

## Hospital Care for Heart Attacks Among First Nations, Inuit and Métis



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To lead the development and maintenance of comprehensive and integrated health information that enables sound policy and effective health system management that improve health and health care.

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# About the Canadian Population Health Initiative

The Canadian Population Health Initiative (CPHI) aims to synthesize key research findings on a given theme, present new data analyses on an issue and share evidence on what we know and what we do not know about what works from a policy and program perspective. In its reports, CPHI does not make recommendations but makes information available to support evidence-informed policy- and decision-making. The underlying goal of each report is to tell a story that will be of interest to policy- and decision-makers to advance thinking and action on population health in Canada.

This specific report, *Hospital Care for Heart Attacks Among First Nations, Inuit and Métis*, will be of particular interest to policy-makers, health system planners and practitioners with an interest in Aboriginal health issues, specifically hospital care and the delivery of cardiac services among First Nations, Inuit and Métis. It will also be of interest to non-governmental organizations and the research community, as well as to those who are interested in Aboriginal and rural health issues, cardiac health and/or health service delivery in Canada.



# Executive Summary

Appropriate and timely health care following a heart attack can reduce mortality and improve a survivor's quality of life, yet evidence suggests that socio-economically disadvantaged populations are less likely to undergo cardiac diagnostic and revascularization procedures—including in countries with universal medical coverage such as Canada and Sweden. Given that First Nations, Inuit and Métis are disproportionately represented among socio-economically disadvantaged populations, this report examines whether this pattern of a lower rate of cardiac procedures holds true for Canada's First Nations, Inuit and Métis.

In Canada, little is known about the incidence of heart attacks among First Nations, Inuit and Métis or the care that they receive to treat a heart attack, as information about patients' ethnicity is not recorded consistently across the country in hospital records. To overcome this challenge, an area-based approach was used to identify areas where a relatively high proportion of residents self-identified as First Nations and Inuit (known as high-First Nations and high-Inuit areas, respectively) and therefore fills an important gap in our knowledge of whether disparities exist in rates of hospitalized heart attacks (new cases), use of cardiac procedures and hospital outcomes in high-First Nations and high-Inuit areas compared with other areas in Canada. This report also showcases analyses related to heart health for Métis from two recent provincial studies, and it highlights and synthesizes examples of promising practices for improving the hospital experiences and health outcomes of First Nations, Inuit or Métis patients who have suffered a heart attack.

## First Nations Areas

Residents of areas with a relatively high proportion of First Nations (known as high-First Nations areas) are more likely to be admitted to acute care hospitals for a heart attack and to be admitted earlier in life than residents of low-Aboriginal areas. They tend to present at hospital with more comorbid conditions, yet they are less likely to undergo coronary angiography and revascularization procedures (in particular percutaneous coronary intervention) during their episode of care, even after controlling for factors such as age, sex, comorbidities and urban/rural residence. However, despite higher rates of heart attacks and comorbidities and lower rates of cardiac procedures, hospital outcomes for heart attack patients, such as 30-day in-hospital mortality, are similar for patients from high-First Nations and low-Aboriginal areas.

## Inuit Areas

Residents of areas with a relatively high proportion of Inuit (known as high-Inuit areas) are less likely to be admitted to an acute care hospital for a heart attack than residents of remote low-Aboriginal areas. As well, all residents of high-Inuit areas live more than 500 km away from hospitals that have on-site revascularization facilities. Despite the distance barrier, rates of diagnostic and revascularization procedures are similar for heart attack patients from high-Inuit and remote low-Aboriginal areas. The small number of hospital admissions for heart attacks in acute care hospitals limits our ability to provide a complete profile of the hospital experiences of heart attack patients from high-Inuit areas.

## Métis

The area-based methodology used for First Nations and Inuit areas cannot be used to identify areas where there is a relatively high proportion of Métis, as less than 10% of Métis live in areas that meet the Geozones definition of a high concentration area. Instead of presenting new analyses for Métis, this report showcases recent analyses from the Manitoba Centre for Health Policy and Ontario's Institute for Clinical Evaluative Sciences, in which provincial Métis registries were linked to hospital records to examine the health and health service use of Métis at the individual level in these provinces. While these studies are not directly comparable, they do highlight that Métis have a higher risk for and higher rates of heart disease than their provincial counterparts, and that Manitoban Métis patients are more likely to receive a coronary artery bypass graft than other Manitobans.

## Interventions to Support Aboriginal Peoples: From Prevention to Treatment

Building on the results of the data analysis, the final chapter of this report reviews Canadian and international research on interventions to identify effective or promising approaches to health service organization and delivery that support Aboriginal populations in dealing with chronic disease. This scan of interventions found that relationship dynamics between patients and providers, and their communities, are the foundation for many strategies and that building relationships that address geographic and cultural barriers are important to consider in the delivery of health care services.

## Conclusion

The results presented in this report highlight that disparities exist in rates of heart attacks and hospital experiences of heart attack patients from high-Aboriginal and low-Aboriginal areas. There continues to be a need to further explore disparities in treatment and care for heart attacks among Aboriginal and non-Aboriginal patients in Canada. In particular, future qualitative and quantitative research could more fully explore treatment interventions beyond diagnostic and revascularization procedures in acute care settings, as well as longer-term outcome indicators that would provide a more comprehensive picture of the care pathways of, equity in access to and receipt of cardiac care for First Nations, Inuit and Métis patients with heart disease.



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Please note that the analyses and conclusions presented in this report do not necessarily reflect those of the individual members of the CPHI Council, the peer reviewers or their affiliated organizations.

# Introduction

Appropriate and timely health care following an acute myocardial infarction (AMI), more commonly referred to as a heart attack, can reduce mortality and complications resulting from the heart attack, as well as improve a survivor's quality of life by reducing debilitating symptoms and disease progression.<sup>1–3</sup>

In Canada, little is known about the incidence of heart attacks among First Nations, Inuit and Métis or the care they receive to treat a heart attack, although it is known that Aboriginal populations have lower overall life expectancy, higher AMI mortality and higher rates of risk factors for heart diseases than other Canadians (see Appendix B).<sup>4–6</sup> The historical experiences of Canada's Aboriginal populations, as well as many ongoing environmental and socio-economic contexts, shape their social determinants of health (such as income, education, food security and housing);<sup>7</sup> these factors can create barriers to adequate, timely and culturally appropriate health care.<sup>7, 8</sup>

Aboriginal peoples are disproportionately represented among socio-economically disadvantaged populations.<sup>9, 10</sup> Various Canadian and international studies have shown that socio-economically disadvantaged populations who are admitted to hospital for a heart attack are less likely to undergo treatments for heart attacks that restore blood flow to the heart by removing or bypassing blockages (that is, revascularization procedures)—including in countries with universal medical coverage such as Canada and Sweden.<sup>11–17</sup> Further, an Australian study showed lower rates of revascularization procedures among Aboriginal and Torres Strait Islander cardiac care patients compared with other patients.<sup>18</sup> What is not known is whether this pattern of lower rates of revascularization procedures holds true for Canada's First Nations, Inuit and Métis.

This report aims to fill an important gap in our knowledge of cardiac health among First Nations, Inuit and Métis and more specifically of whether disparities exist in the rate of heart attacks and in treatment-related factors and outcomes among First Nations, Inuit and Métis compared with others in Canada. A large challenge in reporting on hospitalizations and hospital treatments in Aboriginal populations in Canada is that information about patients' ethnicity is not recorded consistently across the country in hospital records. To overcome this challenge, an area-based approach, such as the Geozones method, has been used in Canada<sup>19, 20</sup> to identify patients living in areas where a relatively high proportion of residents self-identified as First Nations and Inuit (known as high-First Nations and high-Inuit areas, respectively).

This report uses this area-based approach to examine whether disparities exist in rates of hospitalized heart attacks (new cases), use of cardiac procedures and hospital outcomes in high–First Nations and high-Inuit areas compared with other areas in Canada (see chapters 1 and 2). The area-based methodology used for First Nations and Inuit areas cannot be used to identify areas where there is a relatively high proportion of Métis; instead, this report showcases recent analyses on the heart health of Métis from the Manitoba Centre for Health Policy and Ontario’s Institute for Clinical Evaluative Sciences (see Chapter 3). This report also highlights and analyzes a range of Canadian and international interventions aimed at improving the experiences of First Nations, Inuit and Métis patients living with chronic conditions such as heart disease (see Chapter 4).

A range of treatment options is available for patients who have had a heart attack, and this report is not designed to report on all of them. The focus of this report is on diagnostic and revascularization procedures for the treatment of heart attacks in acute care hospitals, as well as treatment-related factors such as comorbid conditions, distance to receive treatment and hospital outcomes for heart attack patients. Treatment interventions for heart attacks in many cases also involve pharmacotherapy, counselling and advice on behavioural factors, and ongoing management of coronary heart disease through the primary health care system; these components are not included in this report due to limited availability of pan-Canadian information, in particular for First Nations, Inuit and Métis.

## Does CIHI Have Other Work Related to This Topic?

Readers of this report may be interested in the following:

- *Obesity in Canada* (2011), Chapter 3: Prevalence Among Aboriginal Populations
- *Health Indicators 2010* (2010), In Focus: Measuring Disparities in the Health System
- *Mentally Healthy Communities: Aboriginal Perspectives* (2009)
- *Improving the Health of Canadians* (2004), Chapter 4: Aboriginal Peoples’ Health
- *Seven Years Later: An Inventory of Population Health Policy Since the Royal Commission on Aboriginal Peoples (1996–2003)* (2004)

Electronic copies of all of these reports can be accessed free of charge on CIHI’s website at [www.cihi.ca/cphi](http://www.cihi.ca/cphi).



**Chapter 1**  
Hospital Care for Heart Attacks in  
First Nations Areas



## Key Findings

Compared with residents of low-Aboriginal areas

- Residents of high-First Nations areas are more likely to experience a heart attack and to do so at a younger age; they are also admitted to hospital with more comorbid conditions.
- Residents of high-First Nations areas are less likely to live near hospitals that have revascularization capacity.
- Heart attack patients from high-First Nations areas are less likely to receive cardiac angiography and revascularization procedures (in particular percutaneous coronary intervention); this pattern persists after controlling for patient and clinical factors.
- Heart attack patients from high-First Nations areas have similar risk-adjusted in-hospital mortality rates.

## Introduction

First Nations are the largest Aboriginal group in Canada, accounting for 60% of the Aboriginal population in 2006 (almost 700,000 people self-identified as First Nations in the 2006 Census).<sup>21</sup> The burden of coronary heart disease among First Nations is high, with heart attack deaths considerably higher in First Nations than in non-Aboriginal Canadians (25% higher among First Nations men and 55% higher among First Nations women).<sup>5</sup> First Nations are at an increased risk of coronary heart disease compared with other Canadians, in part due to higher rates of smoking, obesity, physical inactivity and diabetes (see Appendix B).

This chapter examines multiple aspects of the hospital experience and investigates whether disparities in hospitalization, use of cardiac procedures and in-hospital outcomes exist between residents living in high-First Nations areas and residents of low-Aboriginal areas who were admitted to an acute care hospital for a heart attack.<sup>i</sup>

i. The unit of analysis in this report is an episode of care, which refers to all continuous acute care hospitalizations for AMI, including transfers, procedures performed during the stay (in acute care hospitals, same-day surgery facilities or catheterization laboratories) and discharge information after treatments. For details on the episode-building methodology, please visit [www.cihi.ca/indicators](http://www.cihi.ca/indicators).

## Overview of Data Sources, Methodology and Limitations

Canadian data on admissions for heart attacks and use of cardiac procedures in acute care hospitals was obtained from the Discharge Abstract Database and the National Ambulatory Care Reporting System from the Canadian Institute for Health Information (CIHI) and the Alberta Ambulatory Care Database from Alberta Health and Wellness. Given the small number of heart attack cases in high-First Nations areas, data was pooled for fiscal years 2004–2005 to 2010–2011. Quebec data was excluded because the six-digit postal codes necessary to identify a patient's place of residence were not available for analysis.

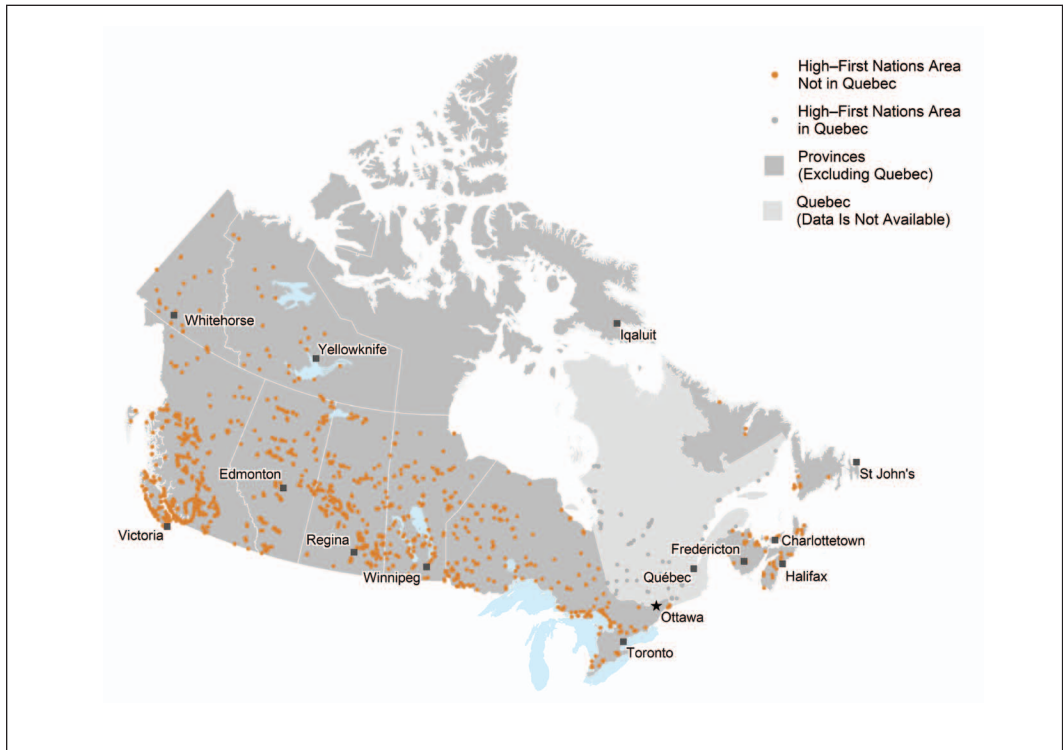
As the hospitalization records in the Discharge Abstract Database do not contain information to directly identify First Nations patients, an area-based methodology was used to distinguish between patients who live in areas where the proportion of First Nations individuals is high (that is, where one-third or more of residents are Aboriginal who predominantly self-identify as First Nations) and patients who live in areas where the proportion of Aboriginal peoples is low (that is, where less than one-third of residents self-identify as Aboriginal). In 2006, approximately half (48%) of the First Nations population in Canada lived in the 2,066 dissemination areas identified as high-First Nations areas (Figure 1). On average, three-quarters (75%) of the 415,980 people in these areas self-identified as First Nations (see Appendix D). Around two in five (43%) high-First Nations dissemination areas (representing 825 individual dissemination areas) were located in on-reserve census subdivisions.

The results in this study should not be generalized to all First Nations, given that Quebec hospitalization records could not be included and given that approximately half of the First Nations population in Canada does not live in areas where the proportion of Aboriginal peoples was considered high. In particular, while a large proportion of First Nations live in urban areas, they are underrepresented in this analysis because relatively few urban areas meet the definition of a high concentration area, which requires at least 33% of residents to be Aboriginal. Further, area-based approaches<sup>22</sup> have been shown to underestimate disparities between groups when compared with individual-level approaches, so using an area-based methodology as a proxy for identification may underestimate the disparities in AMI event rates and use of cardiac procedures between First Nations and others in Canada.

Further details on the area-based coverage and methodology used in this chapter can be found in appendices A and D.

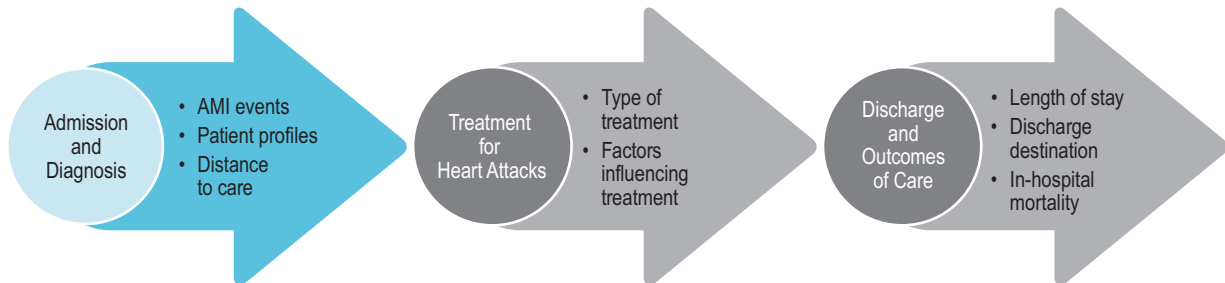


Figure 1: Distribution of High-First Nations Areas, Canada, 2006



Source  
Census, 2006, Statistics Canada.

## Results



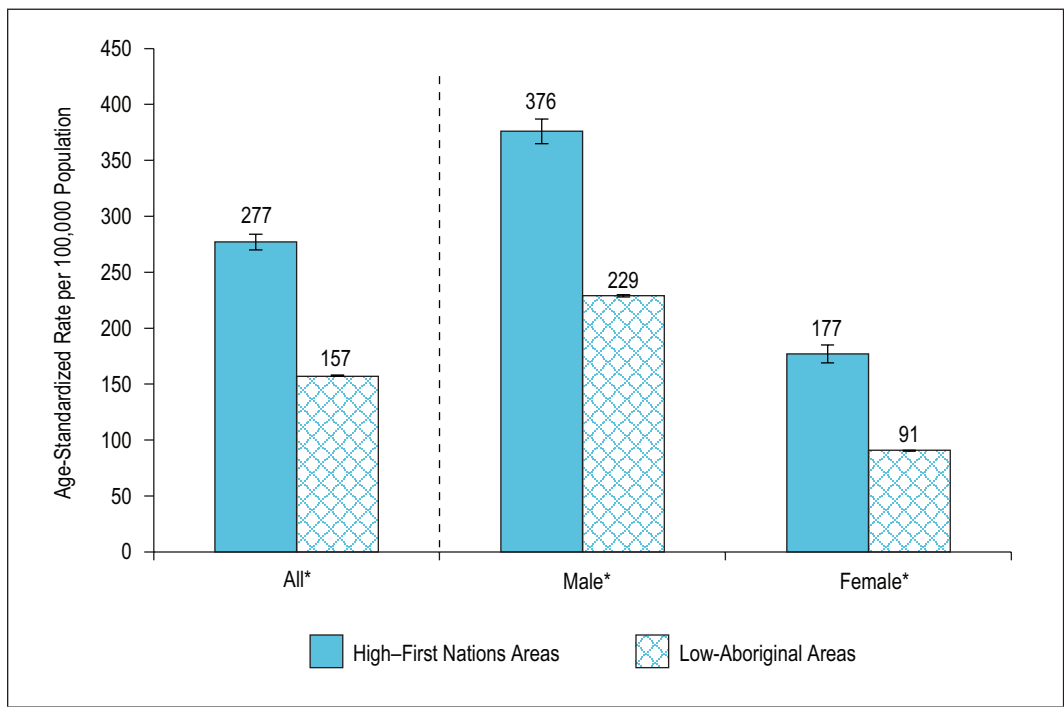
## Admission and Diagnosis

This section provides rates of hospitalized heart attacks (new cases) as well as an overview of the demographics (age, sex), clinical profiles (comorbid conditions) and distance travelled to receive cardiac care for patients admitted to an acute care hospital for a heart attack. These factors have been presented to better understand the factors that may contribute to the hospitalization and treatment of heart attacks for residents from high-First Nations areas and low-Aboriginal areas.

