GPI Atlantic

ATLANTIC HEALTH DATABASE

PART C

DEATH & DISEASE

NOTE

This volume is a companion to Appendix C, and contains brief text descriptions, definitions, data sources, and charts to accompany the Tables in the appendix. Of particular interest are gender differences in the results, so data in the various indicator sets are presented for both males and females.

This volume highlights which Atlantic region health districts have higher or lower rates of particular illnesses or causes of death according to Statistics Canada's raw statistics. However, in many cases, sample sizes at the health district level were small, and the text does not account for the high variability that may result from wide confidence intervals. Statements comparing death and disease rates at the health district level should therefore be interpreted with caution. For most mortality and morbidity indicators, confidence intervals are provided in the accompanying appendix.[1]

Please see Part A for descriptions of the 21 Atlantic region health districts, which, in the case of Nova Scotia and Prince Edward Island, do not necessarily correspond with actual health region administrative boundaries.

Please note that at the time this volume was compiled, the latest available Statistics Canada mortality and morbidity data at the health district level were for 1996. As this volume went to press, 1997 mortality and 1998 morbidity data became available. Subject to interest by users, GPI Atlantic intends to have this database updated on a regular basis.

[1] For example, in Section 3.1.2.2 of this volume, on ischaemic heart disease death rates, the following paragraph appears: "As with all comparative data at the health district level, these results should be interpreted with caution due to small sample sizes and correspondingly wide confidence intervals. For example, for females, seven other Atlantic health districts have a confidence interval with a low-end result that is below the high-end estimate for Bathurst (79.7). This means that it is statistically possible, with a 95% confidence interval, for any one of those eight health districts to have the lowest female ischaemic heart disease death rate in the region. For this reason, readers of these text volumes are referred to the confidence intervals provided in the accompanying appendices (in this case Appendix C, Table 123)." Such caveats are not written into each section, but they could apply to many of the other comparative data as well.

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3.1 Death Rates

Like life expectancy, death rates are a key indicator of overall population health, allowing assessments of the leading causes of death and indirect evaluations of the success of preventive interventions. Many deaths, as noted by Shah,[2] could be prevented by lifestyle alterations.

The leading causes of death have changed dramatically in the last century. Public health improvements, social reforms, and technological advances have sharply reduced the incidence of acute disease and infant mortality in the last hundred years, and thereby substantially increased average life expectancy at birth.

In 1900, the major causes of death were tuberculosis, dysentery, and diphtheria, and average life expectancy at birth was less than 50. Today Atlantic Canadians can expect to live to 78; deaths from the deadly infectious diseases of the early 20th century are extremely rare; smallpox has been eradicated; and measles nearly eliminated through immunization.[3] At the same time, the incidence of chronic disease has increased sharply during the same period, with coronary heart disease surpassing infectious diseases in the 1930s as the major cause of death in Canada and the U.S. The second half of the 20th century, in turn, saw a sharp increase in cancer incidence up to the early 1990s, while deaths from cardiovascular disease fell by nearly half.[4]

Yet despite the marked changes in the nature of illness and primary causes of death in 1900 and 2000, there is a remarkable similarity that provides reason for optimism. Control of the deadly infectious diseases that afflicted Canadians one hundred years ago had far less to do with any break-through medical cures than with interventions that tackled the precursors and social causes of fatal diseases. Disease outbreaks, infant mortality, and premature death were prevented by safer and more hygienic water, food, housing, and work conditions, and by immunization campaigns, even more than by medical advances. Though once epidemic in nature, the acute, infectious diseases of the early 20th century that were once the leading causes of death in Canada are today regarded as almost entirely preventable.

Similarly, the chronic diseases that today account for 80% of deaths in Atlantic Canada, that cause untold suffering and debilitate tens of thousands of Atlantic Canadians, that drain tax dollars and slow the economy, are largely preventable. By some estimates, up to 70% of premature deaths and two-thirds of the cases of chronic disability are preventable

[2] Shah, C.P., *Public Health and Preventive Medicine in Canada,* fourth edition, 1998.
[3] Health Canada, *Statistical Report on the Health of Canadians,* Ottawa, September, 1999, page 324; Almer, Robert, and Donald Eddins, "Cross-Sectional Analysis: Precursors of Premature Death in the United States," in Amler, Robert, and Bruce Hull (eds.), *Closing the Gap: The Burden of Unnecessary Illness,* Oxford University Press, New York and Oxford, 1987, page 181. This introductory section is based on Colman, Ronald, *The Cost of Chronic Disease in Nova Scotia,* GPI Atlantic, Halifax, 2002.
[4] Thompson, Beti, and Michael Pertschuk, "Community Intervention and Advocacy," in Ockene, Ira, and Judith Ockene, *Prevention of Coronary Heart Disease,* Little, Brown, and Company, Boston, 1992, page 494. For cancer trends, see http://www.calacreek.com , summarizing the U.S. National Cancer Institute's *Annual Report to the Nation on the Status of Cancer, 1973-1997*, as published in the May 15, 2000 issue of *Cancer,* authors: Hannah K. Weir, Ph.D. (CDC), Harry M. Rosenberg, Ph.D. (NCHS), Sally W. Vernon, Ph.D. (University of Texas), Kathleen Cronin, Ph.D. (NCI), and Brenda K. Edwards, Ph.D. (NCI). Although these are U.S. statistics, the broad historical trends are applicable to Canada.

and therefore unnecessary.[5] An analysis of death rates and of the leading causes of death in Atlantic Canada is therefore an essential component of a population health strategy designed to prevent premature death from avoidable causes.

One U.S. study, for example, found that more than 40% of deaths can be attributed to preventable causes, led by cigarette smoking, lack of exercise, and poor diet.[6] The U.S. Department of Health and Human Services concluded that up to 50% of chronic disease mortality is attributable to lifestyle factors that can be changed.[7] The study noted that better control of 10 modifiable risk factors could prevent 40-70% of all premature deaths, and two-thirds of all cases of chronic disability.[8]

In an extensive review of the literature, Emory University's Carter Center concluded that 64% of all deaths, 71% of all potential years of life lost before age 65, and 30% of hospital days in the U.S. were preventable. In the U.S. this means that 8.4 million years of life each year before age 65 could potentially be saved.[9] Extrapolated to Atlantic Canada, that amounts to 77,000 potential years of life saved each year.

The Carter Center also found that three preventable precursors of premature death accounted for 46% of all deaths, nearly three-quarters of all preventable causes of death, and more than half of preventable hospital days. These three were tobacco (17% of all deaths; 27% of preventable deaths; 20% of preventable hospital days), high blood pressure (15% of all deaths; 24% of preventable deaths; 12% of preventable hospital days), and over-consumption of high-calorie, fatty foods, which can lead to obesity and high serum cholesterol (14.5% of all deaths; 23% of preventable deaths; 20% of preventable hospital days).

Because these three precursors lead to chronic diseases that may last a long time and kill people at relatively old ages, high blood pressure has been estimated to account for 4% of preventable years of life lost before age 65, and over-consumption of high calorie, fatty foods for 3.5%, while tobacco accounts for 12.6% of all preventable years of life lost before age 65. Other preventable causes of death, such as alcohol abuse and injuries, account for fewer deaths than these three, but relatively more preventable years of life lost before age 65, because they frequently kill people at younger ages.[10]

Aside from behavioural risk factors, socio-economic circumstances also influence death rates. Low income Canadians are more likely to die earlier than those who are in the higher income

[5] U.S. Department of Health and Human Services, 1990, *Prevention '89/'90: Federal Programs and Progress,* Public Health Service, Washington D.C.
[6] McGinnis, J.M., and Foege, W., "Actual Causes of Death in the United States," *Journal of the American Medical Association* 270 (19), 1993, pages 2207-2212.
[7] U.S. Department of Health and Human Services, *Healthy People 2000: National Health Promotion and Disease Prevention Objectives,* Washington, D.C., 1990, DHHS (PHS) publication no. 91-50213.
[8] U.S. Department of Health and Human Services, 1990, *Prevention '89/'90: Federal Programs and Progress,* Public Health Service, Washington D.C.
[9] Amler, Robert, and Bruce Hull (eds.), *Closing the Gap: The Burden of Unnecessary Illness,* Oxford University Press, New York and Oxford, 1987, pages v and 187.
[10] Almer, Robert, and Donald Eddins, "Cross-Sectional Analysis: Precursors of Premature Death in the United States," in Amler, Robert, and Bruce Hull (eds.), *Closing the Gap: The Burden of Unnecessary Illness,* Oxford University Press, New York and Oxford, 1987, pages 184-185.

brackets.[11] The Carter Center study mentioned above identified low socio-economic status as a precursor of several leading causes of death, including cancer, cardiovascular diseases, diabetes mellitus, and infant mortality.[12]

A recent study at York University found poor Canadians at higher risk of heart disease. It attributed 6,366 Canadian heart disease deaths a year to poverty, and nearly $4 billion a year in health care costs to poverty-related heart disease.[13] Extrapolating from these figures, it can be estimated that if all Atlantic Canadians were as heart-healthy as the richest Atlantic Canadians, the province could avoid 500 deaths and $300 million a year in costs due to heart disease.

Since the 1970s, death rates have declined for most of the major causes of death, including coronary heart disease.[14] The one exception is the cancer death rate in females, which has remained stable, while the cancer death rate for males has slowly declined.[15] In sum, death rate statistics can provide health professionals and policy makers with vital information on the leading causes of death with a view to combating potentially fatal diseases through focused prevention, detection, and effective treatment.

3.1.1 Total mortality – age-standardized death rates

Definition

"Age-standardized rate of death from all causes (ICD-9 001-799, E800-E999) per 100,000 population."

Statistics Canada notes that the death rate "indicates the overall health of the population and is similar to what is measured by life expectancy."[16]

Data Source

Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) (1996 data).

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[11] *Toward a Healthy Future: Second Report on the Health of Canadians*, Health Canada, 1999. Available at http://www.hc-sc.gc.ca/hppb/phdd/report/toward/report.htm.

[12] Almer, Robert, and Donald Eddins, "Cross-Sectional Analysis: Precursors of Premature Death in the United States," in Amler, Robert, and Bruce Hull (eds.), *Closing the Gap: The Burden of Unnecessary Illness,* Oxford University Press, New York and Oxford, 1987, table 1, page 183.

[13] Raphael, Dennis, *Inequality is Bad for our Hearts,* York University, 2001 : "Inequality is bad for our hearts: why low income and social exclusion are major causes of heart disease in Canada" can now be read and downloaded from http://depts.washington.edu/eqhlth/paperA15.html; and see "Having Healthy Heart is Often a Question of Income," *The Toronto Star,* 9 November, 2001, page F02.

[14] *Toward a Healthy Future: Second Report on the Health of Canadians*, Health Canada, 1999. Available at http://www.hc-sc.gc.ca/hppb/phdd/report/toward/report.htm.

[15] Ibid.

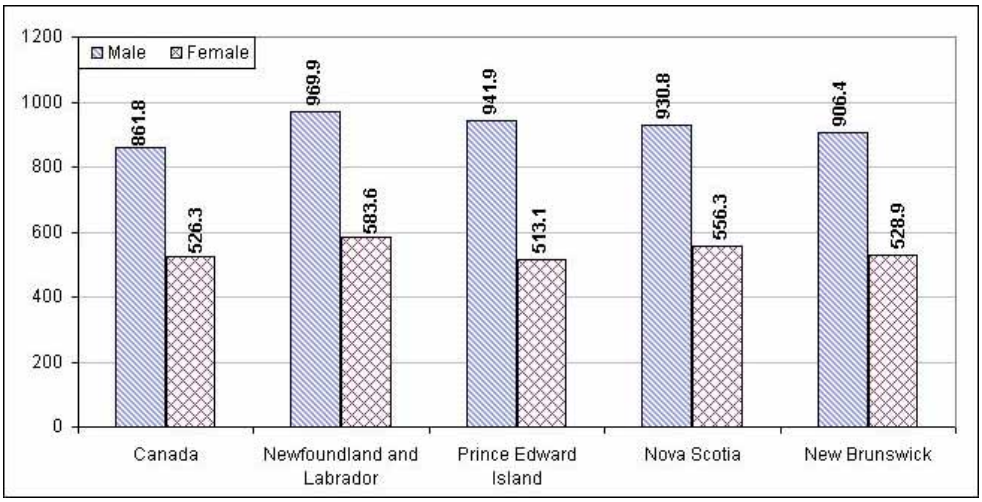
[16] Statistics Canada: http://www.statcan.ca/english/freepub/82-221-XIE/00502/defin1.htm#22.

Rates are age-standardized using the direct method, and the 1991 Canadian Census population structure. All age-standardized total mortality rates are per 100,000 population. All rate comparisons in the following section refer to age-standardized total mortality rates.

Results

Nationally, and in line with historic trends, the male total mortality rate in 1996, 861.8 per 100,000 population, was about 64% higher than the female rate of 526.3 per 100,000. Males in all of the Atlantic Provinces had a higher total mortality rate than the national average. Prince Edward Island had a lower death rate than the national rate for females, while Newfoundland and Labrador, Nova Scotia, and New Brunswick had higher rates for females (Figure 195). The 1997 total mortality data, which became available at the time of publication, show all four Atlantic provinces with higher total mortality rates for both males and females than the national average.

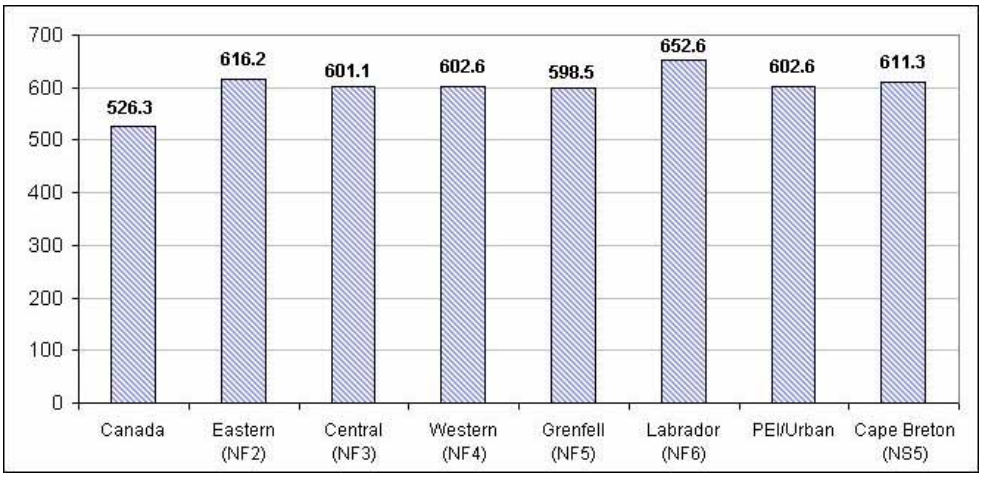
Figure 195. Age-standardized total mortality rate per 100,000 population, by sex, Canada and Atlantic Provinces, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted 11 January, 2003.

Total mortality rates for both sexes in the 21 Atlantic health districts ranged from a high of 869.5 per 100,000 population in Labrador (NF6), to a low of 633.0 in PEI/Rural. For females, Labrador (NF6) had the highest death rate at 652.6. Females in PEI/Rural had the lowest death rate in Atlantic Canada (433.6) - approximately 18% lower than the national rate. Six Atlantic health districts: Eastern (NF2) at 616.2, Central (NF3) at 601.1, Western (NF4) at 602.6, Grenfell (NF5) at 598.5, PEI/Urban 602.6, and Cape Breton (NS5) at 611.3, had female death rates that were approximately 15% higher than the national rate of 526.3 (Figure 196). As with all health district data, caution must be exercised in making comparisons and interpreting results, due to wide confidence intervals and high variability.

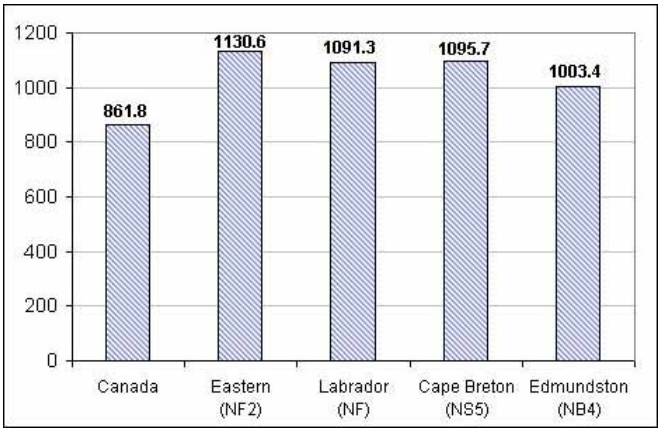
Figure 196. Age-standardized total mortality rate per 100,000, Canada and selected Atlantic health districts, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted 11 January, 2003.

For males, three Atlantic health districts had total mortality rates that were between 26% and 31% higher than the national rate of 861.8: Eastern (NF2) at 1130.6, Cape Breton (NS5) at 1095.7, and Labrador (NF6) at 1091.3 (Figure 197). Edmundston (NB4) had a total male mortality rate (1,003.4) that was 16% higher than the national rate (Figure 197).

Figure 197. Age-standardized total mortality rate per 100,000, males, Canada and selected Atlantic health districts, 1996 (rate)

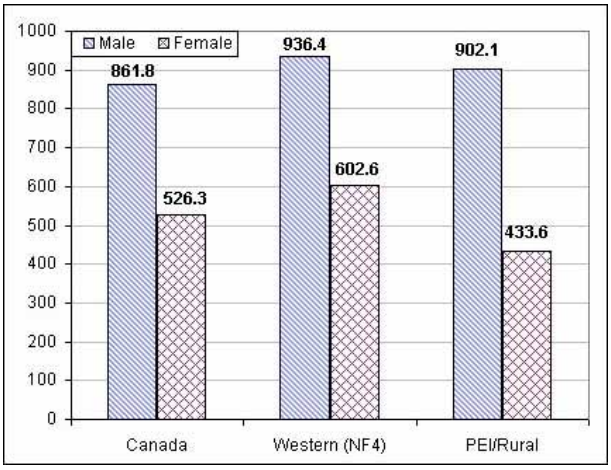


Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted 11 January, 2003.

Nationally, the total mortality rate among males was 64% higher than for females. This male to female ratio was similar in all Atlantic health districts. In PEI/Rural the total mortality rate in

males was more than twice that of females (902.1 males, 433.6 females). In Western (NF4) the total mortality rate among males was approximately 56% higher than among females, the smallest gender variance in the Atlantic health districts (Figure 198).

Figure 198. Age-standardized total mortality rate per 100,000 Canada and selected Atlantic health districts, demonstrating differences in the male-female gap, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted 11 January, 2003.

3.1.2 Circulatory disease deaths

Cardiovascular (or circulatory) diseases (mainly heart disease, stroke, atherosclerosis, and high blood pressure) are the leading causes of death throughout the country, accounting for about 37% of all deaths in Canada.[17]

Ischaemic heart disease, also called coronary heart disease (CHD) or coronary artery disease, results from a reduced blood supply to the heart, and accounts for more than half of all deaths due to cardiovascular disease (CVD) in Canada. Stroke, or cerebrovascular disease, accounts for 20% of CVD deaths, and acute myocardial infarction (heart attack) for more than a quarter of CVD deaths.[18]

CVD death rates in Canada have fallen by nearly half in the last 30 years, mainly due to improved medical and surgical care, but also due to early diagnosis and treatment, reduced

[17] *Toward a Healthy Future: Second Report on the Health of Canadians*, Health Canada, 1999. Available at http://www.hc-sc.gc.ca/hppb/phdd/report/toward/report.htm.

[18] Statistics Canada, Health Indicators, "Circulatory Disease Deaths," available at: http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm#circulatory; Health Canada, *Statistical Report on the Health of Canadians,* Ottawa, 1999, page 291; U.S. Centers for Disease Control and Prevention (CDC), U.S. Department of Health and Human Services, "Chronic Diseases and Their Risk Factors: The Nation's Leading Causes of Death," Atlanta, 1999, pages 10 and 14; Heart and Stroke Foundation of Canada, *The Changing Face of Heart Disease and Stroke in Canada 2000,* Ottawa, October, 1999, pages 72-73, 76-77.

smoking prevalence, and other lifestyle changes.[19] Canada now has one of the lowest circulatory disease rates among developed countries. However, CVD death rates have not fallen as quickly among females as among males.[20] In the U.S., mortality due to heart disease has fallen by an average of 2-3% annually since the 1950s, and is now 55% of the 1950s rate.[21]

U.S. estimates indicate that 43% of the mortality decline is due to improved treatment; 29% to early diagnosis; and 25% to controlling risk factors and thus reducing disease incidence. There appears to have been a substantial shift in these proportions over time. Earlier estimates found that reductions in smoking, high serum cholesterol levels, and other risk factors, accounted for slightly over one half of the observed decline in CHD mortality between 1968 and 1976, while medical interventions contributed to about 40% of the decline.[22]

Because only 25% of the mortality decline is attributable to better risk control and reduced disease incidence, a substantial portion of CVD mortality has been postponed to later ages rather than avoided, sometimes substituting prolonged disability for premature death. Atlantic Canadians lose about 15,000 potential years of life each year as a result of premature death due to heart disease and stroke.[23]

Heart disease and other circulatory diseases are linked to smoking, obesity, poor diets (like high intake of fatty foods), and physical inactivity. For example, epidemiological evidence demonstrates that overweight individuals with a body mass index (BMI) in excess of 27 have a 72% higher relative risk of coronary artery disease and a 14% higher risk of stroke compared to those with healthy weights.[24] Based on this risk and on the prevalence of overweight in Nova Scotia, it has been estimated that 21.5% of the incidence of coronary artery disease and 5% of the incidence of stroke in Nova Scotia are attributable to overweight (BMI $\geq$27).[25]

Epidemiological evidence also indicates that physically inactive Canadians have a 90% higher relative risk of coronary heart disease and a 40% higher risk of stroke than those who are physically active.[26] Based on this risk and on the prevalence of physical inactivity in Nova Scotia, it has been estimated that 36% of the incidence of coronary heart disease and 20% of the incidence of stroke in Nova Scotia are attributable to physical inactivity.[27]

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[19] Heart and Stroke Foundation, op. cit., page 70.
[20] *Toward a Healthy Future: Second Report on the Health of Canadians*, Health Canada, 1999. Available at http://www.hc-sc.gc.ca/hppb/phdd/report/toward/report.htm.
[21] Goldberg, Robert, "Temporal Trends and Declining Mortality Rates from Coronary Heart Disease in the United States," in Ockene, Ira, and Judith Ockene, *Prevention of Coronary Heart Disease,* Little, Brown, and Company, Boston, 1992, page 41.
[22] Heart and Stroke Foundation, op. cit., page 23.
[23] Health Canada, *Statistical Report on the Health of Canadians,* Ottawa, page 321; Heart and Stroke Foundation, op. cit., page 23. See Goldberg, Robert, "Temporal Trends and Declining Mortality Rates from Coronary Heart Disease in the United States," in Ockene, Ira, and Judith Ockene, *Prevention of Coronary Heart Disease,* Little, Brown, and Company, Boston, 1992, page 63.
[24] Birmingham, C. Laird, M.D., et al., "The Cost of Obesity in Canada," *Canadian Medical Association Journal* 160 (4), 23 February, 1999.
[25] Colman, Ronald, *The Cost of Obesity in Nova Scotia,* GPI Atlantic, Halifax, March, 2000, Table 1.
[26] Katzmarzyk, Peter, Normal Gledhill, and Roy Shephard, "The Economic Burden of Physical Inactivity in Canada," *Canadian Medical Association Journal* 163 (11), 28 November, 2000.
[27] Colman, Ronald, *The Cost of Physical Inactivity in Nova Scotia,* GPI Atlantic, Halifax, July, 2002.

In addition to well known heart disease risk factors like smoking, obesity, poor diet, and physical inactivity, researchers have also found that "passive smoking causes heart disease," and that about ten times as many passive smokers die of heart disease as die of lung cancer. A review of ten studies found that both male and female non-smokers exposed to second-hand smoke in the home have an overall 30% higher risk of death from heart disease than those married to non-smokers.[28]

According to one study:

> *"Our result confirms the high risk of heart attack arising from breathing other people's smoke and shows that it is likely to be due to the blood clotting system being very sensitive to small amounts of tobacco smoke."*[29]

The American Heart Association has determined that passive smoking is an important risk factor for heart disease,[30] and the California Environmental Protection Agency concluded that both heart disease mortality, and acute and chronic heart disease morbidity are causally associated with second-hand smoke exposure.[31] Pooling the available statistical evidence from 12 different epidemiological studies, and accounting for confidence levels, researchers have concluded that one can be *"more than 97.5% confident that passive smoking increases the risk of death from heart disease."*[32]

Aside from lifestyle and environmental risk factors, heart disease risk has also been closely linked to income and socio-economic status. A recent study at York University found poor Canadians at higher risk of heart disease. It attributed 6,366 Canadian heart disease deaths a year to poverty, and nearly $4 billion a year in health care costs to poverty-related heart disease.[33] A

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[28] Steenland, Kyle, (1992), "Passive Smoking and the Risk of Heart Disease," *Journal of the American Medical Association,* 267 (1): 94-99, January 1, 1992; Glantz, Stanton and Parmley, William, (1995), "Passive Smoking and Heart Disease: Mechanisms and Risk," *Journal of the American Medical Association,* 273 (13), April 5, 1995; Glantz, Stanton, and Parmley, William, (1991), "Passive Smoking and Heart Disease: Epidemiology, Physiology, and Biochemistry," *Circulation* 83 (1), January, 1991, Clinical Progress Series, pages 1-12; Kawachi, I. et al., (1997), "A Prospective Study Of Passive Smoking And Coronary Heart Disease," *Circulation* 95: 2374-2379; Law, M.R. et al., (1997), "Environmental tobacco smoke exposure and ischaemic heart disease: an evaluation of the evidence," *British Medical Journal* 315: 973-980; Humble, C. et al., (1990), "Passive Smoking and 20-year cardiovascular mortality among non-smoking wives, Evans County, Georgia, *American Journal of Public Health,* 80: 599-601; Howard, G., et al., (1998), "Cigarette Smoking and Progression of Atherosclerosis: The Artherosclerosis in Communities (ARIC) Study," *Journal of the American Medical Association* 279: 119-124; Wells, A. J., (1994), "Passive Smoking as a Cause of Heart Disease," *Journal of the American College of Cardiology* 24: 546-554; Wells, A. J., (1998), "Heart Disease from Passive Smoking in the Workplace," *Journal of the American College of Cardiology* 31: 1-9; National Clearinghouse on Tobacco and Health (1995), The Health Effects of Tobacco Use," cited in Nova Scotia Department of Health, *Towards Healthier Communities in Nova Scotia: A Discussion Paper,* available at http://www.gov.ns.ca/health/smoke_free/default.htm.

[29] Law, et al., (1997), op. cit., and study report in *Times of London,* 17 October, 1997.

[30] Taylor, A.E., et al., (1992), "Environmental tobacco smoke and cardiovascular disease: a position paper from the Council on Cardiopulmonary and Critical Care, American Heart Association, *Circulation* 86: 1-4; Glantz and Parmley (1995), op. cit., page 1047.

[31] Ontario Tobacco Research Unit, University of Toronto (2001), *Protection from Second-Hand Smoke in Ontario: A review of evidence regarding best practices,* May, 2001, page 4.

[32] Glantz and Parmley, (1995), op. cit., pages 1050, 1051.

[33] Raphael, Dennis, *Inequality is Bad for our Hearts,* York University, 2001. "Inequality is bad for our hearts: why low income and social exclusion are major causes of heart disease in Canada." Available at: http://depts.washington.edu/eqhlth/paperA15.html; and "Having Healthy Heart is Often a Question of Income," *The Toronto Star,* 9 November, 2001, page F02.

Norwegian study found that coronary heart disease risk was 2.5 times higher among those in the lowest income and education class than in the highest.[34]

Across North America, improvements in lifestyle behaviours (eating, drinking, smoking, and exercise patterns), and consequent declines in heart disease incidence and mortality, have occurred at a much lower rate among the less educated, less affluent, strata than among higher socio-economic groups.[35]

Definition

"Age-standardized rate of death from circulatory diseases per 100,000 population: all circulatory diseases (ICD-9 390-459), ischaemic heart disease (ICD-9 410-414), cerebrovascular diseases (stroke) (ICD-9 430-438) and all other circulatory diseases (ICD-9 390-409, 415-429, 439-459).

"Measures long-term success in reducing deaths due to circulatory disease, compared with other regions, provinces, and countries. Lower death rates indicate success in circulatory disease prevention, detection, and treatment."[36]

Data Source

Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996. It should be noted that these 1996 data are the most recently available from Statistics Canada for the country's health regions, and therefore the only ones that can be used here for comparative purposes.

Rates are age-standardized using the direct method, and the 1991 Canadian Census population structure. All circulatory disease death rates are per 100,000 population. All rate comparisons in the following section refer to age-standardized circulatory disease death rates.

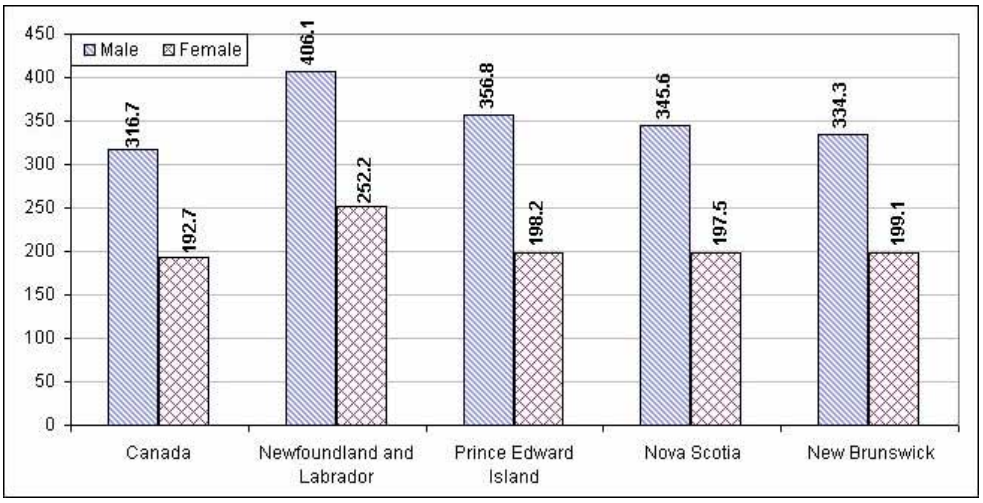
Results

3.1.2.1 All circulatory disease deaths

Nationally, the death rate per 100,000 for all circulatory disease for males in 1996 was 316.7, 64% higher than the female rate of 192.7. All four Atlantic Provinces had higher circulatory disease death rates than the national average both for males and for females. Newfoundland and Labrador had by far the highest overall circulatory disease death rate in Canada (320.6 per 100,000 compared to the national average of 245.8 per 100,000) – 30% higher than the national rate. PEI had the second highest rate in the country (267.1), followed by Manitoba (259.6), Nova Scotia (259.5), and New Brunswick (257.5) (Figure 199).

[34] Kabat-Zinn, Joh, "Psychosocial Factors: Their Importance and Management," in Ockene, Ira, and Judith Ockene, *Prevention of Coronary Heart Disease,* Little, Brown, and Company, Boston, 1992, page 304.
[35] Stamler, Jeremiah and Rose, preface to Ockene, Ira, and Judith Ockene, *Prevention of Coronary Heart Disease,* Little, Brown and Company, Boston, 1992, page xiv.
[36] Statistics Canada: http://www.statcan.ca/english/freepub/82-221-XIE/00502/defin1.htm#23.

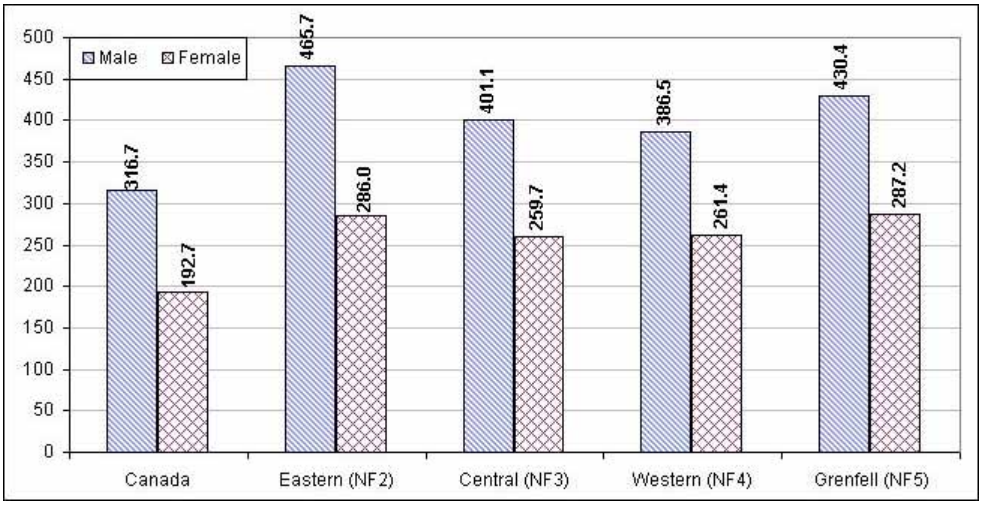
Figure 199. Age-standardized all circulatory disease death rate per 100,000, by sex, Canada and Atlantic Provinces, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) ; available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted 11 January, 2003.

Among the 21 Atlantic health districts, four had notably higher circulatory disease death rates for both males and females than the national and Atlantic region averages – all of them located in Newfoundland and Labrador. Eastern (NF2) had the highest rate per 100,000 for males – 47% higher than the national average, and Grenfell (NF5) had the highest rate of circulatory disease deaths for females – 49% higher than the national average (Figure 200).

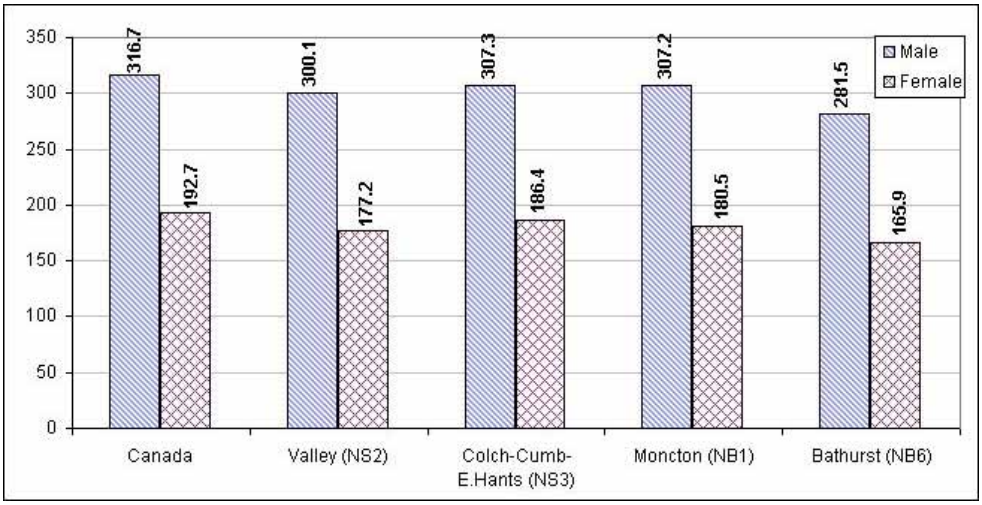
Figure 200. Age-standardized all circulatory disease death rate per 100,000, by sex, Canada and Atlantic health districts with the highest circulatory disease death rates in the region, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates), 1996 available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

Only four of the 21 Atlantic health districts had circulatory disease death rates that were lower than the national average both for males and for females: Annapolis Valley (NS2) with a rate of 300.1 for males and 177.2 for females, Colchester-Cumberland-East Hants (NS3) with a rate of 307.3 for males and 186.4 for females, Moncton (NB1) with a rate of 307.2 for males and 180.5 for females, and Bathurst (NB6) with a rate of 281.5 for males and 165.9 for females (Figure 201). PEI/Rural and Capital (NS6) had overall circulatory disease death rates that were very slightly below the national average, but in both cases this was due to lower female rates, while male rates were higher than the national average in both jurisdictions. As with all health district data, caution must be exercised in making comparisons and interpreting results, due to wide confidence intervals and high variability.

Figure 201. Age-standardized all circulatory disease death rate per 100,000, by sex, Canada and Atlantic health districts with the lowest circulatory disease death rates in the region, 1996, (rate)

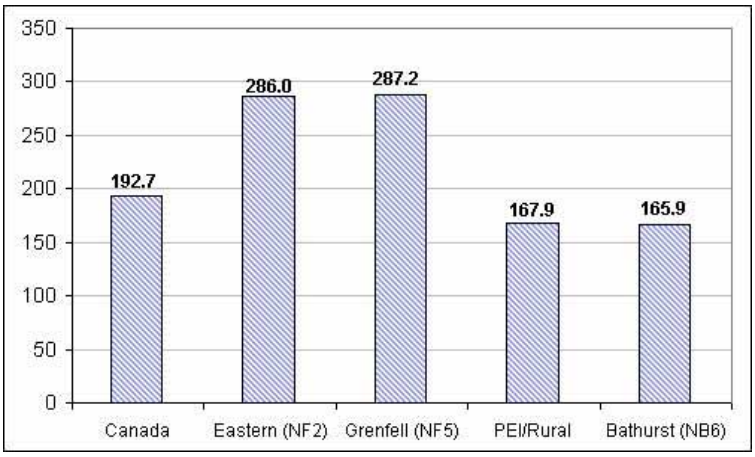


Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates), 19961996 available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

Eastern (NF2) and Grenfell (NF5) had the highest rates of circulatory disease deaths among Atlantic region females – nearly 50% higher than the national rate. PEI/Rural, at 167.9, and Bathurst (NB6), at 165.9, had the lowest circulatory disease death rates for females in Atlantic Canada, both approximately 13% lower than the national rate (Figure 202). Males in Bathurst (NB6) had a rate for all circulatory disease deaths that was 12% lower than the national rate.

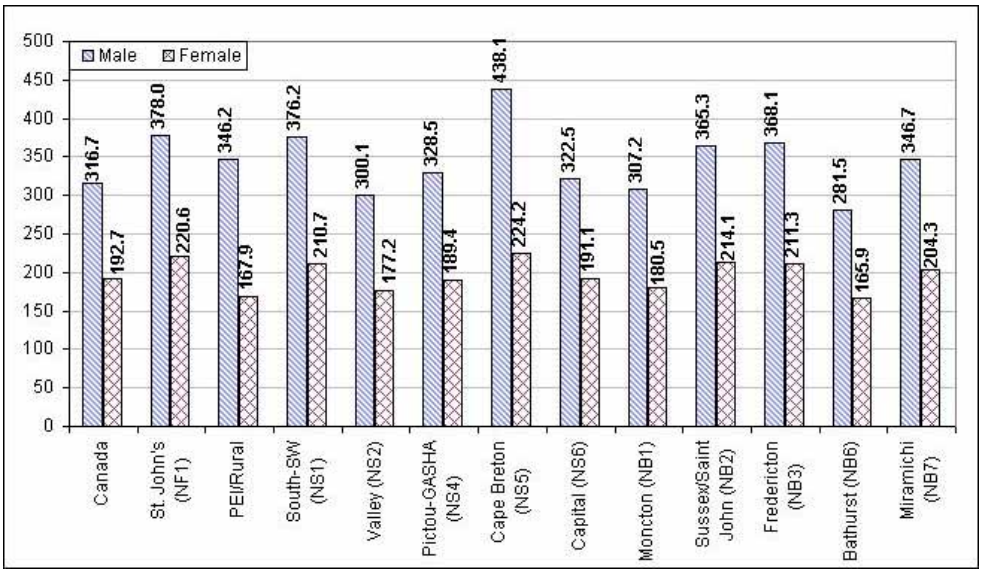
In all Atlantic region health districts, as in Canada and in every province, males had a higher death rate for circulatory diseases than females. In Newfoundland and Labrador, the circulatory disease death rate among males was 61% higher than for females. In PEI it was 80% higher; in Nova Scotia 75% higher, and in New Brunswick 68% higher. PEI/Rural, at 346.2 per 100,000 for males and 167.9 for females, and Cape Breton (NS5), at 438.1 for males and 224.2 for females, had circulatory disease death rates for males that were about twice the female death rates – the widest male-female gaps in the region (Figure 203).

Figure 202. Age-standardized all circulatory disease death rate per 100,000, females, Canada and selected Atlantic health districts, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

Figure 203. Age-standardized all circulatory disease death rate per 100,000, Canada and selected Atlantic health districts, 1996, (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates), 1996; available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

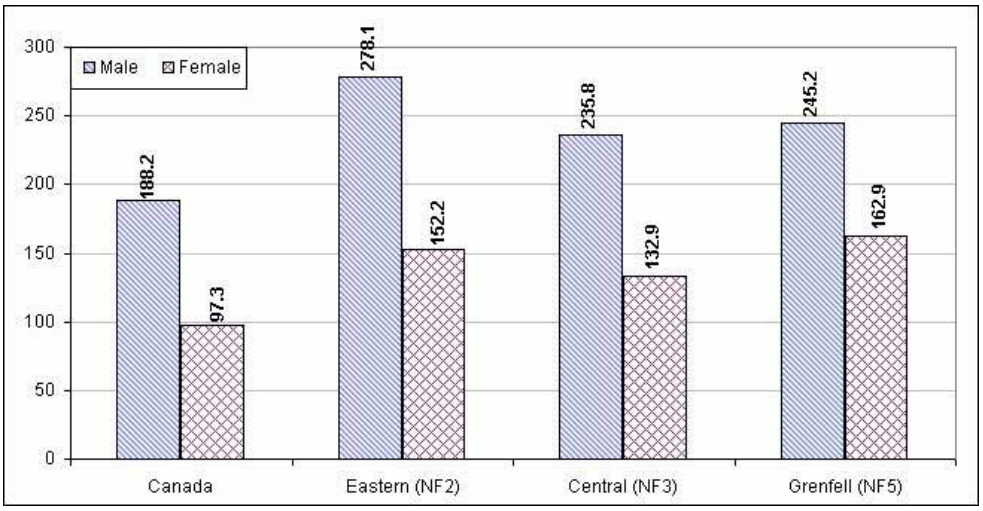
3.1.2.2 Ischaemic heart disease deaths

Newfoundland and Labrador had the highest ischaemic heart disease death rate in Canada, 176.6 per 100,000 population, compared to the national average of 136.4, in 1996. PEI had the country's second highest rate at 147.8 per 100,000. Nova Scotia's ischaemic heart disease death

rate (139.4) was slightly above the national average, and New Brunswick's rate (129.6) was lower than the national rate. However, these averages conceal major gender disparities. Nationally, nearly twice as many males (188.2 per 100,000) as females (97.3) died from ischaemic heart disease.

Of the 21 Atlantic region health districts, five (four of them in Newfoundland and Labrador, plus Cape Breton) had ischaemic heart disease death rates that were at least 25% higher than in Canada as a whole. Two of these (Eastern – NF2 and Grenfell – NF5) had ischaemic heart disease death rates (206.6 and 205.3 respectively) more than 50% higher than the national average (136.4) (Figure 204). The other three – Central (NF3) at 180.1, Cape Breton (NS5) at 175.4, and Western (NF4) at 171.3 had ischaemic heart disease death rates between 25% and 32% higher than the national average.

Figure 204. Age-standardized ischaemic heart disease death rate per 100,000, by sex, Canada and Atlantic health districts with the highest rates in the Atlantic region, 1996 (rate)



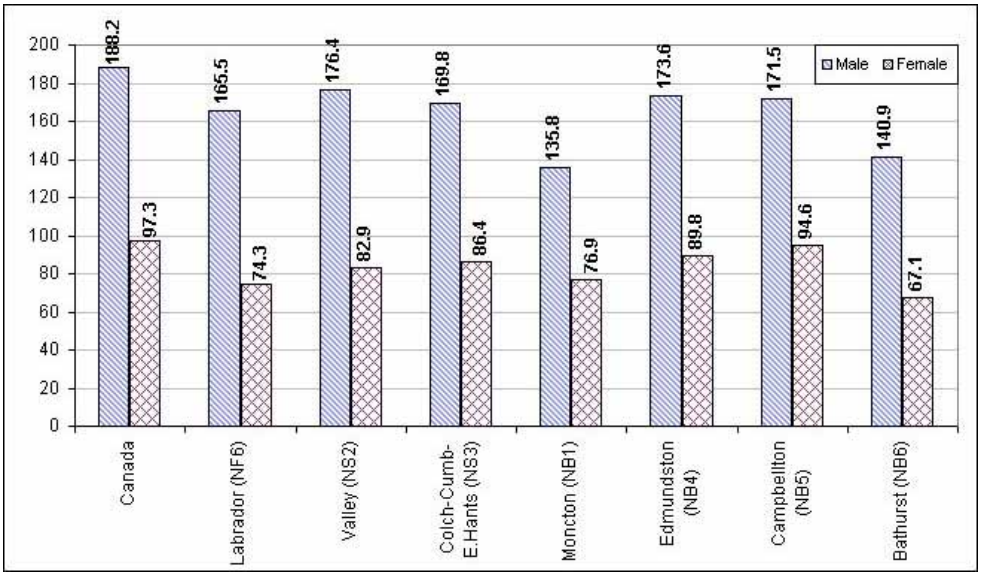
Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996 ; available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

Ten of the 21 Atlantic health districts had lower overall ischaemic heart disease death rates than the national average, and seven of those had lower rates both for males and for females. Of those, Bathurst (NB6) had the lowest ischaemic heart disease death rates both for males and females (140.9 – male, and 67.1 – female, compared to national averages of 188.2 and 97.3 respectively) (Figure 205).

As with all comparative data at the health district level, these results should be interpreted with caution due to small sample sizes and correspondingly wide confidence intervals. For example, for females, seven other Atlantic health districts had a confidence interval with a low-end result that was below the high-end estimate for Bathurst (79.7). This means that it is statistically possible, with a 95% confidence interval, for any one of those eight health districts to have had

the lowest female ischaemic heart disease death rate in the region. For this reason, readers of these text volumes are referred to the confidence intervals provided in the accompanying appendices (in this case Appendix C, Table 123).

Figure 205. Age-standardized ischaemic heart disease death rate per 100,000, by sex, Canada and selected Atlantic health districts with rates lower than the national average, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

Four Newfoundland and Labrador health districts had much higher ischaemic heart disease death rates for females than the national rate of 97.3: Grenfell (NF5), 67% higher at 162.9; Eastern (NF2), 56% higher at 152.2; and Central (NF3) and Western (NF4), with rates approximately 36% higher. In contrast, Bathurst (NB6) had a rate of 67.1, approximately 30% below the national average, while Moncton (NB1) and Labrador (NF6) both had rates approximately 20% below the national rate (Figure 206).

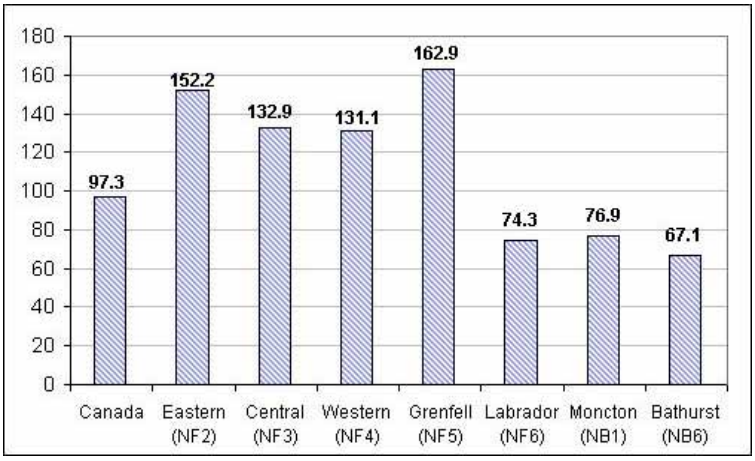
For males, Eastern (NF2) at 278.1 per 100,000 had an ischaemic heart disease rate that was 48% higher than the national rate. Similarly, Cape Breton (NS5) had a rate of 270.1, which was 44% higher than the national rate. Moncton (NB1) had a rate of 135.8, 28% lower than the national rate and Bathurst (NB6) had a rate of 140.9, 25% lower than the national rate.

As in the country as a whole, males in Atlantic Canada were about twice as likely to die from ischaemic heart disease as are females in 1996. The male-female gap was somewhat narrower in Newfoundland and Labrador (1.86:1) and in New Brunswick (1.87:1) than in PEI (1.99:1), and it was particularly wide in Nova Scotia (2.2:1). In Newfoundland and Labrador, the male ischaemic heart disease death rate (238.1) was 27% higher than the national rate, while the female rate (127.8) was 31% higher than the national rate – representing the highest ischaemic

heart disease death rates for both males and females in the country. In Nova Scotia, the wide disparity was the result of a higher than average ischaemic heart disease death rate for males of 204.5 – 9% higher than the national average, and a lower than average rate for females of 92.6 – 5% below the national average.

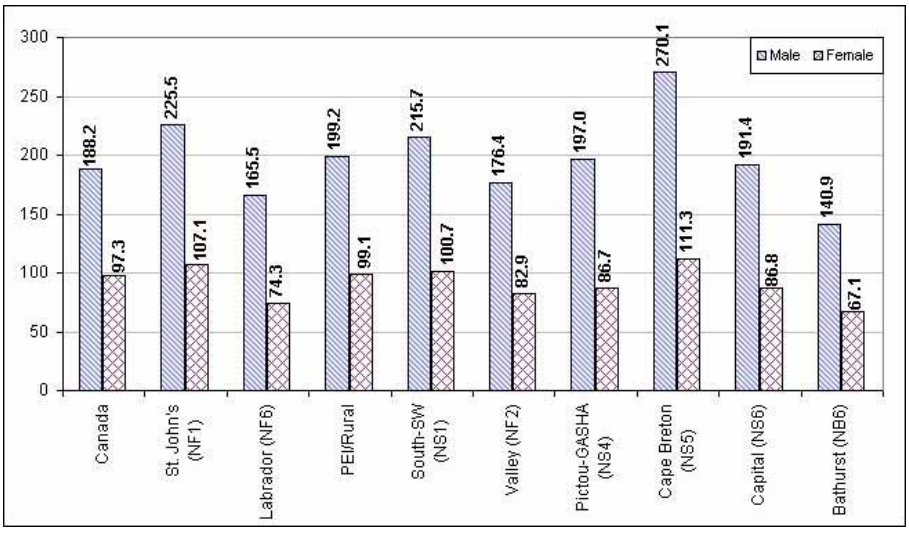
The male-female divide was most pronounced in Cape Breton (NS5) where the ischaemic heart disease death rates were 270.1 for males (44% higher than the national average and the second highest rate in Atlantic Canada) and 111.3 for females, a male-female ratio of 2.4:1 (Figure 207).

Figure 206. Age-standardized ischaemic heart disease death rate per 100,000, females, Canada and selected Atlantic health districts, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

Figure 207. Age-standardized ischaemic heart disease death rate per 100,000, Canada and selected Atlantic health districts with a high gender variance, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (pop. estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

3.1.2.3 Cerebrovascular disease deaths

Newfoundland and Labrador had the highest cerebrovascular death rate for both sexes in 1996 in Canada (62.5 per 100,000) – 29% higher than the national rate of 48.4. PEI had the second highest cerebrovascular death rate for both sexes in Canada at 53.3 per 100,000. The Nova Scotia and New Brunswick rates (45.3 and 47.6 respectively) were below the national average.

