



# PEI HYPERTENSION TRENDS REPORT 2019

## **OBJECTIVE**

The objective of this report is to provide information on the current state of hypertension (HTN) in Prince Edward Island (PEI), with hopes of informing decision-making, planning, and delivery of health services.

## **DATA SOURCES**

The report used data from the PEI Chronic Disease Surveillance System [in collaboration with the Canadian Chronic Disease Surveillance System (CCDSS)<sup>1</sup>], the Canadian Community Health Survey (CCHS), Vital Statistics, and the Deprivation Index from the Institut national de santé publique du Québec (INSPQ).

# TABLE OF CONTENTS

- Background ..... 1
- Incidence of Hypertension ..... 1
  - Age-Specific Hypertension Incidence..... 1
- Prevalence of Hypertension ..... 2
  - Age-Specific Hypertension Prevalence..... 2
  - Crude Prevalence of Hypertension..... 3
  - Prevalence of Hypertension by Zone..... 4
  - Hypertension Prevalence Trends over Time ..... 5
- Mortality..... 7
  - Age-Specific All-Cause Mortality ..... 7
- Hypertension and Multimorbidity ..... 8
- Economic Costs ..... 10
  - Age-Specific Health Care Costs Per Person ..... 10
- Health Complications of Hypertension..... 11
- Risk Factors for Hypertension ..... 12
  - Material and Social Deprivation..... 12
  - Modifiable Risk Factors ..... 14
- Conclusion ..... 15
- References..... 15

## BACKGROUND

Hypertension is the medical term used to describe high blood pressure, a condition that occurs when there is too much pressure in one’s blood vessels.<sup>2</sup> Hypertension is a chronic condition that may cause damage to arteries and serious health problems. It is often called the “silent killer,” because a person can have high blood pressure for years without showing symptoms.<sup>3</sup> The risk of developing hypertension increases with age, and almost everyone develops it eventually.<sup>4</sup> Hypertension can be easily detected with blood pressure assessment and is controllable.<sup>5</sup>

## INCIDENCE OF HYPERTENSION

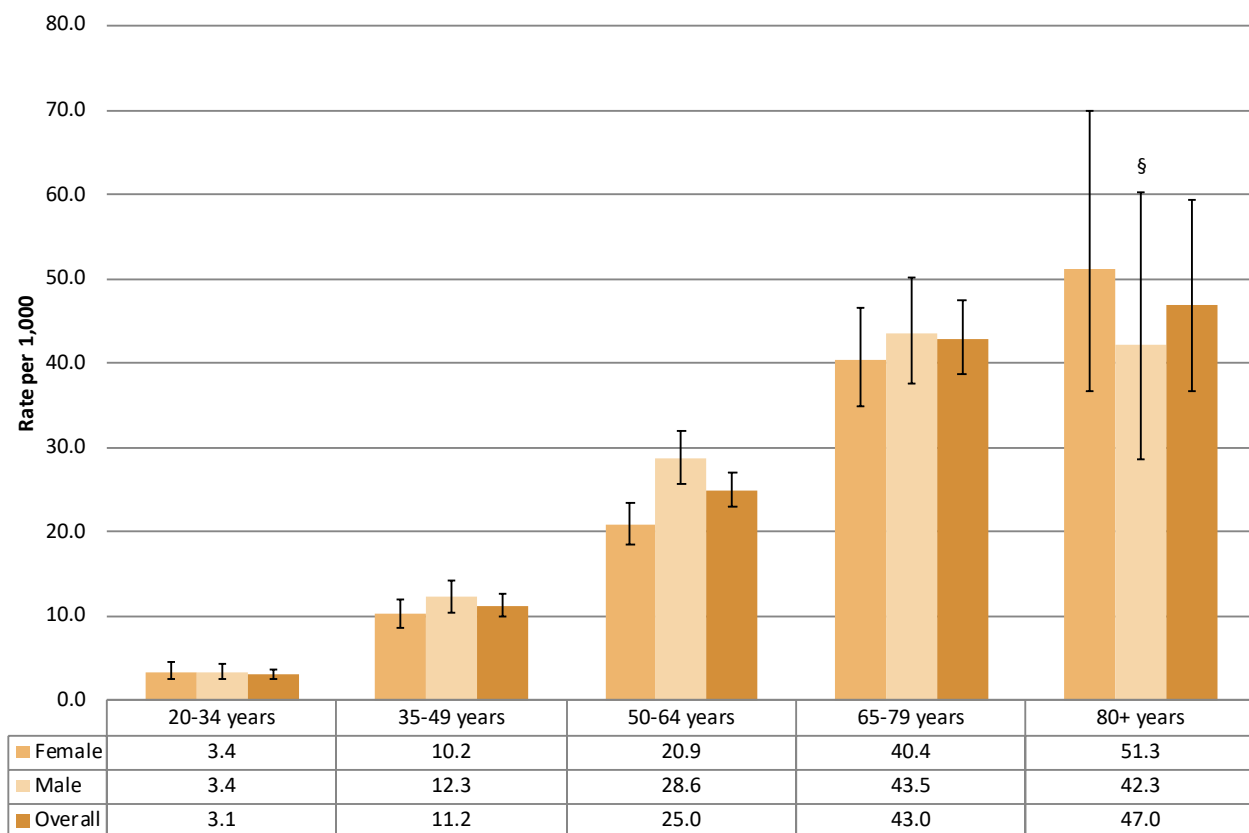
During 2016/17 there were 1,430 new cases of hypertension (incidence) in PEI. The rates of hypertension incidence were 15.8 per 1,000 Islanders (crude rate) and 18.6 per 1,000 Islanders (age-standardized rate).

### Age-Specific Hypertension Incidence

Hypertension incidence increased with age and peaked in male Islanders at 65-79 years of age and in female Islanders at 80 years of age and older. With the exception of Islanders between the ages of 50-64 years, no significant difference was detected in the incidence of hypertension between males and females.

The graphic below shows the age-specific incidence of hypertension in PEI overall and by sex in 2016/17. Rates were estimated using the methodology of the CCDSS.

### Age-Specific Hypertension Incidence by Sex, PEI, Ages 20+, 2016/17



§ Interpret incidence estimate with caution (CV>16.5)