### Heart Attack Rate Higher in High-First Nations Areas

The rate of hospitalized new AMI events (see AMI Event Definition on page 9) was 76% higher for residents from high-First Nations areas than for residents who lived in low-Aboriginal areas (age-standardized rates of 277 and 157 per 100,000, respectively; see Figure 2). Among residents of both high-First Nations and low-Aboriginal areas, nearly two-thirds of heart attack events occurred in men, and men were more than twice as likely as women to be admitted to hospital for a heart attack (Figure 2; see Appendix C).

**Figure 2: Hospitalized AMI Event Rates by Sex, Adults Age 20 and Older, 2004–2005 to 2010–2011**



**Notes**

\* Significantly different from low-Aboriginal areas ( $p < 0.05$ ).

Error bars indicate 95% confidence intervals.

Rates have been age-standardized to the population that identified as First Nations in the 2006 Census.

Rates do not include Quebec data due to differences in data collection.

**Sources**

Discharge Abstract Database, 2004–2005 to 2010–2011, Canadian Institute for Health Information; Census, 2006, Statistics Canada.

## Younger Heart Attack Patients in High–First Nations Areas

At the time of admission, there was a seven-year difference in the median age of heart attack patients from high–First Nations and low-Aboriginal areas (age 64 versus age 71, respectively). The age-specific rates were almost twice as high among those age 45 to 74 for residents from high–First Nations areas compared with those from low-Aboriginal areas, with the gap declining after age 75. Half (50%) of patients from high–First Nations areas were younger than age 65 compared with only one-third (37%) of patients from low-Aboriginal areas (see Appendix C).

## Patients From High–First Nations Areas More Likely to Present With Multiple Comorbidities

The overall health of heart attack patients, as measured by the presence of comorbid conditions in this study, helps to explain disparities in the rate of heart attacks between patients from high–First Nations and low-Aboriginal areas; it has also been shown to influence the type of treatment received, recovery time and hospital outcomes.<sup>23, 24</sup>

Heart attack patients from high–First Nations areas were more likely to have at least one other health condition that was comorbid to their AMI when they were admitted to the hospital than patients from low-Aboriginal areas (age-standardized percentages of 55% and 46%, respectively; see Table 1). For heart attack patients from high–First Nations areas, the most common comorbid conditions were diabetes (39%) followed by heart failure (11%). Diabetes was more likely to be present as a comorbid condition in heart attack patients from high–First Nations areas than low-Aboriginal areas (39% versus 27%, respectively).

A range of initiatives currently under way is designed to manage the prevention and treatment of chronic conditions in communities that have reduced access to health care professionals. The SLICK program is one example of this screening activity, which—in managing comorbid conditions—is part of integrated care for heart attacks (see Case Study on page 10 and Chapter 4).

### AMI Event Definition

**Acute myocardial infarction (AMI) event** is defined as 1) the first hospitalization where the most responsible diagnosis is an AMI or 2) a subsequent hospitalization for an AMI that occurred more than 28 days after the admission for the previous AMI in a given year. Thus, in this study, a patient admitted for two AMIs within 28 days was counted as one AMI event, while a single person may have had more than one AMI event during the study period.

Table 1: Heart Attack Patients With Comorbid Conditions at the Time of Admission, Adults Age 20 and Older, 2005–2006 to 2010–2011 (Age-Standardized Percentage)

	High–First Nations Areas	Low-Aboriginal Areas
<b>Number of Comorbidities</b>		
One or More	54.5*	46.1
Two or More	18.5	15.8
<b>Individual Comorbidity</b>		
Diabetes	39.3*	27.4
Heart Failure	11.3	11.4
Cardiac Dysrhythmia	6.2	6.8
Renal Disease	4.6	5.1
Shock	1.9	1.7
Hypertension	3.8*	4.7
Chronic Obstructive Pulmonary Disease	3.2	2.7
AMI in the Preceding Year	6.6*	5.3

**Notes**

\* Significantly different from low-Aboriginal areas ( $p < 0.05$ ).

All percentages in the table have been age-standardized to the age distribution of the high–First Nations AMI patient population.

Results are based on six years of data to allow for the calculation of AMI in the Preceding Year.

See Appendix A for further details on specific comorbid conditions.

Rates do not include Quebec data due to differences in data collection.

**Sources**

Discharge Abstract Database, 2004–2005 to 2010–2011, Canadian Institute for Health Information; Census, 2006, Statistics Canada.

## Case Study

### Evaluation results of mobile screening initiatives that intervene before contact with acute care services suggest reduced need for emergency department care by dealing with risk factors

The **SLICK (Screening for Limb, I-Eye, Cardiovascular and Kidney Complications [of type 2 diabetes])** program provides Alberta First Nations who have diabetes with an opportunity to be screened for complications from the disease. Through the use of mobile labs, which are staffed by First Nations or people with Aboriginal-specific training, the program aims to facilitate implementation of Canada's clinical practices guidelines and promote community-based care. As part of SLICK, both the program participants and their primary care providers receive screening results, and the participants receive diabetes education. Among participants, reduced body mass index and improved knowledge about the management of diabetes were observed. The evaluation of the program also found a reduction in emergency department visits as well as in service delivery costs.<sup>25</sup>

## Residents of High–First Nations Areas More Likely to Travel Longer Distances to Access Cardiac Care

Heart attacks are acute events that require prompt care; any delays in treatment can affect the severity and complexity of the heart attack as well as a patient's suitability for certain cardiac procedures<sup>26, 27</sup> (see Why Distance Matters below). The estimated distance between the patient's place of residence and the location of the nearest hospital was used to examine whether distance is a key barrier to accessing the required cardiac care.

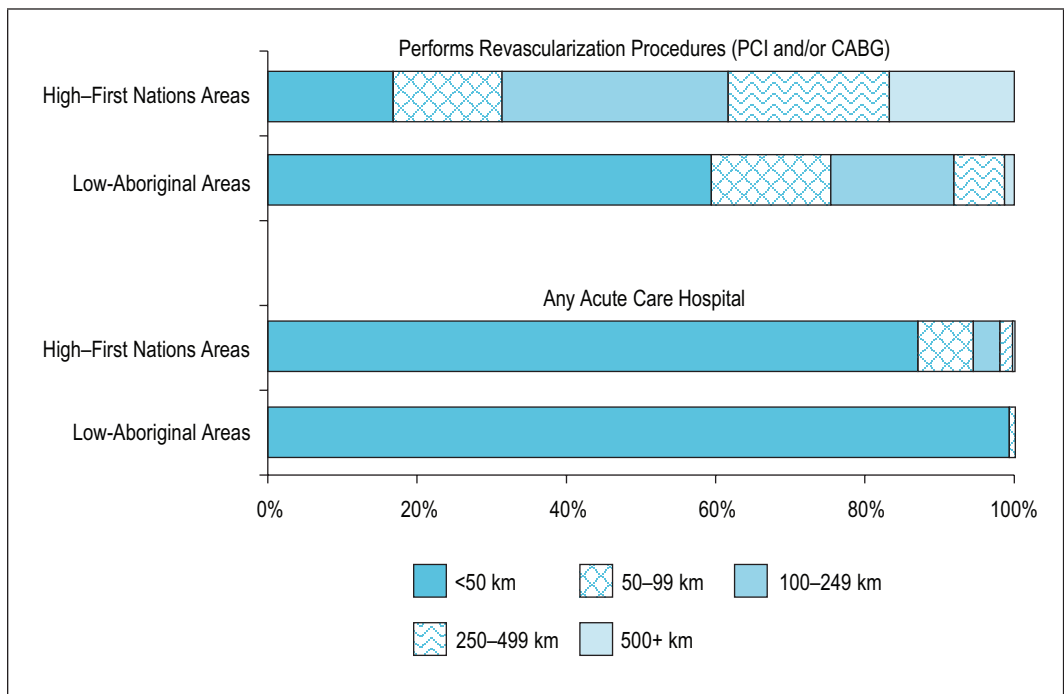
More than one-third (38%) of patients from high–First Nations areas were required to travel more than 250 km to access the nearest hospital with on-site cardiac revascularization capacity, compared with only 8% of patients from low-Aboriginal areas (see Figure 3). This difference may reflect the fact that approximately two-thirds of patients from high–First Nations areas lived in areas considered rural or remote (see Appendix A for definition of residence). Further, 17% of patients from high–First Nations areas were within 50 km of the nearest hospital with the capacity to perform revascularization procedures on-site. By comparison, nearly two-thirds (59%) of patients from low-Aboriginal areas were within 50 km of such hospitals.

Even though residents from low-Aboriginal areas generally had higher access to acute cardiac care services than those from high–First Nations areas, one in six residents from low-Aboriginal areas who also lived in rural and remote areas still needed to travel considerable distances to receive treatment for a heart attack (16% travelled at least 250 km). This suggests that timely access to acute care services is an issue for many residents in rural and remote areas, in both high–First Nations and low-Aboriginal areas.

### Why Distance Matters

Prompt care is critical for heart attack patients, as restoring blood flow to the heart can prevent sudden death or limit damage to the heart muscle. Moreover, initial treatments, such as thrombolytic therapy and percutaneous coronary intervention, are most effective when performed within the first one to two hours of the event for patients with ST-segment elevation myocardial infarction.<sup>26–29</sup> Cardiac treatments such as these, and the more complex coronary artery bypass graft procedure, are generally provided by specialists within specialized facilities. Consequently, cardiac services tend to be offered in larger hospitals in urban areas that have on-site capability for cardiac services and may be less accessible to residents of rural and remote areas.<sup>30</sup> Furthermore, studies have shown that patients who are admitted to a hospital with on-site cardiac revascularization services are more likely to undergo these procedures,<sup>30, 31</sup> and hospitals with high volumes of cardiac procedures tend to have better results.<sup>32, 33</sup>

**Figure 3: Patient Proximity to Nearest Hospital, by Hospital Type, 2004–2005 to 2010–2011**



**Notes**

PCI: percutaneous coronary intervention.

CABG: coronary artery bypass graft.

Distance is calculated using mid-points of patient and hospital postal codes and thus provides an approximation rather than actual travel or driving distance.

Rates do not include Quebec data due to differences in data collection.

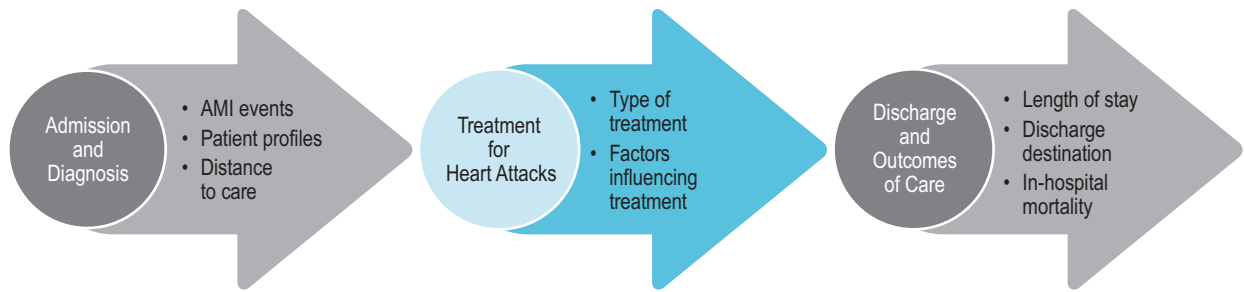
**Sources**

Discharge Abstract Database, 2004–2005 to 2010–2011, Canadian Institute for Health Information; Census, 2006, Statistics Canada.

### Residents of High-First Nations Areas Less Likely to Be Admitted to Hospitals With On-Site Cardiac Revascularization Services

Cardiac services are not offered in all hospitals; it is therefore important to consider the type of hospital to which a patient is admitted to receive care, as well as transfers between hospital facilities.

Overall, heart attack patients from high-First Nations areas were less likely to be admitted to hospitals with on-site cardiac revascularization services than patients from low-Aboriginal areas (unadjusted rates of 30% and 34%, respectively). Moreover, more than one-third (36%) of heart attack patients from high-First Nations areas required at least one transfer between hospital facilities to receive the required care, compared with 26% of patients from low-Aboriginal areas (9% and 5% of patients required two or more transfers, respectively).



## In-Hospital Treatment for Heart Attacks

Treatment interventions for heart attacks focus primarily on restoring blood flow to the heart by removing or bypassing blockages. This can be achieved through pharmaceutical therapies that dissolve blood clots and through two types of revascularization procedures: percutaneous coronary intervention (PCI) and coronary artery bypass graft (CABG) (see Cardiac Procedures Definitions below). In the last decade, PCI has become more common than CABG because it is less invasive and requires shorter recovery times; however, CABG may still be the recommended treatment option for patients with severe heart disease, multiple blocked coronary arteries or additional medical problems.<sup>23</sup>

### Cardiac Procedures Definitions

**Coronary angiography** is a diagnostic procedure that gives a picture of the heart's arteries. The procedure can be used to determine the extent of coronary heart disease and to assess what type of treatment is most appropriate.

**Percutaneous coronary intervention (PCI)** is a non-surgical procedure that involves inserting and inflating a balloon to open a blocked artery. PCI is time-sensitive, and the effectiveness of the intervention is reduced more than 90 minutes after a heart attack for some AMI patients (those with ST-segment elevation myocardial infarction).<sup>26–29</sup>

**Coronary artery bypass graft (CABG)** is a surgical procedure performed on patients with significant narrowing or blockage of multiple heart arteries. During this procedure, arteries or veins from other parts of the body are grafted to bypass blockages in the arteries to the heart.

**Revascularization procedures** include both PCI and CABG.

In this report, coronary angiography, PCI and CABG occurring within 28 days of admission to hospital for AMI were identified using Canadian Classification of Health Intervention codes (see Appendix A). These procedures may have been performed in hospitals, same-day surgery facilities or catheterization laboratories. For details on the indicator methodology used in this report, visit [www.cihi.ca/indicators](http://www.cihi.ca/indicators).

The following analyses examine disparities in the use of these revascularizations procedures, as well as the diagnostic procedure (coronary angiography) that is used to assess the most appropriate type of treatment.

## **Coronary Angiography Less Frequent in Patients From High–First Nations Areas**

Heart attack patients from high–First Nations areas were less likely to receive coronary angiography than patients from low-Aboriginal areas: 51% (age-standardized percentage) of heart attack patients from high–First Nations areas underwent coronary angiography compared with 58% of patients from low-Aboriginal areas within the episode of care (Figure 4).

## **Heart Attack Patients From High–First Nations Areas Less Likely to Receive PCI**

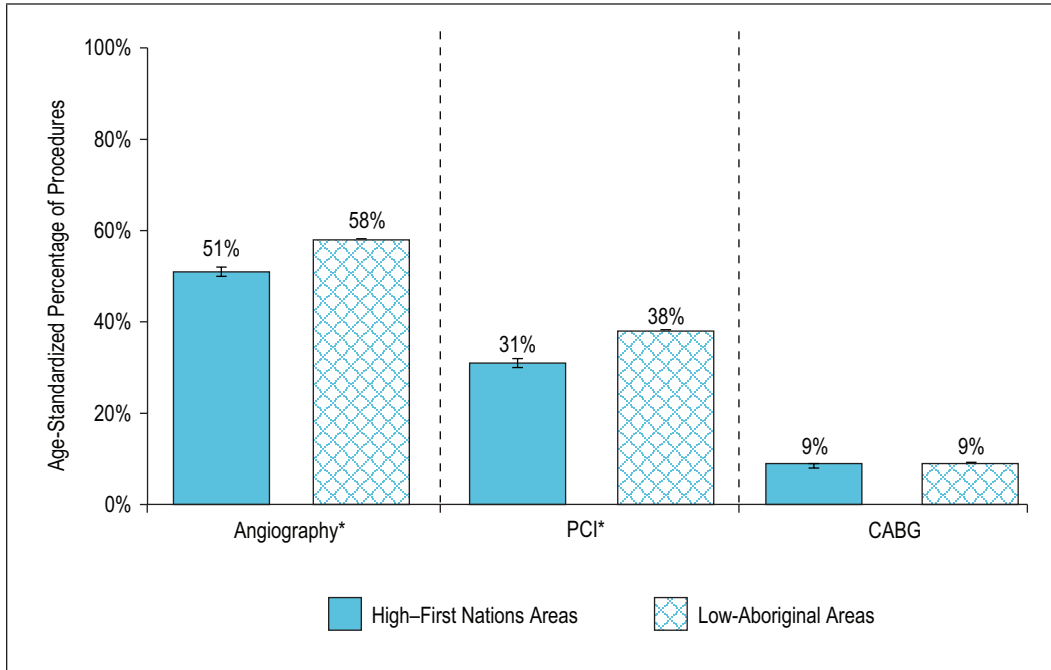
Heart attack patients from high–First Nations areas were less likely to undergo revascularization procedures (PCI and CABG combined) than patients from low-Aboriginal areas (age-standardized percentages of 40% and 47%, respectively). This difference was driven by disparities in the percentage of patients who underwent PCI: almost one-third (31%) of patients from high–First Nations areas received PCI within the episode of care, compared with 38% of patients from low-Aboriginal areas. The proportion of patients treated using CABG was similar, at 9% for both groups (Figure 4).

The previous sections on characteristics of heart attack patients showed that patients from high–First Nations areas on average were younger, were predominantly male and presented to hospital with multiple comorbid conditions; these factors are likely to influence the type of treatment received. After these factors were controlled for, heart attack patients from high–First Nations areas were still less likely to undergo PCI than patients from low-Aboriginal areas. The odds of receiving PCI, after adjusting for these factors (age, sex and at least one comorbid condition), were 27% lower for patients from high–First Nations areas compared with those from low-Aboriginal areas.