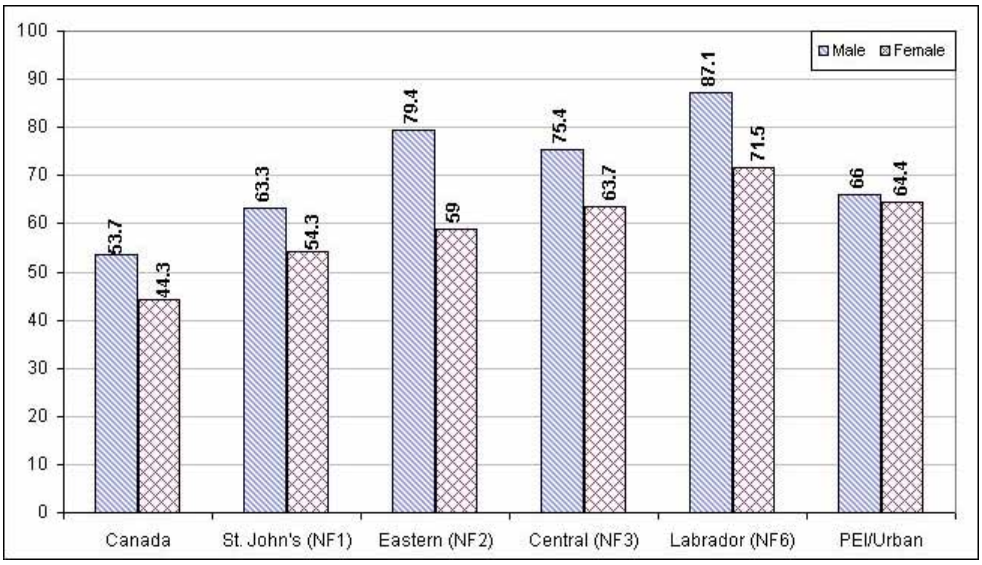
The national cerebrovascular disease death rate per 100,000 was higher for males (53.7) than for females (44.3). Among the 21 Atlantic health districts, Labrador (NF6) had the highest rates for both females (71.5 per 100,000) and males (87.1), with rates more than 60% higher than the national average. Among females, PEI/Urban, with a cerebrovascular disease death rate of 64.4 per 100,000, and Central (NF3) at 63.7, had rates approximately 44% higher than the national rate. Among males, Central (NF3) at 75.4, and Eastern (NF2) at 79.4, had rates 40% higher than the national average (Figure 208).

Eleven Atlantic health districts had cerebrovascular disease death rates that were below the national average of 48.4 per 100,000. Of those, seven health districts had a lower rate both for males and for females than the national rates for males and females. Rural PEI had the lowest cerebrovascular death rate for females (29.4) in Atlantic Canada – 34% below the national average. Campbellton (NB5) had a female rate (31.5) that was 25% less than the national rate. Bathurst (NB6), with a rate of 35.1, and Capital (NS6), with a rate of 37.4, had rates that were at least 15% lower than the national rate. Among males, Pictou-Guysborough-Antigonish-Strait (NS4) at 40.1, and Campbellton (NB5) at 40.3, had the lowest rates in the Atlantic region – 25% below the national rate (Figure 209).

As noted in the previous section, caution must be exercised in making and interpreting these comparisons, due to wide confidence intervals that indicate high variability. For confidence intervals, readers are referred to Table 126 in Appendix C

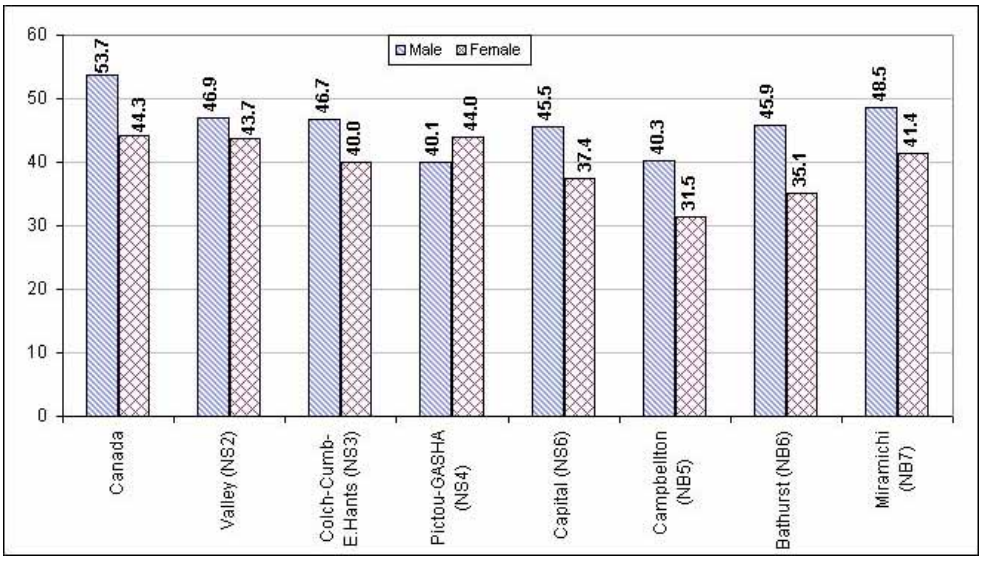
Male cerebrovascular disease death rates were higher than female rates in all Atlantic health districts except Pictou-Guysborough-Antigonish-Strait (NS4), where males had a rate of 40.1 per and females, 44.0. PEI/Rural had the widest gender gap in Atlantic Canada for cerebrovascular disease deaths, with a death rate for males that was more than twice as high as for females (61.7 compared to 29.4). As noted, the statistics show that the female cerebrovascular death rate in PEI/Rural was the lowest in the Atlantic Provinces, though caution must be exercised in making these comparisons due to wide confidence intervals and high variability (Figure 210).

Figure 208. Age-standardized cerebrovascular disease death rate per 100,000, Canada and selected Atlantic health districts with high cerebrovascular death rates, 1996 (rate)



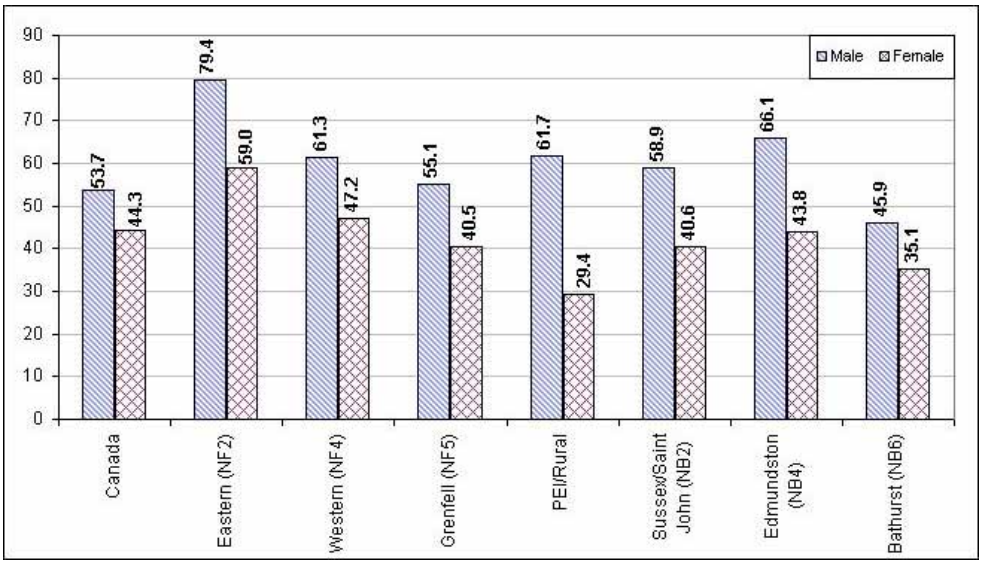
Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (pop. estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

Figure 209. Age-standardized cerebrovascular disease death rate per 100,000, Canada and selected Atlantic health districts with lower rates than the national average, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

Figure 210. Age-standardized cerebrovascular disease death rate per 100,000, Canada and selected Atlantic health districts with a high gender variance, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

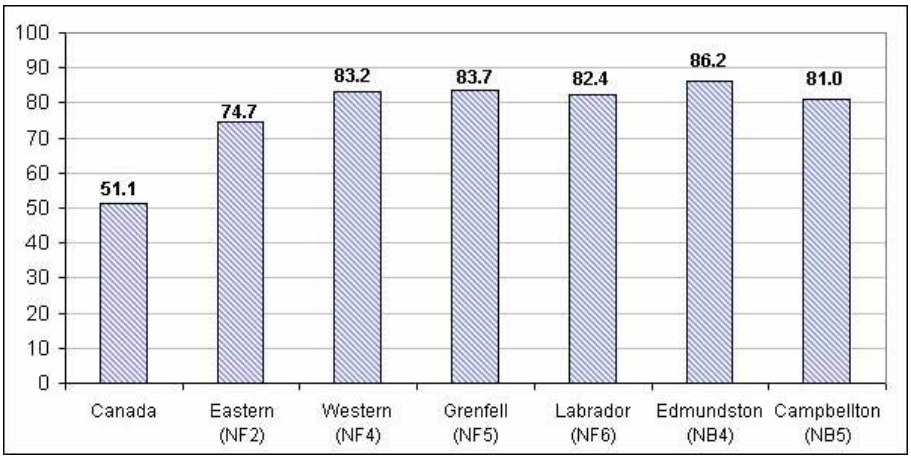
3.1.2.4 All other circulatory disease deaths

All four Atlantic provinces had higher rates of other circulatory disease deaths in 1996 than the national average of 61.0 per 100,000 population (74.8 – male, 51.1 – female). Newfoundland and Labrador had the highest rate of other circulatory disease deaths in the country (81.5), followed by New Brunswick (80.5), Nova Scotia (74.8), Alberta (71.6), Saskatchewan (69.0) and PEI (65.9).

All four Atlantic provinces had the highest rates of other circulatory disease deaths in the country for males, led by New Brunswick (103.8), Newfoundland and Labrador (97.8), Nova Scotia (94.2), and PEI (89.9). Newfoundland and Labrador had the highest rate of other circulatory deaths in the country for females (67.9), followed by New Brunswick (63.1) and Nova Scotia (62.1). In Atlantic Canada, only PEI had a slightly lower rate of other circulatory disease deaths than the national average for females (50.2).

Only three of the 21 Atlantic region health districts had lower female rates of other circulatory disease deaths than the national average: PEI/Rural at 39.4 per 100,000, Miramichi (NB7) at 45.2 and the Annapolis Valley (NS2) at 50.6. The Atlantic health districts with the highest female circulatory disease death rates were Edmundston (NB4) at 86.2 (69% higher than the national average), Grenfell (NF5) at 83.7, Western (NF4) at 83.2, Labrador (NF6) at 82.4 (all more than 60% higher), Campbellton (NB5) at 81.0 (59% higher), and Eastern (NF2) at 74.7 (46% higher) (Figure 211). As noted, caution must be exercised in making these comparisons due to wide confidence intervals and high variability.

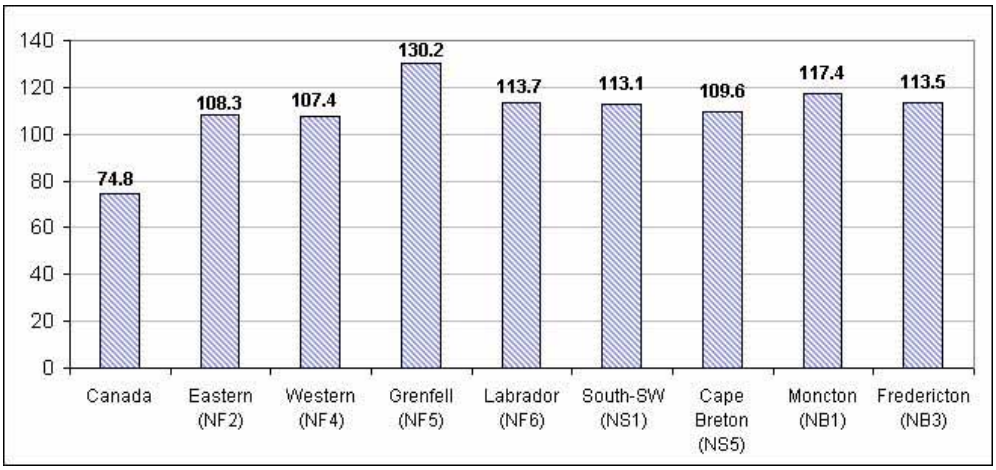
Figure 211. Age-standardized other circulatory disease death rate per 100,000, females, Canada and selected Atlantic health districts, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

Every one of the 21 Atlantic region health districts without exception had higher rates of other circulatory disease deaths for males than the national average, led by Grenfell (NF5) – 130.2, 74% higher than the national rate of 74.8. The second-highest rate was in Moncton (NB1) – 117.4, followed by Labrador (NF6) – 113.7, Fredericton (NB3) – 113.5, South-Southwest (NS1) – 113.1, Cape Breton (NS5) – 109.6, Eastern (NF2) – 108.3, and Western (NF4) – 107.4. In all, eight Atlantic health districts had rates for males above 100.0 per 100,000 and at least 40% higher than the national rate (Figure 212). As with all health district data, caution must be exercised in making comparisons and interpreting results, due to wide confidence intervals and high variability.

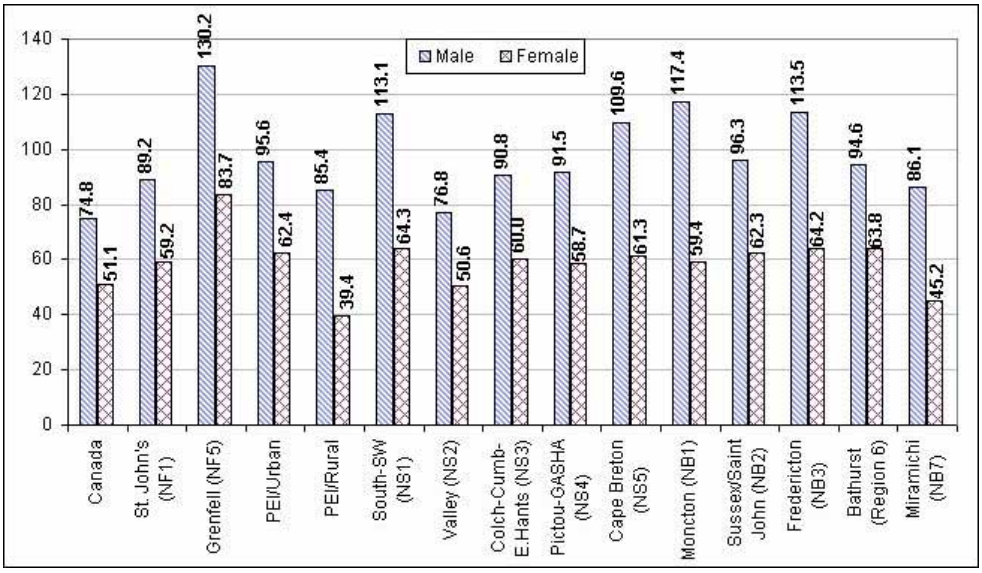
Figure 212. Age-standardized other circulatory disease death rate per 100,000, males, Canada and selected Atlantic health districts, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

As in Canada as a whole, Atlantic region males were about 50% more likely than females to die of other circulatory diseases, and in some districts they were about twice as likely to do so – PEI/Rural (85.4 male, 39.4 female), Moncton (NB1) (117.4 male, 59.4 female) and Miramichi- (NB7) (86.1 male, 45.2 female) (Figure 213).

Figure 213. Age-standardized other circulatory disease death rate per 100,000, males, Canada and selected Atlantic health districts, showing the gender gap, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003 .

3.1.3 Unintentional injury deaths

Although motor vehicle accidents still represent the major cause of deaths due to unintentional injury (followed by falls), the number of deaths resulting from motor vehicle accidents in Canada has dropped substantially, from 5,253 in 1977 to 3,082 in 1996. This is due mostly to wider use of seatbelts and a reduction in the incidence of impaired driving.[37, 38]

Definition

"Age-standardized rate of death from unintentional injuries per 100,000 population. Unintentional ('accidental') injuries include injuries due to causes such as motor vehicle collisions, falls, drowning, burns, and poisoning, but not medical misadventures/complications (ICD-9 E800-E929, excluding E870-E879).

[37] *Toward a Healthy Future: Second Report on the Health of Canadians*, Health Canada, 1999. Available at http://www.hc-sc.gc.ca/hppb/phdd/report/toward/report.htm.
[38] Transport Canada. *Total Collisions and Casualties 1977–1996*. Ottawa: Transport Canada, 1999. Available at www.tc.gc.ca/roadsafety/Stats/stats96/st96tote.htm.

"Measures long-term success in reducing deaths due to unintentional injuries, compared with other districts, provinces, and countries. Measures the adequacy and effectiveness of injury prevention efforts, including public education, community and road design, prevention, emergency care, and treatment resources."[39]

Data Source

Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates).

Rates are age-standardized using the direct method, and the 1991 Canadian Census population structure. All unintentional injury death rates in the following section refer to age-standardized per 100,000 population.

Results

Nationally, the unintentional injury death rates per 100,000 were 38.3 for males and 17.6 for females, for an overall rate of 27.7. Prince Edward Island, Nova Scotia, and New Brunswick had higher rates for males than the national average, but slightly lower rates for females (Figure 214). Newfoundland and Labrador, as a province, had the lowest overall rate of unintentional injury deaths in the country, as well as the lowest rate for females (12.6), and the second lowest rate for males (34.1). But Labrador (NF6) had the highest overall rate of unintentional injuries in Atlantic Canada for both sexes (52.5), including the second highest rate for males (71.0) and the highest rate for females (34.7) (Figure 214).

Throughout Canada, more than twice as many males as females died as a result of unintentional injuries in 1996 (2.2:1 ratio), and the male-female gap was substantially wider in all four Atlantic provinces, ranging from 2.5:1 in Nova Scotia to 3:1 in Prince Edward Island. Thus, all 21 Atlantic region health districts had a substantially higher number of males than females who died from unintentional injuries, with 15 of the 21 registering higher male rates than the national average.

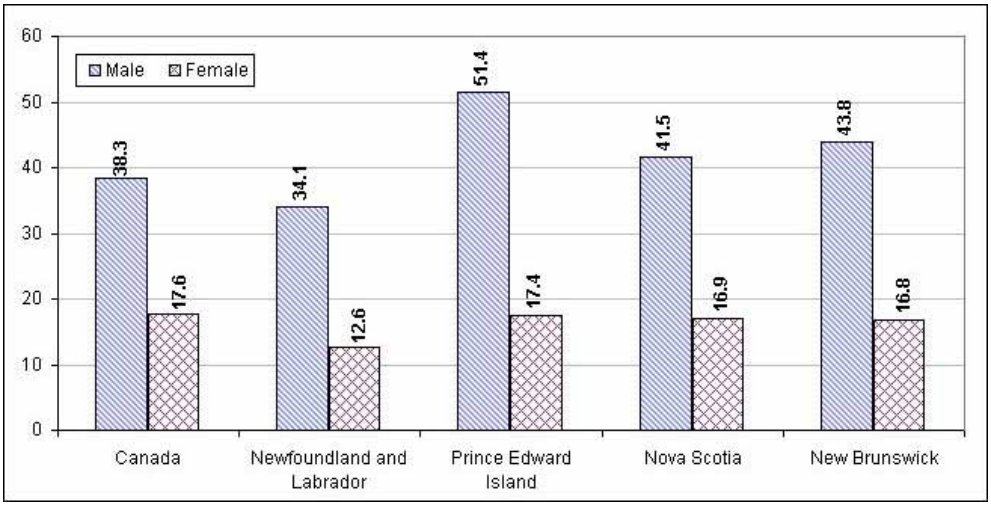
For females, the Labrador (NF6) rate of 34.7 was nearly twice as high as the national rate. The next highest female rates of unintentional injury deaths in Atlantic Canada were in Grenfell (NF5) at 24.8, and Colchester-Cumberland-East Hants (NS3) at 22.9 (Figure 215). For males, Edmundston (NB4) had the highest unintentional injury death rate in Atlantic Canada (78.7), more than double the national average, followed by Labrador (NF6) at 71.0, Campbellton (NB5) at 54.3 and PEI/Rural at 55.0 (Figure 215). As with all health district data, caution must be exercised in making comparisons and interpreting results, due to wide confidence intervals and high variability.

St. John's (NF1) had the lowest unintentional injury death rate for both sexes in Atlantic Canada (16.0 per 100,000), compared to the national average of 27.7. The St. John's area also had the lowest rate in Atlantic Canada for males (21.4) and the second lowest rate for females (10.9) after Western Newfoundland (NF4) at 8.0. Other health districts with low female rates of

[39]Statistics Canada: http://www.statcan.ca/english/freepub/82-221-XIE/00502/defin1.htm#27.

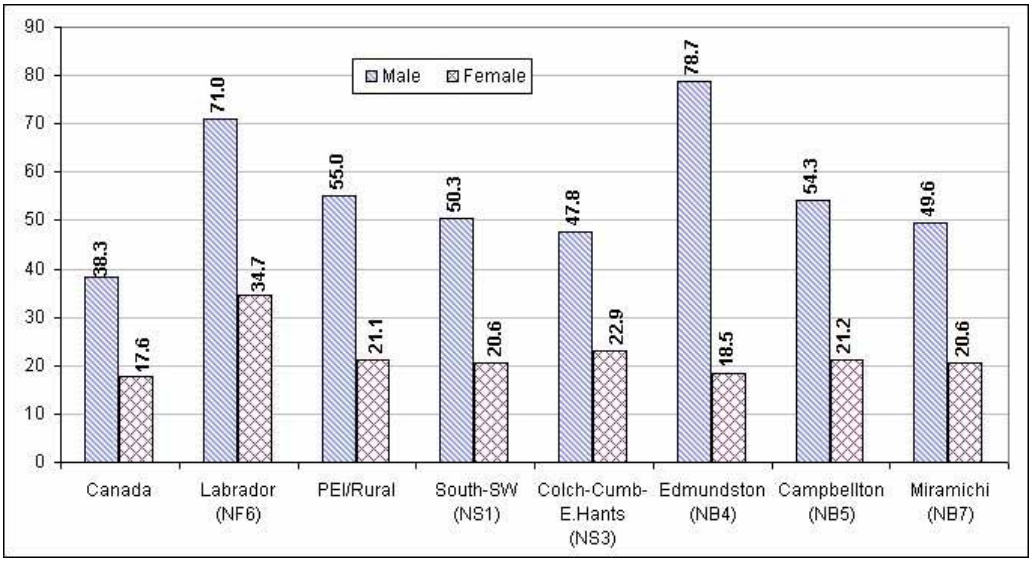
unintentional injury deaths include Central (NF3) at 13.0, Eastern (NF2) at 13.1, PEI/Urban at 13.2, Capital (NS6) at 14.4, and the Annapolis Valley (NS2) at 15.1. Four Atlantic region health districts had lower unintentional injury death rates than the national average: St. John's (NF1), Central (NF3), Annapolis Valley (NS2), and Capital (NS6) (Figure 216).

Figure 214. Age-standardized unintentional injuries death rate per 100,000, by sex, Canada and Atlantic Provinces, 1996 (rate)



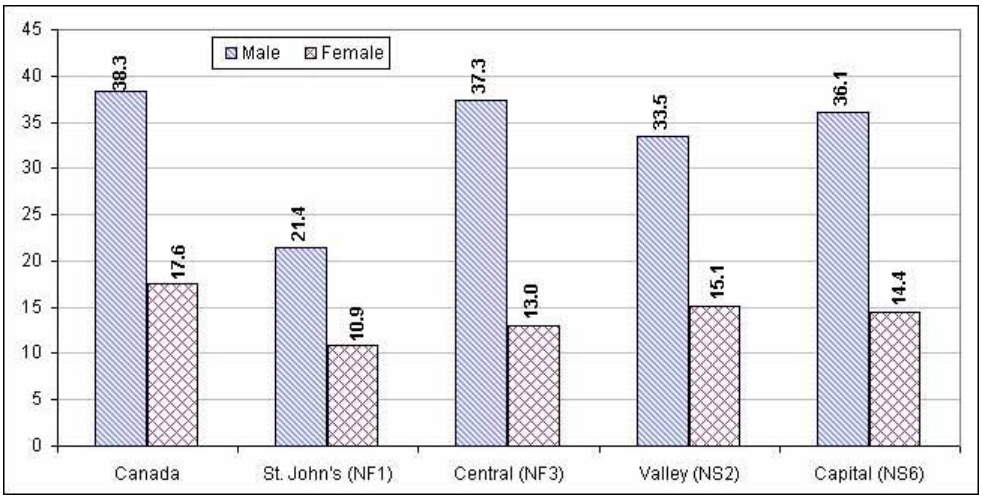
Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

Figure 215. Age-standardized unintentional injuries death rate per 100,000, by sex, Canada and selected Atlantic health districts, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/tables/pdf/14203.pdf, extracted on 11 January, 2003.

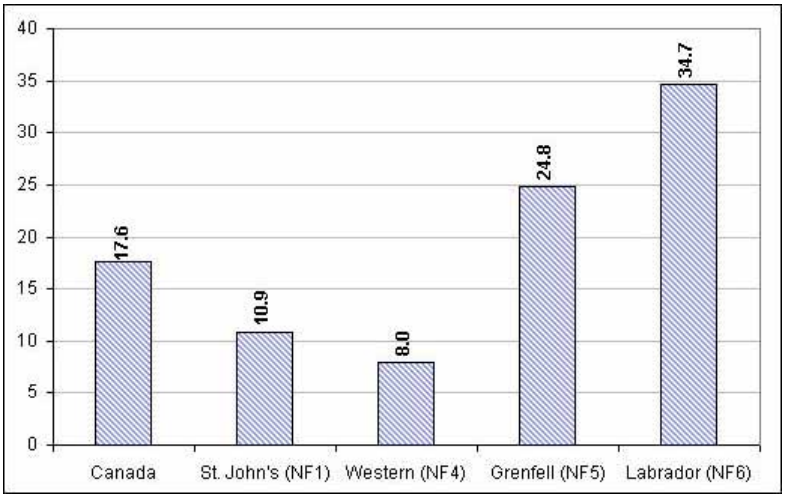
Figure 216. Age-standardized unintentional injuries death rate per 100,000, by sex, Canada and Atlantic health districts with lower rates than the national averages, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

Both the lowest and the highest unintentional injury death rates for females occur in two Newfoundland and Labrador health districts: the Western (NF4) district female rate of 8.0 per 100,000 was less than half than the national rate of 17.6, while Labrador (NF6), with an unintentional injury death rate for females of 34.7, was nearly double the Canadian rate. Grenfell (NF5) at 24.8 and St. John's at 10.9 had the second-highest and second-lowest unintentional injury death rates in the Atlantic region (Figure 217).

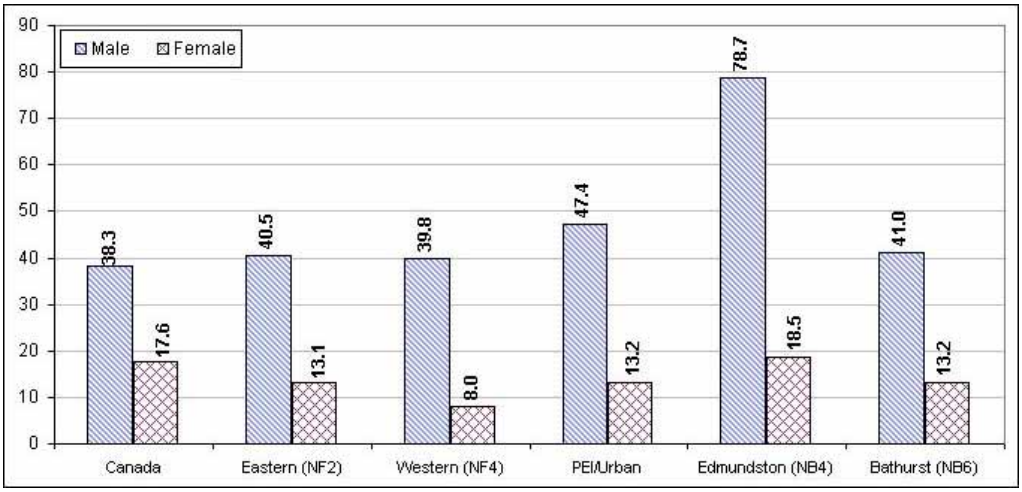
Figure 217. Age-standardized unintentional injuries death rate per 100,000, females, Canada and Atlantic health districts with the highest and lowest rates, 1996 (rate)



Sources: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

As noted earlier, the gender gap for deaths due to unintentional injuries was pronounced across all 21 Atlantic health districts, but it was particularly wide in some regions. In Western (NF4), for example, the death rate due to unintentional injuries for males was five times that of females. Similarly, in Edmundston (NB4) the rate for males was 4.3 times that of females. Other districts that had at least a 3:1 ratio of male to female unintentional injury deaths included Eastern (NF2) with a male rate of 40.5 and a female rate of 13.1, PEI/Urban with a male rate of 47.4 and a female rate of 13.2, and Bathurst (NB6) with a male rate of 41.0 and a female rate of 13.2. Grenfell (NF5) had the smallest gender gap (34.3 for males and 24.8 for females) (Figure 218).

Figure 218. Age-standardized unintentional injuries death rate per 100,000, females, Canada and Atlantic health districts with notable gender variances, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

3.1.5 AIDS deaths

The profile of HIV/AIDS has changed dramatically in the last decade, with the proportion of new HIV infections due to male homosexual activity dropping from 75% of total infections in the late 1980s to 38% today. By contrast, new infections attributable to heterosexual activity rose from 6% to 19% of total infections, and more than doubled in absolute numbers, while infections due to intravenous drug use rose from 9% of all cases to 28% today.[40] Among females, about one quarter of new HIV infections are attributable to injection drug use.[41]

Although males still outnumber females 14 to 1 in both reported AIDS cases and death, that ratio is shrinking.[42] Women represent an increasing proportion of HIV infections, up from 10% a

[40] Dodds, Colin, Ronald Colman, Carol Amaratunga, Jeffrey Wilson, *The Cost of HIV/AIDS in Canada,* GPI Atlantic and Atlantic Centre of Excellence for Women's Health, Halifax, 2001. References, citations, and sources for this section can be found in this study, which is available on the GPI Atlantic web site at www.gpiatlantic.org.
[41] *Toward a Healthy Future: Second Report on the Health of Canadians*, Health Canada, 1999. Available at http://www.hc-sc.gc.ca/hppb/phdd/report/toward/report.htm.
[42] Ibid.

decade ago to 25% today, and of new AIDS cases diagnosed each year, up from 9% as recently as 1995 to 21% in 1999.[43]

In contrast to the national decline in AIDS cases, AIDS cases among Aboriginal Canadians have continued to rise, and there has been a general shift in rates of infection from middle class gay men to vulnerable populations, including the poor, unemployed, minorities, and the poorly educated. Rates of infection in the Canadian prison population are estimated to be at least ten times greater than in the general population.[44]

HIV/AIDS cost Canadians more than $2 billion in 1999 in direct and indirect costs. Health care costs accounted for about $560 million; prevention, research and supports to AIDS victims for about $40 million; and lost economic production due to premature death and disability for nearly $1.5 billion.[45]

Definition

"Age-standardized rate of deaths due to AIDS and HIV infections (ICD-9 042-044) per 100,000 population. Measures success in preventing and treating AIDS and HIV (Human Immunodeficiency Virus, the agent that causes AIDS). Information on deaths can be used to estimate the number of persons living with HIV/AIDS, as well as the impact of treatment."[46]

Data Source

Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates).

Rates are age-standardized using the direct method, and the 1991 Canadian Census population structure. All AIDS death rates are per 100,000 population. All rate comparisons in the following Results section refer to age-standardized AIDS death rates.

Results

Since HIV was first diagnosed 20 years ago, 47,000 Canadians have tested positive for HIV. Of these, 17,165 have developed AIDS, of whom 70% (or 12,088 Canadians) have died of the disease. Health Canada estimates that 15,000 additional Canadians are HIV positive but have not been tested and are unaware of their infection. This means there are as many as 50,000 Canadians (or one in 600) currently living with HIV/AIDS.[47]

However, education, prevention and drug treatments have dramatically lowered the rate of HIV infections, AIDS diagnoses, and AIDS deaths in Canada, particularly in recent years. There were

[43] Dodds, Colin, et al. 2001, op. cit.
[44] Ibid.
[45] Ibid.
[46] Statistics Canada: http://www.statcan.ca/english/freepub/82-221-XIE/00502/defin1.htm#27.
[47] Dodds, Colin, Ronald Colman, Carol Amaratunga, Jeffrey Wilson, *The Cost of HIV.AIDS in Canada,* GPI Atlantic and Atlantic Centre of Excellence for Women's Health, Halifax, 2001. References, citations, and sources for this section can be found in this study, which is available on the GPI Atlantic web site at www.gpiatlantic.org.

25% fewer HIV-positive tests in Canada in 1999 than in 1995, 80% fewer AIDS cases, and 92% fewer AIDS deaths. *New* AIDS cases in Canada in 1999 dropped to 325, the lowest level since 1984.

While there is no known cure for the virus and the disease is still fatal, HIV is being much more successfully managed through drug treatments, and the lives of those infected are being significantly prolonged. Since 1990, the average age of death due to AIDS has increased from 36 years to 41 years.

As noted above, women represent an increasing proportion of HIV infections, up from 10% a decade ago to 25% today, and of new AIDS cases diagnosed each year, up from 9% as recently as 1995 to 21% in 1999.

It is essential not to view these Canadian statistics in isolation from the global AIDS epidemic, since the Canadian experience of the last decade has direct relevance to urgent needs in other countries. Canada's successful investment in prevention and management of HIV/AIDS has not been matched in developing countries with fewer resources. In 1999 alone, AIDS killed 2.6 million people world wide, including half a million children, an increase of more than 70% in just three years. AIDS now kills more people globally than any other infectious disease and is the main cause of death in Africa.

There are now 34 million adults and children in the world living with HIV/AIDS, nearly 70% of them in sub-Saharan Africa alone. Of those, 55% are women – indicating that AIDS is increasingly a women's health issue. The disease is spreading so rapidly that one in six million of the 34 million victims became infected in 1999 alone.

The human, social and economic costs of the disease are devastating, with children orphaned and left without teachers, health care systems unable to cope, and lost productivity slowing growth rates. Twelve per cent of South African educators are HIV positive, and 25% of Ugandan households are now providing for an orphan. Health care expenditures for HIV/AIDS patients in Africa have been estimated at 21 times greater than for the general population.

In short, Canadian successes in stemming the HIV/AIDS epidemic are accompanied by the unchecked and devastating spread of the disease in Africa and elsewhere. According to Dodds et al., the enormous drain on the resources of developing nations, to say nothing of the immense burden of human suffering and premature death, requires that strategies that have proved successful in Canada be applied without delay where the need is greatest. Such investments can be highly cost effective, producing enormous savings in direct health care costs and retained productive capacity.[48]

Rather than becoming complacent about HIV/AIDS due to successes at home, therefore, Dodds et al. argue that it is incumbent upon Canada and other wealthy nations to apply their successful experience abroad, to provide the necessary resources for education and prevention in developing nations, and to facilitate the low-cost provision of drugs that can assist HIV patients to manage the disease successfully. That assistance, they note, should not be regarded as a "cost,

[48] Ibid.

" but as an "investment" that will reduce the appalling costs of the disease and has already been proven to do so in Canada.

In 1996, the AIDS death rate in Canada was 7.4 per 100,000 for males and 0.7 per 100,000 for females.[49] In total, 1,129 Canadian males were reported as having died of AIDS in 1996, of whom seven were in Newfoundland and Labrador, one in PEI, 18 in Nova Scotia, and 13 in New Brunswick. By comparison, 103 Canadian females died of AIDS in 1996.

Reliable data for the Atlantic health districts are limited, as all age-standardized AIDS death rates for females and most of those for males were suppressed by Statistics Canada due to both very small underlying crude counts and extremely high sampling variability. For males, only seven health districts had usable data. Of those, male rates were very low in all reporting health districts compared to the national average of 7.4, except for Capital (NS6) with a rate of 6.6, and Moncton (NB1) with a rate of 6.7. New Brunswick was the only province in Atlantic Canada reporting a female age-standardized AIDS death rate (0.5 per 100,000).

3.1.6 Cancer deaths (malignant neoplasms)

Cancer is the second leading cause of death in Canada and the leading cause of potential years of life lost before age 70.[50] It accounts for 28% of all deaths in the country.[51]

Cancer death rates have declined slowly for men since 1990, while they have remained relatively stable among women over the same period.[52] This is due mainly to a declining lung cancer incidence and mortality among males, and an increase in lung cancer incidence and mortality among females. High current rates of smoking among teenage girls are likely to continue to produce high future rates of lung cancer mortality among women.[53]

Many risk factors for heart disease, including smoking, poor nutrition, physical inactivity, and exposure to second-hand smoke, are also key risk factors for cancer, and are preventable. According to the American Cancer Society, one-third of all cancer deaths are related to poor nutrition. A single behaviour – cigarette smoking – accounts for 85% of all lung cancer cases.[54]

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[49] Note that the ratio reported in *Toward a Healthy Future: Second Report on the Health of Canadians*, Health Canada, 1999. Available at http://www.hc-sc.gc.ca/hppb/phdd/report/toward/report.htm is actually 14:1 rather than 11:1 as indicated by these statistics. The Health Canada publication used 1998 statistics rather than the 1996 statistics that are used here from Statistics Canada's Health Indicators web site. These 1996 statistics are the only ones providing data at the health district level, and therefore are used here for comparative purposes.

[50] *Toward a Healthy Future: Second Report on the Health of Canadians*, Health Canada, 1999. Available at http://www.hc-sc.gc.ca/hppb/phdd/report/toward/report.htm.

[51] Health Canada, *Statistical Report on the Health of Canadians,* Ottawa, 1999, page 318.

[52] Health Canada, *Toward a Healthy Future: Second Report on the Health of Canadians,* Ottawa, 1999, page 21.

[53] Health Canada, *Statistical Report on the Health of Canadians,* Ottawa, 1999, pages 286-287; and *Toward a Healthy Future: Second Report on the Health of Canadians*, Health Canada, 1999. Available at http://www.hc-sc.gc.ca/hppb/phdd/report/toward/report.htm.

[54] U.S. Centers for Disease Control and Prevention (CDC), U.S. Department of Health and Human Services, "Chronic Diseases and Their Risk Factors: The Nation's Leading Causes of Death," Atlanta, 1999, page 18.

Excessive sun exposure is also an important modifiable risk factor, particularly relevant to Nova Scotia, which has by far the highest rate of malignant melanoma in the country, 77% above the national average.[55] Screening services can also help detect cervical cancer, breast cancer, and prostate cancer at an early stage, and thus enable effective treatment that can prevent premature death.

Lung cancer is the leading cause of cancer death for both men and women in Canada, accounting for about 30% of male cancer deaths and 26% of female cancer deaths.[56] Colorectal cancer and prostate cancer are the second and third leading causes of cancer death for men, each accounting for about 12% of male cancer deaths in Canada.

Breast cancer is the second leading cause of cancer deaths for women, accounting for about 17% of female cancer deaths. About 30% of these breast cancer deaths could be prevented through mammogram testing for women aged 50-69. Like lung cancer, the incidence of breast cancer has been increasing among women since the 1970s, but breast cancer mortality has been declining steadily since 1986.[57]

Colorectal cancer is the third leading cause of cancer death for women, accounting for about 12% of all female cancer deaths. Physical inactivity, obesity, and diets high in saturated fats and low in vegetables and whole grains are risk factors for colorectal cancer.[58]

Cancer costs the Nova Scotia health care system $91.3 million a year in hospital, physician, and drug costs alone. Other direct costs, including private expenditures for other institutions and home care, add $49.4 million to this sum, for total health care spending of $140.6 million a year due to cancer. Productivity losses due to premature death and disability as a result of cancer cost the provincial economy an additional $441.3 million a year, for a total economic burden of $582 million that can be attributed to cancer.[59] A substantial portion of these cancer costs could be avoided through preventive measures that reduce risk.

Cancer is the most costly illness in losses due to premature mortality (nearly $430 million annually in Nova Scotia), because it so often claims its victims at young ages. Circulatory diseases and cancer alone account for more than 40% of all productivity losses due to illness in Nova Scotia, and for more than $1.5 billion total in direct and indirect costs.[60]

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[55] Ibid., and National Cancer Institute of Canada, *Canadian Cancer Statistics 2001,* Toronto, April 2001, page 26.
[56] Cancer mortality statistics in this section are from: National Cancer Institute of Canada, *Canadian Cancer Statistics 2003,* Toronto, 2003, Tables 7.2 and 8.2, pages 42 and 44.
[57] Health Canada, *Toward a Healthy Future: Second Report on the Health of Canadians,* Ottawa, 1999, page 22; National Cancer Institute of Canada, 2003, op. cit., page 13.
[58] National Cancer Institute of Canada, 2003, op. cit., pages 42 and 44; U.S. Centers for Disease Control and Prevention, op. cit., pages 26 and 30.
[59] Health Canada, *The Economic Burden of Illness in Canada 1998,* Ottawa. 2002. Hospital, physician, drug, and research costs are currently available for Nova Scotia by illness category, including cancer. However, at the present time, other direct health care costs in Nova Scotia, such as spending for other institutions and home care, have been assessed only for all illness categories combined. These additional direct costs are therefore extrapolated here for cancer, on the assumption that they occupy the same proportion of total direct health care costs for cancer as they do for all diagnostic categories combined. For more details on cost calculations, see Colman, Ronald, *The Cost of Chronic Disease in Nova Scotia,* GPI Atlantic, Halifax. 2002.
[60] Health Canada. 2002., op. cit., and Colman. 2002, op. cit.

Definition

"Age-standardized rate of death from cancer per 100,000 population, for all cancers [malignant neoplasms] (ICD-9 140-208) and for specific sites: colorectal (ICD-9 153-154), lung (ICD-9 162), prostate (ICD-9 185) and female breast (ICD-9 174).

"Measures long-term success in reducing deaths due to cancer, compared with other regions, provinces, and countries. Lower death rates indicate success in cancer prevention, detection, and treatment."[61]

The all cancer death rate per 100,000 population excludes cases of non-melanoma skin cancer (ICD-9 173).

Data Source

Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates).

Rates are age-standardized using the direct method, and the 1991 Canadian Census population structure. All cancer death rates are per 100,000 population. All rate comparisons in the following section refer to age-standardized cancer death rates.

Although the introductory section to this chapter cites the most recent cancer mortality estimates from the National Cancer Institute of Canada's *Canadian Cancer Statistics 2003* (NCIC), the sections below use the 1996 cancer statistics from Statistics Canada's Health Indicators web site for comparative purposes in all the charts. This is because the 1996 data are the most recent available at the health district level.

Wherever more recent National Cancer Institute estimates are referenced below, they will be specifically cited as such, and are not used for any comparisons at the health district level. The 2003 numbers provided by the NCIC and cited below, are estimates. The most recently available actual data in the NCIC publication are for 1999.[62]

Results

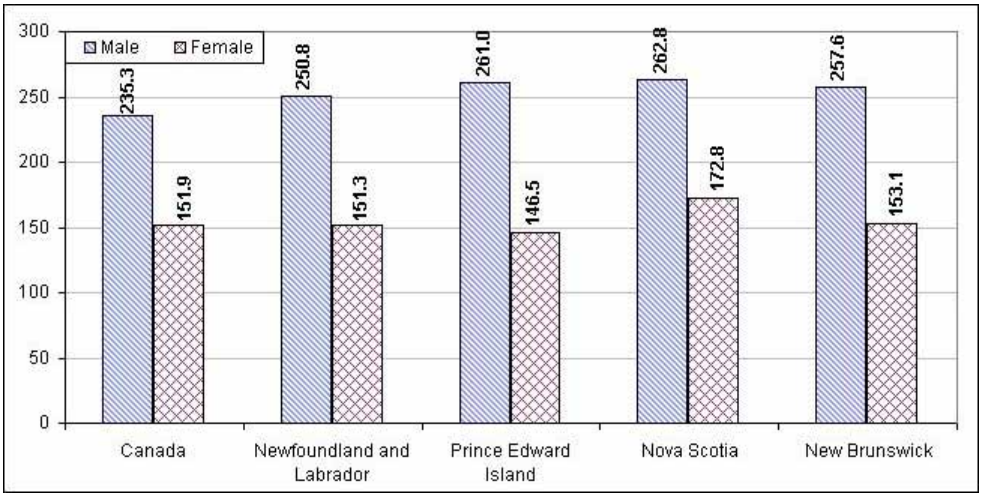
3.1.6.1 All cancers

In 1996, the cancer death rate for both sexes in Canada was 185.7 per 100,000 for all cancers. Nova Scotia had the highest cancer mortality rate in the country (208.3), followed by Quebec (203.9), New Brunswick (196.5), Newfoundland and Labrador (194.3), and PEI (193.8).

[61] Statistics Canada: http://www.statcan.ca/english/freepub/82-221-XIE/00502/defin1.htm#24.
[62] National Cancer Institute of Canada, *Canadian Cancer Statistics 2003,* Toronto, available at: http://www.ncic.cancer.ca/vgn/images/portal/cit_86751114/27/0/89485729cancerstatistics2003_en.pdf.

In 1996 the cancer mortality rate for Canadian males was 235.3 per 100,000 and for Canadian females it was 151.9. Quebec (273.1) had the highest cancer mortality rate for males, followed by Nova Scotia (262.8), PEI (261.0), New Brunswick (257.6), and Newfoundland and Labrador (250.8). Nova Scotia had the highest cancer death rate for females (172.8), followed by Manitoba (159.9), Quebec (159.4), New Brunswick (153.1), Newfoundland and Labrador (151.3). The PEI rate for females (146.5) was somewhat lower than the national average (Figure 219).

Figure 219. Age-standardized all cancer death rate per 100,000, by sex, Canada and Atlantic Provinces, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

In comparing health district cancer mortality rates later in this section, the 1996 provincial rates cited above are used for comparative purposes. However, the most recently available 2003 estimates from the National Cancer Institute of Canada are provided here as well:

The National Cancer Institute's 2003 estimates indicate that Nova Scotia has the highest overall cancer mortality rate in the country – 17% above the national average, and also the highest rates for both men (267 per 100,000) and women (171). The Institute estimates that 2,500 Nova Scotians will die of cancer in 2003 – 1,350 men and 1,150 women.[63] According to these 2003 estimates, the second highest cancer death rate in Canada is in Newfoundland and Labrador (male – 267, female – 159), followed by Quebec (male – 257, female – 160), New Brunswick (male – 254, female – 152), and PEI (male – 249, female – 154).[64]

The number of new cases of cancer indicates the future burden and cost of cancer. The National Cancer Institute estimates that Nova Scotia will also have the highest new cancer incidence in the country in 2003 – 529 per 100,000 for males and 383 per 100,000 for females. Overall, this is 16% higher than the national rates for 2003, which are estimated at 439 for males and 348 for

[63] National Cancer Institute of Canada, *Canadian Cancer Statistics 2003,* Toronto, April 2003, pages 26 and 27.
[64] Ibid., page 27.

females. An estimated 5,000 Nova Scotians will be diagnosed with cancer in 2003 – 2,600 males and 2,400 females – a total increase of 300 since 2001 alone.[65]

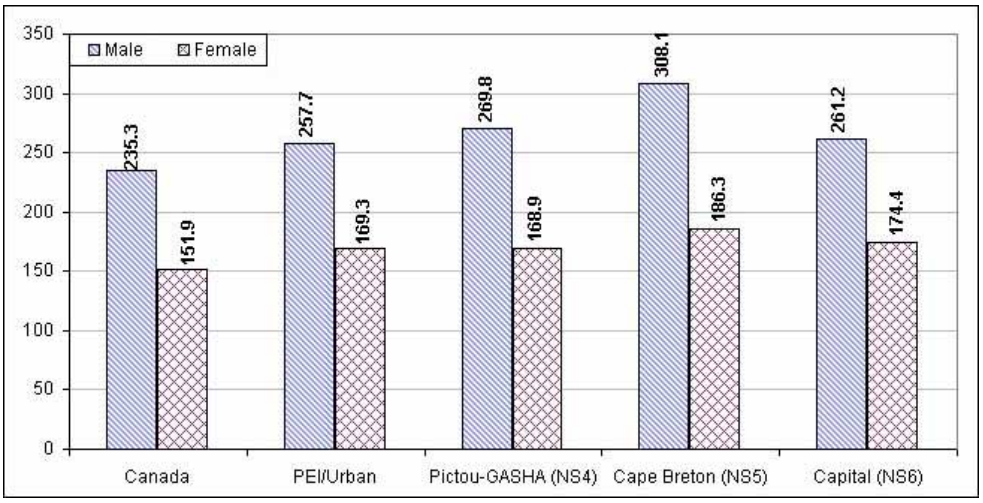
The second highest cancer incidence rate in the country in 2003 is in New Brunswick (male – 534, female – 368), followed by PEI (male – 468, female – 356). Interestingly, despite its high cancer mortality rate, Newfoundland and Labrador has the lowest new cancer incidence in the country for both males (401 per 100,000) and females (290).[66]

A comparison of the 1996 cancer mortality and cancer incidence statistics with the NCIC estimates for 2003 indicates that the cancer gap between Nova Scotia and the rest of the country is growing, with Nova Scotia showing increasingly higher rates than the national average.

Of the 21 Atlantic region health districts, Cape Breton (NS5) had the highest cancer death rate for both sexes (231.8 per 100,000), followed by Eastern (NF2) at 224.7, Campbellton (NB5) at 215.3, Miramichi (NB7) at 212.4, Labrador (NF6) at 212.0, Pictou-Guysborough-Antigonish-Strait (NS4) at 209.8, Capital (NS6) at 206.8, Urban PEI at 205.3, and Colchester-Cumberland-East Hants (NS3) at 205.1. Cape Breton's cancer mortality rate was 25% higher than the national average of 185.7 per 100,000.

Eastern (NF2) had the highest cancer mortality rate for males (317.9 per 100,000), followed by Cape Breton (NS5) at 308.1, and Campbellton (NB5) at 305.9. Cape Breton (NS5) had the highest cancer mortality rate for females at 186.3, followed by Capital (NS6) at 174.4, Colchester-Cumberland-East Hants (NS3) at 170.6, PEI/Urban at 169.3, Pictou-GASHA (NS4) at 168.9, and Sussex-Saint John (NB2) at 167.1451 (Figure 220).

