

# Seniors and the Health Care System: What Is the Impact of Multiple Chronic Conditions?



## Analysis in Brief

## Introduction

Concern about chronic condition care is growing as the prevalence of chronic conditions such as diabetes and high blood pressure increases in Canada.<sup>1</sup> For many chronic conditions, prevalence increases with age, causing a disproportionate health burden on seniors—Canadians age 65 and older.<sup>2</sup> Patients with chronic conditions—in particular multiple chronic conditions, also called comorbidity—typically have poorer quality of life and require considerable health care resources. Effective prevention and management of chronic conditions is required, especially in the face of Canada's large boomer generation entering the senior age category.

This study examined the reported experiences of seniors in Canada being treated for chronic conditions in primary health care (PHC) settings. The results of the study can be used to enhance our understanding of patients' use of health care services and health status, the quality of patient-provider communication, patient self-management and medication management. This report is focused on seniors because they are more likely than younger people to have chronic conditions, especially comorbidities that can be complex and difficult to manage.

## Key Findings

**Healthy seniors need less health care. The amount of health care services seniors will use is largely driven by the number of chronic conditions they have, not their age.**

- In each of the age groups (65 to 74, 75 to 84, and 85 and older), seniors with three or more reported chronic conditions had nearly three times the number of health care visits than seniors with no reported chronic conditions.

### Who We Are

Established in 1994, CIHI is an independent, not-for-profit corporation that provides essential information on Canada's health system and the health of Canadians. Funded by federal, provincial and territorial governments, we are guided by a Board of Directors made up of health leaders across the country.

### Our Vision

To help improve Canada's health system and the well-being of Canadians by being a leading source of unbiased, credible and comparable information that will enable health leaders to make better-informed decisions.

### Federal Identity Program

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- Seniors with three or more reported chronic conditions accounted for 40% of reported health care use among seniors, even though they comprised only 24% of all seniors.
- Seniors with no reported chronic conditions were more likely (92%) to report their health status as “good,” “very good” or “excellent” than those with one (86%), two (77%) or three or more (51%) reported chronic conditions.
- Seniors who reported three or more chronic conditions were taking an average of six prescription medications on a routine or ongoing basis, twice as many medications as seniors with only one chronic condition.

**Seniors taking a high number of prescription medications were at a greater risk of experiencing side effects requiring medical attention, yet fewer than half of seniors with chronic conditions reported having medication reviews.**

- Seniors who reported at least one chronic condition who also reported taking at least five prescription medications on a routine or ongoing basis were more likely to experience a side effect requiring health care (13%) than similar seniors taking only one or two prescription medications (6%).
- Fewer than half of seniors who reported chronic condition(s) reported having had their medications reviewed by a doctor (48%) and reported having had the potential side effects of their prescription medications explained to them by a doctor (47%) at least some of the time.

**Gaps exist in preventive and collaborative care for seniors.**

- Though most seniors have access to PHC, only one in four (28%) seniors who reported chronic condition(s) also reported that they were helped at least some of the time in making a treatment plan, and fewer than half (48%) reported talking at least some of the time to a health professional about their treatment goals.
- About two in five (45%) seniors who reported at least one chronic condition also reported that they had talked at least some of the time in the past year with a health professional about specific things they could do to improve their health or prevent illness (such as stopping smoking, limiting alcohol intake and increasing exercise).

## Methodology

The results presented in this report are based on a survey of Canadians. Specifically, the Canadian Institute for Health Information (CIHI) co-funded the 2008 Canadian Survey of Experiences With Primary Health Care (CSE-PHC), which was conducted by Statistics Canada to provide a new source of high-quality PHC information for use by a broad range of policy-makers and health system decision-makers. As such, this survey can be used to report findings on a range of PHC experiences among seniors living with chronic conditions. The sample consisted of 11,582 adults age 18 and older, including 3,132 seniors. For this analysis, provincial comparisons were standardized by age and sex to control for differences between populations. For more information on the data source and methods, see Appendix A.

# Results

## Section 1: Prevalence and Impact of Chronic Conditions

### Prevalence and Comorbidity in Canada

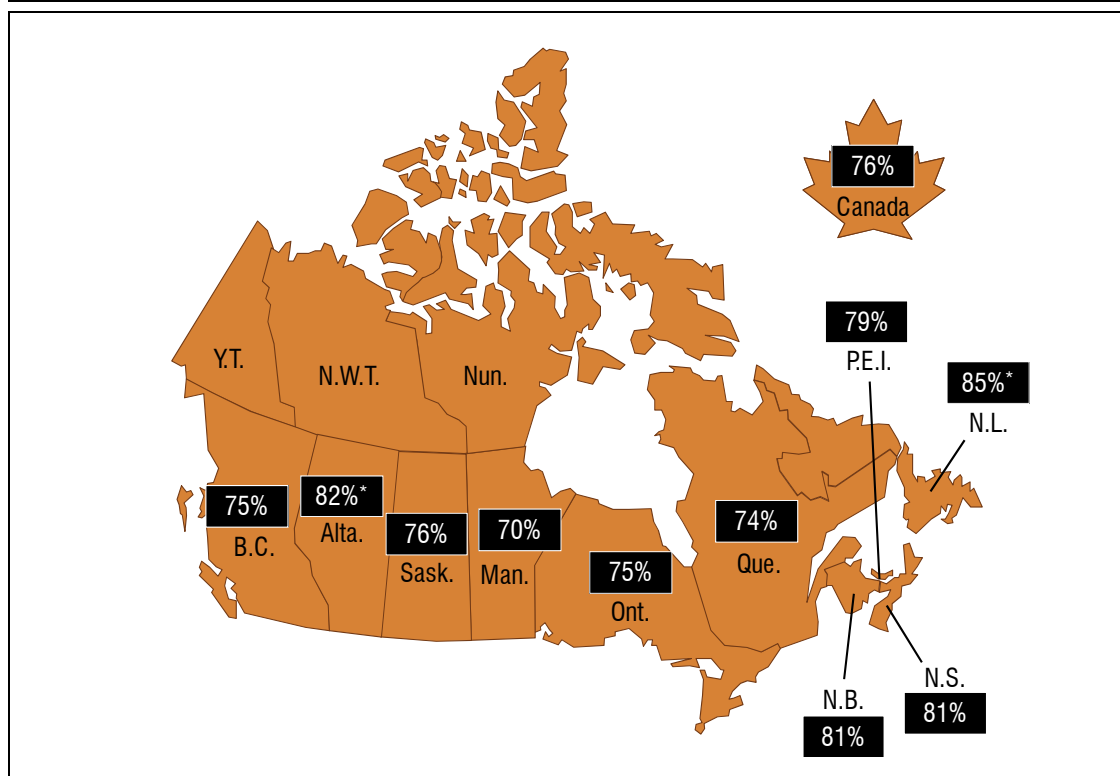
In 2005, the World Health Organization (WHO) projected that chronic conditions would account for 89% of all deaths in Canada for that year. It also projected that between 2005 and 2015, deaths from chronic conditions would increase by 15%.<sup>3</sup> Statistics Canada reported that, in 2005, cancer, diabetes, heart disease, cerebrovascular diseases and lower respiratory diseases caused 65.4% of all deaths.<sup>4</sup>

Surveys and administrative data indicate that certain chronic conditions are affecting an increasing number of Canadian seniors. The Canadian Cancer Registry Database showed 88,406 new cancer diagnoses in senior patients in 2006, a 9% increase over figures from 2000.<sup>5</sup> The Canadian Community Health Survey also showed increases in the prevalence of diabetes (13.5% to 18.1%) and high blood pressure (42.8% to 48.9%) in seniors between 2003 and 2009.<sup>1,2</sup> On the other hand, the prevalence of patients having either arthritis or rheumatism decreased from 47.3% to 41.8% during the same time frame.<sup>1,2</sup>

The increasing prevalence of chronic conditions will have a substantial impact on the population, the health care system and the workforce. For example, one study found that 16% of Canadians age 15 and older have been diagnosed with a form of arthritis, and associated costs of arthritis are more than \$4 billion annually in health care expenses and lost work days.<sup>6</sup> A recent study on the economic cost of diabetes projected the prevalence of diabetes in Canada to increase from 1.3 million in 2000 (4.2% of the population) to 2.5 million (7.3% of the population) in 2010, and the costs of diabetes to the health care system to nearly double to \$12.2 billion in 2010.<sup>7</sup>

The 2008 CSE-PHC results show that 76% of seniors reported having one or more chronic conditions in 2007 (Figure 1). Provincial results ranged from a low of 70% in Manitoba to a high of 85% in Newfoundland and Labrador.

