

# Impact of COVID-19 in adults with chronic conditions:

## Emergency department visits

### Overview

COVID-19 has had a substantial impact on people in Canada. It has affected people's health and strained the healthcare system. [As of early May 2022, more than 3.7 million SARS-CoV-2 infections, confirmed by polymerase chain reaction, have been reported in Canada.](#)

This fact sheet describes the demographics, health characteristics, and outcomes of adults during their first documented emergency department visit (EDV) with a COVID-19 diagnosis. We also look at the relationship between severe EDV outcomes (i.e., hospital admission, transfer to an acute care facility, or death) and sex, age and selected chronic conditions.

We've limited our analysis to adults (aged 20+) visiting select emergency departments in Canada between January 1, 2020 and March 31, 2021. Please refer to the [technical notes](#) for data sources, methods, and limitations.

### Summary of characteristics and outcomes

We analyzed data for 97,939 adult EDVs with a confirmed (69.3%) or suspected (30.7%) COVID-19 diagnosis. Of these:

- › about half were male (49.6%)
- › the average age was 52 years
- › 28.9% arrived by ambulance
- › 74.4% were triaged as urgent or more serious

We examined the data to determine which patients had any of 18 chronic conditions listed in Figure 3. About 22.3% had at least 1 chronic condition.

The most common chronic conditions documented in their acute care hospitalizations over the past 10 years were:

- › hypertension (11.8%)
- › diabetes mellitus (9.4%)
- › ischemic heart disease (5.3%)

With respect to healthcare use over the past 6 months:

- › 28.6% had at least 1 previous EDV
- › 7.9% had at least 1 previous acute care hospitalization

In regards to EDV outcomes (Figure 1):

- › 23.8% were admitted or transferred to an acute care facility
- › 0.2% died

### Characteristics of patients with severe outcomes

Severe outcomes include being admitted to hospital, transferred to an acute care facility, and death. Compared to people with other outcomes, those who had severe outcomes were more likely to:

- › be male (55.6% versus 47.7%)
- › be older (average age: 67 versus 47 years)
- › have had an EDV (35.5% versus 26.4%) or acute care hospitalization (18.6% versus 4.5%) over the past 6 months
- › have pre-existing chronic conditions



Severe outcomes increased with age from 5.7% (20 to 34 year olds) to 69.1% (80+ year olds) (Figure 2). Across all age groups, males were more likely than females to have a severe outcome.

For all 18 of the chronic conditions we examined, adults with severe outcomes were more likely to have the condition than adults with other outcomes (Figure 3). In fact, those with severe outcomes were 3.5 times more likely to have at least 1 chronic condition (49.1% versus 13.9%).

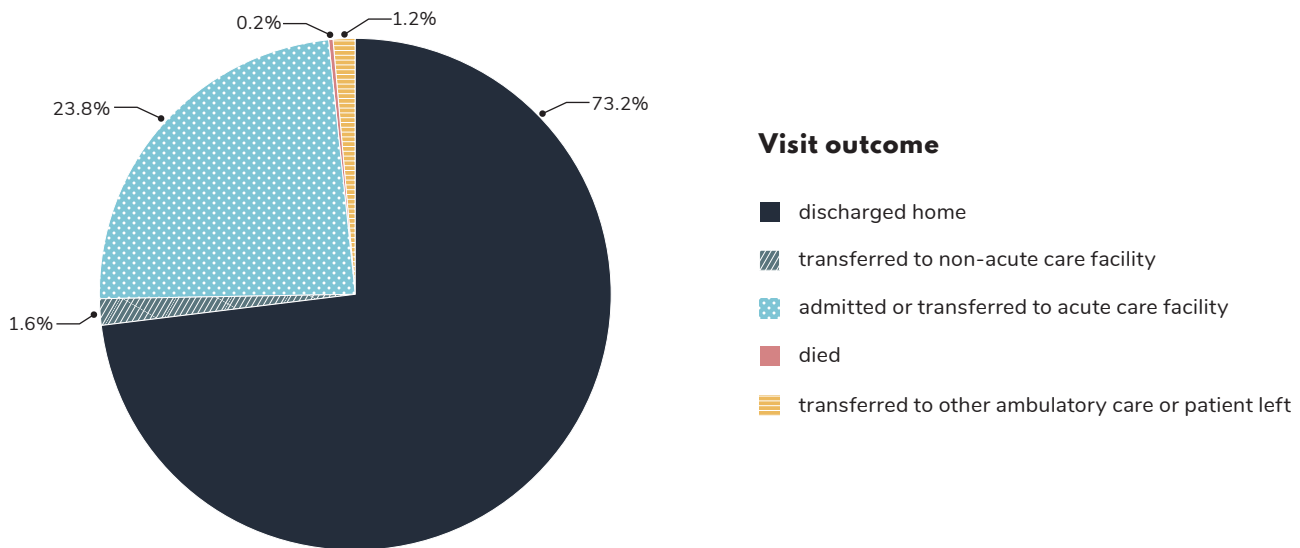
The more chronic conditions a patient had, the more likely they were to have a severe outcome. The percentage of adults experiencing these serious outcomes increased from 15.7% for those with no known chronic conditions, to 71.1% for those with 4 or more (Figure 4). This relationship was observed across all age groups.