Given that heart attack patients from high–First Nations areas are less likely to live near or to be admitted to hospitals with on-site cardiac revascularization capacity and are more likely to live in rural and remote areas, the logistic regression models were stratified by residence (urban versus rural/remote areas) to further examine the risk-adjusted PCI rates. In both rural/remote and urban areas, heart attack patients in high–First Nations areas still had lower odds of receiving PCI than patients in low-Aboriginal areas (19% and 17% lower odds, respectively, of receiving PCI after controlling for age, sex and at least one comorbid condition). While controlling for residence did narrow the gap slightly in PCI use between patients from high–First Nations and low-Aboriginal areas, it did not fully explain the disparity in procedure rates between these two groups.



**Figure 4: AMI Patients Age 20 and Older Who Underwent Cardiac Procedures, 2004–2005 to 2010–2011**



**Notes**

\* Significantly different from low-Aboriginal areas ( $p < 0.05$ ).

PCI: percutaneous coronary intervention.

CABG: coronary artery bypass graft.

Error bars indicate 95% confidence intervals.

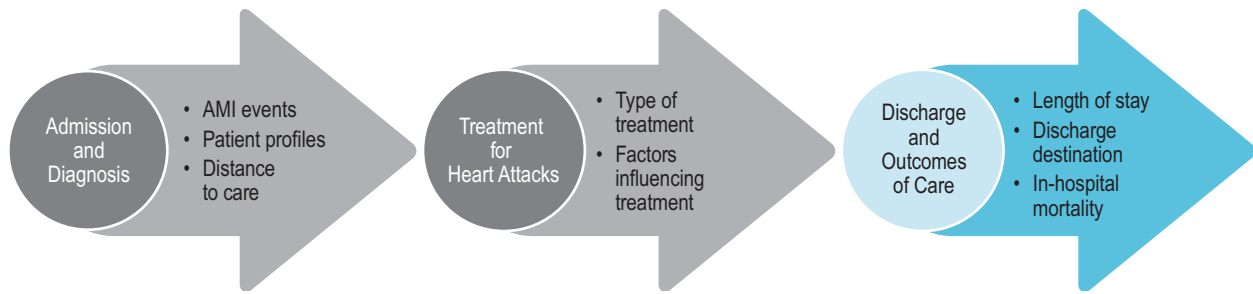
All percentages in the figure have been age-standardized to the age distribution of the high-First Nations AMI patient population.

Rates do not include Quebec data due to differences in data collection.

**Sources**

Discharge Abstract Database and National Ambulatory Care Reporting System, 2004–2005 to 2010–2011, Canadian Institute for Health Information; Alberta Ambulatory Care Database, 2004–2005 to 2009–2010, Alberta Health and Wellness; Census, 2006, Statistics Canada.

The care experiences of heart attack patients are also affected by a number of factors that are not measured in hospitalization records, such as the relationship between patients and care providers and the availability of social support for the patient during the hospital stay and following discharge. To facilitate communication and provide support to Aboriginal patients, many hospitals in Canada have implemented liaison programs similar to the Aboriginal Patient Liaison Program in British Columbia's Northern Health Region (see Case Study on page 16 and Chapter 4).



## Hospital Discharge and Outcomes of Care

This section examines factors related to the overall hospital stay and discharge destinations for heart attack patients after care has been received. These factors include median length of stay, discharge destination and in-hospital mortality—indicators that measure the quality of care and effectiveness (outcomes) of hospital treatments.

### Median Length of Stay Similar for Heart Attack Patients From High–First Nations and Low-Aboriginal Areas

Overall, patients from high–First Nations and low-Aboriginal areas remained in an acute care hospital(s) for a median of six days after being admitted for a heart attack. In both groups of patients, the median length of stay was similar for men and women (six days for both men and women from high–First Nations areas; five days and six days, respectively, for low-Aboriginal areas).

## Case Study

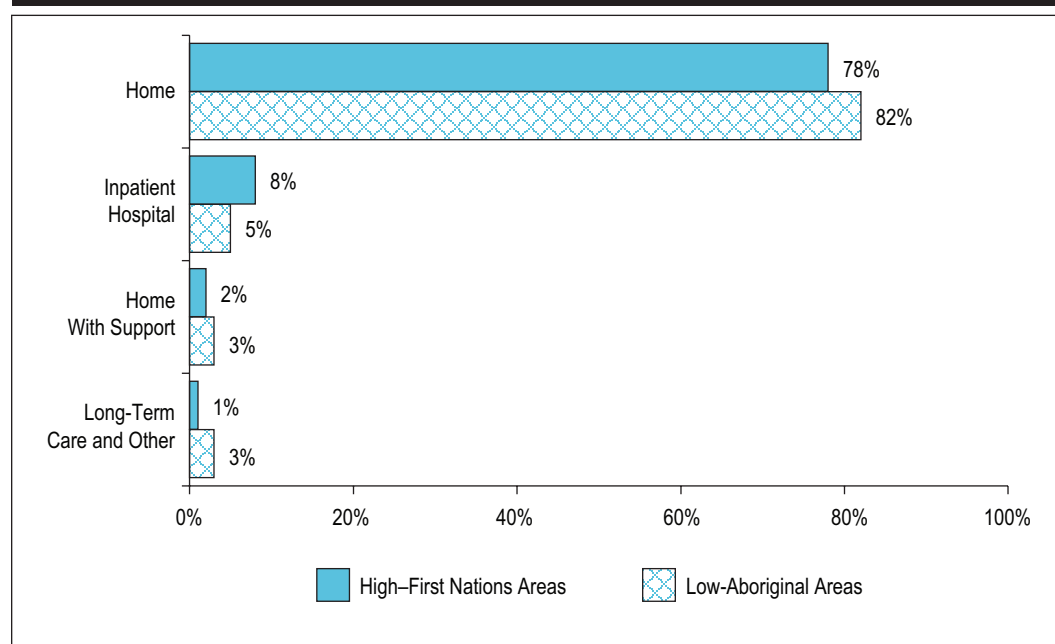
### Aboriginal Patient Liaison Program: Communication between patient and provider affects treatment decisions and experience of care

In B.C.'s Northern Health Region, the **Aboriginal Patient Liaison Program** was designed to help the health care system better serve Aboriginal peoples. Liaisons employed in northern communities assist hospitalized patients with explanations or translation of information about medical processes and procedures, facilitate visits from family and friends, and provide patients with social and emotional support. The liaison program has increased patient satisfaction and comfort with hospital care, improved patient adherence to treatments and enhanced communication between patients and providers during hospitalization. At the system level, the liaison program was perceived to have brought about an increase in collaboration among health service delivery organizations and agencies, more frequent use of health care resources and a reduction in gaps in care for Aboriginal peoples.<sup>34</sup>

## Majority of Heart Attack Patients Head Home After Hospital Stay

More than three-quarters of heart attack patients from high-First Nations areas were discharged home after their hospital stay (age-standardized percentage of 78%), compared with 82% of patients from low-Aboriginal areas (percentages were not statistically significantly different; see Figure 5). Further, 8% of patients from high-First Nations areas were discharged to facilities providing inpatient hospital care, 2% to a home setting that offered support services and 1% to a long-term care facility (see Case Study on page 18 for information on the availability of community care and supports to enable care in regional communities and Chapter 4).

**Figure 5: Place of Discharge for AMI Patients, Adults Age 20 and Older, 2004–2005 to 2010–2011**



### Notes

Percentages in the figure were not statistically significantly different at the 95% level between high-First Nations and low-Aboriginal areas.

Results presented are age-standardized to the age distribution of the high-First Nations AMI patient population.

For place of discharge:

Inpatient Hospital includes facilities providing inpatient care, such as other acute, psychiatric and rehabilitation facilities.

Home With Support includes seniors' lodges, attendant care and home care.

Long-Term Care includes nursing homes, extended care and homes for the aged; Other includes palliative care facilities/hospices and addiction treatment centres.

Percentages do not add up to 100% as not all discharge categories are included.

Rates do not include Quebec data due to differences in data collection.

### Sources

Discharge Abstract Database, 2004–2005 to 2010–2011, Canadian Institute for Health Information; Census, 2006, Statistics Canada.

## **Risk-Adjusted In-Hospital Mortality Rates Similar for Patients From High–First Nations and Low-Aboriginal Areas**

Despite the higher rates of heart attacks and comorbid conditions and lower rates of cardiac procedures among heart attack patients from high–First Nations areas, the 30-day risk-adjusted in-hospital mortality rates (controlling for age, sex and specific comorbid conditions) were similar for heart attack patients from high–First Nations areas and low-Aboriginal areas (8% and 9%, respectively).

## **Case Study**

### **Enabling provision of care upon return to community**

The First Nations and Inuit Home and Community Care program by Health Canada aims to provide basic home and community care services to those residing on a First Nations reserve, Inuit settlement or First Nations community north of 60°. Beyond providing home care services to eligible populations, the program also partners with the communities to conduct local needs assessments, educate staff, build capacity of First Nations and Inuit communities and contribute to the development of operational and service delivery plans. The program is considered to have potential to improve health and quality of life in participating communities. Evaluation results have suggested that, from 2005 to 2011, deterioration in health was significantly prevented or delayed, as patients were discharged earlier from health care facilities, were able to stay in the community longer and had delayed entry to a long-term care facility (see Appendix F).

## Discussion

The analyses in this chapter highlight that disparities exist in the hospital experiences of heart attack patients from high-First Nations and low-Aboriginal areas. In particular, residents living in high-First Nations areas were more likely to be admitted to acute care hospitals for a heart attack, to do so earlier in life and to present at hospital with multiple comorbid conditions; yet despite this apparent higher need, they were less likely to undergo coronary angiography and PCI during their episode of care. This lower PCI procedure rate persisted after controlling for age, sex, at least one comorbid condition and rural/remote residence. While these factors contributed to a slight narrowing in the gap in PCI rates between heart attack patients from high-First Nations and low-Aboriginal areas, they alone do not fully explain the disparity in procedure rates between these two groups. The fact that disparities remain in PCI rates suggests that a range of other factors is influencing this pattern.

A major limitation of this study is not being able to control for the severity and complexity of the heart attack, which would provide further insight into the most appropriate treatment interventions based on a patient's clinical diagnosis. Further, the limited pan-Canadian information on other treatment interventions (such as pharmacotherapy and counselling and advice on health behaviours), long-term prognostic factors (such as overweight or obesity, smoking and follow-up medication treatment) and treatments outside of acute care hospitals affects our ability to examine the care pathways of heart attack patients as they enter and exit the acute care sector. While information has been presented on short-term outcomes—30-day in-hospital mortality—longer-term outcomes such as one-year mortality and readmissions would provide greater insight into complications and survival following cardiac treatment and would assess the effectiveness and quality of care in the management of heart disease across the health care system.

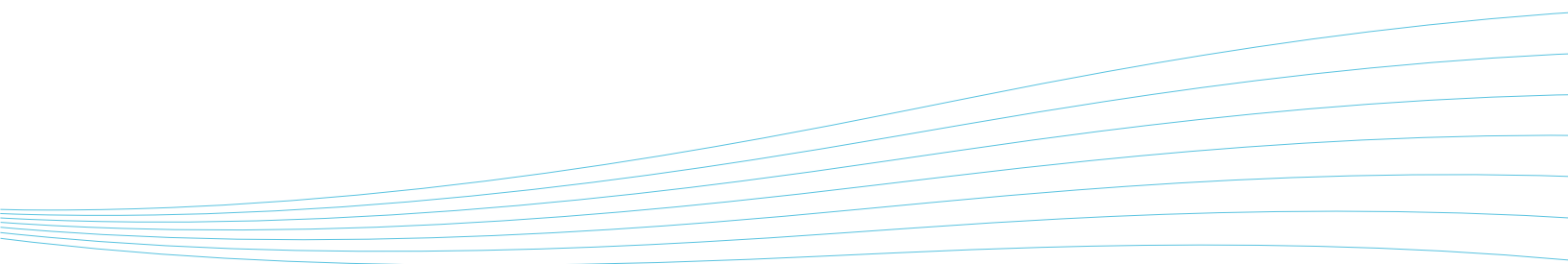
Socio-economic disadvantage plays an important role in generating and maintaining health inequalities; however, this study could not assess the impact of socio-economic disadvantage on hospital experiences, due to the small sample size in high-First Nations areas. Analyzing the confounding relationship with socio-economic status and Aboriginal identity could provide a more complete understanding of inequities within the health care system.

Despite these limitations, this analysis has shown that residents of high-First Nations areas have a higher burden of heart attacks and comorbid conditions and are less likely to receive diagnostic and revascularization procedures; yet short-term outcomes (30-day in-hospital mortality) are similar for heart attack patients from high-First Nations and low-Aboriginal areas. These results suggest that to address disparities in heart attack hospitalizations and cardiac procedures, programs and policies could focus on the underlying disparities in health that contribute to more frequent heart disease and higher rates of comorbid conditions, as well as on identifying mechanisms to ensure timely and equitable access to coronary angiography and revascularization services for heart attack patients from high-First Nations areas.





**Chapter 2**  
Hospitalizations for Heart Attacks in Inuit Areas







## Key Findings

- Residents of high-Inuit areas are less likely to be admitted to acute care hospitals for a heart attack than residents from other remote areas of Canada.
- All heart attack patients from high-Inuit areas need to travel more than 500 km to access the nearest hospital with on-site revascularization capacity.
- Despite the distance barrier, more than half of heart attack patients from high-Inuit areas underwent diagnostic angiography, and 40% received a revascularization procedure (either PCI or CABG); similar percentages were observed for remote low-Aboriginal areas.

## Introduction

According to the 2006 Census, more than 50,000 people in Canada self-identified as Inuit. More than three-quarters (78%) lived in the 52 communities spread across Canada that make up the Inuit homeland. This homeland, known as Inuit Nunangat, includes northern Quebec, northern Labrador, Nunavut and the Northwest Territories. Within Inuit Nunangat, approximately 85% of residents were of Inuit origin.<sup>21</sup>

Large health disparities exist between Inuit and other Canadians. Life expectancy, for example, has been found to be consistently lower (10 to 12 years lower between 1989 and 2008), and mortality rates from suicide, injuries, respiratory disease and cancers are higher in Inuit Nunangat than in the rest of Canada.<sup>35, 36</sup> Coronary heart disease risk factors such as obesity and smoking have also been found to be higher in Inuit (see Appendix B). Despite the high prevalence of heart disease risk factors among Inuit, the rate of heart attack deaths is lower in Inuit Nunangat than in Canada overall.<sup>37</sup> Some research suggests that the traditional Inuit diet, which is high in fish and marine mammals, has a protective effect on the development of coronary heart disease among Inuit.<sup>38</sup> However, there is a generational difference in the intake of traditional food among Inuit, with youth consuming less of the traditional foods that have a protective effect on heart disease.<sup>39</sup> This, in combination with the higher and rising rates of heart disease risk factors,<sup>38</sup> is likely to increase the burden of heart disease among Inuit in the future.

This chapter examines rates of hospitalization and treatment-related factors for heart attack patients from high-Inuit areas. Given that residents of high-Inuit areas are all located in remote areas in this study, their hospital experience is compared with the experience of those who lived in low-Aboriginal areas of Canada that are also considered remote. Because of the very small number of admissions for heart attacks to acute care hospitals among residents of high-Inuit areas (205 cases over seven years), it was not possible to create as complete a profile of hospital experiences as presented for residents of high-First Nations areas (see Chapter 1).

## Overview of Data Sources, Methodology and Limitations

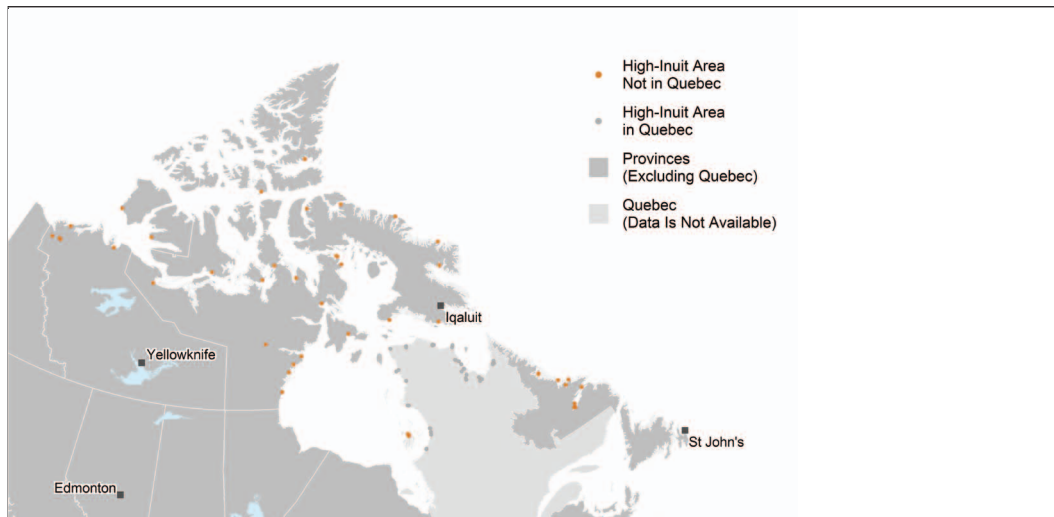
Canadian data on admissions for heart attacks and use of cardiac procedures in acute care hospitals was obtained from the Discharge Abstract Database and the National Ambulatory Care Reporting System from CIHI and the Alberta Ambulatory Care Database from Alberta Health and Wellness. Given the small number of heart attacks in high-Inuit areas, data was pooled for fiscal years 2004–2005 to 2010–2011. Quebec data was excluded because the six-digit postal codes necessary to identify a patient's place of residence were not available for analysis. As a result, the region of Nunavik is excluded from the analyses of high-Inuit areas. Based on the 2006 Census population, the population in high-Inuit areas would have been 21% larger had Nunavik been included.

As hospitalization records in the Discharge Abstract Database do not contain information to directly identify Inuit patients, an area-based methodology was used to distinguish between patients who live in areas where the proportion of Inuit is high (that is, where one-third or more of the residents are Aboriginal and the predominant Aboriginal identity is Inuit) and patients who live in remote areas where the proportion of Aboriginal peoples is low (that is, where less than one-third of residents self-identify as Aboriginal). In 2006, 80% of Inuit in Canada lived in the 99 dissemination areas identified as high-Inuit areas and, on average, 80% of the population in these dissemination areas also self-identified as Inuit (see Figure 6 and Appendix D).