**Figure 1: Percentage of Seniors Who Reported Having 1 or More of 11 Chronic Conditions, for Canada and by Province (Age–Sex Standardized)**



**Notes**

\* Estimate is significantly different than the Canada estimate at the  $p < 0.05$  level.

The following chronic conditions are included: arthritis, asthma, cancer, chronic pain, depression, diabetes, emphysema or chronic obstructive pulmonary disease, heart disease, high blood pressure, a mood disorder other than depression and stroke.

Estimates for the Yukon, the Northwest Territories and Nunavut are not included because of small sample sizes.

The Canada estimate includes the territories.

The analysis included “don’t know” and “refusal” responses; the percentage of non-responses per chronic condition/survey question was less than 2% overall.

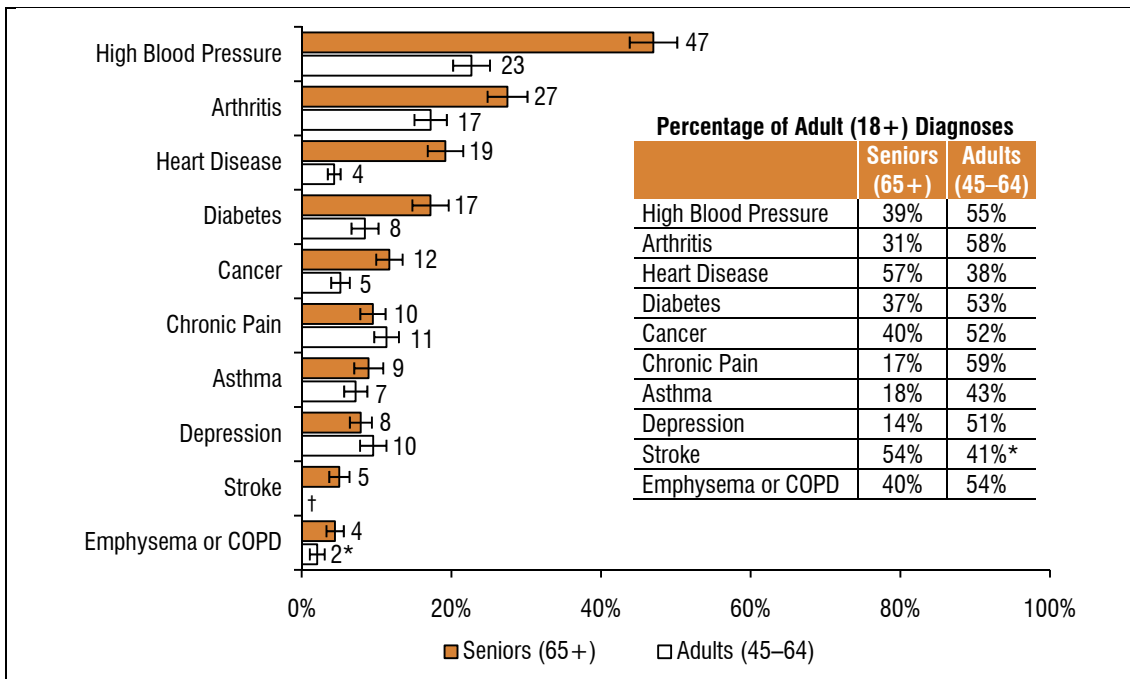
**Sources**

Canadian Survey of Experiences With Primary Health Care, 2008, Statistics Canada; Canadian Institute for Health Information.

These study results show that the most frequently reported chronic conditions among seniors were high blood pressure (47%, approximately 2 million seniors) followed by arthritis (27%, approximately 1.2 million seniors) (Figure 2). The least frequently reported chronic condition was emphysema or chronic obstructive pulmonary disease (COPD) (4%, approximately 190,000 seniors). The five most common combinations of chronic conditions among seniors were

- High blood pressure and arthritis (14%);
- High blood pressure and heart disease (12%);
- High blood pressure and diabetes (11%);
- Heart disease and arthritis (6%); and
- High blood pressure and cancer (6%).

**Figure 2: Percentage of Adults Age 45 to 64 and Seniors Who Reported Individual Chronic Conditions and the Percentage of All Adult Diagnoses From Adults Age 45 to 64 and Seniors, Canada (Crude Estimates)**



**Notes**

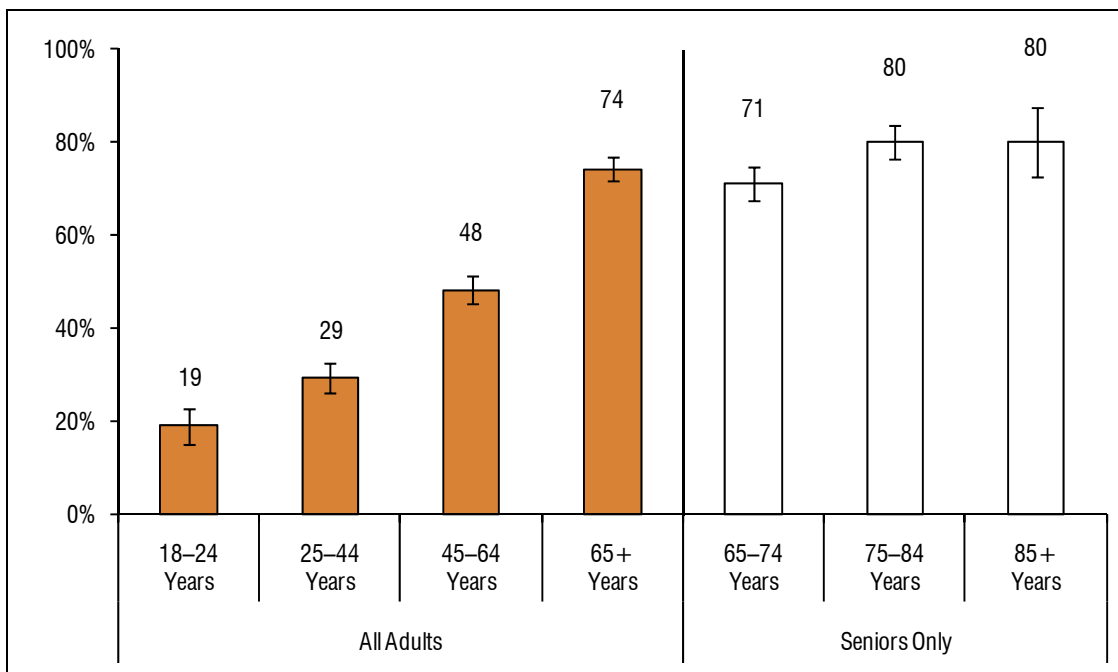
\* Coefficient of variation is between 16.6% and 33.3%; interpret with caution because of high variability.  
 † Coefficient of variation is in excess of 33.3%; estimate suppressed because of high sampling variability.  
 COPD: chronic obstructive pulmonary disease.  
 Mood disorders other than depression are not presented because the coefficient of variation for seniors exceeded 33.3%.  
 The analysis included “don’t know” and “refusal” responses; the percentage of non-responses per chronic condition/survey question was less than 2% overall for seniors and less than 0.5% overall for adults 45 to 64.

**Sources**

Canadian Survey of Experiences With Primary Health Care, 2008, Statistics Canada; Canadian Institute for Health Information.

Seniors were almost four times more likely to report having a chronic condition as adults age 18 to 24 (74% versus 19%) (Figure 3). Nearly one-quarter (24%) of all Canadian seniors reported having 3 or more of the 11 chronic conditions, and another one-quarter (26%) of all Canadian seniors did not report having any of the 11 chronic conditions. The remaining 50% of seniors reported having either 1 or 2 of the 11 chronic conditions. The proportion of seniors with at least one chronic condition increased with age from 71% of seniors age 65 to 74 to 80% of seniors age 75 to 84 but did not increase further among seniors age 85 and older. Sixty-three percent of seniors are between age 65 and 74, 30% are between age 75 and 84 and 7% are age 85 or older.