## PREVALENCE OF HYPERTENSION

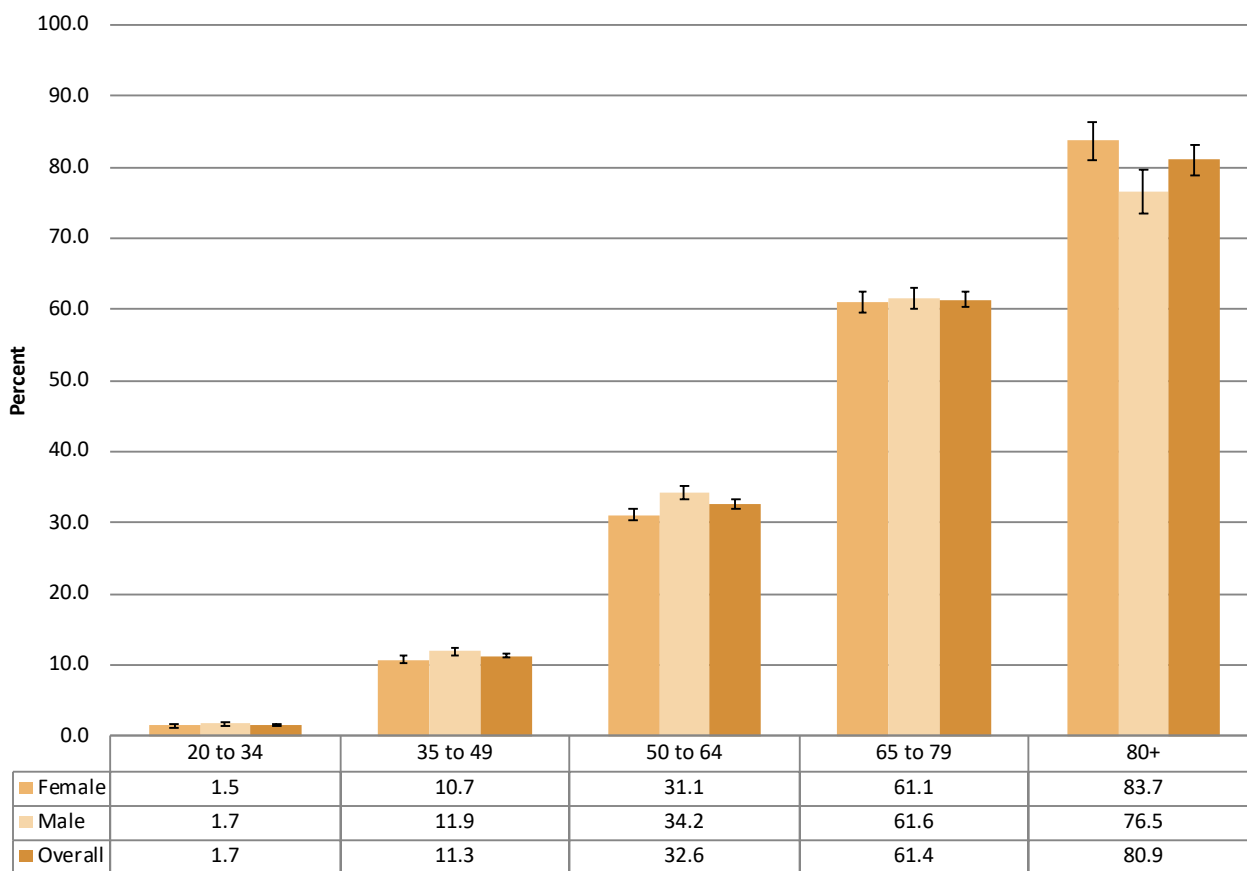
In 2016/17 there were 34,977 Islanders living with hypertension (prevalence). The estimates for hypertension prevalence were 28.2% (crude) and 24.7% (age-standardized).

### Age-Specific Hypertension Prevalence

Hypertension prevalence increased with age in both sexes. The prevalence of hypertension in males was significantly higher than in females for Islanders under 65 years of age, but significantly lower than females for Islanders aged 80 and above.

The graphic below shows the age-specific prevalence of hypertension in PEI overall and by sex in 2016/17. Rates were estimated using the methodology of the CCDSS.

### Age-Specific Hypertension Prevalence by Sex, PEI, Ages 20+, 2016/17

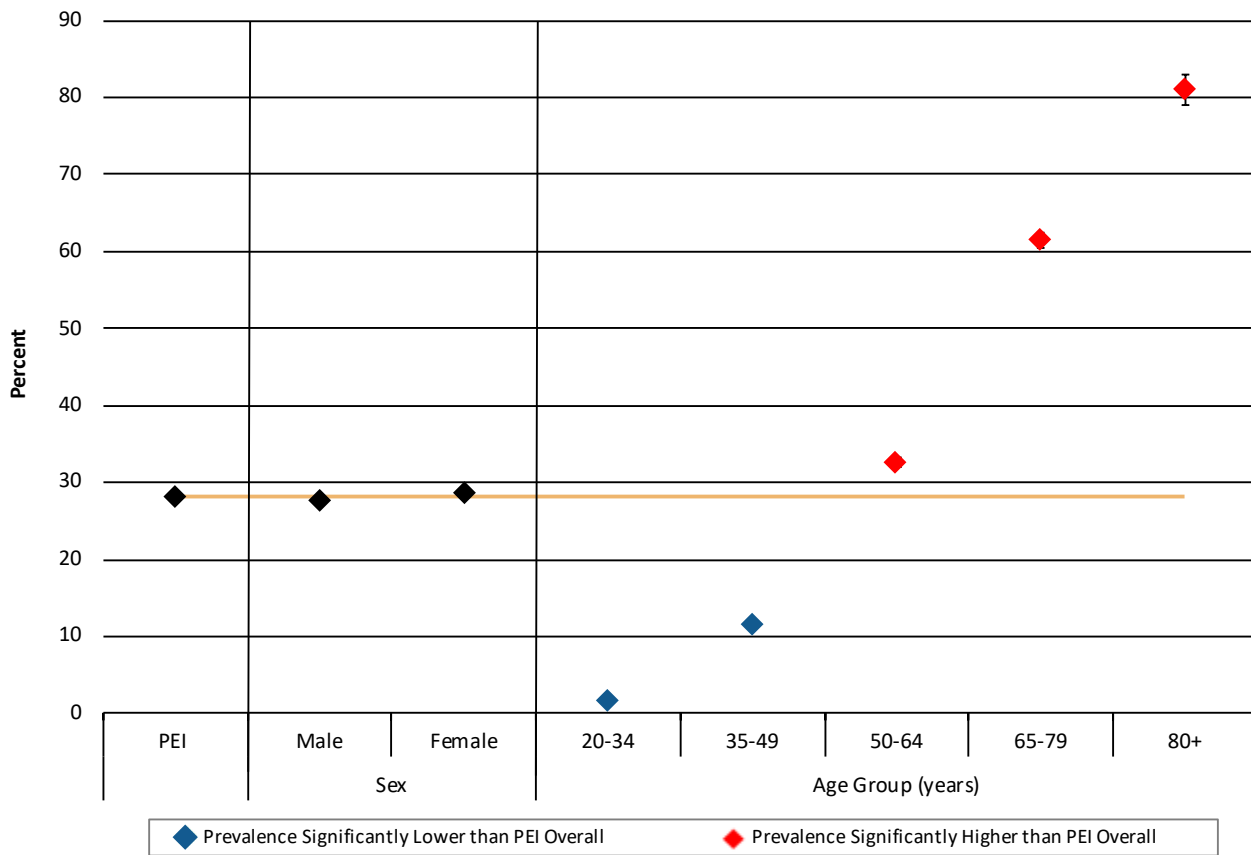


### Crude Prevalence of Hypertension

Compared to the average crude hypertension prevalence of 28.2% in PEI in 2016/17, significantly lower prevalence estimates were seen among Islanders less than 50 years of age and significantly higher prevalence estimates were seen among Islanders 50 years of age and older. Significant differences between the average hypertension prevalence and the prevalence of hypertension for each sex were not detected.

The graphic below shows the crude prevalence of hypertension for ages 20+ in 2016/17 in PEI, stratified by age and sex. Rates were estimated using the methodology of the CCDSS.

