Provincial Health Officer's 2008 Annual Report:
The Health and Well-being of Women in British Columbia

Technical Document

A Focus on Women: Surveillance of Chronic Conditions

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ANALYSIS OF CHRONIC CONDITIONS

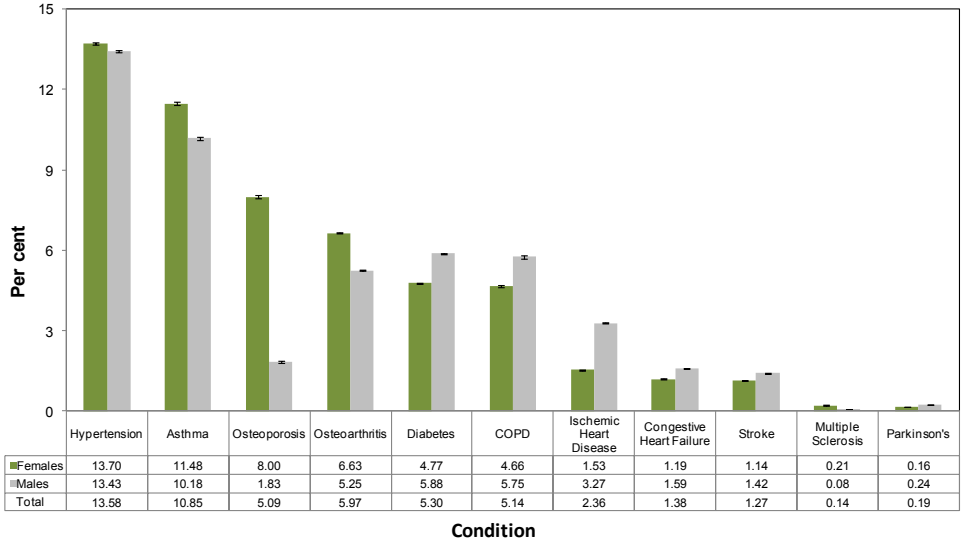
This document provides an overview of chronic illness as they relate specifically to BC women. When reading this document, it is important to keep in mind that not only are women directly impacted by the effects of chronic illness, but they also frequently fill caregiving roles, providing care for spouses or family members who are facing chronic illness. As women live longer, the duration of their own chronic illness, as well as the length of time they devote to caregiving, increases. Thus, changes in rates of chronic disease among both women and men can affect women in multiple ways.

This report profiles 11 key chronic conditions: hypertension, asthma, osteoporosis, osteoarthritis, diabetes, chronic obstructive pulmonary disease (COPD), ischemic heart disease, congestive heart failure, stroke, multiple sclerosis and Parkinson's disease. The analysis explores differences between women and men for each condition both over time and throughout the life span. Chronic conditions were examined in terms of their prevalence within the province, the age distribution of prevalent cases, the number of newly diagnosed or incident cases, and hospital co-morbidity rates among those who have been diagnosed with the disease.

Age-standardized prevalence rates for women and men for each of these conditions in 2008/2009 are presented in Figure 1.[a] The four conditions with the highest prevalence rates for women were hypertension, asthma, osteoporosis and osteoarthritis. The highest age-standardized prevalence rate for women was for hypertension (13.7 per cent). The hypertension rate was also highest for men (13.4 per cent). This finding is particularly relevant considering the high rates of specific co-morbidities that often present alongside hypertension, including heart disease, kidney disease and stroke. The age-standardized prevalence rate for asthma was also considerably higher for women at 11.5 per cent. Osteoporosis was considerably more prevalent among women in older age groups. Overall, women were over four times as likely to be diagnosed with osteoporosis, with an age-standardized prevalence rate of 8.0 per cent, than men (1.8 per cent). Osteoarthritis had an age-standardized rate of 6.6 per cent for women, again primarily in older age groups.

Figure 1

Age-Standardized Prevalence Rate for Select Chronic Conditions, by Sex, BC, 2008/2009



	Hypertension	Asthma	Osteoporosis	Osteoarthritis	Diabetes	COPD	Ischemic Heart Disease	Congestive Heart Failure	Stroke	Multiple Sclerosis	Parkinson's
Females	13.70	11.48	8.00	6.63	4.77	4.66	1.53	1.19	1.14	0.21	0.16
Males	13.43	10.18	1.83	5.25	5.88	5.75	3.27	1.59	1.42	0.08	0.24
Total	13.58	10.85	5.09	5.97	5.30	5.14	2.36	1.38	1.27	0.14	0.19

Condition

Note: Includes 95% confidence intervals. Standardized to Canadian population 1991. COPD = Chronic Obstructive Pulmonary Disease.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

[a] Where appropriate, age ranges have been adjusted to represent the specific age profile affected by each condition. Caution should be used when comparing age-standardized rates across conditions.

Hypertension

Chronic hypertension, or high blood pressure, is an important risk factor for cardiac, cerebrovascular and other vascular diseases. The prevalence of hypertension increases with age, with more women than men reporting hypertension after age 65.[1,2]

Results from the Canadian Health Measures survey, which undertook physical measures of Canadians between March 2007 and February 2009, found that hypertension was prevalent in 19 per cent of Canadian adults aged 20 to 79 years (19.7 per cent in males and 19.0 per cent in females).[3] The Canadian Chronic Disease Surveillance System (CCDSS) found that in 2006/2007, the age-standardized prevalence rate of diagnosed hypertension among people aged 20 years and older was 19.6 per cent in Canada and 17.8 per cent in BC (18.1 per cent among women and 17.5 per cent among men).[1] The prevalence rates in these studies are higher than those presented in this report, because data presented here include all individuals, including those under the age of 20.

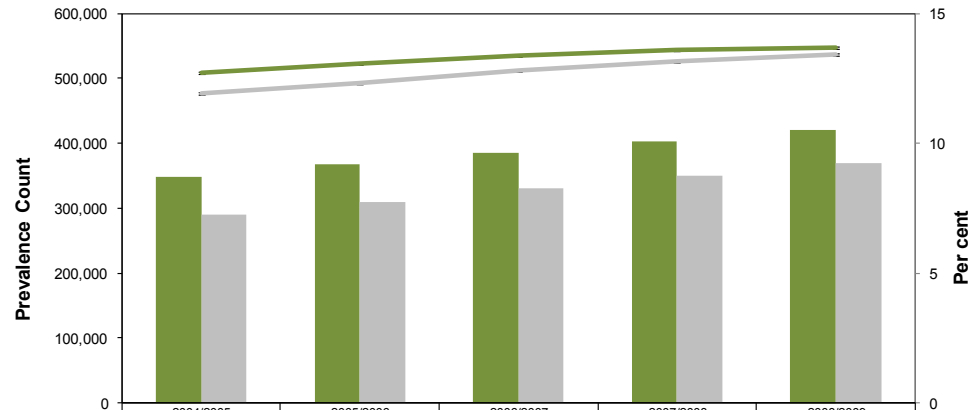
Between 2004/2005 and 2008/2009 in BC, age-standardized prevalence rates for hypertension increased steadily for both women and men (Figure 2). For each of these years, prevalence was higher among women; however, the gap between women and men appears to be narrowing. In 2008/2009, the age-standardized prevalence rate was 13.7 per cent for women, compared to 13.4 per cent for men. This equates to 420,305 women and 370,178 men with hypertension in BC. In the past five years, the difference in the number of prevalent cases between women and men decreased from 57,925 more cases among women in 2004/2005 to 50,127 more cases in 2008/2009.

Age-specific prevalence rates for 2008/2009 show that although women and men tend to have similar rates in the younger age groups, after age 65 rates are higher for women, and the gap widens with each subsequent age category (Figure 3). In 2008/2009, the highest age-specific hypertension rates for both sexes were found in the 80–84 age category: 75.8 per cent for women and 71.0 per cent for men.

Age-specific prevalence counts for 2008/2009 also showed similar numbers of cases between men and women up to age 65. In the 85 and over age group, there were nearly twice as many prevalent cases of hypertension among women compared to men, with women accounting for 67.7 per cent of the total number of prevalent cases in this age group.

Figure 2

Hypertension, Age-Standardized Prevalence Rate and Count, by Sex, BC, 2004/2005 to 2008/2009



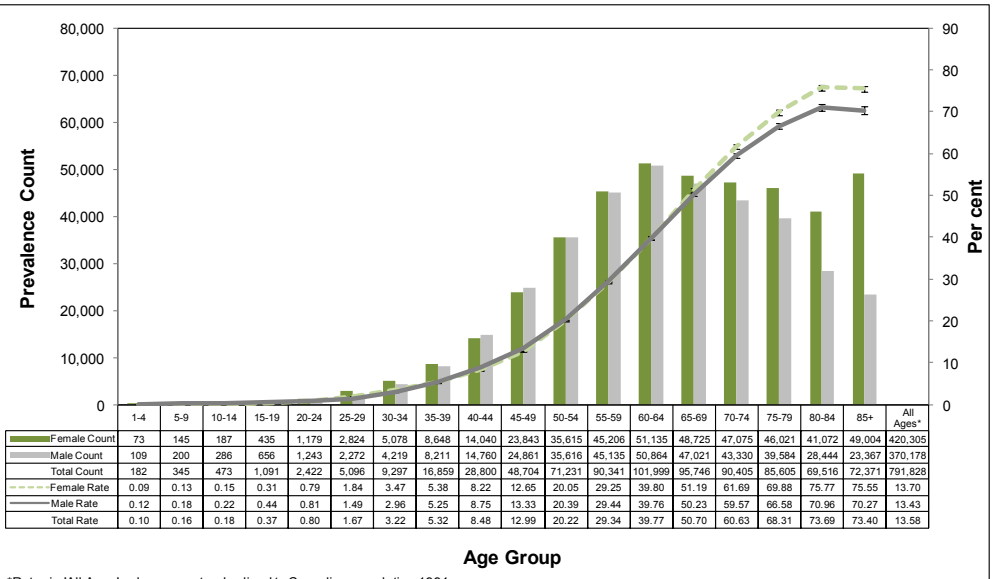
	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
Female Count	347,844	366,845	386,030	403,392	420,305
Male Count	289,919	309,635	330,646	350,765	370,178
Total Count	637,915	676,637	716,840	754,333	791,828
Female Rate	12.72	13.06	13.39	13.59	13.70
Male Rate	11.90	12.33	12.81	13.16	13.43
Total Rate	12.34	12.72	13.12	13.39	13.58

Year

Note: Includes 95% confidence intervals. Standardized to Canadian population 1991. Total counts may exceed the sum of the female and male counts, because the total includes cases in which gender was not specified.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

Figure 3

Hypertension, Age-Specific Prevalence Rate and Count, by Sex and Age, BC, 2008/2009



	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	All Ages*
Female Count	73	145	187	435	1,179	2,824	5,078	8,648	14,040	23,843	35,615	45,206	51,135	48,725	47,075	46,021	41,072	49,004	420,305
Male Count	109	200	286	656	1,243	2,272	4,219	8,211	14,760	24,861	35,616	45,135	50,864	47,021	43,330	39,584	28,444	23,367	370,178
Total Count	182	345	473	1,091	2,422	5,096	9,297	16,859	28,800	48,704	71,231	90,341	101,999	95,746	90,405	85,605	69,516	72,371	791,828
Female Rate	0.09	0.13	0.15	0.31	0.79	1.84	3.47	5.38	8.22	12.65	20.05	29.25	39.80	51.19	61.69	69.88	75.77	75.55	13.70
Male Rate	0.12	0.18	0.22	0.44	0.81	1.49	2.96	5.25	8.75	13.33	20.39	29.44	39.76	50.23	59.57	66.58	70.96	70.27	13.43
Total Rate	0.10	0.16	0.18	0.37	0.80	1.67	3.22	5.32	8.48	12.99	20.22	29.34	39.77	50.70	60.63	68.31	73.69	73.40	13.58

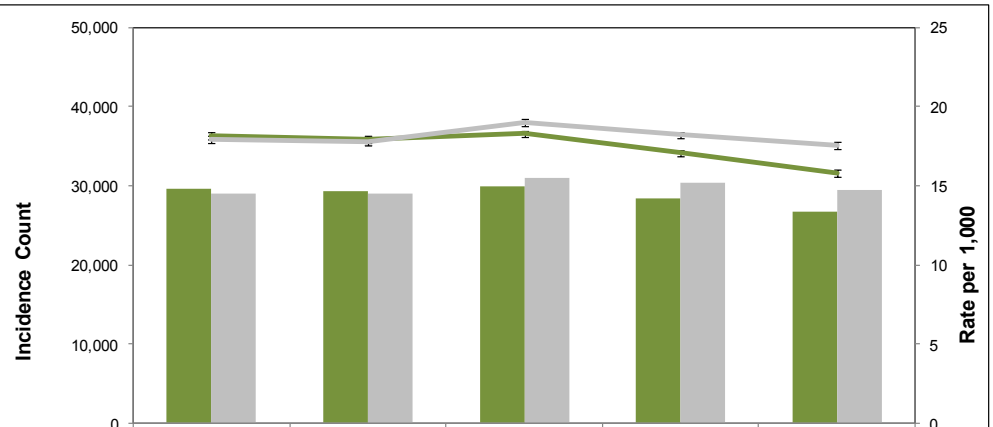
Age Group

*Rates in 'All Ages' column are standardized to Canadian population 1991.
Note: Includes 95% confidence intervals. Total counts may exceed the sum of the female and male counts, because the total includes cases in which gender was not specified.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

Incidence counts have been fairly stable for both men and women between 2004/2005 and 2008/2009 (Figure 4). The decrease seen in 2008/2009 in the number of women newly diagnosed with hypertension could help to explain the narrowing gap in overall prevalence between men and women discussed earlier in this section. In 2008/2009, there were 26,766 women newly diagnosed with hypertension, compared to 29,530 men. This resulted in age-standardized incidence rates for 2008/2009 of 15.8 per 1,000 for women and 17.5 per 1,000 for men.

Figure 4

Hypertension, Age-Standardized Incidence Rate and Count, by Sex, BC, 2004/2005 to 2008/2009



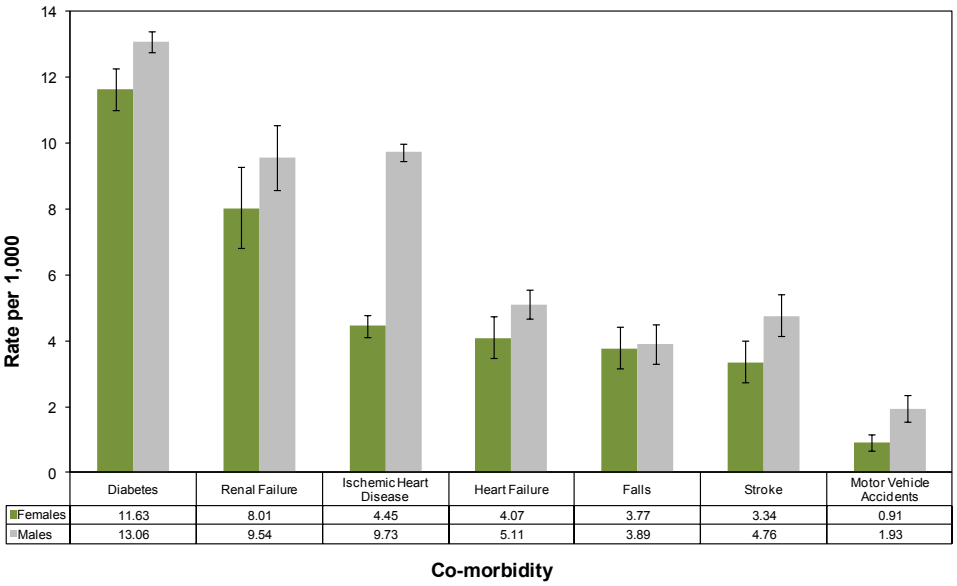
	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
Female Count	29,558	29,331	29,932	28,440	26,766
Male Count	28,996	29,013	31,018	30,320	29,530
Total Count	58,560	58,352	60,958	58,773	56,324
Female Rate	18.17	17.95	18.28	17.07	15.80
Male Rate	17.94	17.76	19.03	18.20	17.54
Total Rate	18.06	17.84	18.64	17.63	16.64

Year

Note: Includes 95% confidence intervals. Standardized to Canadian population 1991. Total counts may exceed the sum of the female and male counts, because the total includes cases in which gender was not specified.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

Figure 5

Hypertension, Age-Standardized Hospital Co-Morbidity Rate, by Sex, BC, 2004/2005-2008/2009



	Diabetes	Renal Failure	Ischemic Heart Disease	Heart Failure	Falls	Stroke	Motor Vehicle Accidents
Females	11.63	8.01	4.45	4.07	3.77	3.34	0.91
Males	13.06	9.54	9.73	5.11	3.89	4.76	1.93

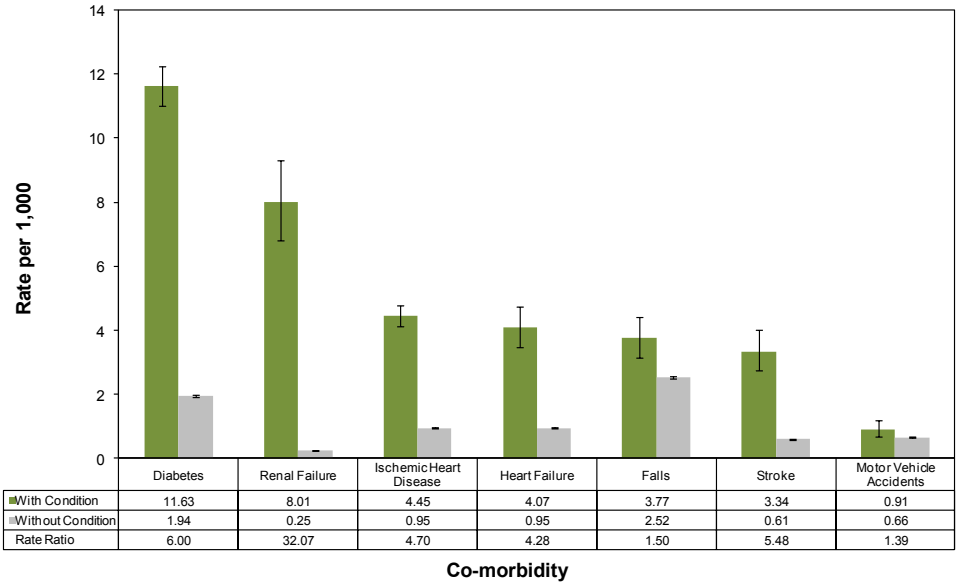
Note: Includes 95% confidence intervals. Standardized to Canadian population 1991.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

For both women and men living with hypertension, hospitalizations were most likely to also indicate diabetes. Between 2004/2005 and 2008/2009, the hospitalization co-morbidity rate for diabetes was 11.6 per 1,000 for women with hypertension, compared to 13.1 per 1,000 for men with hypertension (Figure 5). Men with hypertension had higher hospital co-morbidity rates for all conditions examined. The difference between men and women was particularly prominent for ischemic heart disease: 9.7 per 1,000 for men compared to 4.5 per 1,000 for women.

Age-standardized rates and rate ratios indicate that women with hypertension were considerably more likely to be hospitalized with a range of co-morbid conditions compared to women without hypertension (Figure 6). One notable condition was renal failure, where women with hypertension were 32.1 times more likely to be hospitalized with renal failure than women without hypertension.

Figure 6

Hypertension, Age-Standardized Hospital Co-Morbidity Rate and Rate Ratio, Females with and without Condition, BC, 2004/2005-2008/2009



	Diabetes	Renal Failure	Ischemic Heart Disease	Heart Failure	Falls	Stroke	Motor Vehicle Accidents
With Condition	11.63	8.01	4.45	4.07	3.77	3.34	0.91
Without Condition	1.94	0.25	0.95	0.95	2.52	0.61	0.66
Rate Ratio	6.00	32.07	4.70	4.28	1.50	5.48	1.39

Note: Includes 95% confidence intervals. Standardized to Canadian population 1991.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

Asthma

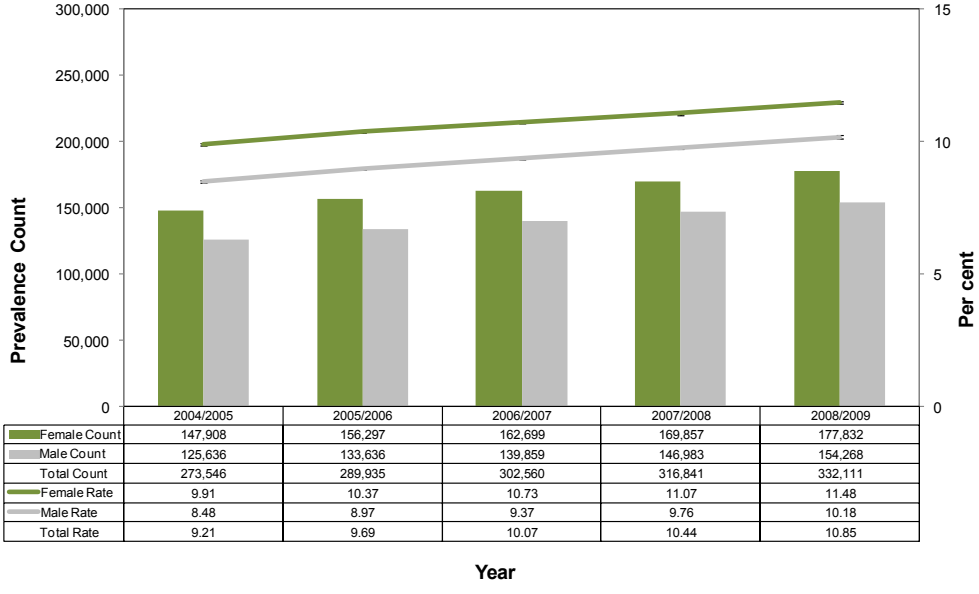
Asthma is a chronic condition resulting from inflammation in the airways in the lungs. The most common symptoms of asthma include shortness of breath, coughing and wheezing.[4] Since 1994/1995, the prevalence of physician-diagnosed asthma has been consistently higher among young boys than girls; however, among adults, more women have asthma than men.[4] Results from the 2003 Canadian Community Health Survey (CCHS) show that the prevalence of asthma in individuals over the age of 12 in BC (7.3 per cent) is statistically lower than the Canadian average (8.3 per cent).[5]

For this analysis, asthma rates and counts are based only on individuals between 5 and 54 years of age. The age-standardized prevalence rate[b] was higher for women compared to men and there has been a steady increase in prevalence over the past five years, with the rate for women rising from 9.9 per cent in 2004/2005 to 11.5 per cent in 2008/2009 (Figure 7). There has been a comparable increase in prevalence among men, from 8.5 per cent in 2004/2005 to 10.2 per cent in 2008/2009. By 2008/2009, there were a total of 177,832 women living in British Columbia who had received a previous diagnosis of asthma, compared to 154,268 men.

Age-specific prevalence rates for 2008/2009 show interesting differences by sex (Figure 8). The prevalence rate was higher for males than females between the ages of 5 and 19 years; however, after the age of 20 this pattern is reversed, with the gap in prevalence rates between men and women increasing with each subsequent age group. The peak in prevalence for both males and females occurs in the teenage years, between the ages of 10 and 14 years for males and between 15 and 19 years for females. Among women 15–19 years old, 13.4 per cent had received a diagnosis for asthma.