**Figure 3: Percentage of Adults Who Reported Having at Least 1 of 11 Chronic Conditions, by Age Group, Canada (Crude Estimates)**



**Notes**

The following chronic conditions are included: arthritis, asthma, cancer, chronic pain, depression, diabetes, emphysema or chronic obstructive pulmonary disease, heart disease, high blood pressure, a mood disorder other than depression and stroke.

The analysis included “don’t know” and “refusal” responses; the percentage of non-responses per chronic condition/survey question was less than 1% overall for all adults.

**Sources**

Canadian Survey of Experiences With Primary Health Care, 2008, Statistics Canada; Canadian Institute for Health Information.

**Self-Reported Health Status Is Poorer as Comorbidity Increases**

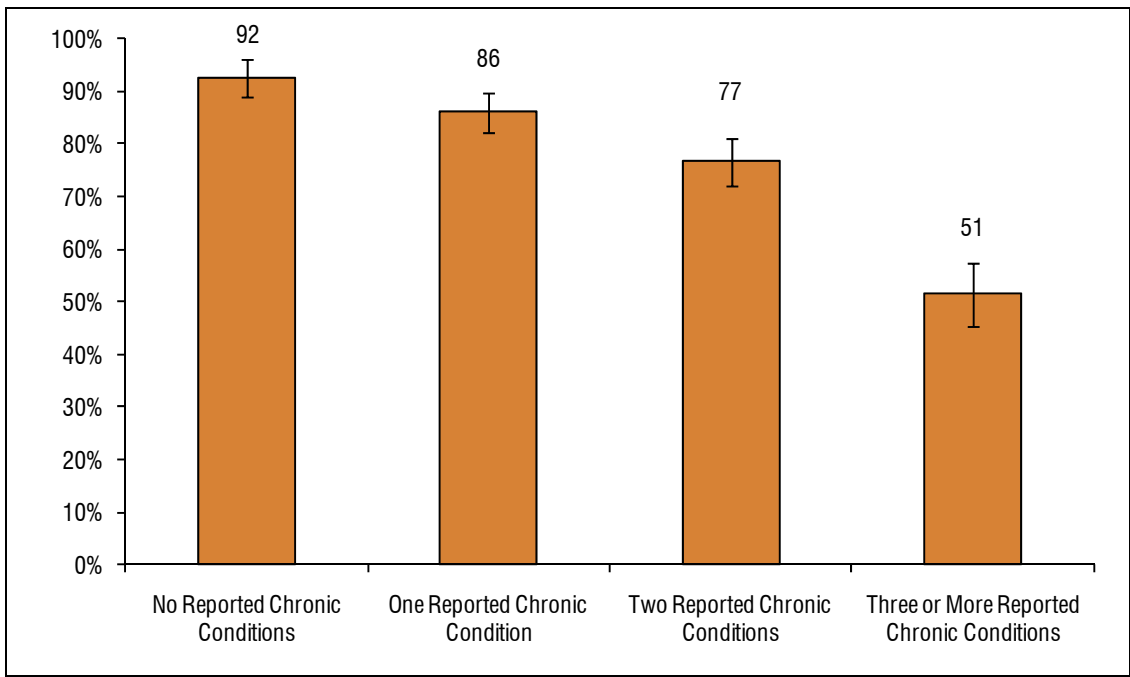
As seniors age, they are more likely to have at least one chronic condition, and older seniors (age 85 and older) are more likely than younger seniors (age 65 to 74) to have at least three chronic conditions (36% versus 20%). The impact of chronic conditions can be measured by their effect on overall health and on the use of health care resources. Poorer self-perceived health status is one indication of the negative effect that chronic conditions have on patients.<sup>2</sup>

More than three in four seniors (77%) in Canada described their health status<sup>i</sup> as “excellent,” “very good” or “good,” compared with 51% of seniors with three or more chronic conditions (Figure 4). Most seniors (70%) reported that their health was about the same as last year. Of the 29% of seniors who reported a change in their health status in the previous year, 57% stated their health was worse than in the previous year and 43% reported their health was better than in the previous year.

Of the 26% of seniors who did not report having any of the 11 chronic conditions, 92% described their general health status as “excellent,” “very good” or “good” (Figure 4). The percentage of seniors who reported their health as “good” or better decreased as the number of chronic conditions increased; only 51% of seniors who reported three or more chronic conditions said their health was “good” or better. Fifteen percent of seniors with at least three chronic conditions reported their health status as “poor.” A similar trend was observed in adults age 45 to 64.

i. Provincial comparisons are presented in Appendix B.

**Figure 4: Percentage of Seniors Who Reported Their Health Status as “Excellent,” “Very Good” or “Good,” by Number of Chronic Conditions, Canada (Crude Estimates)**



**Notes**

The following chronic conditions are included: arthritis, asthma, cancer, chronic pain, depression, diabetes, emphysema or chronic obstructive pulmonary disease, heart disease, high blood pressure, a mood disorder other than depression and stroke.

The analysis included “don’t know” responses; however, data for this response accounted for less than 1% of total responses.

**Sources**

Canadian Survey of Experiences With Primary Health Care, 2008, Statistics Canada; Canadian Institute for Health Information.

**Increased Comorbidity, Increased Health Care Use**

The majority of seniors (94%) reported that they have a regular place of care. The same percentage of seniors reported having a regular medical doctor (94%); this was a higher proportion than among other age groups, including those age 45 to 64 (90%), age 25 to 44 (82%) and age 18 to 24 (78%). Ninety-eight percent of seniors reported having access to either a regular medical doctor or a regular place of care. Nearly two-thirds (63%) of seniors with a PHC provider reported having the same provider for more than seven years. Six percent of seniors with a PHC provider reported having the same provider for less than one year. The vast majority (93%) of seniors with a PHC provider reported that their provider delivered a range of services that met their PHC needs.

Seniors with three or more chronic conditions reported three times more health care resource use—including visits with doctors, nurses, pharmacists, dietitians, physiotherapists, social workers, counsellors, specialists and emergency departments (13.3 million visits per year)—as seniors with no reported chronic conditions (4.5 million visits per year) (Table 1). Seniors with three or more chronic conditions reported more than twice the rate of visits to a family physician or general practitioner and nearly three times the rate of visits to emergency departments as seniors who reported only one chronic condition. Seniors with three or more chronic conditions also reported significantly more visits to nurses, physiotherapists, social workers and counsellors and nearly twice the rate of visits to pharmacists, dietitians and specialist doctors as seniors who reported only one chronic condition.



**Table 1: Rates of Health Care Visits in the Past 12 Months, by Number of Chronic Conditions (Crude Estimates)**

Type of Health Care Visit	Number of Visits by Seniors in Millions (Percentage of Total Row)				Number of Visits by Seniors per 1,000 Seniors			
	No CC	1 CC	2 CC	3+ CC	No CC	1 CC	2 CC	3+ CC
<b>Family Physician or General Practitioner</b>	1.6 (13%)	2.7 (21%)	3.2 (25%)	5.4 (42%)	1,496	2,346	3,357	5,234
<b>Nurse, Physiotherapist, Social Worker or Counsellor<sup>‡</sup></b>	1.2* (15%)	2.0* (26%)	1.8* (23%)	2.9 (36%)	1,087*	1,755*	1,928*	2,816
<b>Pharmacist or Dietitian</b>	0.6 (9%)	1.4 (24%)	1.3 (22%)	2.6* (45%)	511	1,222	1,342	2,547
<b>Specialist (Such as a Surgeon, Cardiologist, Psychiatrist)</b>	†	1.0 (21%)	1.1 (23%)	1.7 (36%)	†	854	1,153	1,626
<b>Hospital Emergency Department</b>	0.2* (13%)	0.3 (18%)	0.4 (23%)	0.7 (46%)	193*	240	382	696
<b>Total Health Care Visits by Seniors</b>	4.5 (14%)	7.5 (23%)	7.7 (23%)	13.3 (40%)	4,158	6,417	8,162	12,920
Health Care Use	Number of Visits by Adults (Age 45 to 64) in Millions (Percentage of Total Row)				Number of Visits by Adults (Age 45 to 64) per 1,000 Adults			
	No CC	1 CC	2 CC	3+ CC	No CC	1 CC	2 CC	3+ CC
<b>Total Health Care Visits by Adults Age 45 to 64</b>	25.3 (25%)	23.9 (24%)	18.3 (18%)	34.1* (34%)	3,907	8,036	11,026	24,789*

**Notes**

\* Coefficient of variation is between 16.6% and 33.3%; interpret with caution because of high variability.