### Hypertension Prevalence, Crude Rates, PEI, Ages 20+, 2016/17

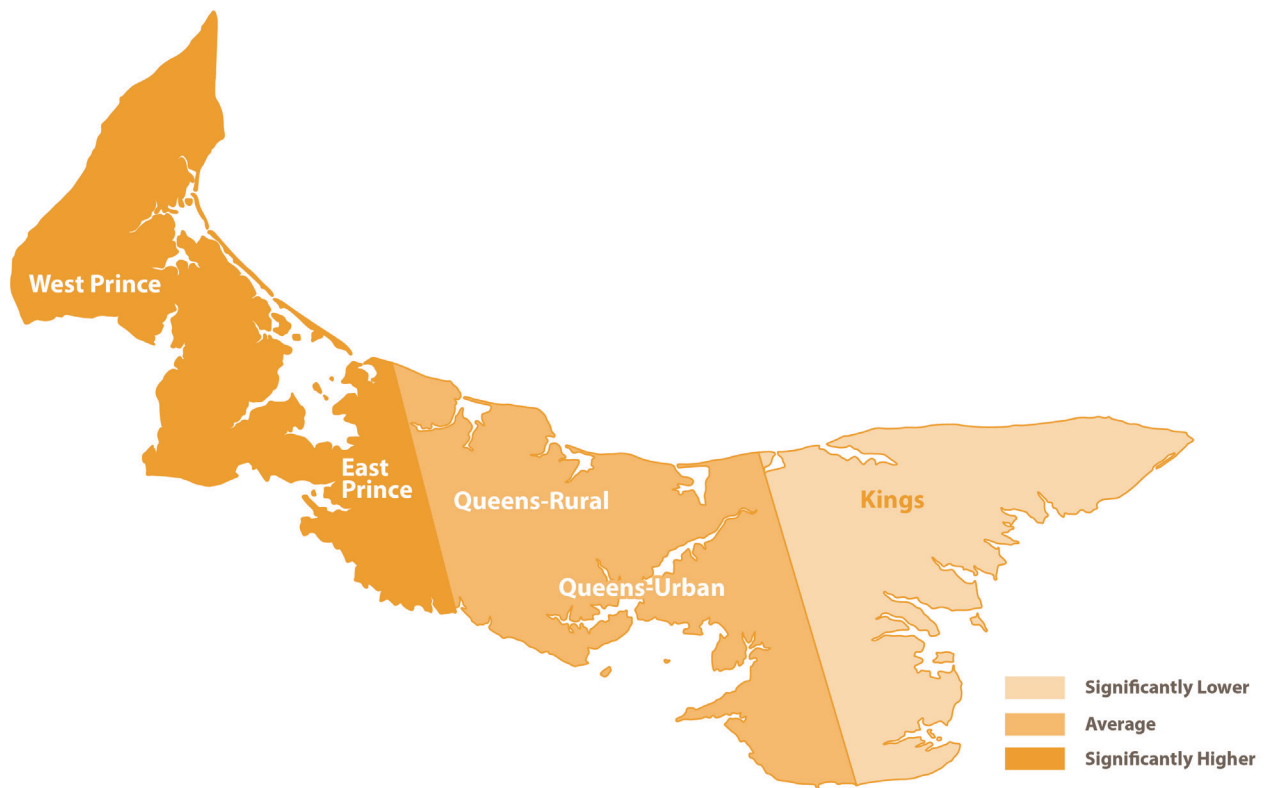


### Prevalence of Hypertension by Zone

There was a significant difference in the prevalence of hypertension in Islanders based upon the geographic area where they lived. When divided into five zones, the crude prevalence per zone in 2016/17 ranged from 26.0% in Queens Urban to 33.3% in West Prince. Islanders who resided in West Prince or East Prince had significantly higher prevalence of hypertension than Islanders overall. Islanders who resided in Queens Rural or Queens Urban had significantly lower prevalence of hypertension than Islanders overall. Differences in prevalence were not detected between Islanders who resided in Kings compared to all Islanders.

A map depicting the prevalence of hypertension per zone compared to the prevalence for PEI overall is shown below. Rates were estimated using the methodology of the CCDSS.

### Hypertension Prevalence by Zone, PEI, Ages 20+, 2016/17

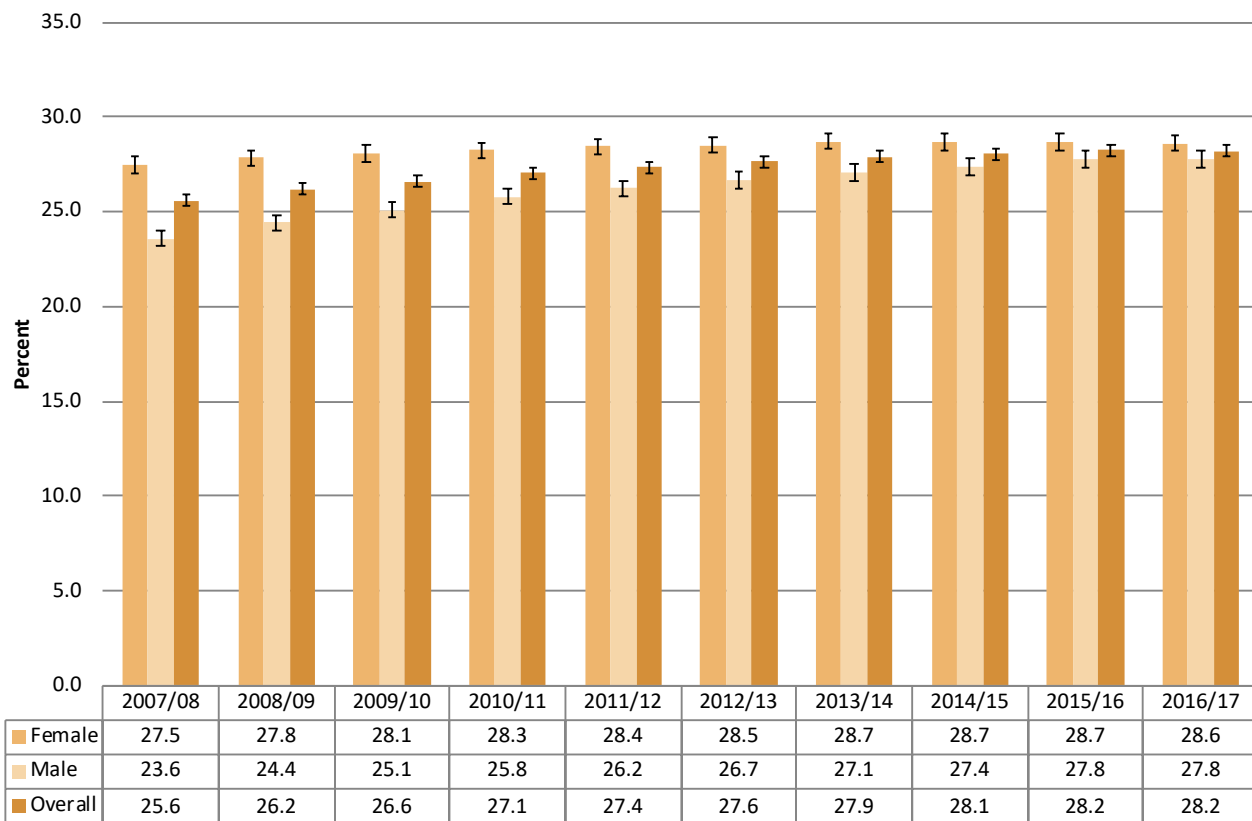


### Hypertension Prevalence Trends over Time

The burden of hypertension in Islanders had been increasing over time but has since plateaued. During the ten-year time period from 2007/08 to 2016/17, the crude prevalence of hypertension increased by 10%. The increasing trend existed for both sexes, but was more substantial among men; the crude prevalence of hypertension increased by 4% in women and by almost 18% in men.