Figure 7

Asthma, Age-Standardized Prevalence Rate and Count, by Sex, BC, 2004/2005 to 2008/2009



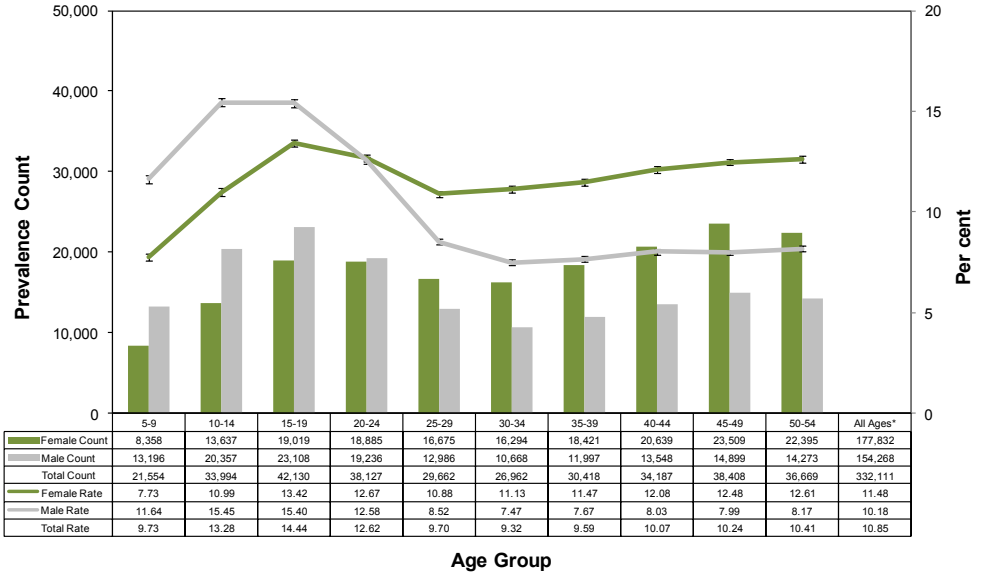
	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
Female Count	147,908	156,297	162,699	169,857	177,832
Male Count	125,636	133,636	139,859	146,983	154,268
Total Count	273,546	289,935	302,560	316,841	332,111
Female Rate	9.91	10.37	10.73	11.07	11.48
Male Rate	8.48	8.97	9.37	9.76	10.18
Total Rate	9.21	9.69	10.07	10.44	10.85

Note: Includes 95% confidence intervals. Standardized to Canadian population 1991. Based on population aged 5 to 54 years only. Total counts may exceed the sum of the female and male counts, because the total includes cases in which gender was not specified.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

[b] Interpreting prevalence rates for asthma is complicated by the fact that asthma can be chronic and/or episodic. Individuals diagnosed as a result of one or more acute episodes of asthma will be considered a prevalent case. A prior bout of asthma may make them more susceptible to future occurrences.

Figure 8

Asthma, Age-Specific Prevalence Rate and Count, by Sex and Age, BC, 2008/2009



	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	All Ages*
Female Count	8,358	13,637	19,019	18,885	16,675	16,294	18,421	20,639	23,509	22,395	177,832
Male Count	13,196	20,357	23,108	19,236	12,986	10,668	11,997	13,548	14,899	14,273	154,268
Total Count	21,554	33,994	42,130	38,127	29,662	26,962	30,418	34,187	38,408	36,669	332,111
Female Rate	7.73	10.99	13.42	12.67	10.88	11.13	11.47	12.08	12.48	12.61	11.48
Male Rate	11.64	15.45	15.40	12.58	8.52	7.47	7.67	8.03	7.99	8.17	10.18
Total Rate	9.73	13.28	14.44	12.62	9.70	9.32	9.59	10.07	10.24	10.41	10.85

Age Group

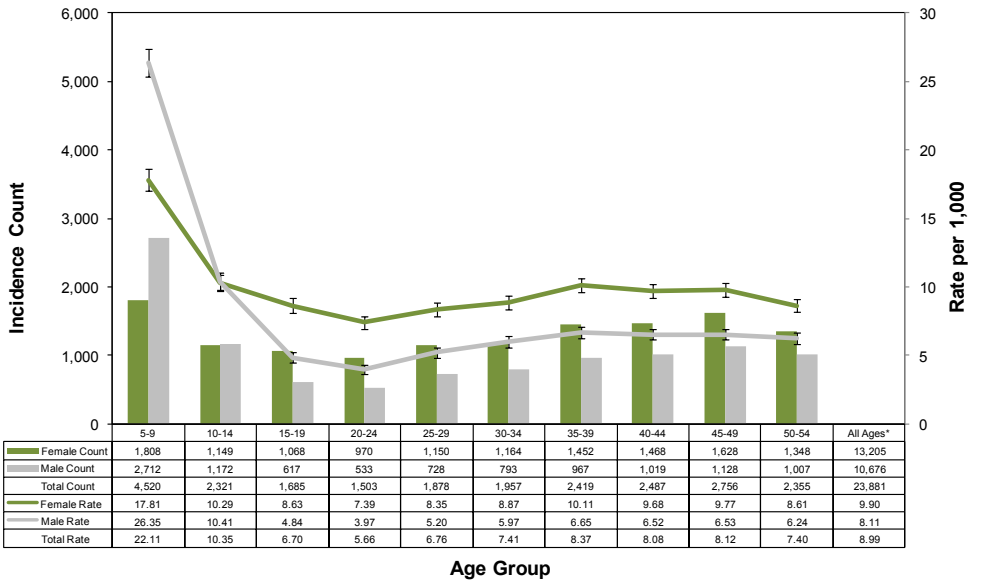
*Rates in 'All Ages' column are standardized to Canadian population 1991.
Note: Includes 95% confidence intervals. Based on population aged 5 to 54 years only. Total counts may exceed the sum of the female and male counts, because the total includes cases in which gender was not specified.

The peak in newly diagnosed cases of asthma in 2008/2009 was found in boys 5–9 years old, with an age-specific incidence rate of 26.4 per 1,000 (Figure 9). The highest incidence rate for girls was also found in the 5–9 year-old age group, at 17.8 new cases per 1,000. However, as seen with age-specific prevalence, the incidence rate for females eventually exceeds the rate for males (in this case, after the age of 14 years).

As seen in Figure 10, between 2004/2005 and 2008/2009, women consistently had a higher age-standardized incidence rate for asthma compared to men. The gap between women and men has been steady over this period, with a slight increase in rates for both women and men between 2006/2007 and 2008/2009. In 2008/2009, there were 13,205 women newly diagnosed with asthma, compared to 10,676 men. This resulted in age-standardized incidence rates of 9.9 per 1,000 for women and 8.1 per 1,000 for men.

Figure 9

Asthma, Age-Specific Incidence Rate and Count, by Sex and Age, BC, 2008/2009



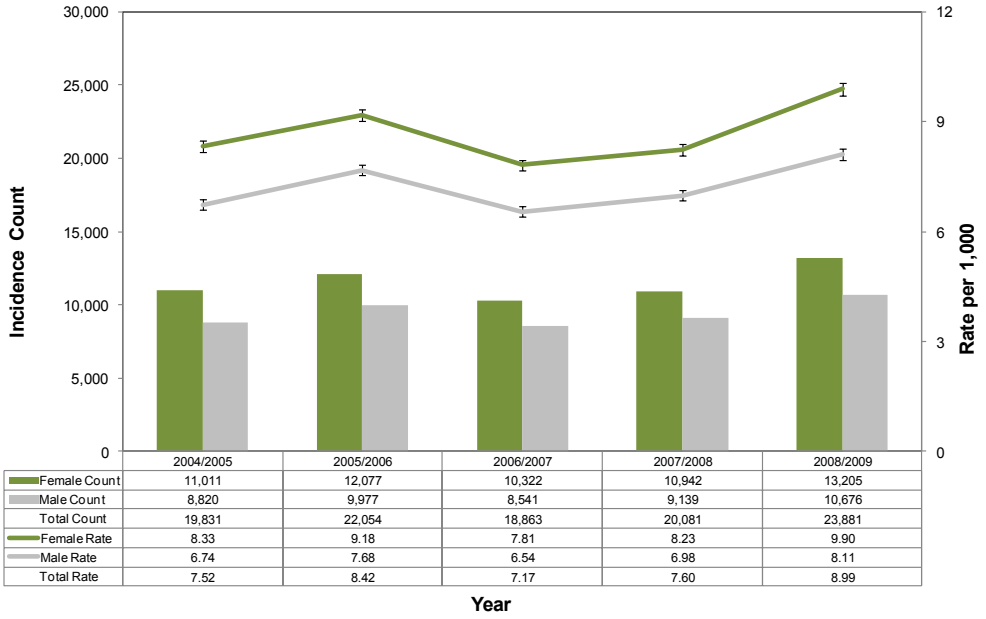
	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	All Ages*
Female Count	1,808	1,149	1,068	970	1,150	1,164	1,452	1,468	1,628	1,348	13,205
Male Count	2,712	1,172	617	533	728	793	967	1,019	1,128	1,007	10,676
Total Count	4,520	2,321	1,685	1,503	1,878	1,957	2,419	2,487	2,756	2,355	23,881
Female Rate	17.81	10.29	8.63	7.39	8.35	8.87	10.11	9.68	9.77	8.61	9.90
Male Rate	26.35	10.41	4.84	3.97	5.20	5.97	6.65	6.52	6.53	6.24	8.11
Total Rate	22.11	10.35	6.70	5.66	6.76	7.41	8.37	8.08	8.12	7.40	8.99

Age Group

*Rates in 'All Ages' column are standardized to Canadian population 1991.
Note: Includes 95% confidence intervals. Total counts may exceed the sum of the female and male counts, because the total includes cases in which gender was not specified.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

Figure 10

Asthma, Age-Standardized Incidence Rate and Count, by Sex, BC, 2004/2005 to 2008/2009



	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
Female Count	11,011	12,077	10,322	10,942	13,205
Male Count	8,820	9,977	8,541	9,139	10,676
Total Count	19,831	22,054	18,863	20,081	23,881
Female Rate	8.33	9.18	7.81	8.23	9.90
Male Rate	6.74	7.68	6.54	6.98	8.11
Total Rate	7.52	8.42	7.17	7.60	8.99

Year

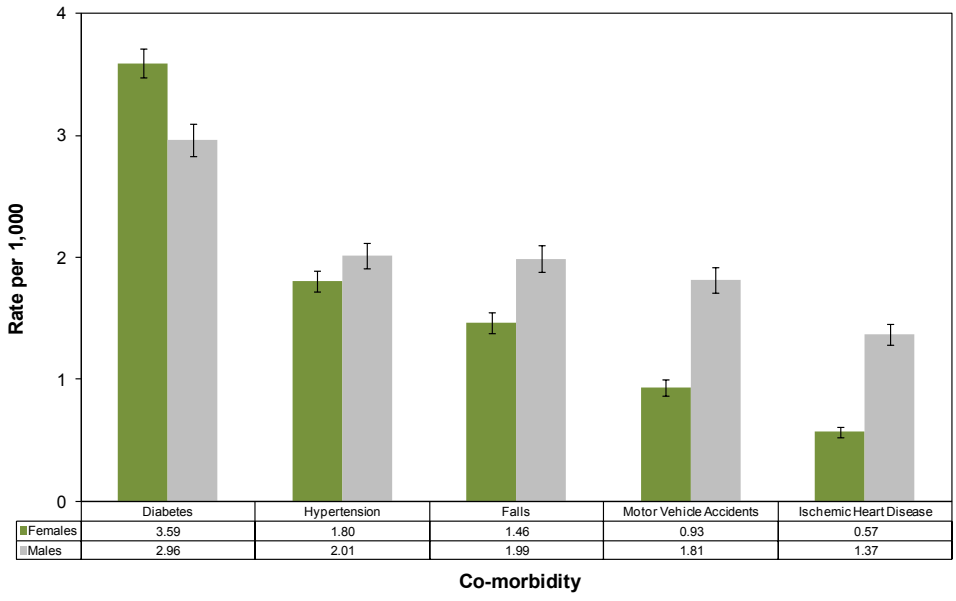
Note: Includes 95% confidence intervals. Standardized to Canadian population 1991. Based on population aged 5 to 54 years only.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

Between 2004/2005 and 2008/2009, hospital co-morbidity rates showed that men with asthma were more likely to also indicate each of the selected co-morbidities, with the exception of diabetes (Figure 11). The hospital co-morbidity rate for diabetes among women with asthma was significantly higher at 3.6 per 1,000, compared to 3.0 per 1,000 for men.

Age-standardized rates and rate ratios indicate that women with asthma were much more likely to be hospitalized with a range of co-morbid conditions compared to women without asthma (Figure 12). Rate ratios were highest with diabetes (3.7), hypertension (3.3) and ischemic heart disease (2.6).

Figure 11

Asthma, Age-Standardized Hospital Co-Morbidity Rate, by Sex, BC, 2004/2005-2008/2009



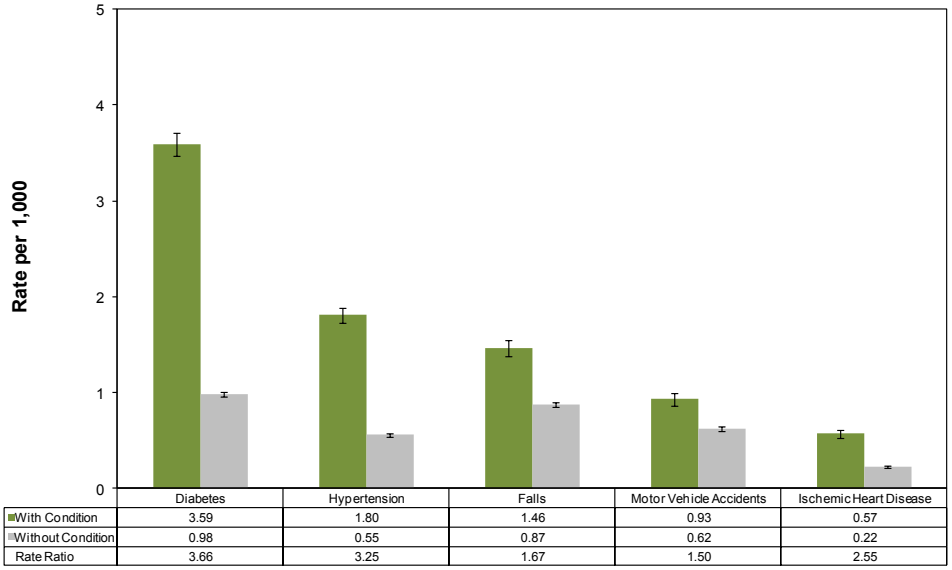
	Diabetes	Hypertension	Falls	Motor Vehicle Accidents	Ischemic Heart Disease
Females	3.59	1.80	1.46	0.93	0.57
Males	2.96	2.01	1.99	1.81	1.37

Co-morbidity

Note: Includes 95% confidence intervals. Standardized to Canadian population 1991. Based on population aged 5 to 54 years only.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

Figure 12

Asthma, Age-Standardized Hospital Co-Morbidity Rate and Rate Ratio, Females with and without Condition, BC, 2004/2005-2008/2009



	Diabetes	Hypertension	Falls	Motor Vehicle Accidents	Ischemic Heart Disease
With Condition	3.59	1.80	1.46	0.93	0.57
Without Condition	0.98	0.55	0.87	0.62	0.22
Rate Ratio	3.66	3.25	1.67	1.50	2.55

Co-morbidity

Note: Includes 95% confidence intervals. Standardized to Canadian population 1991. Based on population aged 5 to 54 years only.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

Osteoporosis

Osteoporosis is a skeletal disorder characterized by low bone density, which contributes to an increased risk of fracture.[6] Because of the seriousness of fractures that can result from thin or brittle bones caused by osteoporosis, the condition is associated with increased levels of chronic pain, disability, mortality, and health care utilization and costs.[7] However, the primary cause of disability and premature mortality is associated with the increased likelihood of a significant fracture, such as a fracture of the spine or hip, than with osteoporosis itself—and fractures are largely preventable.[6]

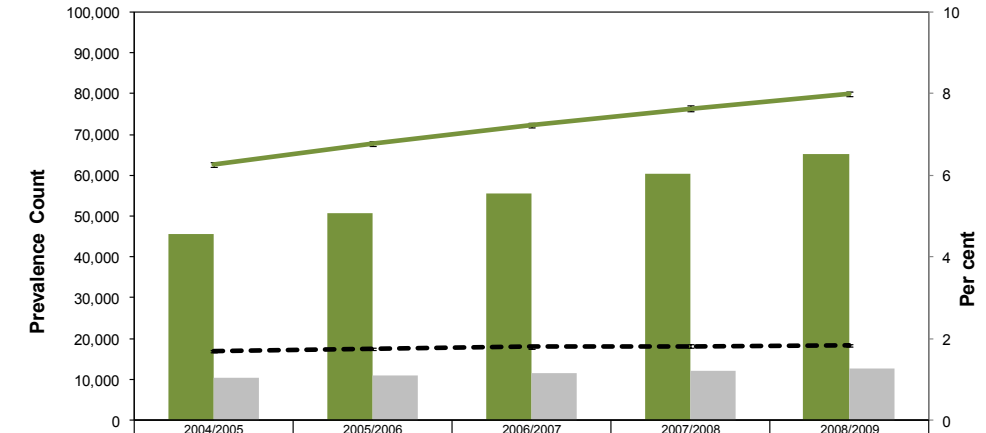
To help prevent osteoporosis, doctors encourage the use of calcium and vitamin D supplements, as well as regular exercise. Bone density screening forms part of secondary prevention efforts to reduce the impact of the disease; however, less than half of Canadians over the age of 65 report having had a bone density test, so osteoporosis may be going undiagnosed in the population.[6] Papaioannou et al.[7] report that despite the fact that the incidence of a first fracture is a significant predictor of future fractures, less than 20 per cent of women and 10 per cent of men who have experienced a fracture receive therapies designed to prevent a future occurrence.

Osteoporosis affects women more than men. According to the CCHS, 1.5 million Canadians aged 40 or older reported a diagnosis of osteoporosis, and women were four times more likely to report the condition than men.[6] Women's increased risk of developing osteoporosis is due, in part, to the rapid decline in bone mass associated with hormonal changes during menopause; these hormonal effects mean that women generally lose more bone density than men as they age.[8] The risk of osteoporosis also increases with age. Other risk factors include heavy alcohol consumption, cigarette smoking and having a low body weight. Prolonged use of certain medications that are known to deplete bone density has also been associated with osteoporosis.[6]

Among BC women over 50 years of age, the age-standardized prevalence rate for osteoporosis has steadily increased over the five-year period from 2004/2005 to 2008/2009 (Figure 13): 6.3 per cent in 2004/2005 to 8.0 per cent in 2008/2009. This translates to 45,686 BC women who had ever been diagnosed with osteoporosis in 2004/2005, to a total of 65,122 in 2008/2009. The age-standardized rate for men was considerably lower and remained relatively consistent over the same time period. By 2008/2009, the rate for men was 1.8 per cent, with a total of 12,712 BC men diagnosed with the disease.

Figure 13

Osteoporosis, Age-Standardized Prevalence Rate and Count, by Sex, BC, 2004/2005 to 2008/2009



	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
Female Count	45,686	50,652	55,473	60,299	65,122
Male Count	10,321	10,992	11,609	12,186	12,712
Total Count	56,009	61,646	67,084	72,488	77,837
Female Rate	6.25	6.77	7.23	7.64	8.00
Male Rate	1.70	1.75	1.79	1.82	1.83
Total Rate	4.14	4.43	4.68	4.90	5.09

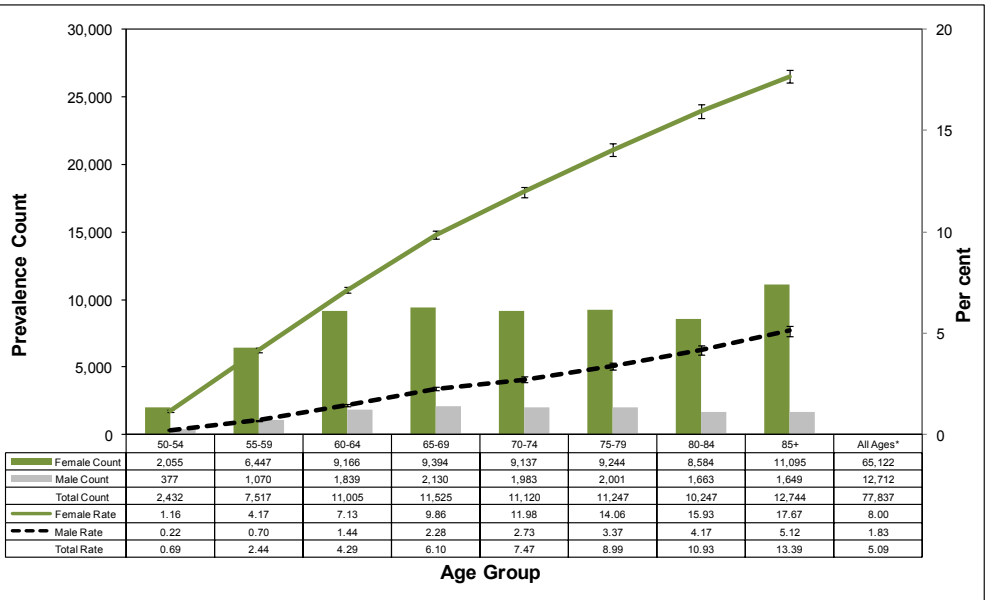
Note: Includes 95% conficence intervals. Standardized to Canadian population 1991. Based on population aged 50 and over only. Total counts may exceed the sum of the female and male counts, because the total includes cases in which gender was not specified.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

There are many possible reasons for the increase in prevalence among women, in particular increases in the proportion of women in post-menopausal years, increasing awareness of the condition, and changing treatment options. Research into trends in physician visits related to osteoporosis in the United States revealed a five-fold increase in visits between 1988 and 2003 as a result of improved treatment and medications.[9] The authors of this study noted that between 91 and 96 per cent of the patients seen were women.