† Coefficient of variation in excess of 33.3%; estimate suppressed because of high sampling variability.

‡ Nursing visits were combined with physiotherapist, social worker or counsellor visits to increase the reliability of the estimates.

CC: reported chronic condition.

The following chronic conditions are included: arthritis, asthma, cancer, chronic pain, depression, diabetes, emphysema or chronic obstructive pulmonary disease, heart disease, high blood pressure, a mood disorder other than depression and stroke.

Visits during overnight stays are not included.

There were eight weighted sample sizes: 1.1 million seniors reported no chronic conditions; 1.2 million seniors reported one chronic condition; 0.9 million seniors reported two chronic conditions; 1.0 million seniors reported three or more chronic conditions; 6.5 million adults age 45 to 64 reported no chronic conditions; 3.0 million adults age 45 to 64 reported one chronic condition; 1.7 million adults age 45 to 64 reported two chronic conditions; and 1.4 million adults age 45 to 64 reported three or more chronic conditions.

**Sources**

Canadian Survey of Experiences With Primary Health Care, 2008, Statistics Canada; Canadian Institute for Health Information.

Total health care use increased with the number of reported chronic conditions across all senior age groups (Table 2). Older seniors did not report a higher rate of health care use than younger seniors; therefore, the number of reported chronic conditions was more important than age as a determinant of health care use by seniors. The higher rate of health care use in adults age 45 to 64, particularly in the high comorbidity groups, could be because seniors who require frequent health care interventions are more likely to live in an institution (for example, nursing home or long-term care residence) and thus would have been excluded from the CSE-PHC survey. Also, having a recently diagnosed chronic condition had a higher impact on the number of health care visits among those age 45 to 64 than it did among seniors. Overall, seniors and adults age 45 to 64 accounted for 14% and 44% of all reported health care visits, respectively.



**Table 2: Rates of Total Health Care Visits in the Past 12 Months by Seniors per 1,000 Seniors, by Age Group and Number of Reported Chronic Conditions (Crude Estimates)**

Age Group	Number of Reported Chronic Conditions (95% Confidence Interval)			
	None	1	2	3+
<b>65–74</b>	4,211* (2,498–5,924)	6,814 (5,600–8,028)	7,629 (6,441–8,816)	13,722 (11,105–16,339)
<b>75–84</b>	3,815* (2,475–5,156)	5,547 (4,689–6,405)	9,501 (7,131–11,871)	11,400 (9,313–13,487)
<b>85+</b>	4,917* (2,795–7,039)	6,268* (4,100–8,436)	6,766* (4,221–9,311)	14,028 (10,843–17,212)

**Notes**

\* Coefficient of variation is between 16.6% and 33.3%; interpret with caution because of high variability.

The following chronic conditions are included: arthritis, asthma, cancer, chronic pain, depression, diabetes, emphysema or chronic obstructive pulmonary disease, heart disease, high blood pressure, a mood disorder other than depression and stroke.

Visits during overnight stays are not included.

There were four weighted sample sizes: 1.1 million seniors reported no chronic conditions; 1.2 million seniors reported one chronic condition; 0.9 million seniors reported two chronic conditions; and 1.0 million seniors reported three or more chronic conditions.

**Sources**

Canadian Survey of Experiences With Primary Health Care, 2008, Statistics Canada; Canadian Institute for Health Information.

**Increased Medication Use Closely Related to Increased Comorbidity**

Seniors who reported one and two chronic condition(s) were taking an average of three and four prescription medications, respectively. Seniors who reported three or more chronic conditions were taking an average of six prescription medications. A similar trend was observed in adults age 45 to 64. Among seniors, the number of prescription medications was more closely related to number of chronic conditions than to age. These estimates include only prescription medications and could be higher if over-the-counter medications were included.

**Economic Impact of Chronic Conditions**

The financial impact of chronic conditions in Canada is substantial, and both the direct impact on health care costs and the indirect effects (such as loss of productivity) have been the subject of considerable research. For example, a study by the Public Health Agency of Canada found that the total burden of cardiovascular disease in Canada in 2000 was \$22.2 billion, including \$7.6 billion in direct costs.<sup>8</sup> Understanding the relationship between the management of chronic conditions in seniors and overall health care costs is particularly important, considering that many chronic conditions become more prevalent with age. Seniors account for an estimated 44% of publicly funded health care costs.<sup>9</sup> Another 2000 study showed that the total economic impact of arthritis was \$6.4 billion, with seniors accounting for \$1.7 billion.<sup>10</sup> In light of the fact that approximately 70% of health care costs in Canada are borne by the public sector,<sup>9</sup> and considering the dramatic impact of high comorbidity on seniors' health care use (tables 1 and 2), it is clear that increased efforts to improve preventive PHC in older adults in Canada could be very beneficial.

## Section 2: Self-Management and Collaborative Care in the Treatment of Chronic Conditions

### Seniors Report Confidence in Self-Management

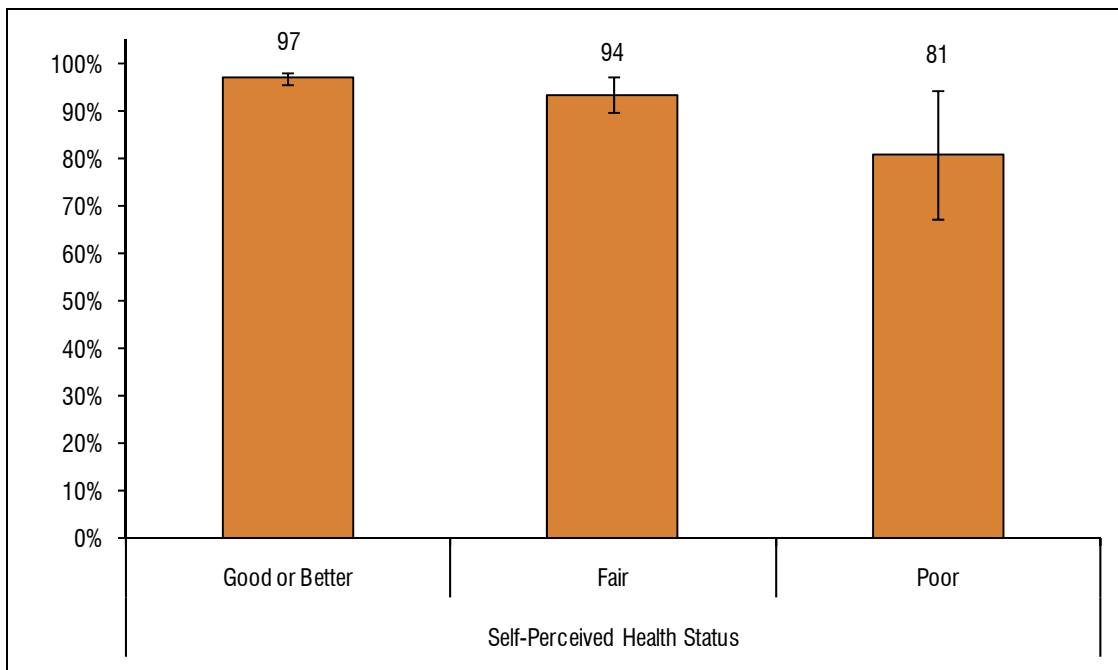
By definition, chronic conditions are persistent and typically require treatment throughout a patient's lifetime. Treatment of chronic conditions usually differs from that of acute conditions in that the focus shifts from curing to managing the condition to prevent complications and the onset of additional conditions. The success of managing chronic conditions is often highly influenced by the patient, including factors such as diet, exercise, medication regime adherence and self-measurements (such as blood glucose and blood pressure measurements).<sup>11</sup> Comorbidity and patients' lack of understanding of chronic conditions and the medications used in the treatment of chronic conditions have been identified as barriers to chronic disease self-management.<sup>12</sup>

The chronic care model (CCM) is a relatively new care model compared to the traditional acute care theme, and research has shown that it improves chronic condition management when a combination of approaches is used. A review of the CCM evidence found that four areas led to the greatest improvements in health outcomes when two or more were used in combination:

- Improved patient education and support;
- Planned, team-based care delivery;
- Improved provider expertise; and
- Improved use of registry-based information systems.<sup>13</sup>

Nine of 10 seniors who reported at least one chronic condition also reported feeling they can self-manage their medical treatments at home. The majority of seniors who described their health status as "poor" also reported that they were confident they could self-manage their medical treatments at home (Figure 5), though seniors who reported their health status as "poor" were less likely to feel they could self-manage their medical treatments at home than seniors who reported their health status as "good," "very good" or "excellent" (81% versus 97%). A similar trend was observed in adults age 45 to 64. Of senior respondents who reported at least one chronic condition, 88% indicated feeling that they knew how to prevent further problems with their health condition.