Figure 220. Age-standardized all cancer death rate per 100,000, by sex, Canada and selected Atlantic health districts, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

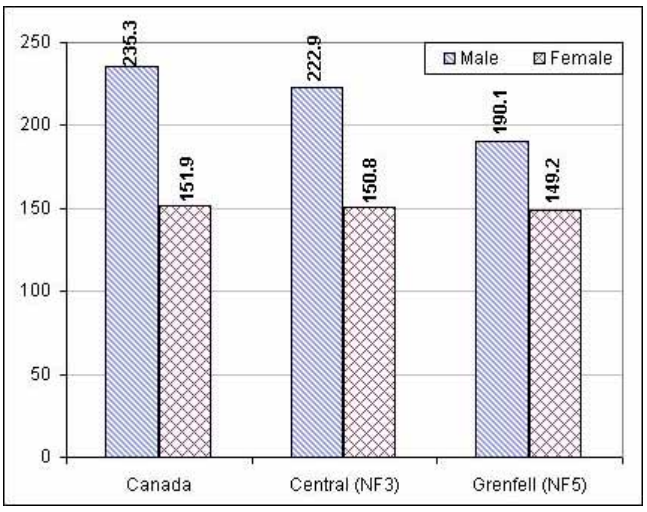
[65] Ibid., pages 24 and 25.
[66] Ibid., page 25.

Only four of the 21 health districts in Atlantic Canada had cancer death rates below the national average for both sexes – Grenfell (NF5) at 168.5, Central (NF3) at 182.1, PEI/Rural at 183.8, and Fredericton (NB3) at 184.3, and only two of these – Grenfell (NF5) and Central (NF3) had lower rates both for males and for females (Figure 221).

Of the 21 Atlantic region health districts, Rural PEI has the lowest cancer death rate for females at 126.1 per 100,000, 17% lower than the national rate, while Cape Breton (NS5) has the highest rate at 186.3 (Figure 222). Among males, Eastern (NF2) has the highest rate at 317.9 and Grenfell (NF5) has the lowest at 190.1. As with all health district data, caution must be exercised in making comparisons and interpreting results, due to wide confidence intervals and high variability.

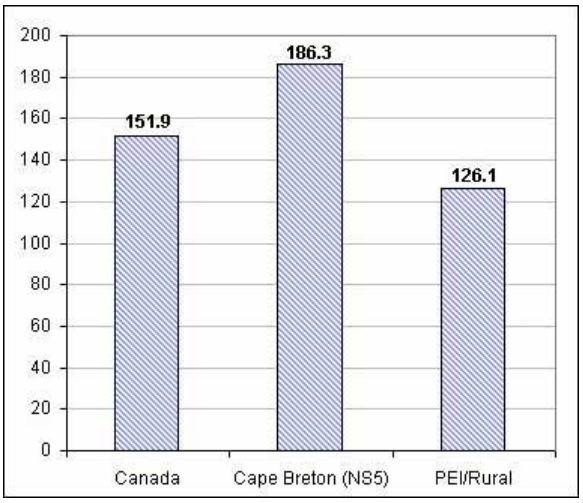
Cancer death rates for Canadian males were 55% higher than for females. Four Atlantic health districts had male cancer death rates that were more than twice as high as the female rates, a variance significantly greater than Canada. Edmundston (NB4), with a male rate of 288.2 and a female rate of 134.3, had the largest gender gap, followed by Eastern (NF2), PEI/Rural, and Campbellton (NB5). By contrast, Grenfell (NF5), at 190.1 for males and 149.2 for females, and South-Southwest (NS1), at235.9 for males and 172.0 for females, had the smallest male-female gaps(Figure 223). In all these comparisons at the health district level, caution must be exercised in interpreting results, due to wide confidence intervals and high variability.

Figure 221. Age-standardized all cancer death rate per 100,000, Canada and Atlantic health districts with rates that are lower than the national averages both for males and for females, 1996 (rate)



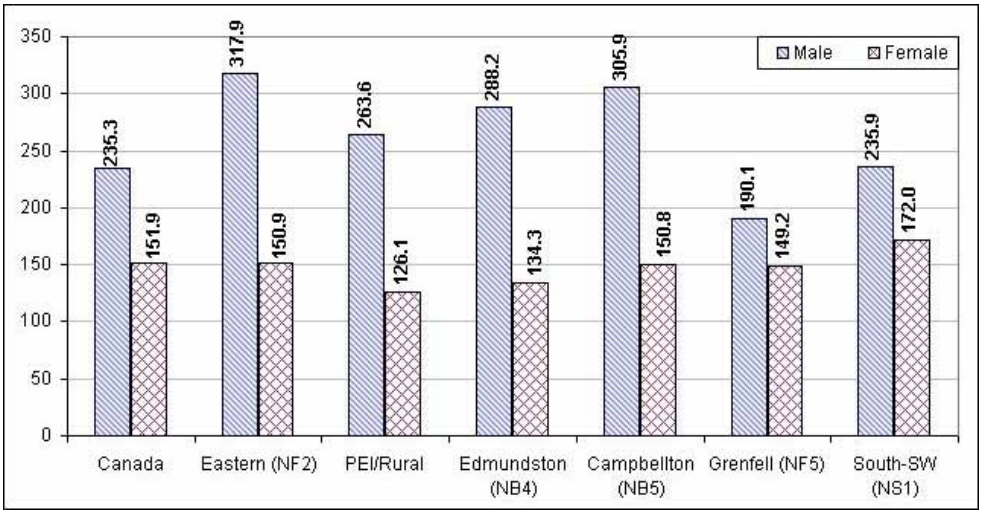
Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

Figure 222. Age-standardized all cancer death rate per 100,000, females, Canada and Atlantic health districts with the highest and lowest female cancer death rates, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

Figure 223. Age-standardized all cancer death rate per 100,000, Canada and selected Atlantic health districts with a notable gender variance, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

3.1.6.2 Lung cancer

As noted above, a single behaviour – cigarette smoking – accounts for 85% of all lung cancer cases.[67] Thus, lung cancer mortality rates largely reflect earlier historical smoking rates, and the

[67] U.S. Centers for Disease Control and Prevention (CDC), U.S. Department of Health and Human Services, "Chronic Diseases and Their Risk Factors: The Nation's Leading Causes of Death," Atlanta, 1999, page 18.

relative gaps between male and female lung cancer deaths reflect similar gender gaps in smoking prevalence.

The causal link between second-hand smoke and lung cancer has been confirmed by a wide range of national scientific academies, research councils, and international agencies like the World Health Organization.[68] For example, the 1998 report of the United Kingdom Scientific Committee on Tobacco and Health similarly concluded that second-hand smoke exposure is a cause of lung cancer, and that those with long-term exposure have an increased risk of 20-30%.[69] A 1997 *British Medical Journal (BMJ)* review of "the accumulated evidence on lung cancer and environmental tobacco smoke" concluded that non-smokers living with a smoker have an excess lung cancer risk of 24%.[70] Up to one-quarter of lung cancer deaths in non-smokers are related to second-hand smoke.[71]

In 1996, the death rate for lung cancer in Canada was 72.0 per 100,000 for males, 32.5 for females, and 49.2 for both sexes combined. In 1996 Quebec had the highest lung cancer death rate in the country (60.4 per 100,000), followed by Nova Scotia (57.8), PEI (56.6), New Brunswick (55.2), and Newfoundland and Labrador (50.0). But these averages conceal significant gender gaps in the Atlantic Provinces.

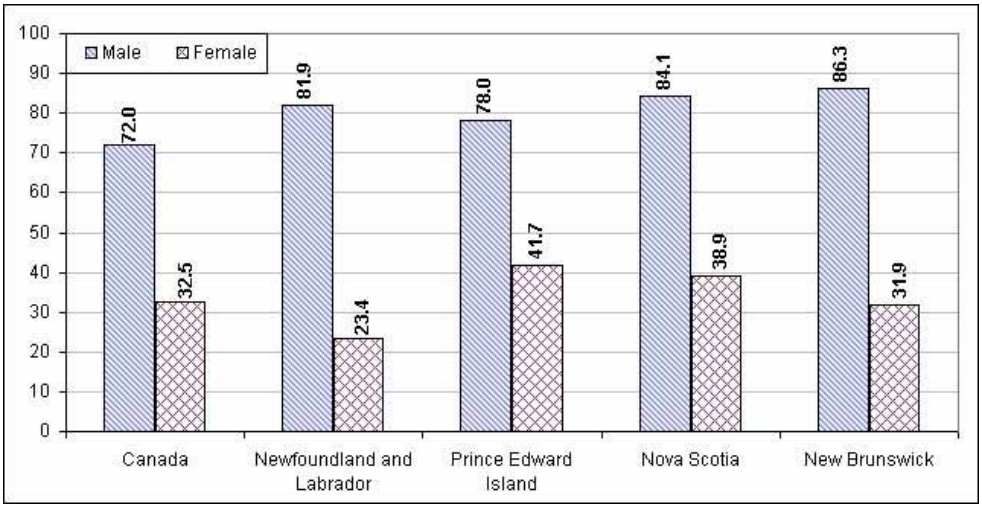
In 1996, all four Atlantic Provinces had higher overall lung cancer death rates than the national average, and higher rates for males. By contrast, Newfoundland and Labrador had by far the lowest female lung cancer mortality rate in the country (23.4), while PEI had by far the highest female lung cancer mortality rate in Canada (41.7), followed by Nova Scotia at 38.9. The lung cancer death rate for New Brunswick females (31.9) was slightly below the national average. Thus, Newfoundland and Labrador had the widest gender gap in lung cancer mortality in the country, with a male rate (81.9) that is 3.5 times the female rate (23.4) (Figure 224).

Lung cancer is the leading cause of cancer deaths for both men and women in Canada as a whole and in every province in the country, accounting for 30% of male cancer deaths and 26% of female cancer deaths in Canada. In the four Atlantic Provinces, according to the NCIC's most recent estimates, lung cancer will account for about 33% of male cancer deaths in 2003.[72] The higher percentage in Atlantic Canada reflects this region's higher historical smoking rates. In 1985, smoking rates were 43% in PEI, 39% in Newfoundland and Labrador, 38% in Nova

[68] Hackshaw, A. K., Law, M.R., and Wald, N.J., (1997) "The accumulated evidence on lung cancer and environmental tobacco smoke," *British Medical Journal,* 315: 980-988, October 18, 1997, footnotes 1-4; American College of Occupational and Environmental Medicine, Position Statement, July 30, 2000, available at http://www.acoem.org/paprguid/papers/etspaper.htm; National Toxicology Program, *Ninth Annual Report on Carcinogens,* available at http://ehis.niehs.nih.gov/roc/ninth/known/ets.pdf.; the conclusions of six of these major scientific reviews are summarized in Ontario Tobacco Research Unit, University of Toronto (2001), *Protection from Second-Hand Smoke in Ontario: A review of evidence regarding best practices,* May, 2001, pages 1-20.
[69] Ontario Tobacco Research Unit, University of Toronto (2001), *Protection from Second-Hand Smoke in Ontario: A review of the evidence regarding best practices,* Toronto, May, 2001, page 7.
[70] Hackshaw, et al., op. cit.
[71] Heart and Stroke Foundation of Canada, (1994), *Environmental Tobacco Smoke: Behind the Smokescreen,* Ottawa.
[72] National Cancer Institute of Canada, *Canadian Cancer Statistics 2003,* Toronto, April 2003, page 27.

Scotia, and 36% in New Brunswick, compared to a national average of 33% in that year.[73] One study found that smoking cessation could eventually prevent more than 600 lung cancer deaths per year in Nova Scotia.[74]

Figure 224. Age-standardized lung cancer death rate per 100,000, by sex, Canada and Atlantic Provinces, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

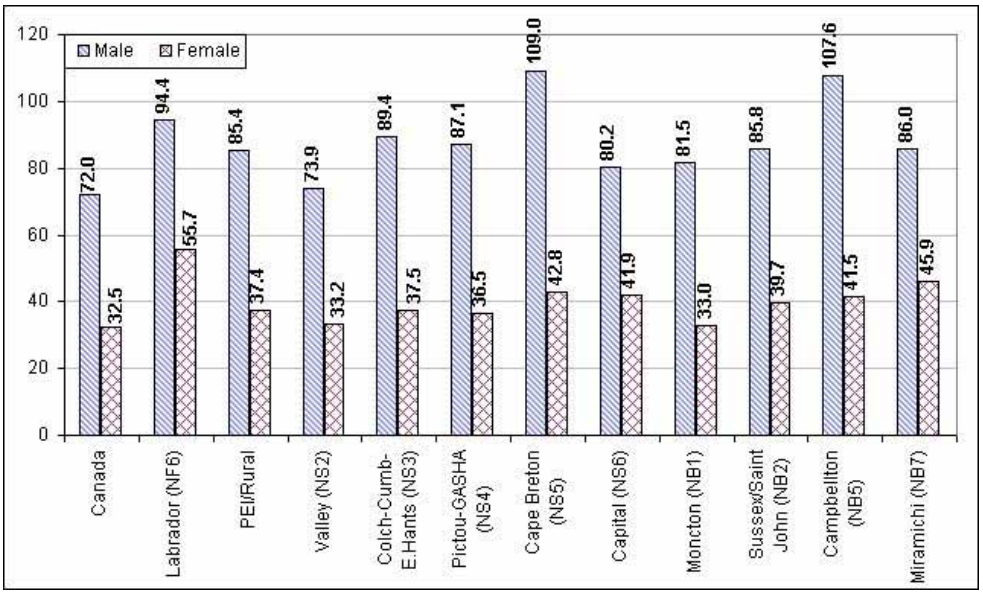
Of the 15 Maritime health districts, 14 had higher lung cancer mortality rates for both sexes combined than the national average (49.2), with Fredericton (NB3) at 47.8 the only exception. In Newfoundland and Labrador, three health districts [Labrador (NF6), Eastern (NF2), and St. John's (NF1)] had higher rates and the other three [Central (NF3, Western (NF4), and Grenfell (NF5)] had lower rates. The highest lung cancer mortality rates in Atlantic Canada were in Labrador (NF6) at 72.9, Cape Breton (NS5) at 69.4, Campbellton (NB5) at 69.1, and Edmundston (NB4) at 67.2. Figures 225 and 226 indicate some of the Atlantic health districts with high lung cancer mortality rates.

Of the 21 Atlantic region health districts, 18 had higher rates of lung cancer mortality for males than the national average (72.0 per 100,000), led by Edmundston (NB4) at 131.3, Eastern (NF2) at 111.6, Cape Breton (NS5) at 109.0, and Campbellton (NB5) at 107.6. Among males, only three districts: Central (NF3) at 65.9, PEI/Urban at 69.1 and South-Southwest (NS1) at 70.3, had lung cancer death rates lower than the national.

[73] 1985 General Social Survey, reported in Health Canada, *Canadian Tobacco Use Monitoring Survey 2001,* available at http://www.hc-sc.gc.ca/hecs-sesc/tobacco/research/ctums/2001/2001overview.html. On the relationship between smoking and lung cancer mortality, see also U.S. Centers for Disease Control, op. cit., page 22; For a summary of 2001 Canadian smoking rates, see Statistics Canada, *The Daily,* 29 May, 2001, available at: http://www.statcan.ca/Daily/English/010529/d010529c.htm

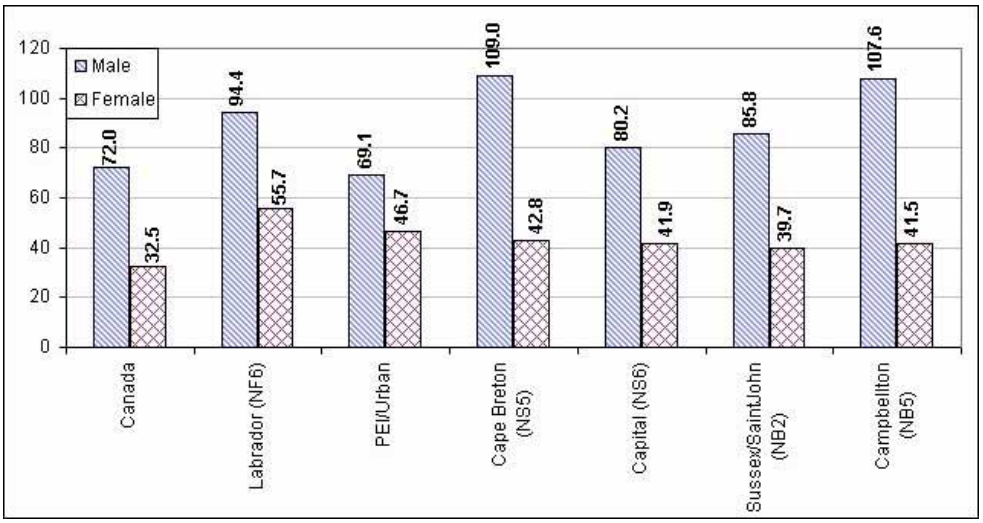
[74] Colman, Ronald, *The Cost of Tobacco in Nova Scotia,* GPI Atlantic, Sydney and Halifax, 2000.

Figure 225. Age-standardized lung cancer death rate per 100,000, by sex, Canada and selected Atlantic health districts, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

Figure 226. Age-standardized lung cancer death rate per 100,000, by sex, Canada and selected Atlantic health districts with significantly higher rates than the national average, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

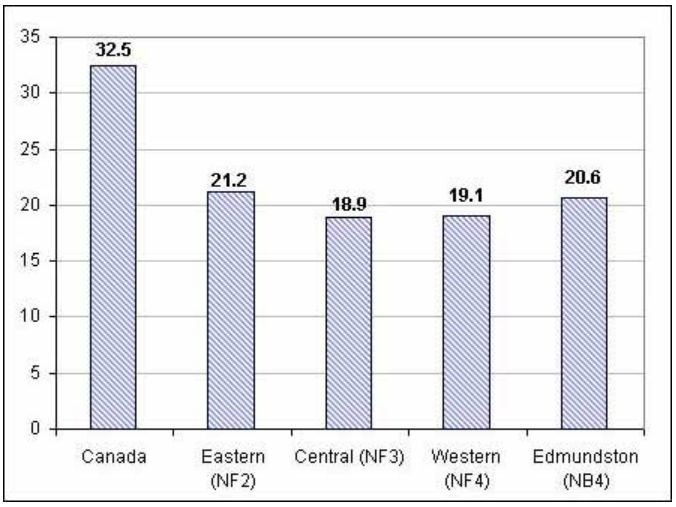
Of the 20 Atlantic region health districts that reported lung cancer death rates for females for 1996 [Statistics Canada did not provide female rates for Grenfell (NF5)], 12 had higher rates than the national average (32.5), including all those in Nova Scotia and PEI. By contrast, all

Newfoundland and Labrador health districts had lower female lung cancer death rates than the national average, with the exception of Labrador (NF6), which had the highest female lung cancer mortality rate in the region (55.7). Not surprisingly, Labrador also had the highest rate of female smoking in Atlantic Canada (30% compared to the national average of 19.4%).

After Labrador, the next highest female lung cancer mortality rates in Atlantic Canada were in PEI/Urban at 46.7, Cape Breton (NS5) at 42.8, Capital (NS5) at 41.9, and Campbellton at 41.7. Cape Breton had the second highest female smoking rate in Atlantic Canada (25.1%), and the other regions with high female lung cancer mortality rates also had female smoking rates well above the national average.

Lung cancer death rates for females in Eastern (NF2) at 21.2, Central (NF3) at 18.9, Western (NF4) at 19.1, and Edmundston (NB4) at 20.6, were significantly lower than the national average (Figure 227).

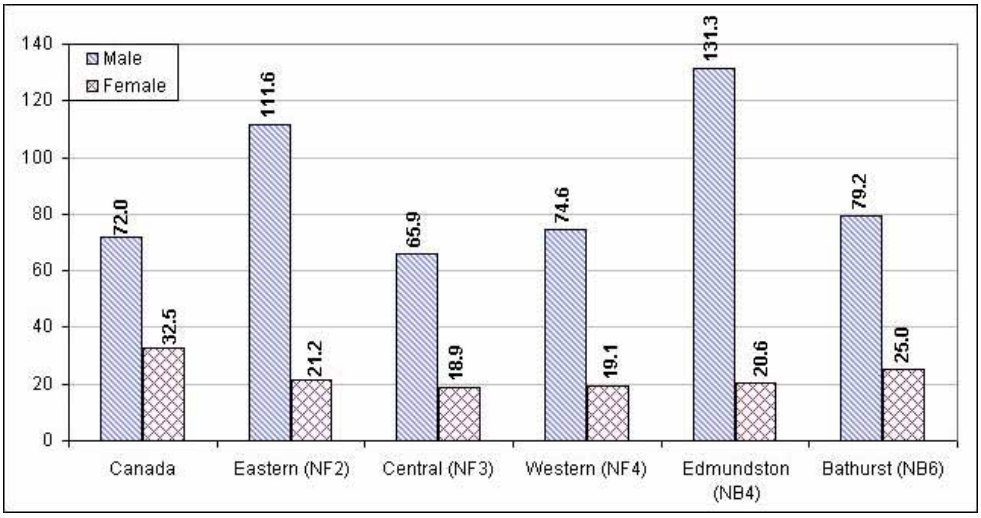
Figure 227. Age-standardized lung cancer death rate per 100,000, females, Canada and selected Atlantic health districts with rates significantly below the national average, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

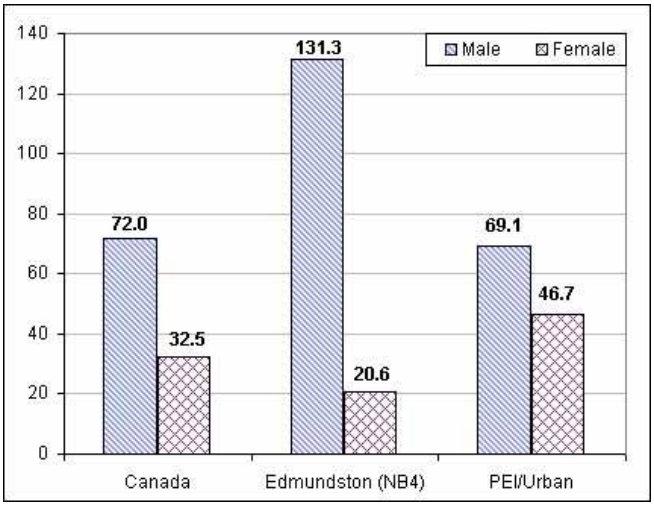
Of the 20 Atlantic region health districts that reported lung cancer death rates for both sexes [Statistics Canada did not provide female rates for Grenfell (NF5)], eleven had higher rates than Canada both for males and for females. All Atlantic health districts, without exception, had substantially higher lung cancer mortality rates for males than for females, as in the country as a whole, and in some districts the male-female ratio was at least 2:1 (Figure 228). The most significant difference was in Edmundston (NB4), where the male rate of 131.3 was more than six times the female rate of 20.6. The smallest gender gap was in Urban PEI where the ratio is 1.5:1 (Figure 229).

Figure 228. Age-standardized lung cancer death rate per 100,000 for selected Atlantic health districts with a large gender gap in lung cancer death rates, compared to Canada, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

Figure 229. Age-standardized lung cancer death rate per 100,000 showing the Atlantic health districts with the largest and smallest gender gaps, compared to Canada, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

3.1.6.3 Colorectal cancer

Colorectal cancer is linked both to obesity and to physical inactivity. Epidemiological evidence demonstrates that overweight individuals with a body mass index (BMI) in excess of 27 have a

16% higher relative risk of colorectal cancer compared to those with healthy weights.[75] Based on this risk and on the prevalence of overweight in Nova Scotia, it has been estimated that about 6% of the incidence of colorectal cancer in Nova Scotia is attributable to overweight (BMI ≥27).[76]

Colon cancers constitute an estimated 67.1% of total colorectal cancers, and about 8.6% of all cancer incidence in Canada. Epidemiological evidence indicates that physically inactive Canadians have a 40% higher relative risk of colon cancer than those who are physically active.[77] Based on this risk and on the prevalence of physical inactivity in Nova Scotia, it has been estimated that nearly 20% of the incidence of colon cancer in Nova Scotia is attributable to physical inactivity.[78]

Colorectal cancers are the second leading cause of cancer deaths for Canadian males and the third (after breast cancer) for females. Nationally, the colorectal cancer death rate in 1996 was 24.4 per 100,000 for males and 15.7 for females, with a combined rate for both sexes of 24.4. These Statistics Canada estimates, to be used in the comparisons below, are lower than the National Cancer Institute's statistics, which indicate a 1996 rate of 29.4 for males and 19.7 for females, with estimates for 2003 of 27.6 for males and 17.4 for females.[79]

The three Maritime provinces had colorectal cancer death rates for both sexes that were lower than the national average (PEI – 17.5 per 100,000; Nova Scotia – 17.7, New Brunswick – 16.4, compared to 19.4 in both Newfoundland and Labrador and in Canada as a whole. Only three Atlantic health districts have colorectal cancer death rates that are higher than the national average for both sexes: Eastern (NF2) at 23.1, the Annapolis Valley (NS2) at 22.3, and Edmundston (NB4) at 20.0 (Figure 230).

Seven Atlantic health districts had female rates of colorectal cancer mortality that were higher than the national average of 15.7, including Eastern (NF2) at 20.1, Central (NF3) at 17.3, Western (NF4) at 15.9, PEI/Urban at 17.2, South-Southwest (NS1) at 17.6, the Annapolis Valley (NS2) at 18.6, and Edmundston (NB4) at 16.5. Four Atlantic health districts had male rates of colorectal cancer mortality that were higher than the national average of 24.4 – Cape Breton (NF5) at 28.5, Eastern (NF2) at 27.4, Valley (NS2) at 26.1, and Bathurst (NB6) at 25.9.

Among the 19 reporting health districts [Statistics Canada did not release results for Labrador (NF6) and Campbellton (NB5)], Miramichi (NB7) had the lowest rate for females, and South-Southwest (NS1) had the lowest rate for males (Figure 231). As with all health district data, caution must be exercised in making comparisons and interpreting results, due to wide confidence intervals and high variability.

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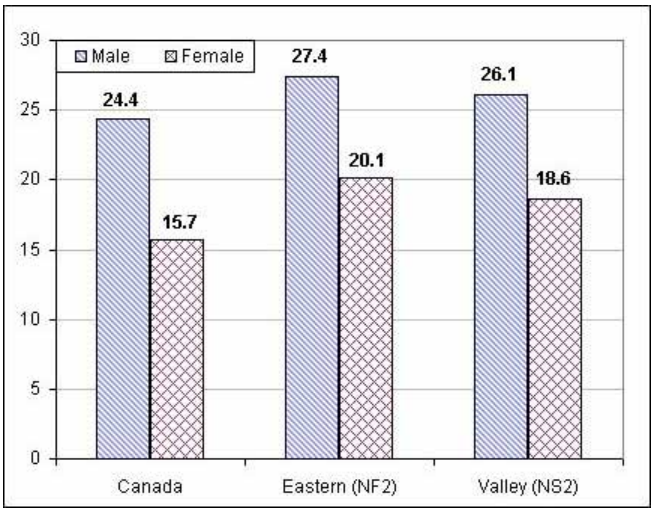
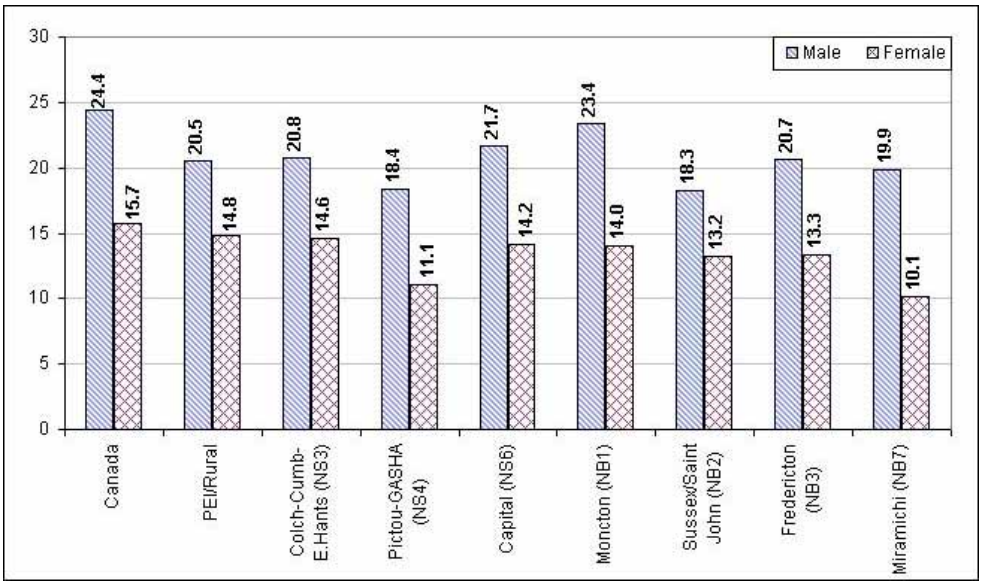
[75] Birmingham, C. Laird, M.D., et al., "The Cost of Obesity in Canada," *Canadian Medical Association Journal* 160 (4), 23 February, 1999.
[76] Colman, Ronald, *The Cost of Obesity in Nova Scotia,* GPI Atlantic, Halifax, March, 2000, Table 1.
[77] Katzmarzyk, Peter, Normal Gledhill, and Roy Shephard, "The Economic Burden of Physical Inactivity in Canada," *Canadian Medical Association Journal* 163 (11), 28 November, 2000.
[78] Colman, Ronald, *The Cost of Physical Inactivity in Nova Scotia,* GPI Atlantic, Halifax, July, 2002.
[79] Statistics Canada estimates are available at: http://www.statcan.ca/english/freepub/82-221-XIE/00502/tables/html/14123.htm. Estimates from the National Cancer Institute of Canada, *Canadian Cancer Statistics 2003,* Toronto, April 2003, are in Tables 7.2 and 8.2, pages 42 and 44, and can be accessed at: http://www.ncic.cancer.ca/vgn/images/portal/cit_86751114/27/0/89485729cancerstatistics2003_en.pdf.

Figure 230. Age-standardized colorectal cancer death rate per 100,000, by sex, Canada and Atlantic health districts with highest colorectal cancer death rates, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

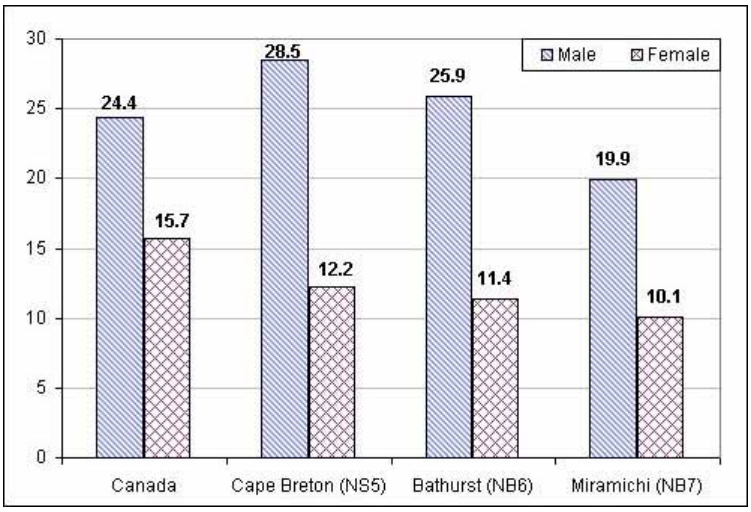
Figure 231. Age-standardized colorectal cancer death rate per 100,000, Canada and selected Atlantic health districts, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

All Atlantic health districts except South-Southwest (NS1) had higher male than female colorectal cancer death rates. The gender gap was widest in Cape Breton (NS5) and Bathurst (NB6), where males were more than twice as likely to die of colorectal cancer than females (Figure 232).

Figure 232. Age-standardized colorectal cancer death rate per 100,000, Canada and Atlantic health districts with wide gender gaps, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

3.1.6.4 Prostate cancer

Prostate cancer is the most commonly diagnosed form of cancer in men, with about 18,800 cases diagnosed annually in Canada, compared to 12,200 lung cancers. The rapid increase in the number of prostate cancer cases detected since the early 1990s is due largely to the widespread availability and use of early detection techniques since that time. Prostate cancer death rates peaked between 1991 and 1995, but have fallen since the mid-1990s, again due in part to earlier detection and treatment.[80]

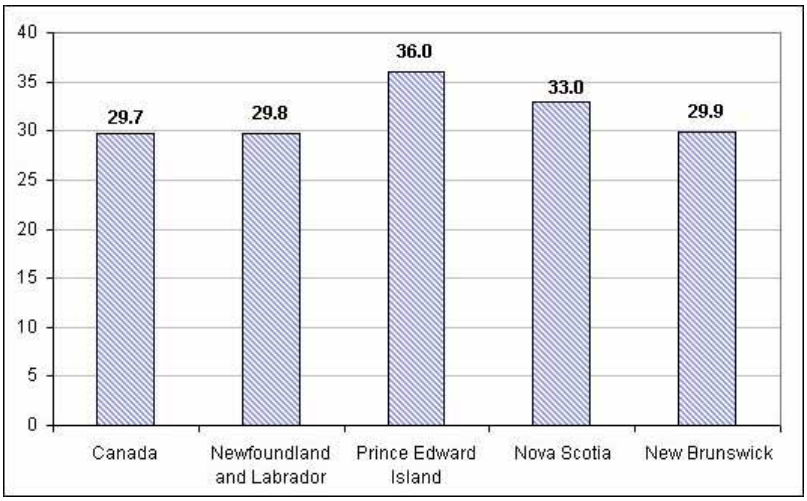
In 1996, all four Atlantic Provinces had prostate cancer death rates that were higher than the national rate of 29.7 per 100,000. PEI had the highest prostate cancer death rate in the country (36.0 per 100,000), followed by Saskatchewan (35.6), and Nova Scotia (33.3) (Figure 233).

The most recent NCIC estimates for 2003 indicate that the highest prostate cancer mortality is now in Saskatchewan (36 per 100,000), followed by Nova Scotia and Newfoundland and Labrador (33), PEI (31), and New Brunswick (30), with all four Atlantic provinces well above the national average of 27 per 100,000 estimated for 2003. As noted earlier, the 1996 Statistics Canada numbers are not comparable to the NCIC estimates, and only the former can be used for comparison purposes at the health district level, where the 1996 data are the most recent available.

However, as before, it is worth noting both sets of statistics to draw attention to what appears to be a growing *gap* between the Atlantic provinces and the rest of the country since the mid-1990s, with cancer mortality rates in Atlantic Canada increasingly higher than the national averages.

[80] National Cancer Institute of Canada, 2003, op. cit., pages 13 and 16.

Figure 233. Age-standardized prostate cancer death rate per 100,000 population, Canada and Atlantic Provinces, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

In 1996, for males, the death rates for all cancers were 6% higher than the national average in Newfoundland and Labrador, 11% higher in PEI, 12% higher in Nova Scotia, and 11% higher in New Brunswick. The NCIC 2003 estimates indicate that they are now 19% higher in Newfoundland and Labrador and in Nova Scotia, 11% higher in PEI, and 13% higher in New Brunswick.

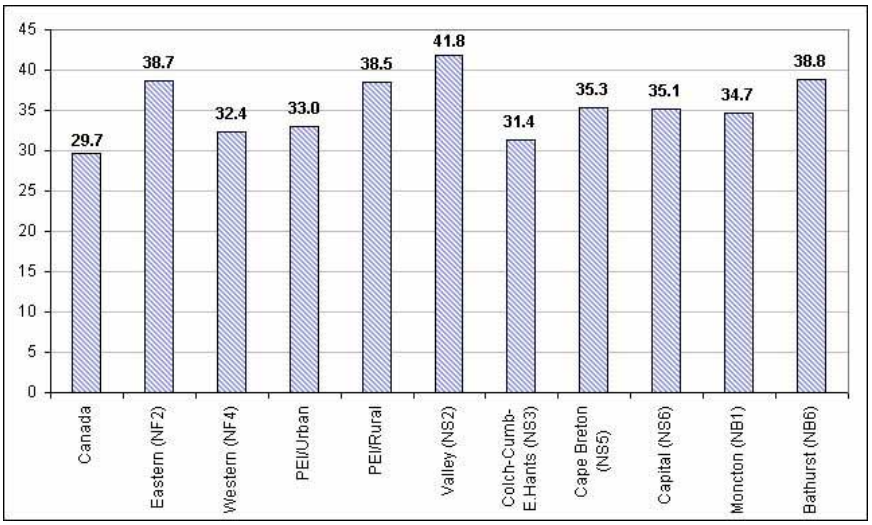
In 1996, for females, the Newfoundland and Labrador cancer death rates was marginally lower than the national rate, the PEI rate was 4% lower, the Nova Scotia rate was 13.7% higher, and the New Brunswick rate 1% higher. The 2003 estimates show Newfoundland and Labrador 5% higher than the national average, PEI 2% higher, Nova Scotia 13.2% higher, and New Brunswick still 1% higher.

For prostate cancer, the 1996 rates showed Newfoundland and Labrador and New Brunswick with about the same rates as the national average, with PEI 21% higher, and Nova Scotia 12% higher. The NCIC 2003 estimates show Newfoundland and Labrador and Nova Scotia 22% higher than the national average, PEI 15% higher, and New Brunswick 11% higher.

It is worth exploring why cancer mortality rates for some cancers have not fallen as fast in Atlantic Canada as in the rest of the country, and whether there is a growing regional health gap in Canada.

Ten of the 19 reporting Atlantic health districts [Statistics Canada did not report age-standardized prostate cancer death rates for Grenfell (NF5) and Labrador (NF6)] had prostate cancer death rates that were higher than the national average in 1996 (Figure 234). The Annapolis Valley (NS2) had the highest prostate cancer death rate in the region at 41.8 per 100,000, and Edmundston (NB4) had the lowest rate at 22.5.

Figure 234. Age-standardized prostate cancer death rate per 100,000 population, Canada and Atlantic health districts with higher rates than the national average, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

3.1.6.5 Female breast cancer

Breast cancer is the most frequently diagnosed cancer in Canadian women, accounting for 30% of all new female cancer cases each year. Incidence rates of breast cancer are increasing among women over 50, but breast cancer mortality has remained relatively stable in recent years, after decreasing somewhat in the 1990s. One in nine Canadian women is expected to develop breast cancer in her lifetime and one in 25 is expected to die from it.[81]

Risk factors for breast cancer include a family history of breast cancer, obesity, physical inactivity, and various reproductive risk factors such as never having had children, being 30 or older at first full-term pregnancy, having early onset of menstruation, and late onset of menopause. However, seventy percent of all women diagnosed with breast cancer have no known risk factors.[82]

Epidemiological evidence demonstrates that overweight women with a body mass index (BMI) in excess of 27 have a 31% higher relative risk of postmenopausal breast cancer compared to those with healthy weights.[83] Based on this risk and on the prevalence of overweight in Nova

[81] Health Canada, *Statistical Report on the Health of Canadians,* Ottawa, 1999, page 285; National Cancer Institute of Canada, *Canadian Cancer Statistics 2002,* Toronto; Gaudette, L.A., Silberberger C., Altmayer, C.A. and Gao, R.N., "Trends in breast cancer incidence and mortality," Statistics Canada, *Health Reports* 1996; 8(2): 29-37.
[82] Kelsey, J.L., Bernstein, L, "Epidemiology and prevention of breast cancer," *Ann Rev Public Health* 1996; 17: 47-67; *Canadian Task Force on the Periodic Health examination: The Canadian guide to clinical preventive health care,* Minister of Public Works and Government Services Canada, catalogue no. H21-117/1994E, 1994.
[83] Birmingham, C. Laird, M.D., et al., "The Cost of Obesity in Canada," *Canadian Medical Association Journal* 160 (4), 23 February, 1999.

Scotia, it has been estimated that 10.5% of the incidence of postmenopausal breast cancer in Nova Scotia is attributable to overweight (BMI ≥ 27).[84]

Epidemiological evidence indicates that physically inactive women have a 20% higher relative risk of breast cancer than those who are physically active.[85] Based on this risk and on the prevalence of physical inactivity in Nova Scotia, it has been estimated that 11% of the incidence of breast cancer in Nova Scotia is attributable to physical inactivity.[86]

Table C1 indicates that breast cancer incidence is increasing in Canada, while breast cancer mortality has stabilized after declining during the 1990s.[87]

Table C1. Female breast cancer, incidence and mortality, Canada, 1995-2002, rate per 100,000 women

Year	1986	1990	1992	1994	1996	1998	1999	2000	2001	2002	2003
Incidence	88.6	96.0	102	98.9	98.5	102.6	103.8	104.6	105.5	106.4	107.3
Mortality	32.0	31.3	30.4	30.0	28.9	26.4	25.2	26.5	26.1	25.8	25.4

Source: Health Canada, Surveillance and Risk Assessment Division, CCDPC; National Cancer Institute of Canada, 2003, Tables 8.1 and 8.2, pages 43-44. Incidence rates for 1999-2003 are estimates, and mortality rates for 2000-2003 are estimates. See National Cancer Institute of Canada, 2003, op. cit., for methodologies used to derive these estimates.

Statistics Canada's 1996 data for Canada, provinces, and health districts – the most recent available mortality data at the health district level – indicate that the rate of breast cancer deaths for Canada in that year was 28.3 per 100,000 women. Nova Scotia had the highest rate of breast cancer deaths in the country at 30.9, and PEI had the lowest rate in the country at 23.8, with Newfoundland and Labrador at 27.0 and New Brunswick at 29.3.

The most recent NCIC estimates for 2003 show all four Atlantic provinces with higher breast cancer mortality rates than the national average. Nova Scotia still has the highest rate in the country (32), followed by Manitoba (29), PEI (28), and New Brunswick, Newfoundland and Labrador, and Quebec at 27 per 100,000, compared to the national average of 25.[88]

Again, as with the data on all cancer deaths and prostate cancer cited above, it is noteworthy that the gap between the Atlantic region and the rest of Canada has grown, that breast cancer mortality has not declined as rapidly in Atlantic Canada as in the rest of the country, and that, in some cases, the mortality rate has actually increased.

[84] Colman, Ronald, *The Cost of Obesity in Nova Scotia,* GPI Atlantic, Halifax, March, 2000, Table 1.
[85] Katzmarzyk, Peter, Normal Gledhill, and Roy Shephard, "The Economic Burden of Physical Inactivity in Canada," *Canadian Medical Association Journal* 163 (11), 28 November, 2000.
[86] Colman, Ronald, *The Cost of Physical Inactivity in Nova Scotia,* GPI Atlantic, Halifax, July, 2002.
[87] Health Canada, Surveillance and Risk Assessment Division, CCDPC; National Cancer Institute, 2003, op. cit, Tables 8.1 and 8.2, pages 43-44.
[88] National Cancer Institute, 2003, op. cit, Table 6, page 27.

Thus, in 1996, the breast cancer mortality rate in Newfoundland and Labrador was 5% below the national average; in 2003 it is estimated to be 8% higher. In 1996 PEI was 16% below the national average; in 2003 it is estimated to be 12% higher. In 1996, Nova Scotia was 9% above the national average; in 2003 it is estimated to be 28% higher. In 1996, New Brunswick was 4% above the national average; in 2003 it is estimated to be 8% higher. Further investigation is required to explore the reasons for this growing gap.

In the 19 reporting health districts [Statistics Canada did not report age-standardized female breast cancer death rates for Grenfell (NF5) and Labrador (NF6)], most age-standardized breast cancer death rates were comparable to the national rate. The highest regional breast cancer death rates were in Western (NF4), with a rate of 34.7, Cape Breton (NS5), with a rate of 33.9, and Capital (NS6), with a rate of 32.9.

These results graphically illustrate the practical utility of this health district level database. Of all the 19 health districts reporting age-standardized breast cancer mortality, the two with the highest death rates also have the lowest rates of routine mammogram screening in the region. Compared to a national average of 51.8%, only 32.3% of Cape Breton women aged 50-69 and 33.8% of women aged 50-69 in Western Newfoundland received a routine screening mammogram in the two years prior to the Canadian Community Health Survey. Enhanced availability of this service in these two communities, along with targeted educational programs, can potentially reduce the high breast cancer death rate in those two health districts.

Eastern (NF2) and Rural PEI had the lowest breast cancer death rates in Atlantic Canada (20.3 and 20.8 respectively) (Figure 235). In those two communities, 43.9% and 44.1%, respectively, of women aged 50-69 received a routine screening in the two years prior to the survey. As with all health district data, caution must be exercised in making comparisons and interpreting results, due to wide confidence intervals and high variability. But the disparities among different Atlantic health districts and the potential connections between breast cancer mortality and mammogram screening in those districts are worth investigating.

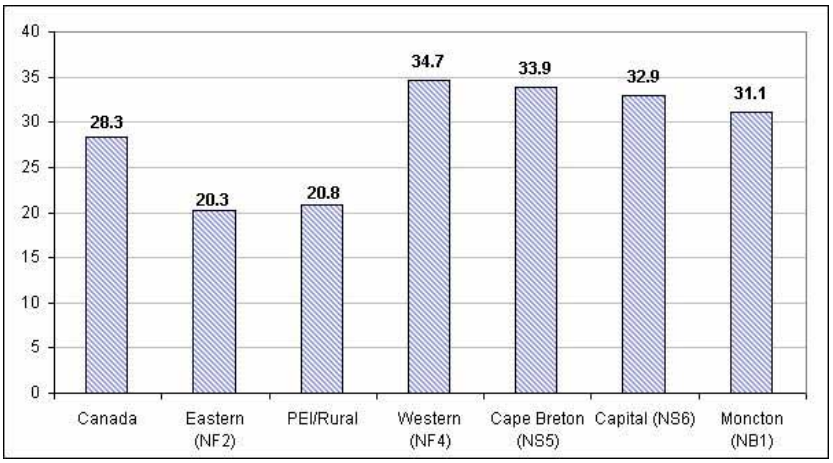
While many factors clearly affect breast cancer mortality, including the risk factors noted at the start of this section, early detection of breast cancer through mammograms *has* been shown to reduce mortality in women age 50-69.[89] The Advisory Committee on Population Health reports that:

> *The dramatic increase in mammography use is a positive example of how public education combined with efficient screening practices can make a dramatic difference in the use of proven preventive measures.*[90]

Currently, mammography screening is recommended every two years for women aged 50-69.[91]

[89] Health Canada, *Toward a Healthy Future: Second Report on the Health of Canadians,* Ottawa, 1999, page 147; National Cancer Institute of Canada, *Canadian Cancer Statistics 2001,* Toronto, April, 2001.
[90] Health Canada, *Toward a Healthy Future,* page 154; Health Canada, *Statistical Report on the Health of Canadians,* Ottawa, 1999, pages 82-85.
[91] Health Canada, *Statistical Report on the Health of Canadians,* Ottawa, 1999, pages 83- 84.

Figure 235. Age-standardized female breast cancer death rate per 100,000, Canada and selected Atlantic health districts, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

3.1.7 Respiratory disease deaths

Both the natural and the built environment play a role in respiratory disease. For example, asthma, which affects more than two million Canadians, has been linked to airborne contaminants. There has been a substantial increase in childhood asthma over the last 20 years, and it is estimated that more than 89,000 Canadian children 0-19 years of age now suffer from asthma (about 13% of boys and 11% of girls.)[92] Increased rates of respiratory infections among Aboriginal children have been linked to poor housing and crowded living conditions.[93] In addition, global climate change is predicted to result in more air pollution, thus increasing respiratory illnesses and deaths.[94]

Nova Scotia and Prince Edward Island have the highest death rates for respiratory diseases in Canada. When deaths from acute respiratory infections like pneumonia and influenza are subtracted, it is estimated that about 375 Nova Scotians die each year from chronic obstructive pulmonary diseases (COPD), including emphysema, asthma, and chronic airway obstruction.[95] About 7% of all Canadians, 6% of Maritimers, and 5% of those in Newfoundland and Labrador are estimated to have asthma, with the highest rates among children.[96]

Smoking is a key risk factor for potentially deadly COPD, and causes a decline in lung function that is irreversible. It is estimated that smokers experience an annual decline in lung volume two

[92] *Toward a Healthy Future: Second Report on the Health of Canadians*, Health Canada, 1999. Available at http://www.hc-sc.gc.ca/hppb/phdd/report/toward/report.htm.
[93] Ibid.
[94] Ibid.
[95] Health Canada, *Statistical Report on the Health of Canadians,* Ottawa, 1999, page 318; and Smith, Bob, President and CEO, Capital District Health Authority, Halifax, "Why Change the Way We Look at Health?"
[96] Health Canada, *Statistical Report,* page 270.

to three times as great as the normal decline in volume that occurs with age in non-smokers. The risks of lung cancer and heart disease diminish rapidly when smokers quit, with light smokers returning to the risk levels of non-smokers after several years. By contrast, COPD risks diminish much more gradually upon cessation, and never return to non-smoker levels.[97]

Second-hand smoke is also a risk factor for respiratory diseases. The link between second-hand smoke and childhood respiratory ailments, including bronchitis, pneumonia and asthma, has been well established. Infants and children of smokers have been found to incur significant risks of respiratory infections, ear problems, asthma, and sudden infant death syndrome. For example, second-hand smoke increases the risk of chronic middle-ear infection in children of smokers by 3.5 times, and the risk of asthma by more than 50%.[98]

Recent studies have found that second-hand smoke also elevates the risk of pneumococcal pneumonia, adult asthma, and chronic bronchitis and emphysema among adults.[99] The California Environmental Protection Agency has found evidence of a causal association between second-hand smoke exposure and both cystic fibrosis and decreased pulmonary function.[100] And the United States Environmental Protection Agency found that:

[97] Studies cited in Oster, Gerry, Graham Colditz, and Nancy Kelly, *The Economic Costs of Smoking and Benefits of Quitting,* Lexington Books, D.C. Health and Company, Lexington, Massachusetts and Toronto, 1984, pages 100-103.

[98] US Environmental Protection Agency, (1992), *Respiratory Health Effects of Passive Smoking: Lung Cancer and Other Disorders,* Publication No. EPA 600/6-90/006F, Washington, D.C., California Environmental Protection Agency, Office of Environmental Health Hazard Assessment, (1997), *Health Effects of Exposure to Environmental Tobacco Smoke,* Sacramento; Report to the Minister of Health from her Expert Panel on the Renewal of the Ontario Tobacco Strategy. (1999), *Actions Will Speak Louder than Words,* Toronto, February, 1999, Mitchell, E.A. et al., (1993), "Smoking and sudden infant death syndrome," *Pediatrics* 91: 1893-1896; Cohen-Klonoff, H.S., et al., "The effect of passive smoking and tobacco exposure through breast milk on sudden infant death syndrome," (1995), *Journal of the American Medical Association* 273: 795-798; Lister, Susan and Jorm, Louisa, (1998), "Parental smoking and respiratory illnesses in Australian children aged 0-4 years: Australian Bureau of Statistics, 1989-90 National Health Survey results, *Australian and New Zealand Journal of Public Health,* 22: 781-786, Canberra, December, 1998.

