)	Yes	No
<b>Minor relative risk (1.1-2.0)</b>		
Socioeconomic status	High	Low
Marital status	Never-married	Ever-married
Place of residence	Urban	Rural
Religion	Jewish	Seventh-Day Adventist, Mormon
Age at first full-term pregnancy	≥ 30 years	<20 years
Age at menarche (first menstruation)	≤ 11 years	≥15 years
Age at menopause	≥ 55 years	<45 years
Obesity		
Breast cancer ≥ 50 years of age	Obese	Thin
Breast cancer < 50 years of age	Thin	Obese

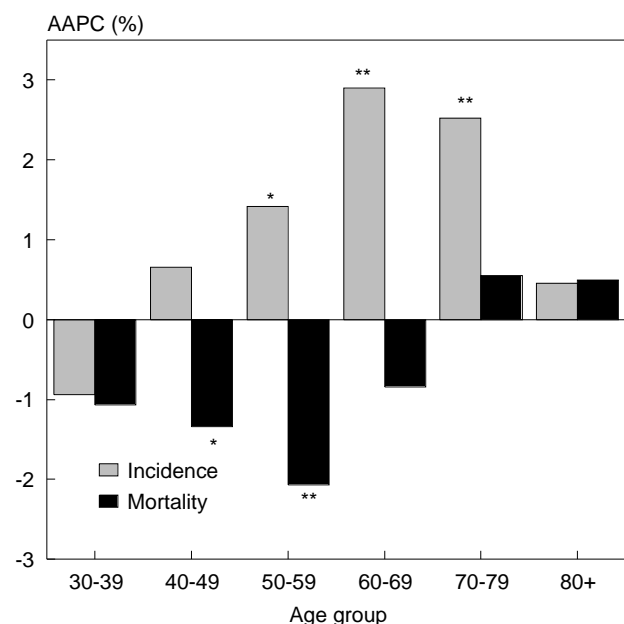
Source: Adapted from Kelsey JL. Breast cancer epidemiology: Summary and future directions. *Epidemiologic Reviews* 1993; 15(1): 256-63.

accounting for 2,684 new cases in 1992—one-third of all cancers diagnosed in this age group. Although the number of newly diagnosed cases in women aged 40 to 49 increased by 65% between 1982 and 1992, incidence rates were fairly stable. The increased number of breast cancers diagnosed in this age group is thus entirely explained by the movement of baby-boomers into the over-40 age group, a trend also observed in the United States.<sup>9,10</sup>

By contrast, notable increases in incidence rates by 2.5% to 3% per year have occurred among women aged 60 to 79 (Chart 4). Because of the rapid rise in breast cancer incidence among women aged 70 to 79, their rate now exceeds that of women aged 80 and over (Chart 5). The upturn among women aged 70 to 79 may reflect increases in mammographic screening or changing reproductive experiences among cohorts.

**Chart 4**

**Average annual percent change (AAPC) in breast cancer incidence (1984-1991) and mortality rates (1984-1993), by age group, women aged 30 and over, Canada**



Source: Health Statistics Division

\* Significantly different from zero ( $p < 0.05$ )

\*\* Significantly different from zero ( $p < 0.01$ )

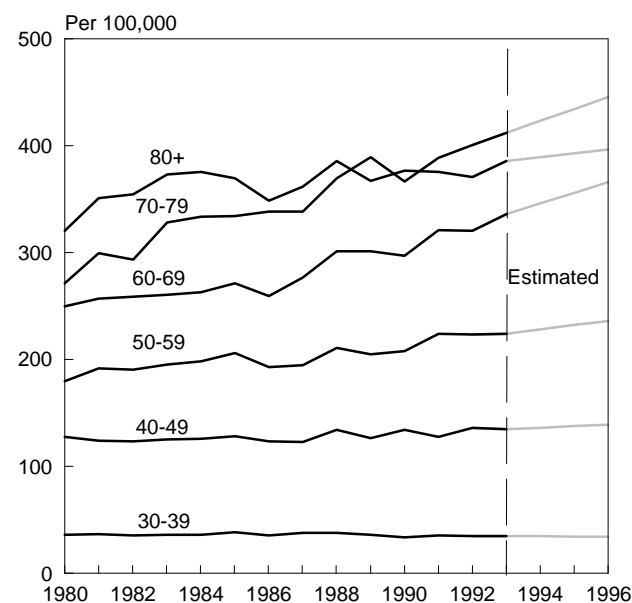
(Women over age 80 in the 1990s would have started childbearing before the 1930s, that is, before the decline in the birth rate during the Depression. From 1930 to 1945, the average age at the birth of first child increased: a well-established risk factor for breast cancer.)

### Mortality rate down slightly

The number of deaths due to breast cancer rose between 1969 and 1996 from 2,750 to an estimated 5,300 (Chart 1). Mortality rates, however, remained relatively stable at around 30 to 32 per 100,000 women between 1969 and 1990 (Chart 2). Between 1990 and 1993, the rate declined from 31 to 29 per 100,000, the lowest since 1950. This decline, while not dramatic, is statistically significant ( $p < 0.05$ ) and is generally comparable to declines in the United States, the United Kingdom, and Australia.<sup>11-15</sup>

**Chart 5**

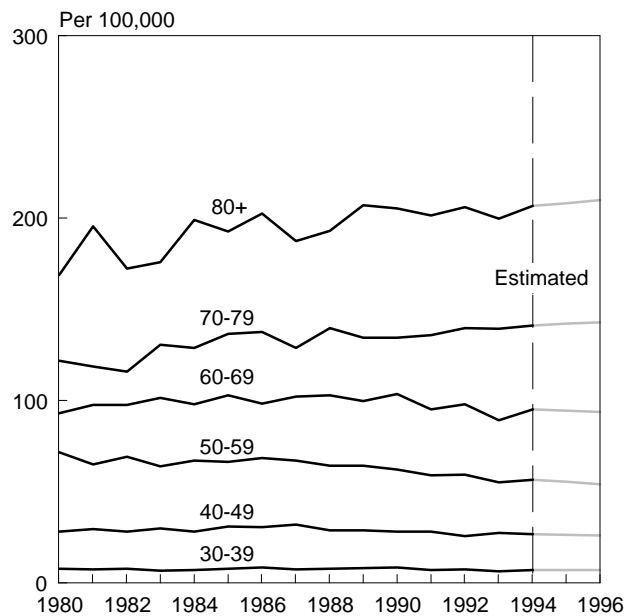
**Breast cancer incidence rates, by age group, women aged 30 and over, Canada 1980-1996**



Source: Canadian Cancer Registry and National Cancer Incidence Reporting System

**Chart 6**

**Breast cancer mortality rates, by age group, women aged 30 and over, Canada, 1980-1996**



Source: Health Statistics Division

**Table 2**

**Age-standardized annual breast cancer incidence rates (1989-1991) and mortality rates (1991-1993), females, Canada, provinces and territories**

	Age-standardized incidence rate	95% confidence interval	Age-standardized mortality rate	95% confidence interval
	Per 100,000			
<b>Canada</b>	<b>97.6</b>	<b>96.7 - 98.5</b>	<b>29.9</b>	<b>29.4 - 30.4</b>
Nfld.	80.0**	73.7 - 86.3	29.1	25.4 - 32.9
P.E.I.	102.2	88.4 - 116.0	25.4	18.7 - 32.0
N.S.	102.3*	97.1 - 107.4	32.9*	30.1 - 35.7
N.B.	95.1	89.5 - 100.7	29.0	26.0 - 32.0
Que.	91.2**	89.4 - 92.9	31.6**	30.6 - 32.6
Ont.	98.1	96.6 - 99.6	30.6*	29.7 - 31.4
Man.	104.7**	99.9 - 109.4	27.5*	25.2 - 29.9
Sask.	102.7*	97.7 - 107.7	27.0*	24.5 - 29.4
Alta.	97.7	94.4 - 101.1	29.9	28.1 - 31.7
B.C.	106.8**	104.0 - 109.5	26.0**	24.7 - 27.3
Yukon	68.8	35.1 - 102.5	18.8	0.6 - 37.0
N.W.T.	67.1*	38.3 - 96.0	37.1	13.0 - 61.3

Source: Health Statistics Division

Note: Rates are age-standardized to the 1991 Canadian population adjusted for net census undercoverage.

\* Significantly different from national rate (p < 0.05)

\*\* Significantly different from national rate (p < 0.01)

Since 1984, breast cancer mortality rates have declined by about 1% to 2% per year among women aged 30 to 59. However in 1990, among women aged 60 to 69, trends in breast cancer mortality changed abruptly (Chart 6). After years of steady increases, rates dropped by almost 15% between 1990 and 1993. On the other hand, mortality rates for women aged 70 and over have been fairly stable since 1984.