The results in this study should not be generalized to all Inuit, given that Quebec hospitalization records could not be included and that area-based approaches have been shown to underestimate disparities between groups when compared with individual-level approaches<sup>22</sup> (that is, using an area-based methodology as a proxy for identification may underestimate the disparities in AMI event rates and use of cardiac procedures between Inuit and others in Canada).

Further details on the area-based coverage and methodology used in this chapter can be found in appendices A and D.

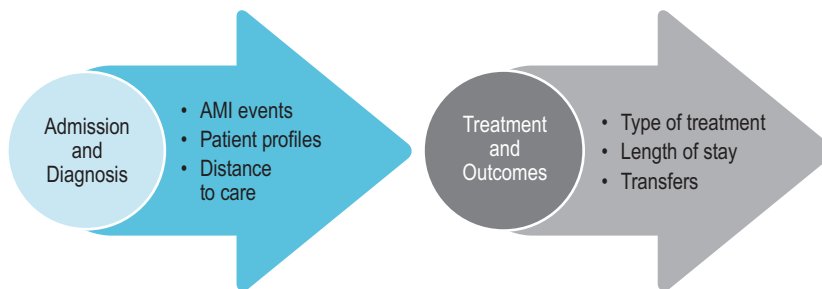
Figure 6: Distribution of High-Inuit Areas, Canada, 2006



**Source**

Census, 2006, Statistics Canada.

## Results



### Admission and Diagnosis

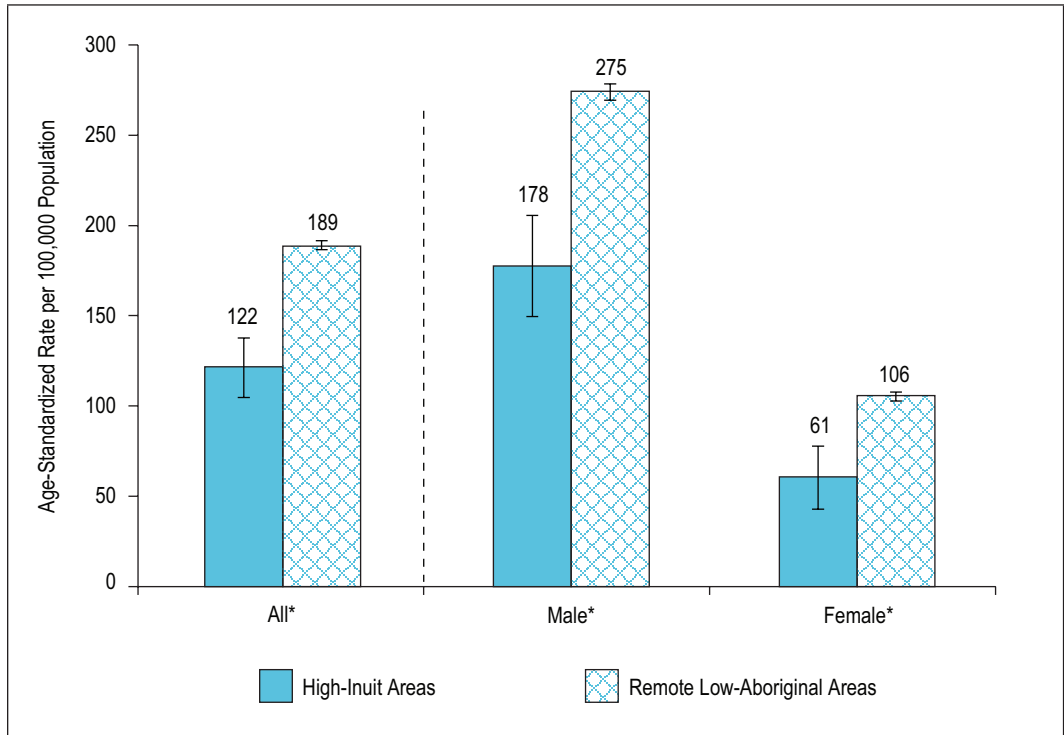
This section provides rates of hospitalized heart attacks (new cases) as well as an overview of the demographics (age, sex), clinical profiles (comorbid conditions) and distance travelled to receive cardiac care for patients admitted to an acute care hospital for a heart attack. These factors have been presented to better understand what may contribute to the rate of heart attacks for residents from high-Inuit areas and remote low-Aboriginal areas.

#### Heart Attack Rate Lower in High-Inuit Areas

The rate of hospitalized new AMI events (see AMI Event Definition on page 9) was 35% lower for residents of high-Inuit areas compared with residents living in remote low-Aboriginal areas (age-standardized rates of 122 and 189 per 100,000, respectively; see Figure 7). Among residents of high-Inuit and remote low-Aboriginal areas, men accounted for 77% and 64% of heart attack events, respectively, and men were almost three times as likely as women to be admitted to hospital for a heart attack (see Appendix C).

When looking at the median age of heart attack patients at the time of admission, those from high-Inuit areas were 10 years younger than patients from remote low-Aboriginal areas (age 61 compared with age 71).

**Figure 7: Hospitalized AMI Event Rates by Sex, Adults Age 20 and Older, 2004–2005 to 2010–2011**



**Notes**

\* Significantly different from low-Aboriginal areas (p<0.05).

Error bars indicate 95% confidence intervals.

Rates have been age-standardized to the population that identified as Inuit in the 2006 Census.

Rates do not include Quebec data due to differences in data collection.

**Sources**

Discharge Abstract Database, 2004–2005 to 2010–2011, Canadian Institute for Health Information; Census, 2006, Statistics Canada.

**One-Third of Heart Attack Patients From High-Inuit Areas Present With Other Chronic Conditions**

As indicated in the previous chapter, the overall health of heart attack patients, as measured by the presence of comorbid conditions in this study, may affect the type of cardiac treatment received, recovery times and outcomes from treatment.

At the time of admission, one in three heart attack patients from high-Inuit areas had at least one other health condition that was comorbid to their AMI (age-standardized percentage of 34%), and 10% presented with two or more comorbid conditions (Table 2). Among patients from remote low-Aboriginal areas, 40% had at least one comorbid condition and 11% had two or more comorbid conditions; these percentages were not statistically significantly different from high-Inuit areas. For heart attack patients from high-Inuit areas, the most common comorbid conditions were diabetes (11%) and heart failure (10%), with the presence of diabetes being more than twice as high in heart attack patients from remote low-Aboriginal areas (25%).

**Table 2: Heart Attack Patients, Selected Comorbid Conditions at the Time of Admission, Adults Age 20 and Older, 2005–2006 to 2010–2011 (Age-Standardized Percentage)**

	High-Inuit Areas	Remote Low-Aboriginal Areas
<b>Number of Comorbidities</b>		
<b>One or More</b>	33.8	39.8
<b>Two or More</b>	10.0	11.3
<b>Individual Comorbidity</b>		
<b>Diabetes</b>	10.7*	24.9
<b>Heart Failure</b>	9.9	7.1
<b>Renal Disease</b>	5.9	2.8

#### Notes

\* Significantly different from remote low-Aboriginal areas ( $p < 0.05$ ).

All percentages in the table have been age-standardized to the age distribution of the high-Inuit AMI patient population.

See Appendix A for further details on specific comorbid conditions.

Rates do not include Quebec data due to differences in data collection.

#### Sources

Discharge Abstract Database, 2004–2005 to 2010–2011, Canadian Institute for Health Information; Census, 2006, Statistics Canada.

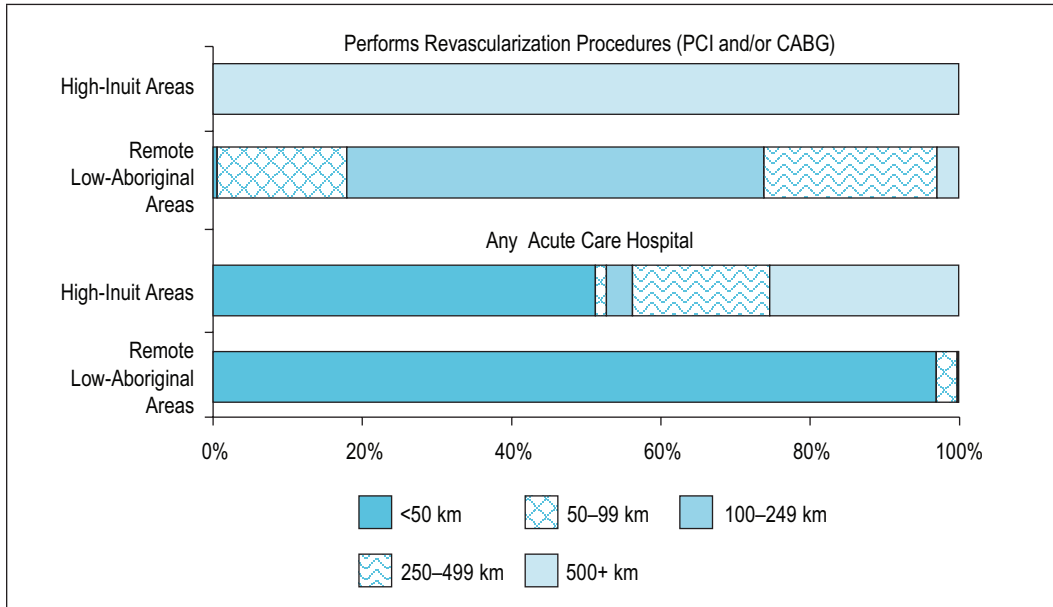
## Patients From High-Inuit Areas Travel More Than 500 km to Access Hospitals With Cardiac Revascularization Capacity

Prompt care is critical for heart attack patients, as restoring blood flow to the heart can prevent sudden death or limit damage to the heart muscle. In order to understand the access challenges faced by residents of high-Inuit areas, an analysis of the estimated distance between the patient's place of residence and the location of the nearest hospital was undertaken.

All heart attack patients living in high-Inuit areas needed to travel more than 500 km to access the nearest hospital with on-site revascularization capacity, while three-quarters (74%) of patients in remote low-Aboriginal areas were within 250 km of the nearest hospital with on-site revascularization capacity (Figure 8). However, even though residents living in remote low-Aboriginal areas had higher access to acute cardiac care services than residents of high-Inuit areas, one-quarter of patients from remote low-Aboriginal areas still needed to travel a considerable distance (at least 250 km) to receive treatment for a heart attack. This suggests that timely access to acute cardiac care services is a challenge for many remote communities.

For residents in remote communities, information and communication technologies, such as those used in telehealth initiatives, can improve access to some types of care (see Case Study on page 28 and Chapter 4).

**Figure 8: Patient Proximity to Nearest Hospital, by Hospital Type, 2004–2005 to 2010–2011**



**Notes**

PCI: percutaneous coronary intervention.  
 CABG: coronary artery bypass graft.

Distance is calculated using mid-points of patient and hospital postal codes and thus provides an approximation rather than actual travel or driving distance.

Rates do not include Quebec data due to differences in data collection.

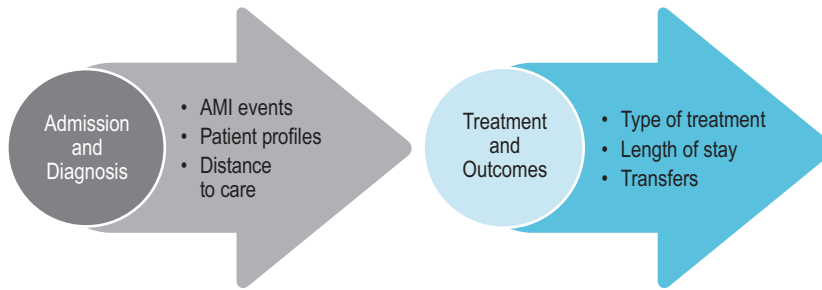
**Sources**

Discharge Abstract Database, 2004–2005 to 2010–2011, Canadian Institute for Health Information; Census, 2006, Statistics Canada.

## Case Study

### Telehealth technology to bridge distance

A pilot telemedicine initiative in Nain, Labrador’s northernmost community, has increased access to specialty care using a robotic system called Rosie the Robot. This system allows off-site physicians to support advanced practice nurses in delivering urgent and emergent care, enabling these nurses to make assessments and diagnoses in real time.<sup>40</sup> The program, launched in 2010, has been established as a permanent intervention in Nain and Happy Valley–Goose Bay.<sup>41</sup> An evaluation showed that the program resulted in improved quality of patient care in remote locations and reduced client travel to larger centres. The initiative and subsequent intervention were made possible through intersectoral partnerships between the local community and the provincial health region, Health Canada, Dalhousie University and other agencies.<sup>40</sup>



## In-Hospital Treatment and Outcomes of Care

This section examines cardiac procedures received to diagnose and treat heart attacks once a patient was admitted to hospital and hospital outcomes (see Cardiac Procedures Definitions page 13). Due to the small number of heart attack events in high-Inuit areas, only limited information could be included on hospital outcomes.

### Despite Distance, 42% of Patients From High-Inuit Areas Receive Revascularization Procedures

More than half of heart attack patients from high-Inuit areas had a diagnostic angiography procedure in hospital (age-standardized percentage of 54%), and 42% underwent a revascularization procedure (PCI and/or CABG) during their episode of care: 111 had coronary angiography, 69 had PCI and 19 had CABG. The corresponding proportions for heart attack patients in remote low-Aboriginal areas were similar at 57% (angiography) and 44% (revascularization) (see Appendix C).

### Number of Transfers and Length of Stay Similar for Heart Attack Patients From High-Inuit and Remote Low-Aboriginal Areas

Once admitted to hospital, 42% of heart attack patients from high-Inuit areas required at least one transfer between hospital facilities to receive the care they needed, similar to the proportion of patients from remote low-Aboriginal areas (40%).

The median length of stay in hospital after being admitted for a heart attack was similar for patients from high-Inuit and remote low-Aboriginal areas (seven days and six days, respectively).

## Discussion

The key finding from this chapter is that heart attack patients from high-Inuit areas need to travel long distances to access specialized care—there are no hospitals with revascularization capacity located within 500 km of these areas. However, despite the distance barrier, rates of diagnostic and revascularization procedures were comparable between heart attack patients from high-Inuit areas and remote low-Aboriginal areas. Given the small number of heart attack patients from high-Inuit areas, it was not possible to assess disparities in some comorbidities or to examine hospital outcomes, thus limiting our ability to provide a complete profile of the hospital experiences of heart attack patients from high-Inuit areas.

The small number of heart attack admissions in acute care hospitals among residents of high-Inuit areas in this study may reflect a lower burden of heart disease among this population, but it may also reflect the challenges that Inuit experience in accessing acute care services. Given the remoteness of Inuit communities, health clinics may be playing a greater role in delivering cardiac care services. Further, fatal heart attacks outside of hospital, which in the general population affect about one in four heart attack patients,<sup>42</sup> are likely to be a greater issue in these communities; consequently, presenting information on hospitalizations presents only part of the heart health story.

There is limited information on heart attack deaths among Inuit, and there continues to be a need to further explore disparities in heart attack outcomes, in particular in-hospital and out-of-hospital mortality, as well as care pathways of Inuit heart attack patients as they enter and exit the acute care sector.





**Chapter 3**  
Summary Profile of Heart Attacks Among Métis



## Key Findings

- An area-based Geozones methodology cannot be used to identify areas where there is a relatively high proportion of Métis, as less than 10% of Métis live in areas that meet the Geozones definition of a high concentration area.
- Instead, information is presented from studies in Manitoba and Ontario, where provincial Métis registries have been linked to hospital records to examine the health and health service use of Métis at the individual level in these provinces.
- While these studies are not directly comparable, they show that Métis have a higher risk for and rates of heart attacks than their provincial counterparts, and that Manitoban Métis patients are more likely to receive CABG than other Manitobans.

## Introduction

According to the 2006 Census, nearly 400,000 people in Canada self-identified as Métis, accounting for one-third of Canada's Aboriginal population.<sup>21</sup> Coronary heart disease is one of the leading causes of death among Métis, and the burden of coronary heart disease, in terms of prevalence and mortality, is higher among Métis than among non-Aboriginal Canadians.<sup>43–45</sup> The increased risk of heart disease among Métis is due in part to higher rates of smoking, obesity, physical inactivity, hypertension and diabetes compared with the rest of the Canadian population (see Appendix B).

There is limited information on heart disease among Métis, because Métis are often not studied as a separate group within health research or they are often included within pan-Aboriginal populations.<sup>46</sup> The area-based methodology used in chapters 1 and 2 of this report cannot be used to identify Métis areas to examine their hospital experiences. While a large proportion of Métis live in Métis settlements, less than 10% of Métis live in areas that meet the Geozones definition of a high concentration area, which requires at least 33% of residents to be Aboriginal and Métis predominant (see *Why Can't the Geozones Methodology Be Used to Study Métis?* on page 34). Instead of presenting new analyses for Métis, this report showcases two recent analyses related to Métis heart health conducted by the Manitoba Centre for Health Policy and Ontario's Institute for Clinical Evaluative Sciences. Both studies use individual-level data, which was made possible by linking the provincial Métis registry to the province's hospital records.<sup>ii</sup>

ii. Please note that the information presented in this chapter is based on individual-level data, while area-based approaches for identifying First Nations and Inuit populations were presented in chapters 1 and 2.

## Provincial Studies

### Manitoba Study

The Manitoba Centre for Health Policy (MCHP) collaborated with the Manitoba Metis Federation (MMF) to produce the report *Profile of Metis Health Status and Healthcare Utilization in Manitoba: A Population-Based Study*.<sup>44</sup> The study examined a wide range of indicators of health status and health care use, including indicators related to heart diseases and treatment.

### Methods

Three data sources were used to identify the Métis population and create the Métis population database for this report: the membership registry of the MMF, relatives of Métis members who did not register with the MMF (such as siblings, children, parents and grandchildren) and self-identification on Statistics Canada's Canadian Community Health Survey and National Population Health Survey.

This report used de-identified administrative data from the Population Health Research Data Repository (which includes hospital and medical claims, physician files, home care and personal care home records, vital statistics, pharmaceutical claims and immunization information from the Manitoba Immunizations Monitoring System) and the Metis Population Database to calculate the incidence of AMI and use of cardiac procedures for those age 40 and older. Data was pooled for five fiscal years, from 2002–2003 to 2006–2007. The report also included information on other conditions that could be major causes of heart attack, such as hypertension, diabetes and coronary heart disease.<sup>iii</sup>

### Why Can't the Geozones Methodology Be Used to Study Métis?

The Geozones methodology<sup>20</sup> that was adopted as a proxy for self-identification of the First Nations and Inuit populations in chapters 1 and 2 of this report is not a valid method by which to identify Métis because of the assumptions made by the methodology. In particular, Geozones is an area-based method that relies on the relative geographical proximity of a group within small areas. This is the case, for example, with Inuit or First Nations communities. Métis, however, are more widely dispersed geographically. In identifying dissemination areas where a third of the residents self-identify as Aboriginal and the most common response is Métis, only 8% of the total Métis population would be represented (compared with 48% of First Nations and 80% of Inuit). See Appendix D for more information.

iii. Residents were considered to have such illnesses if they met the selection criteria of hospitalization (one or more hospitalizations for that condition), physician visit (two or more physician visits for that condition) and/or prescription for medications (one or more prescriptions to treat the condition) within the previous 12 months.