## What you can do to reduce the rate of infections and severe disease

- › Get vaccinated and keep up to date with your booster doses.
- › Stay home when you are sick.
- › Improve indoor ventilation.
- › Wear a mask in high-risk settings.
- › Practise hand hygiene and respiratory etiquette:
  - cough or sneeze into a tissue or the bend of your arm
  - dispose of used tissues as soon as possible
  - clean your hands immediately afterwards
- › Clean and disinfect high-touch surfaces and objects.

For more information on COVID-19, please visit the [Government of Canada's main COVID-19 page](#).

**Figure 1:** Distribution of outcomes for adults (age 20+) during their first emergency department visit with a confirmed or suspected COVID-19 diagnosis, Canada,\* January 1, 2020 to March 31, 2021 (N = 97939)

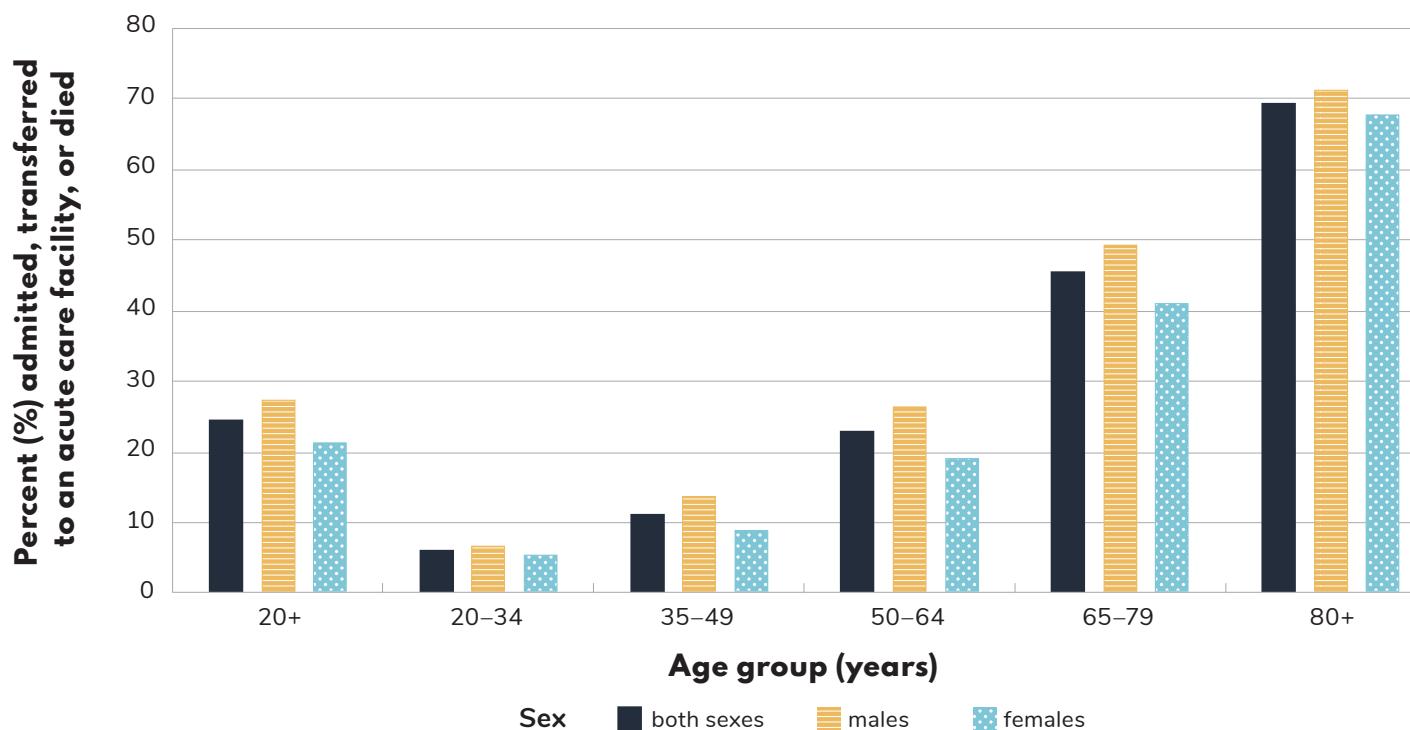


**Source:** Canadian Institute for Health Information's National Ambulatory Care Reporting System.

**Note:** Non-acute care facilities include residential care, group/supportive living, and correctional facilities. COVID-19 = coronavirus disease 2019.