Much of the decrease in cancer mortality among women overall largely is due to the changing trend among women aged 60 to 69. This decrease in mortality since 1990 among these women is consistent with what would be expected based on the reproductive experiences of this birth cohort.<sup>15</sup> Specifically, this group of women tended to become mothers at younger ages than had been the case for earlier cohorts. And younger age at first full-term pregnancy entails a lower relative risk of breast cancer. However, declines in mortality for this and other age groups may also be due to other factors, such as earlier detection through mammography or treatment effects.<sup>12,13,15</sup>

**Across Canada**

Provincial breast cancer incidence rates have generally converged. But while the traditional pronounced gradient of decreasing rates from west to east has largely disappeared,<sup>16</sup> rates are still relatively high in British Columbia, Manitoba, Saskatchewan and Nova Scotia, and low in Quebec, Newfoundland, the Yukon and the Northwest Territories (Table 2). By contrast, mortality rates show a slight east to west gradient, with lower-than-average rates in British Columbia, Saskatchewan and Manitoba.

The higher incidence rates now found in provinces east of Ontario may, in part, reflect improved cancer registration procedures.<sup>3</sup> And because some women will develop more than one primary breast cancer, some inter-provincial differences could be due to registries using different rules to count these multiple primaries.



Changing patterns of age at birth of first child, as well as differing rates of implementation of screening mammography may contribute to provincial variations in breast cancer incidence rates. Socioeconomic factors are also thought to explain at least part of the low incidence rates for Newfoundland. Socioeconomic factors may be related to other risk factors, such as diet, age at menarche (first menstruation), and age at birth of first child (see **International comparisons**)

**Low rate among Inuit**

Low breast cancer incidence rates in the Northwest Territories primarily reflect the very low rates among

the Inuit. From 1969 to 1988, Inuit women in the Northwest Territories had a breast cancer rate just one-tenth the Canadian average.<sup>17</sup> However, anecdotal reports suggest that this trend is changing, with more breast cancers reported for Inuit women in the Northwest Territories since 1988 than were reported in the previous 20 years. Breast cancer rates among Inuit women in northern Quebec and Labrador are about half the Canadian rate, but it is difficult to draw conclusions based on the small numbers involved.<sup>18</sup> Rates for the entire Canadian Inuit population, at one-fifth the Canadian average, are generally lower than those among Alaskan or Greenlandic Inuit, suggesting that the introduction of risk factors for breast cancer occurred later among Canadian Inuit.<sup>17,19</sup>

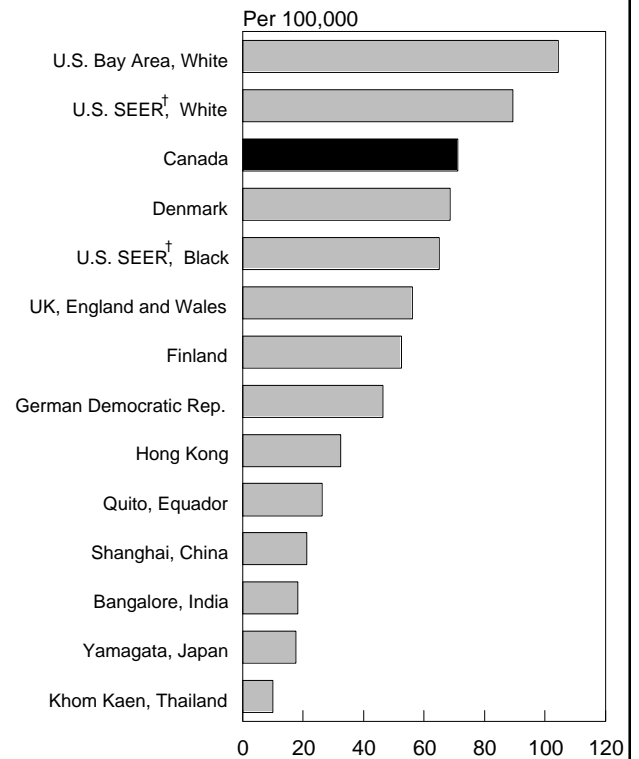
**International comparisons**

According to the most recently available data, Canada's breast cancer incidence rates are among the highest in the world, exceeded primarily by those in the United States.<sup>20</sup> Breast cancer is very much a Western disease, with Canada's rates just ahead of those in western Europe. Very low rates are reported for most Asian and African populations, although rates in Asian countries have increased considerably in recent years.<sup>21</sup> However, when women from these areas migrate to the United States, higher breast cancer rates are found in their daughters and granddaughters, especially those born in the United States or who migrated at a young age. This suggests that social and environmental risk factors for breast cancer are not only more important than genetic risk factors, but also that they can change relatively rapidly, with equally rapid increases in breast cancer risk.<sup>7</sup>

Until the mid-1980s, Canada's breast cancer incidence and mortality rates closely paralleled those of the United States.<sup>22</sup> In Canada, age-standardized incidence rates generally increased until 1988, plateaued in 1989 and 1990, then rose to even higher levels in 1991 and 1992. By contrast, the American rate peaked in 1987, declined in the next two years, and then rose slowly in line with the trend before 1986.<sup>9</sup> The dramatic increase in American rates up to 1987 mainly reflected smaller tumours diagnosed at an early stage. This transitory increase has been attributed to early detection from screening mammography.<sup>10</sup> Further research is needed to determine whether screening explains changes in Canadian trends.

Since 1990, Canada's breast cancer mortality rates have declined slightly. While not dramatic, this is consistent with somewhat stronger declines in the United States, the United Kingdom, and Australia. And in these countries, rates have decreased mainly in women under age 60, except Australia, where the trend has not yet been confirmed. The declines in Britain are thought unlikely to be due to screening, but may reflect improvements in case management and treatment, possibly as a result of the widespread use of tamoxifen in the late 1980s.<sup>12,14</sup>

**Annual female breast cancer incidence rate, Canada and selected countries and registry populations, 1983-1987**



Source: Parkin DM, Muir CS, Whelan SL, et. al. **Cancer Incidence in Five Continents, Volume VI.**

Note: Rates are age-standardized to the World Standard Population.

† The Surveillance, Epidemiology and End Results program (SEER) covers about 10% of the U.S. population.

**A favourable survival rate**

Breast cancer survival rates are more favourable than those of most other forms of cancer.<sup>22,23</sup> According to data from the Alberta and Saskatchewan cancer registries, almost 70% of women diagnosed with breast cancer can expect to live at least five more years, and about 50% can expect to live for at least 10 years. Survival rates vary considerably by age, with younger women far more likely than older women to survive 10 years after diagnosis (Table 3). This occurs, in part, because these statistics are observed survival rates, and older women are more likely to die from other causes.

Less encouraging is the observation that, whereas survival rates for most types of cancer level off after five years, those for breast cancer continue to fall.<sup>22</sup> Thus, for many years after diagnosis, constant vigilance is needed for effective control of breast cancer.

Survival is also highly dependent on the stage at which the cancer is diagnosed. Women diagnosed when the cancer is confined to the breast and is less than 2 cm in size (Stage I) survive far longer on average

**Table 3**

**Ten-year survival after breast cancer diagnosis, by age group, Saskatchewan and northern Alberta, 1980-1990**

Years after diagnosis	All ages	Age group			
		40-49	50-59	60-69	70+
		% surviving			
1	94	98	97	94	90
2	87	92	90	87	81
3	80	86	83	81	71
4	74	81	78	75	64
5	69	77	74	71	58
6	64	74	70	66	51
7	60	72	68	61	44
8	57	69	65	59	39
9	54	67	62	55	35
10	51	66	59	50	32

**Source:** Northern Alberta Breast Registry, Saskatchewan Cancer Registry

**Notes:** Rates calculated are for observed survival. Survival rates are not presented for women under age 40 because of the small number of cases.

than those who are diagnosed with tumours that have metastasized to distant organs (Stage IV) (Chart 7).

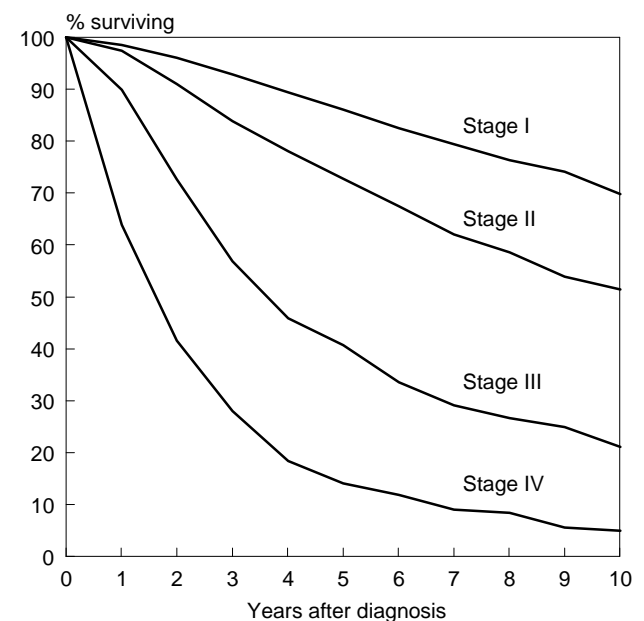
Because of the high incidence and relatively long survival rate, over 80,000 Canadian women who are alive today have been diagnosed with breast cancer.<sup>23</sup> Since these women tend to be younger than survivors of most other types of cancer, it is perhaps not surprising that breast cancer survivors are demanding a higher priority be placed on controlling this disease.