**Figure 5: Percentage of Seniors Who Reported 1 or More of 11 Chronic Conditions Who Also Reported They “Strongly Agree” or “Agree” That They Felt Confident They Could Follow Through on Medical Treatments at Home, by Self-Perceived Health Status, Canada (Crude Estimates)**



**Notes**

The following chronic conditions are included: arthritis, asthma, cancer, chronic pain, depression, diabetes, emphysema or chronic obstructive pulmonary disease, heart disease, high blood pressure, a mood disorder other than depression and stroke.

The analysis included “don’t know” responses for self-perceived health status; however, data for this response accounted for less than 1% of total responses and is not presented.

The analysis included “don’t know” and “refusal” responses for ability to self-manage at home; however, data for these responses combined accounted for less than 3% of total responses.

**Sources**

Canadian Survey of Experiences With Primary Health Care, 2008, Statistics Canada; Canadian Institute for Health Information.

**Gaps in Preventive Care**

One way to reduce the economic and health burden of chronic conditions is through prevention. Preventive care can be applied to patients before the onset of disease or symptoms (primary prevention), in the presence of warning signs or risk factors (secondary prevention) or to patients previously diagnosed to reduce the risk of complications and comorbidity (tertiary prevention).<sup>14</sup>

Despite the fact that the majority of seniors have a regular medical doctor, many are not getting the PHC that can prevent or delay the onset of chronic conditions, nor are they getting the appropriate secondary preventive care to prevent comorbidity and other complications. For example, 2009 CCHS data shows that only 66.5% of seniors received an influenza vaccination within the past year.<sup>1</sup> CCHS data also shows that in 2005, only 49% of seniors with diabetes had a foot examination by a health care professional in the past year, and only 69% had ever had a pupils-dilated eye exam.<sup>15</sup>

The 2008 CSE-PHC data also reflects gaps in primary preventive care. Only 42% of seniors reported that, at least some of the time in the past year, they had talked with a health professional about specific things they could do to improve their health or prevent illness (such as stopping smoking, limiting alcohol consumption and exercising). This number improved only slightly to 45% among seniors who reported at least one chronic condition. Only 57% of seniors and 59% of those reporting chronic conditions reported getting the help they wanted to reach or maintain a healthy body weight. The results for secondary and tertiary prevention are more

encouraging. Among seniors who reported a diagnosis of diabetes, heart disease, stroke or high blood pressure, most reported that within the past year they had measurements taken of their blood pressure (96%), cholesterol (84%), body weight (72%) and blood sugar (78%).

Providers of PHC can help improve the health of the seniors of the future, as well as reduce the economic impact of chronic disease, by regularly engaging in preventive care for middle-aged patients. The survey data shows there is considerable room for improvement in primary prevention among adults age 45 to 64. In this age group, only 45% reported talking with a health professional about specific things they could do to improve their health or prevent illness, and only 55% reported getting the help they wanted to reach or maintain a healthy body weight.

## **Collaborative Care Gaps**

One important aspect of self-management is patient-provider collaborative care, in which patients are engaged and can participate in treatment decisions. Collaborative care generally takes place in a PHC setting, yet it is distinct from the patient education aspect of self-management. Collaborative care can take many forms and can include setting goals for treatment, preparing a treatment or action plan and having patients participate in treatment decisions.<sup>16</sup>

### **Treatment Goals**

Fewer than half (48%) of seniors who reported at least one chronic condition said they had talked at least some of the time in the past 12 months to their PHC provider about their treatment goals, the same percentage as for adults age 18 to 64. Comparison by education level shows that more seniors with a secondary school diploma reported talking at least some of the time in the past 12 months to their PHC provider about their treatment goals than seniors without a secondary school diploma (51% versus 45%). When compared by gender, more male seniors reported talking at least some of the time in the past 12 months to their PHC provider about their treatment goals than female seniors (51% versus 46%).

### **Treatment Plans and Involvement in Clinical Decisions**

Just more than one in four (28%) seniors who reported at least one chronic condition indicated that in the past 12 months they were helped at least some of the time in making a treatment plan (Table 3). Of seniors who reported at least one chronic condition who had seen or talked to their family physician or general practitioner in the past 12 months, more than two in three (70%) also reported being involved at least some of the time in clinical decisions regarding their health care (Table 3). Both of these collaborative care activities were slightly more prevalent among adults age 18 to 64 than among seniors. Among seniors, these collaborative care activity rates were higher among males than females and among those with a secondary school diploma than those without one.

**Table 3: Percentage of Respondents Who Reported 1 or More of 11 Chronic Conditions Who Also Reported They Were Helped at Least Some of the Time in the Past 12 Months in Making a Treatment Plan or Who Also Reported They Were Involved by Their Family Physician/General Practitioner in Clinical Decisions at Least Some of the Time in the Past 12 Months**

Collaborative Care Activity	Percentage of Respondents (95% Confidence Interval)					
	Seniors					Adults 18–64
	All	Males	Females	Diploma	No Diploma	
<b>Helped Make a Treatment Plan</b>	28.4 (25.5–31.2)	32.4 (27.7–37.1)	25.1 (21.3–28.9)	31.1 (27.1–35.1)	25.0 (20.9–29.1)	38.6 (35.2–42.0)
<b>Involved in Clinical Decisions</b>	69.7 (66.6–72.9)	73.2 (68.3–78.0)	67.0 (62.7–71.3)	74.7 (70.9–78.5)	63.4 (58.0–68.8)	75.7 (72.3–79.1)

**Notes**  
 The following chronic conditions are included: arthritis, asthma, cancer, chronic pain, depression, diabetes, emphysema or chronic obstructive pulmonary disease, heart disease, high blood pressure, a mood disorder other than depression and stroke. The analysis included “don’t know” and “refusal” responses for the treatment plan variable; however, data for these responses accounted for less than 4% of total responses among seniors and less than 1% among adults age 18 to 64. The analysis included “don’t know” and “not stated” responses for the clinical decisions variable; however, data for these responses accounted for less than 4% of total responses among seniors and less than 3% among adults age 18 to 64. The analysis also included “not applicable” responses for this variable, accounting for 11% of senior respondents and 7% of respondents age 18 to 64. Respondents who had not visited a family physician/general practitioner within the past 12 months were excluded from the clinical decisions question.

**Sources**  
 Canadian Survey of Experiences With Primary Health Care, 2008, Statistics Canada; Canadian Institute for Health Information.

### Awareness of Available Treatments

More than four in five seniors (86%) who reported at least one chronic condition were aware of the different medical treatments available for their health condition (age–sex–standardized percentage ranged from 87% in Quebec to 81% in Alberta).<sup>ii</sup> Education level (having a secondary school diploma versus not having a secondary school diploma) had no significant effect on the proportion of seniors who were aware of different medical treatments available for their health condition. Awareness of different medical treatments was nearly the same among male and female seniors (85% and 87%, respectively), and there was no significant difference in awareness of medical treatments between seniors and younger adults.

### Awareness of the Impact of Self-Management on Health

Patient education is also an important aspect of self-management. Of seniors who reported chronic condition(s), 60% reported being shown at least some of the time in the past 12 months that what they did to take care of themselves influenced their health condition; 25% reported being given a written list of things they should do to improve their health at least some of the time; 11% reported being encouraged at least some of the time to go to a specific group or class (such as an educational seminar) to help cope with their chronic condition; 14% reported being encouraged at least some of the time to attend programs in the community, such as support groups or exercise classes; and 26% reported being told at least some of the time how visits with other types of doctors (such as specialists or surgeons) helped their treatment.