Figure 14 shows that age-specific prevalence rates for osteoporosis increased with age. This was particularly true for women, where the rate increased from 1.2 per cent in those age 50–54 years to 17.7 per cent in those age 85 or older. The rate for men also increased with age, although at a lower rate than for women: from 0.2 per cent in those age 50–54 years to 5.1 per cent in those age 85 or older. Figure 14 also shows that after age 65, the number of women affected by osteoporosis in each age group is

Figure 14

Osteoporosis, Age-Specific Prevalence Rate and Count, by Sex and Age, BC, 2008/2009

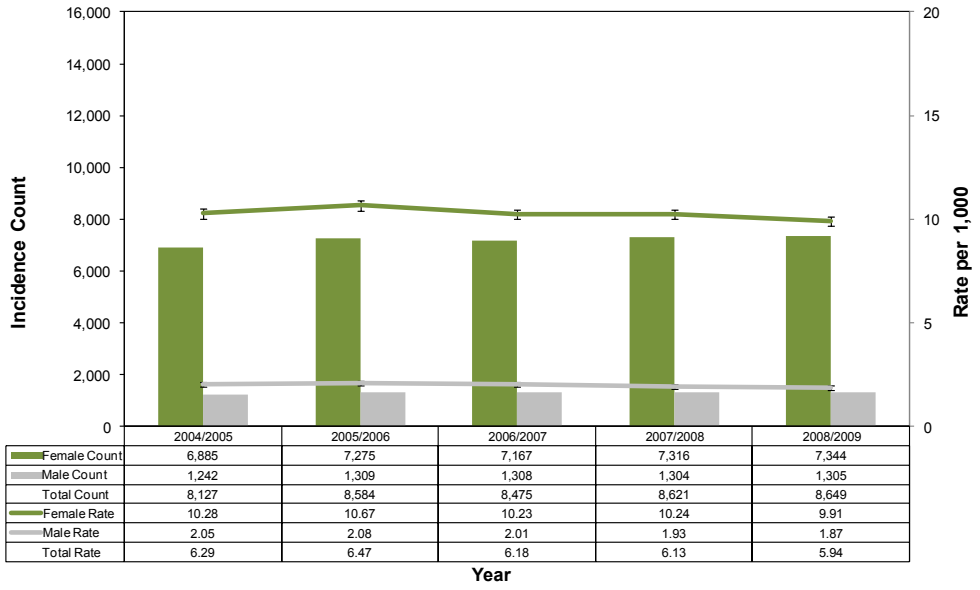


	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	All Ages*
Female Count	2,055	6,447	9,166	9,394	9,137	9,244	8,584	11,095	65,122
Male Count	377	1,070	1,839	2,130	1,983	2,001	1,663	1,649	12,712
Total Count	2,432	7,517	11,005	11,525	11,120	11,247	10,247	12,744	77,837
Female Rate	1.16	4.17	7.13	9.86	11.98	14.06	15.93	17.67	8.00
Male Rate	0.22	0.70	1.44	2.28	2.73	3.37	4.17	5.12	1.83
Total Rate	0.69	2.44	4.29	6.10	7.47	8.99	10.93	13.39	5.09

*Rates in 'All Ages' column are standardized to Canadian population 1991.
Note: Includes 95% confidence intervals. Based on population aged 50 and over only. Total counts may exceed the sum of the female and male as counts, because the total includes cases in which gender was not specified.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

Figure 15

Osteoporosis, Age-Standardized Incidence Rate and Count, by Sex, BC, 2004/2005 to 2008/2009



	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
Female Count	6,885	7,275	7,167	7,316	7,344
Male Count	1,242	1,309	1,308	1,304	1,305
Total Count	8,127	8,584	8,475	8,621	8,649
Female Rate	10.28	10.67	10.23	10.24	9.91
Male Rate	2.05	2.08	2.01	1.93	1.87
Total Rate	6.29	6.47	6.18	6.13	5.94

Year

Note: Includes 95% confidence intervals. Standardized to Canadian population 1991. Based on population aged 50 and over only. Total counts may exceed the sum of the female and male counts, because the total includes cases in which gender was not specified.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

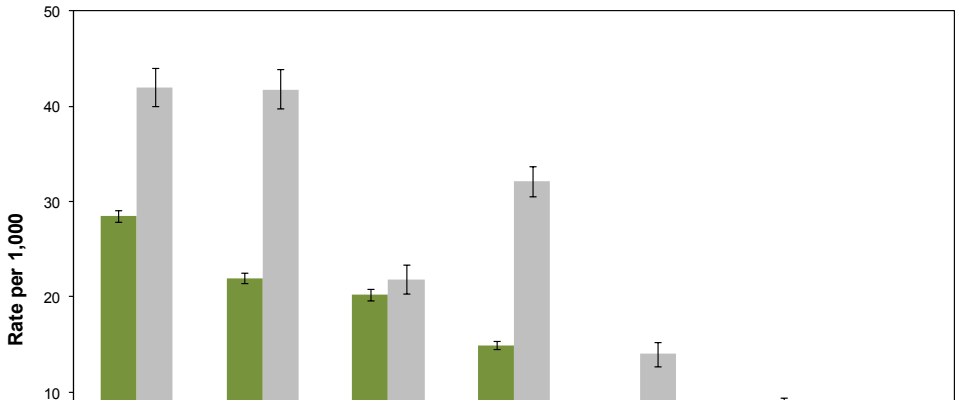
fairly consistent; however, the proportion of women affected increases dramatically with each successive age group.

There was no noteworthy change in age-standardized incidence rates between 2004/2005 and 2008/2009 (Figure 15). In 2008/2009, there were 7,344 newly diagnosed cases of osteoporosis among women in BC, compared to 1,305 cases among men. This corresponded to an age-standardized incidence rate of 9.9 per 1,000 among women and 1.9 per 1,000 among men.

Between 2004/2005 and 2008/2009, hospital co-morbidity rates showed that men with osteoporosis were more likely than women with the condition to also indicate each of the selected co-morbidities (Figure 16). Both women and men with osteoporosis most often had hospitalization records that also indicated hypertension and diabetes. Among men with osteoporosis, the hospital co-morbidity rate for hypertension was 42.0 per 1,000, compared to 28.5 per 1,000 for women with the condition. The hospital co-morbidity rate for diabetes was 41.8 per 1,000

Figure 16

Osteoporosis, Age-Standardized Hospital Co-Morbidity Rate, by Sex, BC, 2004/2005-2008/2009



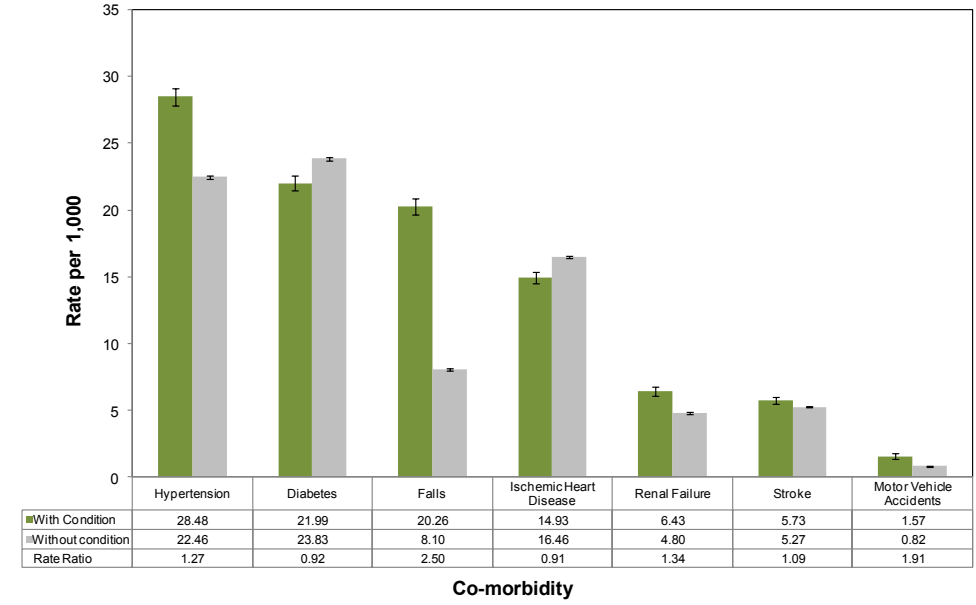
	Hypertension	Diabetes	Falls	Ischemic Heart Disease	Renal Failure	Stroke	Motor Vehicle Accidents
Females	28.48	21.99	20.26	14.93	6.43	5.73	1.57
Males	41.96	41.77	21.81	32.09	14.01	8.62	2.94

Co-morbidity

Note: Includes 95% confidence intervals. Standardized to Canadian population 1991. Based on population aged 50 and over only.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

Figure 17

Osteoporosis, Age-Standardized Hospital Co-Morbidity Rate and Rate Ratio, Females with and without Condition, BC, 2004/2005-2008/2009



	Hypertension	Diabetes	Falls	Ischemic Heart Disease	Renal Failure	Stroke	Motor Vehicle Accidents
With Condition	28.48	21.99	20.26	14.93	6.43	5.73	1.57
Without condition	22.46	23.83	8.10	16.46	4.80	5.27	0.82
Rate Ratio	1.27	0.92	2.50	0.91	1.34	1.09	1.91

Note: Includes 95% confidence intervals. Standardized to Canadian population 1991. Based on population aged 50 and over only.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

among men with osteoporosis, which was nearly twice the rate for women (22.0 per 1,000). The only condition that had no noteworthy difference between women and men was injuries related to falls: 20.3 per 1,000 for women compared to 21.8 per 1,000 for men. As mentioned earlier, falls represent a significant co-morbidity, given that these episodes are often associated with fractures that may lead to long-term or permanent disability and chronic pain.

Figure 17 shows that hypertension was the most common reason for hospitalization for women with and without osteoporosis between 2004/2005 and 2008/2009; however, the rate was higher for women with osteoporosis (28.5 per 1,000, compared to 22.5 per 1,000 for those without the condition). The most significant difference was found in the hospital co-morbidity rate for an injury related to a fall. Women with osteoporosis were 2.5 times as likely to be hospitalized with an injury related to a fall, compared to women without osteoporosis: 20.3 per 1,000 compared to 8.1 per 1,000.

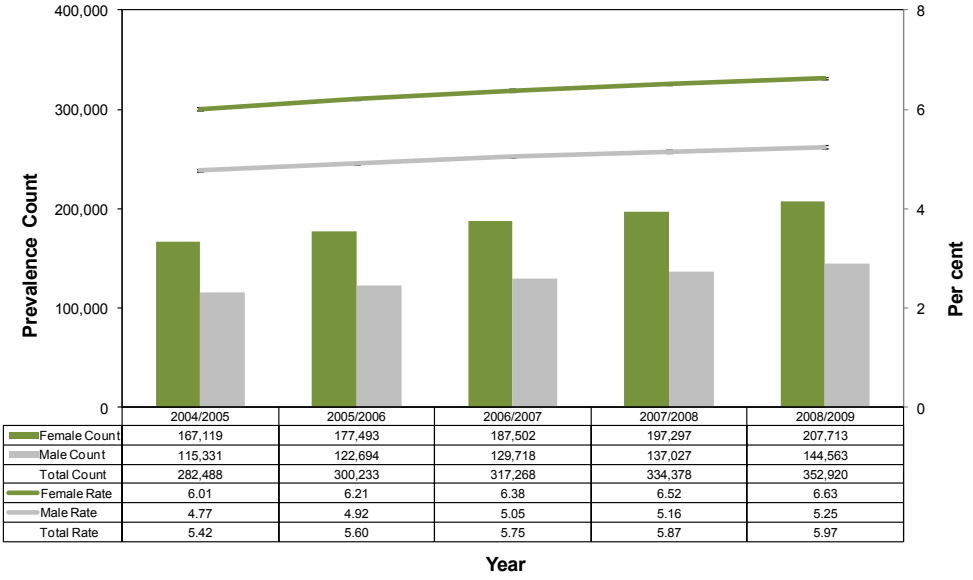
Osteoarthritis

Osteoarthritis is a degenerative disease that causes the cartilage between joints to become thin and rough, decreasing the protective spaces between the bones.[10] Symptoms of osteoarthritis include joint pain, stiffness, limited range of motion, and muscle weakness around the joints, particularly affecting weight-bearing joints such as hips, knees and feet. The causes of osteoarthritis are not completely known, although risk increases if there is a family history or previous injury, or another medical condition has weakened or strained the joint. The risk of developing osteoarthritis is also higher among people who are overweight[10] and increases with age. It is estimated that osteoarthritis affects about 10 per cent of Canada's population.[10]

Rates of osteoarthritis are higher among women after age 55,[10,11] but it is unclear why this is the case. Verbrugge[11] notes that whatever the reason, it appears that women also experience greater levels of activity limitation due to osteoarthritis, and that the difference between men and women in terms of disability increases with age. However, the author also notes that women were more likely to have multiple co-morbid conditions, making it difficult to determine what was attributable to osteoarthritis. Treatment generally focuses on decreasing pain and

Figure 18

Osteoarthritis, Age-Standardized Prevalence Rate and Count, by Sex, BC, 2004/2005 to 2008/2009



	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
Female Count	167,119	177,493	187,502	197,297	207,713
Male Count	115,331	122,694	129,718	137,027	144,563
Total Count	282,488	300,233	317,268	334,378	352,920
Female Rate	6.01	6.21	6.38	6.52	6.63
Male Rate	4.77	4.92	5.05	5.16	5.25
Total Rate	5.42	5.60	5.75	5.87	5.97

Year

Note: Standardized to Canadian population 1991. Total counts may exceed the sum of the female and male counts, because the total includes cases in which gender was not specified.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

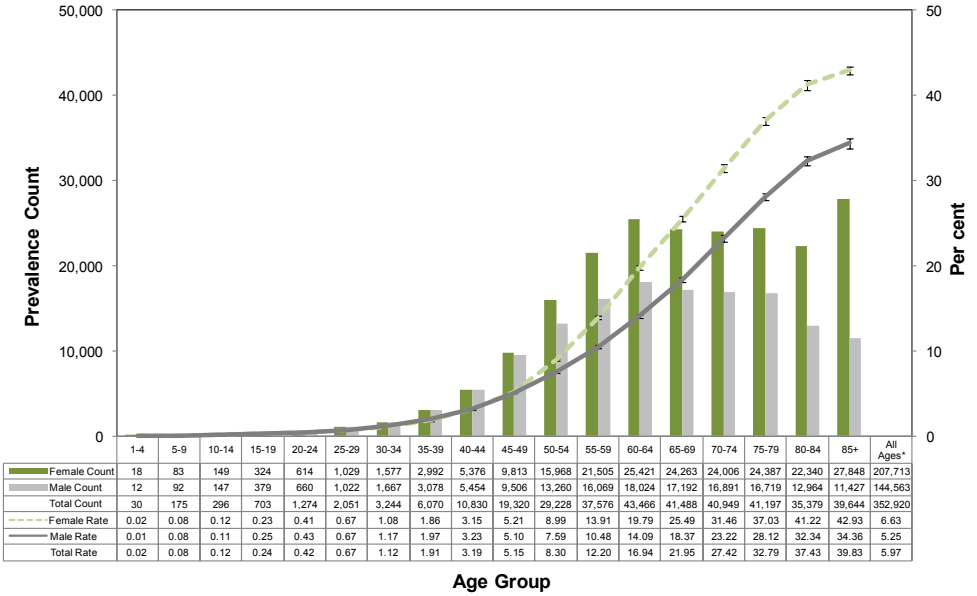
improving joint movement through exercise.[10] Medications are available to reduce stiffness and swelling, and in some cases, joint replacement surgery is required.[10]

In BC, the age-standardized prevalence rate for osteoarthritis has been consistently higher for women than men (Figure 18). Between 2004/2005 and 2008/2009, the rates have been relatively stable for both sexes: from 6.0 per cent in 2004/2005 to 6.6 per cent in 2008/2009 for women, and from 4.8 per cent in 2004/2005 to 5.3 per cent in 2008/2009 for men. In 2008/2009, this represented 207,713 BC women diagnosed with the disease, compared to 144,563 men.

Figure 19 shows that the gap in the prevalence of osteoarthritis between women and men persists throughout the lifespan and increases steadily over time, particularly among women in the post-menopausal years after age 50. In 2008/2009, among women age 50–54, 9.0 per cent had been diagnosed with osteoarthritis, and this percentage

Figure 19

Osteoarthritis, Age-Specific Prevalence Rate and Count, by Sex and Age, BC, 2008/2009



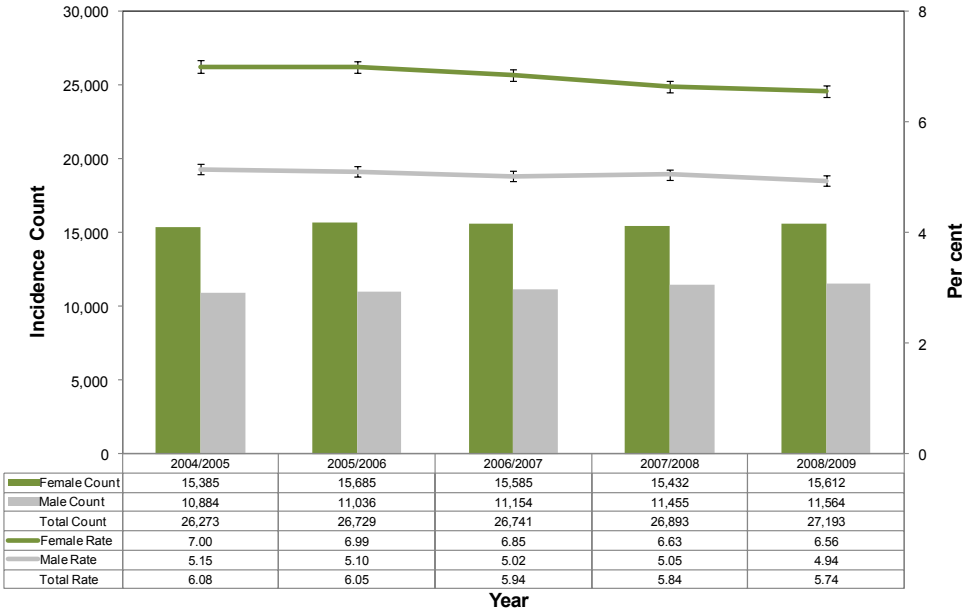
	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	All Ages*
Female Count	18	83	149	324	614	1,029	1,577	2,992	5,376	9,813	15,968	21,505	25,421	24,263	24,006	24,387	22,340	27,848	207,713
Male Count	12	92	147	379	660	1,022	1,667	3,078	5,454	9,506	13,260	16,069	18,024	17,192	16,891	16,719	12,964	11,427	144,563
Total Count	30	175	296	703	1,274	2,051	3,244	6,070	10,830	19,320	29,228	37,576	43,466	41,488	40,949	41,197	35,379	39,644	352,920
Female Rate	0.02	0.08	0.12	0.23	0.41	0.67	1.08	1.86	3.15	5.21	8.99	13.91	19.79	25.49	31.46	37.03	41.22	42.93	6.63
Male Rate	0.01	0.08	0.11	0.25	0.43	0.67	1.17	1.97	3.23	5.10	7.59	10.48	14.09	18.37	23.22	28.12	32.34	34.36	5.25
Total Rate	0.02	0.08	0.12	0.24	0.42	0.67	1.12	1.91	3.19	5.15	8.30	12.20	16.94	21.95	27.42	32.79	37.43	39.83	5.97

Age Group

*Rates in 'All Ages' column are standardized to Canadian population 1991.
Note: Includes 95% confidence intervals. Total counts may exceed the sum of the female and male counts, because the total include s cases in which gender was not specified.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

Figure 20

Osteoarthritis, Age-Standardized Incidence Rate and Count, by Sex, BC, 2004/2005 to 2008/2009



	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
Female Count	15,385	15,685	15,585	15,432	15,612
Male Count	10,884	11,036	11,154	11,455	11,564
Total Count	26,273	26,729	26,741	26,893	27,193
Female Rate	7.00	6.99	6.85	6.63	6.56
Male Rate	5.15	5.10	5.02	5.05	4.94
Total Rate	6.08	6.05	5.94	5.84	5.74

Note: Includes 95% confidence intervals. Standardized to Canadian population 1991. Total counts may exceed the sum of the female and male counts, because the total includes cases in which gender was not specified.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

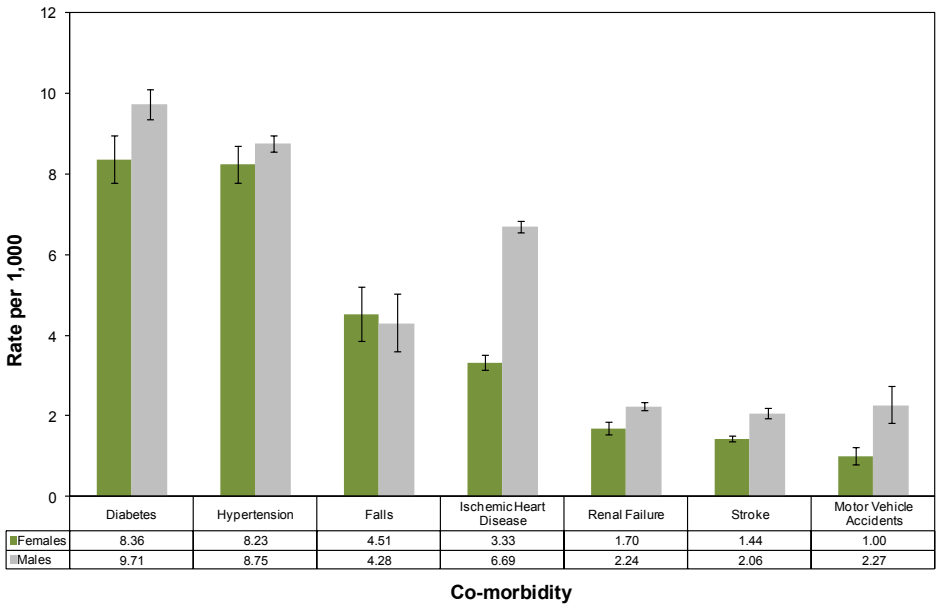
increased to 42.9 per cent by age 85 and older. Men were considerably less likely to have received a diagnosis of osteoarthritis, at 7.6 per cent of those age 50–54 and 34.4 per cent of those age 85 and older.

Age-standardized incidence rates for osteo-arthritis were relatively consistent between 2004/2005 and 2008/2009, and overall were higher for women than men: 6.6 per 1,000 versus 4.9 per 1,000 in 2008/2009 (Figure 20). In 2008/2009, there were 15,612 newly diagnosed cases among women compared to 11,564 among men.