The graphic below shows the crude prevalence of hypertension in PEI overall and by sex for ages 20+ from 2007/08 to 2016/17. Rates were estimated using the methodology of the CCDSS.

### Hypertension Prevalence by Sex and Year, Crude Rates, PEI, Ages 20+, 2007/08 - 2016/17

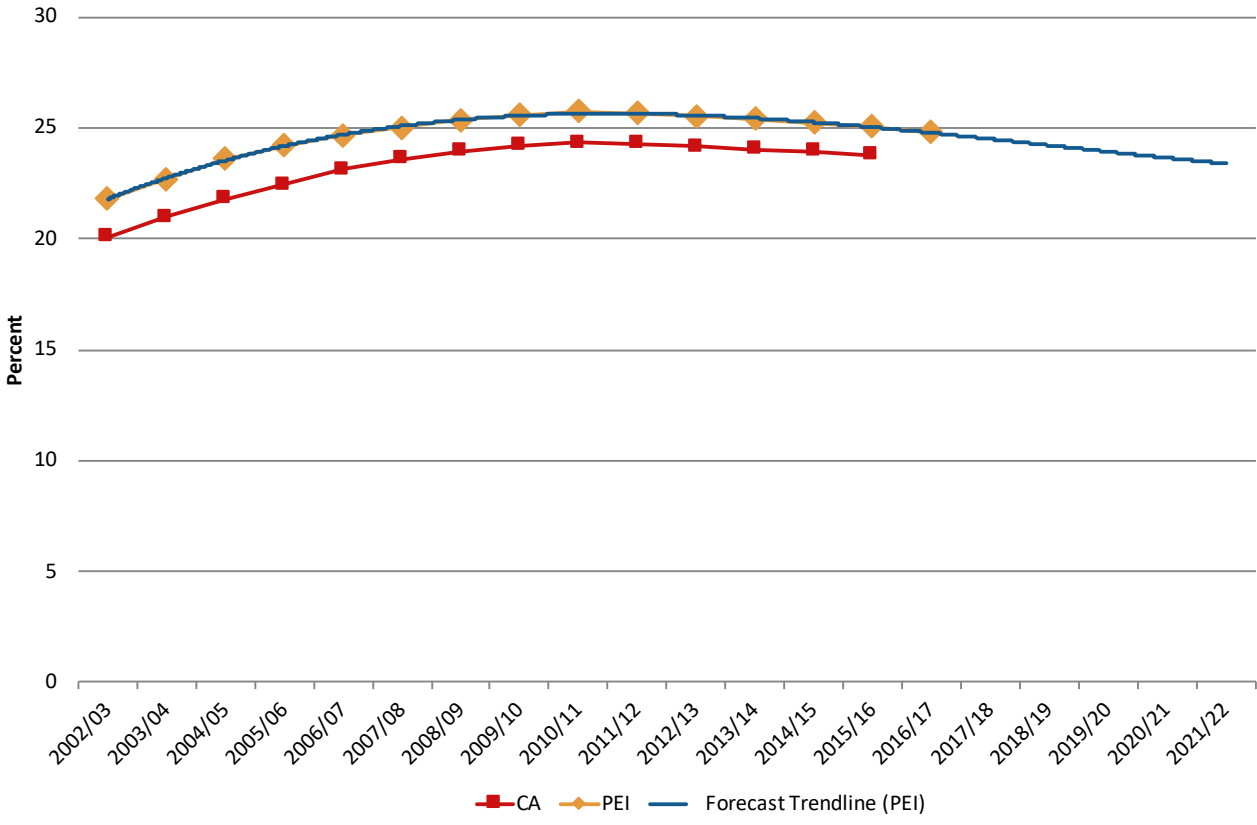




Standardizing for age, the percentage of people living with hypertension had been increasing over time, then plateaued, and has started to decrease for both PEI and Canada.<sup>6</sup> Compared to Canada, the percentage of people living with hypertension was significantly higher in PEI from 2002/03 to 2015/16.<sup>6</sup> The burden of hypertension in Islanders is expected to continue decreasing over the next five years. It is projected that in 2021/22, the age-standardized prevalence of hypertension in PEI will be less than 24%.

The graphic below shows the age-standardized prevalence of hypertension from 2002/03 to 2015/16 for Canada, 2002/03 to 2016/17 for PEI, and prevalence projections to 2021/22 for PEI. Rates for PEI were estimated using the methodology of the CCDSS and rates for Canada were obtained from the CCDSS.<sup>6</sup>

**Hypertension Prevalence, Age-Standardized Rates & Polynomial Forecast Trendline, PEI & Canada, Ages 20+, 2002/03 - 2021/22**



## MORTALITY

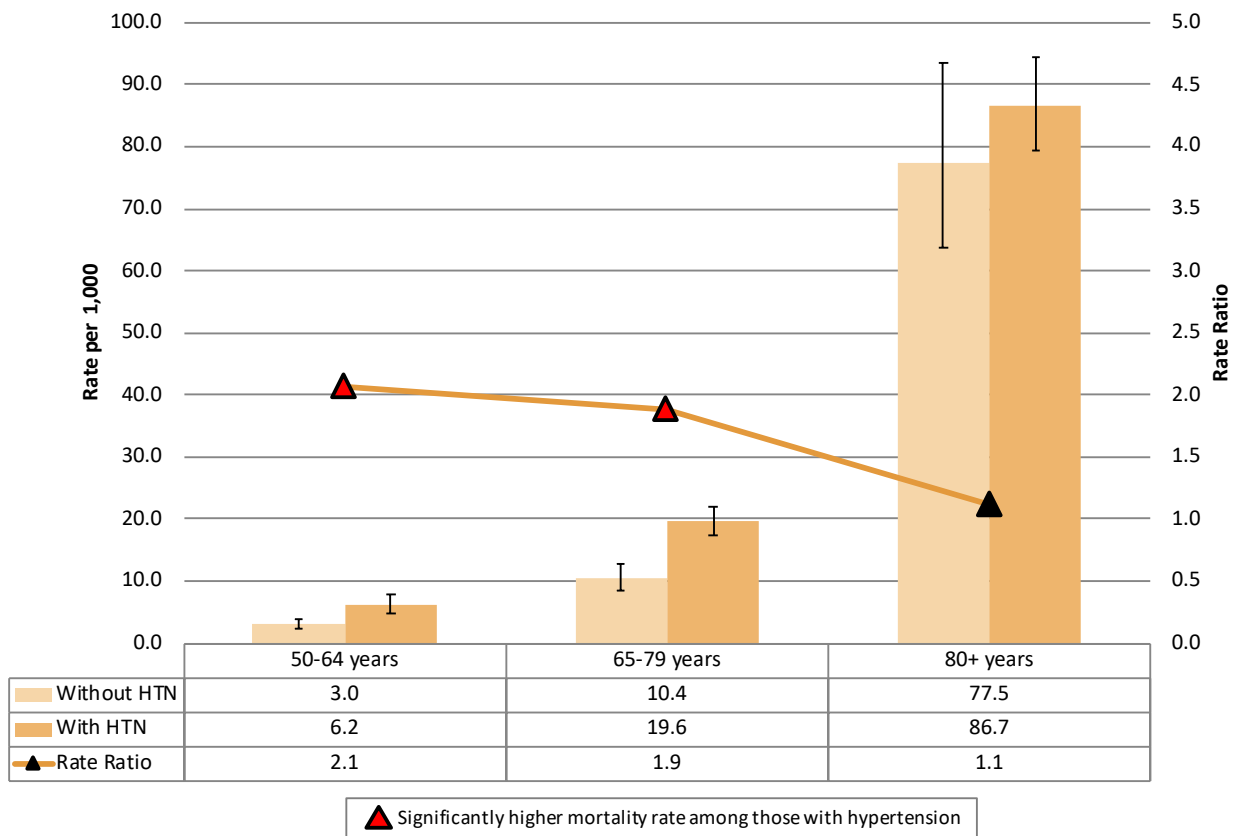
Hypertension reduces life expectancy by about 5 years and is currently ranked as the leading risk factor for death globally.<sup>5,7</sup> In 2016/17, the mortality rate for Islanders with hypertension was 1.6 times higher than for Islanders without hypertension.