[99] Nuorti, J.P. et al., (2000), "Cigarette smoking and invasive pneumococcal disease," *New England Journal of Medicine* 342: 681-689; Sheffield, J.V. and Root, R.K., (2000), "Smoking and pneumococcal infection," 342: 732-734; American College of Occupational and Environmental Medicine (ACOEM) (2000), *Epidemiological Basis for an Occupational and Environmental Policy on Environmental Tobacco Smoke,* July 30, 2000, available at: http://www.acoem.org/paprguid/papers/etspaper.htm, page 2, 3 and 7 (footnotes 23 and 24), citing Jindal, S.K., et al., (1994), "Indices of morbidity in adult patients exposed to environmental tobacco smoke," *Chest.* 106: 746-749 and White, J.R., et al., (1991), "Respiratory illness in non-smokers chronically exposed to tobacco smoke in the workplace," *Chest.* 100: 39-43; Eisner, M. et al., (1998), "Environmental tobacco smoke and adult asthma: The impact of changing exposure status on health outcomes," *American Journal of Respiratory and Critical Care Medicine* 158: 127-133, cited in *A Report to the Minister of Health from her Expert Panel on the renewal of the Ontario Tobacco Strategy* (February 1999), op. cit., pages 22 and 44; Greer, J., et al., (1993), "Asthma related to occupational and ambient air pollutants in nonsmokers, *Journal of Occupational and Environmental Medicine* 35: 909-915; Shephard, R.J., (1992), "Respiratory irritation from environmental tobacco smoke," *Archives of Environmental Health* 47 (2): 123-130; Tyler, Michele, (1998), "Blowing smoke: Do smokers have a right? Limiting the privacy rights of cigarette smokers," *Georgetown Law Journal* 86 (3): 783-811, citing references on respiratory effects of ETS (page 784).

[100] California Environmental Protection Agency, (1997), *Health Effects of Exposure to Environmental Tobacco Smoke,* Office of Environmental Health Hazard Assessment, CEPA, Sacramento.

> *"Environmental tobacco smoke has subtle but significant effects on the respiratory health of non-smokers, including reduced lung function…."*[101]

One California study found that the respiratory health of bartenders improved dramatically after the implementation of California's smoke ban, and concluded:

> *"In addition to potentially reducing the long-term risk of lung cancer and cardiovascular disease, workplace smoking prohibition appears to have immediate beneficial effects on adult respiratory health."*[102]

Self-reported obstructive lung disease has also been associated with second-hand smoke exposure in several studies.[103]

Definition

"Age-standardized rate of death from respiratory diseases per 100,000 population, for all respiratory diseases (ICD-9 460-519), pneumonia and influenza (ICD-9 480-487), bronchitis/emphysema/asthma (ICD-9 490-493) and all other respiratory diseases (ICD-9 460-479, 488-489, 494-519).

"Measures long-term success in reducing deaths due to respiratory disease, compared with other districts, provinces, and countries. Lower death rates indicate success in respiratory disease prevention, detection, and treatment."[104]

Data Source

Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates).

Rates are age-standardized using the direct method, and the 1991 Canadian Census population structure. All respiratory disease death rates in the following Results sections refer to age-standardized rates per 100,000 population.

Results

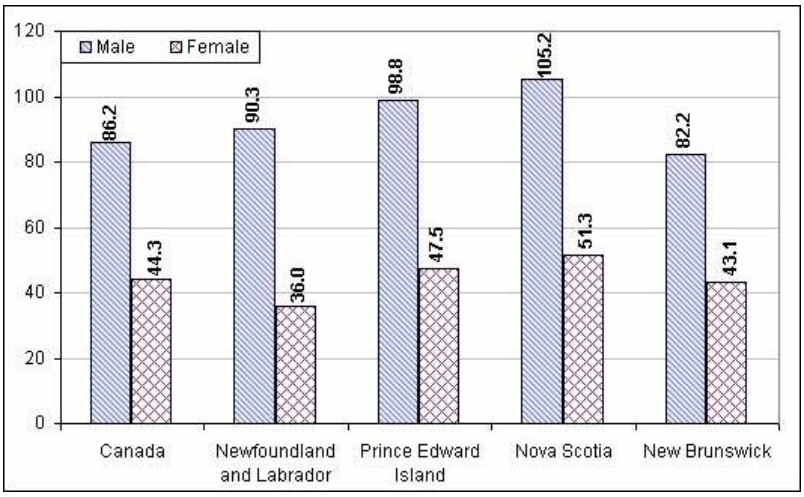
3.1.7.1 All respiratory disease deaths

Statistics Canada's 1996 data – the most recent available at the health district level – indicates a national death rate for all respiratory diseases of 86.2 per 100,000 for males and 44.3 for females, with a combined rate of 59.8. Nova Scotia (71.0) and Prince Edward Island (66.5) have the highest rates of respiratory disease mortality in Canada. In Newfoundland and Labrador, the male rate is higher than the national rate and the female rate is lower, possibly reflecting the

[101] Ontario Tobacco Research Unit, University of Toronto (2001), *Protection from Second-Hand Smoke in Ontario: A review of evidence regarding best practices,* May, 2001, page 2.
[102] Idem., pages 1909 and 1914.
[103] As cited in Eisner, op. cit., page 1913, and footnotes 15, 16 and 47, page 1914.
[104] Statistics Canada: http://www.statcan.ca/english/freepub/82-221-XIE/00502/defin1.htm#25.

sharp gender disparity in smoking rates in that province. In New Brunswick, both the male and female rates are lower than the national rate (Figure 236).

Figure 236. Age-standardized all respiratory disease death rate per 100,000, by sex, Canada and Atlantic Provinces, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

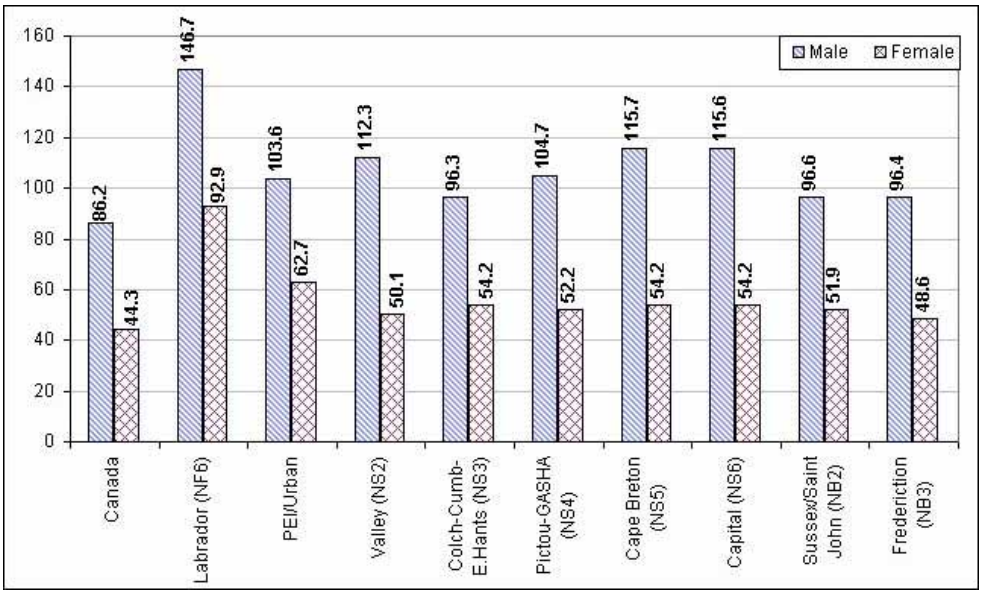
Labrador (NF6) had the by far the highest rates of respiratory disease deaths in Atlantic Canada for both males and females (146.7 and 92.9 per 100,000 respectively). This may partly reflect the fact that Labrador has the highest smoking rates in Atlantic Canada for both males and females (35.6% and 30.0% respectively).

The next highest respiratory disease death rates in Atlantic Canada were all in PEI and Nova Scotia: Urban PEI at 76.6, Cape Breton (NS5) at 76.3, Capital (NS6) at 74.7, the Annapolis Valley (NS2) at 72.9, Pictou-GASHA (NS4) at 72.2, and Colchester-Cumberland-East Hants (NS3) at 70.7.

After Labrador, PEI/Urban had the second-highest rate of respiratory disease deaths for females at 62.7, followed by Capital (NS6), Cape Breton (NS5), and Colchester-Cumberland-East Hants (NS3), all at 54.2, and Pictou-Guysborough-Antigonish-Strait (NS4) at 52.2.. After Labrador, male respiratory disease death rates were highest in Cape Breton (NS5) at 115.7, Capital (NS6) at 115.6, and the Annapolis Valley (NS2) at 112.3, – all about 30% higher than the national rate (Figure 237).

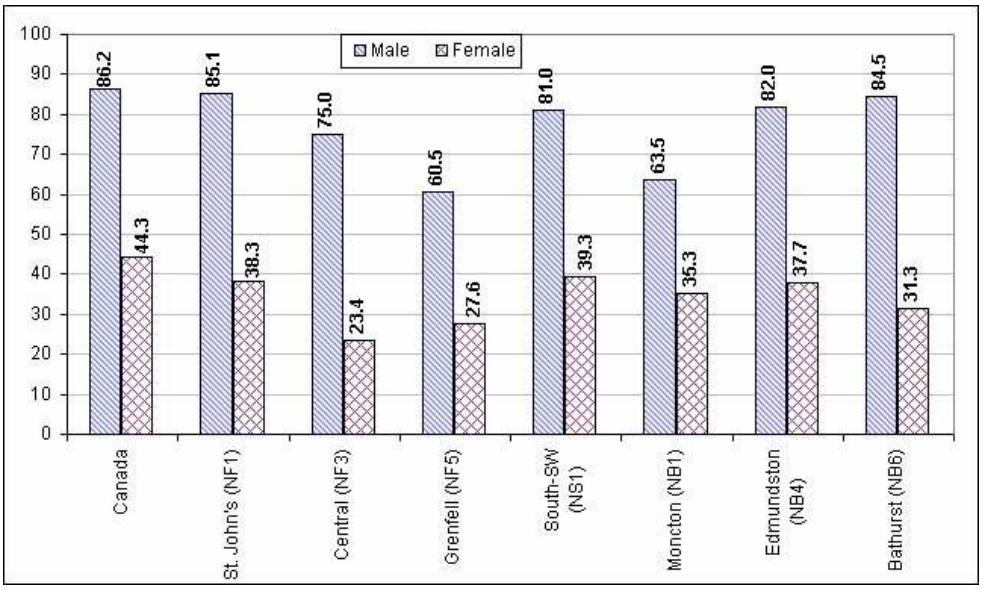
The health districts with relatively low respiratory disease death rates were mostly in Newfoundland and Labrador and in New Brunswick. The lowest female rates in Atlantic Canada were in Central (NF3) at 23.4, Grenfell (NF5) at 27.6, and Bathurst (NB6) at 31.3. The lowest male rates were in Miramichi (NB7) at 57.4, Grenfell (NF5) at 60.5, and Moncton (NB1) at 63.5 (Figure 238). As with all health district data, caution must be exercised in making comparisons and interpreting results, due to wide confidence intervals and high variability.

Figure 237. Age-standardized death rate for all respiratory diseases per 100,000, by sex, Canada and selected Atlantic health districts with high rates, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

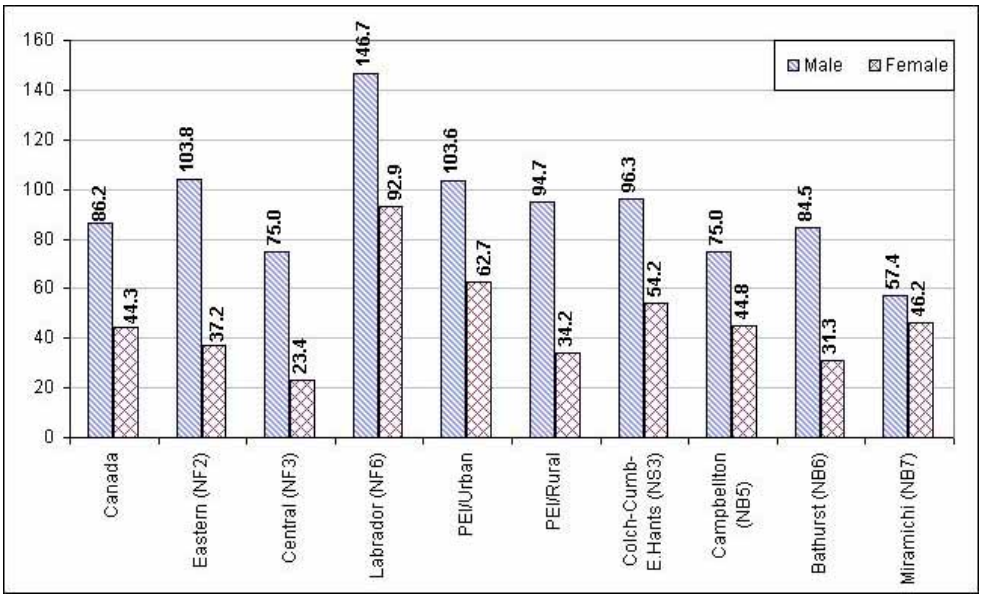
Figure 238. Age-standardized all respiratory disease death rate per 100,000, by sex, Canada and selected Atlantic health districts with lower rates than the national average, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

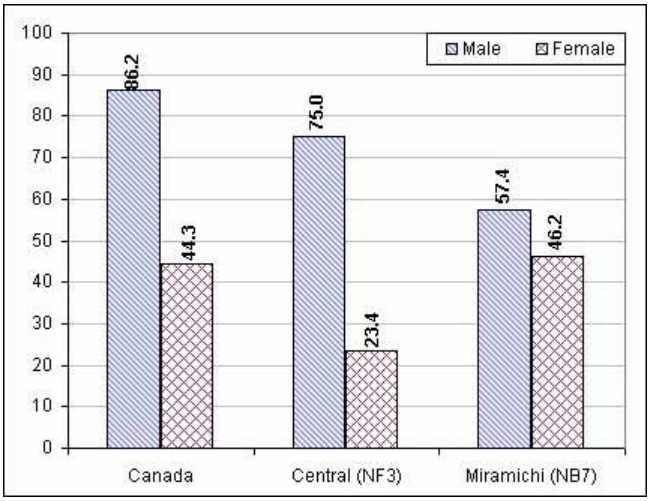
Respiratory death rates were higher for males in all Atlantic health districts, with males about twice as likely to die respiratory diseases as females in most districts (Figure 239). In some health districts, the disparity was even greater. In Central (NF3), for example, the male rate was three times the female rate (75.0 males, 23.4 females). Miramichi (NB7) had the smallest gender gap in the region (Figure 240).

Figure 239. Age-standardized all respiratory disease death rate per 100,000, by sex, Canada and Atlantic health districts, showing gender gaps, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

Figure 240. Age-standardized all respiratory disease death rate per 100,000, Canada and Atlantic health districts with the highest and lowest gender variances, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

3.1.7.2 Pneumonia and influenza

Seniors, aged 65 and older, as well as very young children and those suffering from chronic diseases are at greater risk of experiencing more severe and long lasting complications due to influenza. Influenza is particularly dangerous for elderly people because it increases the risk of developing pneumonia and of exacerbating existing heart and other conditions.[105] The very elderly account for the more than 80% of pneumonia and influenza deaths in Canada. According to Statistics Canada, 6,618 of the 8,030 Canadians who died from pneumonia and influenza in 1997 were older than 75.[106]

Vaccination offers increased protection from both influenza and pneumonia among seniors, and has also been demonstrated to lower the risk of hospitalization for cardiac and cerebrovascular disease. Analyzing data on more than 286,000 U.S. seniors, researchers found that, during both the 1998–1999 and 1999–2000 influenza seasons, those vaccinated against influenza had a significantly lower risk of hospitalization for cardiac disease, cerebrovascular disease, and influenza and pneumonia than unvaccinated subjects. Vaccination was also associated with a lower risk of death from any cause.[107]

In Part A, it was shown that Canadian women, 65 and over, are more likely than senior men to have had a flu shot – 29.1% of senior women and 22.4% of senior men had a flu shot within the last year. Newfoundland has the lowest rate of flu immunization in the country, with seniors in that province less than half as likely as other Canadians to have had a flu shot (Volume A, Figure 76).

Using the 1996 Statistics Canada data – the most recently available for all Atlantic region health districts – pneumonia and influenza national death rates were 31.1 per 100,000 for males and 18.8 for females, for a combined average for both sexes of 23.3. Prince Edward Island and Nova Scotia had the highest influence and pneumonia death rates in the country both for males and for females. By contrast, New Brunswick had the lowest influenza and pneumonia death rate in Canada (Table C2).

Among the 21 Atlantic health districts, the highest pneumonia and influenza death rates were in Labrador (NF6) at 37.2, PEI/Urban at 36.3, Annapolis Valley (NS2) at 33.8, Pictou-GASHA (NS4) at 33.4, and Capital (NS6) at 30.7.

[105] Health Canada, Population and Public Health Branch, information sheet on influenza, available at: http://www.hc-sc.gc.ca/pphb-dgspsp/publicat/info/infflu_e.html. See also Government of Ontario bulletin available at: http://www.healthyontario.com/english/news_details.asp?channel_id=4&text_id=879

[106] Sibbald, Barbara, "Estimates of flu related deaths rise with new statistical models," in *Canadian Medical Association Journal* 168 (6), 18 March, 2003, available at: http://www.cmaj.ca/cgi/content/full/168/6/761-a. Accessed 9 November, 2003.

[107] New England Journal of Medicine, Vol 348, No 14, 3 April 2003, cited in Health Canada, *Infectious Diseases News Brief,* April 11, 2003, available at: http://www.hc-sc.gc.ca/pphb-dgspsp/bid-bmi/dsd-dsm/nb-ab/2003/nb1503_e.html, accessed 9 November, 2003.

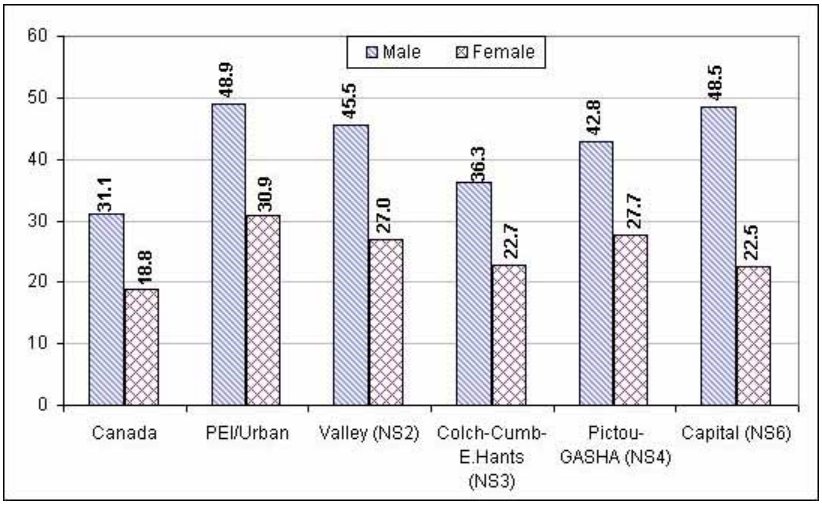
Table C2. Pneumonia and influenza deaths (ICD-9 480-487), age-standardized rate per 100,000 population, by sex, Canada and Atlantic Provinces, 1996

	Canada	Newfoundland and Labrador	Prince Edward Island	Nova Scotia	New Brunswick
Both sexes	23.3	21.2	32.1	29.1	17.3
Males	31.1	33.4	48.1	39.3	21.3
Females	18.8	14.0	23.6	23.6	14.9

Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 9 November, 2003.

The highest pneumonia and influenza death rates for males were in PEI/Urban at 48.9, Capital (NS6) at 48.5, PEI/Rural at 47.4, Valley (NS2) at 45.5, and Eastern Newfoundland (NF2) at 44.7. The highest rates for females were in PEI/Urban at 30.9, Pictou-GASHA (NS4) at 27.7, Valley (NS2) at 27.0, Cape Breton (NS5) at 23.2, Colchester-Cumberland-East Hants (NS3) at 22.7, and Capital (NS6) at 22.5 (Figures 241 and 243).

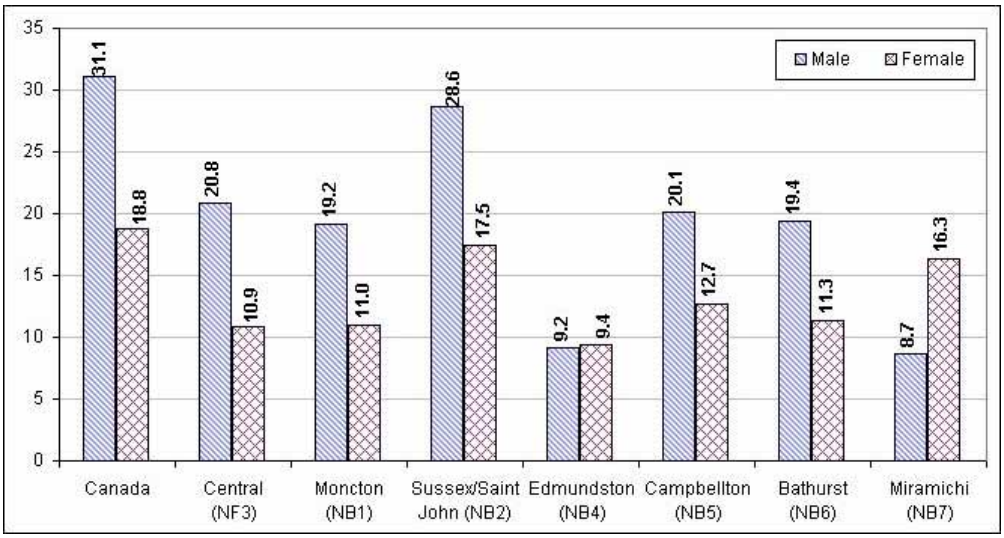
Figure 241. Age-standardized pneumonia and influenza death rate per 100,000, by sex, Canada and selected Atlantic health districts with high rates, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

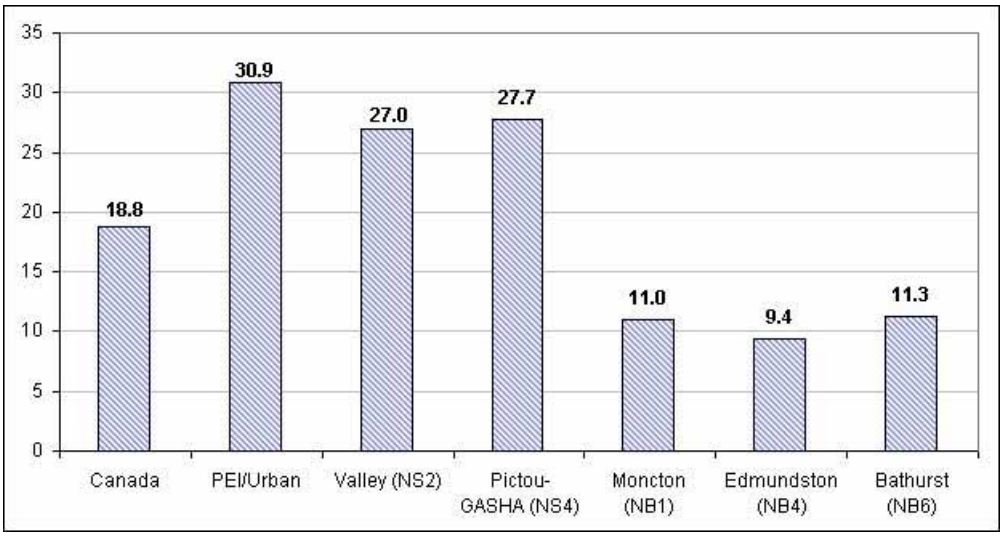
The lowest regional pneumonia and influenza death rates were all in New Brunswick – in Edmundston (NB4) at 10.1, Miramichi (NB7) at 13.5, Moncton (NB1) at 13.8, and Bathurst (NB6) at 14.3, followed by Central (NF3) at 14.9, Grenfell (NF5) at 15, and Campbellton (NB5) at 15.8 (Figure 242).

Figure 242. Age-standardized pneumonia and influenza death rate per 100,000, Canada and selected Atlantic health districts with low rates, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

Figure 243. Age-standardized pneumonia and influenza death rate per 100,000, females, Canada and selected Atlantic health districts, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

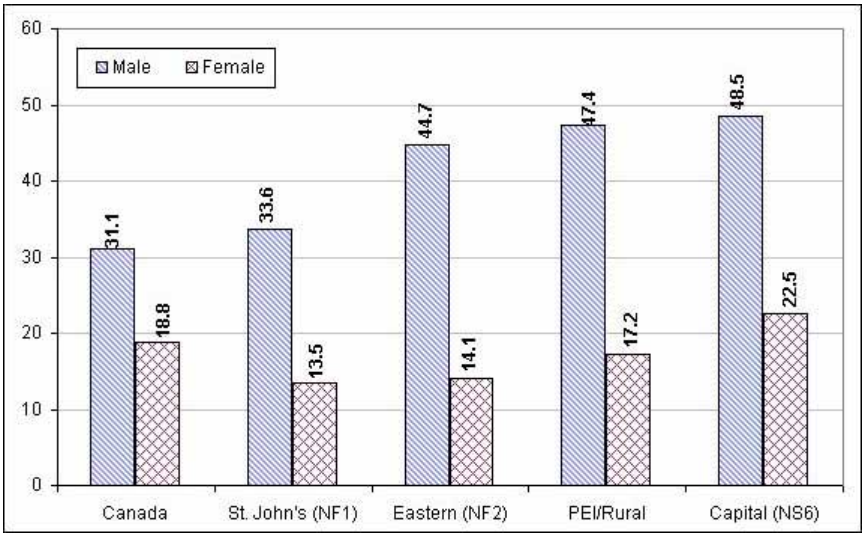
Age-standardized rates for males and females in Grenfell (NF5) and Labrador (NF6) were suppressed due to both a very small underlying count plus extremely high variability. Among

health districts reporting for both sexes, PEI/Urban had the highest rates for both males and females – 57% and 64% respectively above the national averages.

In almost all Atlantic region health districts, males were substantially more likely to die of pneumonia and influenza than females, with Miramichi (NB7) a notable exception at 8.7 per 100,000 for males and 16.3 for females. In some health districts, males were twice as likely as females to die of pneumonia or influenza, and in Eastern (NF2) the death rate for males (44.7) was three times that of females (14.1) (Figure 244).

As with all health district data, caution must be exercised in making comparisons and interpreting results, due to wide confidence intervals and high variability.

Figure 244. Age-standardized pneumonia and influenza death rate per 100,000, by sex, Canada and selected Atlantic health districts with a wide gender gap, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

3.1.7.3 Bronchitis, emphysema and asthma deaths

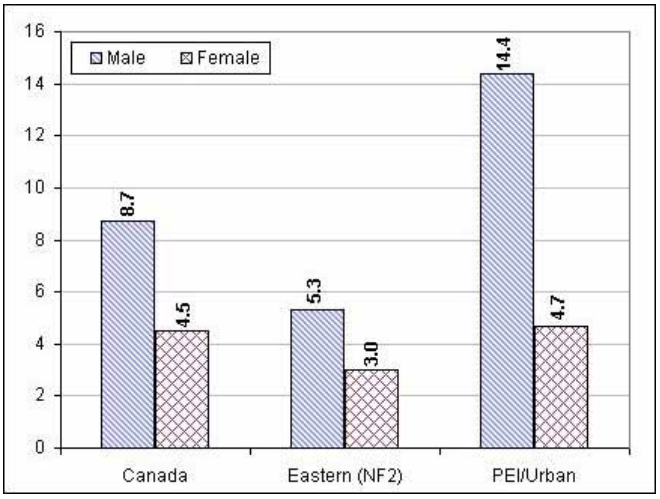
Chronic Obstructive Pulmonary Disease (COPD) includes both emphysema, in which the walls and elasticity of the alveoli are damaged, and chronic bronchitis, where the cells lining the inside of bronchi are inflamed, thereby increasing the risk of infection and obstructing airflow in and out of the lungs. Smoking is responsible for about 80% of COPD cases, while other forms of air pollution may also play a role. Symptoms include cough, production of mucous, and shortness of breath. No cure exists for COPD. Asthma is an inflammation of the airways, characterized by periodic attacks of wheezing, shortness of breath, chest tightness, and coughing.[108]

[108] Health Canada, "*Health and Air Quality*," available at: http://www.hc-sc.gc.ca/hecs-sesc/air_quality/heart_lung.htm.

Again using the 1996 Statistics Canada data that are available at the health district level, the national death rates for bronchitis, emphysema and asthma were 8.7 per 100,000 for males, 4.5 for females, and 6.1 for both sexes combined. In 1996, Prince Edward Island had the second highest rate of bronchitis, emphysema and asthma deaths in the country (7.1) after Quebec (8.2). The PEI rate was 11.4 for males and 4.7 for females, compared to 9.0 and 3.7 in Nova Scotia, 8.2 and 3.9 in New Brunswick, and 5.8 and 2.6 in Newfoundland and Labrador.

Sixteen Atlantic health districts reported data on this indicator for both males and females.[109] The highest bronchitis, emphysema and asthma death rates were in Cape Breton (NS5) at 9.2, and PEI/Urban at 8.1. PEI/Urban at 14.4, and Cape Breton (NS5) at 14.2 also had the highest regional rates for males – 65% higher than the national average, and Cape Breton (NS5) at 6.0 had the highest rate for females. Substantially more males than females died of bronchitis, emphysema and asthma, with the gender gap particularly wide in Annapolis Valley (NS2), Bathurst (NB6), and some other districts (Figures 245 and 246).

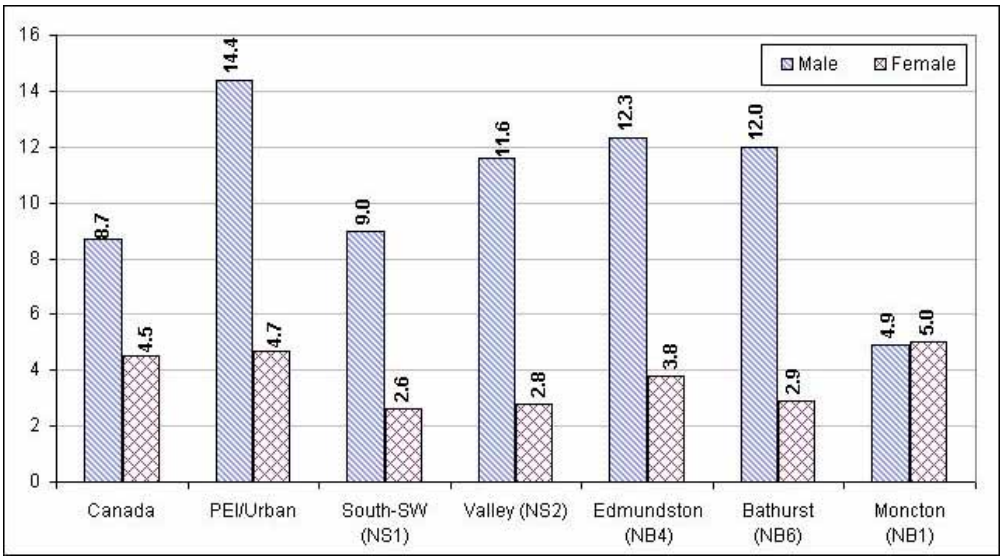
Figure 245. Age-standardized bronchitis, emphysema and asthma death rate per 100,000, by sex, Canada and selected Atlantic health districts, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

[109] Male and female data for Central (NF3), Grenfell (NF5), Labrador (NF6), and Campbellton (NB5), as well as female data for Miramichi (NB7) were suppressed due to both a very small underlying count plus extremely high variability.

Figure 246. Age-standardized bronchitis, emphysema and asthma death rate per 100,000, Canada and selected Atlantic health districts with a wide male-female gap, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

3.1.7.4 All other respiratory disease deaths

According to the 1996 data – the latest available at the health district level – the national death rate for all other respiratory disease was 46.4 per 100,000 for males, 20.9 per 100,000 for females, and 30.3 for both sexes combined. Nova Scotia had the highest death rate in the country for other respiratory diseases for both sexes combined (36.2), followed by Quebec (35.8), and New Brunswick (34.7). By gender the rates for Nova Scotia were 56.9 (male) and 24.0 (female), for New Brunswick – 52.7 and 24.3, for PEI – 39.3 and 19.2, and for Newfoundland and Labrador – 51.1 and 19.4.

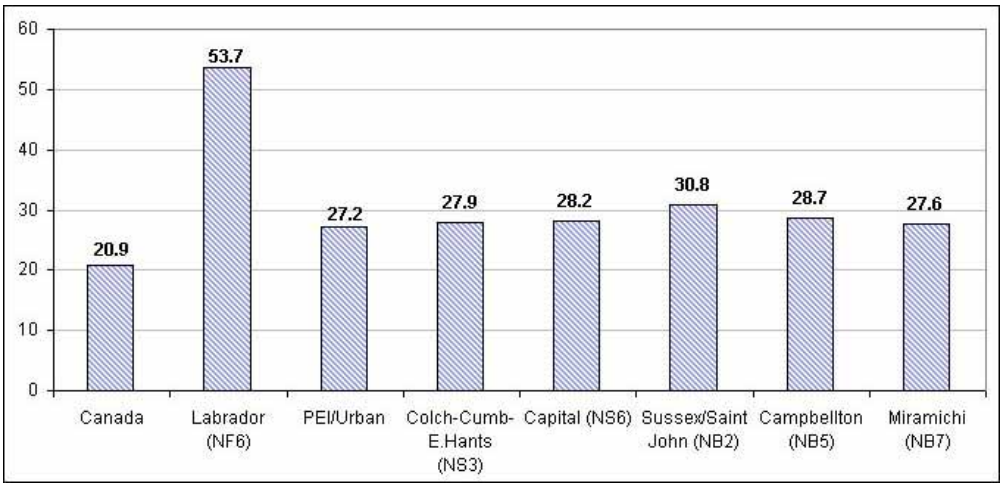
Labrador (NF6) had by far the highest death rates in Atlantic Canada for other respiratory diseases for both males (86.0 per 100,000) and for females (53.7) – 85% and 157% higher than the national averages for males and females. This undoubtedly reflects the fact that both males and females in Labrador also register the highest smoking rates in Atlantic Canada.

Of the 20 Atlantic health districts that reported other respiratory disease death rates for females in 1996,[110] the highest female rates (aside from Labrador) were in Sussex/Saint John (NB2) at 30.8, Capital (NS6) at 28.2, Campbellton (NB5) at 28.7, Colchester-Cumberland-East Hants (NS3) at 27.9, Miramichi (NB7) at 27.6, and PEI/Urban at 27.2. The lowest were in Central (NF3) at 12.0 and PEI/Rural at 12.3 (Figures 247 and 248). Districts with high males rates

[110] The female age-standardized death rate for other respiratory diseases for Grenfell (NF5) was suppressed due to both a very small underlying count and extremely high variability.

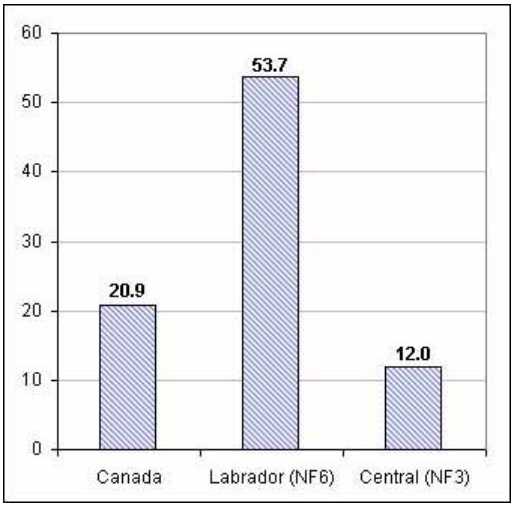
included Cape Breton (NS5) at 78.3, Fredericton (NB3) at 63.9, Capital (NS6) at 61.2, and Edmundston (NB4) at 60.6 (Figure 249).

Figure 247. Age-standardized all other respiratory disease death rate per 100,000, females, Canada and selected Atlantic health districts, 1996 (rate)



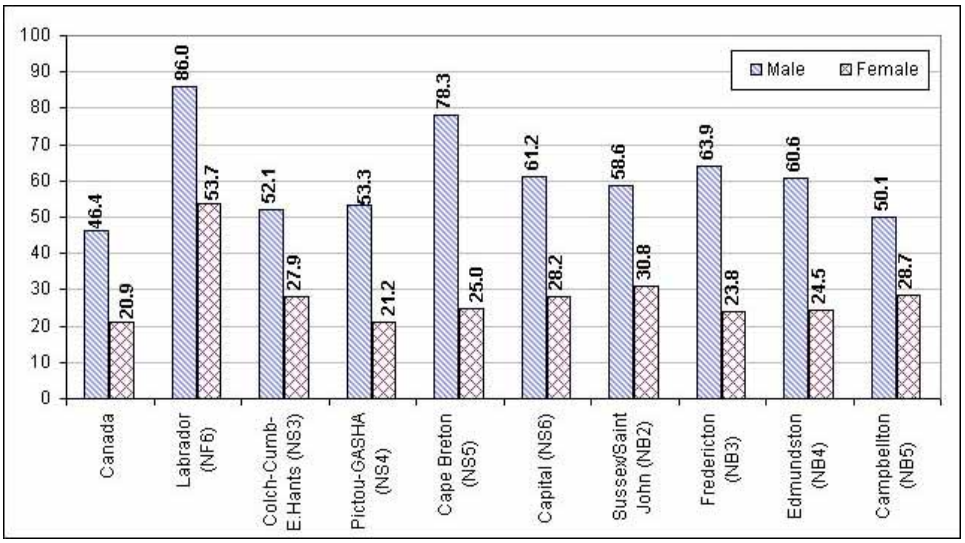
Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

Figure 248. Age-standardized all other respiratory disease death rate per 100,000, females, Canada and Atlantic health districts with the highest and lowest rates, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

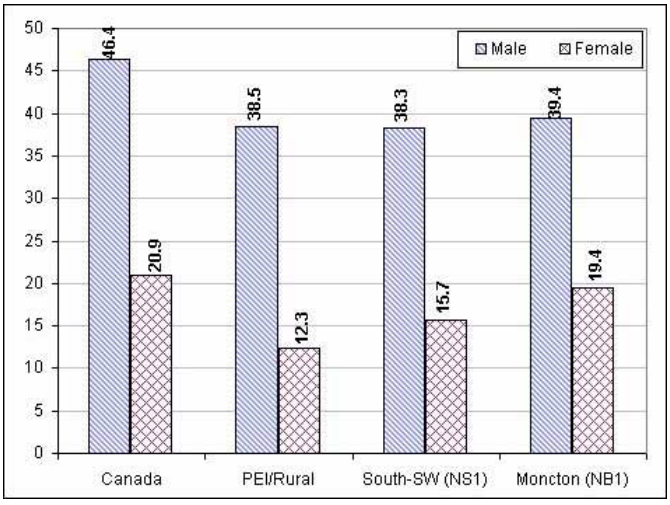
Figure 249. Age-standardized all other respiratory disease death rate per 100,000, by sex, Canada and selected Atlantic health districts with high rates, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

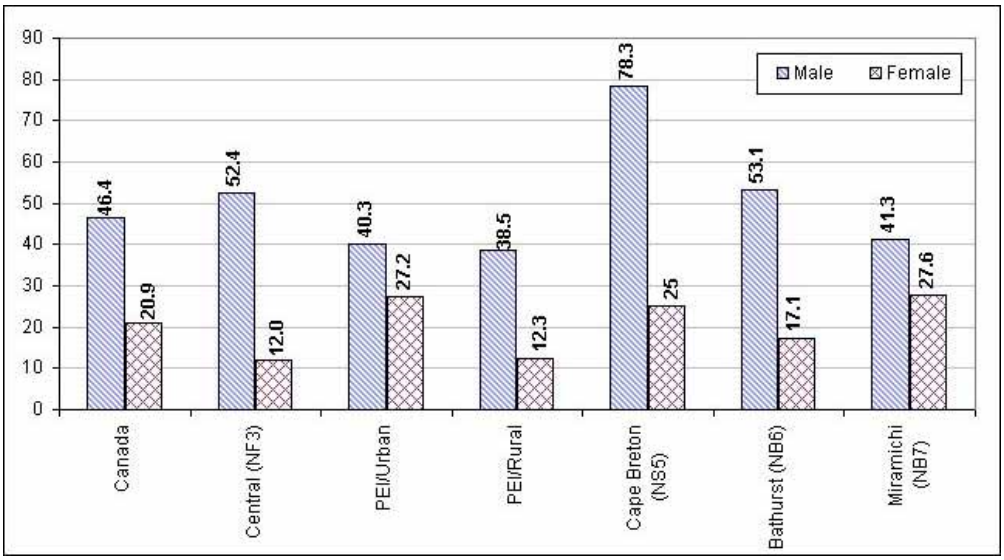
The only health districts with death rates below the national average for other respiratory diseases for both sexes combined were PEI/Rural at 23.3, South-Southwest (NS1) at 24.6, Grenfell (NF5) at 26, Moncton (NB1) at 26.7, Central (NF3) at 29.3, and St. John's (NF1) at 29.9 (Figure 250). With few exceptions, males in most health districts were more than twice as likely as females to die of other respiratory diseases deaths, with the widest gap in Central (NF3) at more than 4 to 1 (Figure 251).

Figure 250. Age-standardized all other respiratory disease death rate per 100,000, by sex, Canada and selected Atlantic health districts with the lower than average rates, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

Figure 251. Age-standardized all other respiratory disease death rate per 100,000, Canada and selected Atlantic health districts with wide gender gaps, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996; at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/deaths3.htm, extracted on 11 January, 2003.

3.1.8 Deaths due to medically treatable diseases

Medically treatable diseases include cervical cancer, bacterial infections, and hypertensive disease. For these diseases, Statistics Canada provides age-standardized death rates per 100,000 for the population aged 5 to 64. For the population aged 5 to 49, pneumonia and unspecified bronchitis are also regarded as medically treatable. Deaths due to medically treatable diseases are an indicator of health system performance.

For all four of these disease categories, Statistics Canada does not report data for many Atlantic health districts due to both a very small underlying count and extremely high variability.[111]

3.1.8.1 Deaths due to medically treatable diseases: cervical cancer

Definition

"Age-standardized rate of deaths due to cervical cancer (ICD-9 180) for females aged 5 to 64.

"The early detection and treatment of cervical cancer appears to be effective in reducing mortality from this disease."[112]

[111] Death rates due to medically treatable diseases are available at: http://www.statcan.ca/english/freepub/82-221-XIE/00502/sysperform/effectiveness1.htm.
[112] Statistics Canada http://www.statcan.ca/english/freepub/82-221-XIE/00502/defin3.htm#66.

Data Source

Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) (1996 data).

Rates are age-standardized using the direct method, and the 1991 Canadian Census population structure. All cervical cancer death rates are per 100,000 population of the specified age group.

Results

In 1996, the highest cervical cancer death rates in the country for females under 65 were in Newfoundland and Labrador and Nova Scotia (both 2.9 per 100,000). The New Brunswick rate was the same as the national average (1.8), and PEI data were suppressed due to both a very small underlying count and extremely high variability. The Atlantic health districts with the highest cervical cancer death rates for females under 65 were Western (NF4) at 5.3 and Cape Breton (NS5) at 5.4 — three times higher than the national average.[113]

3.1.8.2 Deaths due to medically treatable diseases: bacterial infections

Definition

"Age-standardized rate of deaths due to bacterial infections (ICD-9 001-005, 020-041, 320, 382, 383, 390-392, 680-686, 711, 730) for persons aged 5 to 64.

"For the specified age groups, the majority of people with such infections should respond adequately to antibiotics if treated promptly and correctly."[114]

Data Source

Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) (1996 data).

Rates are age-standardized using the direct method, and the 1991 Canadian Census population structure. All bacterial infection death rates are per 100,000 population of the specified age group. All rate comparisons in the following section refer to age-standardized bacterial infection death rates.

Results

In 1996, Nova Scotia had the highest death rate in the country for medically treatable bacterial infections in those under age 65 for both sexes combined (1.2 per 100,000), compared to 0.8 in

[113] Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996, at http://www.statcan.ca/english/freepub/82-221-XIE/00502/tables/html/368.htm, extracted on 11 January, 2003.
[114] Statistics Canada: http://www.statcan.ca/english/freepub/82-221-XIE/00502/defin3.htm#66.

Canada, 0.7 in New Brunswick, and 0.6 in Newfoundland and Labrador. The PEI rate was suppressed due to high sampling variability.

For males, the national rate of deaths due to medically treatable bacterial infections (under age 65) was 0.8 per 100,000. Nova Scotia's rate was slightly higher (0.9) than the national average. Newfoundland and Labrador had the same rate (0.8) and New Brunswick's rate (0.7) was slightly lower than the national rate. PEI's male rate was suppressed due to high sampling variability.

For females, the national rate of deaths due to medically treatable bacterial infections was 0.8 per 100,000. Nova Scotia had the highest female death rate for medically treatable bacterial infections in the country (1.5) – almost double the national average. The Newfoundland and Labrador female rate was suppressed due to high sampling variability. The PEI rate was 0.0, and New Brunswick had the same rate as the national average (0.8).

Among the ten reporting Atlantic health districts, the highest death rates for medically treatable bacterial infections for both sexes combined were all in Nova Scotia – Annapolis Valley (NS2) at 1.8, South-SW (NS1) at 1.4, and Capital (NS6) and Cape Breton (NS5) at 1.3, compared to the national average of 0.8. The highest reported female rates were in Cape Breton (NS5) at 2.1 per 100,000, and Capital (NS6) at 1.5, and the highest male rate was in Capital (NS6) at 1.1, compared to national averages of 0.8 for both males and females.[115]

3.1.8.3 Deaths due to medically treatable diseases: pneumonia and unspecified bronchitis

Definition

"Age-standardized rate of deaths due to pneumonia and unspecified bronchitis (ICD-9 481-486, 490) for persons aged 5 to 49.

"Most pneumonia should respond adequately to antibiotics. With appropriate care, the survival rate should be high for the specified age groups."[116]

Data Source

Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) (1996 data).

Rates are age-standardized using the direct method, and the 1991 Canadian Census population structure. All pneumonia and unspecified bronchitis death rates are per 100,000 population of the specified age group. All rate comparisons in the following section refer to age-standardized pneumonia and unspecified bronchitis death rates.

[115] Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996, at http://www.statcan.ca/english/freepub/82-221-XIE/00502/tables/html/367.htm, extracted on 11 January, 2003.
[116] Statistics Canada: http://www.statcan.ca/english/freepub/82-221-XIE/00502/defin3.htm#66.

Results

Nationally, the 1996 death rate for medically treatable pneumonia and unspecified bronchitis (under age 50) was 0.8 per 100,000 (1.0 for males, 0.7 for females). The Nova Scotia rate was 1.1 (male 1.1, female 1.2), with the Capital health district (NS6) reporting a rate of 1.9 (male 2.7, female 1.2). The Newfoundland and Labrador rate was 0.6 (male 1.0; female rate suppressed due to high sampling variability). The PEI rate was suppressed. The New Brunswick rate was 0.4 (male rate suppressed, female 0.5).[117]

3.1.8.4 Deaths due to medically treatable diseases: hypertensive disease

Definition

"Age-standardized rate of deaths due to hypertensive disease (ICD-9 401-405) for persons aged 5 to 64.

"Intervention on people with hypertensive disease has been shown to decrease morbidity and mortality."[118]

Data Source

Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) (1996 data).

Rates are age-standardized using the direct method, and the 1991 Canadian Census population structure. All hypertensive disease death rates are per 100,000 population of the specified age group. All rate comparisons in the following section refer to age-standardized hypertensive disease death rates.

Results

Obesity and physical inactivity are both known risk factors for hypertension. Epidemiological evidence demonstrates that overweight people with a body mass index (BMI) in excess of 27 have a 150% higher relative risk of hypertension compared to those with healthy weights.[119] Based on this risk and on the prevalence of overweight in Nova Scotia, it has been estimated that 36.5% of the incidence of hypertension in Nova Scotia is attributable to overweight (BMI ≥ 27).[120]

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[117] Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996, at http://www.statcan.ca/english/freepub/82-221-XIE/00502/tables/html/3610.htm, extracted on 11 January, 2003.
[118] Statistics Canada: http://www.statcan.ca/english/freepub/82-221-XIE/00502/defin3.htm#66.
[119] Birmingham, C. Laird, M.D., et al., "The Cost of Obesity in Canada," *Canadian Medical Association Journal* 160 (4), 23 February, 1999.
[120] Colman, Ronald, *The Cost of Obesity in Nova Scotia,* GPI Atlantic, Halifax, March, 2000, Table 1.

Epidemiological evidence indicates that physically inactive people have a 40% higher relative risk of hypertension than those who are physically active.[121] Based on this risk and on the prevalence of physical inactivity in Nova Scotia, it has been estimated that 20% of the incidence of hypertension in Nova Scotia is attributable to physical inactivity.[122]

In 1996, Newfoundland and Labrador and Alberta had the highest medically treatable hypertensive disease death rates for both sexes combined in people under age 65 in the country (0.9 per 100,000, male 1.2, female 0.7). Newfoundland and Labrador had the highest hypertensive disease death rate for females under age 65 in Canada at 0.7 per 100,000, followed by Nova Scotia and Alberta at 0.6 – twice the national rate of 0.3. The national rates were 0.5 per 100,000 for both sexes combined, 0.7 for males, and 0.3 for females. Medically treatable hypertensive disease death rates were zero in PEI, 0.7 per 100,000 in Nova Scotia (male 0.7, female 0.6), and 0.3 in New Brunswick (male 0.5, female rate suppressed.)[123]

The Atlantic health districts with the highest rates were St. John's (NF1) at 1.7 (male 2.0, female rate suppressed) and Cape Breton (NS5) at 1.6 (male 2.2, female rate suppressed).

3.1.9 Thirty day acute myocardial infarction (AMI) in-hospital mortality rate

Definition

"The risk adjusted rate of all cause in-hospital death occurring within 30 days of first admission to an acute care hospital with a diagnosis of AMI.

"To enable comparison across regions, a statistical model was used to adjust for differences in age, sex and co-morbidities. Inter-regional variation in 30-day in-hospital mortality rates may be due to jurisdictional and institutional differences in standards of care, as well as other factors that were not included in the adjustment. These rates should be interpreted with caution due to potential differences in the coding of co-morbid conditions across provinces and territories."[124]

Rates for Newfoundland, British Columbia and Quebec are not available due to differences in coding of AMI (Newfoundland), Emergency Room admissions (BC), and the absence of a diagnosis type (Quebec).

Data Source

Canadian Institute for Health Information, Hospital Morbidity Database.

[121] Katzmarzyk, Peter, Normal Gledhill, and Roy Shephard, "The Economic Burden of Physical Inactivity in Canada," *Canadian Medical Association Journal* 163 (11), 28 November, 2000.
[122] Colman, Ronald, *The Cost of Physical Inactivity in Nova Scotia,* GPI Atlantic, Halifax, July, 2002.
[123] Statistics Canada, Vital Statistics, Death Database, and Demography Division (population estimates) 1996, at http://www.statcan.ca/english/freepub/82-221-XIE/00502/tables/html/369.htm, extracted on 11 January, 2003.
[124] Statistics Canada: http://www.statcan.ca/english/freepub/82-221-XIE/00502/defin1.htm#5.

Results

The 30-day acute myocardial infarction in-hospital mortality rate for 2002 was 12.7% in Prince Edward Island, and 13.0% in Nova Scotia and New Brunswick, compared to the national rate of 12.6. CIHI's 2003 estimates are 12.3% in PEI and New Brunswick and 13.4% in Nova Scotia (the highest rate in the country among the seven reporting provinces), compared to a national rate of 12.1%[125]

3.1.10 Thirty day stroke in-hospital mortality rate

Definition

"The risk adjusted rate of all cause in-hospital death occurring within 30 days of first admission to an acute care hospital with a diagnosis of stroke.