\*Emergency department visits occurring in Quebec, New Brunswick, Newfoundland and Labrador, Northwest Territories, and Nunavut are not included. Coverage is incomplete for British Columbia, Saskatchewan, Manitoba, Nova Scotia, and Prince Edward Island.

**Figure 2:** Percent of adults (age 20+ years) who were admitted, transferred to an acute care facility, or died during their first emergency department visit with a confirmed or suspected COVID-19 diagnosis by age group and sex, Canada,\* January 1, 2020 to March 31, 2021 (N = 97939)



Source: Canadian Institute for Health Information's National Ambulatory Care Reporting System.

Note: COVID-19 = coronavirus disease 2019.

\*Emergency department visits occurring in Quebec, New Brunswick, Newfoundland and Labrador, Northwest Territories, and Nunavut are not included. Coverage is incomplete for British Columbia, Saskatchewan, Manitoba, Nova Scotia, and Prince Edward Island.

## Technical notes

### Data sources

Canadian Institute for Health Information:

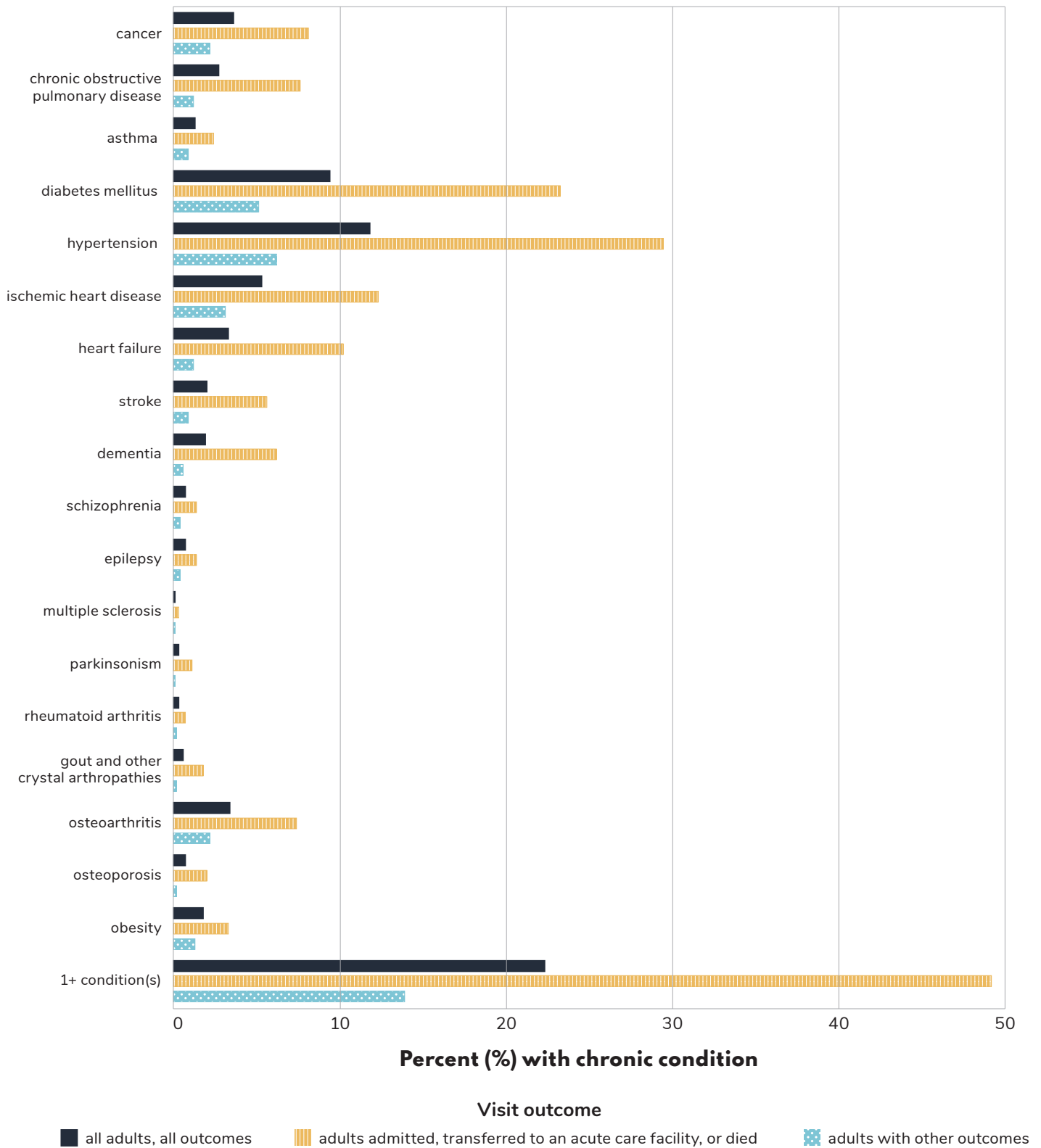
- › [National Ambulatory Care Reporting System \(NACRS\)](#)
- › [Discharge Abstract Database \(DAD\)](#)