### Age-Specific All-Cause Mortality

The difference in mortality rates between those with and without hypertension was largest among those of the ages 50 to 64 years, a two-fold difference, and then decreased with age. Among Islanders who were 80 years of age and older, a significant difference in mortality rate was not detected based upon hypertension status. The mortality rate ratio between Islanders with and without hypertension was lower than the ratio for all Canadians in 2015/16 (rate ratios of 1.4 and 1.9 respectively).<sup>6</sup>

The graphic below presents all-cause mortality among Islanders with and without hypertension by age group for 2016/17. Rates were estimated using the methodology of the CCDSS and data from vital statistics.

### Age Specific All-Cause Mortality Among People with and without Hypertension, PEI, Ages 50+, 2016/17

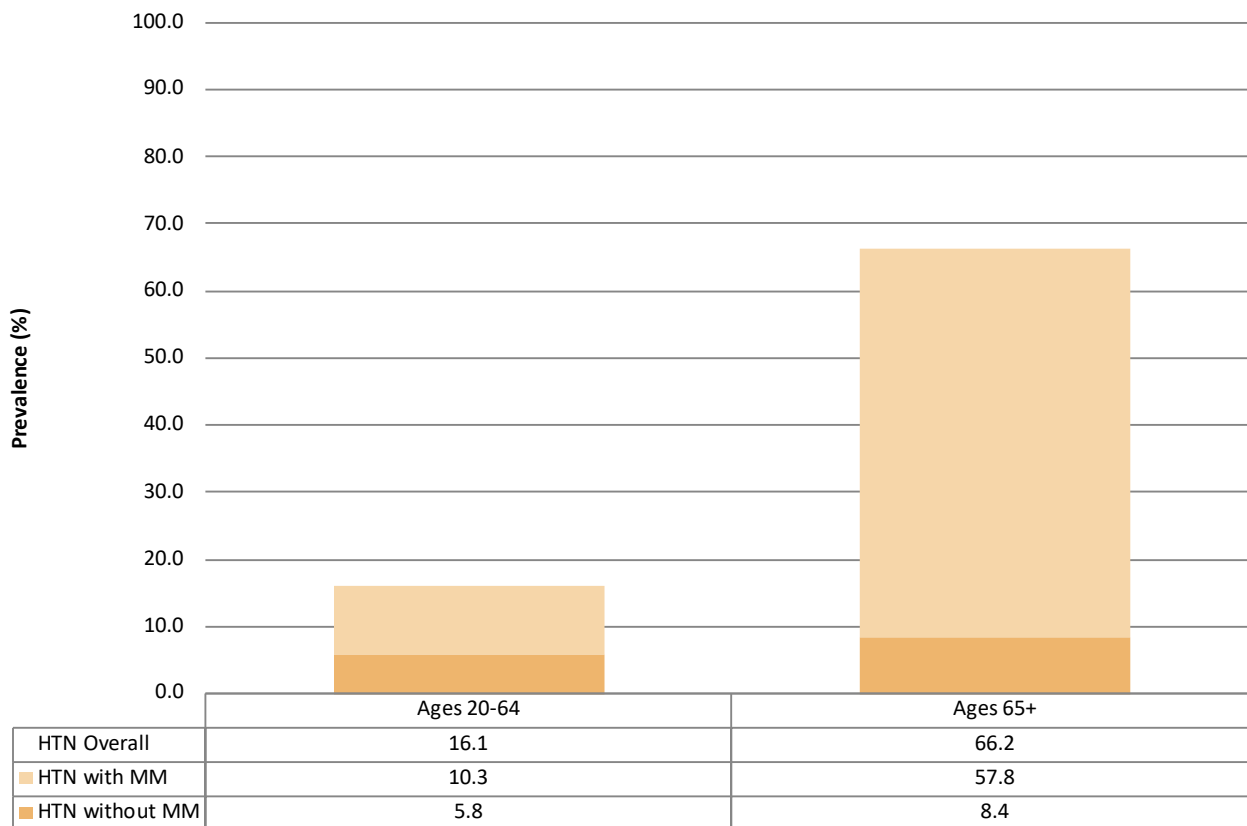


## HYPERTENSION AND MULTIMORBIDITY

Hypertension is associated with a high level of multimorbidity, defined as the presence of two or more disorders.<sup>8</sup> In 2016/17, 77% of hypertensive patients in PEI had at least one other chronic condition. The proportion of hypertensive Islanders that were living with multimorbidity increased with age. Almost 90% of hypertensive seniors were living with multimorbidity; compared to adults under the age of 65, where less than two-thirds were living with multimorbidity. The most common chronic conditions that coexisted with hypertension were osteoarthritis, diabetes, and mood and anxiety disorder.

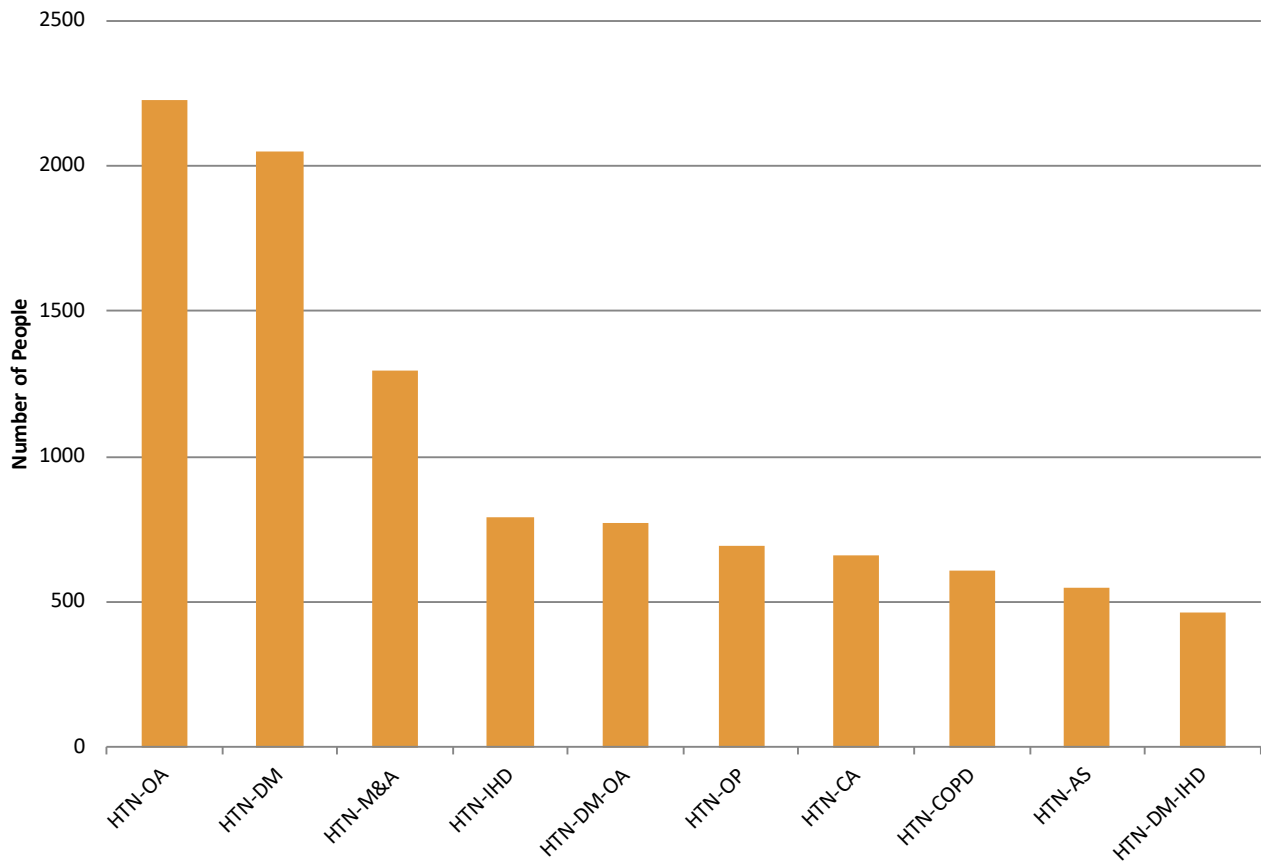
The graphic below presents the prevalence of hypertension with and without multimorbidity by age group for 2016/17.