"To enable comparison across regions, a statistical model was used to adjust for differences in age, sex and co-morbidities. Adjusted mortality rates following stroke may reflect, for example, the underlying effectiveness of treatment and quality of care. Inter-regional variations in rates may be due to jurisdictional and institutional differences in standards of care, as well as other factors that are not included in the adjustment. These rates should be interpreted with caution due to potential differences in the coding of co-morbid conditions across provinces and territories."[126]

Rates for British Columbia and Quebec are not available due to differences in coding of Emergency Room admissions (BC), and the absence of a diagnosis type (Quebec).

Data Source

Canadian Institute for Health Information, Hospital Morbidity Database.

Results

The thirty-day stroke in-hospital mortality rate in 2002 for Newfoundland and Labrador was 24.4% (the highest rate in the country), Prince Edward Island 15.1%, Nova Scotia 24.1% (second highest), and New Brunswick 21.9% (third highest), compared to the national rate of 19.2%. In 2003, among the eight reporting provinces, Nova Scotia has the highest 30-day stroke in-hospital mortality rate in the country at 25.2%, followed by Newfoundland and Labrador at 23.6%, and New Brunswick at 21%, compared to the national rate of 18.9% and the PEI rate of 19.1%.[127]

[125] CIHI Health Indicator Reports, available at: http://www.cihi.ca/hirpt/jsp/HIDispatcher.jsp, which in turn is accessible through http://www.cihi.ca/hirpt/jsp/En_HIQuery.jsp?SelIndicator=108. Accessed February, 2003.
[126] Statistics Canada: http://www.statcan.ca/english/freepub/82-221-XIE/00502/defin3.htm#66.
[127] CIHI Health Indicator Reports, available at: http://www.cihi.ca/hirpt/jsp/HIDispatcher.jsp, which in turn is accessible through http://www.cihi.ca/hirpt/jsp/En_HIQuery.jsp?SelIndicator=108. Accessed February, 2003.

Summary – Death Rates

Using 1996 data – the latest available at the health district level – all four Atlantic Provinces had higher total mortality rates than the national average. Among the leading causes of death are:

- **Circulatory diseases:** All four Atlantic Provinces had higher rates of circulatory disease deaths both for males and for females compared to Canada, with Newfoundland and Labrador having the highest rates in the country. Newfoundland and Labrador also had the highest rates for ischaemic heart disease and cerebrovascular disease.
- **Unintentional injury death rate:** All four Atlantic Provinces had lower rates of unintentional injury deaths for females, while the three Maritime Provinces had higher rates for males. Newfoundland had the lowest rate of unintentional injury deaths in the country, but Labrador has the highest rate in Atlantic Canada.
- **Cancer death rate:** The four Atlantic Provinces all had higher cancer death rates than the national average, and Nova Scotia had the highest rate in the country. Cape Breton had the highest cancer death rate in Atlantic Canada. All four provinces had higher rates of lung cancer deaths than the national average for both males and females.
- **Respiratory disease death rate:** Nova Scotia had the highest respiratory disease death rates in the country for both males and females.
- **Medically treatable disease death rates:** Cervical cancer death rates for females under age 65 in Atlantic Canada were significantly higher than the national average.

3.2 Disease Prevalence

Please note that descriptions of the relevance of these morbidity indicators are largely included in the mortality section of this volume, and therefore not repeated in this section. For brief overviews on the various cancers, asthma, hypertension, and HIV/AIDS, please see the relevant sections of the mortality data. Here, we include brief descriptions only of those diseases (arthritis/rheumatism, and diabetes) not covered in the earlier mortality section.

3.2.1 Musculoskeletal Disorders: Arthritis/rheumatism

Musculoskeletal disorders account for higher disability costs than any other category of illness in Canada, with arthritis and osteoporosis together accounting for greater productivity losses due to long-term disability than any other diagnostic category.[128] One U.S. study estimated that arthritis and heart disease were each responsible for about 15% of total disability in that country.[129]

Arthritis refers to inflammatory conditions affecting the joints, and rheumatism also describes painful inflammations of the joints or muscles.[130] Osteoporosis is a condition of decreased bone mass that may occur with ageing, leading to fragile bones that are at increased risk for serious fall injuries, and fractures.[131] Low calcium intake, vitamin D deficiency, and poor nutrition are linked to low bone mass and bone fragility, which in turn contribute to fracture risk.[132]

Death certificates and hospital records frequently list immediate rather than underlying conditions, so that death and disability costs may be attributed to a resulting injury rather than to the osteoporosis that may be their underlying cause.[133] For example, unintentional falls account for more than half of all hospital injury admissions in Canada, 67% of all hospital days due to injury, and 75% of all in-hospital injury deaths. Seniors 65 and older account for 48% of all fractures and dislocations of the lower limbs and 27% of all fractures and dislocations of the upper limbs.[134] One study found that hip fracture incidence, frequently the result of osteoporosis, is about 130 cases per 100,000 population in most western nations.[135]

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[128] Health Canada, *Economic Burden of Illness in Canada 1998,* Ottawa, December, 2002.
[129] McDuffie, Frederic, et al., "Arthritis and Musculoskeletal Diseases," in Amler, Robert, and Bruce Hull (eds.), *Closing the Gap: The Burden of Unnecessary Illness,* Oxford University Press, New York and Oxford, 1987, page 19.
[130] For details on arthritis, see The Arthritis Society web site at www.arthritis.ca.
[131] "Osteoporosis: Making the diagnosis of osteoporosis," at: http://www.endocrineweb.com/osteoporosis/diagnosis.html.
[132] Heaney, Robert, "Hip Fracture: A Nutritional Perspective," *Proceedings of the Society for Experimental and Biological Medicine*, 200: 153-156, 1992, cited in Province of British Columbia (1996), *Cost Effectiveness/Value of Nutrition Services: An Annotated Bibliography*, prepared by the Nutrition Section, Prevention and Health Promotion, Ministry of Health, Province of British Columbia, July, 1996, page 37.
[133] Colman, Ronald, *The Cost of Chronic Disease in Nova Scotia,* GPI Atlantic, Halifax, 2002, page 7.
[134] Health Canada, *Statistical Report on the Health of Canadians,* Ottawa, 1999, page 243.
[135] Heaney, Robert, "Hip Fracture: A Nutritional Perspective," *Proceedings of the Society for Experimental and Biological Medicine*, 200: 153-156, 1992, cited in Province of British Columbia (1996), *Cost Effectiveness/Value of*

Physical inactivity, obesity, and poor diet are all key modifiable risk factors for chronic musculoskeletal disorders. A substantial portion of the burden of disability caused by these illnesses could therefore be avoided through increases in physical activity, improvements in diet, and weight reduction.

Dr. Graham Colditz of Harvard University's School of Public Health estimates that 15% of the prevalence of osteoarthritis and other musculoskeletal disorders is attributable to obesity.[136] Epidemiological evidence also indicates that physically inactive people have a 60% higher relative risk of osteoporosis than those who are physically active.[137] Based on this risk and on the prevalence of physical inactivity in Nova Scotia, it has been estimated that 27% of the incidence of osteoporosis in Nova Scotia is attributable to physical inactivity.[138]

Statistics Canada's Health Indicators do not include measures of osteoporosis, but they do include measures of arthritis and rheumatism. Statistics Canada's 1994/95 and 1996/97 National Population Health surveys revealed that the major self-reported chronic diseases with the highest number of new cases in Canada were arthritis/rheumatism and non-arthritic back problems. Among seniors aged 65 and over, living in private households, arthritis and rheumatism are the most common chronic health problems reported. Women are 67% more likely to suffer from arthritis or rheumatism, and arthritis is the leading cause of activity limitations for women over 55.[139]

Definition

"Population aged 12 and over who report that they have been diagnosed by a health professional as having arthritis or rheumatism.

"Arthritis/rheumatism includes both rheumatoid arthritis and osteoarthritis, but excludes fibromyalgia."[140]

Data Sources

Statistics Canada, Canadian Community Health Survey, 2000/01, health file; Statistics Canada, National Population Health Survey, 1994/95, 1996/97 and 1998/99, cross sectional sample, health file; Statistics Canada, National Population Health Survey, 1994/95 and 1996/97, cross sectional sample, North component.

Nutrition Services: An Annotated Bibliography, prepared by the Nutrition Section, Prevention and Health Promotion, Ministry of Health, Province of British Columbia, July, 1996, page 37.

[136] Cited in Gardner, Gary, and Brian Halweil, "Nourishing the Underfed and Overfed," in Worldwatch Institute, *State of the World 2000,* W. W. Norton and Co., New York, chapter 4.

[137] Katzmarzyk, Peter, Normal Gledhill, and Roy Shephard, "The Economic Burden of Physical Inactivity in Canada," *Canadian Medical Association Journal* 163 (11), 28 November, 2000.

[138] Colman, Ronald, *The Cost of Physical Inactivity in Nova Scotia,* GPI Atlantic, Halifax, July, 2002.

[139] *Toward a Healthy Future: Second Report on the Health of Canadians*, Health Canada, 1999, page 17. Available at http://www.hc-sc.gc.ca/hppb/phdd/report/toward/report.htm; Health Canada, *Statistical Report on the Health of Canadians,* Ottawa, 1999; and Statistics Canada, Health Indicators, available at: http://www.statcan.ca/english/freepub/82-221-XIE/01002/tables/html/1236.htm.

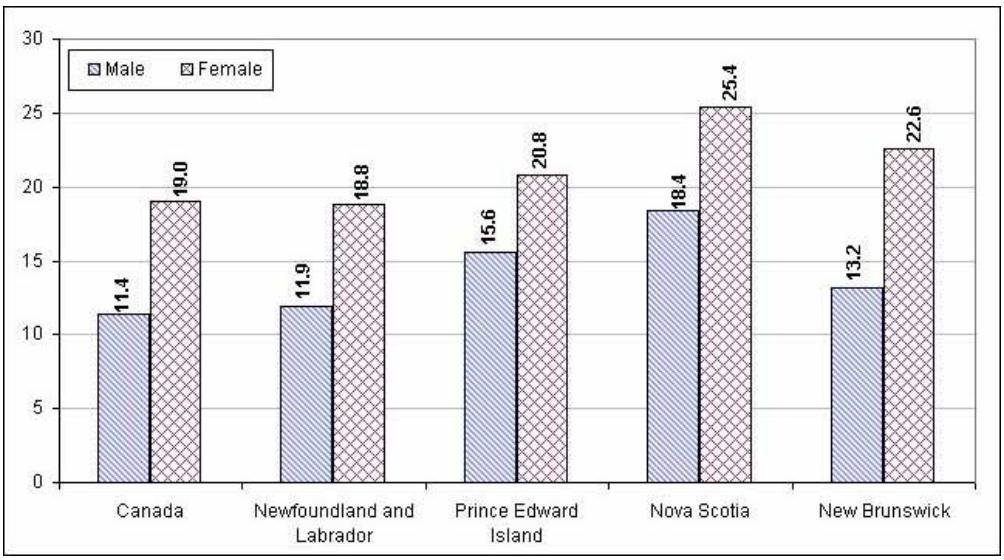
[140] Statistics Canada: http://www.statcan.ca/english/freepub/82-221-XIE/00502/defin1.htm#5.

Results

In 2000/01, Nova Scotia had by far the highest rate of arthritis and rheumatism for both sexes combined in the country – 45% above the national average – with 22% of all Nova Scotians afflicted with the illness, compared to 15.2% of Canadians. The next highest rates were in Saskatchewan (18.5%), Prince Edward Island (18.3%), and New Brunswick (18%). Newfoundland and Labrador had a rate of 15.4% – close to the national average.

Nova Scotia also had by far the highest incidence of arthritis and rheumatism among both males (18.4%) and females (25.4%), compared to the national averages of 11.4% and 19% respectively. The next highest rates for males were in PEI (15.6%), Saskatchewan (14.8%) and New Brunswick (13.2%). The next highest rates for females were in New Brunswick (22.6%), Saskatchewan (22.1%), and PEI (20.8%) (Figure 252).

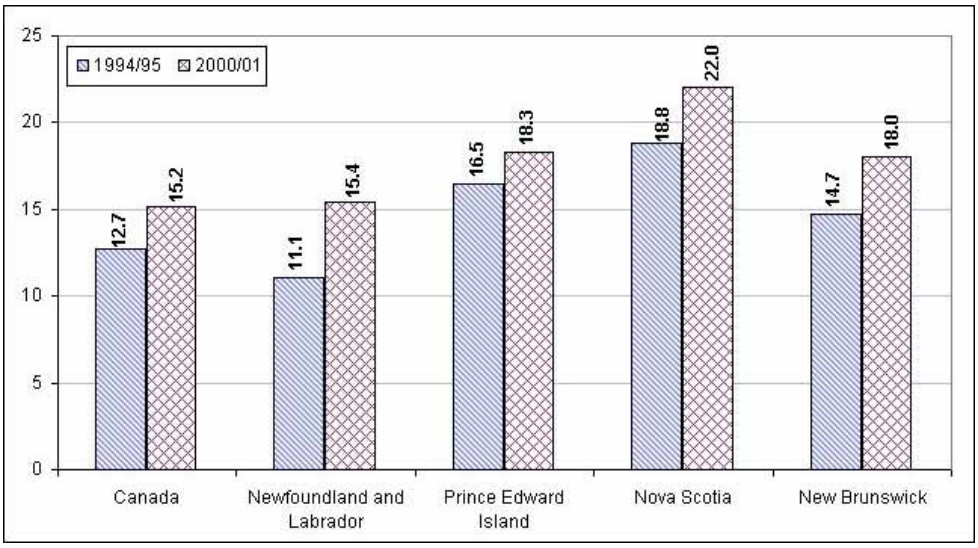
Figure 252. Population aged 12 and over with arthritis/rheumatism, by sex, Canada and Atlantic Provinces, 2000/01 (%)



Source: Statistics Canada, Canadian Community Health Survey, 2000/01, health file; available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/conditions2.htm, extracted 30 December, 2002.

A comparison of the 2000/01 Canadian Community Health Survey with the 1994/95, 1996/97, and 1998/99 National Population Health Surveys indicates that the prevalence of arthritis/rheumatism is steadily increasing both nationally and in Atlantic Canada. For all four Atlantic Provinces, each successive survey shows higher rates of arthritis and rheumatism (Figure 253, and Table 170, Appendix C).

Figure 253. Population aged 12 and over with arthritis/rheumatism, both sexes, Canada and Atlantic Provinces, 1994/95 and 2000/01 (%)



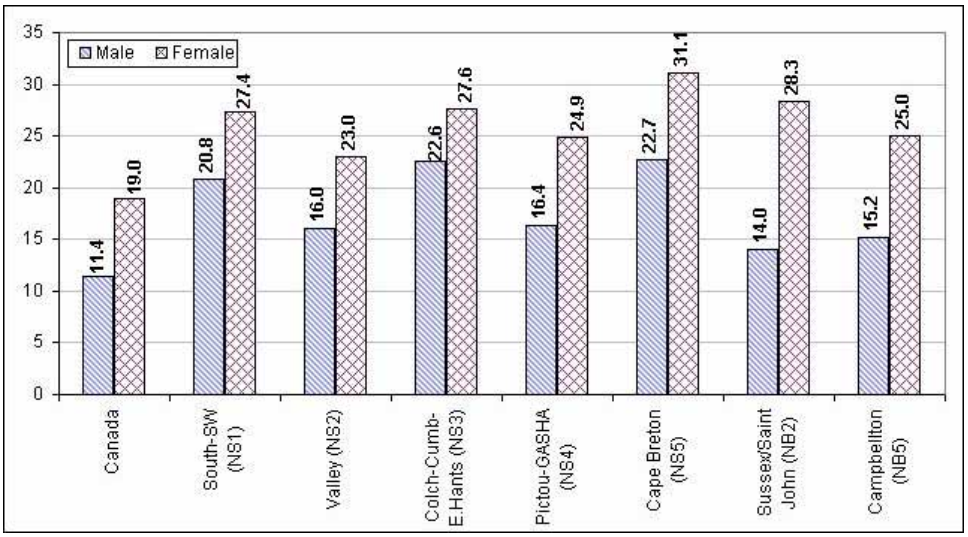
Source: Statistics Canada, Canadian Community Health Survey, 2000/01, health file; Statistics Canada, National Population Health Survey, 1994/95, 1996/97 and 1998/99, cross sectional sample, health file; Statistics Canada, National Population Health Survey, 1994/95 and 1996/97, cross sectional sample, North component; available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/conditions2.htm, extracted 2 February, 2003.

Cape Breton (NS5) had the highest rate of arthritis/rheumatism in Atlantic Canada (27.1%), followed by Colchester-Cumberland-East Hants (NS3) at 25.1% and South-SW (NS1) at 24.1%. Cape Breton also had the highest rates of arthritis/rheumatism for both males and females at 22.7% and 31.1% respectively (Figure 254). Females were substantially more likely to suffer from arthritis/rheumatism than males in every one of Atlantic Canada's 21 health districts (Figure 255).

As with all health district data, caution must be exercised in making comparisons and interpreting results, due to wide confidence intervals and high variability.

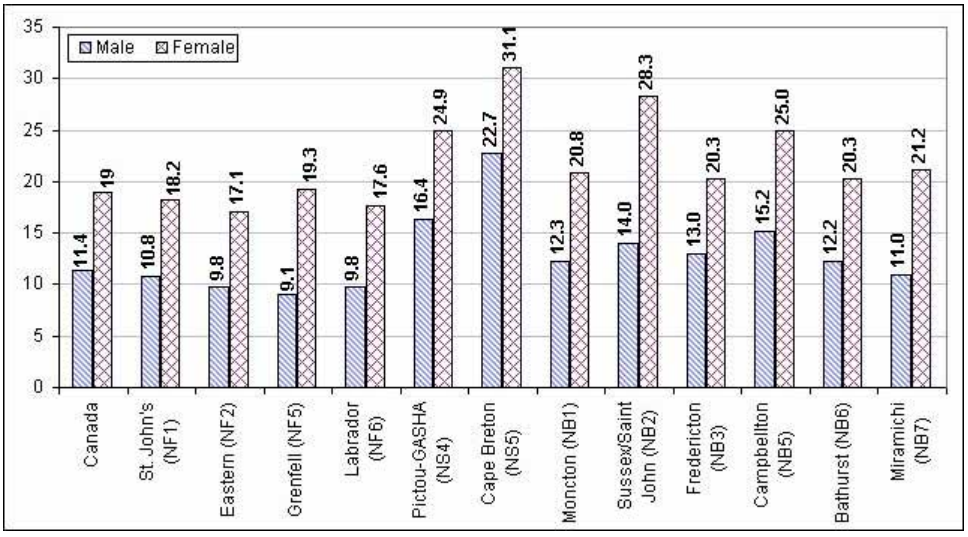
Statistics Canada also provides results for the percentage of the population without arthritis/rheumatism, thus identifying those health districts with the lowest prevalence of these disorders. In Atlantic Canada, these were all in Newfoundland and Labrador, which had the lowest prevalence of arthritis/rheumatism in the region. In Eastern (NF2), 86.5% did not have arthritis or rheumatism in 2000/01, followed by 86.4% in Labrador (NF6), 85.9% in Grenfell (NF5), and 85.4% in St. John's (NF1) (Figure 256).

Figure 254. Population aged 12 and over with arthritis/rheumatism, by sex, Canada and selected Atlantic health districts, 2000/01 (%)



Source: Statistics Canada, Canadian Community Health Survey, 2000/01, health file; available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/conditions2.htm, extracted 30 December, 2002.

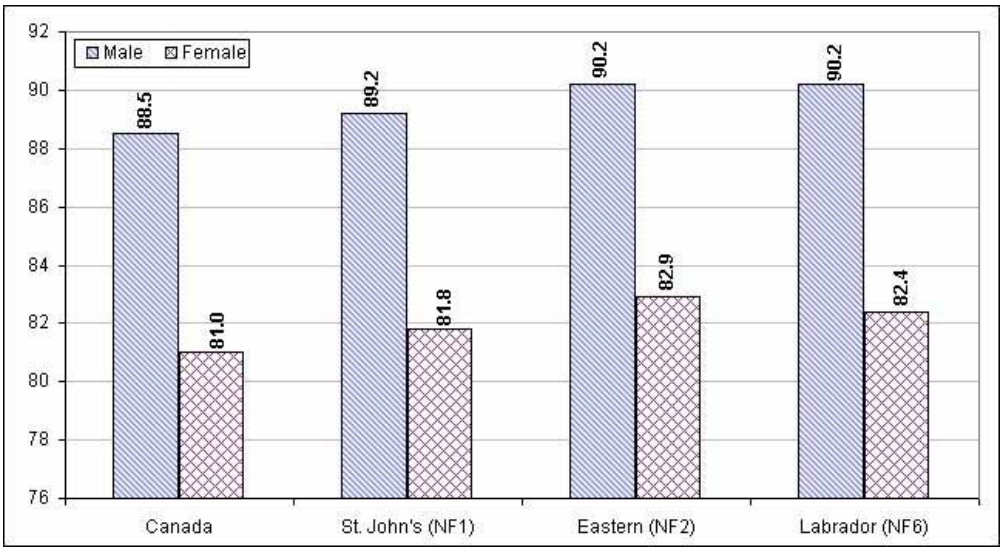
Figure 255. Population aged 12 and over with arthritis/rheumatism, by sex, Canada and selected Atlantic health districts, showing the gender gap, 2000/01 (%)



Source: Statistics Canada, Canadian Community Health Survey, 2000/01, health file; available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/conditions2.htm, extracted 30 December, 2002

Note: Data for males in Bathurst (NB6) have a CV from 16.6% to 33.3% and should be interpreted with caution.

Figure 256. Population aged 12 and over without arthritis, by sex, Canada and selected Atlantic health districts, 2000/01 (%)



Source: Statistics Canada, Canadian Community Health Survey, 2000/01, health file; available at, http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/conditions2.htm, extracted 30 December, 2002.

3.2.2 Diabetes

Diabetes is a serious, lifelong condition that can cause heart disease, kidney failure, and blindness, and often leads to disability and death. More than one million Canadians, and an estimated 105,000 Atlantic Canadians, aged 12 and over, have diabetes.[141] Of these cases, an estimated 92.5% have non-insulin-dependent diabetes mellitus (often called adult-onset diabetes, or diabetes 2). U.S. estimates indicate that diabetes mellitus affects 12 million people in that country.[142]

A study prepared for Nova Scotia's Diabetes Care Program estimated that 4% of the provincial population, and 14% of those aged 65-74, suffer from diabetes 2, with the highest provincial prevalence in Cape Breton County.[143]

Extrapolating from U.S. data on the consequences of diabetes, one study estimated that diabetes is responsible for the total disability of about 3,300 Nova Scotians, including 40 who become blind each year because of diabetic eye disease, more than 200 who receive treatment for kidney failure, and another 200 who undergo diabetes-related lower-extremity amputations. Diabetes is estimated to be the underlying cause of 150 deaths each year in Nova Scotia, and a contributing

[141] Statistics Canada, Canadian Community Health Survey 2000/01, available at: http://www.statcan.ca/english/freepub/82-221-XIE/01002/tables/html/1246.htm. Accessed 10 November, 2003.
[142] Manson, Joann, and Angela Spelsberg, "Primary Prevention of Non-Insulin-Dependent Diabetes Mellitus," *American Journal of Preventive Medicine,* 10 (3), 1994.
[143] LeBlanc, John, "The Prevalence of Diabetes Mellitus in Nova Scotia: What Can We Learn from Routinely Collected Health Data," in *Diabetes Care in Nova Scotia* 8 (4), Diabetes Care Program of Nova Scotia, Halifax, October, 1998.

cause to at least 300 more, for a total of 450 deaths attributable to diabetes (5.7% of all deaths). These premature deaths represent a loss of 5,000 years of life every year in the province.[144]

Because it leads to other serious illnesses, diabetes is under-reported on death certificates, with ensuing conditions like heart disease, stroke, or renal failure listed as the actual cause of death. Consequently, conventional estimates of mortality, disease specific disability, and health expenditures attributed to diabetes are almost certainly underestimates, because of the convention of classifying illnesses by principal diagnosis. Thus, conventional estimates have attributed just 230 deaths a year to diabetes in Nova Scotia (3% of total deaths in the province), whereas more comprehensive U.S. estimates attribute 6.8% of total mortality in that country to diabetes mellitus.[145]

According to Health Canada:

> *"There were 5,447 deaths in 1996 for which diabetes was certified as the underlying cause. This ranks diabetes as the seventh leading cause of death in Canada. However, the actual number of deaths for which diabetes was a contributing factor is probably five times this number."*[146]

The U.S. Centers for Disease Control similarly report:

> *"Actually diabetes contributes to a much larger proportion of mortality, since it is reported on only about half of the death certificates for persons who die with the disease and is listed as the underlying cause on only one-quarter of the certificates on which it appears. The most frequent causes of death among persons with diabetes are ischaemic and other forms of heart disease, cerebrovascular disease, and other forms of atherosclerosis; renal disease, including nephritis/nephrosis and uremia; respiratory disease; and infection."*[147]

In addition to these causes of death, the medical costs of diabetes may often be underestimated, because other complications due to diabetes, such as blindness, kidney failure, disorders of the

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[144] Colman, Ronald, *The Cost of Chronic Disease in Nova Scotia,* GPI Atlantic, Halifax, 2002. These estimates for Nova Scotia are extrapolated from U.S. data on deaths, blindness, kidney failure, and amputations attributable to diabetes. See U.S. Centers for Disease Control and Prevention (CDC), U.S. Department of Health and Human Services, "Chronic Diseases and Their Risk Factors: The Nation's Leading Causes of Death," Atlanta, 1999, page 34; and CDC, *Morbidity and Mortality Weekly Report* (*MMWR)* 35 (46), 21 November, 1986, pages 711-714, available at http://www.cdc.gov/epo/mmwr/preview/mmwrhtml/00000824.htm. Estimates of potential years of life lost and total disability attributable to diabetes mellitus are extrapolated from Huse, Daniel M et al., "The Economic Costs of Non-Insulin-Dependent Diabetes Mellitus," *Journal of the American Medical Association,* 262 (19): 2708-2713, November 17, 1989. Note that these sources are 13-16 years old, and that the incidence of diabetes and its concomitant mortality, morbidity, and disability are higher today.

[145] Colman, Ronald, *The Cost of Chronic Disease in Nova Scotia,* GPI Atlantic, Halifax, 2002, citing Huse, Daniel M et al., "The Economic Costs of Non-Insulin-Dependent Diabetes Mellitus," *Journal of the American Medical Association,* 262 (19): 2708-2713, November 17, 1989. Because of this disparity, the Nova Scotia report cites both the conservative and comprehensive estimates, and attributes between 3% and 6% of deaths in the province to diabetes.

[146] Health Canada, *Diabetes in Canada*, available at: http://www.hc-sc.gc.ca/hpb/lcdc/publicat/diabet99/d02_e.html .

[147] U.S. Centers for Disease Control, op. cit., page 34; and *MMWR* 35 (46), 21 November, 1986, pages 711-714, available at http://www.cdc.gov/epo/mmwr/preview/mmwrhtml/00000824.htm.

pancreas, and infections involving the soft tissues and bone of the face, skull, and brain, may not be attributed to diabetes in the cost classifications.

Diabetes 2 is closely associated with obesity, with more than 50% of cases attributable to overweight.[148] Given the epidemic increase in obesity world wide, it is not surprising that the global population with diabetes has jumped nearly five-fold from 30 million in 1985 to 143 million in 1998. The average age of diabetics is getting younger, and the global incidence of the disease is expected to double to 300 million by the year 2025.[149]

Statistics Canada reports that the prevalence of obesity has more than doubled in Canada since the mid 1980s, and that Canadians with a body mass index greater than 30 are four times as likely to have diabetes as those with healthy weights.[150] One review of the epidemiological evidence found that overweight people with a body mass index (BMI) in excess of 27 are 4.4 time as likely to have type 2 diabetes compared to those with healthy weights.[151] Based on this risk and on the prevalence of overweight in Nova Scotia, it has been estimated that 56.2% of the incidence of type 2 diabetes in Nova Scotia is attributable to overweight (BMI $\geq$ 27).[152]

Physical activity is another known risk factor for diabetes 2. Epidemiological evidence indicates that physically inactive people have a 40% higher relative risk of type 2 diabetes than those who are physically active.[153] Based on this risk and on the prevalence of physical inactivity in Nova Scotia, it has been estimated that 20% of the incidence of type 2 diabetes in Nova Scotia is attributable to physical inactivity.[154]

A substantial portion of diabetes incidence and costs could therefore be avoided through improved nutrition, physical activity, and weight reduction. One study found that the achievable reduction in the risk of non-insulin-dependent diabetes mellitus by favourably altering modifiable risk factors was 50-75% for obesity and 30-50% for physical activity.[155]

The Statistics Canada data reveal little gender variance in the prevalence of diabetes and few differences between urban and rural dwellers. However they show a significantly higher incidence of the disease for those on the low end of the income scale.[156] First Nations and Inuit

[148] C. Laird Birmingham, M.D. et al., "The Cost of Obesity in Canada," *Canadian Medical Association Journal,* 23 February, 1999: 160 (4), page 486; Manson, Joann, and Angela Spelsberg, "Primary Prevention of Non-Insulin-Dependent Diabetes Mellitus," *American Journal of Preventive Medicine,* 10 (3), 1994.
[149] Gardner, Gary and Halweil, Brian, "Nourishing the Underfed and Overfed," in Worldwatch Institute, *State of the World 2000,* Chapter 4, W. W. Norton and Co., New York, 2000, page 72.
[150] Body mass index is calculated by dividing weight in kilograms by height in metres squared. See Gilmore, Jason, "Body Mass Index and Health," *Health Reports* 11 (1), Summer, 1999, Statistics Canada, pages 31-43.
[151] Birmingham, C. Laird, M.D., et al., "The Cost of Obesity in Canada," *Canadian Medical Association Journal* 160 (4), 23 February, 1999.
[152] Colman, Ronald, *The Cost of Obesity in Nova Scotia,* GPI Atlantic, Halifax, March, 2000, Table 1.
[153] Katzmarzyk, Peter, Normal Gledhill, and Roy Shephard, "The Economic Burden of Physical Inactivity in Canada," *Canadian Medical Association Journal* 163 (11), 28 November, 2000.
[154] Colman, Ronald, *The Cost of Physical Inactivity in Nova Scotia,* GPI Atlantic, Halifax, July, 2002.
[155] Manson, Joann, and Angela Spelsberg, "Primary Prevention of Non-Insulin-Dependent Diabetes Mellitus," *American Journal of Preventive Medicine,* 10 (3), 1994.
[156] *Toward a Healthy Future: Second Report on the Health of Canadians*, Health Canada, 1999. Available at http://www.hc-sc.gc.ca/hppb/phdd/report/toward/report.htm.

females have a diabetes rate five times that of Canadian females in general, while First Nations and Inuit males have a rate three times that of Canadian males in general.[157]

Definition

"Population aged 12 and over who report that they have been diagnosed by a health professional as having diabetes."[158]

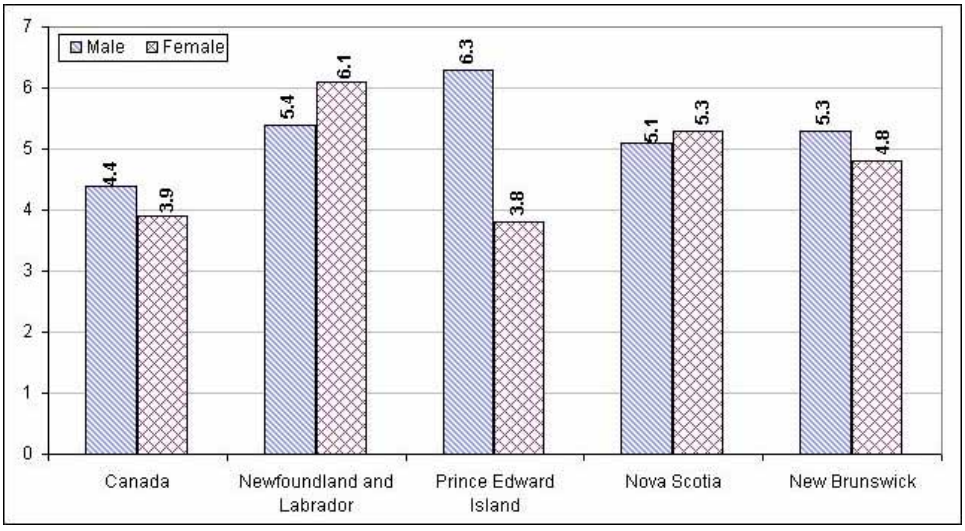
Data Sources

Statistics Canada, Canadian Community Health Survey, 2000/01, health file; Statistics Canada, National Population Health Survey, 1994/95, 1996/97 and 1998/99, cross sectional sample, health file; Statistics Canada, National Population Health Survey, 1994/95 and 1996/97, cross sectional sample, North component.

Results

The four Atlantic provinces had the highest rates of diabetes in the country in 2000/01, with Newfoundland and Labrador more than 40% above the national average, and the three Maritime provinces more than 20% higher than the national average. Newfoundland and Labrador had the highest rate of diabetes in Canada (5.8%), followed by Nova Scotia (5.2%), New Brunswick (5.1%), and PEI (5%), compared to the next highest province, Ontario, at 4.2%, and the national average of 4.1%. PEI had the highest rate for males (6.3%) and Newfoundland and Labrador had the highest rate for females (6.1%) (Figure 257).

Figure 257. Population aged 12 and over with diabetes, Canada and Atlantic Provinces, 2000/01 (%)



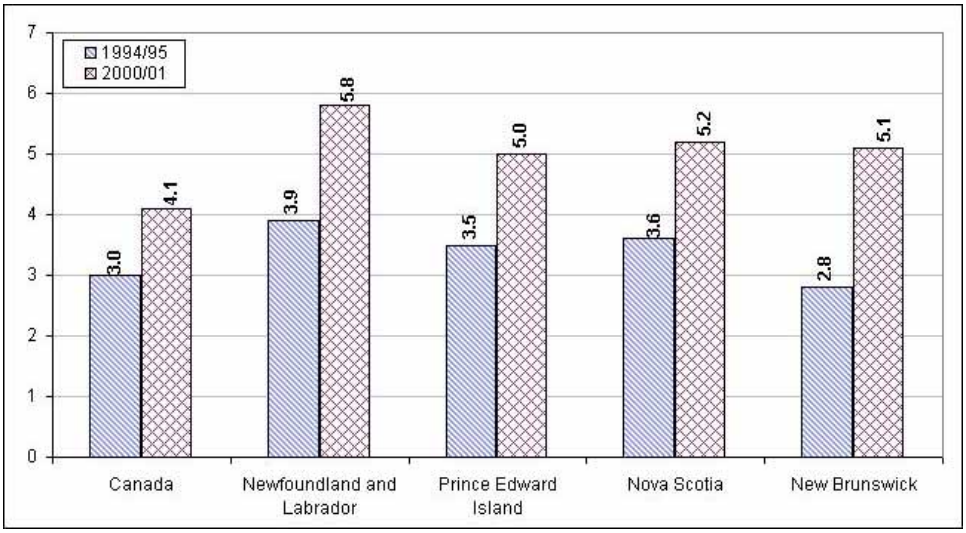
Source: Statistics Canada, Canadian Community Health Survey, 2000/01, health file; available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/conditions2.htm, extracted 30 December, 2002.

[157] Young, T., O'Neill, J., Elias, B., *et al*., "Chronic Diseases." *First Nations and Inuit Regional Health Survey*. Ottawa: First Nations and Inuit Regional Health Survey National Steering Committee, 1999.
[158] Statistics Canada: http://www.statcan.ca/english/freepub/82-221-XIE/00502/defin1.htm#5.

A comparison of the 2000/01 Canadian Community Health Survey with the 1994/95, 1996/97, and 1998/99 National Population Health Surveys indicates that the prevalence of diabetes is steadily increasing both nationally and in Atlantic Canada, parallel to rising rates of overweight in the country.

However, as with other results noted earlier, the health gap between Atlantic Canada and the rest of the country is also widening, with the prevalence of diabetes increasing more rapidly in the Atlantic region than in Canada as a whole. Thus, between 1994/95 and 2000/01, the prevalence of diabetes increased by 37% in Canada, but by 54% in Atlantic Canada – 49% in Newfoundland and Labrador, 43% in PEI, 44% in Nova Scotia, and 82% in New Brunswick (Figure 258, and Table 172, Appendix C).[159]

Figure 258. Population aged 12 and over with diabetes, Canada and Atlantic Provinces, 1994/95 and 2000/01, (%)



Sources: Statistics Canada, Canadian Community Health Survey, 2000/01, health file; Statistics Canada, National Population Health Survey, 1994/95, 1996/97 and 1998/99, cross sectional sample, health file; Statistics Canada, National Population Health Survey, 1994/95 and 1996/97, cross sectional sample, North component available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/conditions2.htm, extracted 2 February, 2003.

Note: 1994/95 provincial data for Atlantic Canada have a coefficient of variation (CV) from 16.6% to 33.3% and should be interpreted with caution.

[159] Atlantic Canada totals are calculated from Statistics Canada, Health Indicators, "Diabetes, by sex, household population aged 12 and over, Canada and provinces, 1994/95-1998/99", available at: http://www.statcan.ca/english/freepub/82-221-XIE/01002/tables/html/1242.htm, and "Diabetes, by sex, household population aged 12 and over, Canada, provinces, territories, health regions and peer groups, 2000/01", available at: http://www.statcan.ca/english/freepub/82-221-XIE/01002/tables/html/1246.htm
It should be noted that 1994/95 provincial data for Atlantic Canada have a coefficient of variation (CV) from 16.6% to 33.3% and should be interpreted with caution.

In 1994/95, out of nearly 24 million Canadians aged 12 and over, about 722,500 reported having diabetes – 3% of the total. In 2000/01, out of 25.8 million Canadians 12 and over, 1.06 million reported having diabetes – 4.1% of the total.[160]

In 1994/95, out of nearly 2 million Atlantic Canadians aged 12 and over, 68,100 reported having diabetes – 3.4% of the total. In 2000/01, out of 2 million Atlantic Canadians, 105,430 reported having diabetes – 5.3% of the total.

This means that, on average, Atlantic Canadians were about 14% more likely than other Canadians to have diabetes in 1994/95. But in 2000/01, they were 29% more likely to have diabetes. Thus the gap between the Atlantic Provinces and the rest of the country more than doubled during this short period.

In 2000/01, 18 of the 21 Atlantic health districts had diabetes rates higher than the national average, led by Central (NF4) at 7.4%, Colchester-Cumberland-East Hants (NS3) at 7%, and Pictou-GASHA (NS4) at 6.9% (Figure 259).[161]

Among the 20 health districts reporting data for females in 2000/01, Western (NF4) had the highest percentage of females with diabetes (8%), followed by Central (NF3) with 7.9%, Miramichi (NB7) with 7.8% (all three at least double the national average), Campbellton (NB5) and South-SW (NS1) at 7.6%, and Colchester-Cumberland-East Hants at 7.4%.[162]

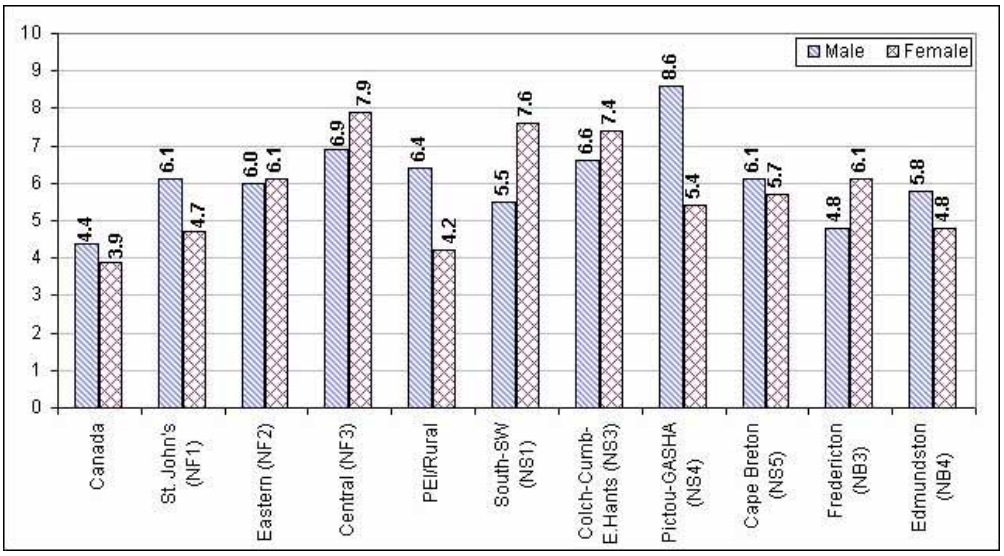
Among 15 health districts reporting data for males in 2000/01, Pictou-Guysborough-Antigonish-Strait (NS4) had the highest rate of diabetes among males (8.6%). Capital (NS6) at 3.5%, and Annapolis Valley (NS2) at 3.9% had the lowest rates of diabetes among males in Atlantic Canada, and were the only health districts registering below the national average for males. Urban PEI and Moncton (NB1) at 3.3% had the lowest percentage of females with diabetes, followed by Sussex/Saint John (NB2) at 3.6%, and Capital (NS6) at 3.7% -- the only districts registering lower rates than the national average for females.[163]

As with all health district data, caution must be exercised in making comparisons and interpreting results, due to wide confidence intervals and high variability.

Statistics Canada also provides results for the percentage of the population without diabetes, thus identifying those health districts with the lowest prevalence of the disease. Only three Atlantic health districts had higher proportions of the population without diabetes than the national average of 95.8% – Capital (NS6) at 96.4%, Grenfell (NF5) at 96.2%, and Labrador (NF6) at 96%. All other health districts have higher overall rates of diabetes, though a few have lower diabetes rates for *either* males *or* females (Figures 259, 260, and 261).

[160] 1994/95 provincial data for Atlantic Canada have a coefficient of variation (CV) from 16.6% to 33.3% and should be interpreted with caution.
[161] Data for Pictou-GASHA (NS4) have a CV from 16.6% to 33.3% and should be interpreted with caution.
[162] Data for females in all these health districts except for South-SW (NS1) have a CV from 16.6% to 33.3% and should be interpreted with caution. Data for females in Miramichi (NB7) and for males in Western (NF4), Grenfell (NF5), Labrador (NF6), Campbellton (NB5), Bathurst (NB6), and Miramichi (NB7) had a coefficient of variation (CV) greater than 33.3%, and were suppressed by Statistics Canada due to extreme sampling variability.
[163] All data cited in this paragraph have a CV from 16.6% to 33.3% and should be interpreted with caution.

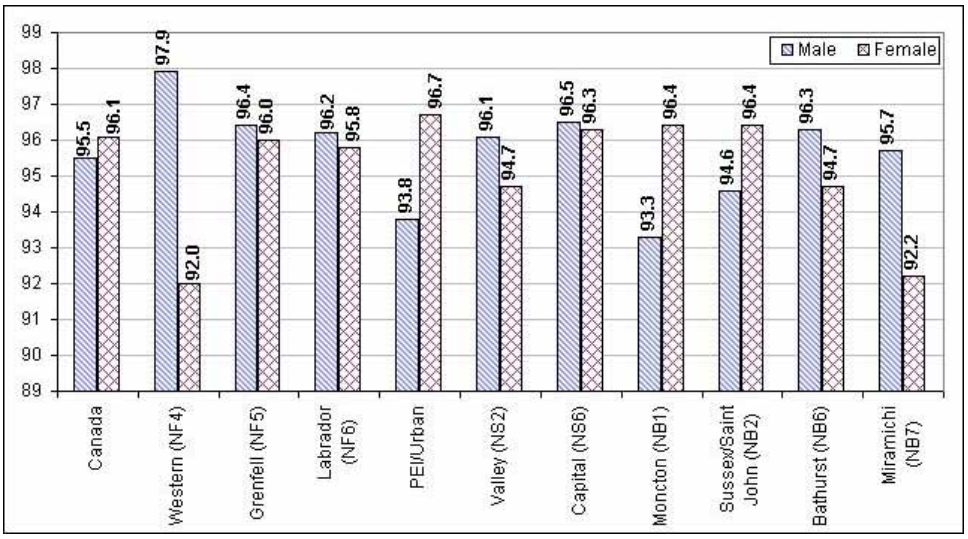
Figure 259. Population aged 12 and over with diabetes, Canada and selected Atlantic health districts with higher rates than the national average, 2000/01 (%)



Source: Statistics Canada, Canadian Community Health Survey, 2000/01, health file; available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/conditions2.htm, extracted 30 December, 2002.

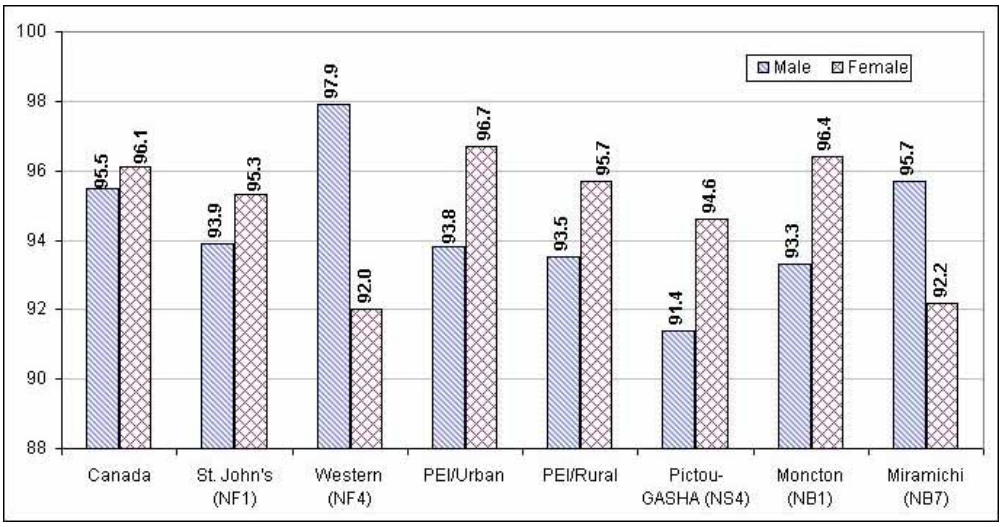
Note: All the data in the above chart except Canada and South-Southwest Nova Scotia (NS1) have a CV from 16.6% to 33.3% and should be interpreted with caution.

Figure 260. Population aged 12 and over without diabetes, by sex, Canada and selected Atlantic health districts, 2000/01 (%)



Source: Statistics Canada, Canadian Community Health Survey, 2000/01, health file; available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/conditions2.htm, extracted 30 December, 2002.

Figure 261. Population aged 12 and over without diabetes, by sex, Canada and selected Atlantic health districts, 2000/01 (%)



Source: Statistics Canada, Canadian Community Health Survey, 2000/01, health file; available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/conditions2.htm, extracted 30 December, 2002.

3.2.3 Asthma

In 1996, the Canadian Asthma Consensus Conference defined asthma as follows:

> *"Asthma is a disorder of the airways characterized by paroxysmal or persistent symptoms (dyspnea, chest tightness, wheeze and cough), with variable airflow limitation [and] airway hyperresponsiveness to a variety of stimuli."*

The Conference recommended that:

> *"the management of asthma should focus on the reduction of this inflammatory state through environmental control measures and the early use of disease-modifying agents, rather than symptomatic therapy alone."*[164]

Overall, asthma affects about two million Canadians. A growing number of sufferers are children, with reported asthma rates among children and youth increasing sharply in the last 25 years. Between 1978 and 1994, the prevalence of asthma increased from 2.5% to 11.2% of Canadian children aged 14 and under.[165] In 1996, about 14% of teens were reported to be asthma sufferers, as were 8% of children under the age of 4.[166] Statistics Canada data for the population

[164] National Asthma Control Task Force (2000), *The Prevention and Management of Asthma in Canada,* Health Canada, Ottawa, available at: http://www.hc-sc.gc.ca/pphb-dgspsp/publicat/pma-pca00/index.html#execsumm. Accessed 10 November, 2003.
[165] Mandl, Michael, M.D., "Air pollution may be linked to rising child asthma rates," *The Chronicle-Herald,* Halifax, 3 May, 2001; available at: http://www.nbenrenb.elements.nb.ca/environews%20files/media/mediaarchives/01/may/asthma.htm. Accessed 10 November, 2003.
[166] Canadian Council on Social Development, *The Progress of Canada's Children 1999/2000: Portrait of Children and Youth,* available at: http://www.ccsd.ca/pubs/pcc00/hl.htm. Accessed 10 November, 2003.

aged 4 and older show that the prevalence of asthma in Canada has steadily increased from 7.2% in 1994/95 to 7.8% in 1996/97 to 8.5% in 1998/99.[167]

Asthma is now the most common chronic disease in children, and the leading cause for admission to hospital. From 1990-1995, asthma was responsible for 6.7% of all hospitalizations for children and youth less than 20 years of age.[168] In total, asthma hospitalizes about 49,000 people a year in Canada, resulting in 198,000 in-hospital days annually.[169] Asthma therefore has a major adverse impact on quality of life, and it also puts a substantial burden on health care services.[170]

Children exposed to second-hand smoke have a 50% elevated risk of asthma and asthma wheeze.[171] Recent studies also show that second-hand smoke elevates the risk of adult asthma.[172] Pollution caused by industrial emissions and automobile exhaust can cause an asthma episode. In large cities that have air pollution problems, the number of emergency department visits for asthma episodes increases when the air quality is very poor.[173]

A major British study showed that the risk of a child being admitted to a hospital emergency department for an acute asthma attack increased the closer the child lived to a main traffic artery. An Italian study showed that children exposed to heavy traffic exhaust in Italy were more likely to have severe asthma than those who were not exposed. When Atlanta, Georgia, put strict driving rules into effect for the 1996 summer Olympics, air pollution dropped and so did the number of children seeking treatment for acute asthma. One study showed asthma-related emergency care visits and hospitalizations decreased about 40%.[174]

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[167] Statistics Canada, Health Indicators, available at: http://www.statcan.ca/english/freepub/82-221-XIE/00401/tables/pdftables/P1252.pdf. Accessed 10 November, 2003.
[168] Health Canada, *Measuring Up: A Health Surveillance Update on Children and Youth,* available at: http://www.hc-sc.gc.ca/pphb-dgspsp/publicat/meas-haut/mu_s_e.html. Accessed 10 November, 2003.
[169] *Toward a Healthy Future: Second Report on the Health of Canadians*, Health Canada, 1999. Available at http://www.hc-sc.gc.ca/hppb/phdd/report/toward/report.htm.
[170] *Toward a Healthy Future: Second Report on the Health of Canadians*, Health Canada, 1999. Available at http://www.hc-sc.gc.ca/hppb/phdd/report/toward/report.htm.
[171] US Environmental Protection Agency, (1992), *Respiratory Health Effects of Passive Smoking: Lung Cancer and Other Disorders,* Publication No. EPA 600/6-90/006F, Washington, D.C., California Environmental Protection Agency, Office of Environmental Health Hazard Assessment, (1997), *Health Effects of Exposure to Environmental Tobacco Smoke,* Sacramento; Report to the Minister of Health from her Expert Panel on the Renewal of the Ontario Tobacco Strategy. (1999), *Actions Will Speak Louder than Words,* Toronto, February, 1999; Lister, Susan and Jorm, Louisa, (1998), "Parental smoking and respiratory illnesses in Australian children aged 0-4 years: ABS 1989-90 National Health Survey results, *Australian and New Zealand Journal of Public Health,* 22: 781-786, Canberra, December, 1998.
[172] Eisner, M. et al., (1998), "Environmental tobacco smoke and adult asthma: The impact of changing exposure status on health outcomes," *American Journal of Respiratory and Critical Care Medicine* 158: 127-133, cited in *A Report to the Minister of Health from her Expert Panel on the Renewal of the Ontario Tobacco Strategy* (February 1999), op. cit., pages 22 and 44; Greer, J., et al., (1993), "Asthma related to occupational and ambient air pollutants in nonsmokers, *Journal of Occupational and Environmental Medicine* 35: 909-915; Shephard, R.J., (1992), "Respiratory irritation from environmental tobacco smoke," *Archives of Environmental Health* 47 (2): 123-130.
[173] U.S. Centers for Disease Control and Prevention, National Center for Environmental Health, "Basic Facts About Asthma," available at: http://www.cdc.gov/nceh/airpollution/asthma/faqs.htm.
[174] Studies cited in: Mandl, Michael, M.D., "Air pollution may be linked to rising child asthma rates," *The Chronicle-Herald,* Halifax, 3 May, 2001; available at:

Definition

"Population aged 12 and over who report that they have been diagnosed by a health professional as having asthma."[175]

Data Sources

Statistics Canada, Canadian Community Health Survey, 2000/01, health file; Statistics Canada, National Population Health Survey, 1994/95, 1996/97 and 1998/99, cross sectional sample, health file; Statistics Canada, National Population Health Survey, 1994/95 and 1996/97, cross sectional sample, North component; Statistics Canada, National Longitudinal Survey of Children and Youth (asthma for 4 to 11 years of age), 1994/95.