### Potential Role of Electronic Systems in Collaborative Care

Increasingly, literature suggests that patient care can be improved by the use of computer-based decision-support systems (such as electronic medical records or EMRs) for such tasks as coordinating care for patients across conditions, providers and settings. Results from a 2009 international Commonwealth Fund survey suggest that the use of EMRs by Canadian PHC providers, and in particular use of EMRs for chronic

ii. Complete provincial comparisons are presented in Appendix B.

care, lags well behind other countries. In this study, only 37% of PHC doctors in Canada used EMRs, the lowest proportion of all the countries studied. In the Netherlands, New Zealand, Norway, the United Kingdom and Australia, 95% or more of PHC physicians used EMRs. Only 10% of Canadian physicians reported having a computerized system to remind patients of regular preventive or follow-up care, compared with 76% in the United Kingdom and 92% in New Zealand. Canada's use of financial incentives for managing patients with chronic diseases or complex needs was similar to many of the other countries studied, at 54%.<sup>17</sup>

## Section 3: Medication Management Among Seniors With Chronic Conditions

### Medication Use Introduces Risk of Side Effects and Adverse Reactions

Prescription medication use increases with age, a fact which can be partially attributed to the presence of multiple morbidities in the elderly.<sup>18</sup> The number of medications being taken correlates with adverse drug reactions (ADRs), which in turn increase with hospital visits.<sup>19–22</sup> ADRs are a significant issue for patient safety. Seniors are especially at risk for ADRs, as the organs that metabolize or rid the body of drugs, specifically the kidneys and liver, have reduced functional ability.<sup>18, 21, 23</sup> Many of these ADRs are related to the dosage and specific medications prescribed that may result in toxicity.<sup>21</sup> Seniors taking multiple medications are less likely than non-seniors to receive information from their physician on proper medication use and any possible side effects.<sup>19</sup> Polypharmacy—the use of five or more medications—is common among seniors with chronic conditions, even more so in seniors with comorbidity. Polypharmacy can lead to reduced compliance with medication regimens and problems with drug–drug interactions and ADRs.<sup>9, 20, 23, 24</sup> Reviews of medications being taken can reduce the number of prescribed medications.<sup>9, 25–28</sup> This reduction has the potential to improve patient safety by reducing the number of ADRs.

### Patient Safety Gaps in Medication Management

Patients visiting physicians for treatment of a chronic disease are likely to leave with a prescription. Data from the 2009 Canadian Disease and Therapeutic Index shows that 81% and 82% of patients left with a prescription after visiting a physician for treatment for hypertension and depression, respectively, whereas only 2% of patients left with a prescription after visiting a physician for a general medical exam or health check-up.<sup>29</sup>

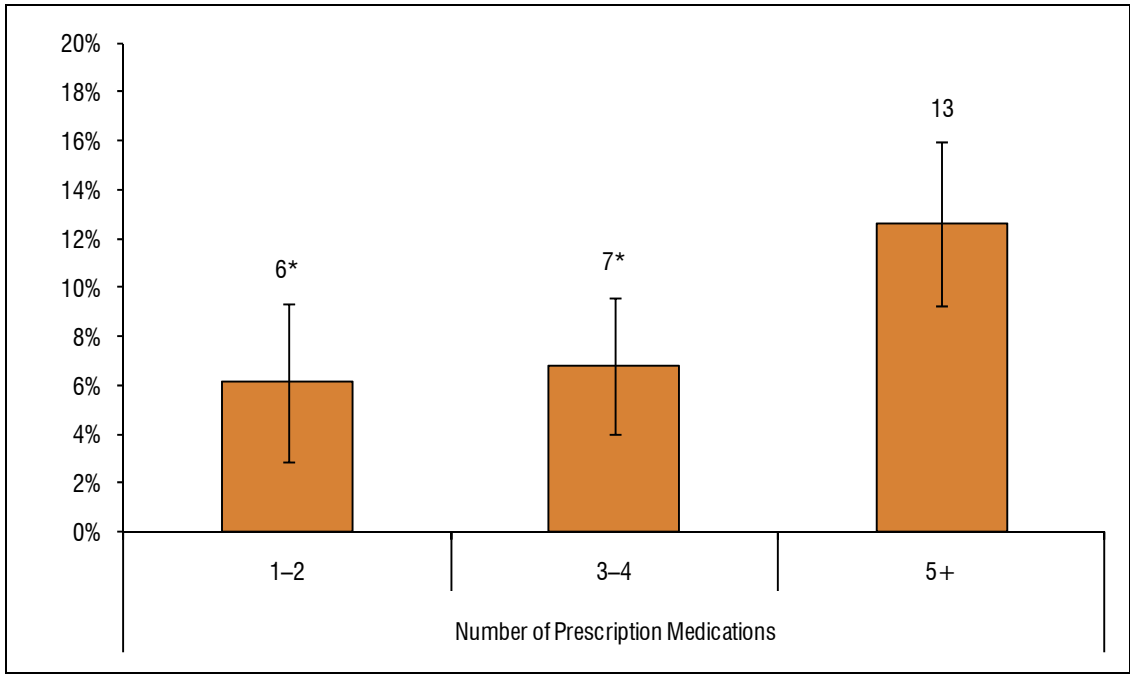
Seniors taking multiple medications have an increased risk of ADRs, inappropriate prescribing and side effects from interactions with external factors (such as alcohol).<sup>18–20</sup> Four percent of seniors who reported at least one chronic condition also reported a prescribing or medication error in the past 12 months. Forty-one percent<sup>iii</sup> of those experiencing errors reported that they resulted in a “somewhat serious” or “very serious” problem. This result is similar to a 2008 Commonwealth Fund survey of sicker adults, in which 9% of Canadian respondents reported being given an incorrect medication or dose within the past two years, the fourth-highest rate in a group of eight developed countries.<sup>30</sup> This international survey also showed that 35% of diagnostic and medication errors in Canada resulted in “somewhat serious” or “very serious” consequences.

Thirteen percent of seniors who reported at least one chronic condition and who took at least five prescription medications (on a regular or ongoing basis) experienced a side effect requiring PHC services in the past 12 months, more than twice the level of similar seniors who were taking only one or two prescription medications (Figure 6). A similar trend was observed in adults age 45 to 64. Strategies to reduce the number of medications when possible could reduce the number of side effects experienced by seniors with polypharmacy.

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iii. Coefficient of variation is between 16.6% and 33.3%; interpret with caution because of high variability.

**Figure 6: Percentage of Seniors Who Reported 1 or More of 11 Chronic Conditions Who Also Reported Experiencing a Side Effect From a Prescription Medication That Required a Visit to a Medical Doctor in the Past 12 Months, by Number of Prescribed Medications, Canada (Crude Estimates)**



**Notes**

\* Coefficient of variation is between 16.6% and 33.3%; interpret with caution because of high variability. The following chronic conditions are included: arthritis, asthma, cancer, chronic pain, depression, diabetes, emphysema or chronic obstructive pulmonary disease, heart disease, high blood pressure, a mood disorder other than depression and stroke. The analysis included “don’t know,” “refusal” and “not stated” responses; however, data for these responses combined accounted for less than 2% of total responses.