As shown in Figure 21, despite the increased prevalence of osteoarthritis among women, aggregated hospital co-morbidity rates among those diagnosed with osteoarthritis were higher for men in all but one of a select group of co-morbid conditions. In large part, this occurs because hospitalization rates for these

Figure 21

Osteoarthritis, Age-Standardized Hospital Co-Morbidity Rate, by Sex, BC, 2004/2005-2008/2009

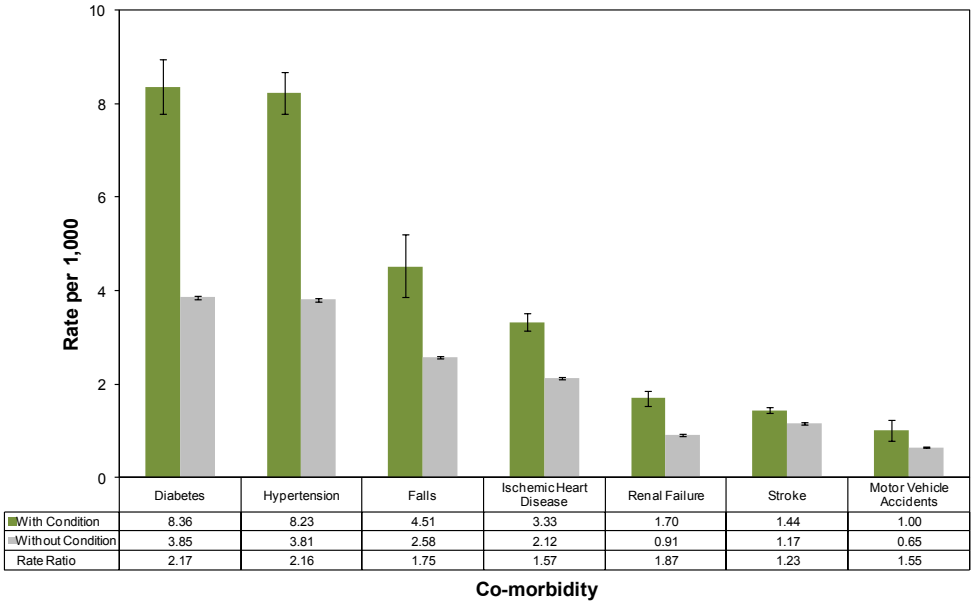


	Diabetes	Hypertension	Falls	Ischemic Heart Disease	Renal Failure	Stroke	Motor Vehicle Accidents
Females	8.36	8.23	4.51	3.33	1.70	1.44	1.00
Males	9.71	8.75	4.28	6.69	2.24	2.06	2.27

Note: Includes 95% confidence intervals. Standardized to Canadian population 1991.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

Figure 22

Osteoarthritis, Age-Standardized Hospital Co-Morbidity Rate and Rate Ratio, Females with and without Condition, BC, 2004/2005-2008/2009



	Diabetes	Hypertension	Falls	Ischemic Heart Disease	Renal Failure	Stroke	Motor Vehicle Accidents
With Condition	8.36	8.23	4.51	3.33	1.70	1.44	1.00
Without Condition	3.85	3.81	2.58	2.12	0.91	1.17	0.65
Rate Ratio	2.17	2.16	1.75	1.57	1.87	1.23	1.55

Co-morbidity

Note: Includes 95% confidence intervals. Standardized to Canadian population 1991.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

conditions were higher for men in general. The most common co-morbid condition requiring hospitalization for both sexes was diabetes (9.7 per 1,000 for men and 8.4 per 1,000 for women), and for women, hypertension was a close second (8.2 per 1,000). Injuries related to a fall was the one area where women with osteoarthritis were more likely to be hospitalized than men, although the difference was not significant.

Age-standardized rate ratios indicate that women with osteoarthritis were more likely to be hospitalized compared to women without the condition for all of the co-morbid conditions examined (Figure 22). Between 2004/2005 and 2008/2009, women with osteoarthritis were 2.2 times more likely than those without the condition to be hospitalized with diabetes or hypertension.

Diabetes

Diabetes mellitus, commonly known as diabetes, is a chronic condition caused by the body's inability to produce and/or use insulin and is an important risk factor for many other conditions that affect women, including high blood pressure, heart disease, stroke and renal failure. If left untreated or poorly managed over long periods of time, the condition can lead to damage of various organs such as the kidneys, eyes, nerves, heart and blood vessels.[12] A 2004 World Health Organization report projected that the global rate of diabetes would rise by 39 per cent between 2000 and 2030;[13] however, rates of diabetes have already surpassed this level in many countries, including Canada.[14]

There are two main forms of diabetes. The less common form, Type 1 diabetes, which has been known as juvenile diabetes, is most often detected in childhood and is an autoimmune disorder resulting in the destruction of insulin-producing cells in the pancreas. The more common form, Type 2 diabetes, also referred to as adult-onset diabetes, is more likely to develop after childhood as a result of insulin resistance and insulin deficiency. In the figures that follow it is not possible to distinguish between Type 1 and Type 2 diabetes, but the majority (approximately 90 per cent) of cases in the population are Type 2. Gestational diabetes, diabetes that develops temporarily during pregnancy, has been excluded from this analysis.

Diabetes is more common among men than women in almost every age group, with the exception of women's childbearing years. These higher rates among younger women may be the result of more frequent physician visits, which increases the likelihood of being diagnosed.[15]

Additionally, although gestational diabetes is typically excluded from rate calculations, it is possible that some gestational cases are inadvertently identified. Rates of diabetes are more prevalent among women of certain population groups, including Aboriginal Canadians, South or West Asians, African Canadians and Hispanic populations.[15] Middle-aged women with diabetes have lower levels of income and education, and are less likely to have a job than women without diabetes.[16] Women with diabetes have reported experiencing higher levels of depression and lower quality of life than men with diabetes.[17] The risk of morbidity and mortality from cardiovascular disease, the most common complication of diabetes, is significantly higher in women than in men.[18]

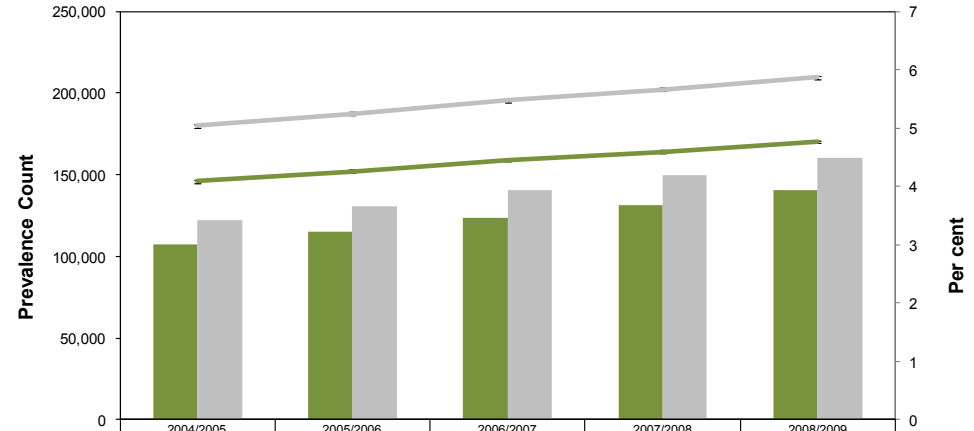
The prevalence of diabetes in Canada has increased by 21 per cent from 2002/2003 to 2006/2007, and the age-standardized incidence has increased 9 per cent over the same time period.[19] In BC, the age-standardized prevalence rate in 2006 was slightly lower for both men and women than the Canadian rate (4.4 per cent versus 4.7 for women and 5.4 per cent versus 5.8 per cent for men).[c,19]

There has been a steady increase in the prevalence of diabetes among the BC population over time. The age-standardized prevalence rate for 2008/2009 was 4.8 per cent for women, compared to 5.9 per cent for men (Figure 23). Overall, this represents 140,498 women, compared to 160,185 men, diagnosed with diabetes. The gap between the number of men and women living with diabetes has been growing steadily. In 2004/2005, there were 14,602 more men than women living with diabetes, but by 2008/2009 this difference had grown to 19,687.

Age-specific prevalence rates for diabetes for 2008/2009 were approximately even for women and men until around age 39. After this point, the prevalence rate for men was consistently

Figure 23

Diabetes, Age-Standardized Prevalence Rate and Count, by Sex, BC, 2004/2005 to 2008/2009



	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
Female Count	107,397	115,077	123,323	131,108	140,498
Male Count	121,999	130,765	140,252	149,491	160,185
Total Count	229,440	245,888	263,625	280,653	301,093
Female Rate	4.09	4.26	4.45	4.60	4.77
Male Rate	5.04	5.25	5.48	5.66	5.88
Total Rate	4.54	4.73	4.94	5.11	5.30

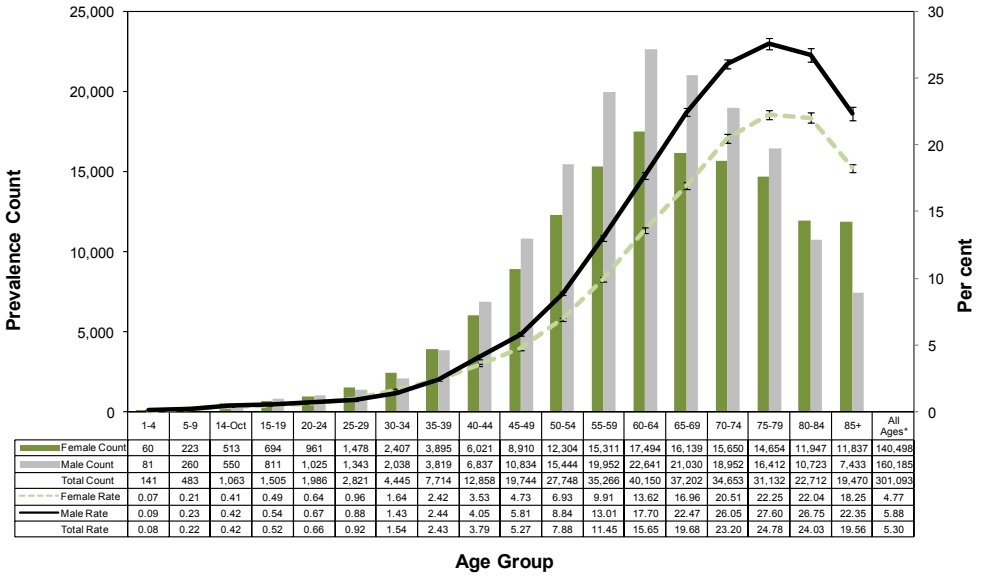
Year

Note: Includes 95% confidence intervals. Standardized to Canadian population 1991. Total counts may exceed the sum of the female and male counts, because the total includes cases in which gender was not specified.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

[c] Rates presented in this report are slightly different than those presented in the Public Health Agency of Canada report due to differences in the way cases have been identified.

Figure 24

Diabetes, Age-Specific Prevalence Rate and Count, by Sex and Age, BC, 2008/2009



	1-4	5-9	14-Oct	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	All Ages*
Female Count	60	223	513	694	961	1,478	2,407	3,895	6,021	8,910	12,304	15,311	17,494	16,139	15,650	14,654	11,947	11,837	140,498
Male Count	81	260	550	811	1,025	1,343	2,038	3,819	6,837	10,834	15,444	19,952	22,641	21,030	18,952	16,412	10,723	7,433	160,185
Total Count	141	483	1,063	1,505	1,986	2,821	4,445	7,714	12,858	19,744	27,748	35,266	40,150	37,202	34,653	31,132	22,712	19,470	301,093
Female Rate	0.07	0.21	0.41	0.49	0.64	0.96	1.64	2.42	3.53	4.73	6.93	9.91	13.62	16.96	20.51	22.25	22.04	18.25	4.77
Male Rate	0.09	0.23	0.42	0.54	0.67	0.88	1.43	2.44	4.05	5.81	8.84	13.01	17.70	22.47	26.05	27.60	26.75	22.35	5.88
Total Rate	0.08	0.22	0.42	0.52	0.66	0.92	1.54	2.43	3.79	5.27	7.88	11.45	15.65	19.68	23.20	24.78	24.03	19.56	5.30

*Rates in 'All Ages' column are standardized to Canadian population 1991.
Note: Includes 95% confidence intervals. Total counts may exceed the sum of the female and male counts, because the total include s cases in which gender was not specified.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

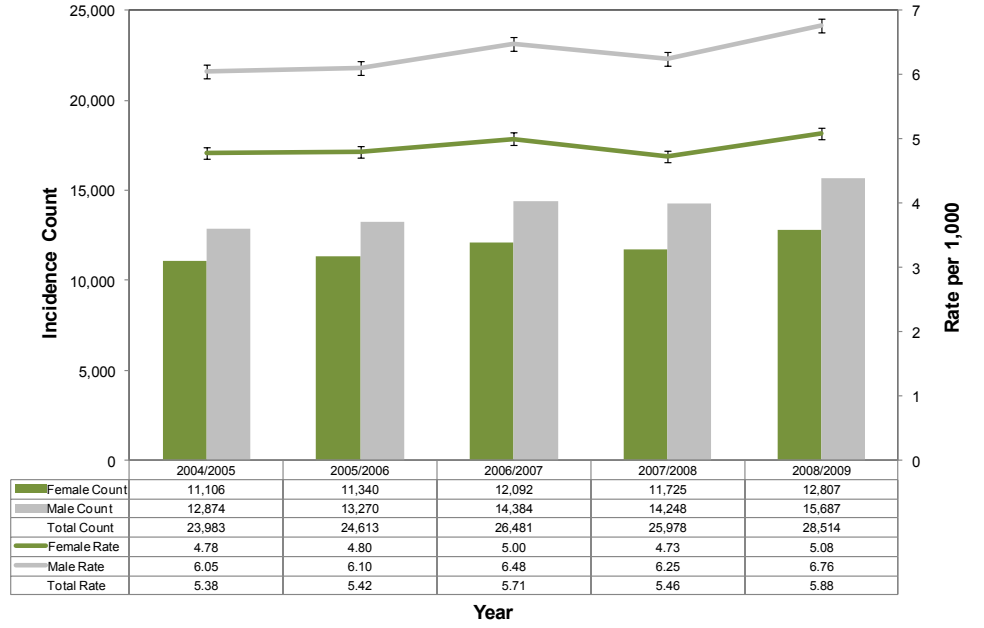
higher than the rate for women in every age group until age 80 (Figure 24). Prevalence rates for both women and men peaked between 75 and 79 years of age (22.3 per cent for women and 27.6 per cent for men). The largest prevalence count for both women and men was found in the 60–64 age group: 17,494 women diagnosed with the disease compared to 22,641 men.

Age-standardized incidence rates show marked differences between women and men (Figure 25). Rates of newly diagnosed cases for men were consistently higher than cases for women in each year between 2004/2005 and 2008/2009. Rates for both women and men peaked in 2008/2009, at 5.1 per 1,000 for women and 6.8 per 1,000 for men. This represents 12,807 newly diagnosed cases among women and 15,687 cases among men.

Aggregated hospital co-morbidity rates for the five-year period between 2004/2005 and

Figure 25

Diabetes, Age-Standardized Incidence Rate and Count, by Sex, BC, 2004/2005 to 2008/2009

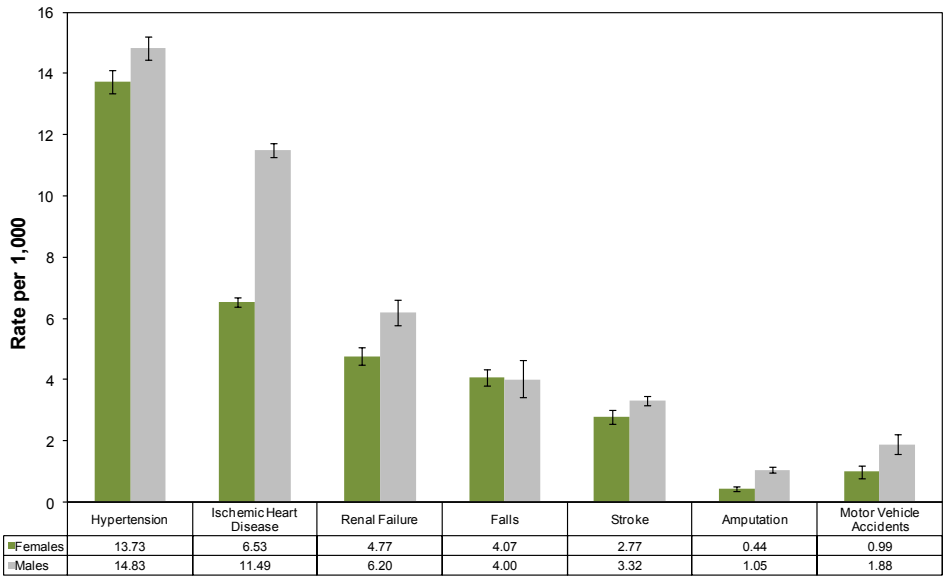


	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
Female Count	11,106	11,340	12,092	11,725	12,807
Male Count	12,874	13,270	14,384	14,248	15,687
Total Count	23,983	24,613	26,481	25,978	28,514
Female Rate	4.78	4.80	5.00	4.73	5.08
Male Rate	6.05	6.10	6.48	6.25	6.76
Total Rate	5.38	5.42	5.71	5.46	5.88

Note: Includes 95% confidence intervals. Standardized to Canadian population 1991. Total counts may exceed the sum of the female and male counts, because the total includes cases in which gender was not specified.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

Figure 26

Diabetes, Age-Standardized Hospital Co-Morbidity Rate, by Sex, BC, 2004/2005-2008/2009



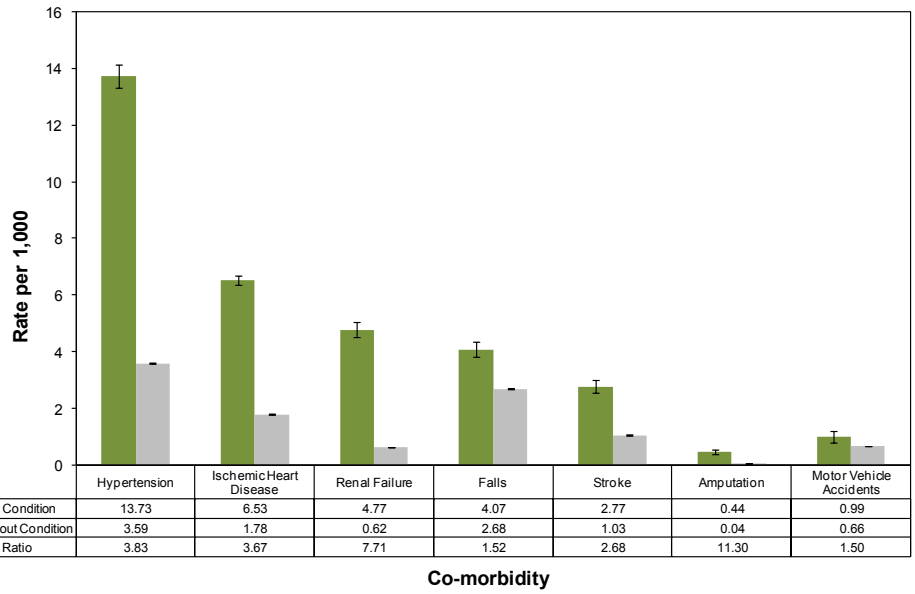
	Hypertension	Ischemic Heart Disease	Renal Failure	Falls	Stroke	Amputation	Motor Vehicle Accidents
Females	13.73	6.53	4.77	4.07	2.77	0.44	0.99
Males	14.83	11.49	6.20	4.00	3.32	1.05	1.88

Note: Includes 95% confidence intervals. Standardized to Canadian population 1991.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

2008/2009 showed that men with diabetes had higher hospitalization rates compared to women for all but one of a select group of co-morbid conditions (Figure 26). Both men and women with diabetes were most likely to be hospitalized for hypertension (13.7 per 1,000 for women and 14.8 per 1,000 for men). Rates for ischemic heart disease were also high, although men were much more likely to be hospitalized compared to women (11.5 per 1,000 for men compared to 6.5 per 1,000 for women). Injuries related to a fall was the one area where women with diabetes were more likely to be hospitalized than men, although the difference was not significant. Aged-standardized rate ratios indicate that women with diabetes were more likely to be hospitalized compared to women without the condition for all of the co-morbid conditions examined (Figure 27). The rate ratio was highest for amputation: women with diabetes were 11.3 times more likely to be hospitalized with amputation compared to women without

Figure 27

Diabetes, Age-Standardized Hospital Co-Morbidity Rate and Rate Ratio, Females with and without Condition, BC, 2004/2005-2008/2009



	Hypertension	Ischemic Heart Disease	Renal Failure	Falls	Stroke	Amputation	Motor Vehicle Accidents
With Condition	13.73	6.53	4.77	4.07	2.77	0.44	0.99
Without Condition	3.59	1.78	0.62	2.68	1.03	0.04	0.66
Rate Ratio	3.83	3.67	7.71	1.52	2.68	11.30	1.50

Note: Includes 95% confidence intervals. Standardized to Canadian population 1991.

diabetes. Rate ratios were also high for hypertension (3.8) and ischemic heart disease (3.7). Women with and without diabetes were most likely to be hospitalized with hypertension, with rates of 13.7 per 1,000 for women with the condition and 3.6 per 1,000 for women without the condition.

Chronic Obstructive Pulmonary Disease

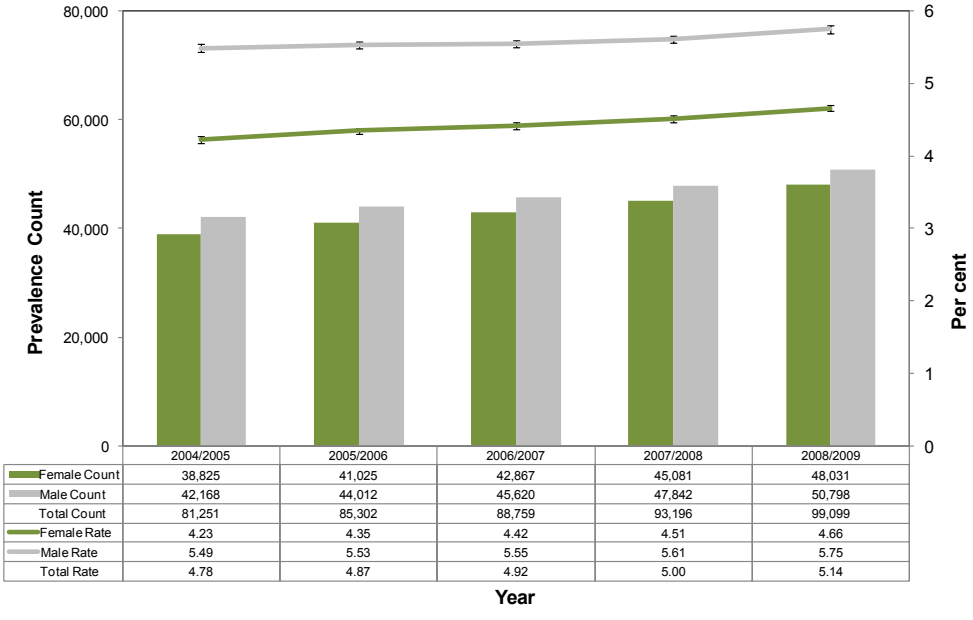
Chronic obstructive pulmonary disease (COPD) is a respiratory disease that causes the airways of the lungs to become inflamed and/or obstructed. The two major forms of the disease are chronic bronchitis and emphysema.[20] COPD has become one of the leading causes of death in women worldwide, killing more women than breast and lung cancer combined.[21] The 2005 CCHS found that 4.4 per cent of men and 4.8 per cent of women over the age of 34 reported being diagnosed with COPD.[4] Rates in BC are lower than other regions of Canada, possibly due to lower smoking rates,[22] which is one of the most important risk factors for COPD. Women with COPD suffer more than men do with a similar severity of COPD. This may be due to women's smaller lung capacity and smaller airways.[20]

Rates of COPD are assessed on the population aged 45 and older only. Age-standardized prevalence rates for COPD among both women and men have shown only minimal changes in the five-year period between 2004/2005 and 2008/2009 (Figure 28). The rate was consistently higher for men than for women, with a total prevalence among men over age 45 of 5.8 per cent in 2008/2009, compared to 4.7 per cent among women. In 2008/2009, there were 48,031 women in British Columbia living with COPD compared to 50,798 men.

Figure 29 shows that age-specific prevalence rates for 2008/2009 increased with age. The rate remained consistently lower for women at each age group compared to men, and the gap between women and men increased steadily with age. Among those people age 85 and older, the prevalence rate for women was 12.6 per cent compared to 18.4 per cent for men.