Results

The 2000/01 health district data below are for the population aged 12 and over. However, in light of the growing importance of childhood asthma, we first briefly examine asthma trends in the population 4 and older. It was noted above that Statistics Canada data for the population aged 4 and older show that the prevalence of asthma in Canada increased from 7.2% in 1994/95 to 8.5% in 1998/99.[176]

Table C3 indicates that asthma rates have also increased in all four Atlantic provinces. In 1998/99, for the population 4 and older, Nova Scotia had the highest asthma rate in the country (up 28% from 1994/95), and also the highest rate for females (12.6% compared to the national female average of 9.1%). By contrast, Newfoundland and Labrador had the lowest overall asthma rate in the country in 1998/99, and also the lowest rate for females (6.4%)

Table C3. Asthma, by sex, household population aged 4 and over, Canada and Atlantic provinces, 1994/95 – 1998/99, (%)

	Canada	Newfoundland and Labrador	Prince Edward Island	Nova Scotia	New Brunswick
1994/95	7.2	5.8	7.2	8.0	6.7
1996/97	7.8	5.9	7.6	8.3	6.7
1998/99	8.5	6.5	8.3	10.2	8.2

Source: Statistics Canada, Health Indicators, available at: http://www.statcan.ca/english/freepub/82-221-XIE/00401/tables/pdftables/P1252.pdf. Accessed 10 November, 2003.

Turning now to the 2000/01 data for the population 12 and older, Nova Scotia still had the highest asthma rate in the country at 9.1%, and Newfoundland and Labrador had the lowest at

http://www.nbenrenb.elements.nb.ca/environews%20files/media/mediaarchives/01/may/asthma.htm. Accessed 10 November, 2003.

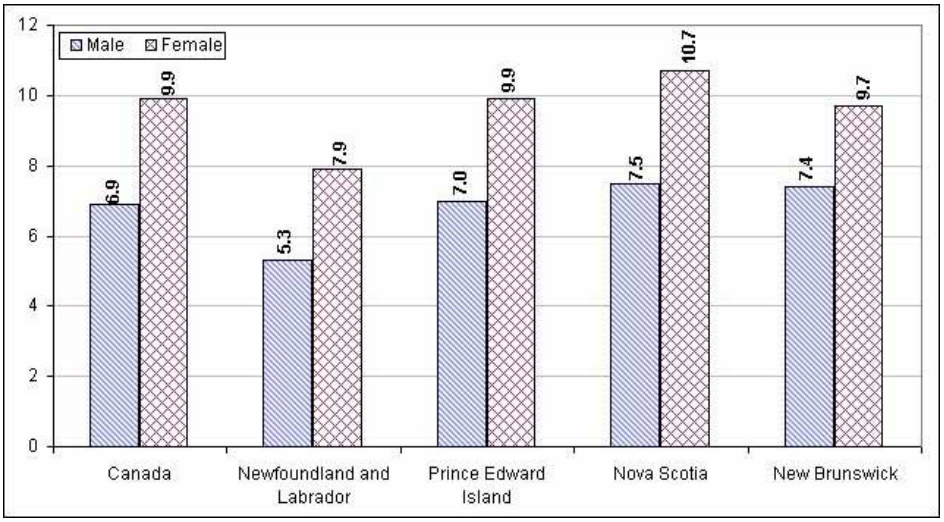
[175] Statistics Canada: http://www.statcan.ca/english/freepub/82-221-XIE/00502/defin1.htm#5.

[176] Statistics Canada, Health Indicators, available at: http://www.statcan.ca/english/freepub/82-221-XIE/00401/tables/pdftables/P1252.pdf. Accessed 10 November, 2003.

6.6%, compared to the national average of 8.4%. PEI (8.5%) and New Brunswick (8.6%) slightly exceeded the national rate.

Canadian females were 50% more likely than males to suffer from asthma – 9.9% of females compared to 6.9% of males. Nova Scotia had the highest female rate of asthma in the country (10.7%), and the second highest male rate (7.5%) after Alberta (7.6%). New Brunswick had the third highest male asthma rate in Canada (7.4%). Newfoundland and Labrador had the lowest asthma rates in the country both for males (5.3%) and for females (7.9%), and PEI was close to the national average for both sexes (Figure 262).

Figure 262. Population aged 12 and over with asthma, Canada and Atlantic Provinces, 2000/01 (%)



Source: Statistics Canada, Canadian Community Health Survey, 2000/01, health file; available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/conditions2.htm, extracted 30 December, 2002.

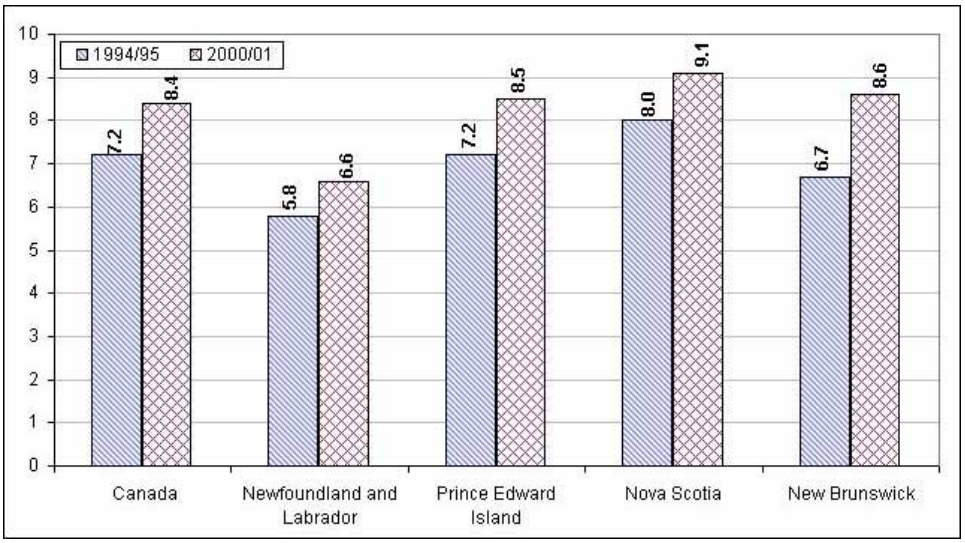
A comparison of the 2000/01 Canadian Community Health Survey with the 1994/95, 1996/97, and 1998/99 National Population Health Surveys indicates that the prevalence of asthma is steadily increasing both nationally and in all four Atlantic Provinces (Figure 263).

Among the 21 Atlantic health districts, the highest rates of asthma in 2000/01 were in Moncton (NB1) at 10.4% and Campbellton (NB5) at 10.3%, and the lowest rates were in Grenfell (NF5) at 4.3% and Miramichi (NB7) at 4.8%. The highest rate for males was in South-Southwest (NS1) at 10.9%, and the highest female rates were in Moncton (NB1) at 12.8%, and Capital (NS6) at 12% (Figures 264 and 265).[177]

As with all health district data, caution must be exercised in making comparisons and interpreting results, due to wide confidence intervals and high variability.

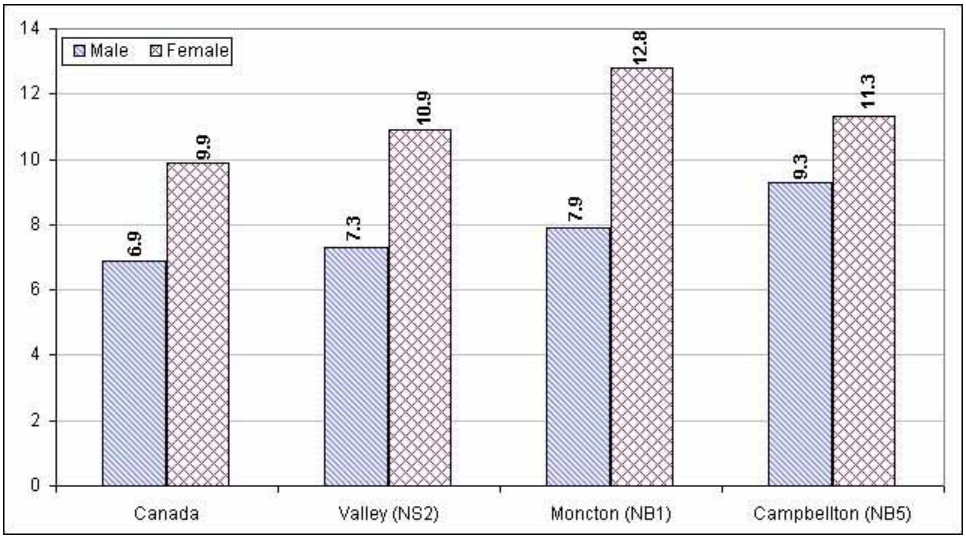
[177] Data in this paragraph for Campbellton (NB5), Grenfell (NF5), Miramichi (NB7), and South-SW (NS1), have a CV from 16.6% to 33.3% and should be interpreted with caution.

Figure 263. Population aged 12 and over with asthma, Canada and Atlantic Provinces, 1994/95 and 2000/01 (%)



Source: Statistics Canada, Canadian Community Health Survey, 2000/01, health file; Statistics Canada, National Population Health Survey, 1994/95, 1996/97 and 1998/99, cross sectional sample, health file; Statistics Canada, National Population Health Survey, 1994/95 and 1996/97, cross sectional sample, North component; Statistics Canada, National Longitudinal Survey of Children and Youth (asthma for 4 to 11 years of age), 1994/95; available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/conditions2.htm, extracted 2 February, 2003.

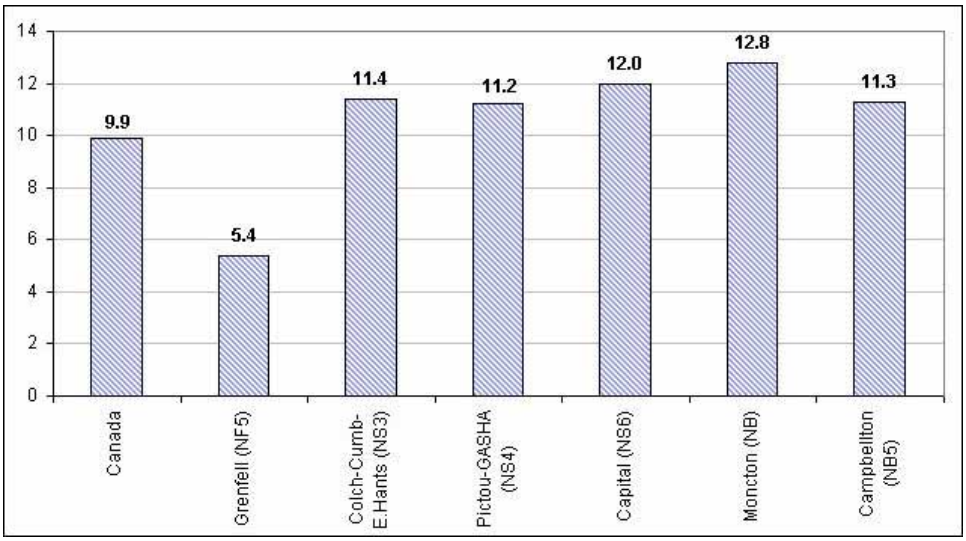
Figure 264. Population aged 12 and over with asthma, by sex, Canada and selected Atlantic health districts, 2000/01, (%)



Source: Statistics Canada, Canadian Community Health Survey, 2000/01, health file; available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/conditions2.htm, extracted 30 December, 2002.

Note: The data in the above chart for Annapolis Valley (NS2) and Campbellton (NB5) have a CV from 16.6% to 33.3% and should be interpreted with caution.

Figure 265. Population aged 12 and over with asthma, females, Canada and selected Atlantic health districts, 2000/01 (%)



Source: Statistics Canada, Canadian Community Health Survey, 2000/01, health file; available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/conditions2.htm, extracted 30 December, 2002.

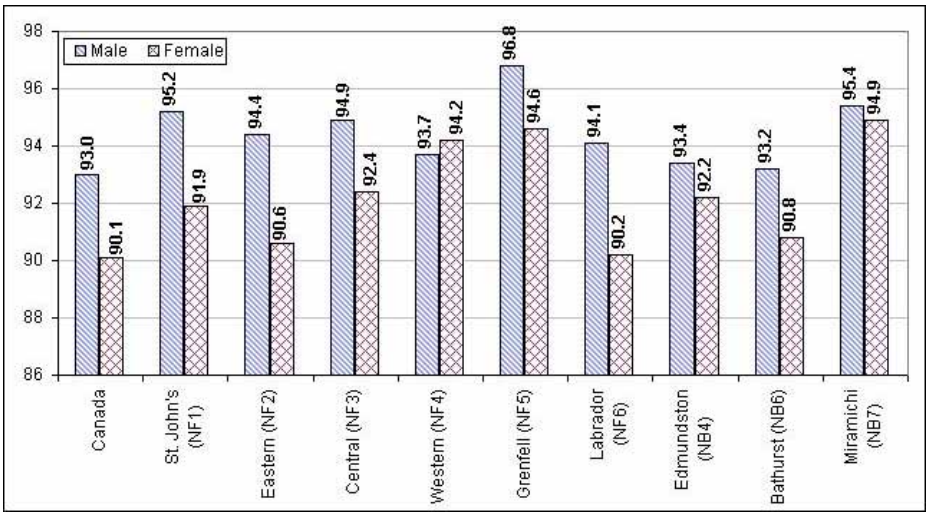
Note: The data in the above chart for Campbellton (NB5), Grenfell (NF5), and Pictou-Guysborough-Antigonish-Strait (NS4) have a CV from 16.6% to 33.3% and should be interpreted with caution.

Statistics Canada also provides results for the percentage of the population without asthma, thus identifying those regions and health districts with the lowest prevalence of the disease.

Thus, all six health districts in Newfoundland and Labrador had higher percentages of both males and females without asthma than the national averages of 93% for males and 90.1% for females. As well, people 12 and older in four New Brunswick health districts [Miramichi (NB7), Edmundston (NB4), Bathurst (NB6), and Sussex/Saint John (NB2)] were less likely to suffer from asthma than other Canadians. Grenfell (NF5) had the highest percentage of the male population without asthma (96.8%), and Miramichi (NB7) had the highest percentage of females without asthma (94.9%) (Figure 266).

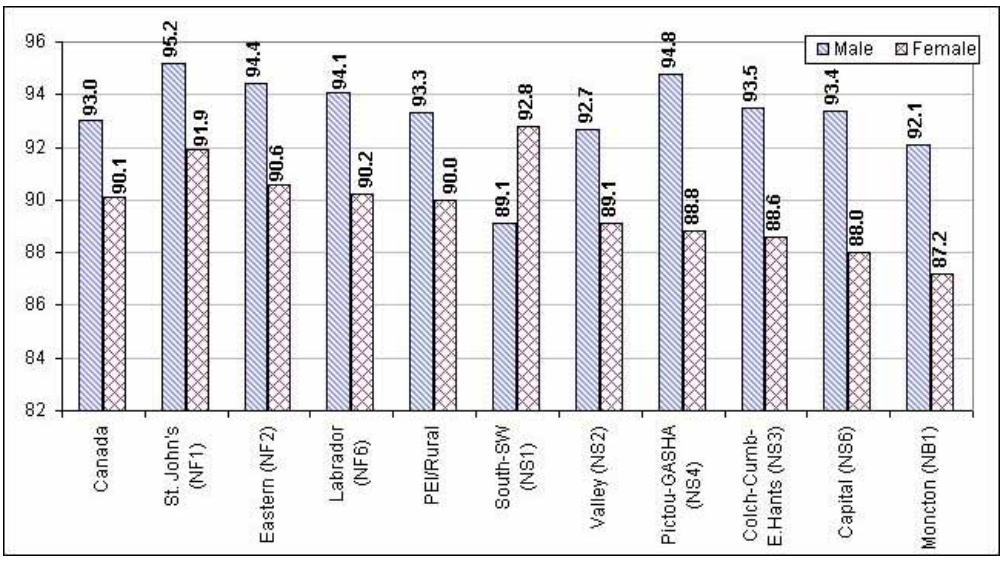
In 18 of the 21 Atlantic health districts, males were more likely to be asthma-free than females, with some districts showing particularly wide gender gaps. A notable exception was South-SW (NS1), which had the lowest proportion of asthma-free males in Atlantic Canada (89.1%) (Figure 267). In Western (NF4) and Cape Breton (NB5), slightly more females than males were asthma-free.

Figure 266. Population aged 12 and over without asthma, by sex, Canada and selected Atlantic health districts, 2000/01 (%)



Source: Statistics Canada, Canadian Community Health Survey, 2000/01, health file; available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/conditions2.htm, extracted 30 December, 2002.

Figure 267. Population aged 12 and over without asthma, Canada and selected Atlantic health districts, 2000/01 (%)



Source: Statistics Canada, Canadian Community Health Survey, 2000/01, health file; available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/conditions2.htm, extracted 30 December, 2002.

3.2.5 High blood pressure

High blood pressure, or hypertension, is recognized as one of the major risk factors and leading causes of disease burden. A recent study ranked high blood pressure as the third leading cause of

the global burden of disease behind childhood and maternal underweight and unsafe sex, which were ranked as the major contributors to loss of healthy life in the poorest regions of the world. The study also ranked high blood pressure with alcohol, tobacco, and high cholesterol as one of the four leading causes of disease burden in developed countries.[178] According to the World Health Organization, hypertension is the second leading risk of death for women in developed countries.[179]

For Canadians 55 and older, high blood pressure is the second most prevalent risk factor for heart disease and stroke, after elevated cholesterol, with more than 50% of older Canadians suffering from hypertension.[180] The Heart and Stroke Foundation of Canada estimates that about 40% of Canadians with high blood pressure do not know it, that almost 20% of people with hypertension are not on any form of treatment, and another 23% are on treatment that is inadequate to control it. Only about 16% of Canadians with hypertension are treated and well controlled.[181]

Some Canadians are at greater risk of hypertension than others. Please see section 3.1.8.4 (on mortality due to medically treatable hypertensive disease) for a brief description on the relationship between hypertension and other risk factors like obesity and physical inactivity. In Canada, high blood pressure, like many other chronic diseases, is far more prevalent among the Aboriginal population where it is three times the rate of the overall population for both males and females.[182]

Definition

"Population aged 12 and over who report that they have been diagnosed by a health professional as having high blood pressure."[183]

Data Sources

Statistics Canada, Canadian Community Health Survey, 2000/01, health file; Statistics Canada, National Population Health Survey, 1994/95, 1996/97 and 1998/99, cross sectional sample, health file; Statistics Canada, National Population Health Survey, 1994/95 and 1996/97, cross sectional sample, North component.

[178] Ezzati *et al.,* "Selected major risk factors and global and regional burden of disease," *The Lancet 360*(9343):1347-1361, October 30, 2002. Available at: http://image.thelancet.com/extras/02art9066web.pdf.
[179] Cited in Heart and Stroke Foundation of Canada bulletin: 31 October, 2003, available at: http://ww2.heartandstroke.ca/Page.asp?PageID=33&ArticleID=2696&Src=news. Accessed 11 November, 2003.
[180] Health Canada, *Heart Disease and Stroke in Canada 1997,* Table 10: Percentage (%) of Population aged 18-74 with Selected CVD Risk Factors, by Age and Sex, Canada 1986-1992. Available at: http://www.hc-sc.gc.ca/pphb-dgspsp/publicat/hdsc97/tab10_e.html. Accessed 11 November, 2003.
[181] Heart and Stroke Foundation of Canada bulletin: 31 October, 2003, available at: http://ww2.heartandstroke.ca/Page.asp?PageID=33&ArticleID=2696&Src=news. Accessed 11 November, 2003.
[182] *Toward a Healthy Future: Second Report on the Health of Canadians*, Health Canada, 1999. Available at http://www.hc-sc.gc.ca/hppb/phdd/report/toward/report.htm.
[183] Statistics Canada: http://www.statcan.ca/english/freepub/82-221-XIE/00502/defin1.htm#5.

Results

The four Atlantic Provinces had by far the highest rates of high blood pressure in Canada in 2000/01 – Nova Scotia (16.2%), Newfoundland and Labrador (15.4%), New Brunswick (14.5%), and PEI (14.0%), compared to the national average of 12.6%. Nova Scotia also had the highest rates of high blood pressure in the country both for males (14.5%) and for females (17.9%), compared to the national averages of 11.4% for males and 13.9% for females (Figure 268).

A comparison of the 2000/01 Canadian Community Health Survey with the 1994/95, 1996/97, and 1998/99 National Population Health Surveys indicates that the prevalence of high blood pressure is steadily increasing both nationally and in all four Atlantic Provinces. In fact, each successive population health survey shows a higher proportion of both Canadians and Atlantic Canadians with high blood pressure, with the Canadian rate in 2000/01 45% higher than in 1994/95, and the Newfoundland and Labrador rate 57% higher. In all four surveys, all four Atlantic Provinces registered higher rates of high blood pressure than the national average, with Nova Scotia consistently recording the highest rates in the country (Figure 269).

Among the 21 Atlantic health districts, Cape Breton had the highest percentage of the population with high blood pressure in 2000/01 for both males and females (18.9% males, 24.3% females) (Figure 270).

Canadian females were about 20% more likely to have high blood pressure than Canadian males. Female rates of high blood pressure were also higher than male rates in 18 of the 21 Atlantic health districts, with the exception of Edmundston (NB4), Urban PEI, and Labrador (NF6), although the size of the gender gap varies widely by district (Figures 271 and 272).[184]

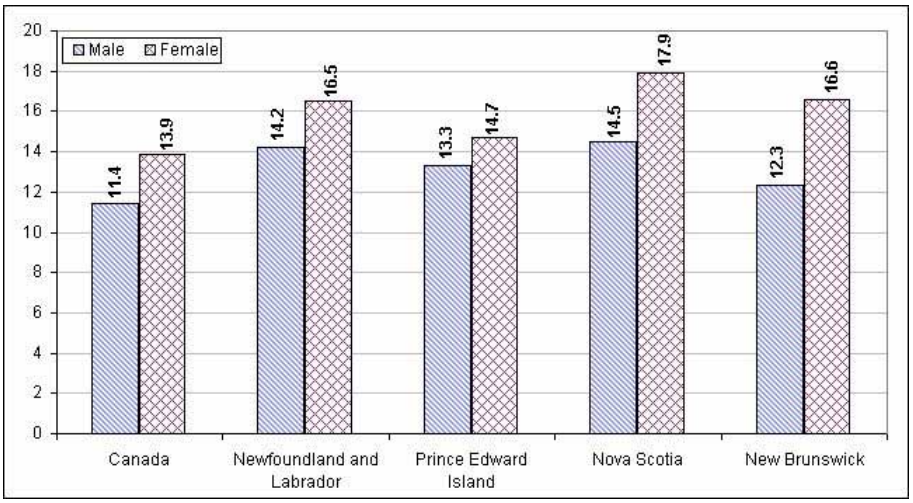
Statistics Canada also provides results for the percentage of the population without high blood pressure, thus identifying those regions and health districts with the lowest prevalence of the disease.

Of all 21 Atlantic health districts, only Fredericton (NB3), at 89.4% of males and 87.4% of females, had a higher percentage of the population 12 and over without high blood pressure than Canada. Annapolis Valley (NS2) had identical percentages to Canada (88.4% of males and 86.0% of females) without high blood pressure (Figure 273).

Looking separately at males and females, Bathurst (NB6) was the only other district with a higher percentage of males without high blood pressure than Canada (91.7%), and Labrador (NF6), PEI/Urban, and Edmundston (NB4) were the only other districts with higher percentages of females without high blood pressure. Cape Breton (NS5) at 75.7%, South-Southwest (NS1) at 77.7%, and Central (NF3) at 78.2% had the lowest percentages of females without high blood pressure in Atlantic Canada (Figure 274).

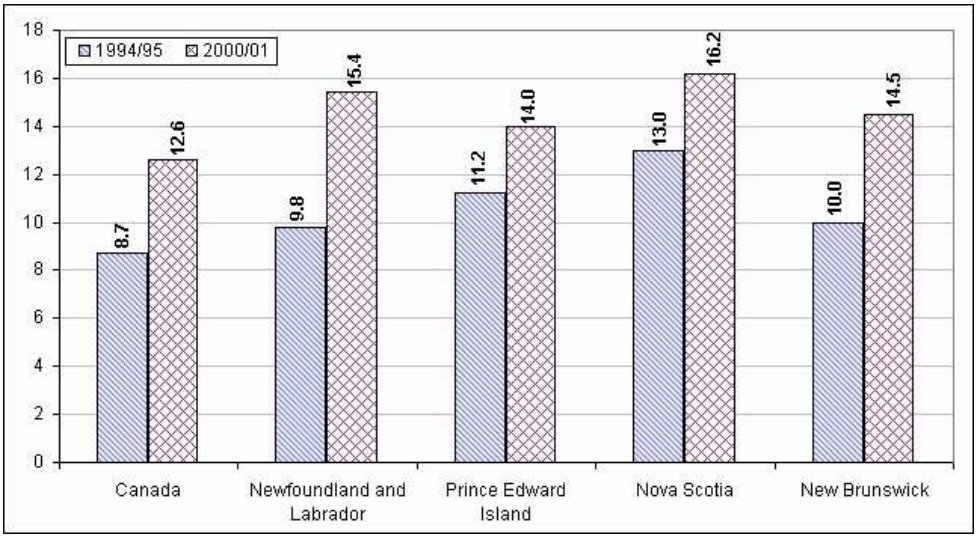
[184] Data for males in Labrador (NF6) and females in Edmundston (NB4) have a CV from 16.6% to 33.3% and should be interpreted with caution.

Figure 268. Population aged 12 and over with high blood pressure, by sex, Canada and Atlantic Provinces, 2000/01 (%)



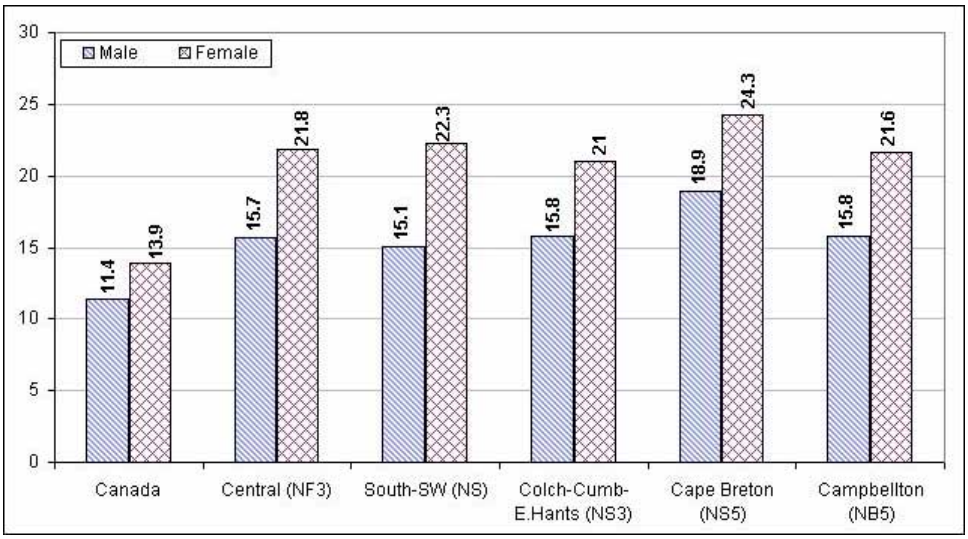
Source: Statistics Canada, Canadian Community Health Survey, 2000/01, health file; available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/conditions2.htm, extracted 30 December, 2002.

Figure 269. Population aged 12 and over with high blood pressure, both sexes, Canada and Atlantic Provinces, 1994/95 and 2000/01 (%)



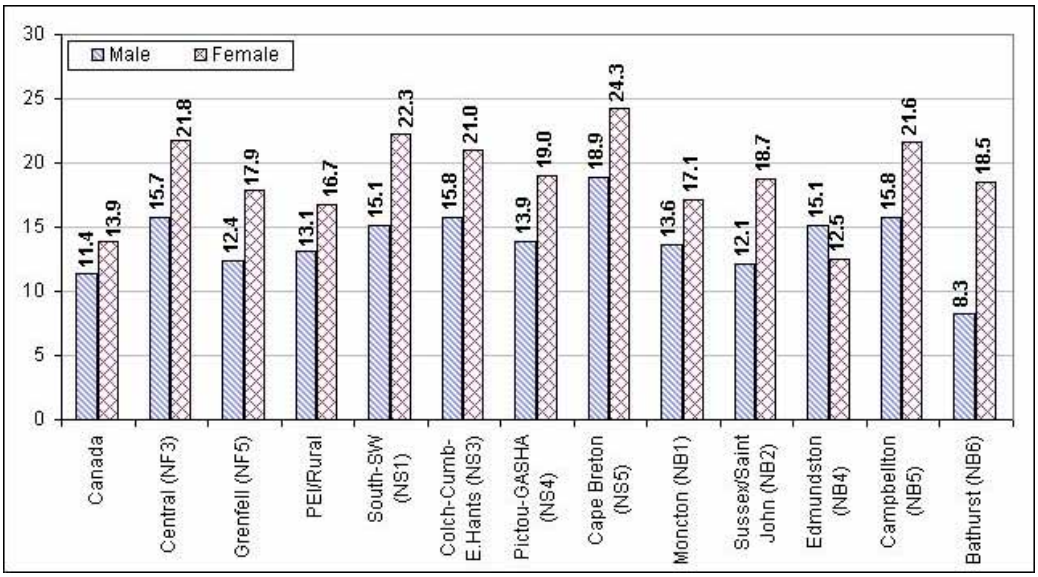
Source: Statistics Canada, Canadian Community Health Survey, 2000/01, health file; Statistics Canada, National Population Health Survey, 1994/95, 1996/97 and 1998/99, cross sectional sample, health file; Statistics Canada, National Population Health Survey, 1994/95 and 1996/97, cross sectional sample, North component; available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/conditions2.htm, extracted 2 February, 2003.

Figure 270. Population aged 12 and over with high blood pressure, by sex, Canada and Atlantic health districts with the highest rates of high blood pressure, 2000/01 (%)



Source: Statistics Canada, Canadian Community Health Survey, 2000/01, health file; available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/conditions2.htm, extracted 30 December, 2002

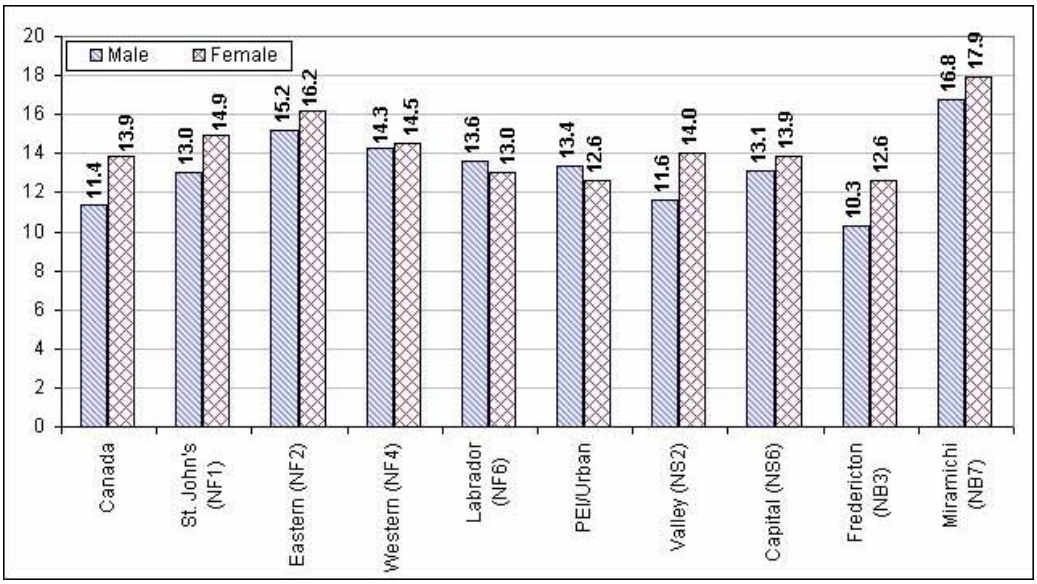
Figure 271. Population aged 12 and over with high blood pressure, Canada and Atlantic health districts with a wide gender gap, 2000/01 (%)



Source: Statistics Canada, Canadian Community Health Survey, 2000/01, health file; available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/conditions2.htm, extracted 30 December, 2002

Note: Data in the above chart for males and females in Grenfell (NF5) and for females in Edmundston (NB4) have a CV from 16.6% to 33.3% and should be interpreted with caution.

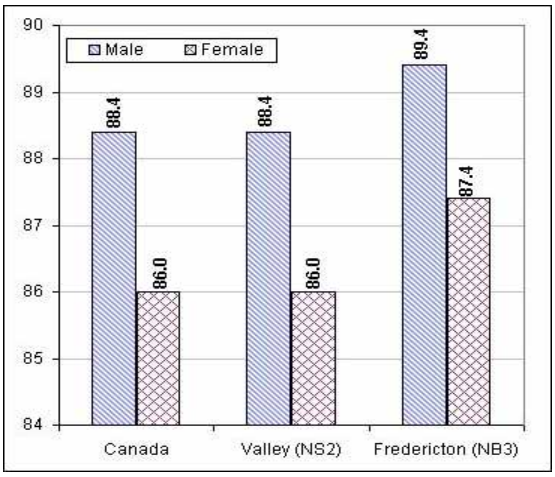
Figure 272. Population aged 12 and over with high blood pressure, Canada and Atlantic health districts with a narrow gender gap, 2000/01 (%)



Source: Statistics Canada, Canadian Community Health Survey, 2000/01, health file; available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/conditions2.htm, extracted 30 December, 2002.

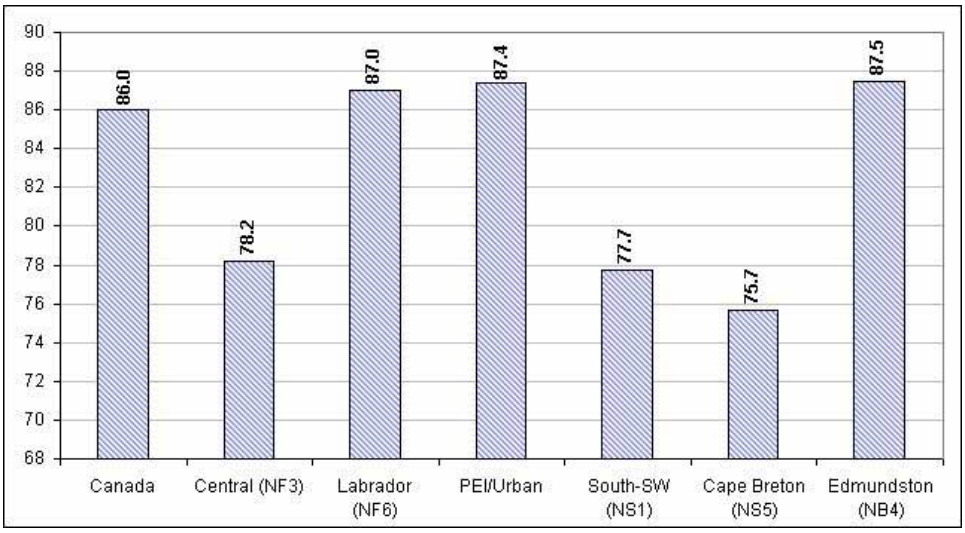
Note: Data for males in Labrador (NF6) have a CV from 16.6% to 33.3% and should be interpreted with caution.

Figure 273. Population aged 12 and over without high blood pressure, by sex, Canada and selected Atlantic health districts, 2000/01 (%)



Source: Statistics Canada, Canadian Community Health Survey, 2000/01, health file; available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/conditions2.htm#high, extracted 30 December, 2002.

Figure 274. Population aged 12 and over without high blood pressure, females Canada and selected Atlantic health districts, 2000/01 (%)



Source: Statistics Canada, Canadian Community Health Survey, 2000/01, health file; available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/conditions2.htm#high, extracted 30 December, 2002.

3.2.6 Cancer incidence

As noted earlier, new cases of lung cancer have declined for males since the 1980s, but the incidence rate has been increasing for females. Breast cancer was the most common newly diagnosed cancer among females in 1998.[185] Please see section 3.1.6 above (on cancer death rates) for trends over time and for brief descriptions of the relationship between particular cancers and known risk factors such as smoking, second-hand smoke, obesity, and physical inactivity.

While the latest actual Canadian data available for age-standardized cancer incidence rates are for the year 1998, Health Canada provides estimates for 1999-2002.[186] For 2002, Nova Scotia had the highest estimated male age-standardized cancer rates in the country, followed closely by New Brunswick. Nova Scotia also had the highest estimated female cancer rates among the Canadian provinces in 2002, and the second highest breast cancer rate after Manitoba .[187]

[185] *Toward a Healthy Future: Second Report on the Health of Canadians*, Health Canada, 1999. Available at http://www.hc-sc.gc.ca/hppb/phdd/report/toward/report.htm.

[186] The latest available actual cancer incidence data, as published in National Cancer Institute of Canada, *Canadian Cancer Statistics 2003,* Toronto, 2003, are for 1998 for Canada, Quebec, and Ontario, and for 1999 for the other eight provinces.

[187] Estimates produced by Health Canada through extrapolation of cancer incidence data from the National Cancer Incidence Reporting System (NCIRS, 1969-1991) and the Canadian Cancer Registry. For 2003 estimates, see National Cancer Institute of Canada, *Canadian Cancer Statistics 2003,* Toronto, 2003, (with key results summarized in section 3.1.6 above).

Estimates for 2003 from the National Cancer Institute of Canada are summarized in section 3.1.6 above.

Definition

"Age-standardized rate of new primary sites of cancer (malignant neoplasms) per 100,000 population, for all cancers (ICD-9 140-208) and for specific sites: colorectal (ICD-9 153-154), lung (ICD-9 162), prostate (ICD-9 185), and female breast (ICD-9 174)."[188]

The all cancer incidence rates exclude cases of non-melanoma skin cancer (ICD-9 173).

Data Sources

Statistics Canada, Vital Statistics, Cancer Database, Canadian Cancer Registry, and Demography Division (population estimates); Health Canada, 1996-1997, (1998-2002 estimates).

Rates are age-standardized using the direct method, and the 1991 Canadian Census population structure. All cancer incidence rates are per 100,000 population. All rate comparisons in the following sections refer to age-standardized cancer incidence rates.

Results

3.2.6.1 All cancers

Note: National and provincial age-standardized all cancer rates are taken from 1996 and 1997 Statistics Canada data. Age-standardized all cancer rates for the Atlantic region health districts have been taken from the 1996 data.

In 1996, Nova Scotia had the highest age-standardized rate of new cancers for both sexes combined in the country (410.6 per 100,000 population), followed by PEI (406.6) and New Brunswick (406.3), compared to the national rate of 384.5. Newfoundland and Labrador had the lowest cancer incidence at 347.0 cases per 100,000 population.

The highest female cancer incidence rate in Canada in 1996 was in Manitoba (360.6), followed by Nova Scotia (358.6) and PEI (347.2). By comparison, the national average for females was 338.5. The three Maritime Provinces had the highest male cancer incidence rates in Canada – New Brunswick at 500.7, PEI at 491.9, and Nova Scotia at 489.8, compared to the national average for males of 453.6. Newfoundland and Labrador had the lowest new cancer rates in the country both for males and for females (402.0 and 306.4 respectively) (Figure 275).

Table C4 below indicates the 1997 incidence rates for all cancers in Canada and the provinces. In 1997, the three Maritime Provinces had the highest overall cancer incidence rates for both sexes combined in Canada – New Brunswick (414.1 per 100,000), PEI (412.7), and Nova Scotia (409.6), compared to the national average of 384.8. The Maritime Provinces also had the country's highest cancer rates for males – New Brunswick (501.9), PEI (501.8) and Nova Scotia

[188] Statistics Canada: http://www.statcan.ca/english/freepub/82-221-XIE/00502/defin1.htm#13.

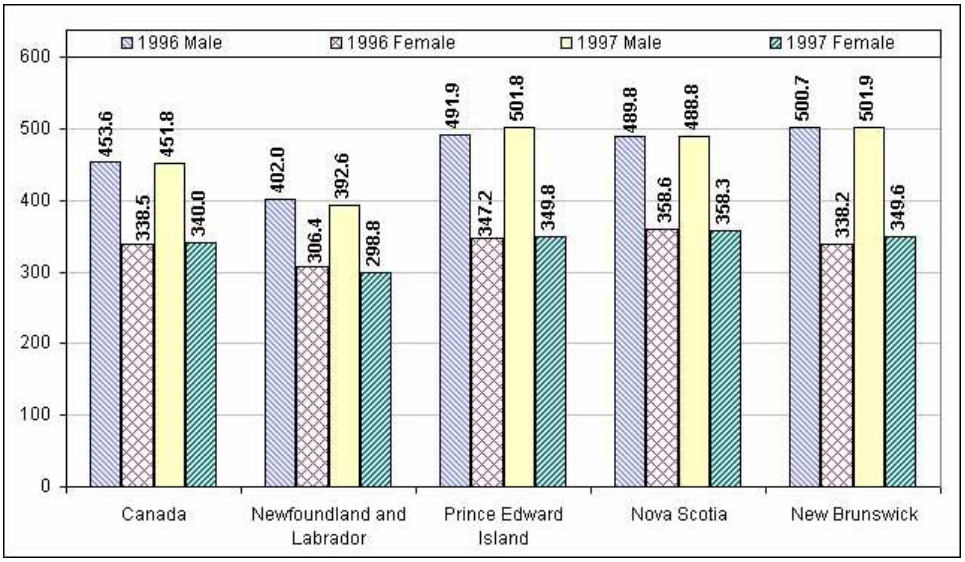
(488.8), compared to the national average of 451.8. The highest female rate was in Manitoba (363.3), followed by Nova Scotia (358.3), PEI (349.8) and New Brunswick (349.6), compared to the national average of 340. In 1997 Newfoundland and Labrador again had the lowest cancer incidence rates in the country both for males (392.6) and for females (298.8) (Figure 275).

Table C4. Cancer incidence rate, by sex, age-standardized rate per 100,000 population, Canada and provinces, annual, 1997

	Both sexes	Males	Females
Canada	384.8	451.8	340.0
Newfoundland and Labrador	338.5	392.6	298.8
Prince Edward Island	412.7	501.8	349.8
Nova Scotia	409.6	488.8	358.3
New Brunswick	414.1	501.9	349.6
Quebec	378.0	452.3	333.1
Ontario	393.5	462.1	347.0
Manitoba	402.2	462.3	363.3
Saskatchewan	370.2	433.1	324.7
Alberta	375.1	423.4	343.5
British Columbia	370.6	431.2	326.4

Source: Statistics Canada, CANSIM Database, Table 103-0004, based on cancer incidence data from the Canadian Cancer Registry Database, the National Cancer Incidence Reporting System and Demography Division (population estimates) of Statistics Canada.

Figure 275. Age-standardized all cancer incidence, rate per 100,000 population, Canada and Atlantic Provinces, 1996 and 1997 (rate)



Source: Statistics Canada, Canadian Cancer Registry Database and Demography Division (population estimates); available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/conditions4.htm, extracted 5 January, 2003.

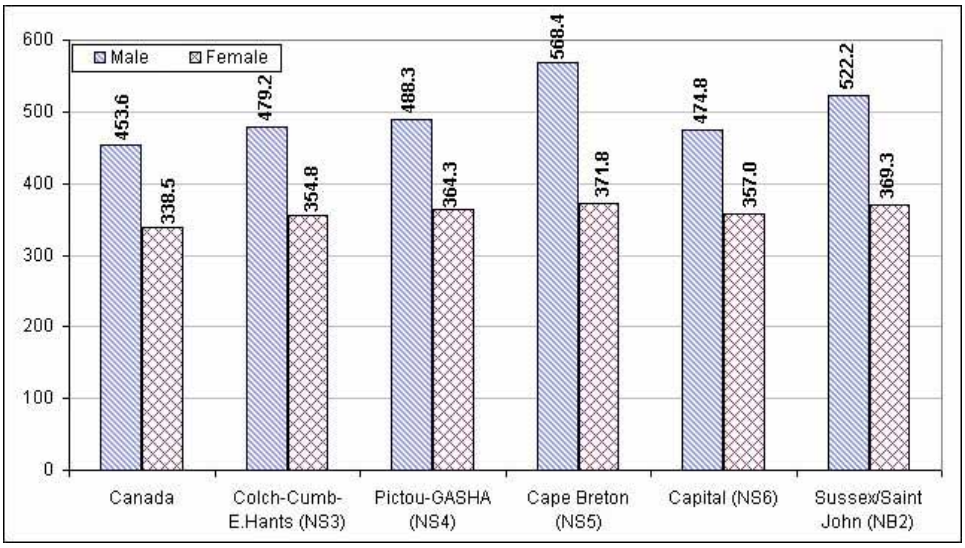
In 1996, the highest cancer rate for both sexes combined in Atlantic Canada was in Cape Breton (NS5) at 445.6, followed by Sussex/Saint John (NB2) at 431.6. In fact, all reporting health districts in the Maritimes had higher cancer rates than the national average of 384.5, with the exception of Edmundston (NB4) at 346.9 and Annapolis Valley (NS2) at 374.8.[189] All health districts in Newfoundland and Labrador had rates below the national average.

Cape Breton (NS5) also had the highest cancer rates in the region both for males (568.4) and for females (371.8) – with the male rate 25% higher than the national average (453.6) and the female rate 10% higher than the Canadian rate (338.5). The next highest male cancer rates were in Sussex/Saint John (NB2) at 522.2, and Campbellton (NB5) at 517.8. The next highest female rates were in Sussex/Saint John (NB2) at 369.3, and Pictou-Guysborough-Antigonish-Strait (NS4) at 364.3 (Figure 276).

Grenfell (NF5) had the lowest cancer rates in Atlantic Canada both for males (298.4) and for females (248.3), and Western Newfoundland (NF4) had the second lowest (332.6 and 263.3 respectively) (Figure 277). The next lowest female cancer rates were in Edmundston (NB4) at 264.2, Labrador (NF6) at 265.5, and Campbellton (NB5) at 295.1.

In 1996, Canadian males were 34% more likely than females to be diagnosed with cancer. Likewise, male cancer rates were higher than female rates in every Atlantic health district, although the gender gap varied considerably by district (Figure 278). As with all health district data, caution must be exercised in making comparisons and interpreting results, due to wide confidence intervals and high variability.

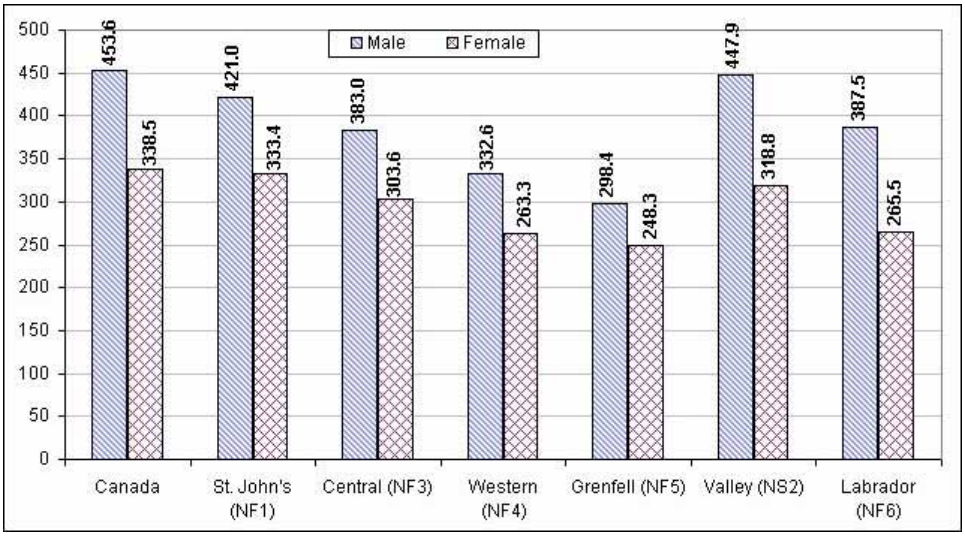
Figure 276. Age-standardized all cancer incidence, rate per 100,000 population, males and females, for selected Atlantic health districts with higher rates than Canada, 1996 (rate)



Source: Statistics Canada, Canadian Cancer Registry Database and Demography Division (population estimates); available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/conditions4.htm, extracted 5 January, 2003.

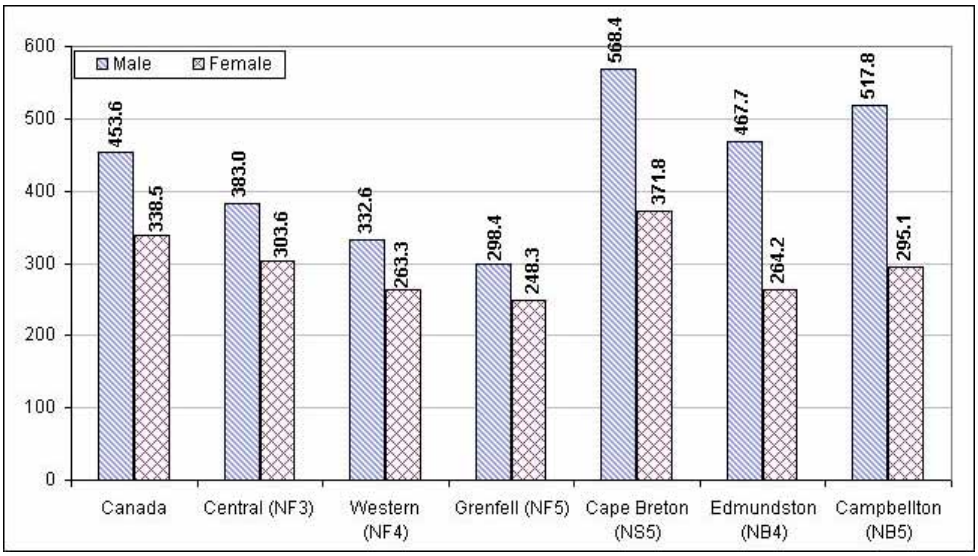
[189] Only provincial data are available for Prince Edward Island.