**Acknowledgments**

The authors thank Marek Wysocki for calculating the average annual percent changes and significance levels for inter-provincial differences in incidence and mortality rates, Karla Nobrega for the survival calculations, and Jane Gentleman and Judy Lee for helpful comments. The co-operation of provincial and territorial cancer registries and vital statistics registrars who supply incidence and mortality data to Statistics Canada is gratefully acknowledged. In particular, we

**Chart 7**

**Ten-year survival after breast cancer diagnosis, by stage of cancer, female, Saskatchewan and northern Alberta, 1980-1990**



**Source:** Northern Alberta Breast Registry, Saskatchewan Cancer Registry

**Note:** Rates calculated are for observed survival.

thank Diane Robson of the Saskatchewan Cancer Registry and Heather Bryant of the Alberta Cancer Registry for providing data to calculate the survival rates.

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# Twenty Years of Marriages

François Nault\*

## Abstract

In 1994, a total of 159,959 marriages were performed in Canada, up only slightly from 159,316 the year before. This small increase had no effect on the crude marriage rate, which remained at 5.5 marriages per 1,000 population. Aside from a brief upturn in the late 1980s, Canada's marriage rate has fallen quite steadily since the early 1970s. The overall decline is also evident when rates are disaggregated by the prior marital status of the bride and groom (single, divorced or widowed).

Since 1974, the average ages of brides and grooms have risen about five years to 30.1 and 32.6, respectively. Nonetheless, the peak ages for marriage are the twenties. In this age range, women's marriage rates exceed those of men, but at older ages, men's rates are higher. And at progressively older ages, a growing proportion of grooms have brides at least 10 years their junior.

The marriage patterns of Quebec residents differ from those of other Canadians. Quebec residents are much more likely to remain single or live common-law, and if they do marry, they are slightly more likely to divorce. Once divorced or widowed, people in Quebec are less likely than those in the rest of Canada to remarry.

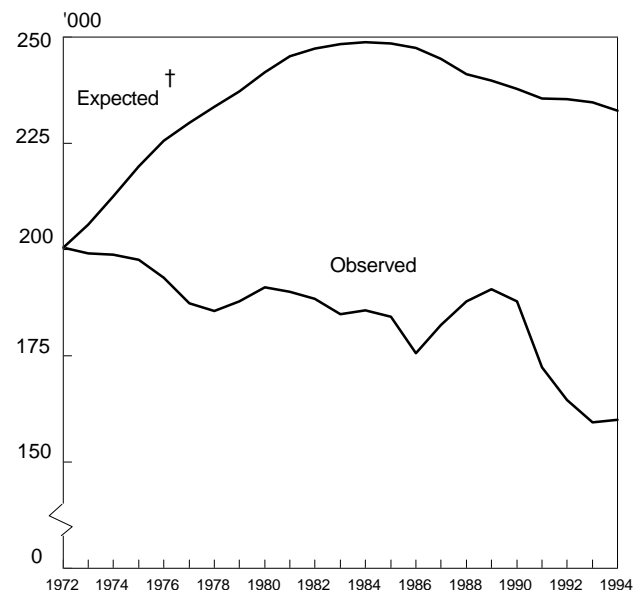
This article is based on data compiled by Statistics Canada from marriage registration forms provided by the central Vital Statistics Registry in each province and territory.

**Key words:** marriage, divorce, marital status, age at marriage, common-law

In 1972, for the first and only time, the number of marriages performed in Canada exceeded 200,000. That year, the crude marriage rate (marriages per 1,000 population) reached its highest level since the late 1940s. As well, the average ages at first marriage were among the lowest ever recorded: 22.2 for brides and 24.7 for grooms. All indications suggested that the immediate future would be a "golden age" for marriages. The oldest members of the baby boom generation were just entering their prime matrimonial years. And had the 1972 marriage rates persisted, the annual number of weddings would have risen steadily to close to 250,000 by 1984. But this never happened. Instead, the marriage rate dropped. As a result, the number of marriages in 1994 was 159,959, far below what would have been "expected" based on 1972 rates (Chart 1).

Chart 1

Expected and observed marriages, Canada, 1972-1994



Source: Observed - Catalogue 84-212; Expected - Author's calculations

† Based on 1972 age-specific marriage rates.

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The drop was interrupted briefly in the late 1980s, when the grounds for obtaining a divorce were liberalized, allowing many to remarry sooner than they otherwise would have. However, by 1990, the downward slide in marriage numbers and rates had resumed.

The decline in the numbers and in the rate of marriage over the past two decades has been attributed to a number of factors—changing values that made divorce and nonmarital childbearing more acceptable; widespread access to and use of contraception; women's growing participation in higher education and the workforce and their resulting financial independence; an unpredictable job market; and a generation pursuing self-fulfillment and avoiding long-term commitments.<sup>1-5</sup>

This article examines national and provincial trends over the past 20 years in the numbers and rates of marriage by the age and previous marital status of the partners (see *Methods*). The data come from marriage registration forms provided to Statistics Canada by the central Vital Statistics Registry in each province and territory.

### Numbers up slightly in 1994

After four years of rapid decline, the number of marriages in Canada rose slightly in 1994 (see *Appendix*). A total of 159,959 couples married that year, up 0.4% from 1993, but still well below the most recent peak of 190,640 in 1989 (see *A temporary reversal*). The small 1994 upturn did not occur everywhere, as the number of marriages fell in Prince

## Methods

### Data source

This article is based on *Marriages, 1994* (Catalogue 84-212).<sup>6</sup> Statistics Canada compiles annual data on marriages provided by the central Vital Statistics Registry in each province and territory. This information includes the age and prior marital status of the bride and groom, and the date and place of the marriage. The data are edited by Statistics Canada to ensure consistency. Because of legal reporting requirements, the registration of marriages is virtually complete. And while the response rate for specific items varies depending on the province and the year, the 1994 response rate for the variables used in this article was 100%.

The denominators for the crude marriage rates are revised population estimates that include non-permanent residents, and that are adjusted for net census undercoverage. From 1981 on, the denominators are by legal marital status, matching the definition used on vital statistics certificates. Before 1981, common-law partners were counted among the married.

### Multi-state life tables

The multi-state life table data in this article are based on *The decline of marriage in Canada, 1981 to 1991* (Catalogue 84-536).<sup>7</sup>

While annual marriage statistics provide a snapshot of a given year and reveal trends, they fail to answer some of the most natural questions about marriage. How many people never marry? What proportion of marriages end in divorce? How many divorced people remarry?

Ideally, these questions would be answered with longitudinal data, which require a long observation period. For example, to measure the exact proportion of people aged 15 in 1994 who never marry would mean following them until the last of them dies.

Similarly, to discover the exact proportion of marriages celebrated in 1994 that end in divorce would require tracing the partners until they divorce or die.

In the absence of such longitudinal statistics, period statistics can be calculated based on age-specific marriage and divorce rates in a given year. These statistics represent what would result if a group of people (a cohort) experienced through their lifetime the marriage and divorce rates observed at each age in a given year. Similar reasoning underlies the calculation of life expectancy and the total fertility rate for a given year. In the case of marriage and divorce, period statistics can be derived using the methodology of multi-state life tables.

### Definitions

**Marital status:** Legal conjugal status of the bride and groom at the time of the marriage. Common-law is not regarded as a legal conjugal status.

**Single:** Persons who have never been married, or whose marriage has been annulled and who have not remarried.

**Married:** Persons who are legally married and who are not separated. **Common-law:** A couple who live together as husband and wife, but who are not legally married to each other.

**Separated:** Legally married persons whose spousal relationship has ended and who are not living with their spouse, but who have not obtained a divorce

**Divorced:** Persons who have obtained a divorce and who have not remarried.

**Widowed:** Persons whose spouse has died and who have not remarried.

**Crude marriage rate:** Number of marriages per 1,000 population.

**Age-sex-specific marriage rate:** Number of marriages per 1,000 unmarried men or 1,000 unmarried women in a specific age group.

### A temporary reversal

After almost steady declines since 1980, the annual number of marriages in Canada began to rise in 1987. That year, the marriage rate, which had been falling for an even longer period, also rose. And until 1991, the number of marriages remained above 180,000.

This period seems to have offered a unique set of conditions favourable to starting a family. The rise in marriages followed an increase in divorces, resulting from amendments to the Divorce Act in 1985 that permitted faster marriage dissolution (after one year of separation rather than three).<sup>8</sup> Many of these divorces were soon followed by remarriages. (Between 1986

and 1987, the marriage rate of divorced people jumped from 67.5 to 72.7 per 1,000.) The upturn in marriages coincided with a surge in home construction, and soon after, an increase in births.<sup>9,10</sup> The biological clock was running out for the oldest baby boom women, who could no longer delay childbearing. Finally, the economy was strong, having recovered from the recession in the early 1980s.