### Prevalence of Hypertension with and without Multimorbidity, PEI, Ages 20+, 2016/17



The graphic below presents the most frequent multimorbidities among hypertensive Islanders for 2016/17.

### Frequency of Hypertension Multimorbidity, PEI, Ages 20+, 2016/17



**Morbidity abbreviations:**

- HTN - hypertension
- OA - osteoarthritis
- DM - diabetes mellitus
- M&A - mood and anxiety disorder
- IHD - ischemic heart disease
- OP - osteoporosis
- CA - cancer
- COPD - chronic obstructive pulmonary disease
- AS - asthma

## ECONOMIC COSTS

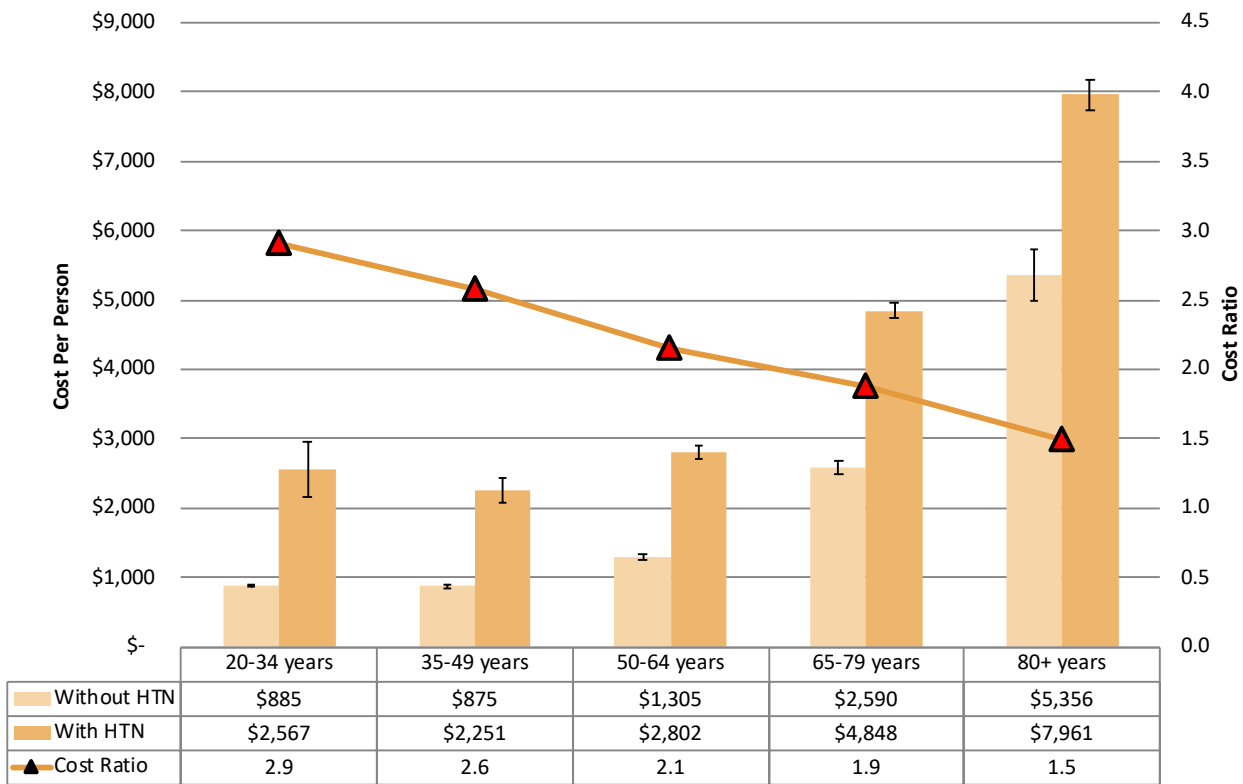
Hypertension accounts for a significant proportion of healthcare spending in Canada and is projected to continue increasing.<sup>9</sup> In PEI from 2012/13 to 2016/17, the average annual cost of hospital care, physician care, and drugs (for people 65 years of age and older) for Islanders with hypertension was estimated to be \$150 million, resulting in an average annual cost of \$4,390 per person. This per-person health care cost was about 3.5 times higher than the per-person cost for Islanders without hypertension.

### Age-Specific Health Care Costs Per Person

The average annual health care costs per person tended to increase with age for all Islanders; however, the differences between the per-person costs for Islanders with hypertension and those without hypertension decreased with age. For Islanders of the ages 20-24 years, health care costs per person were almost three times higher for those with hypertension than for those without hypertension. For Islanders 80 years of age and older, the health care costs per person for those with hypertension was 1.5 times higher than the costs for those without hypertension.

The graphic below presents the average age-specific health care costs per person for those living with hypertension compared to those living without hypertension for 2012/13 to 2016/17. Costs were estimated using the methodology of the CCDSS.

### Average Age-Specific Health Care Costs per Person Among Those with and without Hypertension, PEI, Ages 20+, 2012/13-2016/17