Figure 277. Age-standardized all cancer incidence, rate per 100,000 population, males and females, for selected Atlantic health districts with rates lower than the national average, 1996 (rate)



Source: Statistics Canada, Canadian Cancer Registry Database and Demography Division (population estimates); available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/conditions4.htm, extracted 5 January, 2003.

Figure 278. Age-standardized all cancer incidence, rate per 100,000 population, males and females, showing Atlantic health districts with greatest and least gender variance compared to Canada, 1996 (rate)



Source: Statistics Canada, Canadian Cancer Registry Database and Demography Division (population estimates); available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/conditions4.htm, extracted 5 January, 2003.

Examining cancer incidence trends over a 25-year period, it is noteworthy that in the late 1970s and early 1980s, cancer rates in the three Maritime Provinces were generally lower than the Canadian average. But Maritime cancer rates increased at a much faster rate than in Canada as a whole, and have remained consistently higher than Canadian rates in recent years. By contrast, Newfoundland and Labrador trends are much more favourable, with cancer rates in that province about 5% below the national average in the late 1970s and more than 10% lower, on average, in the 1990s (Figures 279 through 282).

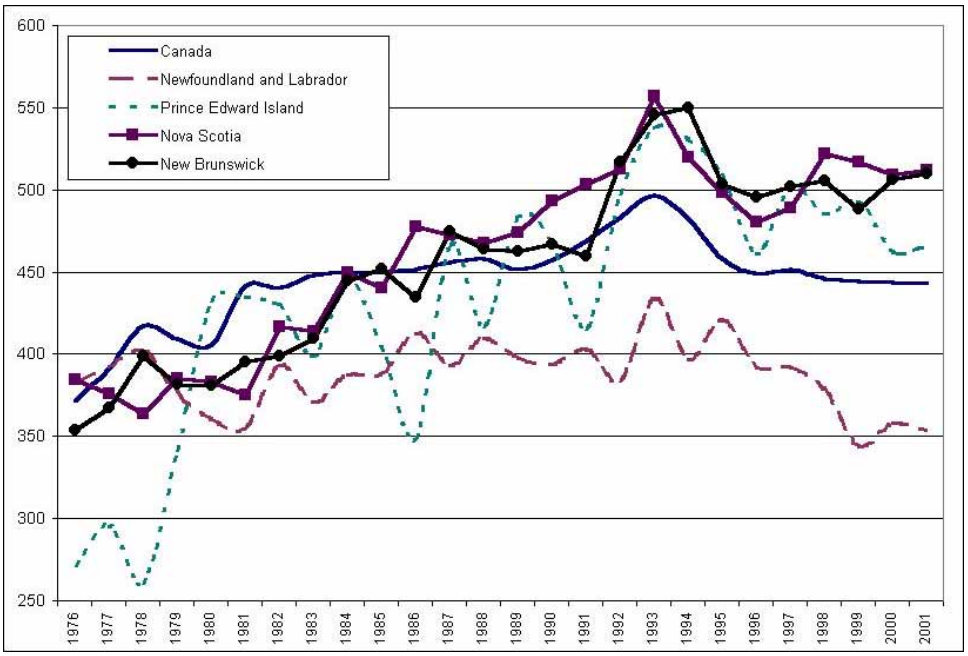
Among males, the cancer incidence rate in 1976 was 371.9 per 100,000 in Canada, 382.7 in Newfoundland and Labrador, 278.9 in PEI, 384.3 in Nova Scotia, and 353.7 in New Brunswick (Figure 279). Between 1976 and 2001, the male cancer incidence rate grew by 19.1% in Canada, 71.6% in PEI, 33.2% in Nova Scotia, and 44.1% in New Brunswick.[190] Newfoundland and Labrador is the only province in Canada in which the estimated all cancer incidence rate for males in 2001 was lower than it was in 1976, having declined by 7.4% during that period (Figures 279 and 280).

Among females, the cancer incidence rate in 1976 was 294. per 100,000 in Canada, 245.0 in Newfoundland and Labrador, 288.1 in PEI, 299.1 in Nova Scotia, and 270.2 in New Brunswick (Figure 281). The female cancer incidence rate increased between 1976 and 2001, both in Canada and in the four Atlantic Provinces, growing by 17.4% in Canada, 14.7% in Newfoundland and Labrador, 23.6% in PEI, 26.0% in Nova Scotia, and 33.6% in New Brunswick (Figures 281 and 282).[191]

[190] Cancer incidence rates for 2001 are estimates produced by Health Canada through extrapolation of cancer incidence data from the National Cancer Incidence Reporting System (NCIRS, 1969-1991) and the Canadian Cancer Registry. Details of the statistical methods used to produce the projections are described in Appendix II: Methods of the Canadian Cancer Statistics monograph produced by the Canadian Cancer Society, the National Cancer Institute of Canada, Statistics Canada, the Provincial/Territorial Cancer Registries, and Health Canada. Explanation from Statistics Canada, CANSIM Database, Table 103-0004: "Cancer incidence rate, by selected site of cancer and sex, age-standardized rate per 100,000 population, Canada, provinces and territories, annual," footnote 1. Available at: Statistics Canada, CANSIM Database, Table 103-0004 "Cancer incidence rate, by selected site of cancer and sex, age-standardized rate per 100,000 population, Canada, provinces and territories, annual". Available at: http://www.statcan.ca/english/freepub/82-221-XIE/01002/hlthstatus/conditions4.htm. Accessed January, 2003.

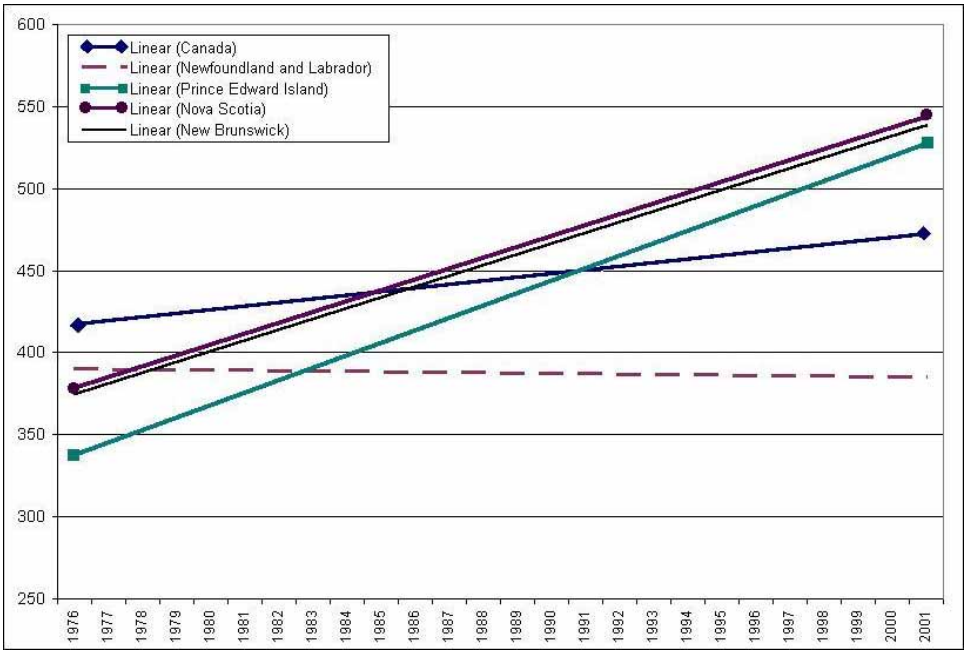
[191] Cancer incidence rates for 2001 are estimates produced by Health Canada. See notation above.

Figure 279. Age-standardized all cancer incidence, rate per 100,000 population, males, Canada and Atlantic Provinces, 1976-2001 (rate)



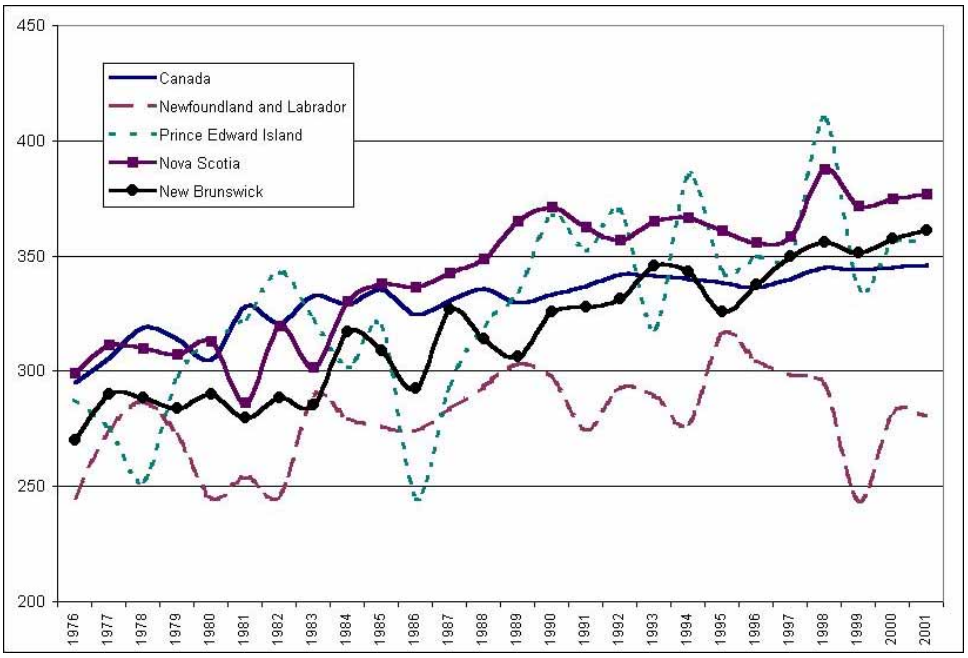
Source: Statistics Canada, Vital Statistics, Cancer Database, Canadian Cancer Registry, and Demography Division (population estimates), Health Canada (1998-2002 estimates).

Figure 280. Age-standardized all cancer incidence, rate per 100,000 population, males, Canada and Atlantic Provinces, 1976-2001 (linear trend)



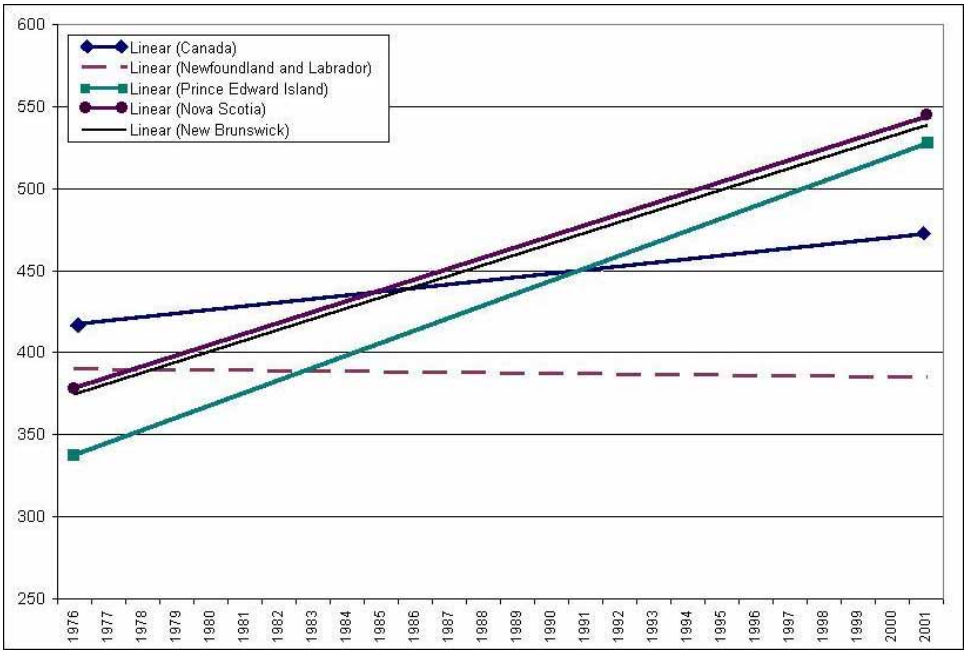
Source: Statistics Canada, Vital Statistics, Cancer Database, Canadian Cancer Registry, and Demography Division (population estimates), Health Canada (1998-2002 estimates).

Figure 281. Age-standardized all cancer incidence, rate per 100,000 population, females, Canada and Atlantic Provinces, 1976-2001 (rate)



Source: Statistics Canada, Vital Statistics, Cancer Database, Canadian Cancer Registry, and Demography Division (population estimates), Health Canada (1998-2002 estimates).

Figure 282. Age-standardized all cancer incidence, rate per 100,000 population, females, Canada and Atlantic Provinces, 1976-2001 (linear trend)



Source: Statistics Canada, Vital Statistics, Cancer Database, Canadian Cancer Registry, and Demography Division (population estimates), Health Canada (1998-2002 estimates).

3.2.6.2 Lung cancer

For brief descriptions of the key risk factors for lung cancer, please see the previous section (3.1.6). Note that national and provincial age-standardized lung cancer rates presented in this section are taken from 1996 and 1997 Statistics Canada data. However, age-standardized lung cancer rates for the Atlantic region health districts have been taken from the 1996 data.

In 1996, Quebec and the Maritime Provinces had the highest age-standardized lung cancer rates for both sexes combined in Canada – 69.5 per 100,000 population in Quebec, 67.0 in Nova Scotia, 66.7 in PEI, and 65.9 in New Brunswick, compared to the national average of 59.0. Newfoundland and Labrador had the lowest lung cancer incidence in the country – 45.2 per 100,000.

Quebec also had the highest lung cancer rates in the country for males (106.8), followed by New Brunswick (98.2), Nova Scotia (92.4), and PEI (84.4), compared to the national average of 82.2. PEI had the highest female incidence of lung cancer (54.1), followed by Nova Scotia (48.6) and Manitoba (47.0). The Newfoundland and Labrador rate for females (23.4) was by far the lowest in the country – an astonishing 44% lower than the national average of 41.6 (Figure 283).

Table C5 below indicates the 1997 rates for lung cancer incidence in Canada and the provinces. In 1997, Quebec and the Maritimes still had the highest lung cancer rates for both sexes combined in Canada – 68.5 per 100,000 in Quebec, followed by 66.8 in Nova Scotia, 64.9 in New Brunswick, and 62.6 in PEI, compared to the national average of 57.9. The highest male rates were in Quebec (103.4), New Brunswick (96.4), PEI (88.7) and Nova Scotia (86.1), compared to the national average of 79.4. The highest female rates were in Nova Scotia (53.5), Manitoba (48.1), PEI (43.8) and Quebec (43.6), compared to the national average of 41.9.

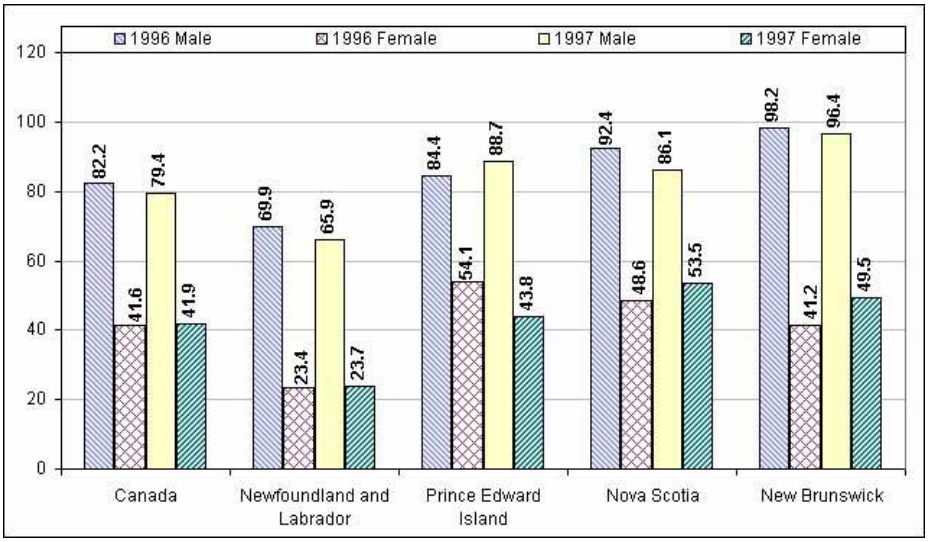
Table C5. Lung cancer incidence, by sex, age-standardized rate per 100,000 population, Canada and provinces, annual, 1997

	Both sexes	Males	Females
Canada	57.9	79.4	41.9
Newfoundland and Labrador	43.3	65.9	23.7
Prince Edward Island	62.6	88.7	43.8
Nova Scotia	66.8	86.1	53.5
New Brunswick	64.9	96.4	40.6
Quebec	68.5	103.4	43.6
Ontario	54.5	72.7	40.8
Manitoba	59.3	74.8	48.1
Saskatchewan	50.5	69.0	35.5
Alberta	50.1	65.9	38.5
British Columbia	52.3	64.9	42.7

Source: Statistics Canada, CANSIM Database, based on cancer incidence data from the Canadian Cancer Registry Database, the National Cancer Incidence Reporting System and Demography Division (population estimates) of Statistics Canada.

As in 1996, Newfoundland and Labrador in 1997 had the lowest lung cancer incidence in Canada (43.3) – 25% below the national average, and by far the lowest rate for females (23.7) – 43% below the national average. The province had the second lowest lung cancer rate for males (65.9) after British Columbia (64.9) (Figure 283).

Figure 283. Age-standardized lung cancer rate per 100,000 population, by sex, Canada and Atlantic Provinces, 1996 and 1997 (rate)



Source: Statistics Canada, Canadian Cancer Registry Database and Demography Division (population estimates); available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/conditions4.htm, extracted 5 January, 2003.

In 1996, Cape Breton (NS5) had the highest lung cancer incidence rate for both sexes combined in Atlantic Canada (76.5 per 100,000), followed by Campbellton (NB5) at 76.1, Edmundston (NB4) at 76.0, and Sussex/Saint John (NB2) at 73.8, compared to the national average of 59.0. Every health district in the Maritimes, with the exception of Moncton (NB1) at 57.7, had higher rates of lung cancer than the national average, and every health district in Newfoundland and Labrador had lower rates.[192]

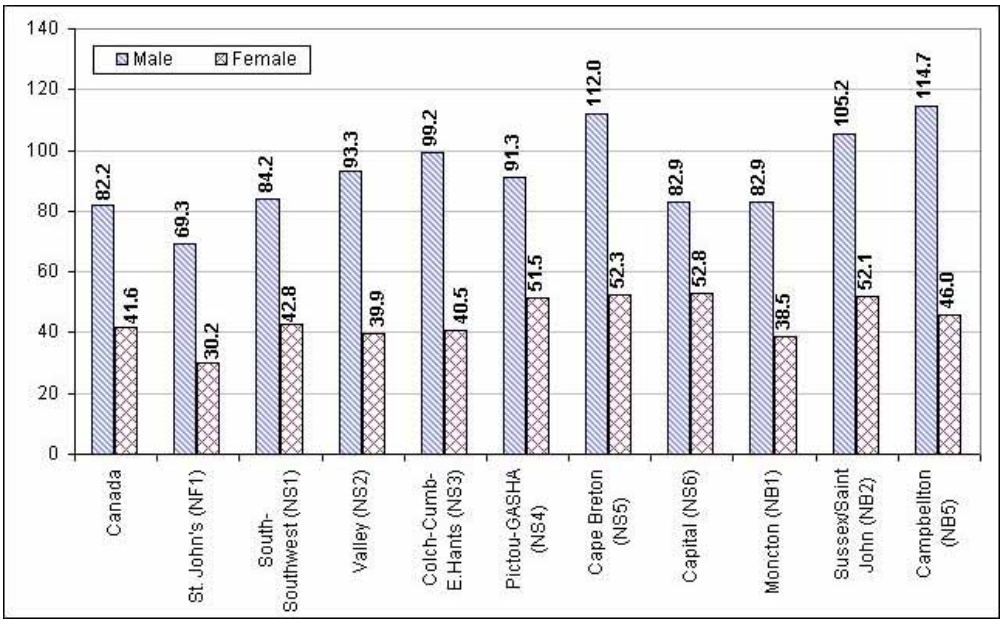
For males, the highest lung cancer rates were in Edmundston (NB4) at 138.1, Campbellton (NB5) at 114.7, and Cape Breton (NS5) at 112.0, For females, the highest rates were in PEI (54.1), Capital (NS6) at 52.8, Cape Breton (NS5) at 52.3, Sussex/Saint John (NB2) at 52.1, and Pictou-GASHA (NS4) at 51.5 (Figure 284).

The lowest reported lung cancer incidence in Atlantic Canada for both males (55.6) and females (12.0) was in Central (NF3). With the exception of Eastern (NF2) which had a higher than average incidence of lung cancer among males (94.6), all reporting health districts in Newfoundland and Labrador had the lowest regional rates of lung cancer for both males and females.[193] In the Maritimes, New Brunswick had the lowest incidence of female lung cancer,

[192] Only provincial data are available for PEI.
[193] Figures for Grenfell (NF5) females and Labrador (NF6) males and females were suppressed by Statistics Canada to meet the confidentiality provisions of the *Statistics Act*.

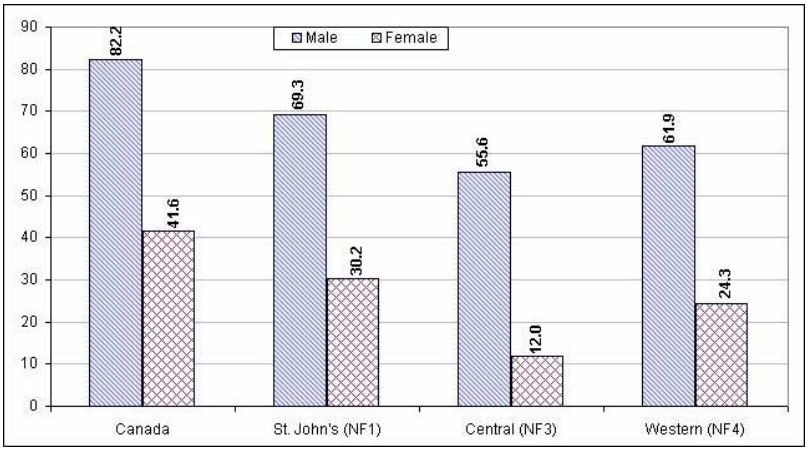
with Edmundston (NB4) at 30.4, Bathurst (NB6) at 30.6, Fredericton (NB3) at 34.2, and Moncton (NB1) at 38.5 all reporting rates below the national average for females (41.6) (Figure 285).

Figure 284. Age-standardized lung cancer rate per 100,000 population, Canada and selected Atlantic health districts, 1996 (rate)



Source: Statistics Canada, Canadian Cancer Registry Database and Demography Division (population estimates; available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/conditions4.htm, extracted 5 January, 2002.

Figure 285. Age-standardized lung cancer rate per 100,000 population, Canada and selected Newfoundland and Labrador health districts, 1996 (rate)



Source: Statistics Canada, Canadian Cancer Registry Database and Demography Division (population estimates; available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/conditions4.htm, extracted 5 January, 2002.

In 1996, Canadian males were about twice as likely to be diagnosed with lung cancer as females (82.2 vs. 41.6). But these rates are converging and the gender gap is rapidly narrowing, as male lung cancer rates fall and female rates rise in response to earlier increases in female smoking. For 2002, Statistics Canada projected a male rate of 73.9 and a female rate of 47.3, narrowing the gap from 2:1 six years earlier to 1.6:1 in 2002.

In 1996, in every Atlantic health district, males were also much more likely than females to be diagnosed with lung cancer. Within Atlantic Canada, in 1996, the gender gap was widest in Newfoundland and Labrador (3:1), and narrowest in PEI (1.6:1), with ratios of 2.4:1 in New Brunswick and 1.9:1 in Nova Scotia. Males in Central (NF3) and Edmundston (NB4) were about 4.5 times as likely to be diagnosed with lung cancer as females (Figures 286 and 287).

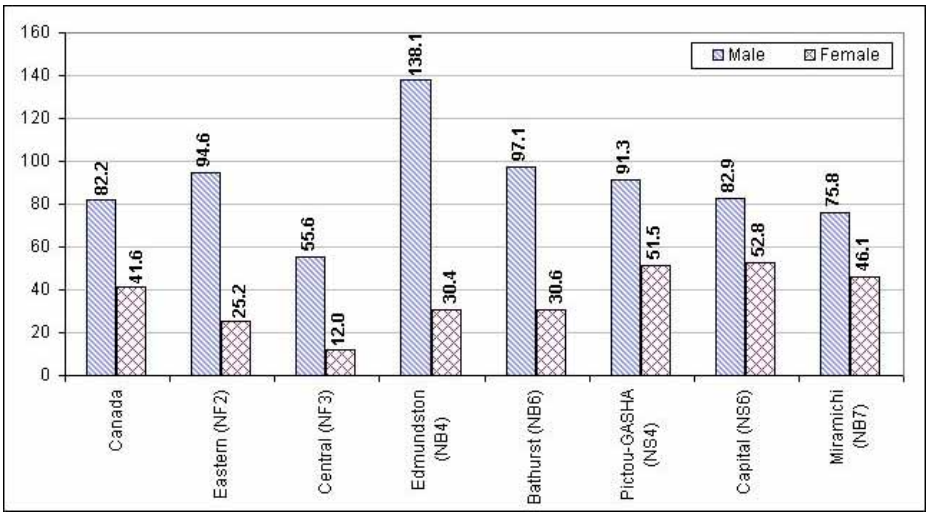
As with all health district data, caution must be exercised in making comparisons and interpreting results, due to wide confidence intervals and high variability.

Examining lung cancer incidence trends over a 25-year period, it is again noteworthy – as with other health indicators – that the health gap between the Maritimes and the rest of Canada has widened considerably over time. Since the mid-1980s, male lung cancer rates have fallen much more rapidly in Canada than in the Maritimes, and female lung cancer rates have increased at a much faster rate in the Maritimes than in the rest of Canada (Figures 288 through 291).

Among males, the lung cancer incidence rate in 1976 was 75.7 per 100,000 for Canada, 57.1 in Newfoundland and Labrador, 50.5 in PEI, 81.7 in Nova Scotia, and 71.6 in New Brunswick (Figure 288). Between 1976 and 2001, the male lung cancer incidence grew by 73.7% in Prince Edward Island, 17.0% in Nova Scotia, and 37.2% in New Brunswick, and fell by 0.4% in Canada and by 15.2% in Newfoundland and Labrador (Figures 288 and 289).

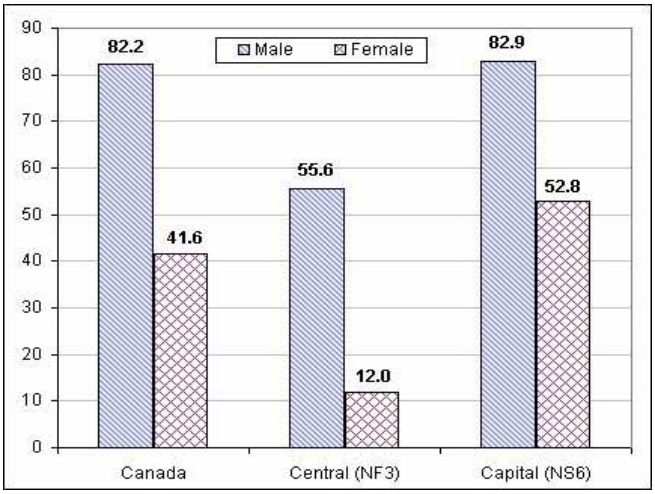
Among females, the lung cancer incidence rate in 1976 was 16.3 per 100,000 in Canada, 9.9 in Newfoundland and Labrador, 13.3 in PEI, 15.7 in Nova Scotia, and 14.8 in New Brunswick (Figures 290 and 291). The female incidence rate increased in Canada and the four Atlantic Provinces between 1976 and 2001, growing by 184.7% in Canada, 146.5% in Newfoundland and Labrador, 321.1% in PEI, 251.0% in Nova Scotia, and 245.3% in New Brunswick (Figures 290 and 291).

Figure 286. Age-standardized lung cancer rate per 100,000 population, Canada and selected Atlantic health districts, showing gender variations, 1996 (rate)



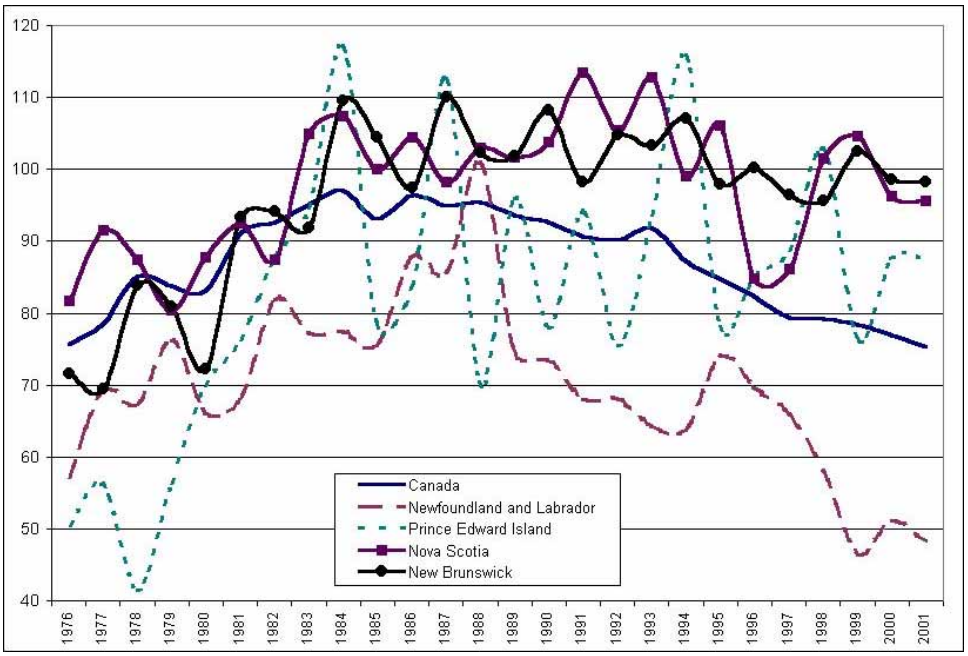
Source: Statistics Canada, Canadian Cancer Registry Database and Demography Division (population estimates; available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/conditions4.htm, extracted 3 January, 2003.

Figure 287. Age-standardized lung cancer rate per 100,000 population, Canada and Atlantic health districts with the highest and lowest female lung cancer rates, 1996 (rate)



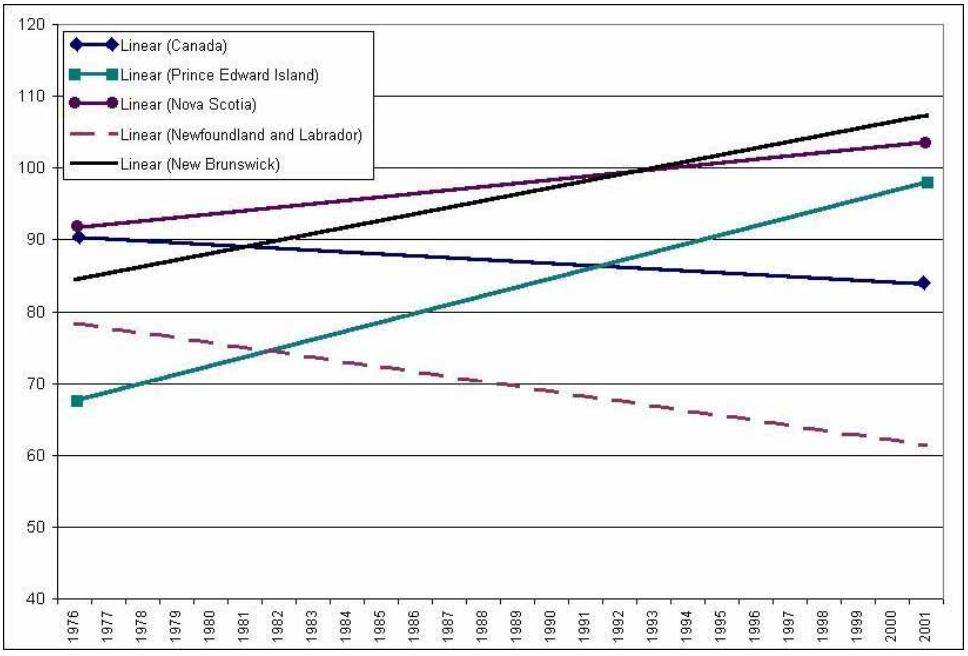
Source: Statistics Canada, Canadian Cancer Registry Database and Demography Division (population estimates; available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/conditions4.htm, extracted 5 January, 2003.

Figure 288. Age-standardized lung cancer rate per 100,000 population, males, Canada and Atlantic Provinces, 1976-2001 (rate)



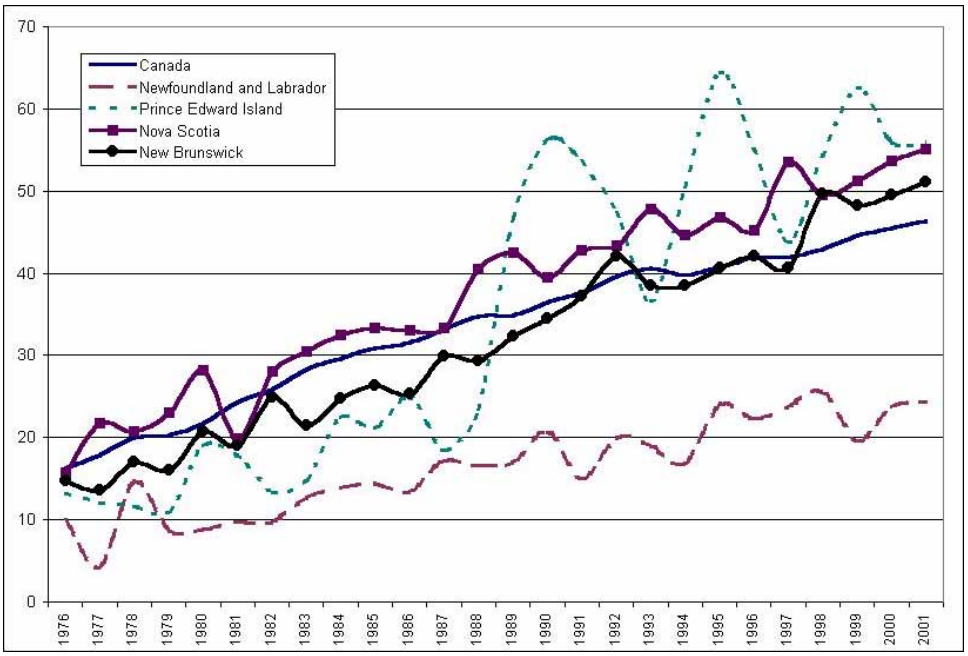
Source: Statistics Canada, Vital Statistics, Cancer Database, Canadian Cancer Registry, and Demography Division (population estimates), Health Canada (1998-2002 estimates).

Figure 289. Age-standardized lung cancer rate per 100,000 population, males, Canada and Atlantic Provinces, 1976-2001 (linear trend)



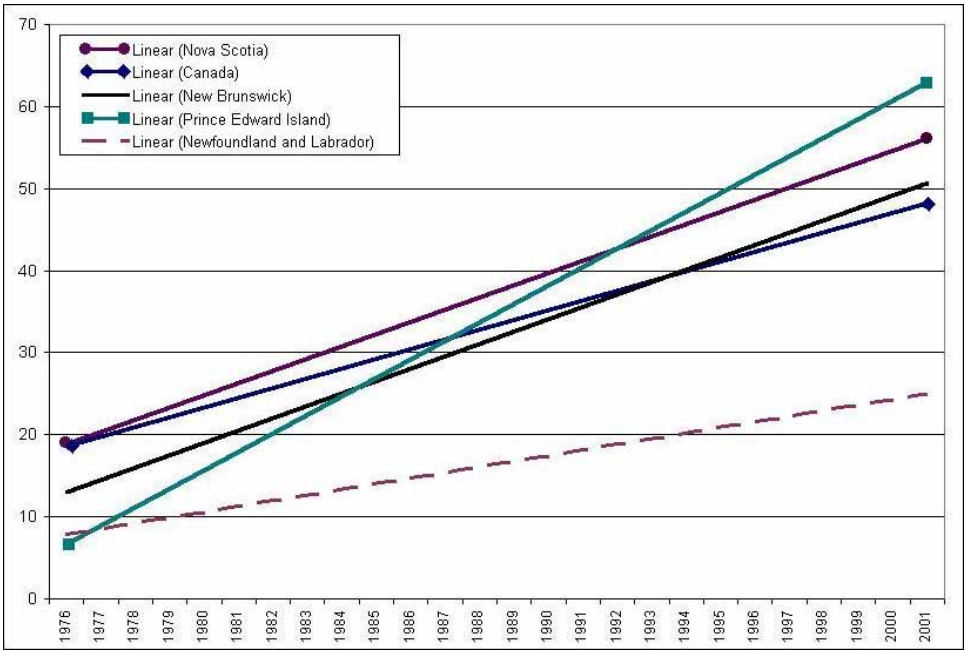
Source: Statistics Canada, Vital Statistics, Cancer Database, Canadian Cancer Registry, and Demography Division (population estimates), Health Canada (1998-2002 estimates).

Figure 290. Age-standardized lung cancer rate per 100,000 population, females, Canada and Atlantic Provinces, 1976-2001 (rate)



Source: Statistics Canada, Vital Statistics, Cancer Database, Canadian Cancer Registry, and Demography Division (population estimates), Health Canada (1998-2002 estimates).

Figure 291. Age-standardized lung cancer rate per 100,000 population, females, Canada and Atlantic Provinces, 1976-2001 (linear trend)



Source: Statistics Canada, Vital Statistics, Cancer Database, Canadian Cancer Registry, and Demography Division (population estimates), Health Canada (1998-2002 estimates).

3.2.6.3 Colorectal cancer

For brief descriptions of the key risk factors for colorectal cancer, please see the previous section (3.1.6). Note that national and provincial age-standardized colorectal cancer rates presented in this section are taken from 1996 and 1997 Statistics Canada data. However, age-standardized colorectal cancer rates for the Atlantic region health districts have been taken from the 1996 data.

In 1996, all four Atlantic Provinces had higher age-standardized rates of colorectal cancer incidence than the national average both for both sexes combined. PEI had the highest colorectal cancer rate in the country (58.4 per 100,000), followed by Newfoundland and Labrador (58.2), Nova Scotia (56.2), Manitoba (52.0), and New Brunswick (51.6), compared to the national average of 49.6.

In 1996 Newfoundland and Labrador had the highest rate of colorectal cancer in the country for males (69.9), followed by Nova Scotia (67.1), and PEI (64.8). The Canadian rate for males was 60.3 per 100,000. The four Atlantic Provinces had the highest colorectal cancer rates in the country for females – PEI (53.9), Newfoundland and Labrador (48.6), Nova Scotia (48.1), and New Brunswick (44.1), compared to the national average for females of 41.2.

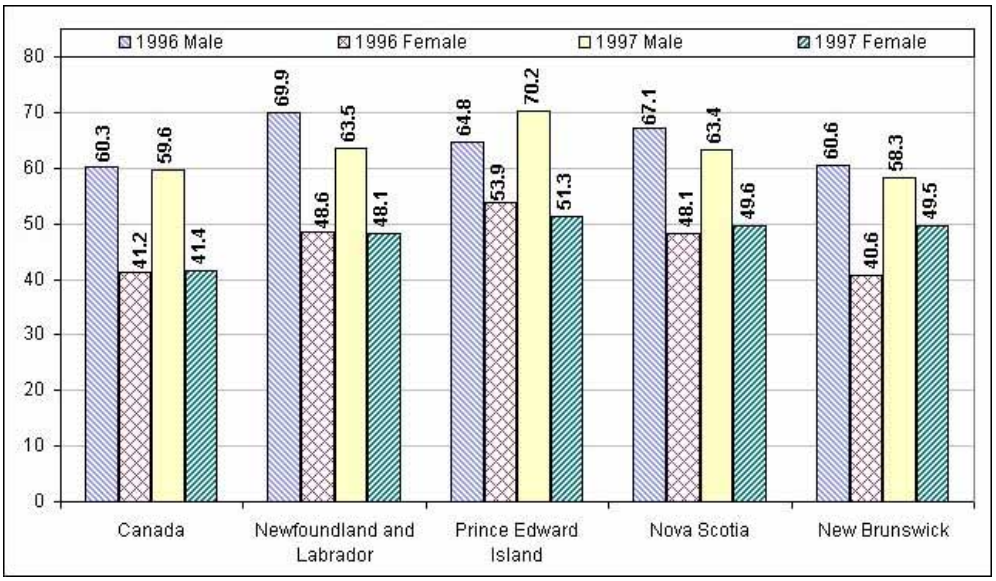
Table C6 below indicates the 1997 rates for colorectal cancer incidence in Canada and in the provinces. In 1997, the highest rates of colorectal cancer in the country were in PEI (59.7 per 100,000), Nova Scotia (55.4), Newfoundland and Labrador (55.1), Manitoba (54.5) and New Brunswick (53.5), compared to the national average of 49.3. The highest male incidence was in PEI (70.2), followed by Manitoba (64.4), Newfoundland and Labrador (63.5), and Nova Scotia (63.4), compared to the national average for males of 59.6. The four Atlantic provinces had the highest female rates of colorectal cancer in Canada – PEI (51.3), Nova Scotia (49.6), New Brunswick (49.5), and Newfoundland and Labrador (Figure 292).

Table C6. Colorectal cancer incidence, by sex, age-standardized rate per 100,000 population, Canada and provinces, annual, 1997

	Both sexes	Males	Females
Canada	49.3	59.6	41.1
Newfoundland and Labrador	55.1	63.5	48.1
Prince Edward Island	59.7	70.2	51.3
Nova Scotia	55.4	63.4	49.6
New Brunswick	53.5	58.3	49.5
Quebec	49.5	60.5	41.4
Ontario	49.8	60.6	41.0
Manitoba	54.5	64.4	46.2
Saskatchewan	45.9	56.8	36.7
Alberta	45.6	55.5	37.2
British Columbia	45.7	56.0	37.6

Source: Statistics Canada, CANSIM Database, based on cancer incidence data from the Canadian Cancer Registry Database, the National Cancer Incidence Reporting System and Demography Division (population estimates) of Statistics Canada. Available at: http://www.statcan.ca/english/freepub/82-221-XIE/01002/hlthstatus/conditions4.htm. Accessed January, 2003.

Figure 292. Age-standardized colorectal cancer rate per 100,000 population, Canada and Atlantic Provinces, 1996 and 1997 (rate)



Source: Statistics Canada, Canadian Cancer Registry Database and Demography Division (population estimates; available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/conditions4.htm, extracted 5 January, 2003.

In 1996, the highest colorectal cancer rates for both sexes combined in Canada were in Eastern (NF2) at 67.0 per 100,000, Central (NF3) at 65.0, Campbellton (NB5) at 62.1, and Colchester-Cumberland-East Hants (NS3) at 60.0. The highest rates for males were in Eastern (NF2) at 77.1, Cape Breton (NS5) at 76.7, St. John's (NF1) at 76.5, and Pictou-GASHA (NS4) at 75.4. The highest female rates were again in Eastern (NF2) at 59.1, followed by Central (NF3) at 57.2, Campbellton (NB5) at 55.3, and Colchester-Cumberland-East Hants (NS3) at 54.9 (Figure 293).[194]

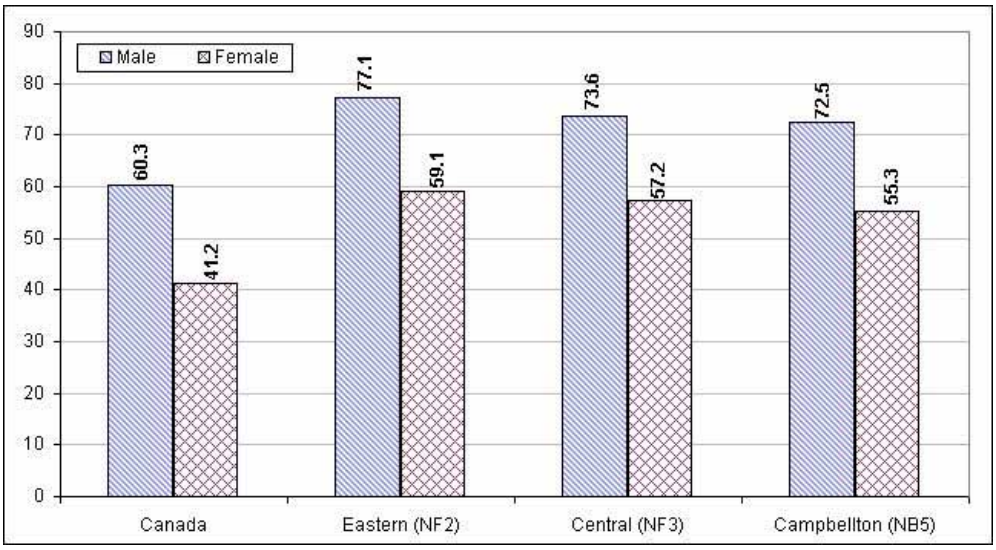
Only five of Atlantic Canada's 21 health districts had rates of colorectal cancer for both sexes combined that were below the national average of 49.6 – Western (NF4) at 38.0 per 100,000, Bathurst (NB6) at 39.7, Labrador (NF6) at 39.8, Edmundston (NB4) at 46.8, and Miramichi (NB7) at 48.4. The lowest males rates were in Western (NF4) at 42.6, Bathurst (NB6) at 47.7, and Miramichi (NB7) at 51.1. The lowest female rates were in Edmundston (NB4) and Bathurst (NB6) at 32.9, and in Western (NF4) at 34 per 100,000 (Figure 294).

Canadian males were nearly 50% more likely to be diagnosed with colorectal cancer than females. Likewise, every Atlantic health district had higher male than female colorectal cancer rates, though the size of the gender gap varies by district. In Edmundston (NB4), nearly twice as many males than females were diagnosed with colorectal cancer in 1996, while the gap is much narrower in other districts (Figure 295).

[194] Only provincial data are available for Prince Edward Island. Data on females in Grenfell (NF5) and Labrador (NF6) were suppressed by Statistics Canada to meet the confidentiality provisions of the Statistics Act.

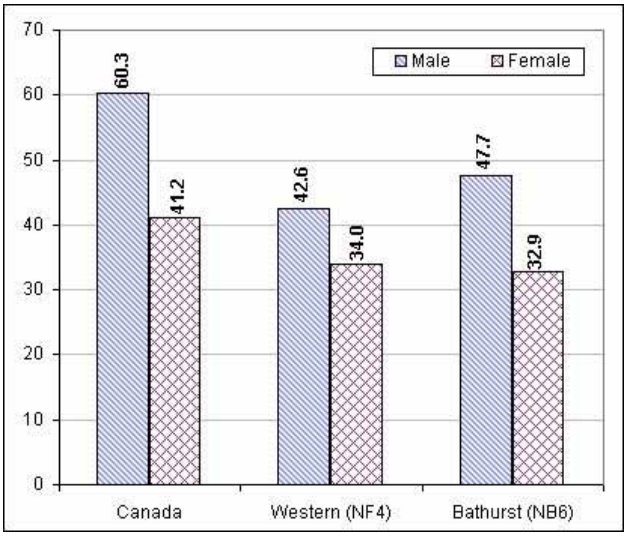
As with all health district data, caution must be exercised in making comparisons and interpreting results, due to wide confidence intervals and high variability.

Figure 293. Age-standardized colorectal cancer rate per 100,000 population, by sex, Canada and selected Atlantic health districts, 1996 (rate)



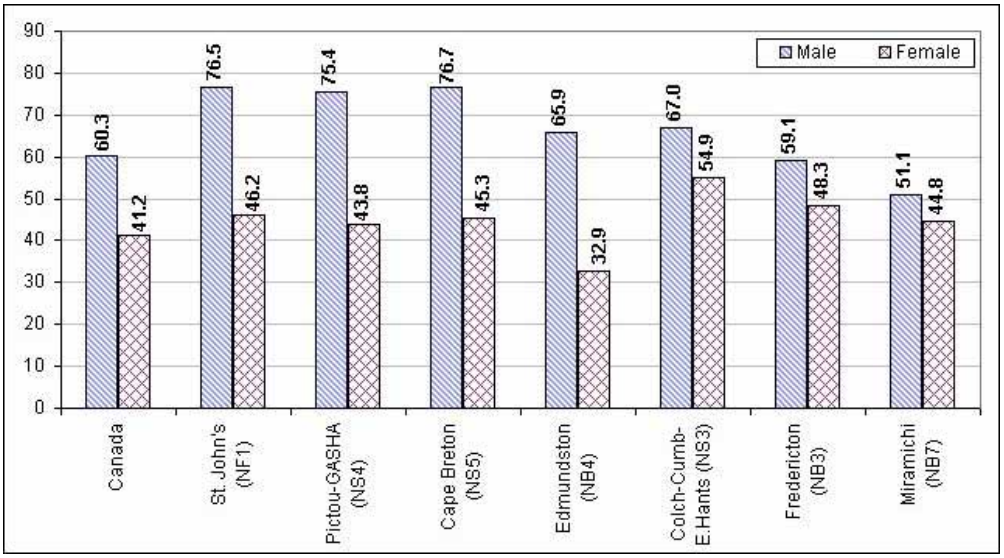
Source: Statistics Canada, Canadian Cancer Registry Database and Demography Division (population estimates; available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/conditions4.htm, extracted 5 January, 2003.

Figure 294. Age-standardized colorectal cancer rate per 100,000 population, Canada and Atlantic health districts with the lowest regional colorectal cancer rates, 1996 (rate)



Source: Statistics Canada, Canadian Cancer Registry Database and Demography Division (population estimates; available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/conditions4.htm, extracted 5 January, 2003.