This period now appears to have been a short-term reversal of the general trend. The beginning of an economic recession in 1990 saw the annual number of marriages fall by more than 15,000 between 1990 and 1991, the largest single-year drop in the previous two decades.

#### Divorces, Canada, 1981-1994



Source: Catalogue 84-213

#### Dwelling starts, Canada, 1981-1994



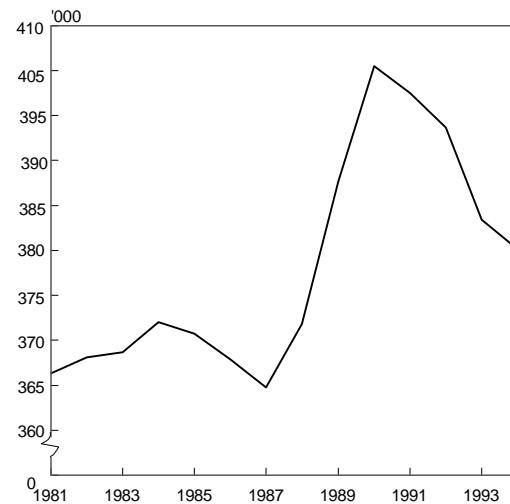
Source: Canada Mortgage and Housing Corporation, Canadian Housing Statistics, 1994

#### Marriages, Canada, 1981-1994



Source: Catalogue 84-212

#### Births, Canada, 1981-1994



Source: Catalogue 84-210

Edward Island, Nova Scotia, Quebec, Manitoba, and the Yukon. Moreover, the slight overall increase in the number of marriages did not raise the nation's marriage rate, which in 1994 was 5.5 marriages per 1,000 population, the same as in 1993.

Canada's 1994 marriage rate was slightly higher than that of the European Union (5.2), but much lower than the rate in the United States (9.1).<sup>11</sup> Canada's marriage rate was also somewhat lower than that of Australia (5.8), New Zealand (6.2), or Japan (6.3) (Table 1).<sup>12</sup>

**Table 1**

**Crude marriage rates, selected countries, 1975, 1980, 1985, 1990, 1994**

Country	1975	1980	1985	1990	1994
Marriages per 1,000 population					
<b>Canada</b>	<b>8.5</b>	<b>7.8</b>	<b>7.1</b>	<b>6.8</b>	<b>5.5</b>
Australia	7.5	7.4	7.2	6.9	5.8
Belgium	7.3	6.7	5.8	6.5	5.1
Czechoslovakia	9.5	7.7	7.7	8.4	..
Denmark	6.3	5.2	5.7	6.1	6.8
Federal Republic of Germany	6.3	5.9	6.0	6.6	5.4
Finland	6.7	6.1	5.3	5.0	4.9
France	7.3	6.2	4.9	5.1	4.4
Greece	8.4	6.5	6.4	5.9	6.7
Hungary	9.9	7.5	6.9	6.4	..
Ireland	6.7	6.4	5.2	5.1	4.6
Israel	9.4	7.6	6.9	6.8	..
Italy	6.7	5.7	5.2	5.4	5.0
Japan	8.4	6.6	6.1	5.8	6.3
Mexico	7.8	7.2	6.6	7.5	..
Netherlands	7.3	6.4	5.7	6.4	5.4
New Zealand	8.0	7.4	7.6	6.9	6.2
Norway	6.5	5.4	4.9	5.2	4.8
Poland	9.7	8.6	7.2	6.7	..
Spain	7.6	6.8	5.0	5.6	5.0
Sweden	5.4	4.5	4.6	4.7	4.9
Switzerland	5.5	5.6	6.0	6.9	6.1
United Kingdom	7.7	7.5	6.9	6.5	..
United States	9.8	10.4	10.1	9.8	9.1
U.S.S.R. <sup>†</sup>	10.7	10.3	9.8	8.9	..

**Sources:** *United Nations, Demographic Year Books 1982, 1986 and 1993; Statistics Canada, Catalogue 91-209E*

<sup>†</sup> *Russian Federation for 1990.*

## Long-term provincial trends

In most provinces, there were fewer marriages in 1994 than in 1974. The two exceptions were Alberta and British Columbia, but even there, the 1994 figures were down from highs in the late 1980s and early 1990s.

Trends in crude marriage rates are even more consistent. In every province, the 1994 rate was below the 1974 rate. The decline was particularly pronounced in Quebec, where a high proportion of couples are in common-law unions. In that province, the crude marriage rate dropped from 8.2 to 3.4 per 1,000 population between 1974 and 1994, so that it is now the lowest in the country (see *The Quebec difference*). Because of its large population, Quebec's extremely low marriage rate markedly affects the national figure. In fact, 1994 rates in all the other provinces were above the national level. For instance, in Prince Edward Island, Ontario, Alberta and British Columbia, the rates were more than 6 marriages per 1,000 population.

## Higher remarriage rate among divorced

Crude marriage rates, calculated on the basis of the total population, tell only part of the story, since not everyone is eligible to get married. People who are already married and children are not part of the "marriage pool." Rates that take account of age and marital status provide a better indication of marriage trends.

Throughout the 1974-1994 period, the highest marriage rates were among those who had been divorced. Next most likely to marry were single people, and finally, those who were widowed. Nonetheless, marriage rates for people in each of the three groups dropped sharply over the two decades (Table 2).

By 1994, the marriage rate for divorced people was 41.9 marriages per 1,000, a steep decline from 151.6 in 1974. The marriage rate among single people also fell: from 71.4 to 32.4 per 1,000. Among the people least likely to marry—widows and widowers—the rate declined from 14.2 to 6.2 marriages per 1,000.

Marriage rates among single and widowed people dropped almost steadily over the two decades. However, there was a slight upturn in the late 1980s, after changes to the Divorce Act in 1985. Among the divorced population, the upturn in marriage rates was sharper, but equally brief.

A longer-term effect of the liberalization of divorce is evident in the distribution of marriages by the marital status of the bride and groom. By 1994, at least one partner in 24% of all marriages was remarrying, compared with 14% in 1974. This shift is entirely attributable to divorced people, rather than widows and widowers. In 1994, 20% of brides and 21% of grooms

**The Quebec difference**

The sharp drop in marriages is partly attributable to a rise in common-law unions.

Nowhere are common-law relationships more prevalent than in the province of Quebec. By 1991, 19% of Quebec couples were in common-law unions, up from 8% in 1981. In the rest of Canada, the corresponding figure also rose, but was much lower: 5% in 1991, compared with 3% in 1981.<sup>7</sup>

The large number of Quebec couples opting for a common-law arrangement widened differences that already existed between the marriage and divorce patterns of residents of Quebec and the rest of Canada. For example, based on prevailing age-specific marriage rates, the percentage of Quebec men who would never marry increased from 29% in 1981 to 50% in 1991; the increase for women was from 26% to 44%. The percentages in the rest of Canada remained well below Quebec levels, rising from 17% to 24% for men and from 14% to 18% for women.

At the same time, based on prevailing age-specific divorce rates, the percentage of marriages that would end in divorce increased from 30% to 35% in Quebec, and from 29% to 30% in the rest of Canada. A more dramatic change was the drop in the percentage of divorced people who would eventually remarry. In Quebec, this figure fell from 62% to 46% between 1981 and 1991 for men, and from 48% to 34% for women. In the rest of Canada, the percentages of divorced people who could be expected to remarry also dropped from 78% to 69% for men, and from 69% to 58% for women.

Similarly, in Quebec, the percentage of widowers and widows who would eventually remarry fell from 13% to 7% and from 5% to 2%, respectively. The declines in the rest of Canada were not as sharp, with the percentages dropping from 17% to 13% for widowers, and from 6% to 4% for widows.

Because of these trends, the average number of years residents of Quebec and of the rest of Canada can expect to spend in each marital status differ substantially. By 1991, at age 15, Quebec men could expect to live, on average, 11 more years single and 14 fewer years married than men in the rest of Canada. Women in Quebec could expect to live 15 more years single and 14

fewer years married than women in the rest of Canada. Differences in years widowed and divorced were less pronounced.

The discrepancy in years married is somewhat offset by years in common-law unions. By 1991, men in Québec could expect to spend 7.9 years in a common-law union, compared with 3.3 years for men in the rest of Canada. The corresponding figures for women were 7.7 and 3.1 years.

Thus, Quebec's marital relationships increasingly diverge from those of other Canadians.

An in-depth analysis of marriage in Quebec and the rest of Canada is presented in *The decline of marriage in Canada, 1981 to 1991* (Catalogue 84-536).