Figure 28

Chronic Obstructive Pulmonary Disease, Age-Standardized Prevalence Rate and Count, by Sex, BC, 2004/2005 to 2008/2009

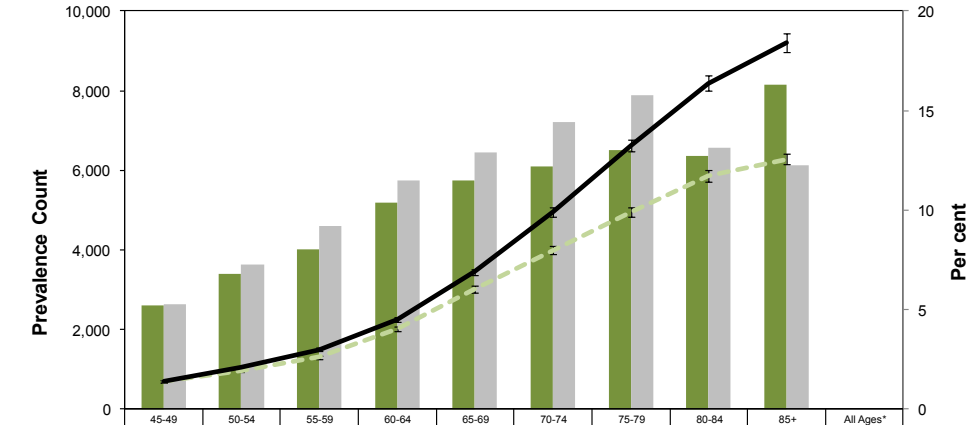


	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
Female Count	38,825	41,025	42,867	45,081	48,031
Male Count	42,168	44,012	45,620	47,842	50,798
Total Count	81,251	85,302	88,759	93,196	99,099
Female Rate	4.23	4.35	4.42	4.51	4.66
Male Rate	5.49	5.53	5.55	5.61	5.75
Total Rate	4.78	4.87	4.92	5.00	5.14

Note: Includes 95% confidence intervals. Standardized to the Canadian population 1991. Based on population aged 45 years and over only. Total counts may exceed the sum of the female and male counts, because the total includes cases in which gender was not specified.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

Figure 29

Chronic Obstructive Pulmonary Disease, Age-Specific Prevalence Rate and Count, by Sex and Age, BC, 2008/2009



	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	All Ages*
Female Count	2,591	3,388	4,023	5,196	5,738	6,080	6,514	6,361	8,140	48,031
Male Count	2,619	3,614	4,590	5,742	6,437	7,216	7,889	6,566	6,125	50,798
Total Count	5,210	7,002	8,614	10,941	12,183	13,306	14,431	12,946	14,466	99,099
Female Rate	1.37	1.91	2.60	4.04	6.03	7.97	9.89	11.74	12.55	4.66
Male Rate	1.40	2.07	2.99	4.49	6.88	9.92	13.27	16.38	18.42	5.75
Total Rate	1.39	1.99	2.80	4.26	6.45	8.91	11.48	13.69	14.53	5.14

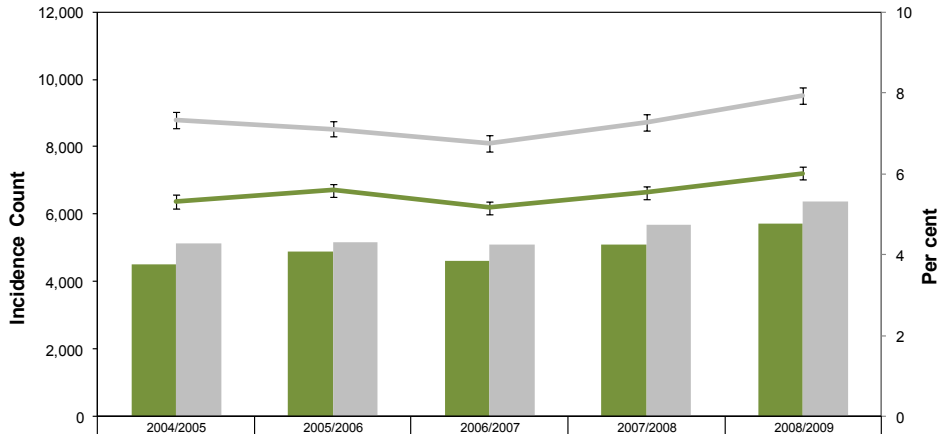
Age Group

* Rates in 'All Ages' column are standardized to Canadian population 1991.
Note: Includes 95% confidence intervals. Based on population aged 45 years and over only. Total counts may exceed the sum of the female and male counts, because the total includes cases in which gender was not specified.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

Between 2004/2005 and 2008/2009, there was very little change in age-standardized incidence rates for COPD for women and men (Figure 30). In 2008/2009, there were 5,714 newly diagnosed cases among women compared to 6,388 newly diagnosed cases among men. This resulted in an age-standardized incidence rate of 6.0 per 1,000 for women and 7.9 per 1,000 for men. Aggregated hospital co-morbidity rates for the five-year period between 2004/2005 and 2008/2009 showed that men with COPD had higher hospitalization rates compared to women for most of the co-morbid conditions studied, with the exception of injuries related to falls and lung cancer. Men and women with COPD were most likely to be hospitalized for diabetes or hypertension. For women, the rates were 46.2 per 1,000 for diabetes and 45.3 per 1,000 for hypertension. For men, the rates were 49.1 per 1,000 for diabetes and 45.8 per 1,000 for hypertension (Figure 31).

Figure 30

Chronic Obstructive Pulmonary Disease, Age-Standardized Incidence Rate and Count, by Sex, BC, 2004/2005 to 2008/2009



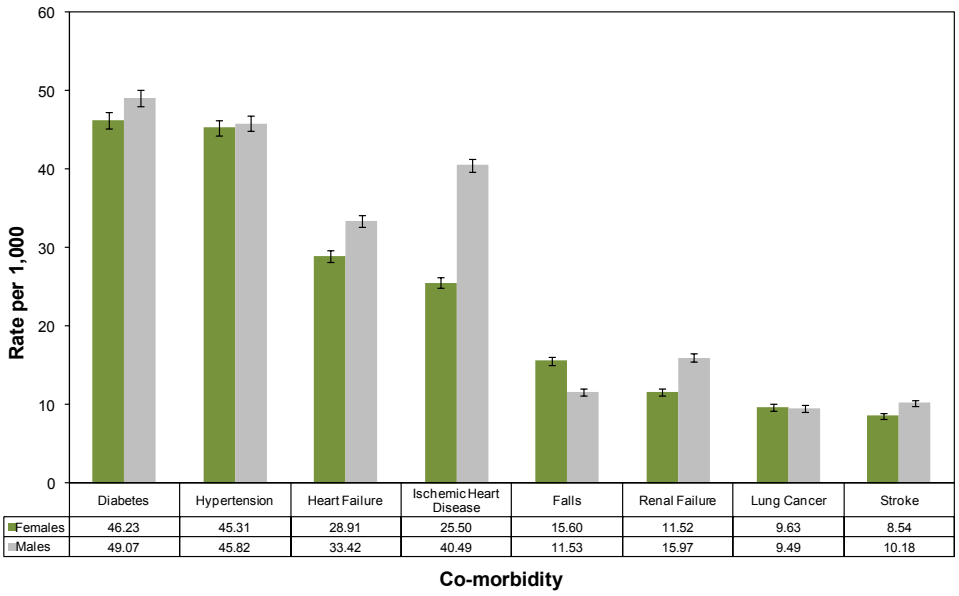
	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
Female Count	4,531	4,892	4,623	5,117	5,714
Male Count	5,128	5,172	5,091	5,674	6,388
Total Count	9,682	10,086	9,730	10,802	12,111
Female Rate	5.31	5.59	5.16	5.53	6.01
Male Rate	7.31	7.11	6.75	7.27	7.93
Total Rate	6.17	6.24	5.84	6.29	6.85

Year

Note: Includes 95% confidence intervals. Standardized to Canadian pouplation 1991. Based on population aged 45 years and over only. Total counts may exceed the sum of the female and male counts, because the total includes cases in which gender was not specified.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

Figure 31

Chronic Obstructive Pulmonary Disease, Age-Standardized Hospital Co-Morbidity Rate, by Sex, BC, 2004/2005-2008/2009



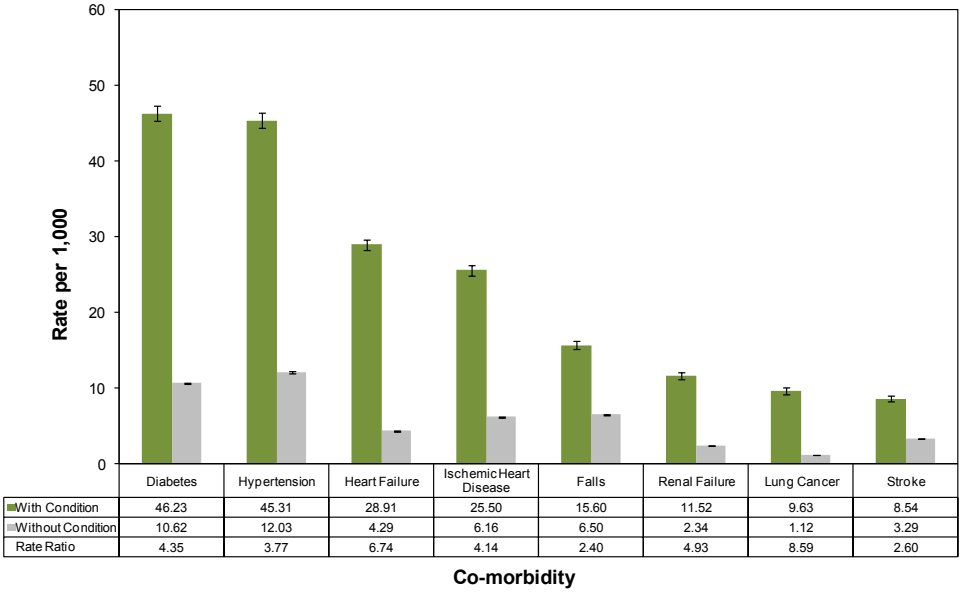
	Diabetes	Hypertension	Heart Failure	Ischemic Heart Disease	Falls	Renal Failure	Lung Cancer	Stroke
Females	46.23	45.31	28.91	25.50	15.60	11.52	9.63	8.54
Males	49.07	45.82	33.42	40.49	11.53	15.97	9.49	10.18

Note: Includes 95% confidence intervals. Standardized to Canadian population 1991. Based on population aged 45 years and over only.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

Women with COPD had a much higher age-standardized hospital co-morbidity rate for each of the selected co-morbid conditions compared to women without COPD (Figure 32). The rate ratio was highest for lung cancer: women with COPD were 8.6 times more likely to be hospitalized for lung cancer compared to women without COPD. This is likely linked to smoking as a risk factor for developing COPD. The rate ratio was also high for heart failure, as women with COPD were 6.7 times more likely to be hospitalized with heart failure compared to women without COPD.

Figure 32

Chronic Obstructive Pulmonary Disease, Age-Standardized Hospital Co-Morbidity Rate and Rate Ratio, Females with and without Condition, BC, 2004/2005-2008/2009



	Diabetes	Hypertension	Heart Failure	Ischemic Heart Disease	Falls	Renal Failure	Lung Cancer	Stroke
With Condition	46.23	45.31	28.91	25.50	15.60	11.52	9.63	8.54
Without Condition	10.62	12.03	4.29	6.16	6.50	2.34	1.12	3.29
Rate Ratio	4.35	3.77	6.74	4.14	2.40	4.93	8.59	2.60

Note: Includes 95% confidence intervals. Standardized to Canadian population 1991. Based on population aged 45 years and over only.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

Ischemic Heart Disease

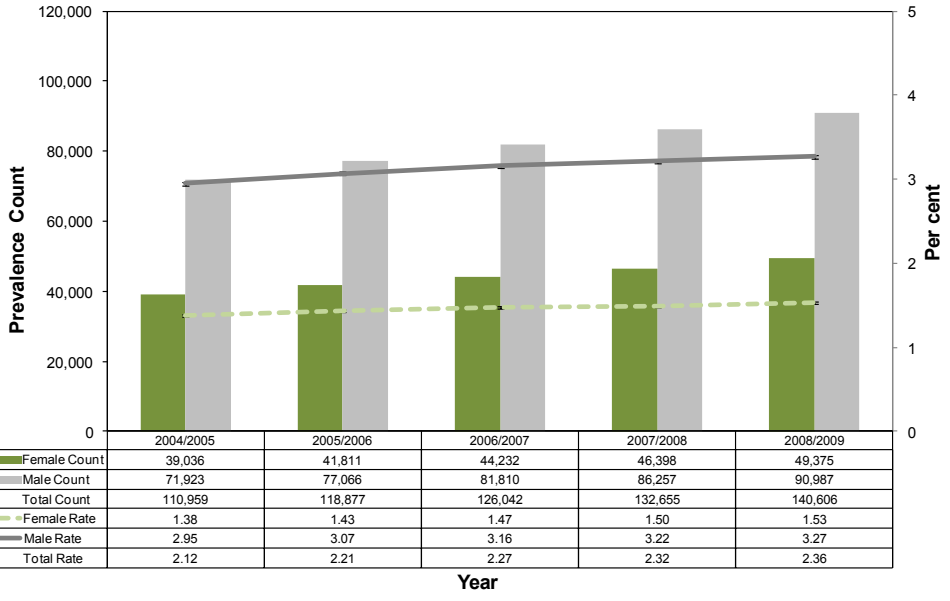
Heart disease is the number one cause of death in Canada for women over the age of 55.[23] Ischemic heart disease is one of the three most common types of heart disease[d] and is caused by the build-up of deposits inside the coronary arteries, which results in a lack of oxygenated blood. Both hospitalization rates and death rates have been decreasing for ischemic heart disease;[24] however, compared to women from the healthiest countries of the world, BC women have a higher mortality rate for ischemic heart disease.[25] Women tend to be affected by heart disease later in life than men, with rates of hospitalization for ischemic heart disease and heart attack increasing noticeably around 55 years of age, compared to 45 years of age for men.[1]

Over the past five years, age-standardized prevalence rates for ischemic heart disease in BC have remained relatively consistent for both women and men (Figure 33). The rate was higher for men than women, and has risen gradually from 3.0 per cent in 2004/2005 to 3.3 per cent in 2008/2009. The rate for women has increased more slowly over the same time period, from 1.4 per cent to 1.5 per cent. In 2008/2009, 49,375 women had been diagnosed with ischemic heart disease, compared to 90,987 men.

Age-specific prevalence rates for 2008/2009 showed that among all age groups, there were considerably more men living with ischemic heart disease than women, with the peak in the 80–84 age group: 23.8 per cent for men and 12.9 per cent for women (Figure 34).

Figure 33

Ischemic Heart Disease, Age-Standardized Prevalence Rate and Count, by Sex, BC, 2004/2005 to 2008/2009



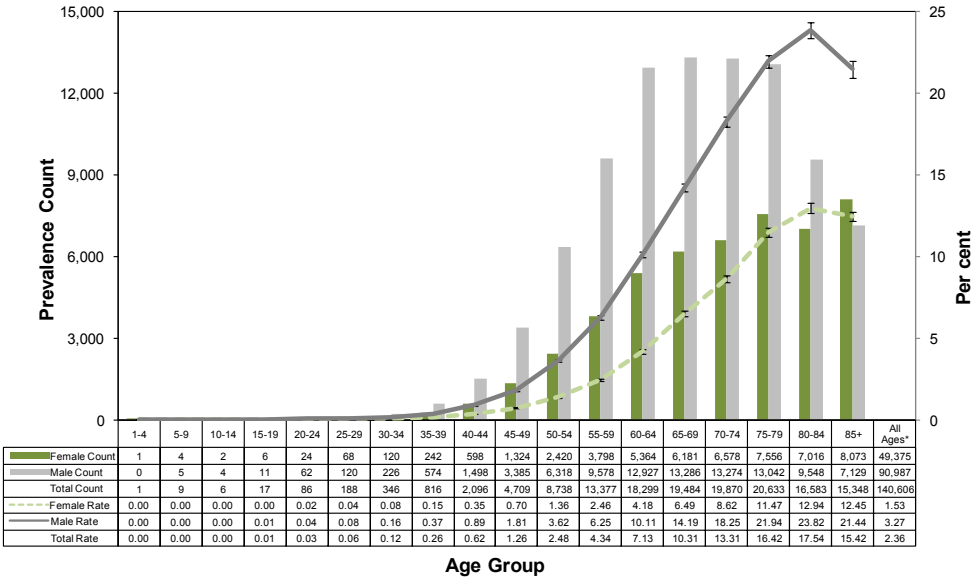
	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
Female Count	39,036	41,811	44,232	46,398	49,375
Male Count	71,923	77,066	81,810	86,257	90,987
Total Count	110,959	118,877	126,042	132,655	140,606
Female Rate	1.38	1.43	1.47	1.50	1.53
Male Rate	2.95	3.07	3.16	3.22	3.27
Total Rate	2.12	2.21	2.27	2.32	2.36

Note: Includes 95% confidence intervals. Standardized to Canadian population 1991. Total counts may exceed the sum of the female and male counts, because the total includes cases in which gender was not specified.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

[d] The other common types of heart disease are acute myocardial infarction and congestive heart failure.

Figure 34

Ischemic Heart Disease, Age-Specific Prevalence Rate and Count, by Sex and Age, BC, 2008/2009



	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	All Ages*
Female Count	1	4	2	6	24	68	120	242	598	1,324	2,420	3,798	5,364	6,181	6,578	7,556	7,016	8,073	49,375
Male Count	0	5	4	11	62	120	226	574	1,498	3,385	6,318	9,578	12,927	13,286	13,274	13,042	9,548	7,129	90,987
Total Count	1	9	6	17	86	188	346	816	2,096	4,709	8,738	13,377	18,299	19,484	19,870	20,633	16,583	15,348	140,606
Female Rate	0.00	0.00	0.00	0.00	0.02	0.04	0.08	0.15	0.35	0.70	1.36	2.46	4.18	6.49	8.62	11.47	12.94	12.45	1.53
Male Rate	0.00	0.00	0.00	0.01	0.04	0.08	0.16	0.37	0.89	1.81	3.62	6.25	10.11	14.19	18.25	21.94	23.82	21.44	3.27
Total Rate	0.00	0.00	0.00	0.01	0.03	0.06	0.12	0.26	0.62	1.26	2.48	4.34	7.13	10.31	13.31	16.42	17.54	15.42	2.36

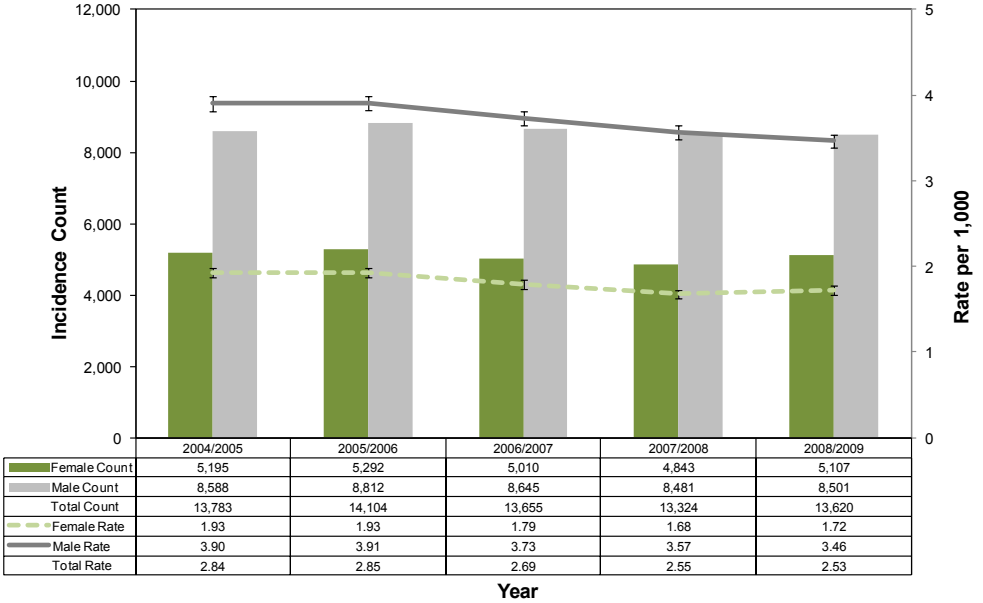
* Rates in 'All Ages' column are standardized to Canadian population 1991.
Note: Includes 95% confidence intervals. Total counts may exceed the sum of the female and male counts, because the total includes cases in which gender was not specified.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

Age-standardized incidence rates for both sexes have remained relatively consistent, with a slight decline between 2004/2005 and 2008/2009 (Figure 35). In 2008/2009, there were 5,107 newly diagnosed cases among BC women, compared to 8,501 cases among BC men. These figures equate to an age-standardized incidence rate of 1.7 per 1,000 for women and 3.5 per 1,000 for men.