### Methodology

We extracted EDVs with a COVID-19-related diagnosis occurring between January 1, 2020 and March 31, 2021 from NACRS. To identify these EDVs, we searched the main and other problem fields of visit records for

International Statistical Classification of Diseases and Related Health Problems, 10th revision, Canada (ICD-10-CA) diagnosis codes introduced to capture COVID-19 (U07.1, U07.2, U07.3, U07.4, U07.5). For visits containing a subset of the full NACRS dataset with no main or other problem data, we also searched the discharge diagnosis fields. We retained for analysis all first visits for a person that had a confirmed (U07.1) or suspected (U07.2) COVID-19 diagnosis. People were identified using birth year, province/territory issuing the health card number, and anonymized health card number.

**Figure 3:** Percent of adults (age 20+ years) with chronic conditions at their first emergency department visit with a confirmed or suspected COVID-19 diagnosis by visit outcome, Canada,\* January 1, 2020 to March 31, 2021 (N = 97939)

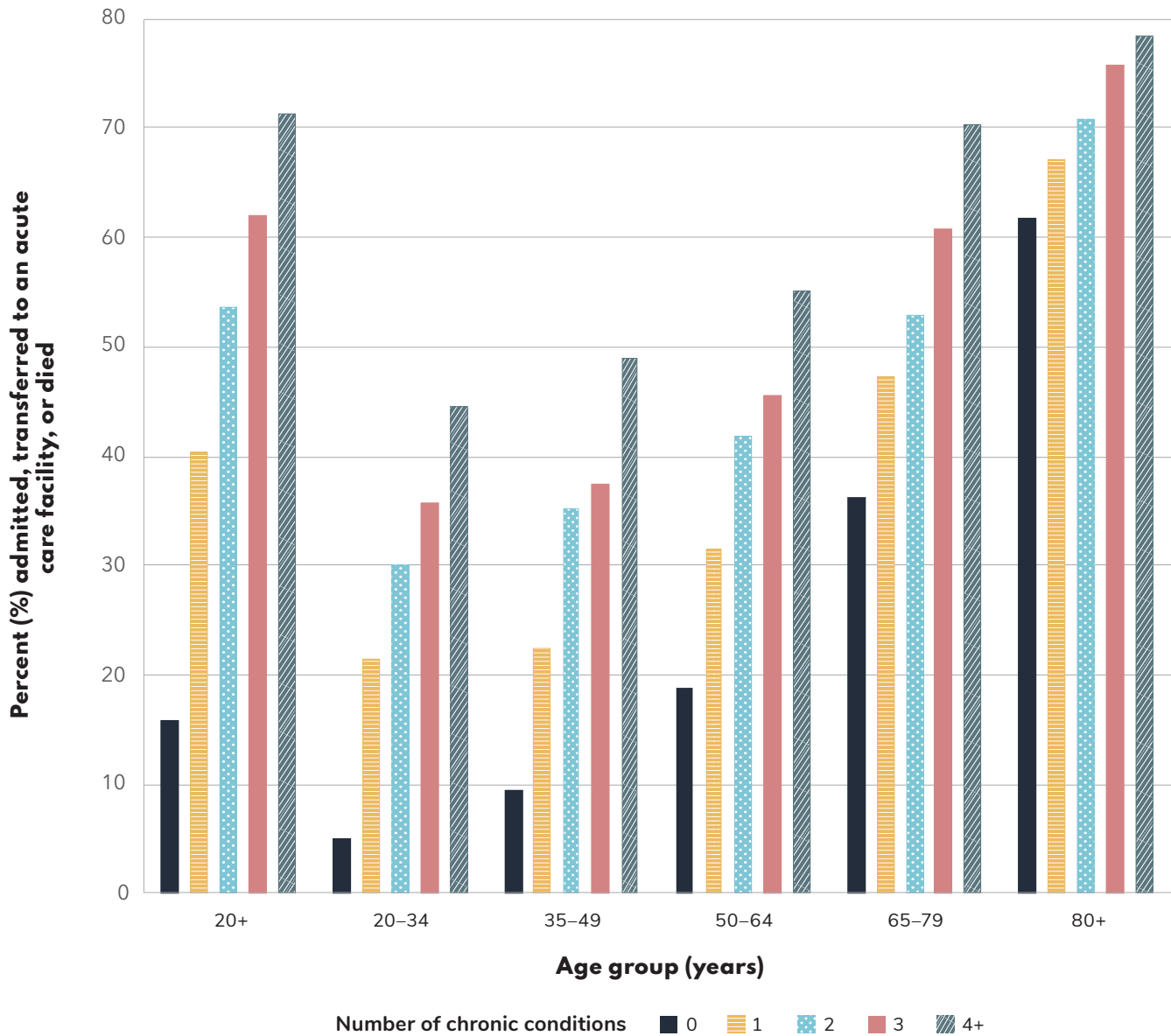


**Source:** Canadian Institute for Health Information's National Ambulatory Care Reporting System and Discharge Abstract Database.

**Note:** Other outcomes include: discharged home, transferred to non-acute care facility, transferred to other ambulatory care, or patient leaving. COVID-19 = coronavirus disease 2019.

\*Emergency department visits occurring in Quebec, New Brunswick, Newfoundland and Labrador, Northwest Territories, and Nunavut are not included. Coverage is incomplete for British Columbia, Saskatchewan, Manitoba, Nova Scotia, and Prince Edward Island.

**Figure 4:** Percent of adults (age 20+ years) who were admitted, transferred to an acute care facility, or died during their first emergency department visit with a confirmed or suspected COVID-19 diagnosis by age group and chronic condition count, Canada,\* January 1, 2020 to March 31, 2021 (N = 97939)



Source: Canadian Institute for Health Information's National Ambulatory Care Reporting System and Discharge Abstract Database.

Note: COVID-19 = coronavirus disease 2019.

\*Emergency department visits occurring in Quebec, New Brunswick, Newfoundland and Labrador, Northwest Territories, and Nunavut are not included. Coverage is incomplete for British Columbia, Saskatchewan, Manitoba, Nova Scotia, and Prince Edward Island.