**Average number of years expected to be spent in each marital status at age 15, by sex, Quebec and rest of Canada, 1991**



Source: Catalogue 84-536



**Table 2**

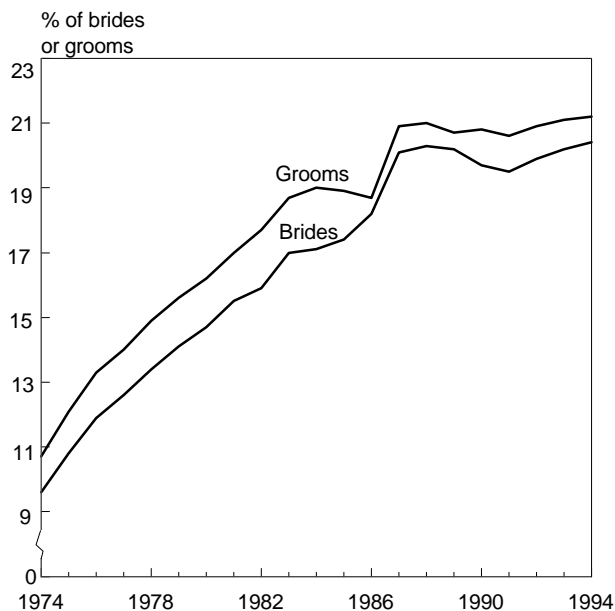
**Marriage rates, by prior marital status, Canada, 1974-1994**

	Marital status prior to marriage		
	Single	Divorced	Widowed
	Marriages per 1,000 aged 15+		
1974	71.4	151.6	14.2
1975	68.4	148.0	13.5
1976	62.6	135.5	12.5
1977	60.9	123.8	12.1
1978	58.4	114.6	11.3
1979	57.6	106.0	10.8
1980	57.0	97.8	10.5
1981	50.8	93.1	9.9
1982	49.2	87.8	9.0
1983	47.0	84.8	8.5
1984	46.3	80.3	9.2
1985	45.4	74.6	8.3
1986	42.4	67.5	7.8
1987	42.1	72.7	8.9
1988	42.9	70.5	8.2
1989	42.8	66.1	8.3
1990	41.5	60.4	7.5
1991	37.6	51.6	6.9
1992	34.9	47.1	6.6
1993	32.9	43.7	6.2
1994	32.4	41.9	6.2

Source: Catalogue 84-212

**Chart 2**

**Previously divorced people as percent of brides and grooms, Canada, 1974-1994**



Source: Catalogue 84-212

had previously been divorced, up from 10% and 11%, respectively, in 1974 (Chart 2). The proportion of grooms who were widowers remained around 3%, while the proportion of brides who were widows fell slightly from 4% to 3%.

**Delaying marriage**

Not only are fewer people marrying, but those who do so are waiting longer to take their vows. By 1994, the average age of brides was 30.1 years, and of grooms, 32.6 years; in 1974, the corresponding ages had been 24.9 and 27.4.

Understandably, the age of brides and grooms varies with their prior marital status. But regardless of prior marital status, brides and grooms were older in 1994 than in 1974. Those who married for the first time were the youngest. In 1994, the average ages of first-time brides and grooms were 26.9 and 28.8, up from 22.5 and 24.8 in 1974. For divorced people remarrying in 1994, the average ages were 38.6 for brides and 42.1 for grooms, compared with 34.9 and 38.4 two decades earlier. The average ages of widows and widowers who remarried in 1994 were 55.2 and 61.4; in 1974, the averages had been 52.8 and 58.5.

**Whom do they marry?**

People tend to marry someone of the same marital status. This is especially true of those marrying for the first time. In 1994, almost 90% of brides and grooms who had never been married were marrying people who also had never married. Slightly over half of divorced brides and grooms married people who had been divorced, although around 40% of them married single people. Widows and widowers who remarried also tended to marry each other (44%), but almost as many (39% of men and 37% of women) married people who had been divorced.

For both sexes, the twenties are the peak years for getting married. However, marriage rates per 1,000 unmarried persons differ substantially for men and women at various ages (Chart 3). In 1994, marriage rates were highest at ages 25 to 29, but there was a

wide gap: 81.4 marriages per 1,000 unmarried women versus 66.1 for men. In fact, until age 35, women's marriage rates exceed men's. Thereafter, men are more likely than women to marry, and the difference widens with advancing age. For example, among people in their late fifties, the marriage rate was 21.0 per 1,000 unmarried men, compared with 8.7 for women.

Grooms are likely to be older than their brides, particularly at older ages.<sup>13</sup> In 1994, 14% of grooms aged 40 to 44 married women at least 10 years younger than themselves. The corresponding figure for grooms aged 50 to 54 was 25%, and for those aged 60 to 64, 33%. By contrast, only about 4% of brides in these age ranges married men at least 10 years younger than themselves.

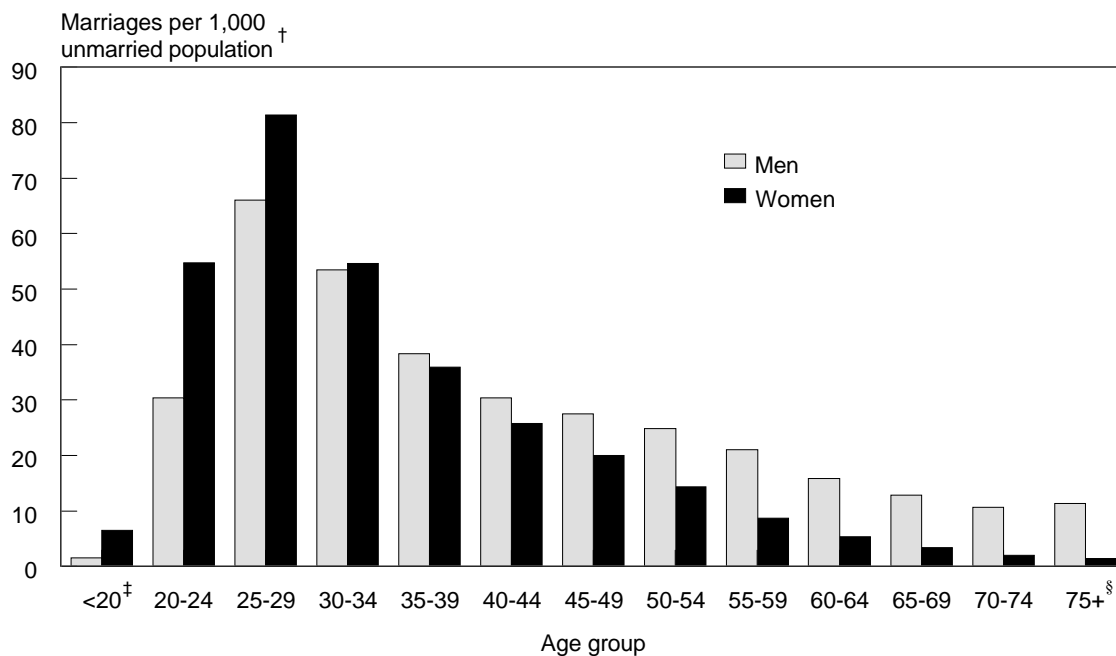
### When do they marry?

Picking a date for a wedding is a blend of convenience, superstition, and romance.

Canadians tend to get married in the summer. July is the peak month for marriages, followed by August, and then September (Chart 4). Saturday is the day most couples choose, especially if it is part of a long weekend. It follows, then, that long weekends during the summer are popular times for weddings. The weekends adjoining Canada Day in July, the Civic Holiday at the beginning of August, and Labour Day in early September bring an upturn in marriages.

### Chart 3

**Marriage rates, by age and sex, Canada, 1994**



Source: Catalogue 84-212

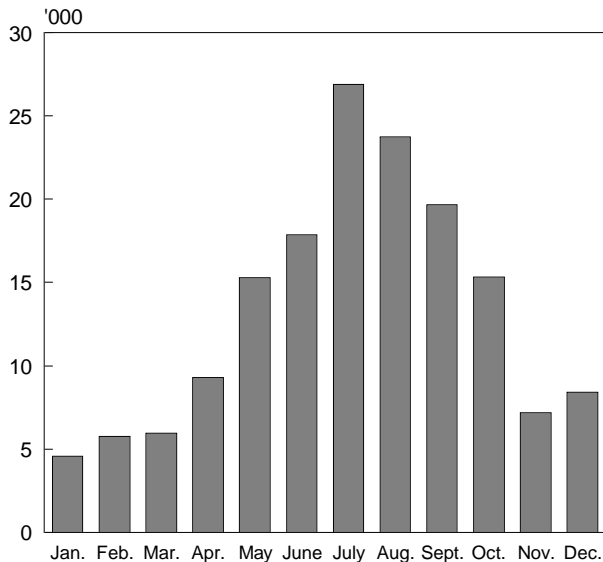
<sup>†</sup> The unmarried population is comprised of single, widowed, and divorced people.

<sup>‡</sup> Denominator includes only people aged 15 to 19.

<sup>§</sup> Denominator includes only people aged 75 to 79.