Five-year aggregate hospitalization rates for a select group of co-morbidities showed very different patterns among men and women (Figure 36). Women with ischemic heart disease had higher hospitalization rates than men for each of the co-morbid conditions selected, but most of these differences were not statistically significant. It is possible that the differences are related to a higher survival rate among women with ischemic heart disease and an increasing

Figure 35

Ischemic Heart Disease, Age-Standardized Incidence Rate and Count, by Sex, BC, 2004/2005 to 2008/2009

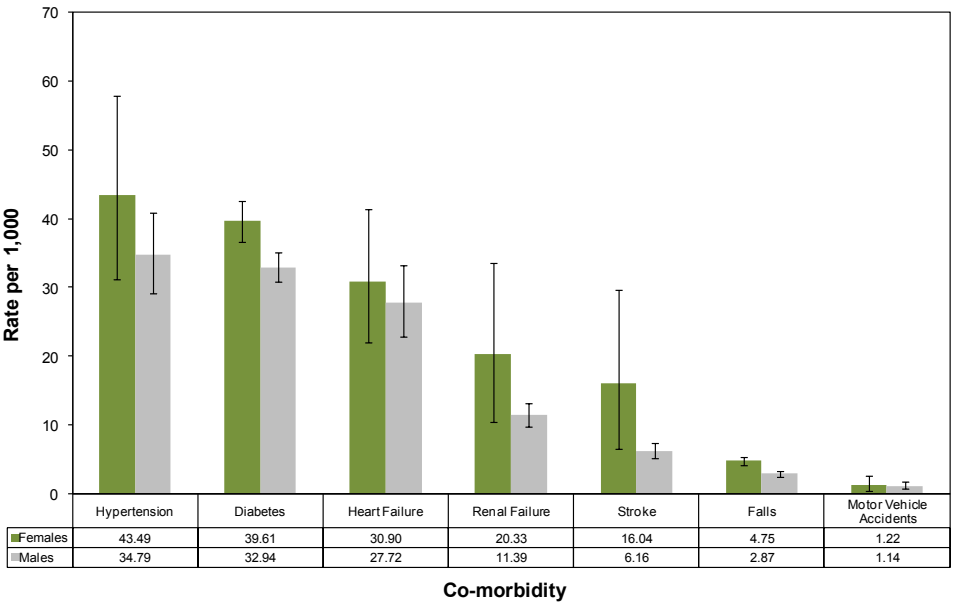


	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
Female Count	5,195	5,292	5,010	4,843	5,107
Male Count	8,588	8,812	8,645	8,481	8,501
Total Count	13,783	14,104	13,655	13,324	13,620
Female Rate	1.93	1.93	1.79	1.68	1.72
Male Rate	3.90	3.91	3.73	3.57	3.46
Total Rate	2.84	2.85	2.69	2.55	2.53

Note: Includes 95% confidence intervals. Standardized to Canadian population 1991. Total counts may exceed the sum of the female and male counts, because the total includes cases in which gender was not specified.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

Figure 36

Ischemic Heart Disease, Age-Standardized Hospital Co-Morbidity Rate, by Sex, BC, 2004/2005-2008/2009



	Hypertension	Diabetes	Heart Failure	Renal Failure	Stroke	Falls	Motor Vehicle Accidents
Females	43.49	39.61	30.90	20.33	16.04	4.75	1.22
Males	34.79	32.94	27.72	11.39	6.16	2.87	1.14

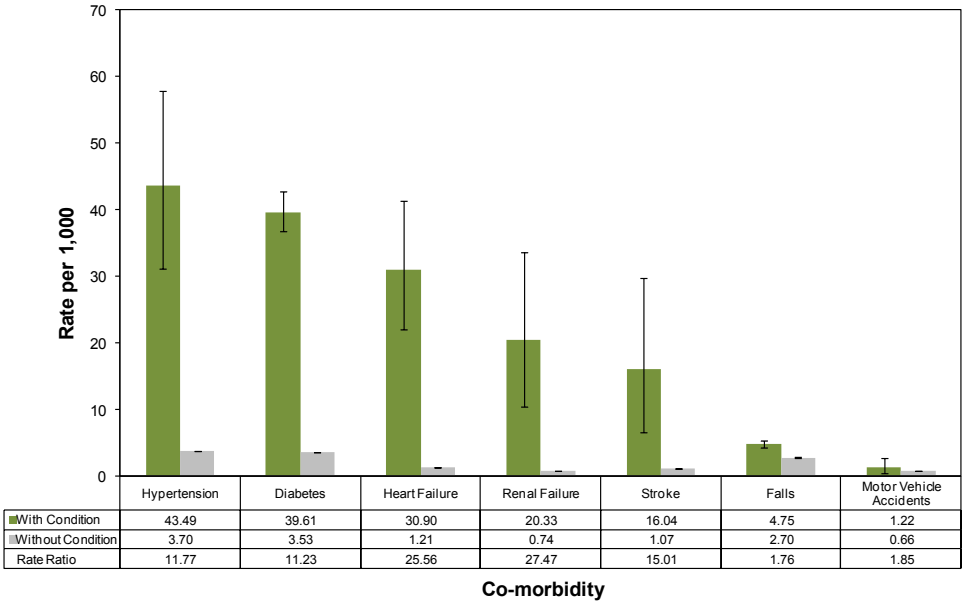
Note: Includes 95% confidence intervals. Standardized to Canadian population 1991.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

incidence among women in older age groups, resulting in a greater likelihood of hospitalization with multiple co-morbid conditions.

Women with ischemic heart disease were much more likely to be hospitalized with each of the selected co-morbidities than women without the disease (Figure 37). The rate ratio was highest for renal failure: women with ischemic heart disease were 27.5 times more likely to be hospitalized for renal failure, compared to women without the disease. The rate ratio was also high for heart failure, as omen with ischemic heart disease were 25.6 times more likely to be hospitalized than women without the disease. The highest hospitalization rate for both groups was for hypertension: 43.5 per 1,000 for women with ischemic heart disease compared to 3.7 per 1,000 for women without the disease.

Figure 37

Ischemic Heart Disease, Age-Standardized Hospital Co-Morbidity Rate and Rate Ratio, Females with and without Condition, BC, 2004/2005-2008/2009



	Hypertension	Diabetes	Heart Failure	Renal Failure	Stroke	Falls	Motor Vehicle Accidents
With Condition	43.49	39.61	30.90	20.33	16.04	4.75	1.22
Without Condition	3.70	3.53	1.21	0.74	1.07	2.70	0.66
Rate Ratio	11.77	11.23	25.56	27.47	15.01	1.76	1.85

Note: Includes 95% confidence intervals. Standardized to Canadian population 1991.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

Congestive Heart Failure

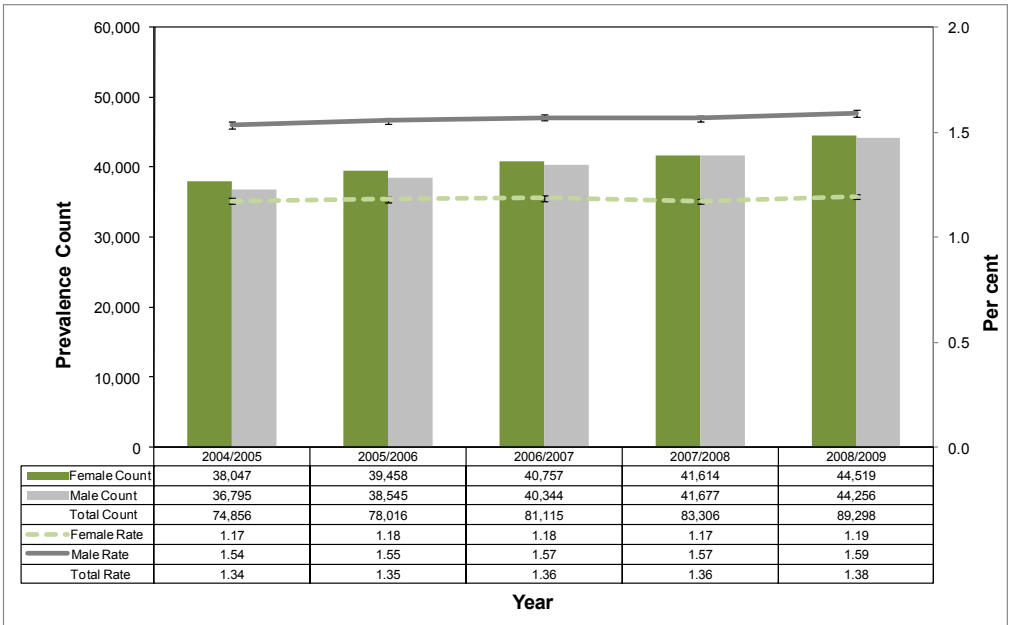
Congestive heart failure (CHF) is another common type of heart disease in which the heart is not able to pump blood effectively, resulting in a build-up of fluid in the lungs or legs, often referred to as edema.[1] Hospitalization rates for CHF have been greater for men than for women, although the difference is less than that seen for ischemic heart disease and acute myocardial infarction.[24] The rates have been decreasing since 1994 and this trend is believed to be due to more timely and appropriate treatment and better management of hypertension, high cholesterol and ischemic heart disease.[24] Hospitalization records often record CHF as an associated condition, rather than the primary diagnosis, so analysis of hospitalization data by primary diagnosis likely under-represents CHF.[24]

Age-standardized prevalence rates for CHF were stable over time for both women and men. In 2008/2009, the age-standardized prevalence rate for women was 1.2 per cent, compared to 1.6 per cent for men (Figure 38). In the same year, the actual number of prevalent cases was only slightly higher for women, at 44,519 cases, compared to 44,256 cases for men. This is due to the fact that the disease is most common in older age groups, and since women have a higher average life expectancy, the same number of cases is divided among a larger population base, resulting in a lower age-standardized rate.

Age-specific prevalence rates for CHF among both women and men increase steadily with age, starting around 50 years of age and increasing exponentially with each subsequent age group (Figure 39). The peak prevalence for both sexes

Figure 38

Congestive Heart Failure, Age-Standardized Prevalence Rate and Count, by Sex, BC, 2004/2005 to 2008/2009



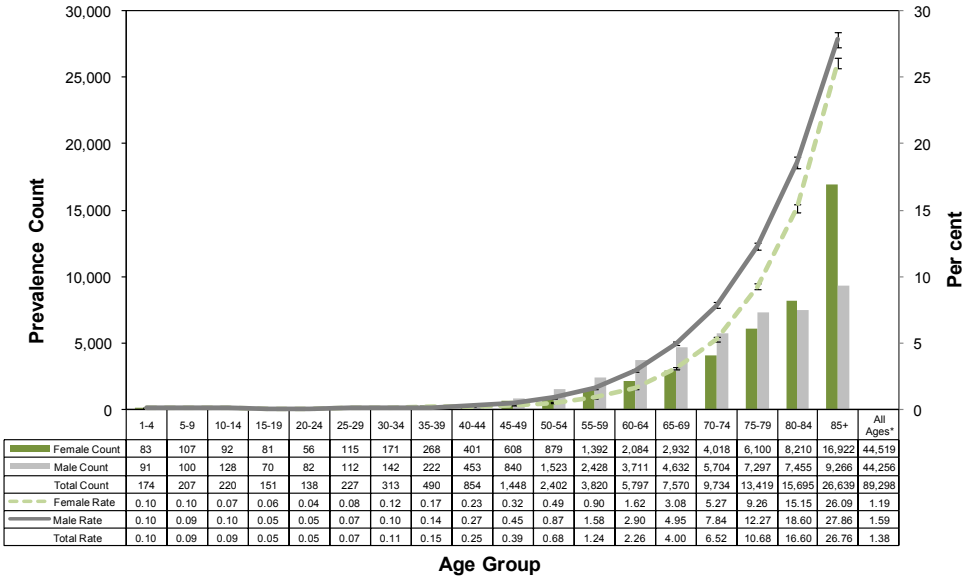
	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
Female Count	38,047	39,458	40,757	41,614	44,519
Male Count	36,795	38,545	40,344	41,677	44,256
Total Count	74,856	78,016	81,115	83,306	89,298
Female Rate	1.17	1.18	1.18	1.17	1.19
Male Rate	1.54	1.55	1.57	1.57	1.59
Total Rate	1.34	1.35	1.36	1.36	1.38

Year

Note: Includes 95% confidence intervals. Standardized to Canadian population 1991. Total counts may exceed the sum of the female and male counts, because the total includes cases in which gender was not specified.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

Figure 39

Congestive Heart Failure, Age-Specific Prevalence Rate and Count, by Sex and Age, BC, 2008/2009



	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	All Ages*
Female Count	83	107	92	81	56	115	171	268	401	608	879	1,392	2,084	2,932	4,018	6,100	8,210	16,922	44,519
Male Count	91	100	128	70	82	112	142	222	453	840	1,523	2,428	3,711	4,632	5,704	7,297	7,455	9,266	44,256
Total Count	174	207	220	151	138	227	313	490	854	1,448	2,402	3,820	5,797	7,570	9,734	13,419	15,695	26,639	89,298
Female Rate	0.10	0.10	0.07	0.06	0.04	0.08	0.12	0.17	0.23	0.32	0.49	0.90	1.62	3.08	5.27	9.26	15.15	26.09	1.19
Male Rate	0.10	0.09	0.10	0.05	0.05	0.07	0.10	0.14	0.27	0.45	0.87	1.58	2.90	4.95	7.84	12.27	18.60	27.86	1.59
Total Rate	0.10	0.09	0.09	0.05	0.05	0.07	0.11	0.15	0.25	0.39	0.68	1.24	2.26	4.00	6.52	10.68	16.60	26.76	1.38

* Rates in 'All Ages' column are standardized to Canadian population 1991.
Note: Includes 95% confidence intervals. Total counts may exceed the sum of the female and male counts, because the total includes cases in which gender was not specified.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

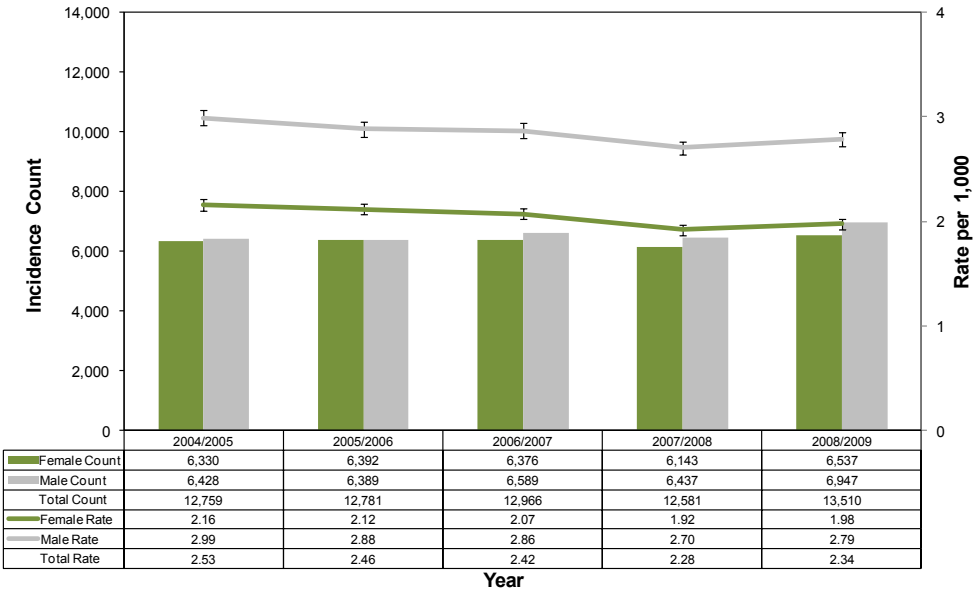
is in the highest age group (85+): 26.1 per cent of women and 27.9 per cent of men.

Age-standardized incidence rates for CHF were consistent for both women and men between 2004/2005 and 2008/2009 (Figure 40). In 2008/2009, the rate was higher for men than women (2.8 per 1,000 for men compared to 2.0 per 1,000 for women). These figures represent 6,537 newly diagnosed cases among BC women compared to 6,947 cases among BC men.

Age-standardized hospital co-morbidity rates for the five-year period between 2004/2005 and 2008/2009 showed that men with CHF had higher hospitalization rates compared to women for all but two of the selected co-morbidities Women with CHF had a higher hospital co-morbidity rate for diabetes (49.9 per 1,000), although the difference was not significant, and

Figure 40

Congestive Heart Failure, Age-Standardized Incidence Rate and Count, by Sex, BC, 2004/2005 to 2008/2009

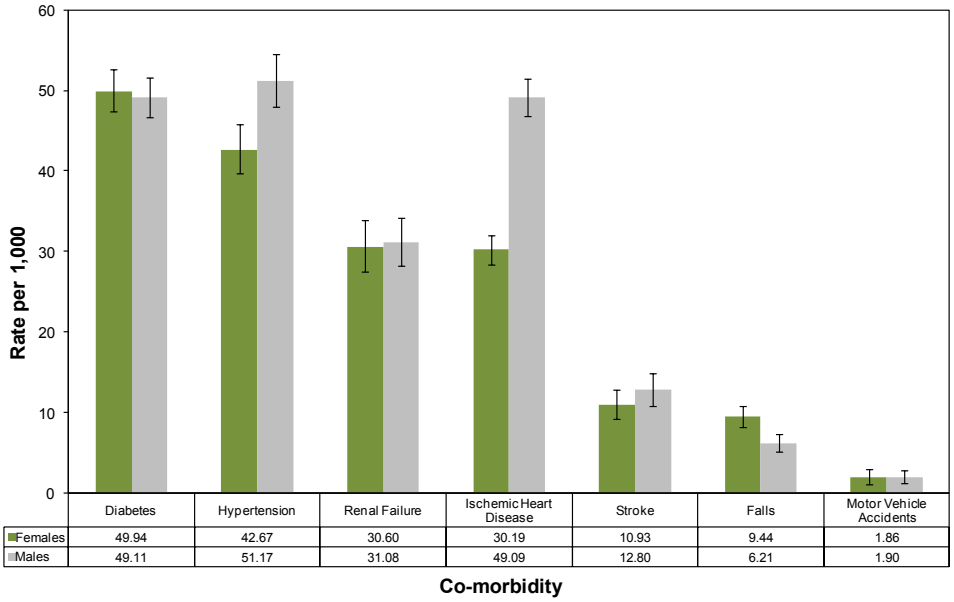


	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
Female Count	6,330	6,392	6,376	6,143	6,537
Male Count	6,428	6,389	6,589	6,437	6,947
Total Count	12,759	12,781	12,966	12,581	13,510
Female Rate	2.16	2.12	2.07	1.92	1.98
Male Rate	2.99	2.88	2.86	2.70	2.79
Total Rate	2.53	2.46	2.42	2.28	2.34

Note: Includes 95% confidence intervals. Standardized to Canadian population 1991. Total counts may exceed the sum of the female and male counts, because the total includes cases in which gender was not specified.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

Figure 41

Congestive Heart Failure, Age-Standardized Hospital Co-Morbidity Rate, by Sex, BC, 2004/2005-2008/2009



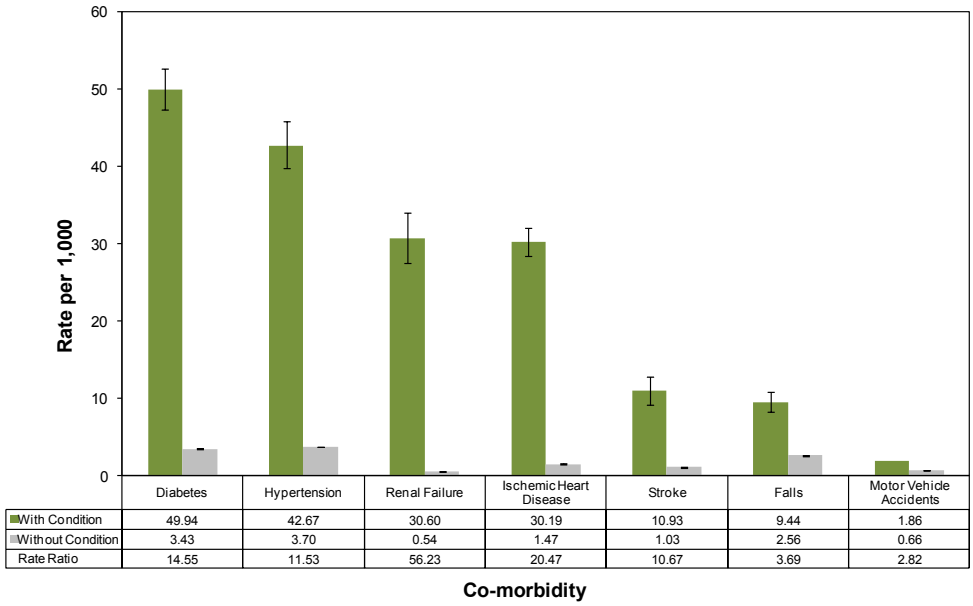
Note: Includes 95% confidence intervals. Standardized to Canadian population 1991.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

for injuries related to a fall (9.4 per 1,000). Men with CHF were considerably more likely to be hospitalized with ischemic heart disease: 49.1 per 1,000 compared to 30.2 per 1,000 for women with CHF (Figure 41).

Women with CHF were considerably more likely to be hospitalized with each of the selected co-morbidities than women without CHF (Figure 42). The greatest difference was seen in hospitalizations for renal failure: women with CHF were 56.2 times more likely to be hospitalized with renal failure, compared to women without CHF. Hospitalization rates were highest for diabetes (49.9 per 1,000 for women with CHF compared to 3.4 per 1,000 for women without CHF). The highest hospitalization rate for women without CHF was for hypertension (3.7 per 1,000), although this rate was considerably lower than the rate for women with CHF (42.7 per 1,000).

Figure 42

Congestive Heart Failure, Age-Standardized Hospital Co-Morbidity Rate and Rate Ratio, Females with and without Condition, BC, 2004/2005-2008/2009



Note: Includes 95% confidence intervals. Standardized to Canadian population 1991.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

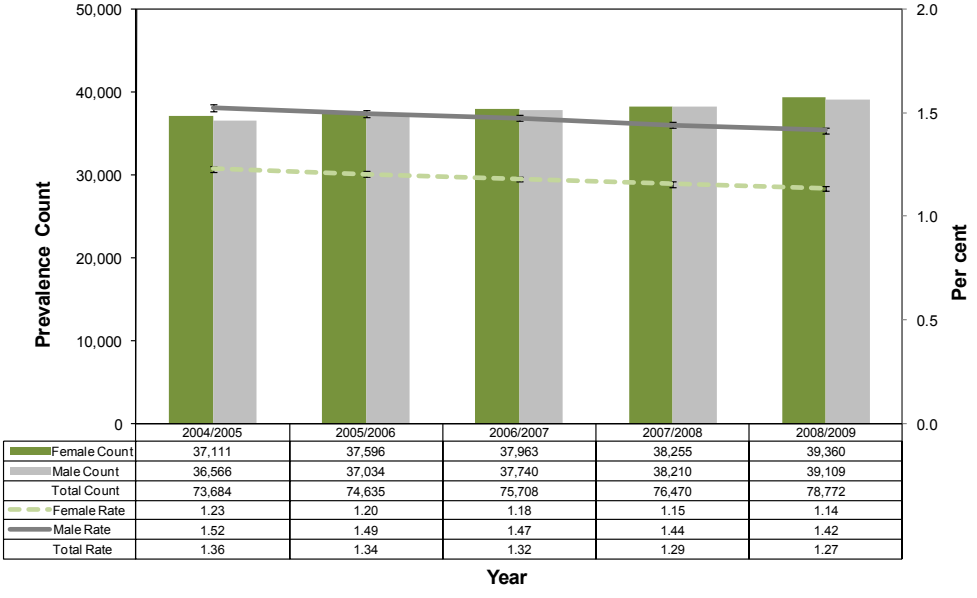
Stroke

Stroke is one of the most common presentations of cerebrovascular disease, in which disruption of blood flow to portions of the brain results in a loss of function.[24] Rates of hospitalization for stroke increase over the age of 60 for both men and women but the rate is higher for men.[24] Hospitalization records may not reveal the true number of individuals affected by stroke because approximately one-third of all individuals seen in an emergency department for stroke are never admitted to hospital. In addition, for every symptomatic stroke, up to ten individuals with less apparent effects go unrecognized.[1] Plans to create a BC Stroke Registry will make it easier to get a more complete and consistent picture of the incidence and prevalence of stroke in BC.[26]

British Columbia data show that there have been minimal decreases in age-standardized prevalence rates for stroke among both women and men from 2004/2005 to 2008/2009 (Figure 43). The rate for women has decreased from 1.2 per cent to 1.1 per cent in this time period, while the rate for men has decreased from 1.5 per cent to 1.4 per cent. In 2008/2009, there were 39,360 BC women who had been diagnosed with a stroke, compared to 39,109 men. Similar to congestive heart failure, differences in age-standardized rates between women and men with minimal differences in observed counts are due to women living longer than men and the increase in rates of stroke with age.