## Results

The study found that, overall, the health status of the Métis in Manitoba was poorer than that of other Manitobans: they were 34% more likely to have diabetes, 13% more likely to have hypertension and 40% more likely to have coronary heart disease (among adults age 19 and older). Consistent with this pattern, the incidence of AMI (fatal and non-fatal events) among Métis age 40 and older in Manitoba was 26% higher than for other Manitobans (age- and sex-standardized rates of 5.4 and 4.3 per 1,000, respectively). Furthermore, the study looked at the AMI rate by regional health authority (RHA) and found that the AMI rate was considerably higher among Métis residents in three RHAs (Central, Winnipeg and Parkland); the rate was 30% to 49% higher than for other Manitobans living in these areas.

For heart attack treatments, the report observed that cardiac catheterization (a diagnostic procedure) and CABG were performed more frequently (44% and 53% higher, respectively) among Métis compared with all other Manitobans (cardiac catheterization rates: 9.5 and 6.6 per 1,000; CABG rates: 2.3 and 1.5 per 1,000). The higher rates of procedures among Métis may reflect a greater need for these procedures due to the higher rates of heart disease and AMI compared with the rest of the province.

## Ontario Study

Ontario's Institute for Clinical Evaluative Sciences (ICES) partnered with the Métis Nation of Ontario to report on specific Métis health topics.<sup>45, 47</sup> Their report on cardiovascular diseases examined vital statistics, such as mortality rates, and hospital information, such as admission and readmission rates, for Métis living in Ontario. The study did not report on specific in-hospital cardiac procedures used to treat heart attack patients.

## Methods

This study was based on the citizenship registry of the Métis Nation of Ontario, which represents 18% of Ontario's total Métis population (as of spring 2005). The registry was linked with a provincial health care administrative database housed at ICES. The number of cases for selected cardiovascular diseases was estimated using physician, emergency department and hospital visit records from the Ontario Health Insurance Plan and CIHI's National Ambulatory Care Reporting System and Discharge Abstract Database.

The prevalence of acute coronary syndrome (which includes heart attacks and unstable angina) was calculated for Métis and for the general population age 20 and older in three fiscal years (2006–2007 to 2008–2009). The general population refers to all other citizens of Ontario, including Métis who are not part of the registry.

## Results

The study found that the prevalence of acute coronary syndrome was almost twice as high among Métis as the general population of Ontario (age- and sex-standardized rates of 1.9 and 1.1 per 100, respectively). Despite the higher rate of acute coronary syndrome among Métis, the study found no differences in readmission rates or mortality rates for acute coronary syndrome between Métis and other Ontarians.

## Study Differences

The methodologies used by the MCHP and ICES showcase two provincial examples of Métis heart health analyses. While these results highlight a higher burden of heart disease among Métis, the data presented is not directly comparable due to differences in methodology and scope. In particular there are differences in the following:

- The method for identifying Métis: Both studies used the Métis registry to identify Métis in each province, but the Manitoba report also included relatives of Métis members as well as Métis who self-identified on the Canadian Community Health Survey and National Population Health Survey. To learn more about the Métis registry, please visit [www.metisnation.ca](http://www.metisnation.ca).
- Age cohort: The results presented for Manitoba are based on the population age 40 and older, while the results from Ontario are based on the population age 20 and older.
- Study period: The Manitoba data relates to five fiscal years (2002–2003 to 2006–2007), compared with three years (2006–2007 to 2008–2009) for Ontario.
- Selected heart diseases: Manitoba results relate to AMI, while Ontario results include the broader heart disease category of acute coronary syndrome (which includes AMI and unstable angina).

Given these differences, the results from the two provincial studies should not be compared with each other, nor should they be compared with the results in the previous chapters, which used area-based approaches and different case selection methods.

## Discussion

Limited health information is available about Métis in Canada.<sup>48</sup> The information presented in this chapter highlights a higher burden of heart disease among Métis according to provincial data collections and emphasizes the need for further research, data development and analysis on the incidence and treatment of heart attacks among Métis across Canada.

A recent review assessed the breadth of Métis-specific health research published to date.<sup>49</sup> With the goal of guiding future work, the study identified a number of gaps, including an overall shortage of Métis-specific work and, in particular, a scarcity of data on the health of Métis populations.<sup>46</sup> The National Collaborating Centre for Aboriginal Health has reported numerous challenges to conducting research on the health and well-being of Métis, several of which relate to the availability of information on Métis populations. Some of these are practical challenges to collecting data, such as the difficulty in fully exploring complex issues in surveys that address a large range of topics. Registries, where they do exist, may not capture all Métis and may rely on self-identification of ethnicity, which can change over time. Further—concerning the analysis of that data—the sample size for any population may be so small as to prevent disaggregating by region or by Aboriginal group. As a result, information might be available for the pan-Aboriginal population, but the data may not relate in a meaningful way to an area or population, such as Métis.

Various strategies could address these limitations and, as illustrated through the studies in Manitoba and Ontario, there are innovative ways to increase the volume of Métis-specific data and research with existing resources. The methodologies used by the MCHP and ICES to assess the health status and capture the health utilization behaviour of Métis within these provinces present a viable option for similar analyses of Métis in other provinces across Canada. By replicating these methods province to province, we may be able to better understand the health care utilization characteristics of Métis and disparities in use of services that are associated with the rates of known risk factors captured in the health literature.







**Chapter 4**  
Interventions to Support Aboriginal Peoples:  
From Prevention to Treatment



## Key Findings

- The analyses presented in the preceding chapters show that disparities exist in acute care settings for First Nations, Inuit and Métis populations. This chapter outlines ways for regions, facilities and communities to address these challenges.
- Most of the interventions found are not specific to heart attack patients, so some of the examples presented are promising practices from the delivery of care for chronic conditions in general.
- Relationships between patients and providers, and their communities, are the foundation for many of these interventions, and building relationships that address geographic and cultural barriers are important to consider in the delivery of health care services.

## Introduction

Effective treatment and prevention require a range of approaches; this chapter explores examples of interventions that use several different strategies. Building on the results of the data analysis, which focused on hospital treatments and outcomes for heart attack patients, this chapter reviews research on interventions that improve care pathways for Aboriginal peoples who enter the health care system. Based on a scan of interventions, this chapter will present options for addressing some of the particular barriers to care faced by First Nations, Inuit and Métis, and then provide an overview of the broader system for chronic care. Of the more than 70 examples of policies and programs for Aboriginal peoples found in a literature search, the options highlighted below illustrate some possibilities for preventing and treating heart health issues (see appendices E and F for further details on methodology and interventions).

## Bridging Data and Policy

The previous chapters of this report highlighted that disparities exist in the hospital experiences of First Nations, Inuit and Métis patients in accessing care for heart attacks. Although the situation of each population is unique, First Nations, Inuit and Métis face some similar challenges in accessing care. Stories from health regions and health care facilities across Canada tell of promising ways to provide care to First Nations, Inuit and Métis patients. Providers, patients and communities can build relationships in ways that address geographic and cultural barriers to access. A few examples follow; these stories show how practice can be changed to support Aboriginal peoples from prevention to treatment.

Many patients from high-First Nations and high-Inuit areas travel long distances to access hospital care for heart attacks (see chapters 1 and 2). Several initiatives work around this challenge by finding innovative ways of bridging distance. Telehealth is one way of delivering a range of services, including medical services or diagnoses, as well as professional and patient education.<sup>50</sup> By bringing services to communities that might not have local treatment centres, telehealth can improve access to care,<sup>50</sup> which means fewer people need to travel in order to reach those services.<sup>50</sup> Innovative delivery can be designed on a smaller scale too; examples include using mobile service units, like Saskatoon's Primary Health Bus<sup>51</sup> and B.C.'s First Nations Mobile Diabetes Telemedicine Clinic,<sup>52</sup> and using a robotic system to provide access to specialty care, like Labrador's Rosie the Robot initiative.<sup>40, 41</sup>

Providing a care and healing environment that is culturally appropriate is one part of improving the patient experience for First Nations, Inuit and Métis. The hospitalization data used in this report does not include information on the underlying determinants of Aboriginal health; these factors do, however, create barriers to adequate, timely and culturally appropriate health care.<sup>7</sup> Building strong relationships between communities, families and patients can inform many strategies for improving the appropriateness of care. Several initiatives work to raise providers' cultural awareness and build their cultural competence. The Sioux Lookout Mena Ya Win Health Centre, in northwestern Ontario, for example, supports families to be involved in care, such as by providing video visitation for patients who are away from their home communities,<sup>53</sup> and accommodates traditional medicines for patients when possible.<sup>54</sup>

Distance, both geographic and cultural, can be a challenge to accessing care. Many promising practices, including the ones named above, deliver health services in ways that recognize and address the barriers to care faced by First Nations, Inuit and Métis populations. Care for chronic conditions, such as heart disease, is provided by a whole system of supports and services, which involves a lot of people—beyond the provider and patient—and a range of intervention strategies. In this chapter, interventions are categorized into action areas from the Expanded Chronic Care Model (ECCM), which integrates intervention strategies for preventing and treating chronic illness from across the health care system.<sup>55</sup>

The ECCM is one of many frameworks for dealing with illness that allows for an analysis of different components within the health system. Although not specific to the health of Aboriginal populations or to heart disease, this model for action on chronic conditions might be of particular relevance to the analysis of population health outcomes. Similar to holistic models of health, the ECCM recognizes the importance of community; in this framework, the community is both an actor and a space for intervention (see Appendix E).

## Overview of Methodology

The literature search and synthesis of interventions included in this report focused on services related to chronic conditions that aim to support Aboriginal patients who enter the health care system. As there is limited research on interventions related to heart attacks in particular, this scan of interventions considered the broader category of heart health, as well as research about chronic conditions in general. This broader approach was informed by the large overlap in risk factors for heart disease and other chronic conditions, and because many of the comorbid conditions examined in heart attack patients from high-First Nations and high-Inuit areas are other chronic conditions (see chapters 1 and 2). Including these broader chronic care interventions assumes that knowledge about providing appropriate care across various barriers, such as distance to services and lack of culturally safe care, could be applicable to care for cardiac conditions.

Interventions can refer to a range of strategies to alter the physical or social environment,<sup>56</sup> including legislative and policy action, as well as smaller-scale programs and local-level initiatives. A comprehensive review of policies and legislation that affect Aboriginal health was recently completed,<sup>57</sup> so the scan in this study focused on initiatives at the local level, to identify effective or promising approaches to health service organization and delivery that support First Nations, Inuit or Métis in dealing with chronic disease. The scan identified examples of practice from the published literature and from websites. To be considered in the synthesis, interventions included, or were specifically for, Aboriginal populations and were from Canada, Australia or the United States. While the scan largely focused on evaluated interventions, many practices still need to be evaluated to demonstrate their effectiveness and outcomes.

The information for this synthesis was compiled from literature searches and web-based scanning. Given this methodology, and the breadth of available information, it is not possible to make conclusions about the relative contribution of different approaches or about the relative investments by various jurisdictions. Furthermore, because the circumstances and priorities of each community will vary, there is no universal best-fit for investing in interventions.

For more information on the methods for the intervention scan, see Appendix E.

## Results

### Delivery System Design and Reorientation of Health Services

Research has shown that challenges in patient–provider interaction can have significant effects on the experience and quality of care for patients who are Aboriginal.<sup>58</sup> Redesigning delivery systems encourages health care professionals to acknowledge and respond to the influence of determinants outside of health care.<sup>59</sup> Reorienting health services to be culturally safe can improve the experience of Aboriginal patients.

Reorienting the system can involve tailoring the human resources involved in service delivery (see Non-Evaluated Interventions: Health Workforce below). Liaison or coordinator services, such as those provided by Northern Health Region in B.C., can assist patients in accessing services<sup>34</sup> and improve patient experience. By recognizing and advocating for the needs of an individual, the liaison can improve the quality of life of the patient. Another approach to improving access is providing an interpreter; the language access interpreter services of the Winnipeg Regional Health Authority have been identified as a leading practice by Accreditation Canada.<sup>60</sup> Evidence from practice suggests promising ways to enhance the cultural competence of allied professionals who provide care to Aboriginal populations. For example, in Australia, a medicines management program for pharmacists has been associated with an increased sense of preparedness for dealing with Indigenous health issues and with improved relationships with Aboriginal health worker colleagues.<sup>61</sup>

### Non-Evaluated Interventions: Health Workforce

This synthesis focuses on initiatives that have been evaluated, to profile some of what is known about programming for heart health. Interventions that have not been evaluated also provide useful information about current activity. For example, several regions have initiatives to improve the diversity or representativeness of the health service workforce; among these, Winnipeg, Assiniboine and Burntwood health regions in Manitoba have workforce development strategies that address recruitment and retention of staff who are Aboriginal. These initiatives aim to build the cultural competency and capacity of the health authority<sup>66</sup> by creating culturally sensitive work environments<sup>67</sup> and improving communication with patients' communities.<sup>68</sup> No evaluations have been identified, but the initiatives are consistent with other promising practices that reorient health services to support Aboriginal patients.

Another dimension of reorienting health services involves bridging distance. Other initiatives are also intended to enable delivery of services in rural, remote and reserve Aboriginal communities. For example, Health Canada's Non-Insured Health Benefits program for First Nations and Inuit provides transportation to access medically necessary services in other locations,<sup>62</sup> and its Home and Community Care program builds capacity for communities to develop and deliver care locally.<sup>63</sup> Such programs can respond to the unique needs of First Nations and Inuit communities,<sup>62</sup> can increase community capacity to manage and provide services, and can enable a longer stay in the community before transfer to long-term care or earlier discharge from hospital.<sup>63</sup>

## **Supporting Self-Management and Development of Personal Skills**

Given the rising prevalence of risk factors for heart disease among some Aboriginal populations,<sup>64</sup> improving population health status might involve increasing knowledge of the disease, its symptoms, and available treatments and supports. Various initiatives are intended to build individual and population capacities to manage health conditions and encourage healthy preventive behaviours. This type of care supports people in improving control over their own health and environment, such as by coping with identified conditions and maintaining wellness.<sup>59</sup> In addition to patient education, support can include enabling people to use tools, build confidence and develop skills for self-management.<sup>65</sup> Like any approach, these tools are likely more effective in combination with other methods. Support for self-management and personal skill development can be strengthened with action on determinants, such as education, income and social supports, that can sometimes create barriers to participation.<sup>59</sup>

Health promotion tailored for First Nations, Inuit or Métis populations might focus on similar skills as initiatives for other populations, such as adopting healthy behaviours and reducing exposure to risks. In many cases, messaging is adapted to be more culturally appropriate for patients from First Nations, Inuit or Métis communities. Responding to the health and illness needs of each population, however, also involves providing this type of service in regions that are often under-resourced. One of the innovations identified in the scan is developing health human resources to serve these sometimes rural and remote communities, for example, by recruiting staff from the community<sup>69</sup> or training existing providers.<sup>25, 70</sup>

Screening programs can provide individual patients with health status and self-management information. In addition to explaining a personalized risk profile, instructing on care and providing further treatment or testing,<sup>25, 52, 71</sup> some initiatives for Aboriginal patients also send results to primary care providers<sup>25, 52</sup> or educate local providers on screening and care.<sup>25, 72</sup> These initiatives are associated with improved health status,<sup>25, 71, 72</sup> improved patient knowledge about management of chronic conditions and risk factors<sup>25, 71, 72</sup> and lower mean cost per client than travelling to specialists.<sup>52</sup>

## Supporting Decisions by Health Care Professionals

Decision-support activities inform choices for treatment and care.<sup>59</sup> Clinical guidelines point to best practice for treatment for heart attacks in the general population. The analyses in this report highlight the use of a few of these best practices, such as the timely administration of therapies like PCI and CABG (see Chapter 1). The health system also encompasses screening activities and other disease management roles for primary care providers who care for Aboriginal populations.

A recent review of guidelines for screening for and treatment of diabetes among Aboriginal patients found only one set of recommendations. The recommendations, supported by evidence of varying strength, focus on activities for First Nations children.<sup>73</sup> Some of the recommendations relate to changes to school and community environments, but the guidelines also note the role of health care providers in screening children who meet risk factors for diabetes.

Guidelines for cardiovascular disease treatment also emphasize the role of health care professionals in early detection. Harmonized guidelines for cardiovascular care among the whole population include a screening strategy for cardiovascular disease and associated risk factors.

## More Complete Information Systems

Data on health outcomes has a clinical use in evaluating and monitoring care. Information about the needs of a community can also inform planning for prevention and treatment at the population level. This kind of data allows providers and planners to understand population needs and contexts, thereby expanding the focus of care beyond the health care system.<sup>59</sup>

Databases in clinical care can enhance service delivery. In Australian coordinated care trials, a web database integrated clinical guidelines for disease management screening and records management scheduling of appointments.<sup>69, 74</sup> At the same time, responsibility for planning and purchasing services was devolved to newly created local health boards.<sup>69</sup> The study found increased delivery of some services,<sup>69, 74</sup> higher rates of new diagnoses,<sup>75</sup> an increase in recording of services<sup>69</sup> and improved provider compliance with screening guidelines.<sup>75</sup> These results suggest that the trials, which facilitated the use of information on best practice in clinical settings, resulted in better coordination of care.



In addition to informing decisions about care for individual patients, routine data collection could be useful for planning care at the population level. The analyses presented in this report are one example that aims to examine treatment and care for heart attacks among First Nations, Inuit and Métis populations; however, the availability of data reduces the scope, comprehensiveness and generalizability of these analyses to all First Nations, Inuit and Métis populations. A more precise illustration of how health outcomes and access to health services differ for these populations could be formed if additional information was collected that could provide a more accurate understanding of inequalities and contribute to identifying ways to address the gaps.

The data collection and analysis concerning Métis in Manitoba is an example of a population-level information system. This collaborative research and data project<sup>44</sup> involved linking the Population Health Research Data Repository with the membership list from the Manitoba Metis Federation. See Chapter 3 for further information.