Figure 295. Age-standardized colorectal cancer rate per 100,000 population, by sex, Canada and Atlantic health districts with the greatest and least gender variance, 1996 (rate)



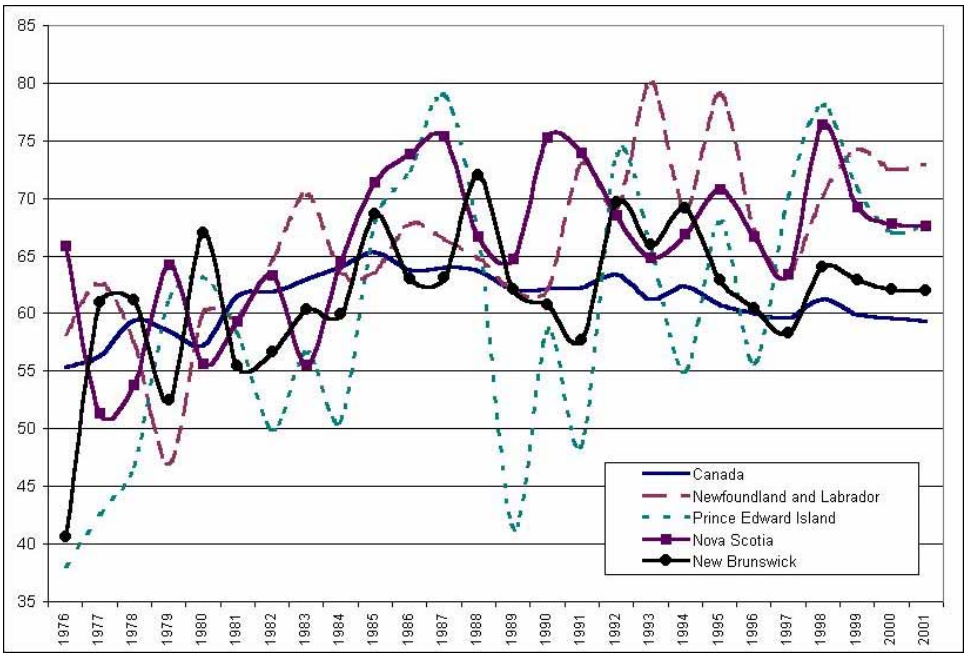
Source: Statistics Canada, Canadian Cancer Registry Database and Demography Division (population estimates; available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/conditions4.htm, extracted 5 January, 2003.

Examining colorectal cancer incidence trends over a 25-year period, it is apparent that the health gap between Atlantic Canada and the rest of Canada has widened over time.[195] While Atlantic Canada as a whole had colorectal cancer rates comparable to Canadian rates in the late 1970s and early 1980s, the region now has considerably higher rates than the Canadian average. In particular, the steady decline in colorectal cancer incidence among Canadian females in the last 20 years has not been matched by comparable improvements in Atlantic Canada.

In 1976, the male colorectal cancer rate was 55.3 per 100,000 in Canada, 58.2 in Newfoundland and Labrador, 38.1 in PEI, 65.9 in Nova Scotia, and 40.6 in New Brunswick. Between 1976 and 2001, the male incidence rate grew by 7.2% in Canada, 25.4% in Newfoundland and Labrador, 77.7% in Prince Edward Island, 2.6% in Nova Scotia, and 52.7% in New Brunswick (Figures 296 and 297).

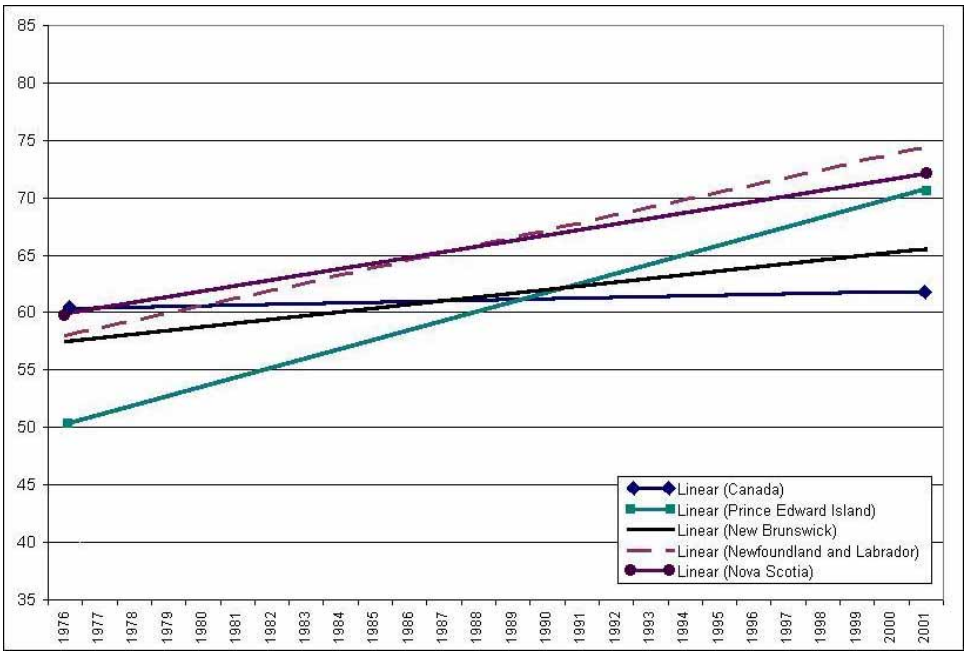
[195] Statistics Canada, CANSIM Database, Table 103-0004 "Cancer incidence rate, by selected site of cancer and sex, age-standardized rate per 100,000 population, Canada, provinces and territories, annual", 1976-2002. Available at: http://www.statcan.ca/english/freepub/82-221-XIE/01002/hlthstatus/conditions4.htm. Accessed January, 2003. The 1976 to 1997 cancer age-standardized rates are based on cancer incidence data from the Canadian Cancer Registry Database, the National Cancer Incidence Reporting System and Demography Division (population estimates) of Statistics Canada. 1998 to 2002 age-standardized rates are estimates produced by Health Canada through extrapolation of cancer incidence data from the National Cancer Incidence Reporting System (NCIRS, 1969-1991) and the Canadian Cancer Registry. Details of the statistical methods used to produce the projections are described in Appendix II: Methods of the Canadian Cancer Statistics monograph produced by the Canadian Cancer Society, the National Cancer Institute of Canada, Statistics Canada, the Provincial/Territorial Cancer Registries, and Health Canada.

Figure 296. Age-standardized colorectal cancer rate per 100,000 population, males, Canada and Atlantic Provinces, 1976-2001 (rate)



Source: Statistics Canada, Vital Statistics, Cancer Database, Canadian Cancer Registry, and Demography Division (population estimates), Health Canada (1998-2002 estimates).

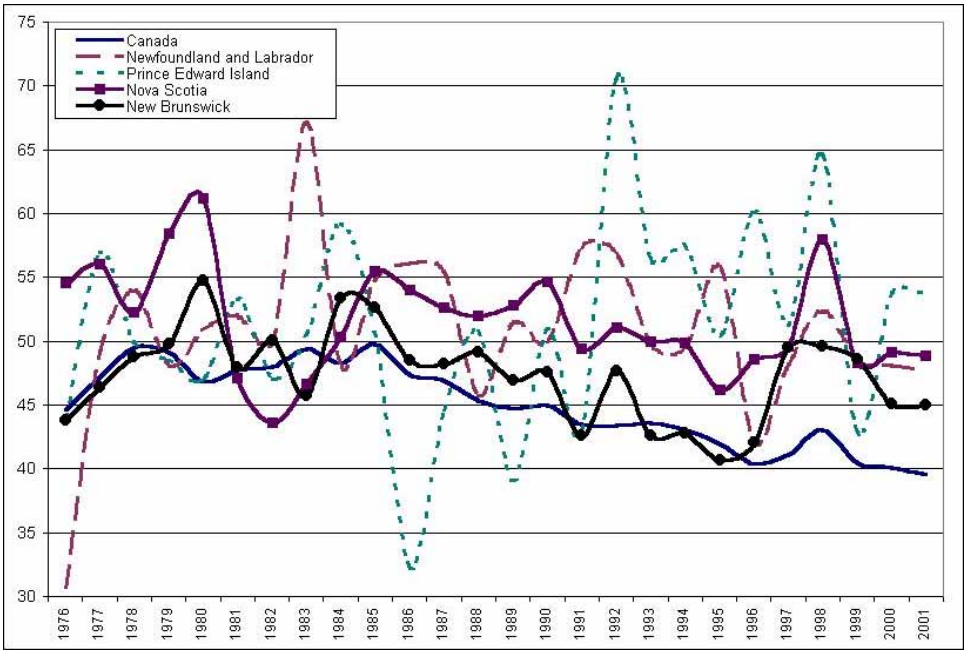
Figure 297. Age-standardized colorectal cancer rate per 100,000 population, males, Canada and Atlantic Provinces, 1976-2001 (linear trend)



Source: Statistics Canada, Vital Statistics, Cancer Database, Canadian Cancer Registry, and Demography Division (population estimates), Health Canada (1998-2002 estimates).

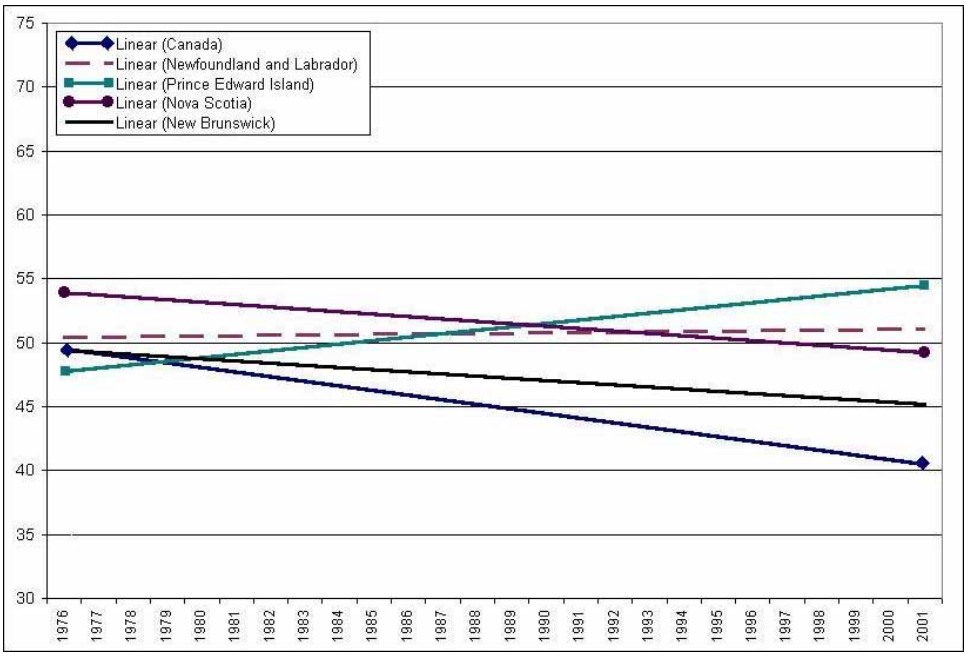
In 1976, the female colorectal cancer rate was 44.6 per 100,000 in Canada, 30.7 in Newfoundland and Labrador, 44.0 for PEI, 54.6 in Nova Scotia, and 43.8 in New Brunswick (Figures 298 and 299). While the female incidence rate fell by 11.2% in Canada between 1976 and 2001, the rate *increased* by 55.4% in Newfoundland and Labrador, 22.0% in PEI, and 2.7% in New Brunswick. Nova Scotia saw a 10.4% decline in the female colorectal cancer rate between 1976 and 2001, but its1976 rate was by far the highest in the country – 22% above the Canadian average – and its estimated 2001 rate (48.9) is still the second highest after PEI. Since the early 1990s in particular, the incidence of colorectal cancer among Canadian females has continued to decline, while rates have stabilized in the Atlantic Provinces (Figures 297 and 298).

Figure 298. Age-standardized colorectal cancer rate per 100,000 population, females, Canada and Atlantic Provinces, 1976-2001 (rate)



Source: Statistics Canada, Vital Statistics, Cancer Database, Canadian Cancer Registry, and Demography Division (population estimates), Health Canada (1998-2002 estimates).

Figure 299. Age-standardized colorectal cancer rate per 100,000 population, females, Canada and Atlantic Provinces, 1976-2001 (linear trend)



Source: Statistics Canada, Vital Statistics, Cancer Database, Canadian Cancer Registry, and Demography Division (population estimates), Health Canada (1998-2002 estimates).

3.2.6.4 Prostate cancer

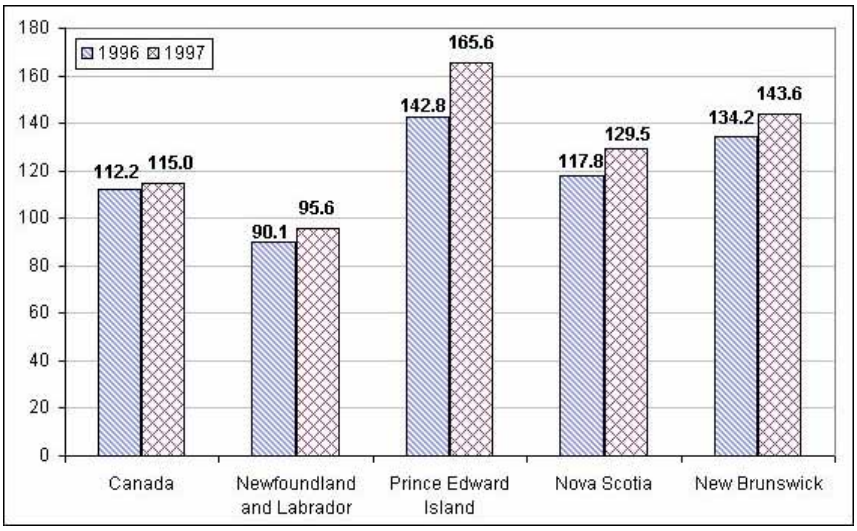
For descriptions of prostate cancer trends, please see also the prostate cancer mortality section of this volume (3.1.6.4). There it was noted that prostate cancer is the most commonly diagnosed form of cancer in men, with about 18,800 cases diagnosed annually in Canada, compared to 12,200 lung cancers. The rapid increase in the number of prostate cancer cases detected since the early 1990s is due largely to the widespread availability and use of early detection techniques since that time. Prostate cancer death rates peaked in Canada between 1991 and 1995, but have fallen since the mid-1990s, again due in part to earlier detection and treatment.[196]

Note that national and provincial age-standardized prostate cancer rates presented in this section are taken from 1996 and 1997 Statistics Canada data. However, age-standardized prostate cancer rates for the Atlantic region health districts have been taken from the 1996 data.

In 1996, Prince Edward Island had the highest prostate cancer rate in the country – 142.8 per 100,000 population, followed by New Brunswick at 134.2. In 1996, the national prostate cancer rate was 112.2 per 100,000, and the Nova Scotia rate was 117.8. Newfoundland and Labrador had the second lowest prostate cancer rate in the country (90.1) after Quebec (88.7) (Figure 300).

[196] National Cancer Institute of Canada, 2003, op. cit., pages 13 and 16.

Figure 300. Age-standardized prostate cancer rate per 100,000 population, Canada and Atlantic Provinces, 1996 and 1997 (rate)



Source: Statistics Canada, Vital Statistics, Cancer Database, Canadian Cancer Registry, and Demography Division (population estimates).

Table C7 below indicates the trend in prostate cancer incidence in Canada and in the provinces from 1993 to 2002, with the 1998-2002 estimates reflecting Health Canada's forecasts. In 1997, the most recent year for which actual data are available, the three Maritime Provinces had the highest prostate cancer rates in the country – PEI (165.6), New Brunswick (143.6), and Nova Scotia (129.5), compared to the national average of 115 per 100,000. As in the previous year, Newfoundland and Labrador again had the second lowest incidence of prostate cancer in the country (95.6) after Quebec (83.0).

In 1996, the highest rates of prostate cancer incidence in Atlantic Canada were in Cape Breton (NS5) at 158.5 per 100,000, Sussex/Saint John (NB2) at 147.0, Bathurst (NB6) at 136.0, and Fredericton (NB3) at 134.9. The lowest rates were in Western (NF4) at 81.9, the Annapolis Valley (NS2) at 85.3, St. John's (NF1) at 90.4, Eastern (NF2) at 92.1, and South-Southwest (NS1) at 94.0 (Figure 301).[197] As with all health district data, caution must be exercised in making comparisons and interpreting results, due to wide confidence intervals and high variability.

[197] Only provincial data are available for Prince Edward Island. Data for Grenfell (NF5) and Labrador (NF6) were suppressed by Statistics Canada to meet the confidentiality provisions of the Statistics Act.

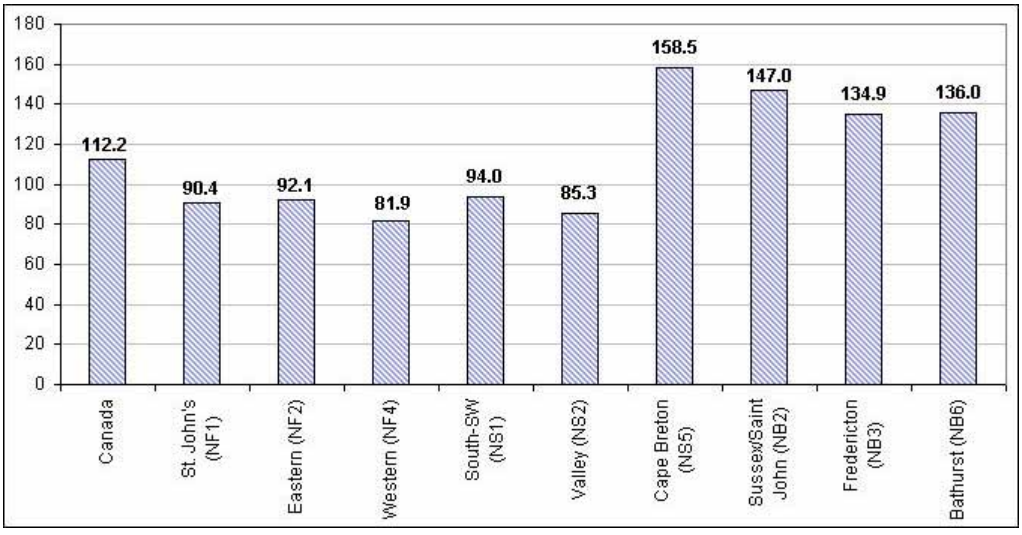
Table C7. Prostate cancer incidence, by sex, age-standardized rate per 100,000 population, Canada and provinces, annual, 1993-2002

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Canada	140.4	129.4	111.3	109.7	115.0	113.7	113.9	116.0	118.2	120.3
Newfoundland and Labrador	102.7	80.8	79.2	95.1	95.6	100.2	104.0	95.0	95.0	95.0
Prince Edward Island	170.8	201.4	148.4	112.4	165.6	127.3	122.3	136.6	135.7	135.0
Nova Scotia	148.4	145.4	110.7	112.4	129.5	131.4	139.8	137.6	141.8	146.0
New Brunswick	182.5	163.9	128.0	130.5	143.6	150.2	136.8	144.7	146.1	147.7
Quebec	123.5	119.9	98.3	84.9	83.0	83.2	82.3	79.7	77.2	75.0
Ontario	130.2	124.3	110.6	113.7	125.8	121.5	122.1	123.3	124.7	126.5
Manitoba	183.7	160.0	138.9	113.6	122.3	128.3	114.3	123.4	123.4	123.4
Saskatchewan	154.6	137.5	115.7	110.1	111.7	123.9	137.4	124.0	123.9	123.9
Alberta	143.9	129.1	123.5	129.9	121.1	126.8	135.8	133.6	136.3	139.3
British Columbia	171.9	142.2	120.1	127.1	128.5	121.1	143.4	124.5	122.5	120.7

Note: 1998-2002 data are forecasts.

Source: Statistics Canada, CANSIM Database. The 1993 to 1997 cancer age-standardized rates are based on cancer incidence data from the Canadian Cancer Registry Database, the National Cancer Incidence Reporting System and Demography Division (population estimates) of Statistics Canada. The 1998 to 2002 age-standardized rates are estimates produced by Health Canada through extrapolation (f) of cancer incidence data from the National Cancer Incidence Reporting System (NCIRS, 1969-1991) and the Canadian Cancer Registry. Details of the statistical methods used to produce the projections are described in Appendix II: Methods of the Canadian Cancer Statistics monograph produced by the Canadian Cancer Society, the National Cancer Institute of Canada, Statistics Canada, the Provincial/Territorial Cancer Registries, and Health Canada. Explanation from Footnote 1, CANSIM, Table 103-0004 – "Cancer incidence rate, by selected site of cancer and sex, age-standardized rate per 100,000 population, Canada, provinces and territories, annual." Available at: http://www.statcan.ca/english/freepub/82-221-XIE/01002/hlthstatus/conditions4.htm. Accessed 12 November, 2003.

Figure 301. Age-standardized prostate cancer rate per 100,000 population, Canada and selected Atlantic health districts, 1996 (rate)



Source: Statistics Canada, Vital Statistics, Cancer Database, Canadian Cancer Registry, and Demography Division (population estimates), Health Canada (1998-2002 estimates).

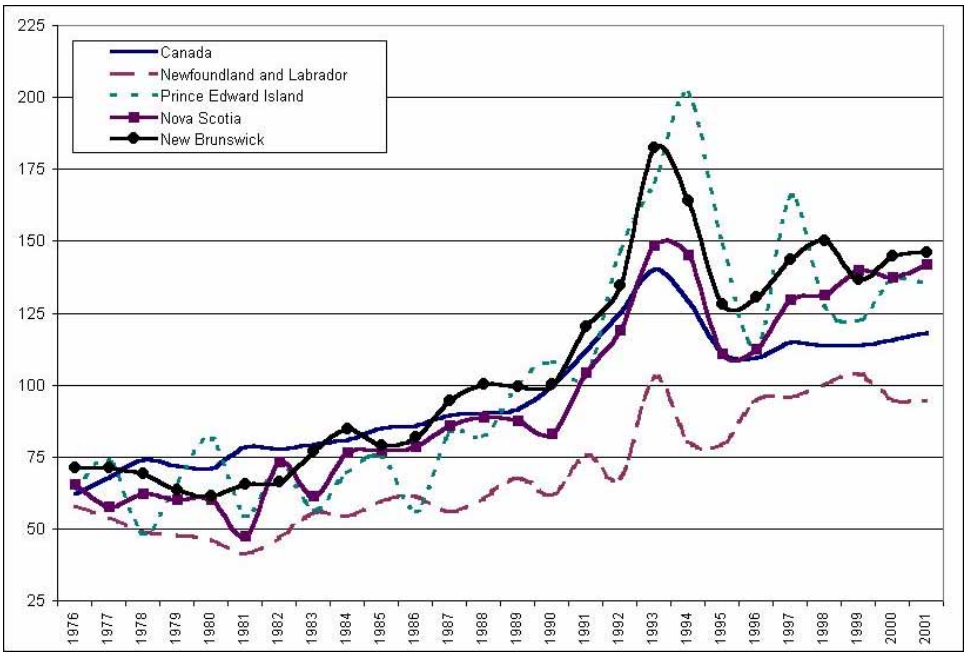
Examining prostate cancer incidence trends over a 25-year period, it is again apparent – as with other indicators noted earlier – that the health gap between the Maritime Provinces and the rest of Canada has widened over time.[198] While the Maritime Provinces had lower prostate cancer rates than Canada in the late 1970s and early 1980s, they now have much higher rates. In Canada as a whole, prostate cancer diagnoses increased sharply in the early 1990s, largely due to improved early detection techniques, but then declined and levelled off in the mid to late 1990s. In the Maritimes, however, prostate cancer rates rose again in the late 1990s to higher rates than the national rates leaving a much wider gap today than existed ten years earlier. As noted below, the rate of increase in prostate cancer in all three Maritime Provinces from 1976 to 2001 was greater than in Canada as a whole.

Newfoundland and Labrador, by contrast, shows a much more favourable trend, remaining substantially below the Canadian rate since 1977, and (like the Canadian trend) levelling off since the mid-1990s (Figures 302 and 303).

The prostate cancer incidence rate in 1976 was 62.1 for Canada, 58.0 for Newfoundland and Labrador, 63.8 for PEI, 65.3 for Nova Scotia, and 71.4 for New Brunswick (Figure 302). Between 1976 and 2001, the prostate cancer incidence rate grew by 90.3% in Canada, 63.8% in Newfoundland and Labrador, 112.7% in PEI, 117.2% in Nova Scotia, and 104.6% in New Brunswick between 1976 and 2001.

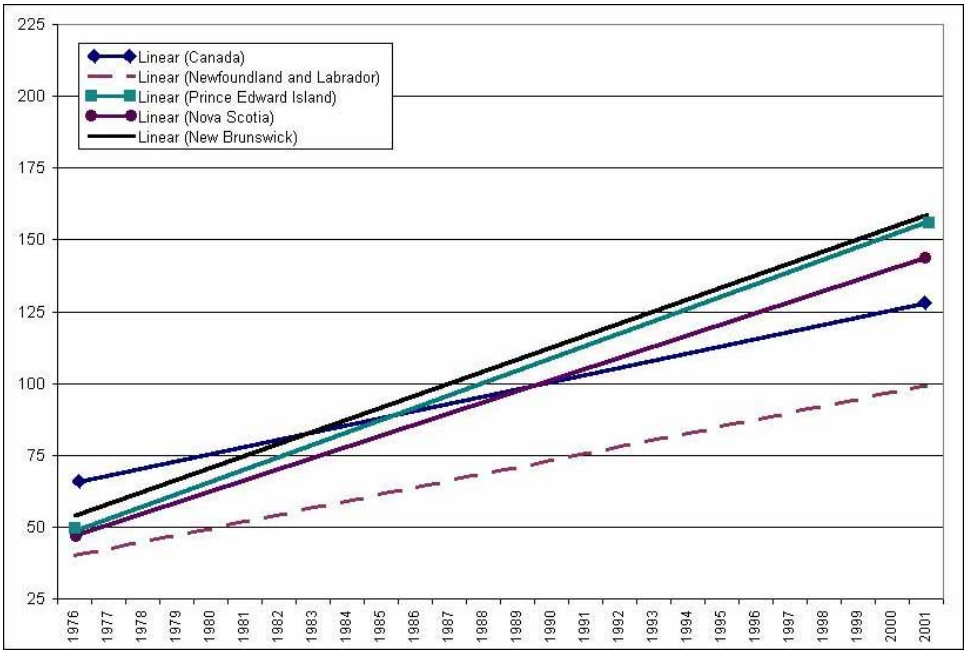
[198] Statistics Canada, CANSIM Database, Table 103-0004 "Cancer incidence rate, by selected site of cancer and sex, age-standardized rate per 100,000 population, Canada, provinces and territories, annual", 1976-2002. Available at: http://www.statcan.ca/english/freepub/82-221-XIE/01002/hlthstatus/conditions4.htm. Accessed January, 2003. The 1976 to 1997 cancer age-standardized rates are based on cancer incidence data from the Canadian Cancer Registry Database, the National Cancer Incidence Reporting System and Demography Division (population estimates) of Statistics Canada. 1998 to 2002 age-standardized rates are estimates produced by Health Canada through extrapolation of cancer incidence data from the National Cancer Incidence Reporting System (NCIRS, 1969-1991) and the Canadian Cancer Registry. Details of the statistical methods used to produce the projections are described in Appendix II: Methods of the Canadian Cancer Statistics monograph produced by the Canadian Cancer Society, the National Cancer Institute of Canada, Statistics Canada, the Provincial/Territorial Cancer Registries, and Health Canada.

Figure 302. Age-standardized prostate cancer rate per 100,000 population, Canada and Atlantic Provinces, 1976-2001 (rate)



Source: Statistics Canada, Vital Statistics, Cancer Database, Canadian Cancer Registry, and Demography Division (population estimates), Health Canada (1998-2002 estimates).

Figure 303. Age-standardized prostate cancer rate per 100,000 population, Canada and Atlantic Provinces, 1976-2001 (linear trend)



Source: Statistics Canada, Vital Statistics, Cancer Database, Canadian Cancer Registry, and Demography Division (population estimates), Health Canada (1998-2002 estimates).

3.2.6.5 Female breast cancer

For brief descriptions of breast cancer trends and key risk factors for breast cancer, please see the previous section (3.1.6). Note that national and provincial age-standardized breast cancer rates presented in this section are taken from 1996 and 1997 Statistics Canada data. However, age-standardized breast cancer rates for the Atlantic region health districts have been taken from the 1996 data.

In 1996, Nova Scotia and New Brunswick had breast cancer rates (103.4 and 100.3 per 100,000 respectively) that were higher than the national average (99.9). Newfoundland and Labrador had the lowest breast cancer rate in the country (88.6) with Saskatchewan the second lowest (95.5) and PEI the third lowest (98.2).

In 1997, the latest year for which actual data are available, the highest breast cancer rate in the country was in Alberta (109.5), followed by Nova Scotia (104.9) and PEI (103.4). Newfoundland and Labrador again registered the lowest breast cancer incidence in the country (84.4), and New Brunswick at 99.5 was below the national average of 102.0 per 100,000.

Table C8 below indicates the trends in breast cancer incidence in Canada and in the provinces from 1992 to 2002, with the 1998-2002 estimates reflecting Health Canada's forecasts.
The incidence of breast cancer has been rising and is projected by Health Canada to increase nation wide to 106.1 in 2002. Estimates for 2002 show Nova Scotia and New Brunswick with the second and third highest rates of breast cancer in the country (111.7 and 110.4 respectively) after Manitoba at 114.2. According to Health Canada's 2002 estimates, Newfoundland and Labrador is projected to continue having the lowest breast cancer rate in the country (94.2), and PEI at 106.9 is estimated to be close to the national average (Table C8 and Figure 304).

In 1996, the highest rates of breast cancer in Atlantic Canada were in Pictou-GASHA (NS4) at 112.8 per 100,000, Fredericton (NB3) at 110.7, Sussex/Saint John (NB2) at 105.3, Cape Breton (NS5) at 104.4, St. John's (NF1) at 103.3, Capital (NS6) at 102.8, and Labrador (NF6) at 101.2. All other Atlantic health districts had breast cancer rates below the national average of 99.9 per 100,000. The lowest rates were in Campbellton (NB5) at 67.9, Western (NF4) at 73.2, and Eastern (NF2) at 78.7 (Figure 305).[199] As with all health district data, caution must be exercised in making comparisons and interpreting results, due to wide confidence intervals and high variability.

Examining breast cancer incidence trends over a 25-year period, it is again apparent – as with other indicators noted earlier – that the health gap between Atlantic Canada and the rest of Canada has widened over time. Breast cancer rates have increased at a faster rate in Atlantic Canada than in the rest of the country. Thus, while the Maritimes generally had rates at or below the Canadian average during the late 1970s and most of the 1980s, Maritime rates are now higher than the Canadian average, with Nova Scotia and New Brunswick estimated to have the second and third highest rates in the country in 2002.

[199] Only provincial data are available for Prince Edward Island.

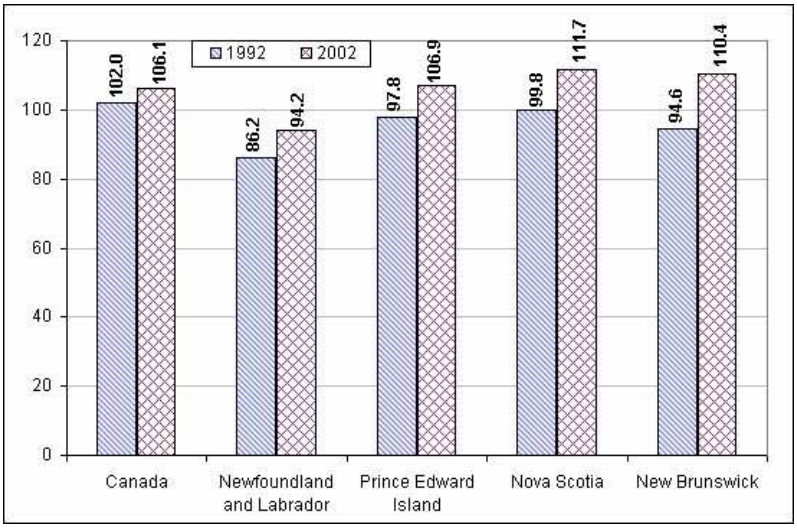
Table C8. Breast cancer incidence, by sex, age-standardized rate per 100,000 population, Canada and provinces, annual, 1992-2002

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Canada	102.0	99.2	98.9	98.7	98.5	102.0	102.6	103.6	104.4	105.3	106.1
Newfoundland and Labrador	86.2	82.4	81.3	90.4	90.7	84.4	86.2	84.3	91.4	92.8	94.2
Prince Edward Island	97.8	66.8	119.6	96.1	95.3	103.4	136.8	101.4	106.9	106.9	106.9
Nova Scotia	99.8	100.6	105.3	105.7	99.5	104.9	112.1	105.1	109.5	110.6	111.7
New Brunswick	94.6	101.3	101.5	101.5	99.6	99.5	103.0	102.0	107.3	108.8	110.4
Quebec	96.4	97.2	97.8	98.2	98.2	98.8	106.0	103.5	104.7	105.9	107.2
Ontario	104.1	99.1	98.5	99.1	98.1	103.1	100.8	103.4	104.1	104.9	105.7
Manitoba	102.0	104.6	105.5	111.7	107.5	101.7	103.9	110.4	111.7	113.0	114.2
Saskatchewan	105.5	103.9	96.5	93.9	91.6	100.7	96.0	100.0	98.5	98.5	98.4
Alberta	108.4	99.3	96.5	92.9	100.0	109.5	99.1	110.3	106.2	107.1	108.1
British Columbia	106.1	102.9	101.0	99.0	99.8	103.0	102.9	102.3	102.2	102.2	102.1

Note: 1998-2002 data are forecasts.

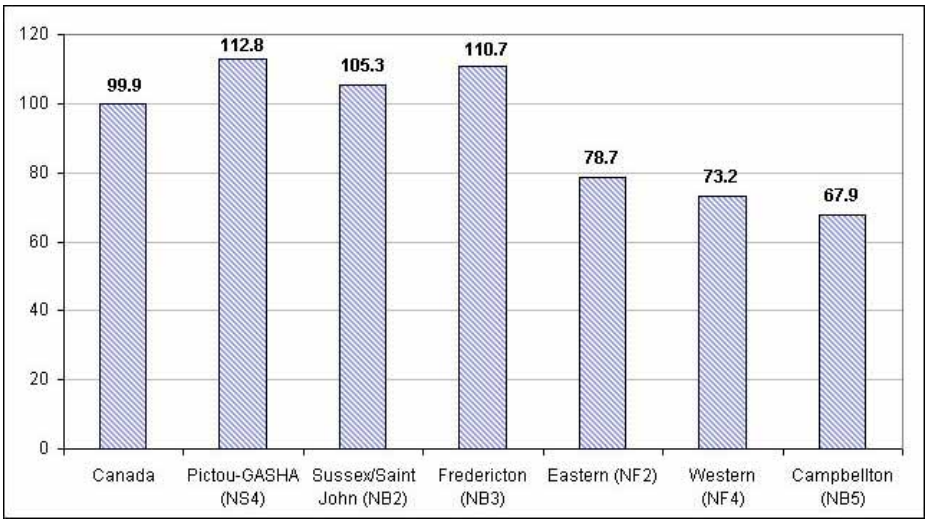
Source: Statistics Canada, CANSIM Database: The 1976 to 1997 cancer age-standardized rates are based on cancer incidence data from the Canadian Cancer Registry Database, the National Cancer Incidence Reporting System and Demography Division (population estimates) of Statistics Canada. The 1998 to 2002 age-standardized rates are estimates produced by Health Canada through extrapolation (f) of cancer incidence data from the National Cancer Incidence Reporting System (NCIRS, 1969-1991) and the Canadian Cancer Registry. Details of the statistical methods used to produce the projections are described in Appendix II: Methods of the Canadian Cancer Statistics monograph produced by the Canadian Cancer Society, the National Cancer Institute of Canada, Statistics Canada, the Provincial/Territorial Cancer Registries, and Health Canada. Explanation from Footnote 1, CANSIM, Table 103-0004 – "Cancer incidence rate, by selected site of cancer and sex, age-standardized rate per 100,000 population, Canada, provinces and territories, annual." Available at: http://www.statcan.ca/english/freepub/82-221-XIE/01002/hlthstatus/conditions4.htm. Accessed 12 November, 2003.

Figure 304. Age-standardized female breast cancer rate per 100,000 female population, Canada and Atlantic Provinces, 1992 and 2002 (rate)



Source: Statistics Canada, Vital Statistics, Cancer Database, Canadian Cancer Registry, and Demography Division (population estimates), Health Canada 1992 -2002, available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/conditions4.htm, extracted 20 January, 2003.

Figure 305. Age-standardized female breast cancer rate per 100,000 female population, Canada and selected Atlantic health districts, 1996 (rate)



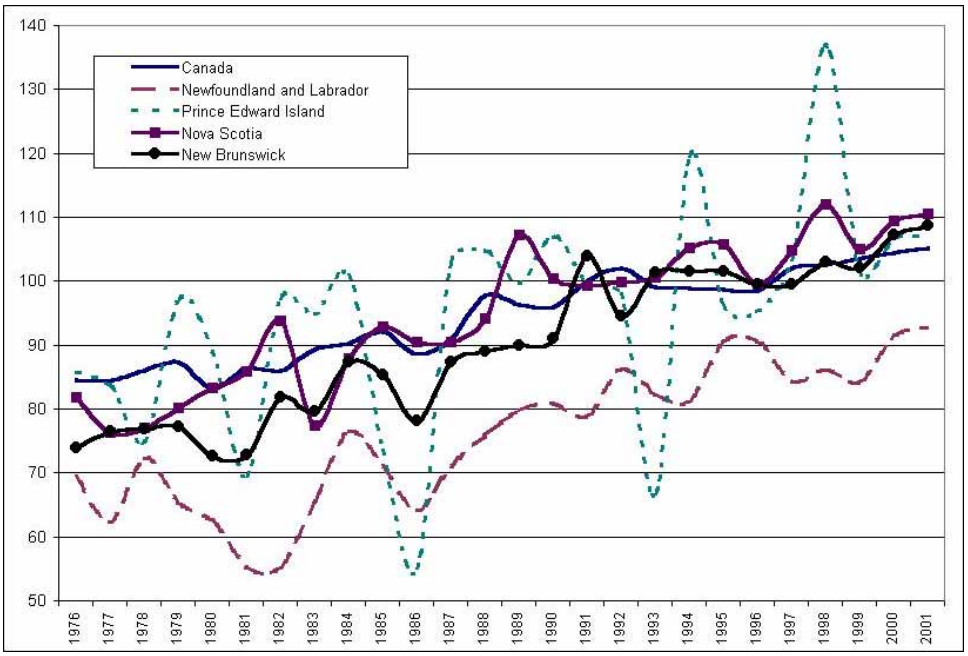
Source: Statistics Canada, Canadian Cancer Registry Database and Demography Division (population estimates; available at http://www.statcan.ca/english/freepub/82-221-XIE/00502/hlthstatus/conditions4.htm, extracted 5 January, 2003.

Even in Newfoundland and Labrador, which regularly posts the lowest breast cancer rates in the country, the gap is narrowing, and the rates have begun to converge. Thus, since the early 1990s, the Canadian breast cancer rate has increased by about 7%, while the Newfoundland and Labrador rate has grown twice as fast – by about 15%.[200]

The female breast cancer incidence rate in 1976 was 84.6 for Canada, 69.3 for Newfoundland and Labrador, 85.9 for PEI, 81.8 for Nova Scotia, and 74.0 for New Brunswick. Between 1976 and 2001, the incidence rate grew by 24.5% in Canada, 33.9% in Newfoundland and Labrador, 24.4% in PEI, 35.2% in Nova Scotia, and 47.0% in New Brunswick (Figures 306 and 307).

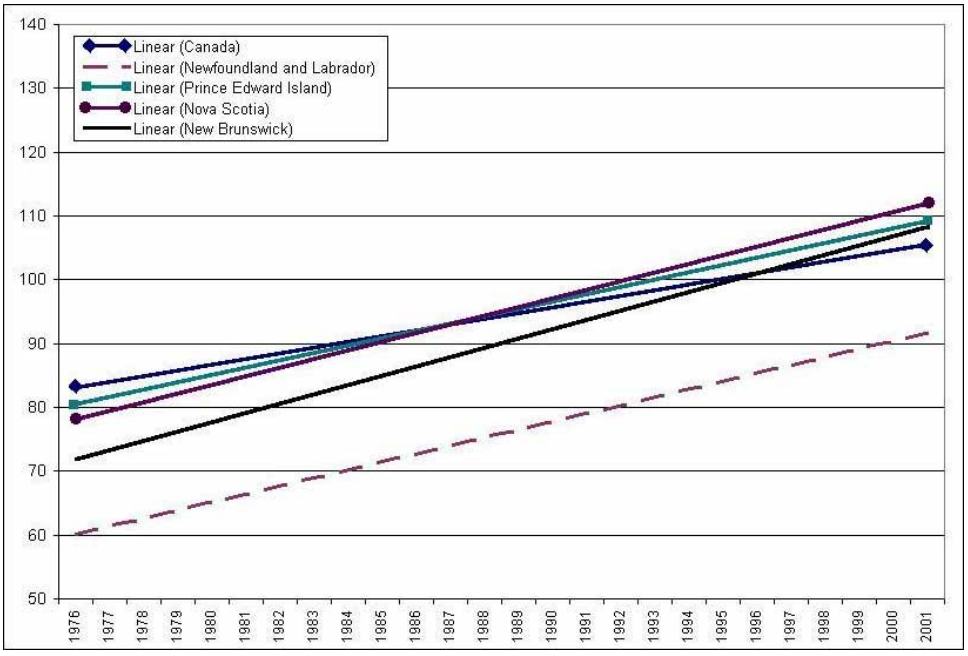
[200] Statistics Canada, CANSIM Database, Table 103-0004 "Cancer incidence rate, by selected site of cancer and sex, age-standardized rate per 100,000 population, Canada, provinces and territories, annual", 1976-2002. Available at: http://www.statcan.ca/english/freepub/82-221-XIE/01002/hlthstatus/conditions4.htm. Accessed January, 2003. The 1976 to 1997 cancer age-standardized rates are based on cancer incidence data from the Canadian Cancer Registry Database, the National Cancer Incidence Reporting System and Demography Division (population estimates) of Statistics Canada. 1998 to 2002 age-standardized rates are estimates produced by Health Canada through extrapolation of cancer incidence data from the National Cancer Incidence Reporting System (NCIRS, 1969-1991) and the Canadian Cancer Registry. Details of the statistical methods used to produce the projections are described in Appendix II: Methods of the Canadian Cancer Statistics monograph produced by the Canadian Cancer Society, the National Cancer Institute of Canada, Statistics Canada, the Provincial/Territorial Cancer Registries, and Health Canada.

Figure 306. Age-standardized female breast cancer rate per 100,000 population, Canada and Atlantic Provinces, 1976-2001 (rate)



Source: Statistics Canada, Vital Statistics, Cancer Database, Canadian Cancer Registry, and Demography Division (population estimates), Health Canada (1998-2002 estimates).

Figure 307. Age-standardized female breast cancer rate per 100,000 population, Canada and Atlantic Provinces, 1976-2001 (linear trend)



Source: Statistics Canada, Vital Statistics, Cancer Database, Canadian Cancer Registry, and Demography Division (population estimates), Health Canada (1998-2002 estimates).

3.2.7 HIV

For a brief description of trends in HIV/AIDS in Canada, and the changing socio-demographic profile of the disease, see section 3.1.5 above. HIV infection rates are increasing among women, injection drug users, and Aborginals. Injection drug users account for half of all new infections.[201]

As it is only possible to determine HIV infection through testing, it is estimated by Health Canada that, of the estimated 40,000 Canadians with HIV in 1996, between 11,000 and 17,000 did not know they had it.. In 1996-97, 15% of both males and females had had an HIV test, with those between 25-34 most likely to have had one.[202]

Definition

"Number of new positive HIV cases in a given year. Information is based on those who have been tested for HIV."[203]

Data Source

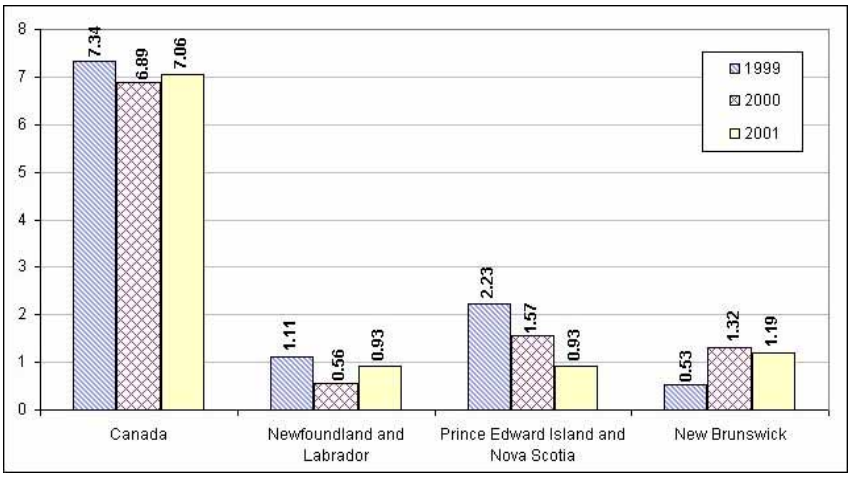
Health Canada, Population and Public Health Branch, HIV and AIDS in Canada: Surveillance Report to June 30, 2000, and Health Canada. HIV and AIDS in Canada. Surveillance report to December 31, 2001.

Results

The rate of positive HIV test reports in 2001 for Canada was 7.06 per 100,000 population. In the Atlantic Provinces, the rates were significantly lower than the national rate. In Newfoundland and Labrador, Nova Scotia and PEI the rate was 0.93 per 100,000.[204] In New Brunswick the rate was 1.19 per 100,000 (Figure 308).

[201] *Toward a Healthy Future: Second Report on the Health of Canadians*, Health Canada, 1999. Available at http://www.hc-sc.gc.ca/hppb/phdd/report/toward/report.htm, page 19.
[202] *Toward a Healthy Future: Second Report on the Health of Canadians*, Health Canada, 1999. Available at http://www.hc-sc.gc.ca/hppb/phdd/report/toward/report.htm.
[203] Statistics Canada: http://www.statcan.ca/english/freepub/82-221-XIE/00502/defin3.htm#66.
[204] Note: The HIV infection rate for Nova Scotia and Prince Edward Island is combined in Health Canada's HIV and AIDS surveillance reports, and is reported as one number.

Figure 308. HIV case rate per 100,000, Canada and Atlantic Provinces, 1999, 2000 and 2001 (rate)



Sources: Health Canada, Population and Public Health Branch, HIV and AIDS in Canada: Surveillance Report to June 30, 2000; and Health Canada. HIV and AIDS in Canada. Surveillance report to December 31, 2001; Division of HIV/AIDS Epidemiology and Surveillance; Centre for Infectious Disease Prevention and Control, Health Canada, 2002. Available at: http://www.hc-sc.gc.ca/pphb-dgspsp/publicat/aids-sida/haic-vsac0602/pdf/haic-vsac0602.pdf and http://www.hc-sc.gc.ca/pphb-dgspsp/publicat/aids-sida/haic-vsac1201/pdf/haic-vsac1201.pdf. Accessed January, 2003.

Summary – Disease Prevalence

In the disease prevalence section:

- **Arthritis/rheumatism:** Nova Scotia has by far the highest rate of arthritis and rheumatism in the country – 45% above the national average – with 22% of all Nova Scotians afflicted with the illness, compared to 15.2% of Canadians. Prince Edward Island (18.3%), and New Brunswick (18%) have the third and fourth highest rates in the country. Newfoundland and Labrador has a rate of 15.4% - close to the national average. Cape Breton (NS5) has the highest rate of arthritis/rheumatism in Atlantic Canada (27.1%). Rates of arthritis/rheumatism have risen steadily both nationally and in all four Atlantic provinces since 1994/95.

- **Diabetes:** Newfoundland and Labrador has the highest rate of diabetes in Canada (5.8%), followed by Nova Scotia (5.2%), New Brunswick (5.1%), and PEI (5%), compared to the national average of 4.1%. The prevalence of diabetes has increased dramatically across the country since 1994/95, parallel to rising rates of overweight, but is increasing more rapidly in Atlantic Canada than in Canada as a whole.

- **Asthma:** Nova Scotia has the highest asthma rate in the country at 9.1%, and Newfoundland and Labrador has the lowest at 6.6%, compared to the national average of 8.4%. PEI (8.5%) and New Brunswick (8.6%) slightly exceed the national rate. Rates of asthma have increased steadily since 1994/95 both nationally and in Atlantic Canada.

- **High blood pressure:** The four Atlantic Provinces have by far the highest rates of high blood pressure in Canada – Nova Scotia (16.2%), Newfoundland and Labrador (15.4%), New Brunswick (14.5%), and PEI (14%), compared to the national average of 12.6%. Nova Scotia also has the highest rates of high blood pressure in the country both for males (14.5%) and for females (17.9%), compared to the national averages of 11.4% for males and 13.9% for females. Cape Breton (NS5) has the highest rates of high blood pressure in Atlantic Canada both for males (18.9%) and for females (24.3%). The prevalence of high blood pressure is steadily increasing both nationally and in all four Atlantic Provinces.

- **Cancer incidence:** In 1997, the three Maritime Provinces had the highest overall cancer incidence rates in Canada – New Brunswick (414.1 per 100,000), PEI (412.7), and Nova Scotia (409.6), compared to the national average of 384.8. Newfoundland and Labrador had the lowest cancer incidence rates in the country (338.5). In 1996, the highest cancer rate in Atlantic Canada was in Cape Breton (NS5) at 445.6, followed by Sussex/Saint John (NB2) at 431.6.

- **Lung cancer:** In 1997, the Maritimes had the highest lung cancer rates in Canada after Quebec – 66.8 per 100,000 in Nova Scotia, 64.9 in New Brunswick, and 62.6 in PEI, compared to the national average of 57.9. Newfoundland and Labrador had the lowest lung cancer incidence in Canada (43.3) – 25% below the national average. In 1996, Cape Breton (NS5) had the highest lung cancer rate in Atlantic Canada (76.5 per 100,000).

  Since the mid-1980s, male lung cancer rates have fallen much more rapidly in Canada than in the Maritimes, and female lung cancer rates have increased at a much faster rate in the Maritimes than in the rest of Canada. Newfoundland and Labrador rates have been more favourable, with male lung cancer incidence falling more rapidly than in Canada, and female rates still the lowest in Canada – 47% below the national average. These lung cancer trends illustrate a growing health gap between the Maritimes and the rest of Canada, as indicated by a wide range of indicators in this database.

- **Colorectal cancer:** In 1997, the highest rates of colorectal cancer in the country were in PEI (59.7 per 100,000), Nova Scotia (55.4), Newfoundland and Labrador (55.1), Manitoba (54.5) and New Brunswick (53.5), compared to the national average of 49.3.

- **Prostate cancer:** In 1997, the three Maritime Provinces had the highest prostate cancer rates in the country – PEI (165.6 per 100,000), New Brunswick (143.6), and Nova Scotia (129.5), compared to the national average of 115 per 100,000. Newfoundland and Labrador had the second lowest incidence of prostate cancer in the country (95.6) after Quebec (83.0).

- **Breast cancer:** In 1997, Nova Scotia (104.9) and PEI (103.4) had the second and third highest breast cancer rates in the country after Alberta (109.5). Newfoundland and Labrador had the lowest breast cancer incidence in the country (84.4), and New Brunswick at 99.5 was below the national average of 102 per 100,000. The incidence of breast cancer is rising and is projected to increase to 106.1 nation wide in 2002, 106.9 in PEI, 110.4 in New Brunswick, 111.7 in Nova Scotia (second highest in Canada), and 94.2 in Newfoundland and Labrador (lowest in Canada).

- **HIV:** HIV infection rates in the Atlantic Provinces are six to seven times lower than the national rate.