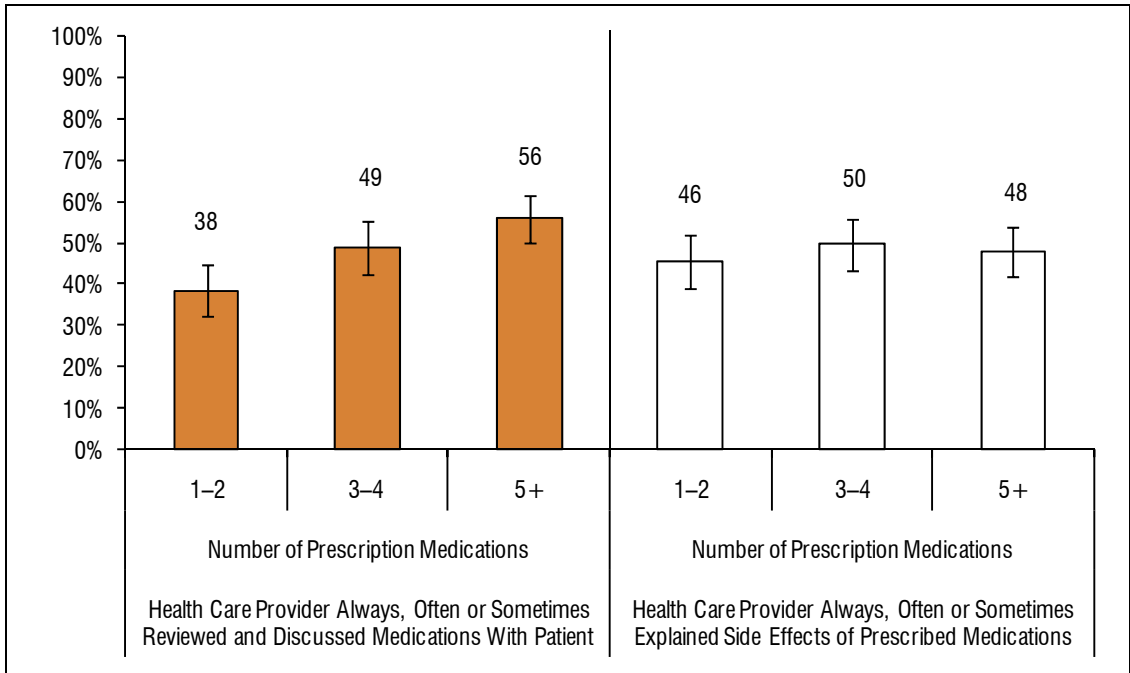
**Sources**

Canadian Survey of Experiences With Primary Health Care, 2008, Statistics Canada; Canadian Institute for Health Information.

Of all seniors who reported at least one chronic condition, only 48% reported having had medication reviews conducted by their PHC provider at least some of the time. Of seniors who reported at least one chronic condition and who took at least five prescription medications on a regular or ongoing basis, 56% reported receiving medication reviews by their medical doctors in the past 12 months at least some of the time, compared with 38% of those taking only one or two medications (Figure 7). Fewer than half (47%) of seniors who reported at least one chronic condition also reported having had the side effects of their prescription medications explained to them at least some of the time (Figure 7). There was little change in this rate associated with increasing numbers of prescription medications. Of seniors who reported at least one chronic condition and who took at least five prescription medications, nearly one in five (18%) indicated that they rarely or never had a medication review, and 24% stated that the question of medication review was not applicable as they had been taking their medications for at least 12 months. Medication reviews and discussions of side effects may still be warranted for seniors with long-term use of medications because drug pharmacokinetics can change with age and ADR risk may increase.<sup>21, 23, 24, 31</sup>



**Figure 7: Percentage of Seniors Who Reported 1 or More of 11 Chronic Conditions Who Also Reported That Their Health Care Provider “Always,” “Often” or “Sometimes” Reviewed and Discussed Their Medications or “Always,” “Often” or “Sometimes” Had Explained Side Effects of Prescribed Medications in the Past 12 Months, by Number of Prescribed Medications, Canada (Crude Estimates)**



**Notes**  
 The following chronic conditions are included: arthritis, asthma, cancer, chronic pain, depression, diabetes, emphysema or chronic obstructive pulmonary disease, heart disease, high blood pressure, a mood disorder other than depression and stroke.  
 The analysis included “don’t know,” “refusal” and “not stated” responses for the medication review variable; however, data for these responses accounted for less than 3% of total responses. The analysis also included the “not applicable (long-term use of the same medication, side effect discussion redundant)” response, which accounted for approximately 30% of total responses.  
 The analysis included “don’t know,” “refusal” and “not stated” responses for the side effect explanation variable; however, data for these responses accounted for less than 2% of total responses. The analysis also included the “not applicable (long-term use of the same medication, side effect discussion redundant)” response, which accounted for approximately 34% of total responses.

**Sources**  
 Canadian Survey of Experiences With Primary Health Care, 2008, Statistics Canada; Canadian Institute for Health Information.

# Summary

The prevalence of chronic conditions is increasing and will continue to have a substantial impact on the health of Canadians and on the health care system. Fortunately, there is room for improvement in the health care system's management of these conditions. The increasing economic burden of caring for seniors is related not only to the rising prevalence of chronic conditions but also to Canada's aging population; seniors made up 13.2% of the population at the time of the 2006 census, a figure projected to increase to 21.2% by 2026.<sup>2</sup>

Seniors with high comorbidity (three or more chronic conditions) report poorer health, take more prescription medications and have the highest rate of health care visits among seniors with chronic conditions. This finding would have been more pronounced if seniors living in institutions, including those in long-term care facilities, had been included in the survey, as it is likely that these seniors have high rates and more advanced stages of chronic conditions. Therefore, reducing the occurrence of comorbidity through prevention can have a significant effect on seniors' health and on health care resource use. There are opportunities to improve the way that care for chronic conditions is provided, and this has the potential to deliver significant benefits to the health of Canadians and to the health care system.

Primary health care plays a strong and vital role in managing chronic conditions.<sup>32</sup> The WHO found that aspects of PHC that were crucial to better outcomes and to the effectiveness of the health care system include person-centredness, continuity of care, and comprehensive and integrated responses.<sup>33</sup> A well-defined treatment plan has been identified as a key component of managing chronic conditions, and shared decision-making and establishment of goals have been identified as key elements of the patient–physician partnering competency of health care providers for efficient and effective treatment of chronic conditions.<sup>34</sup> Interventions that promote provider–patient collaborative care and patient education can include providing financial incentives and specific training to providers,<sup>35</sup> establishing PHC teams that include non-physician team members that are trained in patient self-management<sup>11</sup> and creating guidelines that focus on patient-centred care.<sup>34</sup> Successful patient self-management requires a shift in the patient–physician relationship to actively engage patients in their own care.<sup>35</sup>

In 2008, pharmaceuticals were the second-largest category of health care expenditure and were expected to account for 17.4% of health care spending (\$29.8 billion), up from 15.0% 10 years earlier.<sup>9</sup> A 2008 CIHI report on drug expenditures in six provinces found that more than \$1 billion was spent on seniors from publicly funded programs alone.<sup>36</sup> Ranked by total cost, 6 of the top 10 drug classes had a common use related to chronic cardiovascular or respiratory conditions.<sup>36</sup> There is evidence that adverse drug events are not uncommon in PHC; one study reported that 25% of patients reported that they had adverse drug events, and of these 28% were ameliorable (symptoms were not responded to quickly enough) and an additional 11% were preventable.<sup>37</sup> In addition, inappropriate prescribing has also been identified as a problem in medication management for seniors.<sup>38</sup> Given that drug use by seniors is increasing,<sup>36</sup> it is important for physicians to effectively manage prescription medications. However, only 47% of seniors with chronic conditions reported having side effects explained to them, and as a result patients may not respond to symptoms quickly enough. In addition, many patients are not having medication reviews conducted to ensure they are on the optimal medication regimen. Possible interventions to reduce adverse drug events can include reviewing Beers criteria or the Beers list in determining appropriate prescribing,<sup>39</sup> reducing the number of prescribing physicians,<sup>40</sup> promoting participation of pharmacists and advanced practice nurses in medication management,<sup>41</sup> conducting routine medication reviews (including of over-the-counter medications)<sup>25</sup> and increasing patient education that includes input from pharmacologists or pharmacists.<sup>28</sup>

Seniors with high comorbidity are a key group for improvements in health care delivery and effective health care spending. Statistically significant differences were observed between seniors who reported high comorbidity and seniors who reported fewer or no chronic conditions in several areas. Seniors who reported

high comorbidity were less likely to describe their general health status as “good,” “very good” or “excellent,” had more total health care visits, were more likely to have polypharmacy (taking five or more prescription medications) and were more likely to experience a side effect requiring PHC services than seniors who reported fewer or no chronic conditions. Preventing seniors with chronic conditions, and especially seniors with one or two chronic conditions, from developing additional chronic conditions would strongly benefit seniors’ health and actively contribute to the reduction of health care spending in Canada.