We obtained information on chronic conditions by linking EDVs to DAD acute care hospital separations occurring within the past 10 years. For the majority of conditions, we used [Canadian Chronic Disease Surveillance System \(CCDSS\)](#) validated case definitions with some exceptions to address gestational diabetes and hypertension. To determine if a person had a history of cancer (C00-C97) or obesity (E66), we searched all 25 diagnosis fields. In total, 18 chronic conditions were examined (see Figure 3 for a complete list). We also obtained information on number of EDVs and acute care hospitalizations within the past 6 months by linking to NACRS and DAD, respectively.

All reported comparisons and associations are statistically significant at an alpha level of 0.05 (two-tailed). We used the chi-square test to compare proportions and test for associations, and the t-test to compare means.

## Data limitations

Some important data limitations should be acknowledged.

First, NACRS does not capture all EDVs occurring in Canada. EDVs occurring in New Brunswick, Newfoundland and Labrador, Northwest Territories, and Nunavut are not included, and coverage is incomplete for British Columbia, Saskatchewan, Manitoba, Nova Scotia, and Prince Edward Island. Further, EDVs occurring in Quebec are not available to the Public Health Agency of Canada.

Second, since the prevalence of chronic conditions is based on past acute care hospitalizations, it is likely underestimated. Among the chronic conditions examined in this fact sheet, only diabetes mellitus is routinely coded when documented. For the other chronic conditions, mandatory reporting is based on criteria like the condition increasing a patient's length of stay, or the condition co-occurring with other specific conditions that have been coded. In addition, some adults with chronic conditions may not have past acute care hospitalizations. Consequently, direct comparisons with CCDSS prevalence estimates should not be made because the CCDSS uses additional data sources, such as physician billing claims and prescription drug records, to identify chronic conditions.

## Acknowledgements

The data sources for this fact sheet are made possible through collaborations between the provinces and territories and the Canadian Institute for Health Information. Results and interpretations reported in this fact sheet are those of the Public Health Agency of Canada. No endorsement by the provinces and territories or the Canadian Institute for Health Information is intended or inferred.