## **Strengthening Community Action**

In the case of supporting wellness of Aboriginal populations, the process of gathering evidence about what works can involve engaging those same populations, for example, in advisory capacities or for accountability.<sup>76</sup> This can strengthen community action by building community capacity to prevent and deal with illness or improve health, to set priorities, to identify and remove barriers and to mobilize public participation.<sup>59</sup> Cultural competence and cultural safety initiatives are characterized by community involvement, for example, through the involvement of those receiving care, families and communities in designing services.<sup>77, 78</sup>

In several cases, structures have been established at regional and local levels for the purpose of increasing collaboration, sharing promising practices and allowing dialogue on the knowledge and experience of Aboriginal health. One such initiative involved an evaluation of the participants' perceptions of changes to decision-making at the health region level. The Aboriginal Health Improvement Committees in Northern Health Region, B.C., are permanent committees for addressing health issues and for strengthening relationships between health service providers and First Nations communities, replacing short-term consultations on separate projects or issues.<sup>79</sup> According to participants, the committees have increased awareness of local First Nations health issues, improved the cultural competency of non-Aboriginal participants and improved communication between members.<sup>79</sup>

Governance structures can encourage this collaborative approach. Funding streams that require or facilitate community involvement in setting priorities or design can improve access to care<sup>80</sup> and are also associated with improved health. In communities that receive funding for local governance and delivery, evaluations note a decrease in risk factors for chronic disease, such as obesity, tobacco use and high blood pressure. Those same funding opportunities can change the way communities are involved on an ongoing basis, beyond the requirement of the funding, for example, by creating structures for community consultation<sup>76</sup> or for partnership in governance.<sup>81</sup> One example is the Tui'kn Partnership of five First Nations communities in Cape Breton. Their initiative, which began with collaborative service delivery, has grown to shared governance of primary health care delivery.<sup>81</sup>

## Other Factors for Effective Treatment and Prevention

Effective treatment and prevention require a range of approaches; this synthesis explored examples from five different strategies. Although the programs and services are located in and serve different communities using various methods, they are connected with common themes. Across the examples, authors identified factors that help and factors that hinder the provision of services. These factors are not the only ones that determine success or disappointment, but they have played some role in how the interventions have been delivered. Some of the same themes are consistent across many types of interventions for any population—that is, they are not necessarily specific to care for chronic conditions among First Nations, Inuit and Métis populations. These factors nonetheless merit mention in this synthesis as relevant considerations for planning and implementing interventions in and with Aboriginal communities.

Many of the evaluation studies comment on features of context that organizations or institutions might encounter in designing and delivering these programs. The most frequently cited factors concern adequate resourcing. Skilled and enthusiastic human resources are recognized as assets for programs.<sup>63, 69, 75</sup> However, many programs face difficulty maintaining appropriate staffing levels to deliver the intended services.<sup>50, 63, 69, 74, 80, 82</sup> In other cases, the shortfall is in available data or capacity to monitor health status or evaluate program performance.<sup>75, 76, 80</sup> For initiatives that rely on specialized equipment, several studies noted that the required resources include technical and administrative support,<sup>83</sup> in addition to the required equipment.<sup>50</sup> A few also recognize the challenges of operating within the short timelines and limited funding of their policy environment.<sup>75</sup>

Opportunities to build partnerships and work in collaboration support success. These can include linking with other programs to reach the target population<sup>84</sup> and structured opportunities for sharing information between provider groups<sup>61</sup> and among communities to learn about promising practices.<sup>63, 76</sup> Other studies identified formal collaboration with universities as a factor that supports the ability to provide and evaluate effective care.<sup>25, 54</sup>

Community involvement is also a factor, as some studies observe challenges from a lack of community support or of patient consent.<sup>25, 63, 72</sup> In some cases, this is related to variable staff capacity for managing connections with communities.<sup>76</sup> In addition to describing the challenges to implementing programs, several studies also note barriers to participating. Differences in culture—such as language and values—as well as geographic distance can impede full access to even effective programming.<sup>25, 80</sup> Furthermore, some research recognizes that these interventions are being delivered in contexts where populations face additional challenges to health. Among the barriers noted are limited access to resources such as adequate food<sup>72, 85</sup> and infrastructure for active lifestyles.<sup>85</sup>

Community involvement and control—when present—can support success and can take various forms.<sup>50, 70, 80</sup> Studies note planning at the level of the community,<sup>85</sup> local service provision or referral<sup>70</sup> and flexibility in project governance<sup>86</sup> as features that facilitate program delivery. Awareness<sup>87</sup> and, perhaps more importantly, acceptance and ownership<sup>25, 72</sup> by the community are also identified as key factors.

## Discussion

Interventions in health care settings are important components of improving heart health among First Nations, Inuit and Métis populations. As shown in the ECCM, comprehensive care for chronic conditions also involves initiatives outside of hospital settings that can affect the experience of, and access to, care for patients who are Aboriginal. Redesigning delivery systems can provide services and supports that bridge cultural and geographic barriers; similar innovative strategies can be used in health promotion activities that enable early detection and self-management. Practitioners and system managers make decisions about care for their patients and populations, decisions that can be supported by robust information systems and with the input of those receiving services.

Relationships between patients and providers, and their communities, are the foundation for many approaches. Some of the approaches to care—namely delivery system design/reorientation of health services—relate directly to the nature of interactions between practitioners and patients, but all of the approaches can ultimately influence patients' experiences of care. Changing the relationships between communities and carers could be the focus of an intervention; modifying those interactions could also be the method for enabling change in broader structural determinants, such as governance. Productive interactions and relationships that ensure cultural safety, as well as that respond to the presenting health conditions, underpin any intervention, whatever the approach, whether clinical or community-based.

This requires a shift in the way providers think about culture as a determinant of health. Culture is sometimes related to, but extends beyond, visible markers of difference, such as race, ethnicity, practices and traditions. These issues are sometimes taken as the explanation for disparity, but the underlying determinants of health status may also be related to socio-political circumstances beyond the control of individuals and communities.<sup>53, 88</sup> The interventions described here are important strategies for a health system response, including primary care, disease prevention and health promotion activities tailored for population-based need. However, given that many determinants of health are outside the control of the health system, a comprehensive response will require intersectoral action to address the root issues of the disparity in health.

This study has explored various ways that the health system can respond to the health care needs of heart attack patients who are First Nations, Inuit or Métis. Improving the accessibility of care involves recognizing the determinants of Aboriginal health and responding with various strategies. The promising practices highlight some opportunities for enhancing access to health services, but other determinants—such as income, social support, housing and food security—were beyond the scope of this study. An exploration of these factors, which are known to affect health, their interactions and the pathways by which they lead to inequities in health is an avenue for further research.

## Additional Resources

CPHI's analyses explore patterns of health within and between population groups to foster a better understanding of factors that affect the health of individuals and communities. We also seek out and summarize evidence about what works at a policy and program level to contribute to the development of policies that reduce inequities and improve the health and well-being of Canadians.

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# Appendix A: Data and Methods

## Data Sources

Multiple data sources were used to assess demographic, geographic and administrative health information about populations defined by area of residence. The following data sources are the main ones used in this report:

### **Discharge Abstract Database, CIHI**

The Discharge Abstract Database (DAD) captures administrative, clinical and demographic information on hospital discharges (including deaths, sign-outs and transfers) across Canada. This data is provided directly to CIHI from participating hospitals from all provinces and territories, excluding Quebec. In this report, the DAD was used to identify hospitalization cases for AMI, based on the most responsible diagnosis, which represents the diagnosis responsible for the greatest portion of the patient's length of stay in hospital. (For details of diagnosis codes, procedure codes, and inclusion and exclusion criteria, please see Coding Selection on page 56.) Only cases in acute care facilities were included in this report, thereby excluding hospitalizations in long-term care, rehabilitation and psychiatric facilities. Given the small number of AMI events in high-Aboriginal areas, data was pooled for fiscal years 2004–2005 to 2010–2011. Quebec data was excluded from this analysis because the six-digit postal codes necessary to identify a patient's place of residence were not available for analysis.

### **National Ambulatory Care Reporting System, CIHI**

The National Ambulatory Care Reporting System (NACRS) contains data on hospital-based and community-based emergency and ambulatory care (for example, day surgery and outpatient clinics). NACRS collects demographic, administrative, clinical and service-specific data. This database was used to capture procedures performed in same-day surgery facilities or catheterization laboratories for patients with a diagnosis of AMI.

### **Geozones Aboriginal File Based on 2006 Census, Statistics Canada**

This file was developed at Statistics Canada using self-reported 2006 Census information to calculate the percentage of the population that identified as Aboriginal for each dissemination area (DA) or census subdivision (CSD), if DA-level data was missing. It should be noted that there were 22 incompletely enumerated Indian reserves and settlements in the 2006 Census. In the Geozones Aboriginal file, Aboriginal percentage was imputed using CSD-level information for some DAs with missing information.<sup>89</sup>

The term “Aboriginal” refers to people who identified themselves as North American Indian, Inuit, Métis and other Aboriginal or as having multiple Aboriginal identities in the 2006 Census. “First Nations” was used throughout this study to refer to those who reported their identity as “North American Indian.”

The Geozone file identified DAs where the percentage of the Aboriginal population was at least 33%; this was consistent with other research on hospitalizations that used the proportion of Aboriginal residents to classify geographic areas.<sup>19, 20, 90, 91</sup> Areas that were classified as high-Aboriginal were also assigned a predominant area identity (First Nations, Inuit or Métis). High-First Nations areas or high-Inuit areas were defined as DAs outside of Quebec where at least 33% of the 2006 Census population self-identified as Aboriginal and the predominant identity reported was North American Indian (that is, First Nations) or Inuit.

Patients admitted to hospital for AMI were classified as residents of high-First Nations, high-Inuit or low-Aboriginal areas using Statistics Canada's Postal Code Conversion File (PCCF+)<sup>89</sup> and Geozones Aboriginal File. Records with incomplete, missing or invalid postal codes (13%) were excluded from the analysis. Geozones Aboriginal File by using the DA. Records with incomplete, missing or invalid postal codes (13%) were excluded from the analysis.

To classify DAs into urban, rural and remote categories, Statistics Canada's Statistical Area Classification was used. **Urban areas** are defined as communities that have more than 10,000 residents and that were labelled by Statistics Canada as census metropolitan areas (CMAs) or census agglomerations (CAs). Areas outside urban areas and outside the territories are divided into four categories—Strong, Moderate, Weak and No Metropolitan Influenced Zones (MIZ)—according to the proportion of residents that commuted to work in an urban core. Areas in the territories outside CMAs and CAs are classified as No MIZ. For this report, Strong and Moderate MIZ areas were classified as **rural** and Weak and No MIZ areas as **remote**.

## Statistical Methods

### Age-Standardization

Hospital event rates were age-standardized per 100,000 people using a direct method of standardization. Event rate comparisons between high-First Nations and low-Aboriginal areas were standardized to the population that identified as First Nations in the 2006 Census. Event rate comparisons between high-Inuit and remote low-Aboriginal areas were standardized to the population that identified as Inuit in the 2006 Census.

An age-standardized rate is a weighted average of the age-specific rates, where the weights are the proportions of a standard population in the corresponding age groups. It represents what the crude rate would have been in the study population if that population had the same age distribution as the standard population. This method addresses the potential confounding effect of age by producing age-standardized rates computed using the same standard population. Given the young age profile of the Aboriginal population, and given that rates of chronic conditions and hospitalizations increase with age, it was necessary to standardize results to remove the impact of these differences.

In comparing comorbid conditions and cardiac procedure use between high-First Nations and the low-Aboriginal areas, the percentages were standardized to the age distribution of the high-First Nations AMI patient population using the direct method. Similarly, the age distribution of the high-Inuit AMI patient population was used to standardize the comorbidity and procedure rates for patients in high-Inuit areas.



## Risk-Adjustment

A multiple logistic regression model was used to risk-adjust the PCI procedure rates and 30-day in-hospital mortality rate by taking into account a range of factors that may influence treatment decisions and in-hospital death. The risk-adjusted procedure models adjusted for age, sex and the presence of at least one comorbid condition: shock, heart failure, pulmonary edema, cardiac dysrhythmia, diabetes mellitus, renal disease, cancer, chronic obstructive pulmonary disease, hypertension, peripheral vascular disease, cerebrovascular disease and AMI in the preceding year. The 30-day in-hospital risk-adjusted mortality rates controlled for age, sex and these specific comorbid conditions, except that diabetes was replaced by diabetes with complications.

To examine the effect of residence on the risk-adjusted PCI procedure rates, separate logistic regression models were created for rural/remote and urban areas.

## Statistical Comparisons of Rates

This report examined whether the rates for populations in high-Aboriginal areas and low-Aboriginal areas were statistically significantly different. Pair-wise comparisons of rates for high- and low-Aboriginal areas were estimated by calculating the rate difference and 95% confidence intervals based on a Bernoulli distribution to test for statistically significant differences. If this confidence interval did not include 0, we concluded that the two rates were statistically significantly different with 95% certainty; otherwise, the conclusion of a statistically significant difference was not made.

## Rate Ratio

The rate ratio is a **relative** measure of inequality; it divides the rate of the areas with a higher proportion of Aboriginal peoples by the rate of the areas with a lower proportion of Aboriginal peoples. The measure was used in Appendix C to assess the size of the gap between the two groups.

## Rate Difference

The rate difference is an **absolute** measure of inequality; it subtracts the rate of the areas with a higher proportion of Aboriginal peoples from the rate of the areas with a lower proportion of Aboriginal peoples. The measure was used in Appendix C for assessing the size of the gap between the two groups.

## Coding Selection

The following ICD-10-CA and CCI codes were used in this report:

### ICD-10-CA Disease Codes

- Acute myocardial infarction: I21, I22
- Shock (mainly cardiogenic and hypovolemic shock): R57
- Heart failure: I50
- Pulmonary edema: J81
- Cardiac dysrhythmia: I47–I49
- Diabetes mellitus: E100–E109, E110–E119, E130–E139, E140–E149
- Diabetes with complications: E100–E107, E110–E117, E130–E137, E140–E147
- Renal disease: N17–N19, R34, I12, I13
- Cancer: C00–C26, C30–C44, C45–C97, Z510, Z511
- Chronic obstructive pulmonary disease: J41–J44, J47
- Hypertension: I11, I100, I101
- Peripheral vascular disease: I70, I739
- Cerebrovascular disease: I60–I67, I69, G450–G452, G454, G458, G459

### CCI Procedure Codes

- Coronary angiography: 3.IP.10.VX
- Percutaneous coronary intervention: 1. IJ.50, 1.IJ.57.GQ, 1.IJ.54.GQ-AZ
- Coronary artery bypass graft: 1. IJ.76

# Appendix B: Heart Disease Risk Factors

Table B1: Coronary Heart Disease Risk Factor Comparison, Canada

Population	Data	Heart Disease	Obesity**	Hypertension or High Blood Pressure	Diabetes	Tobacco (Daily)	Physical Inactivity***
<b>First Nations (Off Reserve)</b>	Rate/Prevalence*	7.5%†	28.4%††	17.9%†	8.7%††.‡‡	34.8%††	51.8%††
	95% CIs	—	25.1–31.7	—	7.0–10.4	31.1–38.5	48.0–55.5
	Age Covered	20+	18+	20+	12+	18+	20+
	Source	APS	CCHS	APS	CCHS	CCHS	CCHS
	Year	2006	2009–2010	2006	2009–2010	2009–2010	2009–2010
<b>First Nations (On Reserve)</b>	Rate/Prevalence*	5.7%‡	40.2%††	21.8%‡	15.3%††.‡‡	43.2%‡	62.5%‡
	95% CIs	—	38.5–42.0	20.6–23.0	14.2–16.4	41.6–44.8	—
	Age Covered	18+	18+	18+	18+	18+	18+
	Source	RHS	RHS	RHS	RHS	RHS	RHS
	Year	2008–2010	2008–2010	2008–2010	2008–2010	2008–2010	2008–2010
<b>Métis</b>	Rate/Prevalence*	7.8%†	24.9%††	17.9%†	5.8%††.‡‡	34.6%††	46.7%††
	95% CIs	—	21.2–28.6	—	4.4–7.3	31.1–38.0	42.8–50.6
	Age Covered	20+	18+	20+	12+	18+	20+
	Source	APS	CCHS	APS	CCHS	CCHS	CCHS
	Year	2006	2009–2010	2006	2009–2010	2009–2010	2009–2010
<b>Inuit</b>	Rate/Prevalence*	5.9%†	33.0%††	14.5%†	4.0%††	44.4%††	59.6%††
	95% CIs	—	23.3–42.8	—	3.3–5.6	36.4–52.4	50.5–68.6
	Age Covered	20+	18+	20+	15+	18+	20+
	Source	APS	CCHS	APS	APS	CCHS	CCHS
	Year	2006	2009–2010	2006	2006	2009–2010	2009–2010
<b>Canada†††</b>	Rate/Prevalence*	4.8%§	18.1%††	19.2%§	6.2%§§	15.6%§§	47.7%§§
	95% CIs	—	—	—	6.0–6.4	15.3–15.9	47.2–48.2
	Age Covered	12+	18+	20+	12+	12+	12+
	Source	CCHS	CCHS	CCHS	CCHS	CCHS	CCHS
	Year	2007	2009–2010	2007	2009–2010	2009–2010	2009–2010

## Notes

\* Refers to the crude prevalence/rate of self-reported chronic diseases (reported to be diagnosed by a health professional) or risk factors.

† Source: Statistics Canada. *The Health of First Nations Living Off-Reserve, Inuit and Metis Adults in Canada: The Impact of Socio-Economic Status on Inequalities in Health*. Ottawa, ON: Statistics Canada; 2010.

‡ Source: The First Nations Information Governance Centre. *First Nations Regional Health Survey 2008/2010 National Report*. Akwesasne, ON: FNIGC; 2012.

§ Source: Public Health Agency of Canada. *Tracking Heart Disease and Stroke in Canada*. Ottawa, ON: PHAC; 2009.

Notes (cont'd)

\*\* According to the World Health Organization and Health Canada guidelines, individuals age 18 and older with a body mass index (BMI) greater than 30 kg/m<sup>2</sup> are considered obese. In the CCHS, BMI is calculated for the population, excluding pregnant females and persons less than 3 feet (0.914 metres) tall or greater than 6 feet 11 inches (2.108 metres) tall.

†† Source: Public Health Agency of Canada. *Diabetes in Canada: Facts and Figures From a Public Health Perspective*. Ottawa, ON: PHAC; 2011.

‡‡ Excluding gestational diabetes.

§§ Source: Statistics Canada. Table 105-0502—Health indicator profile, two year period estimates, by age group and sex, Canada, provinces, territories, health regions (2011 boundaries) and peer groups, occasional. CANSIM Database. <http://www.statcan.gc.ca>.

\*\*\* Persons for whom the sum of average daily energy expenditure on all leisure time physical activities was less than 1.5 kcal/kg/day were considered to be physically inactive.

††† Canada refers to all of Canada.