## Chart 4

### Marriages by month, Canada, 1994



Source: Catalogue 84-212

In 1994, 70% of marriages took place on Saturdays, and 41% were celebrated during the 11 weeks from June 18 to September 3. However, the top day for weddings that year, when 5,091 couples exchanged vows, was Saturday August 20, which was not part of a long weekend. This high number may reflect a spillover from the previous Saturday, which had seen an abnormally low number of marriages (3,497) for a Saturday in August, possibly because it fell on the 13th day of the month.

As well as the summer months, in 1994, relatively large numbers of couples married on the Saturdays of Victoria Day in May (3,558) and Thanksgiving in October (3,347), and to a lesser extent, on the Saturday nearest Remembrance Day in November (1,325) and on December 17 and 31 (1,146 and 1,013, respectively). And there was one day in 1994 with a higher number of marriages than any other Tuesday that year: 527 on February 14.

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## Appendix

## Number of marriages and crude marriage rates, Canada, provinces and territories, 1974-1994

	Canada	Nfld.	P.E.I.	N.S.	N.B.	Que.†	Ont.	Man.	Sask.	Alta.	B.C.	Yukon	N.W.T.
Number of marriages													
1974	198,824	4,276	990	7,112	6,108	51,532	72,716	9,231	7,988	16,691	21,734	190	256
1975	197,585	4,313	936	7,059	5,945	50,377	72,209	8,915	8,066	17,520	21,824	201	220
1976	193,343	4,171	971	6,690	5,754	50,790	69,364	8,297	7,563	17,752	21,536	192	263
1977	187,344	3,895	892	6,304	5,275	48,171	67,730	8,238	7,237	17,976	21,156	204	266
1978	185,523	3,841	939	6,560	5,310	45,936	67,491	8,232	7,139	18,277	21,388	194	216
1979	187,811	3,737	893	6,920	5,355	46,341	67,980	7,769	7,272	18,999	22,087	181	277
1980	191,069	3,783	939	6,791	5,321	44,848	68,840	7,869	7,561	20,818	23,830	200	269
1981	190,082	3,758	849	6,632	5,108	41,005	70,281	8,123	7,329	21,781	24,699	235	282
1982	188,360	3,764	855	6,486	4,923	38,354	71,595	8,264	7,491	22,312	23,831	225	260
1983	184,675	3,778	937	6,505	5,260	36,144	70,893	8,261	7,504	21,172	23,692	243	286
1984	185,597	3,567	1,057	6,798	5,294	37,433	71,922	8,393	7,213	20,052	23,397	212	259
1985	184,096	3,220	956	6,807	5,312	37,026	72,891	8,296	7,132	19,750	22,292	185	229
1986	175,518	3,421	970	6,445	4,962	33,083	70,839	7,816	6,820	18,896	21,826	183	257
1987	182,151	3,481	924	6,697	4,924	32,616	76,201	7,994	6,853	18,640	23,395	189	237
1988	187,728	3,686	965	6,894	5,292	33,519	78,533	7,908	6,767	19,272	24,461	209	222
1989	190,640	3,905	1,019	6,828	5,254	33,325	80,377	7,800	6,637	19,888	25,170	214	223
1990	187,737	3,791	996	6,386	5,044	32,060	80,097	7,666	6,229	19,806	25,216	218	228
1991	172,251	3,480	876	5,845	4,521	28,922	72,938	7,032	5,923	18,612	23,691	196	215
1992	164,573	3,254	850	5,623	4,313	25,841	70,079	6,899	5,664	17,871	23,749	221	209
1993	159,316	3,163	885	5,403	4,177	25,021	66,575	6,752	5,638	17,860	23,446	180	216
1994	159,959	3,318	850	5,374	4,219	24,985	66,694	6,585	5,689	18,096	23,739	169	241
Marriages per 1,000 population													
1974	8.7	7.8	8.5	8.7	9.2	8.2	8.8	9.0	8.8	9.5	8.9	9.0	6.2
1975	8.5	7.7	7.9	8.5	8.8	7.9	8.7	8.7	8.8	9.7	8.7	9.1	5.1
1976	8.2	7.4	8.2	8.0	8.3	7.9	8.2	8.0	8.1	9.5	8.5	8.5	5.9
1977	7.9	6.9	7.4	7.5	7.6	7.5	7.9	7.9	7.6	9.2	8.2	8.9	5.9
1978	7.7	6.8	7.7	7.8	7.6	7.1	7.8	7.9	7.5	9.0	8.1	8.1	4.7
1979	7.7	6.5	7.2	8.1	7.6	7.1	7.8	7.5	7.6	9.0	8.3	7.5	6.0
1980	7.8	6.6	7.6	7.9	7.5	6.9	7.8	7.6	7.8	9.5	8.6	8.2	5.8
1981	7.6	6.5	6.8	7.7	7.2	6.2	8.0	7.8	7.5	9.5	8.7	9.8	5.9
1982	7.5	6.5	6.9	7.5	6.9	5.8	8.0	7.9	7.6	9.4	8.3	9.1	5.2
1983	7.3	6.5	7.4	7.5	7.3	5.5	7.8	7.8	7.5	8.8	8.1	10.2	5.6
1984	7.2	6.1	8.3	7.7	7.3	5.6	7.8	7.8	7.1	8.4	7.9	8.8	4.9
1985	7.1	5.5	7.5	7.7	7.3	5.5	7.8	7.6	6.9	8.2	7.5	7.5	4.2
1986	6.7	5.9	7.5	7.2	6.8	4.9	7.5	7.1	6.6	7.7	7.2	7.4	4.6
1987	6.9	6.0	7.2	7.5	6.7	4.8	7.9	7.3	6.6	7.6	7.6	7.3	4.3
1988	7.0	6.4	7.4	7.7	7.2	4.9	7.9	7.2	6.6	7.8	7.8	7.8	3.9
1989	7.0	6.8	7.8	7.5	7.1	4.8	7.9	7.1	6.5	7.9	7.8	7.8	3.9
1990	6.8	6.5	7.6	7.0	6.8	4.6	7.7	6.9	6.2	7.7	7.6	7.8	3.8
1991	6.1	6.0	6.7	6.4	6.0	4.1	7.0	6.3	5.9	7.2	7.0	6.7	3.5
1992	5.8	5.6	6.5	6.1	5.7	3.6	6.6	6.2	5.6	6.8	6.8	7.3	3.3
1993	5.5	5.4	6.6	5.8	5.5	3.5	6.2	6.0	5.6	6.6	6.6	5.9	3.4
1994	5.5	5.7	6.3	5.8	5.6	3.4	6.1	5.8	5.6	6.7	6.5	5.7	3.7

Source: Catalogue 84-212

† Figures adjusted for undercount in the province of Quebec in 1976.

## Data Releases

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### Therapeutic Abortions, 1994

Canadian women obtained a record 106,255 therapeutic abortions in 1994, up 1.8% from 104,403 in 1993. This was the smallest annual percentage increase since 1990, and compares with increases of 2.3% in 1991 and 7.4% in 1992.

The ratio of abortions to live births also rose, but again, the increase was the smallest in four years. Canada's 1994 abortion rate was 27.6 abortions per 100 live births, up from 26.9 in 1993. (In the United States, in 1992—the latest year for which figures are available—the rate was 37.9 abortions per 100 live births, well above Canada's 1992 rate of 25.6.)

All the growth in 1994 came from an increase in the number of clinic abortions. In fact, over the past four years, the percentage of abortions performed in clinics has increased substantially, while the number performed in hospitals or obtained by Canadian women in the United States both decreased.

Even so, hospitals still accounted for more than two-thirds of all abortions in 1994. The typical woman obtaining a hospital abortion was a 26-year-old who had had one previous delivery and was less than 10 weeks pregnant at the time of the abortion.

Canadian hospitals performed 71,630 therapeutic abortions in 1994, down 1.1% from the year before. However, with the exception of 1993, the 1994 figure still exceeded the number of hospital abortions in any year since 1970.

In 1994, half of all women who had a hospital abortion were aged 20 to 29, and about a third were over age 30. One in every five was under age 20.

Between 1984 and 1994, the percentage of hospital abortions that were obtained by women under age 20 fell from 24% to 20%. The figure was stable for women aged 20 to 29 (around 55%), and increased for those aged 30 to 39 (from 19% to 25%). Women aged 40 and over accounted for a small and relatively stable percentage (between 2% and 3%) of annual abortions. The decrease in the percentage of hospital abortions accounted for by women under 20 and the increase of 30- to 39-year-olds may be partly explained by the shift in population from younger to older age groups.

The establishment of clinics in eight provinces, combined with an increase in abortions performed in these clinics, produced the overall rise in the annual number and rate of therapeutic abortion between 1990 and 1994. These clinics opened after the January 1988 decision by the Supreme Court of Canada, which struck down the 1969 abortion law. Before the ruling, abortion clinics operated only in the province of Quebec.

In 1994, clinics reported 34,287 abortions, up 8.8% from the year before. Since 1990, the number of clinic abortions has increased 69%. By 1994, 32% of abortions were performed in clinics, compared with 22% in 1990.