## Additional Resources

The following reports from the Canadian Institute for Health Information are available at [www.cihi.ca](http://www.cihi.ca).

- *Experiences With Primary Health Care in Canada*
- *Diabetes Care Gaps and Disparities in Canada*
- *Drug Claims by Seniors: An Analysis Focusing on Potentially Inappropriate Medication Use, 2000 to 2006*
- *Highlights of 2008–2009 Inpatient Hospitalizations and Emergency Department Visits*

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# Appendix A: Methodology

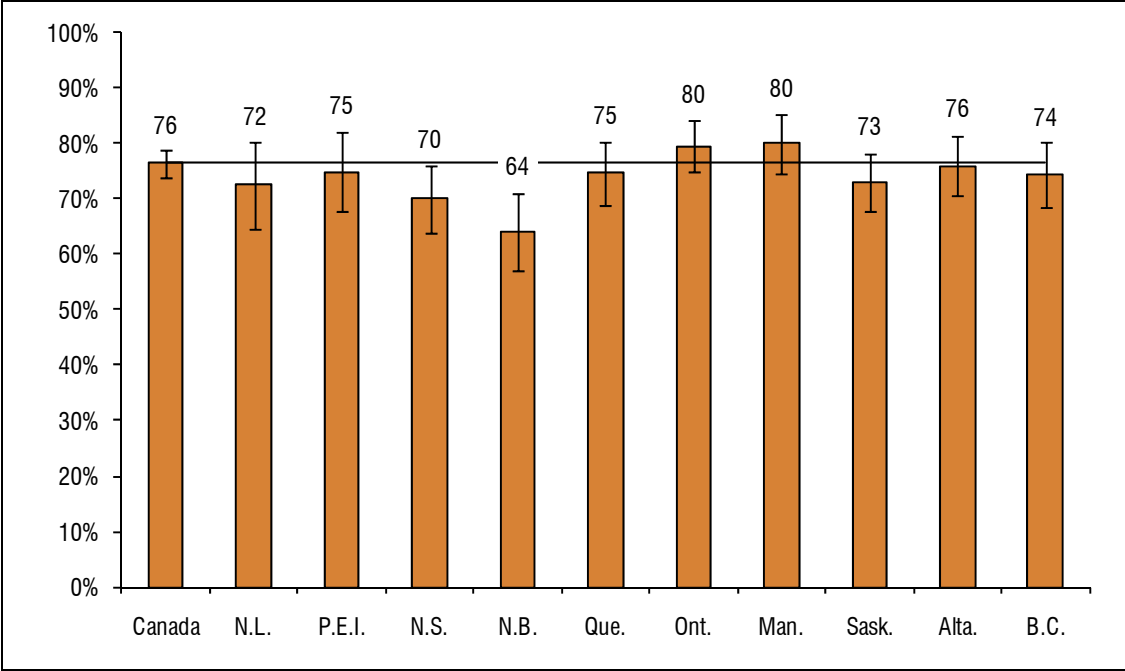
The results in the report *Seniors and the Health Care System: What Is the Impact of Multiple Chronic Conditions?* are based on data from the 2008 Canadian Survey of Experiences With Primary Health Care (CSE-PHC). Statistics Canada conducted the 2008 CSE-PHC from April 14, 2008, to June 30, 2008, using computer-assisted telephone interviews. The sample for the survey was a subsample of respondents to cycle 4.1 of the Canadian Community Health Survey (2007) who were 18 and older. The survey did not include residents of First Nations reserves and Crown land, full-time members of the Canadian Forces, inmates of institutions or residents of isolated areas. Additional information on the survey is available from Statistics Canada.

The sample was designed to produce pan-Canadian and provincial estimates. A response weighting strategy was used to ensure the representativeness of the age and sex distributions of the population. A bootstrap technique was used to estimate the variance and confidence intervals; 95% confidence intervals were estimated and are identified by vertical lines at the top of the bars in the figures. The final sample included a small number of respondents from all territories to ensure pan-Canadian representativeness; however, the sample was too small to produce territorial estimates. In the context of this analysis, the term “seniors” refers to adults age 65 and older and the term “adults” refers to adults age 18 and older, unless otherwise specified. Where appropriate, analyses by province were age- and sex-standardized to control for age and sex differences between populations.

A total of 11,582 adults responded to the survey, including 3,132 seniors, for an overall response rate of 71%. Provincial response rates ranged from 67% to 76%. Some respondents were not asked certain survey questions that were not applicable in light of earlier answers; these valid skips were removed from all analyses. Additional technical notes are available upon request from the Primary Health Care Information program ([phc@cihi.ca](mailto:phc@cihi.ca)). Please direct requests for custom tables or information on data access to Statistics Canada ([ssd@statcan.ca](mailto:ssd@statcan.ca)).

# Appendix B: Provincial Figures

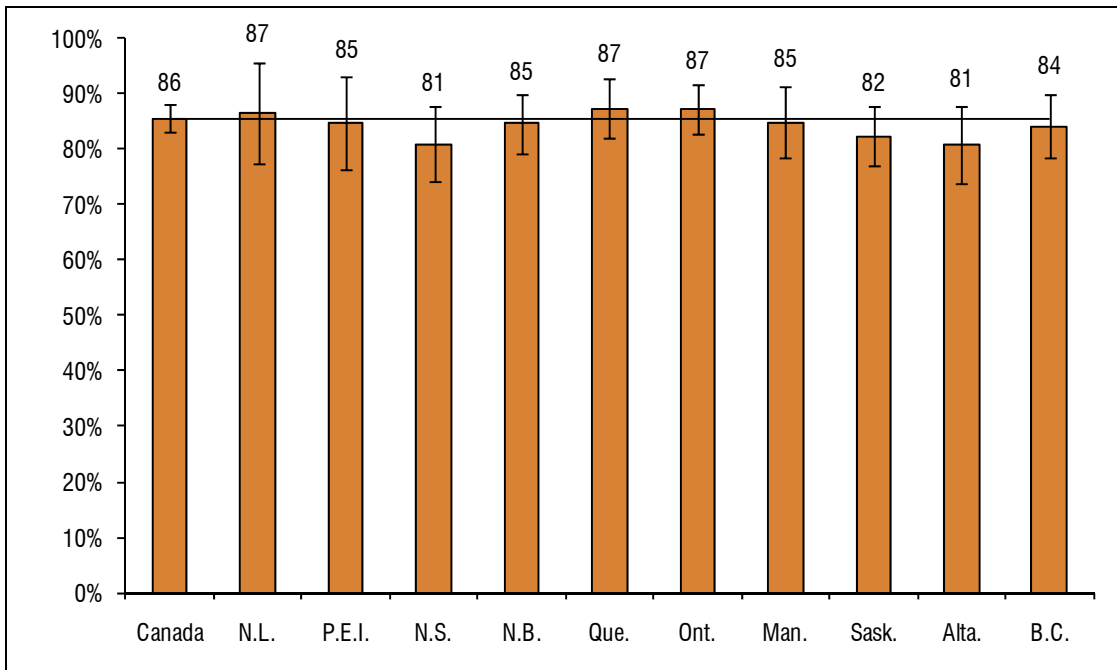
Figure B-1: Percentage of Seniors Who Reported Their Health Status as “Excellent,” “Very Good” or “Good,” by Province (Age–Sex Standardized)



**Note**  
Analysis included “don’t know” responses; however, data for this response account for less than 1% of total responses.

**Sources**  
Canadian Survey of Experiences With Primary Health Care, 2008, Statistics Canada; Canadian Institute for Health Information.

**Figure B-2: Percentage of Seniors Who Reported 1 or More of 11 Chronic Conditions Who “Strongly Agree” or “Agree” That They Were Aware of the Different Medical Treatment Options for Their Health Condition, by Province (Age–Sex Standardized)**



**Notes**

The following chronic conditions are included: arthritis, asthma, cancer, chronic pain, depression, diabetes, emphysema or chronic obstructive pulmonary disease, heart disease, high blood pressure, a mood disorder other than depression and stroke. Analysis included “don’t know” and “refusal” responses; however, data for these responses combined account for less than 5% of total responses.

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Canadian Survey of Experiences With Primary Health Care, 2008, Statistics Canada; Canadian Institute for Health Information.

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