

Review

Access to Cardiovascular Care for Indigenous Peoples in Canada: A Rapid Review

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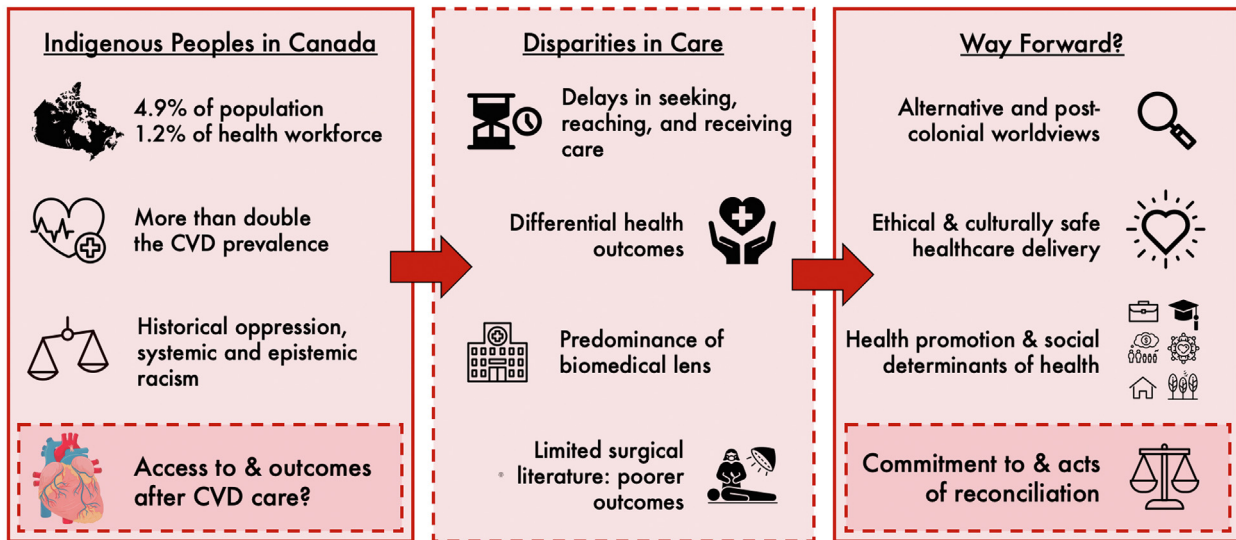
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ABSTRACT

Indigenous peoples in Canada are at an increased risk of cardiovascular disease compared to non-Indigenous people. Contributing factors

RÉSUMÉ

Le risque de maladies cardiovasculaires est plus élevé chez les populations autochtones du Canada que chez les populations non

include historical oppression, racism, healthcare biases, and disparities in terms of the social determinants of health. Access to and inequity in cardiovascular care for Indigenous peoples in Canada remain poorly studied and understood. A rapid review of the literature was performed using the PubMed/MEDLINE, Web of Science, and Indigenous Studies Portal (iPortal) databases to identify articles describing access to cardiovascular care for Indigenous peoples in Canada between 2002 and 2021. Included articles were presented narratively in the context of delays in seeking, reaching, or receiving care, or as disparities in cardiovascular outcomes, and were assessed for their successful engagement in indigenous health research using a preexisting framework. Current research suggests that gaps most prominently present as delays in receiving care and as poorer long-term outcomes. The literature is concentrated in Alberta, Manitoba, and Ontario, as well as among First Nations people, and is largely rooted in a biomedical worldview. Additional community-driven research is required to better elucidate the gaps in access to holistic cardiovascular care for Indigenous peoples in Canada. Healthcare professionals, researchers, and policymakers should reflect further upon their actions and privilege, educate themselves about historical facts and the Truth and Reconciliation Commission, tackle prevailing disparities and systemic barriers in the healthcare systems, and develop culturally safe and ethically appropriate healthcare interventions to improve the health of all Indigenous peoples in Canada.