The demographic characteristics of women who had clinic abortions were generally similar to those of women who had hospital abortions. However, clinic abortions were more likely to occur in very early gestation or in mid-gestation. About 40% of clinic abortions were obtained by women who had been pregnant fewer than nine weeks, compared with 36% of hospital abortions. In addition, 17% of abortions performed in clinics were at 13 to 20 weeks' gestation, compared with 8% of those in hospitals.

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The women who had clinic abortions were less likely than those who had hospital abortions to have had a prior delivery (50% versus 58%), but more likely to have had at least one prior induced abortion (40% versus 29%).

The opening of clinics in Canada contributed to a sharp decline in abortions obtained by Canadian women in the United States. The number reported by the United States fell to 338 in 1994, a record low, and only about a fifth of the 1990 level of 1,573.

The rate of complications immediately following an abortion has dropped considerably since 1975, largely because of an increase in the proportion of abortions that are performed early in the pregnancy (at less than 13 weeks).

Demographic and medical data were available for 69% of total abortions in 1994: 78% of hospital abortions and 52% of clinic abortions. Such information was not available for abortion cases involving Canadian women reported by the United States.

**Therapeutic abortions** (82-219-XPB, \$30) is now available. See **How to Order**. For further information, contact Surinder Wadhera (613-951-3415).

### **Hospital Annual Statistics and Indicators, 1993-94**

Since the mid-1980s, a dramatic shift to outpatient treatment has occurred in acute-care hospitals. In 1993-94, there were 1.34 outpatient visits for every day an inpatient spent in an acute-care public general hospital (with no long-term care beds). This was a substantial increase over 0.95 in 1986-87.

The ratio of outpatient visits to inpatient days for all hospitals (with short- and/or long-term beds) also increased in this period from 0.62 to 0.86.

Hospitals reported a record number of outpatient visits (38.3 million) in 1993-94, up 14% since 1986-87. Visits to emergency units peaked in 1990-91, then

dropped 8% to 16.0 million by 1993-94. By contrast, since 1986-87, outpatient visits to three other ambulatory care areas increased sharply. Visits to day- and night-care programs rose 46% (to 2.7 million), to surgical day-care, 37% (to 1.8 million), and to general and special clinics, 23% (to 17.8 million).

The average hospital stay was 13 days in 1993-94, down a full day from the peak of 14 days in 1988-89. In acute-care public general hospitals (with no long-term beds), the average stay fell from 8 to 7 days. The average stay also fell from 8 to 7 days in short-term beds in public general hospitals that provide both short- and long-term care. (General hospitals represent 72% of all public hospitals.)

The total number of hospital beds in operation reached its maximum in 1986-87, the same year inpatient days peaked. Since then, hospitals have reduced their beds in operation by 16% to 144,200 in 1993-94, and the number of inpatient days dropped 18% to 44.3 million.

After strong annual increases in the preceding years, public hospital operating expenses reached \$24.1 billion in 1991-92. Subsequently, slower increases (less than 1% annually) brought the 1993-94 total to \$24.3 billion. These figures are based on data reported by 90% of Canada's 998 public hospitals, representing 94% of the 166,153 approved beds. Private and federal hospitals, which together comprise 14% of hospitals but only 4% of beds, are not required to report financial information on this survey.

**Hospital annual statistics 1993-94** (paper: 83-242-XPB, \$90; microfiche: 83-242-XMB, \$65) and **Hospital indicators 1993-94** (paper: 83-246-XPB, \$60; microfiche: 83-246-XMB, \$45) are now available. See **How to Order**. For further information, contact Patricia Tully (613-951-8782).

### **Postcensal Population Estimates**

Each issue of **Health Reports** includes current quarterly population estimates. July 1, 1995 estimates are shown on the following page.

Revised postcensal population estimates, by sex and age group, Canada, provinces and territories, July 1, 1995