— Data not available

CI: confidence interval.

APS: Aboriginal Peoples Survey.

CCHS: Canadian Community Health Survey.

RHS: First Nations Regional Longitudinal Health Survey.

## Appendix C: Data Tables

**Table C1: Hospitalized AMI Event Rates of Residents of High-First Nations and Low-Aboriginal Areas, Adults Age 20 and Older, Canada Excluding Quebec, 2004–2005 to 2010–2011**

	High-First Nations Areas			Low-Aboriginal Areas			Rate Difference	Rate Ratio
	Number of AMI Events	Rate per 100,000	95% Confidence Interval	Number of AMI Events	Rate per 100,000	95% Confidence Interval		
<b>Overall</b>								
<b>Crude</b>	6,560	347	338–355	347,128	280	279–281	67	1.2
<b>Age-Standardized*</b>	—	277	270–284	—	157	157–158	120	1.8
<b>Sex*</b>								
<b>Men</b>	4,306	376	365–387	219,159	229	228–230	147	1.6
<b>Women</b>	2,254	177	169–184	127,969	91	90–91	86	1.9
<b>Age Group</b>								
<b>20–34</b>	57	9	7–11	1,832	6	6–6	3	1.5
<b>35–44</b>	380	89	80–98	12,736	50	49–51	39	1.8
<b>45–54</b>	1,217	332	313–350	45,490	177	175–178	155	1.9
<b>55–64</b>	1,636	686	653–719	68,106	363	361–366	323	1.9
<b>65–74</b>	1,551	1,143	1,086–1,200	73,536	626	621–630	517	1.8
<b>75+</b>	1,719	1,971	1,878–2,064	145,428	1,359	1,352–1,366	612	1.5

### Notes

\* Rates have been age-standardized to the population that identified as First Nations in the 2006 Census.

— Not applicable.

Results do not include Quebec data due to differences in data collection.

### Sources

Discharge Abstract Database, 2004–2005 to 2010–2011, Canadian Institute for Health Information; Census, 2006, Statistics Canada.

Table C2: Procedure Rates for AMI Patients From High-First Nations and Low-Aboriginal Areas, Adults Age 20 and Older, Canada Excluding Quebec, 2004–2005 to 2010–2011

	High-First Nations Areas			Low-Aboriginal Areas			Rate Difference	Rate Ratio
	Number of Procedures	Percentage	95% Confidence Interval	Number of Procedures	Percentage	95% Confidence Interval		
<b>Coronary Angiography</b>								
<b>Overall</b>								
Crude	3,352	51	49–53	178,137	51	51–52	0	1.0
Age-Standardized*	—	51	50–52	—	58	58–58	-7	0.9
<b>Sex*</b>								
Men	2,393	54	52–55	125,504	60	60–60	-6	0.9
Women	959	46	44–48	52,633	55	54–55	-9	0.8
<b>Age Group</b>								
20–44	310	71	63–79	11,047	76	75–77	-5	0.9
45–54	782	64	60–69	34,390	76	75–77	-12	0.8
55–64	968	59	56–63	48,123	71	70–71	-12	0.8
65–74	791	51	48–55	42,906	58	58–59	-7	0.9
75+	501	29	27–32	41,671	29	28–29	0	1.0
<b>Revascularization (PCI and CABG Combined)</b>								
<b>Overall</b>								
Crude	2,593	40	38–41	141,837	41	41–41	-1	1.0
Age-Standardized*	—	40	39–41	—	47	47–47	-7	0.9
<b>Sex*</b>								
Men	1,945	44	42–45	104,191	50	50–50	-6	0.9
Women	648	31	29–33	37,646	39	39–39	-8	0.8
<b>Age Group</b>								
20–44	227	52	45–59	8,360	58	56–59	-6	0.9
45–54	623	51	47–55	28,541	63	62–64	-12	0.8
55–64	759	46	43–50	40,182	59	59–60	-13	0.8
65–74	615	40	37–43	34,080	46	46–47	-6	0.9
75+	369	21	19–24	30,674	21	21–21	0	1.0

**Table C2: Procedure Rates for AMI Patients From High–First Nations and Low-Aboriginal Areas, Adults Age 20 and Older, Canada Excluding Quebec, 2004–2005 to 2010–2011 (cont'd)**

	High–First Nations Areas			Low-Aboriginal Areas			Rate Difference	Rate Ratio
	Number of Procedures	Percentage	95% Confidence Interval	Number of Procedures	Percentage	95% Confidence Interval		
<b>Percutaneous Coronary Intervention</b>								
<b>Overall</b>								
<b>Crude</b>	2,012	31	29–32	114,374	33	33–33	-2	0.9
<b>Age-Standardized*</b>	—	31	30–32	—	38	38–38	-7	0.8
<b>Sex*</b>								
<b>Men</b>	1,488	33	32–35	82,978	40	40–40	-7	0.8
<b>Women</b>	524	25	23–27	31,396	33	33–33	-8	0.8
<b>Age Group</b>								
<b>20–44</b>	204	47	40–53	7,664	53	52–54	-6	0.9
<b>45–54</b>	501	41	38–45	24,974	55	54–56	-14	0.7
<b>55–64</b>	580	35	33–38	32,377	48	47–48	-13	0.7
<b>65–74</b>	437	28	26–31	25,417	35	34–35	-7	0.8
<b>75+</b>	290	17	15–19	23,942	16	16–17	1	1.1
<b>Coronary Artery Bypass Graft</b>								
<b>Overall</b>								
<b>Crude</b>	612	9	9–10	29,136	8	8–9	1	1.1
<b>Age-Standardized*</b>	—	9	9–10	—	9	9–9	0	1.0
<b>Sex*</b>								
<b>Men</b>	480	11	10–12	22,513	11	11–11	0	1.0
<b>Women</b>	132	6	5–7	6,623	6	6–7	0	1.0
<b>Age Group</b>								
<b>20–44</b>	24	5	3–8	779	5	5–6	0	1.0
<b>45–54</b>	126	10	9–12	3,850	8	8–9	2	1.3
<b>55–64</b>	191	12	10–13	8,322	12	12–13	0	1.0
<b>65–74</b>	190	12	11–14	9,159	12	12–13	0	1.0
<b>75+</b>	81	5	4–6	7,026	5	5–5	0	1.0

**Notes**

\* Standardized to the age distribution of the high–First Nations AMI patient population.

— Not applicable.

Results do not include Quebec data due to differences in data collection.

**Sources**

Discharge Abstract Database and National Ambulatory Care Reporting System, 2004–2005 to 2010–2011, Canadian Institute for Health Information; Alberta Ambulatory Care Database, 2004–2005 to 2009–2010, Alberta Health and Wellness; Census, 2006, Statistics Canada.

Table C3: Hospitalized AMI Event Rates of Residents of High-Inuit and Remote Low-Aboriginal Areas, Adults Age 20 and Older, Canada Excluding Quebec, 2004–2005 to 2010–2011

	High-Inuit Areas			Remote Low-Aboriginal Areas			Rate Difference	Rate Ratio
	Number of Procedures	Percentage	95% Confidence Interval	Number of Procedures	Percentage	95% Confidence Interval		
<b>Overall</b>								
<b>Crude</b>	205	125	108–142	33,293	376	372–380	-251	0.5
<b>Age-Standardized*</b>	—	122	105–138	—	189	187–192	-67	0.6
<b>Sex*</b>								
<b>Men</b>	157	178	150–206	21,409	275	270–279	-97	0.6
<b>Women</b>	48	61	43–78	11,884	106	103–108	-45	0.6
<b>Age Group</b>								
<b>20–54</b>	72	53	41–65	5,307	99	96–101	-46	0.5
<b>55–74</b>	101	412	331–492	14,173	558	549–567	-146	0.7
<b>75+</b>	32	1,027	671–1,383	13,813	1,462	1,437–1,486	-435	0.7

**Notes**

\* Rates have been age-standardized to the population that identified as Inuit in the 2006 Census.

— Not applicable.

Results do not include Quebec data due to differences in data collection.

**Sources**

Discharge Abstract Database, 2004–2005 to 2010–2011, Canadian Institute for Health Information; Census, 2006, Statistics Canada.



**Table C4: Procedure Rates for AMI Patients From High-Inuit and Remote Low-Aboriginal Areas, Adults Age 20 and Older, Canada Excluding Quebec, 2004–2005 to 2010–2011**

	High-Inuit Areas			Remote Low-Aboriginal Areas			Rate Difference	Rate Ratio
	Number of Procedures	Percentage	95% Confidence Interval	Number of Procedures	Percentage	95% Confidence Interval		
<b>Coronary Angiography</b>								
<b>Overall</b>								
<b>Crude</b>	111	54	44–64	15,283	46	45–47	8	1.2
<b>Age-Standardized*</b>	—	54	47–61	—	57	44–64	-3	0.9
<b>Revascularization (PCI and CABG Combined)</b>								
<b>Overall</b>								
<b>Crude</b>	87	42	34–51	11,778	36	35–36	6	1.2
<b>Age-Standardized*</b>	—	42	36–49	—	44	44–45	-2	1.0
<b>Percutaneous Coronary Intervention</b>								
<b>Overall</b>								
<b>Crude</b>	69	34	26–42	9,326	28	28–29	6	1.2
<b>Age-Standardized*</b>	—	34	27–40	—	36	36–37	-2	0.9
<b>Coronary Artery Bypass Graft</b>								
<b>Overall</b>								
<b>Crude</b>	19	9	5–13	2,555	8	7–8	1	1.1
<b>Age-Standardized*</b>	—	9	5–13	—	9	8–9	0	1.0

**Notes**

\* Standardized to the age distribution of the high-Inuit AMI patient population using three age groups: 20 to 54, 55 to 74 and 75+.

— Not applicable.

Results do not include Quebec due to differences in data collection.

**Sources**

Discharge Abstract Database and National Ambulatory Care Reporting System, 2004–2005 to 2010–2011, Canadian Institute for Health Information; Alberta Ambulatory Care Database, 2004–2005 to 2009–2010, Alberta Health and Wellness; Census, 2006, Statistics Canada.



## Appendix D: Geozones Method

Table D1: Summary of Concentration and Coverage Using 33% Cut-Off, 2006

	Self-Identified Populations (Number)				Total* (Number)	Concentration (%)
	First Nations	Métis	Inuit	Non-Aboriginal		
<b>Area Type</b>						
<b>Predominantly First Nations</b>	311,900	17,025	685	81,065	<b>415,980</b>	75.0
<b>Predominantly Métis</b>	10,935	29,250	805	35,900	<b>77,975</b>	37.5
<b>Predominantly Inuit</b>	1,030	780	40,190	8,385	<b>50,540</b>	79.5
<b>Low-Proportion Aboriginal</b>	325,520	329,455	8,340	29,749,265	<b>30,453,155</b>	97.7
<b>Total</b>	<b>649,385</b>	<b>376,510</b>	<b>50,020</b>	<b>29,874,615</b>	<b>30,997,650</b>	
<b>Percentage Population Coverage Using Geozones Methodology (%)</b>	48.0	7.8	80.4	99.6		

### Notes

\* Includes those who responded "multiple Aboriginal identities" or "Aboriginal not included elsewhere."

Based on responses to Aboriginal identity questions in the 2006 Census (20% sample data).

A 33% cut-off was used to define areas as "high-proportion Aboriginal."

Concentration is the proportion of area residents who reported the identity (for example, First Nations) assigned to the area. Coverage is the proportion of the population who live in the area type that matches their self-reported identity (for example, the proportion of Métis who are in Métis-predominant areas), as defined in this study.

### Sources

Census, 2006, and Geozones Aboriginal File Based on 2006 Census, Statistics Canada.

Table D2: Geozones Distribution of Dissemination Areas Across Canada, by High- and Low-Aboriginal Area Classification, 2006

	Total DAs		Low-Aboriginal		High-First Nations		High-Inuit		High-Métis		Unclassifiable	
	Number	Number	%	Number	%	Number	%	Number	%	Number	%	
<b>Canada</b>	54,626	51,994	95.2	2,066	3.8	99	0.2	189	0.3	278	0.5	
<b>B.C.</b>	7,471	6,826	91.4	630	8.4	—	—	3	0.0	12	0.2	
<b>Alta.</b>	5,357	5,114	91.4	178	3.3	—	—	33	0.6	32	0.6	
<b>Sask.</b>	2,431	1,878	77.3	414	17.0	—	—	62	2.6	77	3.2	
<b>Man.</b>	2,152	1,853	86.1	232	10.8	—	—	62	2.9	5	0.2	
<b>Ont.</b>	19,177	18,859	98.3	300	1.6	—	—	7	0.0	11	0.1	
<b>Que.</b>	13,408	13,125	97.9	137	1.0	40	0.3	3	0.0	103	0.8	
<b>N.B.</b>	1,439	1,385	96.2	51	3.5	—	—	—	—	3	0.2	
<b>N.S.</b>	1,633	1,592	97.5	41	2.5	—	—	—	—	—	—	
<b>P.E.I.</b>	292	287	98.3	5	1.7	—	—	—	—	—	—	
<b>N.L.</b>	1,062	1,001	94.3	13	1.2	11	1.0	13	1.2	24	2.3	
<b>Y.T.</b>	78	48	61.5	27	34.6	—	—	—	—	3	3.8	
<b>N.W.T.</b>	84	26	31.0	38	45.2	12	14.3	6	7.1	2	2.4	
<b>Nun.</b>	42	—	—	—	—	36	85.7	—	—	6	14.3	

**Notes**

DA: dissemination area.

— Not applicable.

A 33% cut-off was used to define areas as “high-proportion Aboriginal”; these areas were further classified as high-First Nations, high-Inuit or high-Métis based on the predominant Aboriginal group.

**Sources**

Census, 2006, Proportion Aboriginal File Based on 2006 Census and Supplementary Population Estimates, Statistics Canada.

## Appendix E: Methods for Intervention Scan

The results of the intervention scan are based on a review of academic and grey literature.

A search protocol using keywords from four domains was developed to identify interventions:

1. Main themes of cardiovascular health, including *heart, acute myocardial infarction, stroke and heart disease*.
2. Intervention terms, including *program, policy, initiative and intervention*.
3. Terms related to the health service delivery setting, including *hospital, nursing station, long-term care facility and community*.
4. Terms related to the population of interest, including *First Nation(s), Inuit, Métis and Aboriginal*.

Peer-reviewed journals were searched using Medline, Econlit and PsycINFO. Web-based searches of the Cochrane Collaboration (Cochrane Reviews), [healthvidence.ca](http://healthvidence.ca) and the Canadian Best Practices Portal for Health Promotion and Chronic Disease Prevention were also searched.

Searches were limited by language (English only) and to those resources published after 2004. Title and abstract screenings were also conducted. The objective of the title screening was to identify programs or interventions that seek to improve the cardiovascular disease-related health outcomes of Aboriginal peoples living in Canada. After title screening, interventions underwent an abstract review to further refine the sample by selecting recent, evaluated interventions. All interventions are offered with or for Aboriginal peoples in Canada or comparable jurisdictions (in this case, Australia and the United States).

The search was for programs and policies that operate at local or regional levels to prevent or treat chronic conditions. The focus on local and regional levels was intended to build on the results of other research; a comprehensive review of policies and legislation that affect Aboriginal health was recently completed. The research identified that, to date, most policies and legislation for Aboriginal, First Nations, Inuit and/or Métis in Canada focus on clarifying who has responsibility within complex jurisdictional arrangements rather than developing or directing specific initiatives for delivering services. Of these, only a few are related to health; some policies have created innovative arrangements for self-government, including delegating administration of health services<sup>57</sup> or emphasizing reductions in disparity. Further, most policies apply at the level of region or province, not nationally, so the result is a patchwork of legislation and lack of clarity about who is covered by the various provisions.

## Evaluated Interventions

For the present synthesis, more than 70 interventions were reviewed in detail; of these, about 30 had been evaluated for effectiveness (see Appendix F for a table listing these interventions). This synthesis focuses on those examples of practice that demonstrate some measure of effectiveness. A complete portrait of the intervention landscape includes those promising practices that are not evaluated, including a wide range of activities from regions and facilities that are working to address the challenges faced by First Nations, Inuit and Métis populations in care settings. Although the evaluated interventions form the primary sample, other programs and services that were not evaluated are included where they highlight innovative and promising activity.

The evaluation studies reported a range of outcome measures (for example, change in patient perception, risk factors, health behaviours or health outcomes), while others captured some measure of change in provider practice or readiness. These reflect effects in a number of areas, including—but not limited to—physical health, which might influence the patient experience or the ability of the community to support the care of patients.

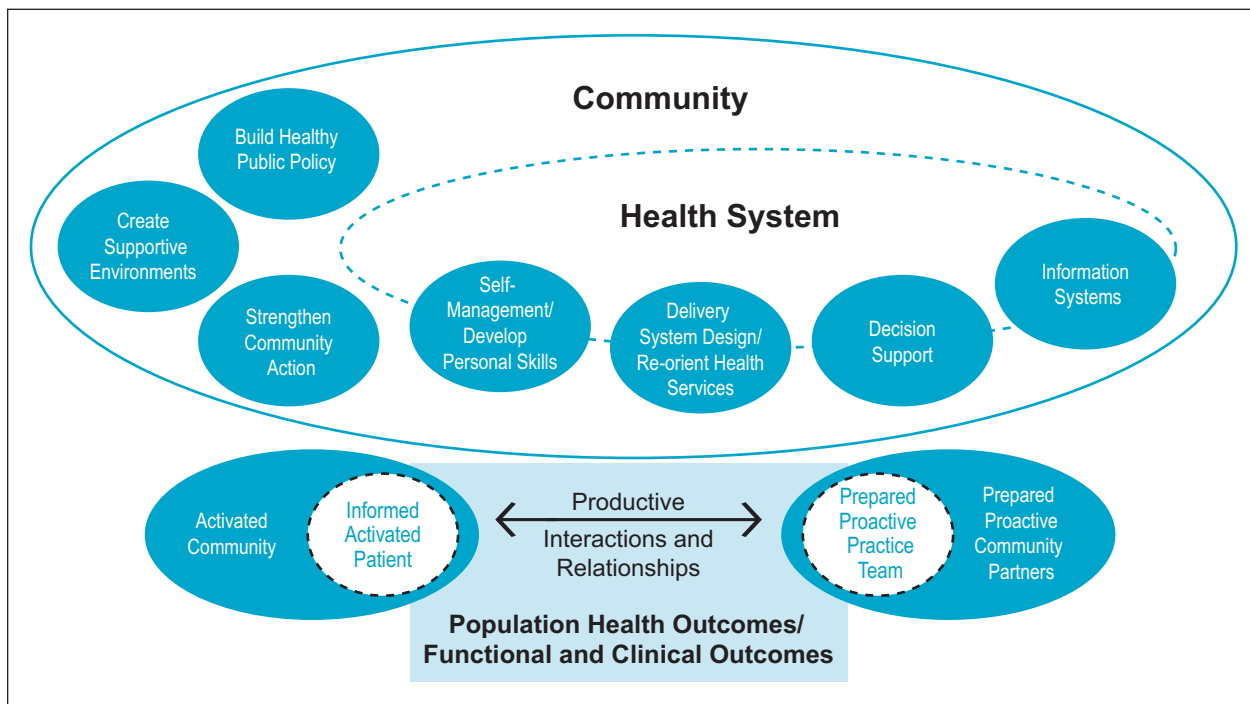
## The Expanded Chronic Care Model

In the Expanded Chronic Care Model (ECCM), improved population and individual health outcomes result from interactions and relationships between patients and practice teams. Importantly, both patients and providers are characterized as engaged—“informed and activated” and “prepared and proactive”—and they are understood to be embedded in their communities. The two are shown as interacting in “productive” exchanges (Figure E1).