autochtones. L'oppression historique, le racisme, les préjugés dans les soins de santé et les disparités quant aux déterminants sociaux de la santé sont des facteurs qui contribuent à ce phénomène. L'accès aux soins cardiovasculaires et l'équité des soins pour les personnes autochtones du Canada sont des questions peu étudiées et mal comprises. Une revue rapide de la littérature a été réalisée dans les bases de données *PubMed/MEDLINE*, *Web of Science* et *Indigenous Studies Portal* (iPortal) pour recenser les articles publiés entre 2002 et 2021 qui décrivent l'accès aux soins cardiovasculaires pour les peuples autochtones du Canada. Les articles retenus sont présentés de manière narrative et font état de retards dans la recherche de soins, dans l'atteinte d'un établissement de soins et dans l'obtention des soins, ou de certaines disparités quant aux résultats de santé cardiovasculaire. Ces articles ont également été évalués d'après leur intégration réussie des principes de recherche en santé autochtone à partir d'un cadre déjà établi. Selon les recherches actuelles, les écarts se manifestent principalement par des retards dans l'obtention des soins et par des résultats de santé plus défavorables à long terme. Les études publiées se concentrent surtout sur l'Alberta, le Manitoba et l'Ontario, portent principalement sur les Premières Nations et sont en grande partie abordées selon une perspective biomédicale. Des recherches plus approfondies, menées avec les communautés autochtones, sont nécessaires pour mieux comprendre les écarts dans l'accès à des soins cardiovasculaires holistiques pour les peuples autochtones du Canada. Les professionnels de la santé, les chercheurs et les décideurs politiques devraient entreprendre un processus de réflexion approfondie sur leurs actions et leurs privilèges, s'informer sur les réalités historiques ainsi que sur la Commission de vérité et réconciliation, s'attaquer aux disparités qui perdurent et aux barrières systémiques dans l'accès aux soins de santé, et mettre en place des interventions de soins culturellement sécuritaires et éthiquement adaptées, pour améliorer la santé de l'ensemble de la population autochtone du Canada.

Cardiovascular diseases (CVDs) are the leading cause of morbidity and mortality worldwide,¹ causing nearly 18 million deaths each year and resulting in over 500 million people living with CVD.² In Canada, 4.3 million people live with CVD, and more than 80,000 people die from CVD each year.² Incidence, prevalence, and mortality rates for CVD are higher among Indigenous peoples compared to those among non-Indigenous individuals in Canada.³ For example, assessing the burdens of acute coronary syndromes, congestive heart failure, stroke, atrial fibrillation, and hypertension, prevalence rates were 25% to 77% higher among Métis people compared to those in the general population in Ontario.⁴ Moreover, First Nations people have approximately 2.5 times the CVD prevalence of that of non-First Nations people in Canada.⁵ This epidemiologic disparity is further reflected in the prevalence of “forgotten” CVDs, such as rheumatic heart disease.⁶

Although eradicated among most non-Indigenous peoples in Canada, rheumatic heart disease remains a preventable cause of heart failure and death among Indigenous peoples in Canada.⁷ To illustrate, despite comprising only 8% of the population, First Nations people were faced with approximately 41% of the invasive group A streptococcal infections in Canada, which give rise to rheumatic heart disease if left untreated.⁸ Relative incidence data suggest that Indigenous peoples are 10 to 75 times more likely than non-Indigenous peoples in Canada to have invasive group A streptococcal infections.^{9,10} The variability in both cardiovascular risk factors and CVD outcomes in Indigenous peoples in Canada can be explained partially by geographic factors (eg, distance to healthcare facilities, urban-rural status) and healthcare biases (eg, greater biases in healthcare settings with fewer Indigenous patients). However, socioeconomic status, trust in the healthcare system, social supports, access to education and health literacy, and the affordability of cardiovascular medications have also been associated with cardiovascular health and worse outcomes among 8 First Nations communities across Canada.³ Altogether, Indigenous peoples in Canada have seen a disproportionate increase in the need for specialty care services for their CVD, a contrast to the decline that has occurred in non-Indigenous patients with CVD in Canada.¹¹

Access to care can be defined as a function of geographic accessibility, infrastructural capacity, healthcare quality,

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Please see page 789 for disclosure information.