	Canada	Nfld	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta	B.C.	Yukon	N.W.T.
	'000												
<b>Both sexes</b>	<b>29,606.1</b>	<b>575.4</b>	<b>136.1</b>	<b>937.8</b>	<b>760.1</b>	<b>7,334.2</b>	<b>11,100.3</b>	<b>1,137.5</b>	<b>1,015.6</b>	<b>2,747.0</b>	<b>3,766.0</b>	<b>30.1</b>	<b>65.8</b>
<1	381.6	6.3	1.7	11.0	8.9	89.1	145.8	16.4	13.9	39.0	47.5	0.5	1.5
1-4	1,606.0	26.9	7.5	47.2	37.5	384.6	608.2	67.1	59.5	164.2	195.0	2.1	6.0
5-9	1,998.5	37.9	10.1	63.0	49.8	453.5	753.4	82.6	80.4	211.5	246.1	2.3	7.8
10-14	2,003.3	44.2	9.9	62.9	52.3	474.6	732.1	80.4	81.4	209.1	248.0	2.4	5.9
15-19	1,979.9	46.5	10.1	64.0	54.5	497.4	712.7	79.0	75.5	192.0	240.9	2.1	5.3
20-24	2,044.0	48.7	10.0	67.9	57.8	477.1	768.4	81.8	68.4	195.6	260.8	2.0	5.5
25-29	2,245.1	46.2	9.7	69.4	57.3	533.6	868.8	82.1	64.5	216.0	289.0	2.3	6.4
30-34	2,675.8	48.0	11.2	82.6	65.7	659.6	1,033.3	96.1	80.5	256.4	332.2	3.3	6.8
35-39	2,602.2	48.2	10.8	80.8	64.0	664.3	961.5	92.8	82.0	259.9	329.4	3.1	5.5
40-44	2,322.8	46.7	9.6	72.1	60.1	598.2	851.0	83.1	72.8	220.0	301.7	2.9	4.5
45-49	2,083.2	41.7	9.6	66.9	55.0	540.4	775.2	73.6	60.3	181.3	273.2	2.5	3.6
50-54	1,595.4	29.9	6.9	51.0	40.4	434.2	589.0	56.6	46.6	132.6	204.4	1.6	2.2
55-59	1,295.2	23.9	5.9	41.4	32.1	338.0	492.0	46.7	41.4	106.3	164.8	0.8	1.7
60-64	1,214.5	20.9	5.4	38.2	29.9	317.5	462.9	44.8	41.2	96.3	155.2	0.8	1.3
65-69	1,119.0	18.8	4.9	34.1	27.7	287.6	430.7	43.1	40.2	85.6	144.8	0.6	0.9
70-74	968.4	15.4	4.4	31.1	25.4	238.4	373.5	40.8	37.1	70.9	130.6	0.4	0.4
75-79	671.0	12.2	3.6	24.7	18.9	161.0	245.9	30.6	30.3	50.4	92.9	0.2	0.3
80-84	456.0	8.0	2.6	16.8	12.8	106.0	167.5	22.2	22.0	33.7	64.2	0.1	0.2
85-89	228.9	3.5	1.3	8.3	6.5	53.3	84.8	11.5	11.5	17.2	30.7	0.1	0.1
90+	115.2	1.7	0.8	4.4	3.3	25.6	43.4	6.1	6.2	9.0	14.6	0.0	0.1
<b>Males</b>	<b>14,664.3</b>	<b>288.5</b>	<b>67.2</b>	<b>462.6</b>	<b>376.6</b>	<b>3,614.1</b>	<b>5,481.3</b>	<b>564.1</b>	<b>504.8</b>	<b>1,383.5</b>	<b>1,872.2</b>	<b>15.3</b>	<b>34.1</b>
<1	195.9	3.2	0.9	5.7	4.6	45.7	74.8	8.4	7.2	20.0	24.4	0.2	0.8
1-4	823.3	13.7	3.8	24.3	19.1	197.2	311.9	34.3	30.5	84.3	100.0	1.1	3.0
5-9	1,021.3	19.4	5.2	32.3	25.6	231.8	384.9	42.5	41.0	108.2	125.4	1.2	4.0
10-14	1,023.9	22.4	5.1	31.7	26.7	242.4	374.6	41.4	41.5	107.3	126.6	1.2	3.1
15-19	1,014.8	23.8	5.0	32.6	28.0	254.8	365.9	39.9	38.9	98.3	123.8	1.1	2.6
20-24	1,036.4	25.2	5.1	34.8	29.5	242.5	388.7	42.2	34.5	99.8	130.5	1.0	2.7
25-29	1,133.2	23.6	4.9	35.5	29.0	271.9	434.5	41.8	32.3	109.6	145.8	1.1	3.3
30-34	1,355.9	24.0	5.5	41.6	33.2	336.1	522.9	49.1	40.1	130.7	167.5	1.6	3.5
35-39	1,309.7	24.1	5.3	40.0	31.9	334.9	482.5	47.3	41.8	133.2	164.3	1.4	2.8
40-44	1,159.6	23.5	4.9	35.5	29.9	299.1	420.9	41.4	37.4	112.4	150.8	1.5	2.4
45-49	1,047.3	21.1	4.9	33.7	28.0	270.5	386.8	37.3	30.9	92.4	138.6	1.2	2.0
50-54	799.6	15.3	3.5	25.8	20.5	215.3	293.9	28.4	23.3	67.8	103.6	1.0	1.2
55-59	643.2	12.2	2.9	20.7	16.1	165.5	243.5	23.2	20.6	54.1	83.2	0.5	0.9
60-64	596.8	10.6	2.7	18.6	14.5	152.1	227.0	22.0	20.5	48.5	79.1	0.5	0.7
65-69	527.6	9.1	2.4	15.8	12.8	131.5	203.5	20.2	19.3	41.7	70.4	0.4	0.5
70-74	425.8	7.2	2.1	13.7	11.3	101.7	163.7	17.8	17.0	32.1	58.8	0.2	0.2
75-79	274.9	5.3	1.5	10.2	8.0	62.5	101.0	12.7	13.1	21.3	39.1	0.1	0.1
80-84	170.4	3.2	0.9	6.2	4.9	36.9	62.5	8.5	8.7	13.0	25.4	0.0	0.1
85-89	73.8	1.2	0.4	2.7	2.1	15.7	26.8	3.9	4.2	6.0	10.7	0.0	0.1
90+	30.8	0.5	0.2	1.1	0.9	6.2	11.0	1.6	2.0	2.8	4.4	0.0	0.0
<b>Females</b>	<b>14,941.8</b>	<b>286.9</b>	<b>68.9</b>	<b>475.1</b>	<b>383.5</b>	<b>3,720.1</b>	<b>5,619.0</b>	<b>573.4</b>	<b>510.9</b>	<b>1,363.5</b>	<b>1,893.8</b>	<b>14.8</b>	<b>31.7</b>
<1	185.6	3.0	0.8	5.3	4.4	43.4	71.0	8.0	6.7	19.0	23.1	0.2	0.7
1-4	782.7	13.2	3.7	22.9	18.4	187.5	296.3	32.8	29.0	79.9	95.0	1.1	3.0
5-9	977.3	18.5	4.9	30.7	24.3	221.7	368.6	40.1	39.4	103.4	120.8	1.0	3.8
10-14	979.4	21.8	4.9	31.2	25.6	232.3	357.5	39.0	40.0	101.8	121.4	1.2	2.8
15-19	965.1	22.7	5.1	31.3	26.4	242.6	346.8	39.1	36.6	93.6	117.2	1.0	2.7
20-24	1,007.6	23.5	4.9	33.1	28.3	234.6	379.7	39.7	33.9	95.9	130.2	1.0	2.8
25-29	1,111.9	22.6	4.8	33.9	28.3	261.6	434.3	40.3	32.2	106.4	143.2	1.2	3.1
30-34	1,319.9	24.0	5.7	41.0	32.5	323.6	510.4	47.0	40.4	125.7	164.7	1.7	3.3
35-39	1,292.5	24.1	5.5	40.7	32.1	329.4	478.9	45.4	40.2	126.7	165.1	1.7	2.7
40-44	1,163.2	23.2	4.7	36.7	30.2	299.1	430.1	41.7	35.4	107.6	150.9	1.4	2.1
45-49	1,035.9	20.6	4.7	33.2	27.1	269.9	388.4	36.3	29.4	88.9	134.6	1.3	1.5
50-54	795.8	14.6	3.4	25.2	19.9	219.0	295.1	28.2	23.3	64.8	100.8	0.7	1.0
55-59	651.9	11.7	3.0	20.7	16.0	172.5	248.5	23.6	20.9	52.3	81.6	0.4	0.7
60-64	617.7	10.3	2.7	19.6	15.4	165.4	235.9	22.8	20.7	47.8	76.1	0.4	0.6
65-69	591.4	9.7	2.5	18.3	14.9	156.1	227.2	22.9	20.9	43.8	74.4	0.2	0.4
70-74	542.7	8.3	2.4	17.4	14.1	136.7	209.8	23.0	20.0	38.8	71.8	0.2	0.2
75-79	396.1	6.9	2.1	14.4	10.9	98.5	144.9	17.9	17.2	29.1	53.8	0.1	0.1
80-84	285.6	4.8	1.7	10.5	7.9	69.2	105.0	13.7	13.3	20.6	38.8	0.1	0.1
85-89	155.1	2.3	0.9	5.6	4.4	37.7	58.0	7.6	7.3	11.2	20.0	0.0	0.0
90+	84.4	1.1	0.5	3.3	2.4	19.4	32.4	4.5	4.3	6.2	10.2	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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			\$250		
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Births and Deaths	84-210	Paper	\$35	\$42	\$49
		Microfiche	\$25	\$30	\$35
Reproductive Health: Pregnancies and Rates, Canada, 1974-1993	82-568	Paper	\$32	\$39	\$45
Selected Birth and Fertility Statistics, Canada	82-553	Paper	\$40	\$48	\$56
<b>Cancer</b>					
Cancer in Canada	82-218	Paper	\$25	\$30	\$35
<b>Deaths</b>					
Births and Deaths	84-210	Paper	\$35	\$42	\$49
		Microfiche	\$25	\$30	\$35
Mortality - Summary List of Causes	84-209	Paper	\$30	\$36	\$42
Selected Mortality Statistics, Canada	82-548	Paper	\$40	\$48	\$56
Selected Infant Mortality and Related Statistics, Canada	82-549	Paper	\$40	\$48	\$56
<b>Divorce</b>					
Divorces	84-213	Paper	\$30	\$36	\$42
		Microfiche	\$25	\$30	\$35
<b>Hospitals</b>					
Hospital Statistics: Preliminary Annual Report	83-241	Paper	\$30	\$36	\$42
		Microfiche	\$25	\$30	\$35
Hospital Annual Statistics	83-242	Paper	\$90	\$108	\$126
		Microfiche	\$65	\$ 78	\$ 91



Title	Catalogue number	Format	Price		
			Canada	U.S. (\$ US)	Other countries (\$ US)
<b>Hospitals - continued</b>					
Hospital Indicators	83-246	Paper Microfiche	\$60 \$45	\$72 \$54	\$84 \$63
List of Canadian Hospitals	83-239	Paper	\$20	\$24	\$28
<b>Hospitalization</b>					
Hospital Morbidity and Surgical Procedures	82-216	Paper Microfiche	\$40 \$35	\$48 \$42	\$56 \$49
Canadian Classification of Diagnostic, Therapeutic and Surgical Procedures and Treatments	82-562E	Paper	\$40	\$48	\$56
<b>Life Expectancy</b>					
Life Tables, Canada and Provinces, 1990-1992	84-537	Paper	\$40	\$48	\$56
<b>Marriage</b>					
Marriages	84-212	Paper Microfiche	\$30 \$25	\$36 \$30	\$42 \$35
Selected Marriage Statistics	82-552	Paper	\$40	\$48	\$56
The Decline of Marriage in Canada. 1981 to 1991	84-536	Paper	\$36	\$44	\$51
<b>Mental Health</b>					
Mental Health Statistics	83-245	Paper	\$15	\$18	\$21
<b>National Population Health Survey</b>					
National Population Health Survey Overview 1994-95	82-567	Paper	\$10	\$12	\$14
<b>Nursing</b>					
Nursing in Canada 1995: Registered Nurses	83-243	Paper Microfiche	\$30 \$25	\$36 \$30	\$42 \$35
<b>Residential Facilities</b>					
List of Residential Care Facilities	83-240	Paper	\$20	\$24	\$28
Residential Care Facilities	83-237	Paper Microfiche	\$35 \$25	\$42 \$30	\$49 \$35
<b>Therapeutic Abortion</b>					
Selected Therapeutic Abortion Statistics	82-550	Paper	\$40	\$48	\$56
Therapeutic Abortions	82-219	Paper Microfiche	\$30 \$25	\$36 \$30	\$42 \$35
<b>Tuberculosis</b>					
Tuberculosis Statistics	82-220	Paper Microfiche	\$32 \$25	\$39 \$30	\$45 \$35

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## National Population Health Survey, 1994-95 public use microdata files

Requests for National Population Health Survey data products should be directed to:

Client Custom Services Unit  
Health Statistics Division  
Statistics Canada  
Ottawa, Ontario  
K1A 0T6

Telephone: (613) 951-1746  
Fax: (613) 951-0792

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	Product number	Format	Price			
			Canada	US (\$ US)	Other countries (\$ US)	
Public-use household member microdata files	• ASCII	82F0001XDB95001	Diskette	\$1,300	\$1,300	\$1,300
	• ASCII and IVISION	82F0001XCB95001	CD-ROM	\$1,600	\$1,600	\$1,600
Residential Care	• ASCII	82M0010XDB	Diskette	\$ 500	\$ 500	\$ 500

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## Special Tabulations

Requests for special tabulations should be directed to:

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Health Statistics Division  
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Fax: (613) 951-0792