Figure 43

Stroke, Age-Standardized Prevalence Rate and Count, by Sex, BC, 2004/2005 to 2008/2009

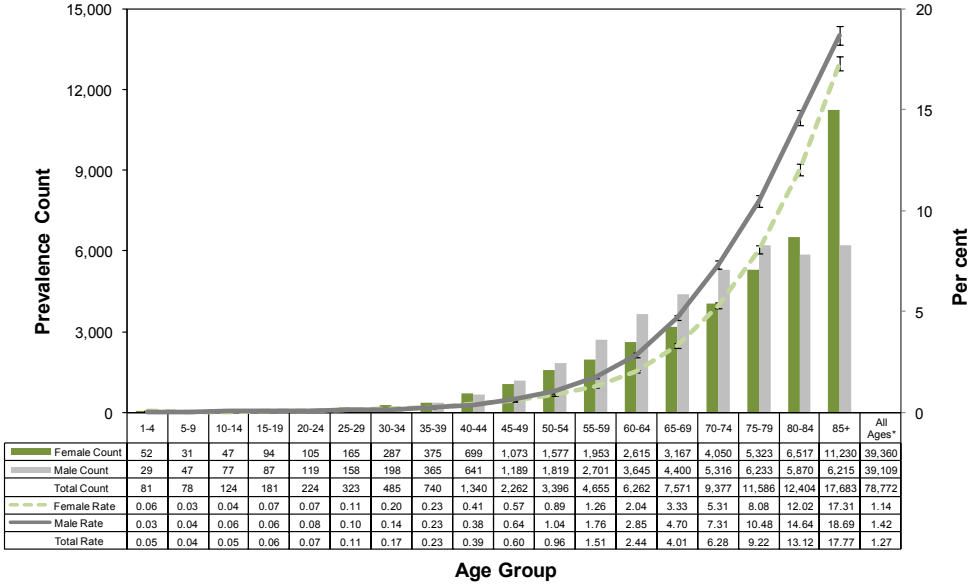


	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
Female Count	37,111	37,596	37,963	38,255	39,360
Male Count	36,566	37,034	37,740	38,210	39,109
Total Count	73,684	74,635	75,708	76,470	78,772
Female Rate	1.23	1.20	1.18	1.15	1.14
Male Rate	1.52	1.49	1.47	1.44	1.42
Total Rate	1.36	1.34	1.32	1.29	1.27

Note: Includes 95% confidence intervals. Standardized to Canadian population 1991. Total counts may exceed the sum of the female and male counts, because the total includes cases in which gender was not specified.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

Figure 44

Stroke, Age-Specific Prevalence Rate and Count, by Sex and Age, BC, 2008/2009



	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	All Ages*
Female Count	52	31	47	94	105	165	287	375	699	1,073	1,577	1,953	2,615	3,167	4,050	5,323	6,517	11,230	39,360
Male Count	29	47	77	87	119	158	198	365	641	1,189	1,819	2,701	3,645	4,400	5,316	6,233	5,870	6,215	39,109
Total Count	81	78	124	181	224	323	485	740	1,340	2,262	3,396	4,655	6,262	7,571	9,377	11,586	12,404	17,683	78,772
Female Rate	0.06	0.03	0.04	0.07	0.07	0.11	0.20	0.23	0.41	0.57	0.89	1.26	2.04	3.33	5.31	8.08	12.02	17.31	1.14
Male Rate	0.03	0.04	0.06	0.06	0.08	0.10	0.14	0.23	0.38	0.64	1.04	1.76	2.85	4.70	7.31	10.48	14.64	18.69	1.42
Total Rate	0.05	0.04	0.05	0.06	0.07	0.11	0.17	0.23	0.39	0.60	0.96	1.51	2.44	4.01	6.28	9.22	13.12	17.77	1.27

* Rates in 'All Ages' column are standardized to Canadian population 1991.
Note: Includes 95% confidence intervals. Total counts may exceed the sum of the female and male counts, because the total includes cases in which gender was not specified.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

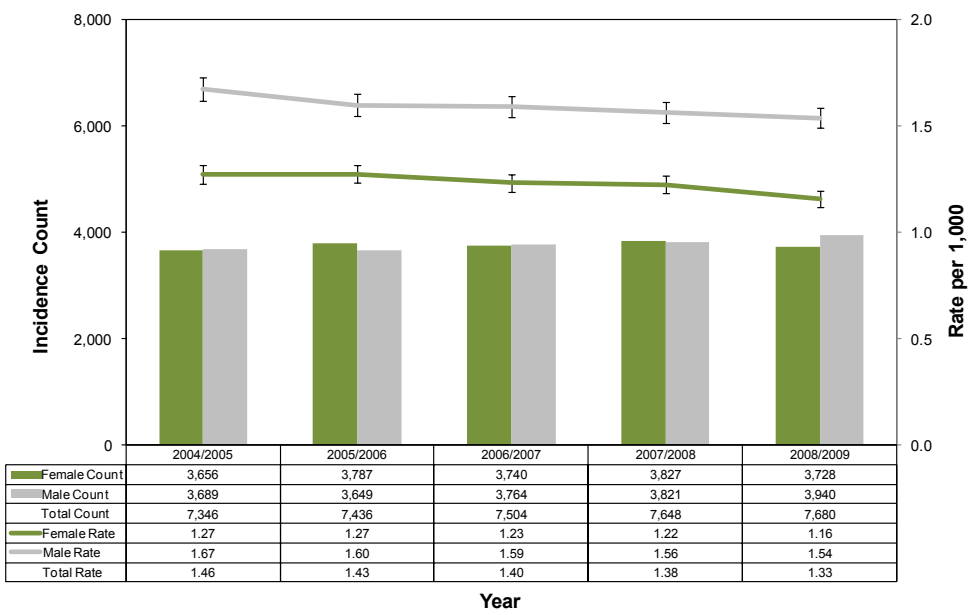
Age-specific prevalence rates for 2008/2009 showed a higher rate for men in every age group over age 45, with prevalence for both women and men peaking in the oldest age group (85+): 17.3 per cent of women and 18.7 per cent of men (Figure 44).

There was very little change in age-standardized incidence rates for both women and men over the five-year period from 2004/2005 to 2008/2009 (Figure 45). In 2008/2009, there were 3,728 newly diagnosed cases of stroke among women, compared to 3,940 new cases among men. This corresponds to an age-standardized rate of 1.2 per 1,000 for women and 1.5 per 1,000 for men.

Age-standardized hospital co-morbidity rates for the five-year period between 2004/2005 and 2008/2009 showed than men with stroke had higher hospitalization rates compared to women with stroke for all of the selected co-morbid

Figure 45

Stroke, Age-Standardized Incidence Rate and Count, by Sex, BC, 2004/2005 to 2008/2009

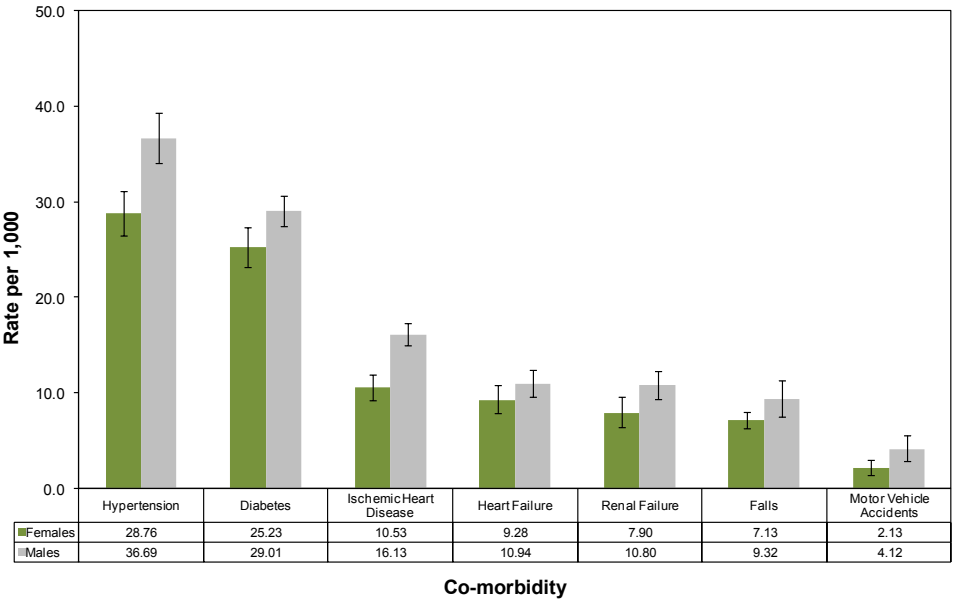


	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
Female Count	3,656	3,787	3,740	3,827	3,728
Male Count	3,689	3,649	3,764	3,821	3,940
Total Count	7,346	7,436	7,504	7,648	7,680
Female Rate	1.27	1.27	1.23	1.22	1.16
Male Rate	1.67	1.60	1.59	1.56	1.54
Total Rate	1.46	1.43	1.40	1.38	1.33

Note: Includes 95% confidence intervals. Standardized to Canadian population 1991. Total counts may exceed the sum of the female and male counts, because the total includes cases in which gender was not specified.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

Figure 46

Stroke, Age-Standardized Hospital Co-Morbidity Rate, by Sex, BC, 2004/2005-2008/2009



	Hypertension	Diabetes	Ischemic Heart Disease	Heart Failure	Renal Failure	Falls	Motor Vehicle Accidents
Females	28.76	25.23	10.53	9.28	7.90	7.13	2.13
Males	36.69	29.01	16.13	10.94	10.80	9.32	4.12

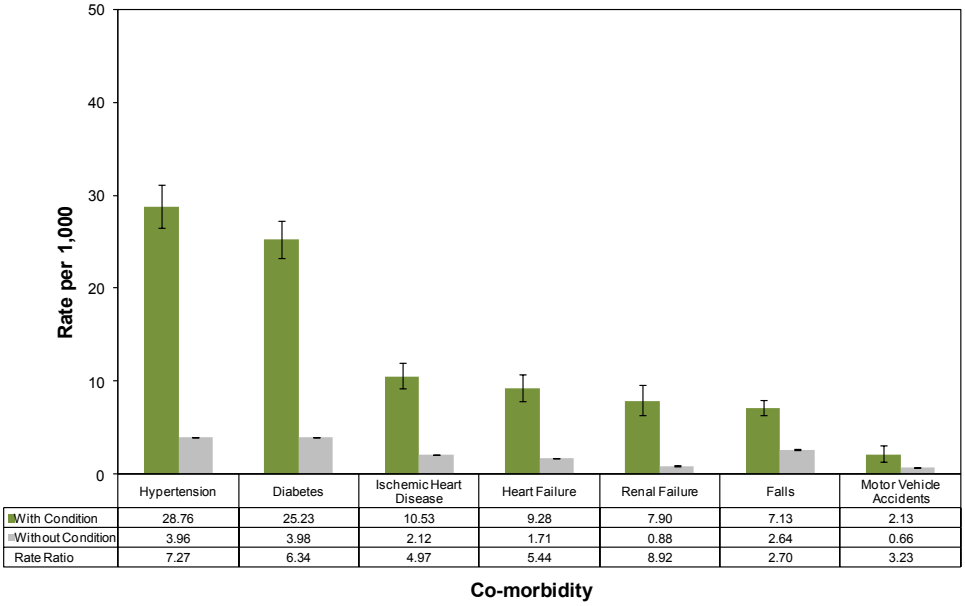
Note: Includes 95% confidence intervals. Standardized to Canadian population 1991.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

conditions (Figure 46). Both women and men with stroke were most likely to be hospitalized for hypertension, with rates of 28.8 per 1,000 for women and 36.7 per 1,000 for men.

Women with stroke were considerably more likely to be hospitalized with a range of selected co-morbid conditions compared to women without stroke (Figure 47). The highest rate ratio was observed for renal failure: women with a previous stroke diagnosis were 8.9 times more likely to be hospitalized with renal failure compared to women without a stroke diagnosis. Hypertension was the most common co-morbid condition found in hospitalizations among both women with and without a stroke diagnosis, with rates of 28.8 per 1,000 among women with the condition and 4.0 per 1,000 among women without the condition.

Figure 47

Stroke, Age-Standardized Hospital Co-Morbidity Rate and Rate Ratio, Females with and without Condition, BC, 2004/2005-2008/2009



	Hypertension	Diabetes	Ischemic Heart Disease	Heart Failure	Renal Failure	Falls	Motor Vehicle Accidents
With Condition	28.76	25.23	10.53	9.28	7.90	7.13	2.13
Without Condition	3.96	3.98	2.12	1.71	0.88	2.64	0.66
Rate Ratio	7.27	6.34	4.97	5.44	8.92	2.70	3.23

Note: Includes 95% confidence intervals. Standardized to Canadian population 1991.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

Multiple Sclerosis

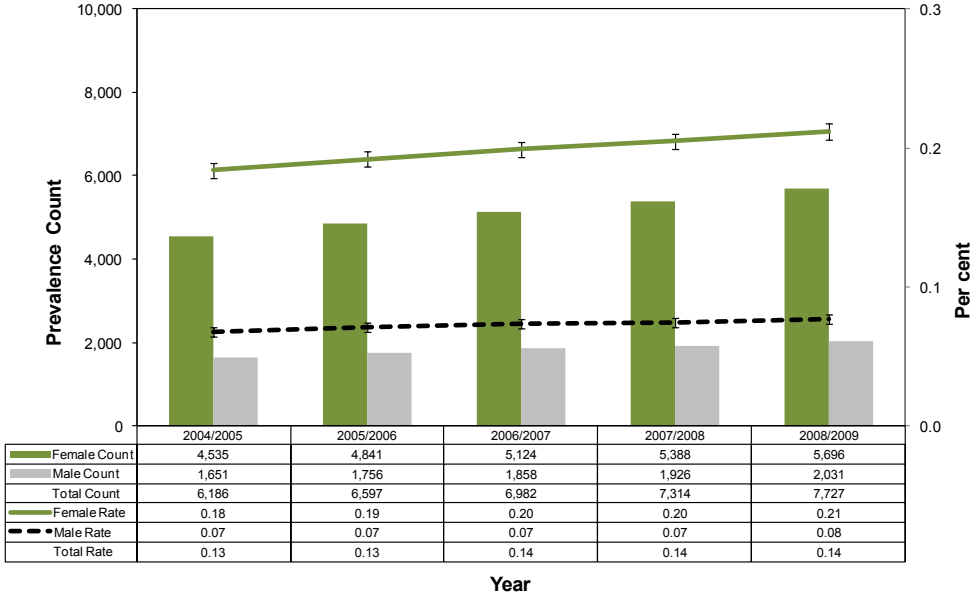
Multiple sclerosis (MS) is a disease of the central nervous system that is thought to attack the protective covering (myelin sheath) of nerves, as well as causing damage affecting both white and grey brain matter. Although MS is not usually fatal, it results in disability and decreased quality of life.

There has been no comprehensive prevalence study of MS conducted in BC since 1986. However, using data from the CCHS for 2000/2001, an estimate of MS prevalence was derived, with an aim to explore regional variation in MS across Canada.[27] British Columbia had an estimated prevalence of 240 per 100,000, which was equal to the rate for Canada as a whole. This study also found that females were at higher risk of MS (with an odds ratio of 2.1). There has been a suggestion that the number of women affected by MS relative to men has been increasing over the past 50 years and now exceeds 3.2:1 in Canada.[29] However, there are methodological challenges with studies that look at changes over time, which can make it difficult to interpret results.

Age-standardized prevalence rates for MS among women and men showed slight increases over the five-year period from 2004/2005 to 2008/2009, and the rate for women was considerably and consistently higher than the rate for men over this entire period (Figure 48). In 2008/2009, the prevalence rate for women was 0.21 per cent, compared to 0.08 per cent for men. This represents 5,696 women currently living in the province with MS, compared to 2,031 men. Age-specific prevalence rates for 2008/2009 clearly illustrate differences between women and men (Figure 49). Peak prevalence among women was between 50 and 59 years of age, with a total of 0.53 per cent of women in this age group living with MS. The peak age group for men

Figure 48

Multiple Sclerosis, Age-Standardized Prevalence Rate and Count, by Sex, BC, 2004/2005 to 2008/2009

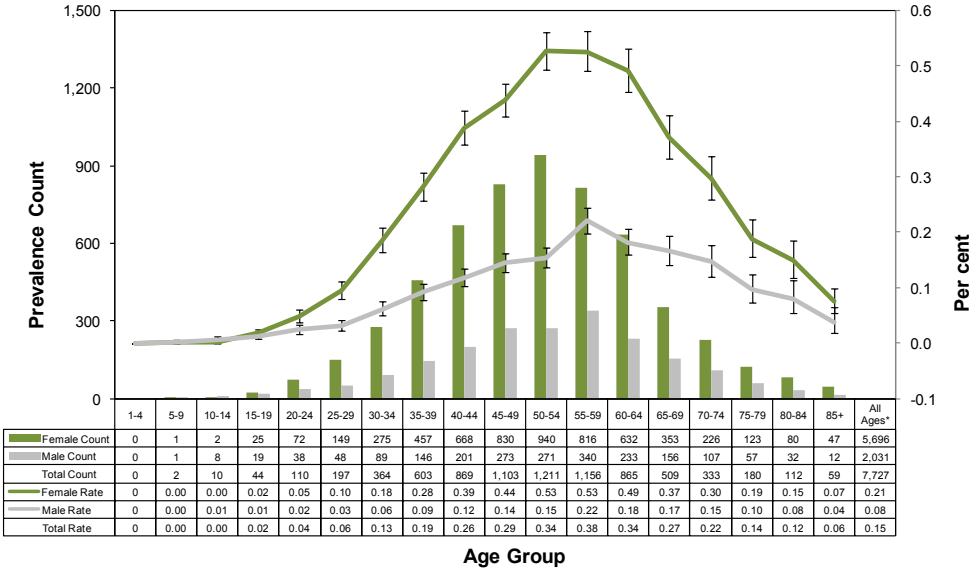


	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
Female Count	4,535	4,841	5,124	5,388	5,696
Male Count	1,651	1,756	1,858	1,926	2,031
Total Count	6,186	6,597	6,982	7,314	7,727
Female Rate	0.18	0.19	0.20	0.20	0.21
Male Rate	0.07	0.07	0.07	0.07	0.08
Total Rate	0.13	0.13	0.14	0.14	0.14

Note: Includes 95% confidence intervals. Standardized to Canadian population 1991. Total counts may exceed the sum of the female and male counts, because the total includes cases in which gender was not specified.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

Figure 49

Multiple Sclerosis, Age-Specific Prevalence Rate and Count, by Sex and Age, BC, 2008/2009



	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	All Ages*
Female Count	0	1	2	25	72	149	275	457	668	830	940	816	632	353	226	123	80	47	5,696
Male Count	0	1	8	19	38	48	89	146	201	273	271	340	233	156	107	57	32	12	2,031
Total Count	0	2	10	44	110	197	364	603	869	1,103	1,211	1,156	865	509	333	180	112	59	7,727
Female Rate	0	0.00	0.00	0.02	0.05	0.10	0.18	0.28	0.39	0.44	0.53	0.53	0.49	0.37	0.30	0.19	0.15	0.07	0.21
Male Rate	0	0.00	0.01	0.01	0.02	0.03	0.06	0.09	0.12	0.14	0.15	0.22	0.18	0.17	0.15	0.10	0.08	0.04	0.08
Total Rate	0	0.00	0.00	0.02	0.04	0.06	0.13	0.19	0.26	0.29	0.34	0.38	0.34	0.27	0.22	0.14	0.12	0.06	0.15

Age Group

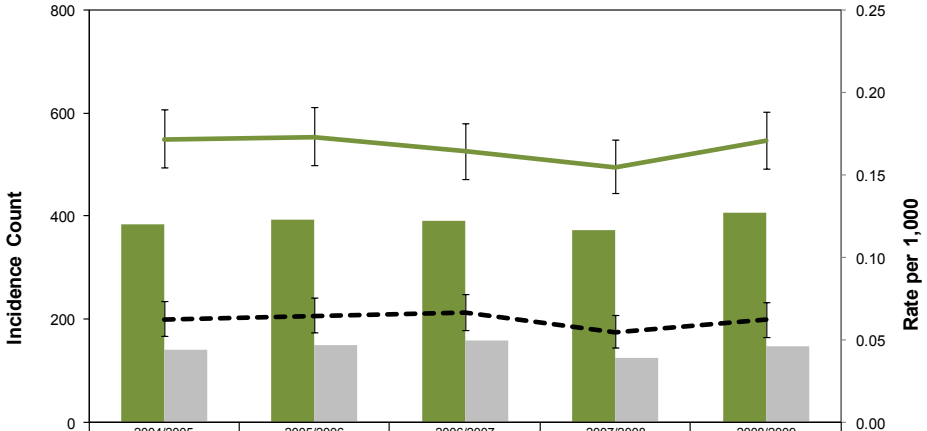
* Rates in 'All Ages' column are standardized to Canadian population 1991.
Note: Includes 95% confidence intervals. Total counts may exceed the sum of the female and male counts, because the total includes cases in which gender was not specified.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

was 55–59 years of age; however, the rate was considerably lower (0.22 per cent). The pattern of age-specific prevalence is different for MS than for other chronic conditions such as diabetes because life expectancy among persons with MS is slightly shorter than among those without MS (approximately five to six years). Some of the differences in age-specific prevalence rates may also be due to changes in diagnostic patterns; however, this has not yet been thoroughly studied.[29]

Age-standardized incidence rates remained consistent for both sexes between 2004/2005 and 2008/2009 (Figure 50). The incidence rate for 2008/2009 showed that women were diagnosed with MS at a rate of 0.17 per 1,000, compared to 0.06 per 1,000 among men. This equates to 406 newly diagnosed cases among women and 147 newly diagnosed cases among men.