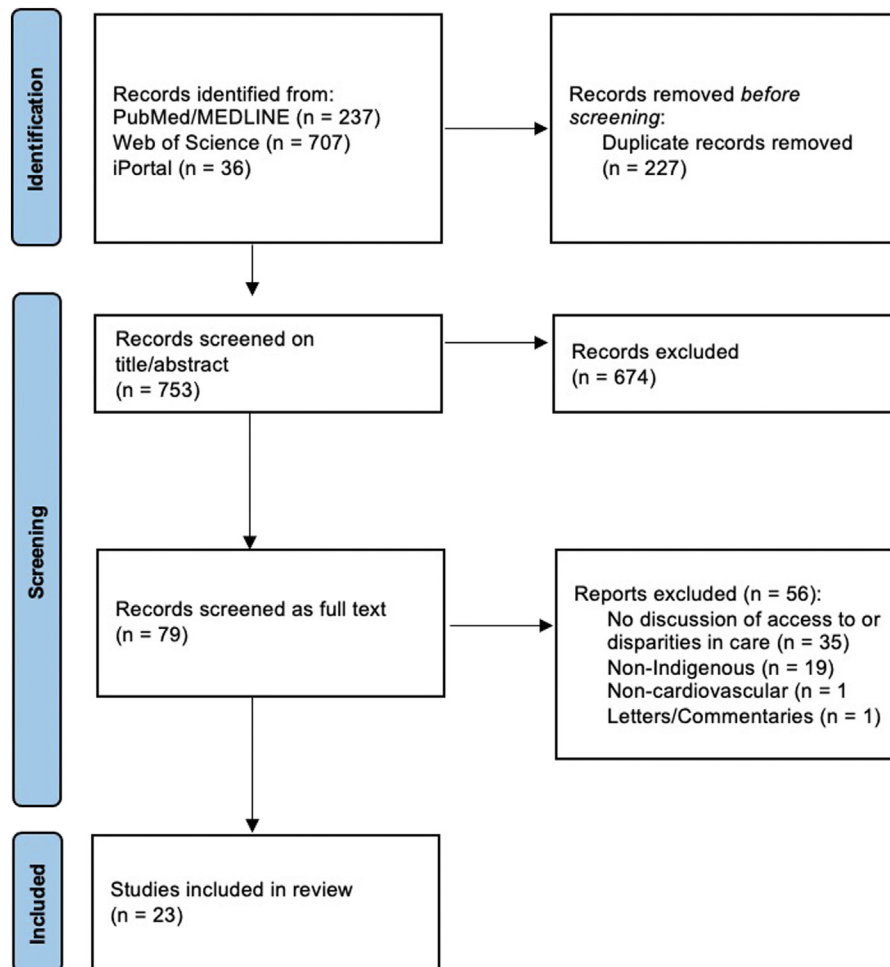


Figure 1. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram.

financial affordability, and social acceptability.¹² In a universal health coverage system such as that in Canada, financial affordability can be assumed to be of negligible importance, except for the need for chronic medication use (eg, secondary cardiovascular prevention). In contrast, geographic barriers (eg, remote location of patients' residence), infrastructural capacity (eg, limited tertiary capacity in local healthcare facilities), healthcare quality (eg, structural racism and biases), and social acceptability (eg, skepticism of healthcare system and limited recognition of indigenous medicine in tertiary care centres) remain of concern.¹³⁻¹⁶ These biomedical barriers in access to care are widespread among Indigenous peoples in Canada.¹⁷ In addition, the current Canadian health system structure, shaped by the Canada Health Act of 1984, has further perpetuated fragmented healthcare delivery between Indigenous peoples and non-indigenous individuals across Canada, due to the complete omission of delivery for Indigenous peoples.¹⁸ Data availability on access to and outcomes after cardiovascular and surgical care for Indigenous peoples in Canada remain scarce and of low-quality, but existing data suggest that they have poorer access and outcomes compared to those of non-Indigenous peoples in Canada.^{19,20}

In this rapid review, we explore the current scientific literature regarding access to, utilization of, and outcomes after cardiovascular care for Indigenous peoples in Canada. The findings from this review may help identify gaps in knowledge to better inform future research priorities and policy questions to address these disparities in care. Priority should be given to approaches designed to close the gap in healthcare access and outcomes between Indigenous peoples and non-Indigenous peoples in Canada.

Methods

Literature search

A rapid review was performed using the PubMed/MEDLINE, Web of Science, and Indigenous Studies Portal (iPortal) databases to identify literature describing access to, utilization of, and outcomes after medical and surgical cardiovascular care for Indigenous peoples in Canada during the past 2 decades (January 2002—December 2021) from a biomedical perspective. The search strategy is summarized in [Supplemental Appendix S1](#). Rapid reviews are a form of literature review that synthesizes existing knowledge in an

Table 1. Characteristics of studies describing access to, utilization of, and outcomes after cardiovascular care for Indigenous peoples in Canada

Article characteristics	Number (%) of articles (N = 23)
Location	
Pan-Canadian/Unspecified	8 (34.8)
Alberta	5 (21.7)
Manitoba	5 (21.7)
Ontario	4 (17.4)
Saskatchewan	1 (4.3)
Indigenous communities	
First Nations	13 (56.5)
Métis	1 (4.3)
Inuit	0 (0.0)
Unspecified	9 (39.1)
Theme*	
Delay in seeking care	6 (26.1)
Delay in reaching care	2 (8.7)
Delay in receiving care	3 (13.0)
Disparities in care	12 (52.2)
Clinical topics*	
Screening and prevention	11 (47.8)
Acute care	5 (21.7)
Cardiac surgery or interventional cardiology	3 (13.0)
Other	6 (26.1)