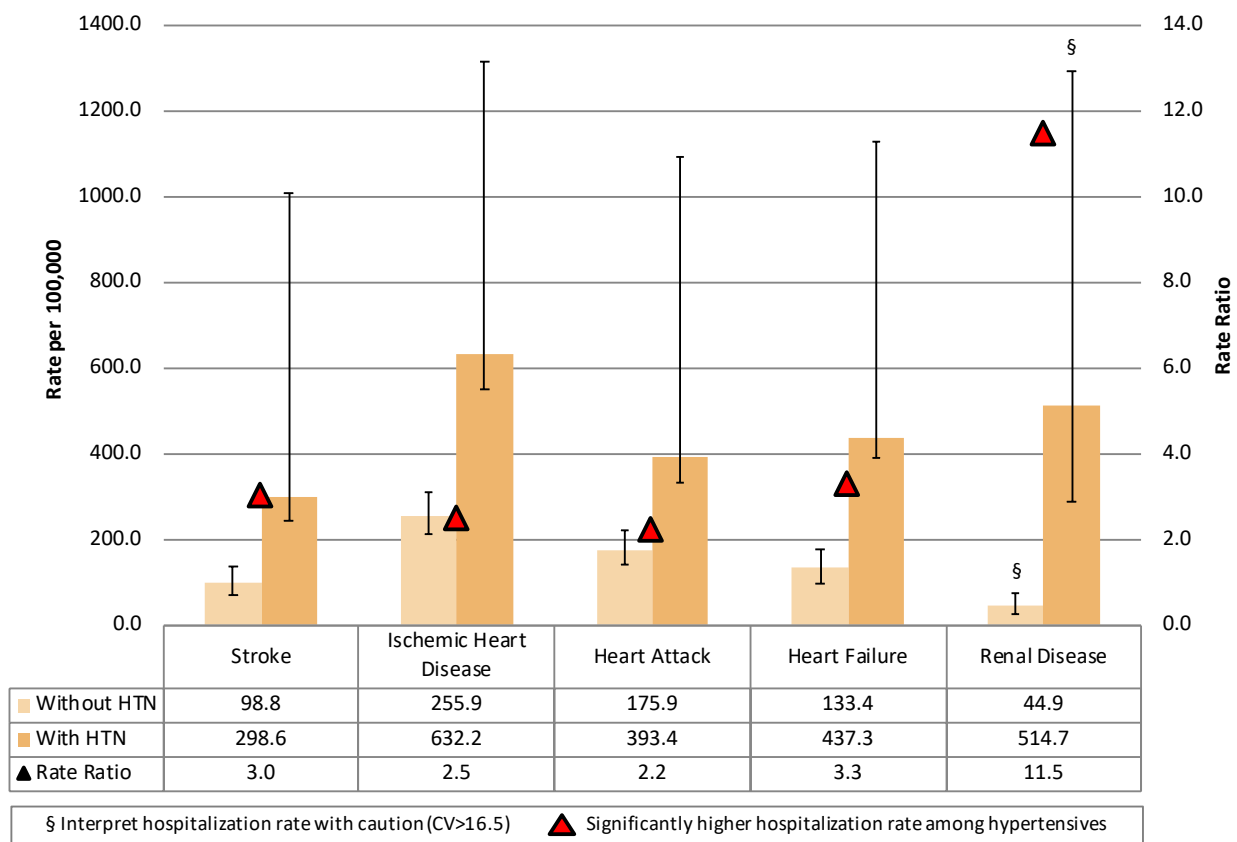
▲ Significantly higher cost per person among those with hypertension

## HEALTH COMPLICATIONS OF HYPERTENSION

Hypertension increases people’s risk for many health complications and is the single most important risk factor worldwide for the development of cardiovascular disease.<sup>10-12</sup> In 2016/17, Islanders with hypertension were almost twice as likely as those without hypertension to be hospitalized. In particular, Islanders with hypertension were more likely to be hospitalized with another cardiovascular condition than were those without hypertension; specifically, three times more likely to be hospitalized for stroke or heart failure, 2.5 times more likely for ischemic heart disease (narrowing of arteries that supply blood to the heart), and twice as likely for heart attack. The hospitalization rate for renal disease was also higher for Islanders with hypertension; however, these rates and ratios should be considered with caution due to the effect of small numbers on the accuracy of the estimations.

The graphic below presents the rates of hospitalization due to complications for those living with hypertension compared to those living without hypertension for ages 20+ for 2016/17. Rates were estimated using the methodology of the CCDSS.

### Hospitalization due to Complications Among People with and without Hypertension, Age-Standardized Rates, PEI, Ages 20+, 2016/17



**Note:** A person was included in a category if they had at least one hospitalization with a diagnosis code for that complication during 2016/17. People hospitalized with more than one complication were counted once in each category.

## RISK FACTORS FOR HYPERTENSION

There are numerous risk factors for hypertension, some of which can be managed and others which are beyond one's control. Family history of high blood pressure (genetic predisposition) and a person's age are non-modifiable risk factors.<sup>13</sup> Encouragingly, evidence suggests that healthy lifestyle factors and community-based approaches to reduce blood pressure can offset, at least to some extent, genetic predisposition towards hypertension.<sup>10,14</sup> Risk factors that are controllable and/or modifiable that have been attributed to developing hypertension include: unhealthy diet, obesity, physical inactivity, excessive alcohol consumption, smoking, stress, health conditions, and socio-demographic and economic characteristics.<sup>10,11,13,15,16</sup>

For this report, an examination of socio-economic characteristics and modifiable risk factors was conducted for Islanders living with hypertension compared to Islanders living without hypertension. Attention to social determinants of health and modifiable risk factors can be of benefit to decrease the risk of developing hypertension, can help control blood pressure among those with hypertension, and may mitigate the risk of subsequent health, particularly cardiovascular, complications.

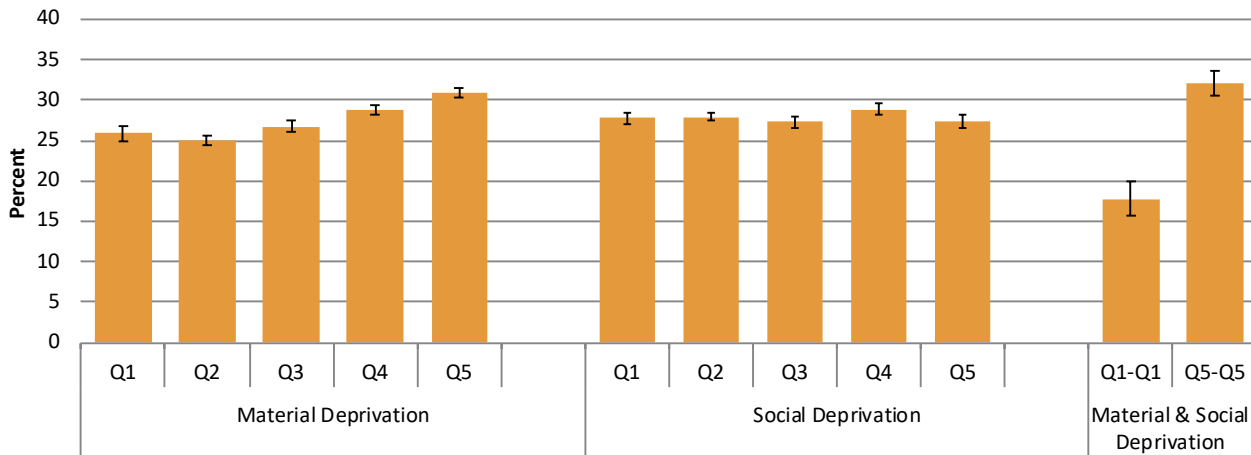
### Material and Social Deprivation

To measure and monitor social inequalities in health and wellness, an area-based deprivation index was developed for Québec and Canada (INSPQ).<sup>17</sup> Since its development, this deprivation index has been validated and used extensively in the field of public health throughout Canada.<sup>18</sup> It is made up of six socio-economic indicators selected from the Canadian Census that are divided into a material deprivation component and a social deprivation component. The material component reflects education, employment, and income, and the social component reflects marital status (being widowed, separated, or divorced), living alone, and being in a single-parent family.<sup>19</sup> The deprivation index is structured so that the fifth quintile (Q5) indicates most deprived, while the first quintile (Q1) indicates most privileged. The material and social components can be examined separately or jointly.