Figure 50

Multiple Sclerosis, Age-Standardized Incidence Rate and Count, by Sex, BC, 2004/2005 to 2008/2009



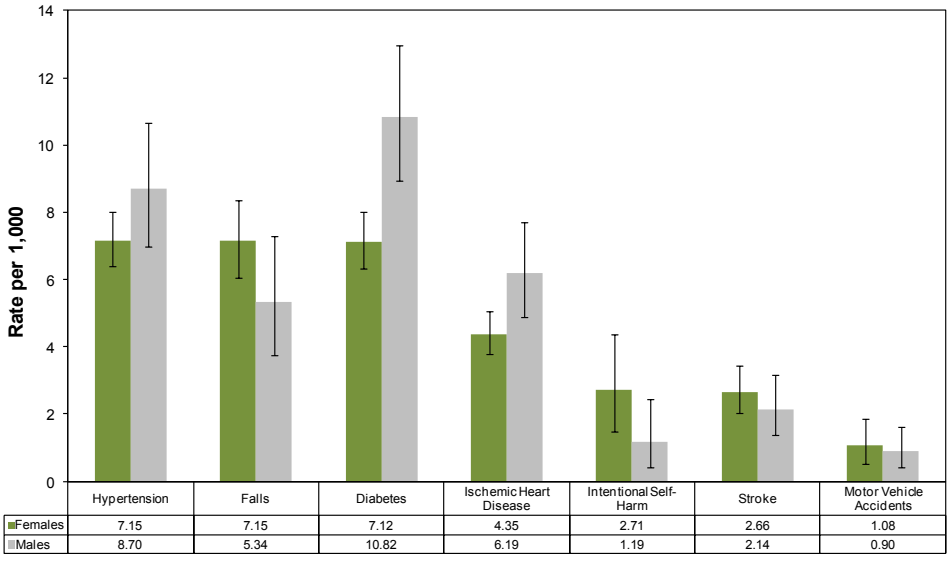
	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
Female Count	385	392	391	372	406
Male Count	141	149	158	125	147
Total Count	526	541	549	497	553
Female Rate	0.17	0.17	0.16	0.15	0.17
Male Rate	0.06	0.06	0.07	0.05	0.06
Total Rate	0.12	0.12	0.12	0.10	0.12

Year

Note: Includes 95% confidence intervals. Standardized to Canadian population 1991. Total counts may exceed the sum of the female and male counts, because the total includes cases in which gender was not specified.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

Figure 51

Multiple Sclerosis, Age-Standardized Hospital Co-Morbidity Rate, by Sex, BC, 2004/2005-2008/2009



	Hypertension	Falls	Diabetes	Ischemic Heart Disease	Intentional Self-Harm	Stroke	Motor Vehicle Accidents
Females	7.15	7.15	7.12	4.35	2.71	2.66	1.08
Males	8.70	5.34	10.82	6.19	1.19	2.14	0.90

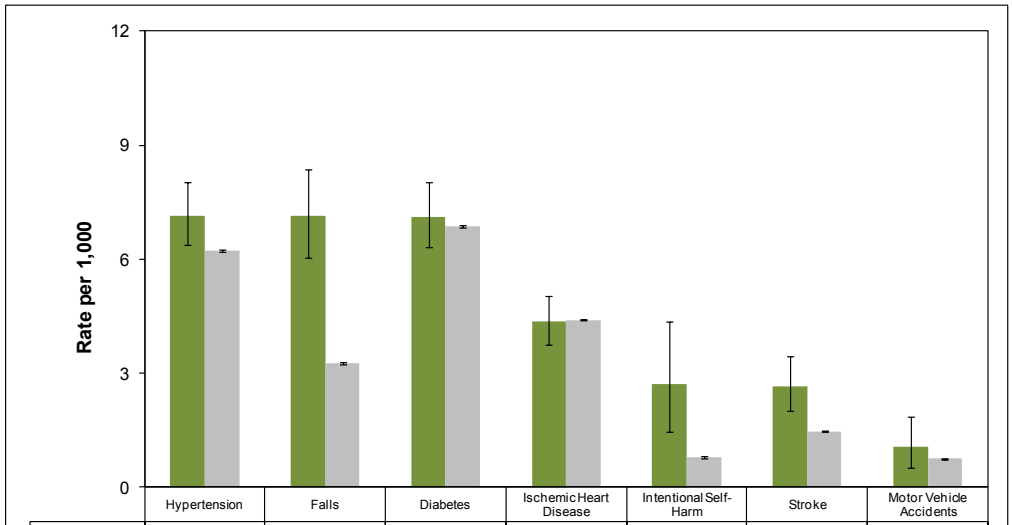
Note: Includes 95% confidence intervals. Standardized to Canadian population 1991.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

The age-standardized hospital co-morbidity rates for the five-year period between 2004/2005 and 2008/2009 show that women with MS were most often hospitalized for hypertension (7.2 per 1,000), injuries related to a fall (7.2 per 1,000) or diabetes (7.1 per 1,000) (Figure 51).

Women with MS were more likely to be hospitalized with a range of selected co-morbidities compared to women without MS (Figure 52). The highest rate ratio was seen with hospitalizations for intentional self-harm: women with MS were 3.4 times more likely to be hospitalized with this condition compared to women without MS. Women with MS were also more likely to be hospitalized for injuries related to a fall (7.2 per 1,000, compared to 3.3 per 1,000 among women without MS). There was also a significant difference seen in rates for hospitalizations indicating a stroke. The hospital co-morbidity rate for stroke was 2.7 per 1,000 for women with MS, compared to 1.5 per 1,000 for women without the condition (rate ratio of 1.8).

Figure 5

Multiple Sclerosis, Age-Standardized Hospital Co-Morbidity Rate and Rate Ratio, Females with and without Condition, BC, 2004/2005-2008/2009



	Hypertension	Falls	Diabetes	Ischemic Heart Disease	Intentional Self-Harm	Stroke	Motor Vehicle Accidents
With Condition	7.15	7.15	7.12	4.35	2.71	2.66	1.08
Without Condition	6.24	3.27	6.86	4.41	0.79	1.47	0.75
Rate Ratio	1.15	2.18	1.04	0.99	3.42	1.81	1.44

Note: Includes 95% confidence intervals. Standardized to Canadian population 1991.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

Parkinson's Disease

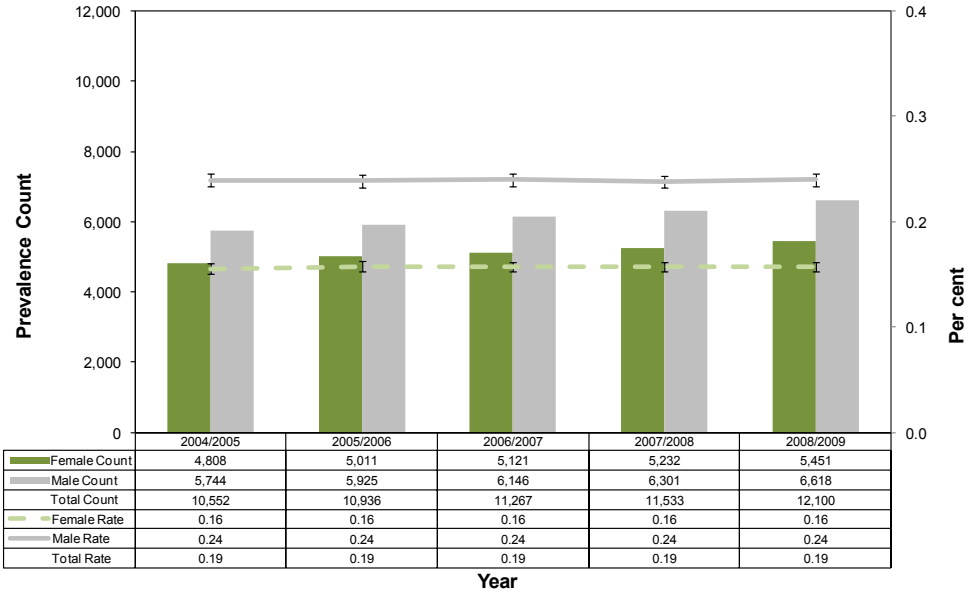
Parkinson's disease is a progressive degenerative disease of the nervous system, with symptoms including tremors and impaired balance. It is a major cause of mortality among seniors over the age of 80. Individuals with the condition are at greater risk for falls and depression.[30] Studies have found different patterns of Parkinson's incidence for men and women, with many studies finding a higher incidence among men.[31] An Ontario study of Parkinson's using administrative records found that between 1992 and 1998 there was a 5.4 per cent increase in the annual age-adjusted prevalence rate for men (from 3.5 to 3.7 per 1,000) and a slightly higher (9.8 per cent) increase in the age-adjusted prevalence rate for women (from 3.2 to 3.5 per 1,000).[32]

Age-standardized prevalence rates for Parkinson's disease for women and men were consistent over the five-year period from 2004/2005 to 2008/2009 (Figure 53). In 2008/2009, the rate for men was higher than the rate for women: 0.24 per cent compared to 0.16 per cent. This represents 5,451 BC women living with Parkinson's disease, compared to 6,618 men.

In 2008/2009, the age-specific prevalence rate for Parkinson's disease showed a steady increase among both women and men beginning in the 40–44 age group, with the peak prevalence for both women and men occurring in the oldest age group (85+): 2.2 per cent for women and 3.5 per cent for men (Figure 54).

Figure 53

Parkinson's Disease, Age-Standardized Prevalence Rate and Count, by Sex, BC, 2004/2005 to 2008/2009

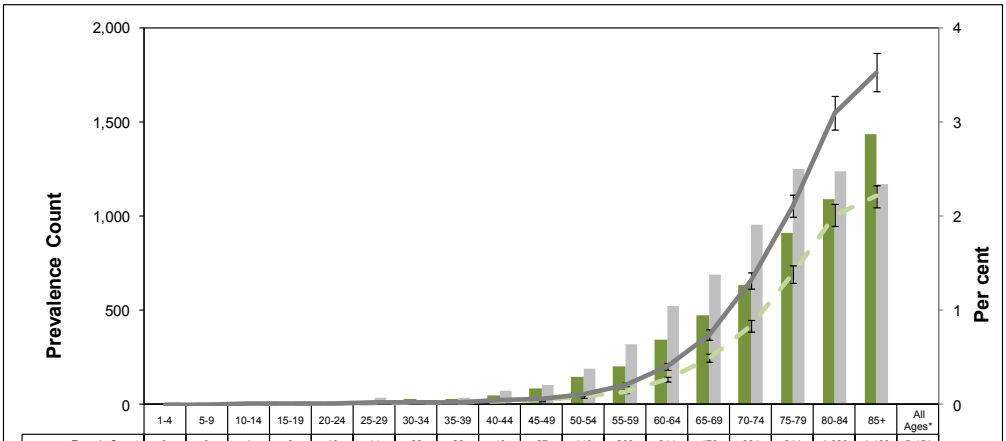


	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
Female Count	4,808	5,011	5,121	5,232	5,451
Male Count	5,744	5,925	6,146	6,301	6,618
Total Count	10,552	10,936	11,267	11,533	12,100
Female Rate	0.16	0.16	0.16	0.16	0.16
Male Rate	0.24	0.24	0.24	0.24	0.24
Total Rate	0.19	0.19	0.19	0.19	0.19

Note: Includes 95% confidence intervals. Standardized to Canadian population 1991. Total counts may exceed the sum of the female and male counts, because the total includes cases in which gender was not specified.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

Figure 54

Parkinson's Disease, Age-Specific Prevalence Rate and Count, by Sex and Age, BC, 2008/2009



	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	All Ages*
Female Count	0	0	1	6	13	14	26	28	49	87	143	203	344	470	634	911	1,089	1,433	5,451
Male Count	0	2	5	6	8	33	22	35	73	101	188	321	519	688	956	1,251	1,239	1,171	6,618
Total Count	0	2	6	12	21	47	48	63	122	188	331	524	864	1,159	1,590	2,163	2,329	2,631	12,100
Female Rate	0.00	0.00	0.00	0.00	0.01	0.01	0.02	0.02	0.03	0.05	0.08	0.13	0.27	0.49	0.83	1.38	2.01	2.21	0.16
Male Rate	0.00	0.00	0.00	0.00	0.01	0.02	0.02	0.02	0.04	0.05	0.11	0.21	0.41	0.73	1.31	2.10	3.09	3.52	0.24
Total Rate	0.00	0.00	0.00	0.00	0.01	0.02	0.02	0.02	0.04	0.05	0.09	0.17	0.34	0.61	1.06	1.72	2.46	2.64	0.19

Age Group

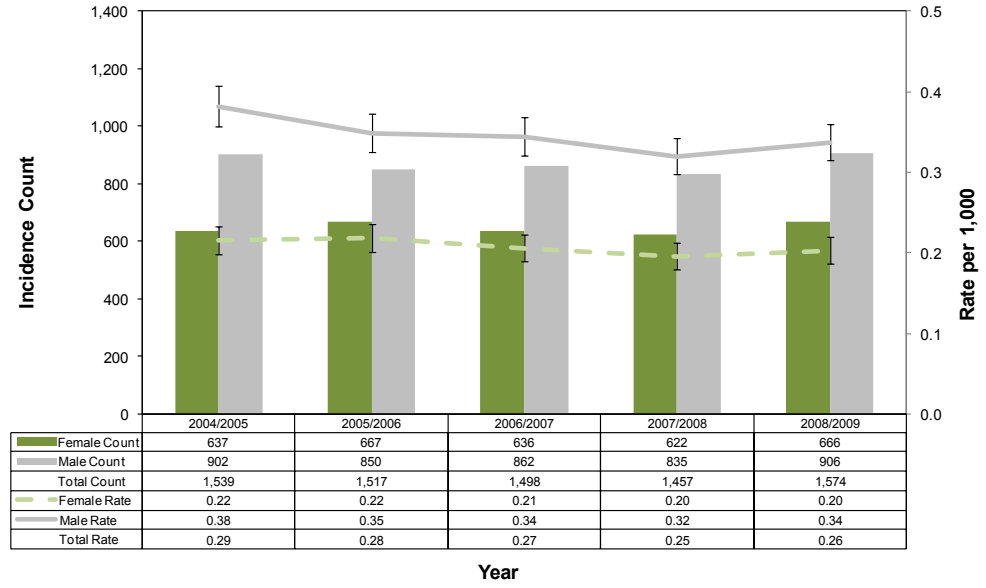
*Rates in 'All Ages' column are standardized to Canadian population 1991.
Note: Includes 95% confidence intervals. Total counts may exceed the sum of the female and male counts, because the total include s cases in which gender was not specified. Data is suppressed in the younger age groups due to low numbers.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

Age-standardized incidence rates for Parkinson's disease remained steady over the five-year period from 2004/2005 to 2008/2009 (Figure 55). In 2008/2009 in BC, there 666 newly diagnosed cases of Parkinson's disease among women and 906 new cases among men. This represents an age-standardized rate of 0.2 per 1,000 for women and 0.3 per 1,000 for men.

Age-standardized hospital co-morbidity rates for the five-year period between 2004/2005 and 2008/2009 showed that men with Parkinson's disease were more likely to be hospitalized than women with the disease for all but two co-morbid conditions examined: renal failure and injuries related to a fall (Figure 56). Often, differences between women and men were not statistically significant. Women with Parkinson's disease were most likely to be hospitalized for diabetes (15.2 per 1,000), whereas men with Parkinson's were most likely to be hospitalized for hypertension (17.4 per 1,000).

Figure 55

Parkinson's Disease, Age-Standardized Incidence Rate and Count, by Sex, BC, 2004/2005 to 2008/2009



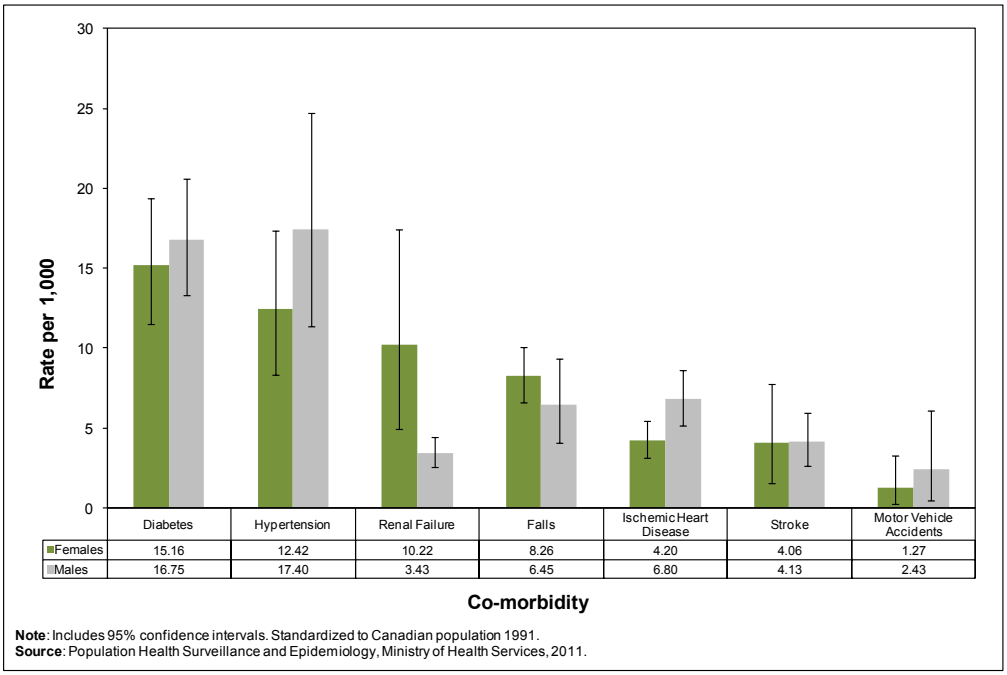
	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
Female Count	637	667	636	622	666
Male Count	902	850	862	835	906
Total Count	1,539	1,517	1,498	1,457	1,574
Female Rate	0.22	0.22	0.21	0.20	0.20
Male Rate	0.38	0.35	0.34	0.32	0.34
Total Rate	0.29	0.28	0.27	0.25	0.26

Year

Note: Includes 95% confidence intervals. Standardized to Canadian population 1991. Total counts may exceed the sum of the female and male counts, because the total includes cases in which gender was not specified.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

Figure 56

Parkinson's Disease, Age-Standardized Hospital Co-Morbidity Rate, by Sex, BC, 2004/2005-2008/2009



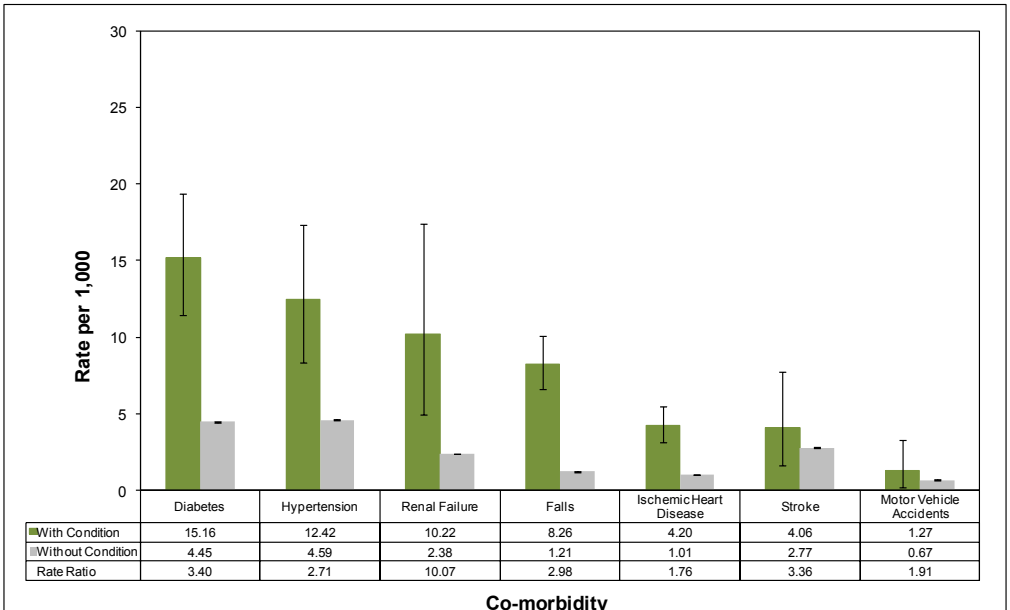
	Diabetes	Hypertension	Renal Failure	Falls	Ischemic Heart Disease	Stroke	Motor Vehicle Accidents
Females	15.16	12.42	10.22	8.26	4.20	4.06	1.27
Males	16.75	17.40	3.43	6.45	6.80	4.13	2.43

Note: Includes 95% confidence intervals. Standardized to Canadian population 1991.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

Women with Parkinson's disease were more likely to be hospitalized with each of the selected co-morbidities compared to women without the disease (Figure 57). The highest rate ratio was seen with renal failure: women with Parkinson's disease were 10.1 times more likely to be hospitalized with this condition than women without the disease. Women with Parkinson's disease were most likely to be hospitalized for diabetes (15.2 per 1,000), while women without Parkinson's disease were most likely to be hospitalized for hypertension (4.6 per 1,000).

Figure 57

Parkinson's Disease, Age-Standardized Hospital Co-Morbidity Rate and Rate Ratio, Females with and without Condition, BC, 2004/2005-2008/2009



	Diabetes	Hypertension	Renal Failure	Falls	Ischemic Heart Disease	Stroke	Motor Vehicle Accidents
With Condition	15.16	12.42	10.22	8.26	4.20	4.06	1.27
Without Condition	4.45	4.59	2.38	1.21	1.01	2.77	0.67
Rate Ratio	3.40	2.71	10.07	2.98	1.76	3.36	1.91

Note: Includes 95% confidence intervals. Standardized to Canadian population 1991.
Source: Population Health Surveillance and Epidemiology, Ministry of Health Services, 2011.

APPENDIX A – METHODOLOGY/CASE DEFINITION

Data presented on chronic conditions were produced using the Canadian Chronic Disease Surveillance System software. This national surveillance system is a result of collaboration among the provinces, territories and the Public Health Agency of Canada. The system allows for the improvement and standardization of data collection and analysis and is used to measure key health indicators including prevalence, incidence, mortality, and hospitalized co-morbidity rates of individuals with chronic conditions both for Canada as a whole and for individual provinces and territories.

Aggregate hospital co-morbidity rates were calculated using aggregate data from the total number of hospitalizations within the five-year period between 2004/2005 and 2008/2009.

For all conditions with the exception of multiple sclerosis, in order to qualify as a case, a person must

- have been eligible for BC Medical Services Plan coverage at the time of diagnosis.
- receive at least two Medical Services Plan physician services or one hospitalization within a one-year period in which one of the diagnostic codes (next page) was used.

  Hospital diagnoses are assumed to be accurate while physician diagnoses require the confirmation of a second claim.

For multiple sclerosis, this case definition was adjusted to reflect the longer period typically involved in diagnosis. The revised case definition involved a minimum of seven multiple sclerosis-related services, including any combination of physician visits, hospital admissions or prescriptions over an extended 20-year period.

Medical Services Plan records (physician services) use ICD-9 codes, most often at the three-digit level, making a fine distinction of conditions more difficult. Hospital records, initially using ICD-9 codes but switching to ICD-10 codes in 2001/2002, allow for more specific identification of conditions. Case definition is based on the last qualifying diagnosis date as the case date. All conditions noted below are based on "cumulative prevalence", meaning once they qualify as an incident case they are carried forward each year. This method may be problematic for conditions that are more episodic in nature, such as asthma.

Diagnostic Codes and Specific Populations Used for Each Chronic Condition

Age-standardized rates presented are standardized to the Canadian population, 1991. (Ages >1 year for all)

Codes used for Hypertension:
ICD-9 codes: 401, 402, 403, 404, 405
ICD-10 codes: I10, I11, I12, I13, I15

Codes used for Asthma:
ICD-9 codes: 493
ICD-10 codes: J45, J46
Notes: Persons aged 5 to 54 years only.

Codes used for Osteoporosis :
ICD-9 codes: 733
ICD-10 codes: M80, M81
Notes: Persons aged 50 and older only.

Codes used for Osteoarthritis:
ICD-9 codes: 715
ICD-10 codes: M15, M16, M17, M18, M19

Codes used for Diabetes:
ICD-9 codes: 250
ICD-10 codes: E10, E11, E12, E13, E14
Notes: Women in childbearing years in the gestational period have been excluded, including all women within 120 days prior to and 180 days after a birth event. Additionally, the BC case definition for diabetes utilizes prescription information to capture individuals who have received medications relating to diabetes treatment, including insulin, metformin, and anti-diabetic agents.

Codes used for Chronic Obstructive Pulmonary Disease:
ICD-9 codes: 491, 492, 496
ICD-10 codes: J41, J42, J43, J44
Notes: Persons aged 45 and older only.

Codes used for Ischemic Heart Disease:
ICD-9 codes: 410, 413
ICD-10 codes: I20, I21

Codes used for Congestive Heart Failure:
ICD-9 codes: 428
ICD-10 codes: I50

Codes used for Stroke:
ICD-9 codes: 401, 402, 403, 404, 405
ICD-10 codes: I10, I11, I12, I13, I15

Codes used for Multiple Sclerosis:
ICD-9 codes: 340
ICD-10 codes: G35
Notes: The BC case definition for multiple sclerosis utilizes prescription information to capture individuals who have received medications relating to MS treatment, including Betaseron, Avonex, Rebif, Tysabri and Copaxone.

Codes used for Parkinson's Disease:
ICD-9 codes: 332
ICD-10 codes: G20, G21

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