*Articles may have more than one theme and/or clinical topic.

accelerated manner, whereby the traditional systematic review process is shortened by, for example, performing a literature screening with only one reviewer, not conducting a risk of bias or quality appraisal, and presenting results in a narrative format.²¹ Articles were screened for relevance based on (i) their title-abstract and (ii) being full texts identified using Covidence screening software.²² Articles presenting original research, conference abstracts, or articles presenting a review of the literature were included. Commentaries, letters to the editor, editorials, articles describing Indigenous peoples outside of Canada, articles describing only non-Indigenous individuals, and articles not describing cardiovascular care were excluded. No exclusion was made based on language. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Rapid Reviews (PRISMA-RR) was used to guide the literature review process and presentation.²³

Literature assessment

Included articles had key information extracted, were summarized, and were categorized into 3 distinct themes according to the Three Delays Framework in access to care.²⁴ The Three Delays Framework divides delays in care into 3 distinct points in time. First, a delay in seeking care may occur, owing to patients not being aware of the need for care (eg, asymptomatic) or feeling deterred from seeking care (eg, by financial barriers, logistical reasons, distance). Important to note is that fear of stigma may also be present (eg, stigma associated with having a certain condition or one's identity), along with structural racism. The second type of delay is in reaching care, in situations in which the decision has been made to seek care, or doing so has become necessary, but considerable time elapses before a care location is reached (eg, owing to long distances, poor road infrastructure, geographic, and environmental conditions). The third type of delay is in

receiving care, which occurs when the point of care is reached but patients have to wait a disproportionate amount of time to receive the necessary care (eg, owing to long waiting lists, administrative barriers, and unconscious biases). We added a fourth distinct theme relating to the overall disparities in outcomes when receiving care and after having received care.

The following "considerations for successful engagement in indigenous health research" per Hyett et al.²⁵ were used to determine whether the included literature is reflective of Indigenous peoples:

- description of the historical context;
- description of the present-day context;
- ethical guidelines or protocols for indigenous health research reported (eg, Tri-Council Policy Statement on Ethical Conduct for Research Involving Humans; First Nations principles of ownership, control, access, and possession or OCAP; approval by the indigenous ethics review board);
- use of indigenous or culturally appropriate methods (ie, research tools) and methodologies (ie, theoretical lens for research). Examples of relevant methods include storytelling (use of stories to share perspectives) and symbol-based reflection (use of symbols to share perspectives). Examples of relevant methodologies include two-eyes seeing (use of both an indigenous and Western lens) and petal flower (framework in which the self is central, the methodology is the foundation, and petals represent different methods of knowledge generation);
- community-based research (eg, community engagement, active dissemination);
- deficit-versus-strength-based research (eg, assess how research may stigmatize communities; highlight strengths and skills of communities); and
- research allyship (eg, development of relationships with Indigenous peoples, Indigenous peoples as coauthors, enabling indigenous scholars to have first/last authorship position in research publications).

Results

A total of 753 articles were identified after exclusion of duplicates; 23 articles were identified after screening and for final inclusion (Fig. 1).

Disparities in care were the most common type of disparity (N = 12; 52.2%), whereas prevention and screening (diagnosis) of CVD was the most common focus of articles (N = 11; 47.8%). Articles were most commonly pan-Canadian or without a distinct geographic location (N = 8; 34.8%), with Alberta and Manitoba the most common individual provinces studied (for each, N = 5; 21.7%). First Nations were the most commonly described indigenous communities (N = 13; 56.5%). Table 1 summarizes article characteristics. Figure 2 presents the geographic coverage of studies that were not pan-Canadian or were without specified location.

Delay in seeking care

In Canada, an analysis of over 100,000 adults, of whom 1% were Indigenous peoples, showed that, although only 2.6% of the overall sample reported never having had their