The top section of the ECCM is depicted as two large ovals—the health system is embedded within the community. In the model, the first four approaches are shown as overlapping the border between the health system and the broader community. This placement represents that these strategies can include activities from both health care delivery settings and the community. “Strengthening community action” is depicted, along with the approaches of “building healthy public policy” and “creating supportive environments,” in the larger community context, outside of the health system. Strategies to improve health include action beyond clinical services to address the social, environmental and cultural factors that influence health.

Building healthy public policy and creating supportive environments are important approaches for improving population health and addressing risk factors and social determinants of health, such as living and employment conditions, housing and education. Such interventions were outside the scope of this report and so were not included in the scan and synthesis included in this report. Several organizations have contributed to the understanding of these approaches with possible and recommended action.<sup>92, 93</sup>

Figure E1: The Expanded Chronic Care Model: Integrating Population Health Promotion

**Sources**

Adapted with permission from Barr V, Robinson S, Marin-Link B, Underhill L, Dotts A, Ravensdale D. The Expanded Chronic Care Model: an integration of concepts and strategies from population health promotion and the chronic care model. *Hosp Q.* 2002;7(1):77.

Adapted from Glasgow R, Orleans C, Wagner E, Curry S, Solberg L. Does the Chronic Care Model also serve as a template for improving prevention? *Milbank Q.* 2001;79(4) and World Health Organization, Health and Welfare Canada and Canadian Public Health Association. *Ottawa Charter for Health Promotion.* Geneva, Switzerland: WHO; 1986.





## Appendix F: Intervention Scan

	Program	Description	Involvement of Target Population(s)	Outcomes/Findings
Decision Support	Coordinated Care Trials (Australia) <sup>69, 74</sup>	<ul style="list-style-type: none"> <li>Development and dissemination of clinical guidelines for diabetes management and intervention, including screening, along with health education and monitoring</li> <li>Introduction of electronic information systems for scheduling appointments</li> <li>Clinicians and managers discuss the results of scheduled audits</li> </ul>	<ul style="list-style-type: none"> <li>Increases the responsibility of local health boards and the involvement of the local ethics committee in research approval</li> <li>Employment of locally recruited Aboriginal health workers</li> </ul>	<ul style="list-style-type: none"> <li>Increase in use of some health services—clinical examination, laboratory investigation and vaccination</li> <li>Increase in recording of services, which allowed use in clinical practice, improving service delivery</li> <li>Change in services delivered within care plan to better match with best practice model</li> </ul>
	Aboriginal Health Transition Fund (Ontario, Canada) <sup>94</sup>	<ul style="list-style-type: none"> <li>Health education, screening, engagement, culturally based services and research</li> </ul>	<ul style="list-style-type: none"> <li>Engagement as a primary goal in some initiatives; others provided training or involved communities in advisory capacities, for accountability or as source of information</li> </ul>	<ul style="list-style-type: none"> <li>Increased awareness about barriers to adaptation of services</li> <li>Formation of advisory committees, including some that will continue their work past the end of funding</li> </ul>
	Aboriginal Health Improvement Committees (British Columbia, Canada) <sup>79</sup>	<ul style="list-style-type: none"> <li>Established seven permanent Aboriginal Health Improvement Committees</li> </ul>	<ul style="list-style-type: none"> <li>Aboriginal leaders were consulted in forming the committees</li> </ul>	<ul style="list-style-type: none"> <li>Increased awareness of local Aboriginal health issues</li> <li>Increased cultural competency of non-Aboriginal participants</li> <li>Improved communication between committee members</li> </ul>
	RP7 Remote Presence Videoconferencing Robot (Nain, Labrador) <sup>40, 41</sup>	<ul style="list-style-type: none"> <li>Allows off-site physicians to support advanced practice nurses in delivering urgent and emergent care, enabling the nurses to make assessments and diagnoses in real time</li> </ul>	<ul style="list-style-type: none"> <li>Made possible through intersectoral partnerships between the local community and provincial health region, Health Canada, Dalhousie University and other agencies</li> </ul>	<ul style="list-style-type: none"> <li>Improved quality of patient care in remote locations</li> <li>Reduced client travel to larger centres</li> </ul>

	Program	Description	Involvement of Target Population(s)	Outcomes/Findings
Decision Support (cont'd)	Holistic Wellness Framework and Knowledge Networks (Manitoba Metis Federation and Health and Wellness Department) <sup>95</sup>	<ul style="list-style-type: none"> <li>The Knowledge Translation model, based on five levels of public participation, ensures that Métis research maximizes benefits directly back to the Métis population</li> <li>Knowledge networks engage affiliated regional health authority leaders and Manitoba Metis Federation region representatives to ensure that local-level health needs are met and future needs are identified, both of which are informed by the Knowledge Translation model</li> </ul>	<ul style="list-style-type: none"> <li>Local-level Métis health consumer experiences are incorporated into all knowledge network activities</li> <li>Collaboration between regional health authorities and the Manitoba Metis Federation is the central feature of the federation's knowledge translation activities, which are funded by the Public Health Agency of Canada and the Province of Manitoba</li> </ul>	<ul style="list-style-type: none"> <li>Themes identified by knowledge network sessions inform the advisory plan used by nine regional health authorities to adapt and evaluate services</li> <li>Current knowledge network cycles have informed research planning involving seven Métis regions</li> </ul>
	Tele-Rehab (Ontario, Canada) <sup>83</sup>	<ul style="list-style-type: none"> <li>Interdisciplinary rehabilitation consultations for people with stroke that assess "physical, emotional, and social wellbeing"</li> <li>Care recommendations provided, as appropriate</li> </ul>	<ul style="list-style-type: none"> <li>Partnerships with First Nations communities, telemedicine and health care providers "have been developed and/or enhanced"</li> </ul>	<ul style="list-style-type: none"> <li>Participants were satisfied</li> <li>Found to be feasible and acceptable for people from areas without on-site service</li> <li>Service allowed for identification of ongoing needs</li> </ul>
Information Systems	Acute Rheumatic Fever and Rheumatic Heart Disease Register (Australia) <sup>82</sup>	<ul style="list-style-type: none"> <li>An automated register recommends a schedule for specialist clinical interventions in secondary prevention and assigns patients to a priority category</li> </ul>	—	<ul style="list-style-type: none"> <li>Most (93%) names included appropriately</li> <li>Adherence to guidelines for delivery and follow-up treatment</li> </ul>
	(no program name) (Australia) <sup>75</sup>	<ul style="list-style-type: none"> <li>A chronic disease health check uses a web-based database for entry, consultation and evaluation</li> </ul>	—	<ul style="list-style-type: none"> <li>Improved compliance with guidelines for screening and treatment</li> <li>Significant improvements in blood pressure readings over the short term</li> </ul>

	Program	Description	Involvement of Target Population(s)	Outcomes/Findings
Reorient Health Services	LiveWell With Chronic Conditions For Aboriginal People (Canadian Diabetes Strategy Community-Based Program) <sup>84</sup>	<ul style="list-style-type: none"> <li>Peer leaders trained to facilitate weekly small groups on self-management using a scripted manual on self-care</li> </ul>	<ul style="list-style-type: none"> <li>Key partners included the friendship centre and the tribal council, and Aboriginal leaders implemented the program</li> <li>Elders recommended adaptations to the program manual, including integration of the medicine wheel</li> </ul>	<ul style="list-style-type: none"> <li>Storytelling to capture impact perceived by leaders, including impact on community</li> </ul>
	Non-Insured Health Benefits Program (Canada) <sup>62</sup>	<ul style="list-style-type: none"> <li>Provides funding for benefits not covered under provincial/territorial, private or public insurance</li> <li>Applies criteria of medical necessity, national consistency and equitable access</li> </ul>	—	<ul style="list-style-type: none"> <li>The program is necessary, filling a gap in services and providing access to others</li> <li>Medical transportation services respond to the unique needs of First Nations and Inuit, with expenditures weighted to clients from remote/isolated regions</li> </ul>
	Telehealth (Canada) <sup>50</sup>	<ul style="list-style-type: none"> <li>Each community selected three telehealth applications, such as urgent/emergent, telerehabilitation, televisitation, teleconsult with general practitioners/specialists, education on diabetes management, mental health services, continuing education for staff and diabetes monitoring</li> </ul>	<ul style="list-style-type: none"> <li>Community providers are involved in needs assessments, including through interviews with community leaders/elders</li> </ul>	<ul style="list-style-type: none"> <li>Responds to community needs and results in high level of satisfaction among patients</li> <li>Improved access to care</li> <li>Improved self-perceived competency of personnel</li> <li>Decreased efficiency (longer appointments and higher cost)</li> <li>Avoids transfers in 30% to 40% of cases</li> </ul>
	Health Integration Initiative (Canada) <sup>86</sup>	<ul style="list-style-type: none"> <li>Integrates federally funded First Nations and Inuit health programming with provincial and territorial health systems</li> <li>Funds research on program integration and creates a framework to guide future integration</li> </ul>	<ul style="list-style-type: none"> <li>Applied a collaborative partnership approach to engage First Nations and Inuit communities</li> </ul>	<ul style="list-style-type: none"> <li>Program design led to sustainable project development</li> <li>Produced a model that could be readily applied to other First Nations/Inuit communities</li> </ul>
	Indigenous Cardiac Outreach Program (Australia) <sup>70</sup>	<ul style="list-style-type: none"> <li>Workshops train Indigenous health care workers to play a larger role in screening, and a cardiac service team travels to communities to assess individuals referred by the communities</li> </ul>	<ul style="list-style-type: none"> <li>Indigenous health care workers refer patients to the travelling specialist clinic</li> </ul>	<ul style="list-style-type: none"> <li>The intervention reaches the desired target population (80% to 85% of patients are Indigenous) and in 90% of cases does not duplicate efforts</li> </ul>

	Program	Description	Involvement of Target Population(s)	Outcomes/Findings
Reorient Health Services (cont'd)	Aboriginal Patient Liaison Program (British Columbia, Canada) <sup>34</sup>	<ul style="list-style-type: none"> <li>• Liaison officer links Aboriginal patients to appropriate health services, provides or enables language translation, assists with patient–physician communications, provides social and emotional support, facilitates visitation, works with discharge planning team and helps arrange travel</li> <li>• Liaison connects with the community and elders to identify needs and seek guidance, mediate problems, provide cultural support, educate health region staff and participate in the Aboriginal Health Improvement Committee</li> </ul>	<ul style="list-style-type: none"> <li>• Liaison officers respond to the needs of Aboriginal patients</li> <li>• Elders and the community were consulted</li> </ul>	<ul style="list-style-type: none"> <li>• Increased access</li> <li>• Increased patient satisfaction, comfort and adherence to treatments, as well as improved health status</li> <li>• Increased collaboration among health service organizations</li> <li>• More effective use of resources</li> <li>• Reduced gaps in care for Aboriginal peoples</li> </ul>
	Pharmacist-Led Medicines Education Program for Aboriginal Health Workers (Australia) <sup>61</sup>	<ul style="list-style-type: none"> <li>• Pharmacists educated Aboriginal health workers in a number of sessions aimed at building capacity and forging relationships</li> </ul>	<ul style="list-style-type: none"> <li>• Indigenous people were involved in designing educational material</li> </ul>	<ul style="list-style-type: none"> <li>• Increased sense of preparedness to deal with Indigenous health issues</li> <li>• Improved networking between pharmacists and Aboriginal health workers</li> </ul>
	Home and Community Care (Canada) <sup>63</sup>	<ul style="list-style-type: none"> <li>• Provides client assessments, case management, referrals, service linkages, home care nursing services, home support personal care services, in-home respite care, access to specialized medical equipment, supplies and drugs</li> </ul>	<ul style="list-style-type: none"> <li>• Communities or community organizations submit plans and are consulted in the program planning phase</li> <li>• Initiatives for community capacity-building, including staff training and infrastructure development</li> </ul>	<ul style="list-style-type: none"> <li>• Most (90%) respondents perceived health deterioration was significantly prevented or delayed</li> <li>• Employment for local staff, materials made available in First Nations languages</li> <li>• Increased community capacity</li> <li>• Increased self-care knowledge among patients</li> </ul>
	Sioux Lookout Meno Ya Win Health Centre (Ontario, Canada) <sup>53, 54</sup>	<ul style="list-style-type: none"> <li>• A Traditional Healing, Medicines, Foods and Supports Programme integrated in almost all clinical pathways</li> <li>• Two-day cultural orientation for all hospital staff</li> <li>• Video visitation</li> </ul>	<ul style="list-style-type: none"> <li>• Annual meetings translated and broadcast for northern Aboriginal communities</li> <li>• Community leaders and elders were consulted during program development</li> <li>• Governance and leadership include Anishnabe representation and advisors</li> </ul>	<ul style="list-style-type: none"> <li>• Client appreciation of culturally sensitive services</li> <li>• Decrease in patient complaints</li> <li>• Increased interpreter availability, increased average use</li> <li>• Improved staff perception of interpreter services</li> <li>• Increased availability and use of program components</li> </ul>

	Program	Description	Involvement of Target Population(s)	Outcomes/Findings
Reorient Health Services (cont'd)	Primary Health Bus (Saskatoon, Saskatchewan, Canada) <sup>51</sup>	<ul style="list-style-type: none"> <li>• A mobile health centre serving city core neighbourhoods, offering treatment, health promotion and education, follow-up care and referral</li> </ul>	—	<ul style="list-style-type: none"> <li>• Leading practice recognized by Accreditation Canada</li> </ul>
	Language Access Interpreter Services (Manitoba, Canada) <sup>60</sup>	<ul style="list-style-type: none"> <li>• Interpreters provide in-person services in 32 languages and over-the-phone services in more than 170 languages when urgent and emergent situations arise</li> </ul>	—	<ul style="list-style-type: none"> <li>• Leading practice recognized by Accreditation Canada</li> </ul>
Self-Management/ Develop Personal Skills	Diabetes Management and Care Program (Australia) <sup>72</sup>	<ul style="list-style-type: none"> <li>• Clinical risk assessments and supervision of weight reduction through semi-structured physical activity and nutrition education</li> <li>• Provides immediate results along with an explanation</li> <li>• Provides education for Aboriginal health workers</li> </ul>	<ul style="list-style-type: none"> <li>• Formal agreements between Aboriginal-run organizations and the communities</li> <li>• Information on health status given back to the communities</li> </ul>	<ul style="list-style-type: none"> <li>• Lower weight and reduced BMI</li> <li>• Improved biochemical markers</li> <li>• Increased physical activity</li> </ul>
	Adult Health Check (Australia) <sup>96, 97</sup>	<ul style="list-style-type: none"> <li>• A nurse or doctor uses a customized health check form to provide screening and follow-up with preventive interventions</li> </ul>	<ul style="list-style-type: none"> <li>• A local elder corporation consulted on and supported the project</li> </ul>	<ul style="list-style-type: none"> <li>• Provides an opportunity to deliver health education, diagnosis and treatment</li> </ul>
	Diabetes Risk Evaluation and Microalbuminuria (DREAM3) Study (Saskatchewan, Canada) <sup>67</sup>	<ul style="list-style-type: none"> <li>• Treatment for hypertension managed by a home and community care nurse</li> <li>• Participants could be accompanied by home health aides from their reserve upon request, for language and cultural support</li> </ul>	<ul style="list-style-type: none"> <li>• Tribal Council Indian Health Services approved the study</li> <li>• Members of the care team were from local Aboriginal communities</li> </ul>	<ul style="list-style-type: none"> <li>• Improved blood pressure at 24-month follow-up</li> </ul>
	Screening for Limb, I-Eye, Cardiovascular and Kidney Complications (SLICK) (Alberta, Canada) <sup>25</sup>	<ul style="list-style-type: none"> <li>• A mobile lab with First Nations staff and others with Aboriginal-specific training</li> <li>• Clinical assessment forwards results to the clients and their primary care providers</li> <li>• Education for local providers</li> </ul>	<ul style="list-style-type: none"> <li>• Lab staffed primarily with First Nations health professionals</li> </ul>	<ul style="list-style-type: none"> <li>• Fewer emergency room visits</li> <li>• No significant change in subjective health status or services</li> <li>• Improved knowledge</li> <li>• Reduced service delivery cost over conventional delivery</li> </ul>
	Hearts in Training (British Columbia, Canada) <sup>71</sup>	<ul style="list-style-type: none"> <li>• 13-week physical activity training program including assessment of behavioural and anthropomorphic risk factors</li> <li>• Counselling provided to explain results and develop plans for improving fitness and cardiovascular risk</li> </ul>	<ul style="list-style-type: none"> <li>• Exercise groups led by Aboriginal community members</li> <li>• Registration and implementation through offices of local organizations and government</li> </ul>	<ul style="list-style-type: none"> <li>• Improvements in health measures</li> <li>• Improved cardiovascular risk profiles</li> <li>• Increased frequency of physical activity</li> <li>• High program compliance suggests acceptability</li> </ul>

	Program	Description	Involvement of Target Population(s)	Outcomes/Findings
Strengthen Community Action	First Nations and Inuit Health Transfer (Canada) <sup>80</sup>	• Community funding based on a needs assessment and community health plan	• Communities develop plan and allocate funding	• Improved access to care • Improved health outcomes
	Steps to a Healthier Anishinaabe (Michigan, U.S.) <sup>85</sup>	• Funds disbursed to tribes, which design and implement health promotion interventions for the community's needs, with a focus on risk factors	• Organized by a non-profit inter-tribal council of 12 Michigan tribes	—
	Tui'kn Partnership (Nova Scotia, Canada) <sup>81</sup>	• Five First Nations collaborate on planning, funding and delivering primary care services through the Aboriginal Health Transition Fund	• Regional governance of planning, funding, delivering health services	• The partnership continued beyond the funding requirements to five-year strategic plan

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