In 2016/17, the prevalence of hypertension among Islanders was significantly associated with the amount of deprivation in the community where they lived. With increasing material deprivation, significantly higher percentages of Islanders were living with hypertension. A significant association was not detected between hypertension and the social deprivation of the community in which they lived. When considered in combination, the burden of hypertension was significantly higher for people living in areas that had the highest levels of material and social deprivation (Q5-Q5, crude prevalence of 32.0%) compared to those living in areas that had the highest levels of material and social privilege (Q1-Q1, crude prevalence of 17.7%).

The graphic below shows the crude prevalence of hypertension for ages 20+ in 2016/17, stratified by material and social deprivation quintiles. Rates were estimated using the INSPQ deprivation index (2011) and the methodology of the CCDSS.

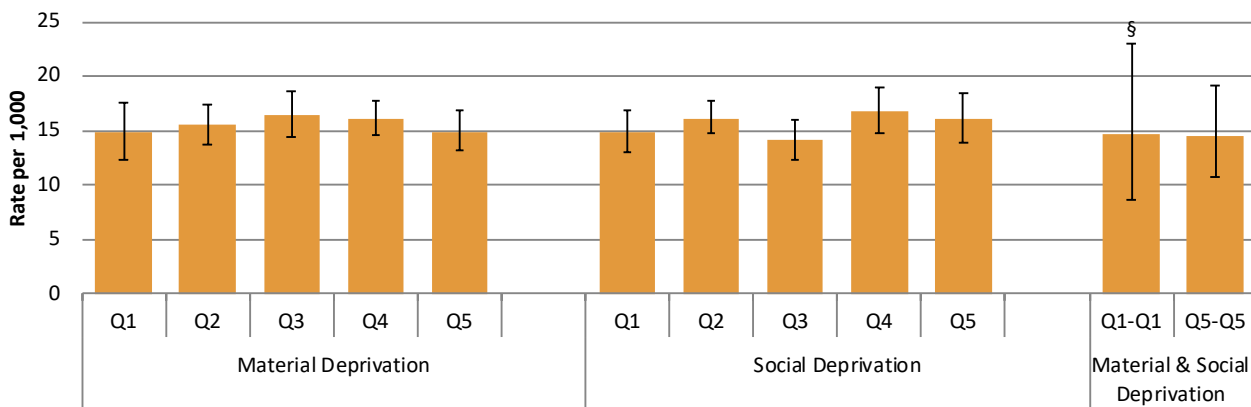
## Hypertension Prevalence by Material and Social Deprivation, Crude Rates, PEI, Ages 20+, 2016/17



In 2016/17, significant associations were not detected between the incidence of hypertension among Islanders and the amount of material and/or social deprivation in the community where they lived.

The graphic below shows the incidence of hypertension for ages 20+ in 2016/17, stratified by material and social deprivation quintiles. Rates were estimated using the INSPQ deprivation index (2011) and the methodology of the CCDSS.

## Hypertension Incidence by Material and Social Deprivation, Crude Rates, PEI, Ages 20+, 2016/17



§ Interpret incidence estimate with caution (CV>16.5)

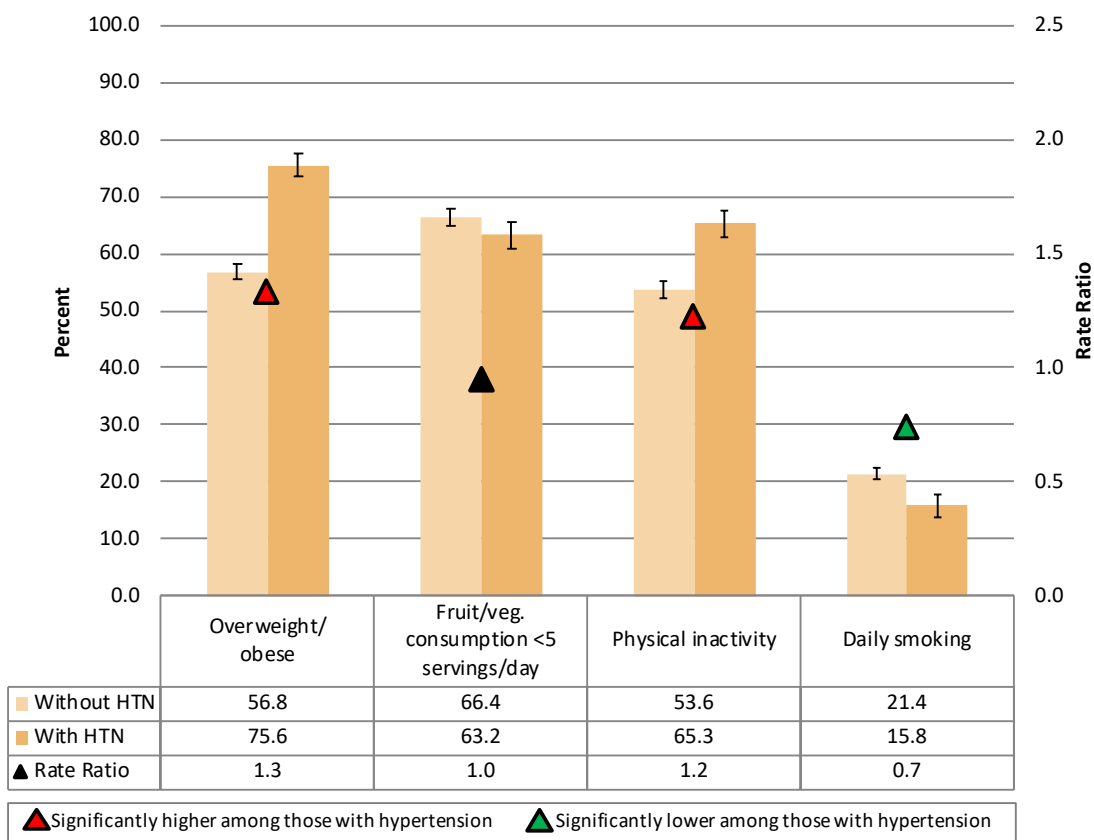


## Modifiable Risk Factors

From CCHS survey responses in 2001 to 2013/14, Islanders with hypertension were significantly more likely to be overweight or obese and to be physically inactive than were Islanders without hypertension. Specifically, being overweight or obese was 30% more likely and physical inactivity was 20% more likely among those with hypertension than those without hypertension. No significant association was found between hypertension status and the proportion of Islanders who consumed less than five servings of fruit or vegetables daily. In contrast, Islanders with hypertension were significantly less likely to smoke cigarettes on a daily basis than were those without hypertension (30% less likely).

The graphic below shows the prevalence of modifiable risk factors among people with and without hypertension in PEI for ages 20+ from 2001 to 2013/14. Rates were estimated using data from the CCHS.

### Modifiable Risk Factors Among People with and without Hypertension, PEI, Ages 20+, 2000/01 to 2013/14



## CONCLUSION

Hypertension is a highly prevalent condition, particularly as people age. Encouragingly, healthy lifestyle choices (e.g., increased physical activity, healthy eating, and obesity prevention) can reduce the risk of developing hypertension and the subsequent health complications. Greater promotion of primary hypertension prevention will not only reduce hypertension incidence and improve the quality of life of those diagnosed, it will also result in cost savings in the management of high blood pressure and the treatment of cardiovascular disease sequelae. Healthy public policies to create healthy environments and communities are required to encourage healthy choices in the places people work, live and play.<sup>16,20</sup> Consideration of social determinants of health in the design, implementation, and evaluation of hypertension prevention and control efforts will also reduce the health inequities among those diagnosed with high blood pressure.

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