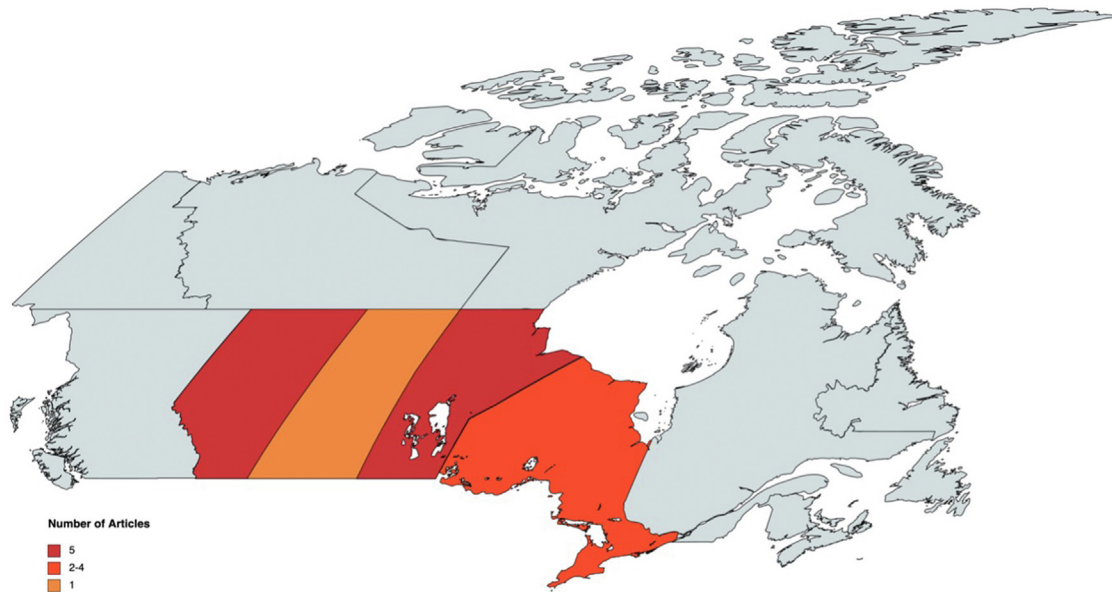


Figure 2. Distribution of geographic origins of studies describing access to, utilization of, and outcomes after cardiovascular care for Indigenous peoples in Canada. Eight articles were pan-Canadian or did not have a specified location. Map was created with www.mapchart.net.

blood pressure measured, 4.7% of those were Indigenous peoples.²⁶ Similarly, cardiovascular screening and primary and secondary prevention have been insufficient among type 2 diabetic First Nations patients in Canada, with less than 10% of known diabetic patients meeting all clinical guidelines for secondary prevention and laboratory targets (ie, blood glucose, cholesterol, and blood pressure).²⁷⁻²⁹

In Manitoba, First Nations patients who received coronary angiography were less likely to visit a family physician or specialist (ie, internist, cardiologist, or cardiac surgeon) during the year after the angiogram, compared to non-First Nations patients.³⁰ First Nations people who received an angiogram for stable ischemic heart disease also were more likely to require hospitalization for acute myocardial infarction (hazard ratio [HR] 2.26; 95% confidence interval [CI]: 1.79-2.85) and die (HR 1.50; 95% CI: 1.17-1.94), compared to other patients at 5-year follow-up. These disparities persisted after accounting for revascularization interventions (ie, percutaneous coronary intervention or coronary artery bypass grafting) and disease complexity (ie, disease severity, overall health status, and existing comorbidities). Furthermore, First Nations patients had higher hospital admission rates compared to those of non-First Nations patients for both acute myocardial infarction (adjusted HR 3.03; 95% CI: 1.40-6.55) and congestive heart failure (adjusted HR 3.84; 95% CI: 1.37-10.78).³¹ This result was observed despite adjusting for cardiovascular medication use,³² as First Nations patients were less likely to have intermediate (odds ratio [OR] 0.75; 95% CI: 0.57-0.99) or high medication possession ratios (OR 0.64; 95% CI: 0.50-0.81) of statins, which are measures of medication supplies, compared to non-First Nations patients.

Delay in reaching care

Geographic distances limit timely access to specialty care, such as cardiovascular care, for those who live in rural or remote areas. First Nations patients with CVD who live in areas with

high densities of Indigenous peoples are more likely to travel long distances to receive the necessary cardiovascular care, compared to those living in areas with lower densities of Indigenous peoples.²⁰ Similarly, poor road infrastructure, emergency medical services being distant, and potentially dangerous geographic conditions limit emergency care for remote indigenous communities. These issues are particularly problematic for acute cardiovascular events, such as acute myocardial infarction, aortic dissection, and cardiac arrest. As a result, Indigenous peoples in Canada are faced with substantially longer times between the onset of symptoms and hospital presentation compared to those in the general population.³³

Delay in receiving care

Once individuals know they require care and have reached the appropriate healthcare facility, a (further) delay in receiving care can occur due to waiting lists or healthcare biases. First Nations people in Manitoba were less likely to undergo coronary angiography compared to the general population (2.7 vs 3.3 per 1000 population per year; $P < 0.01$).³⁴ Moreover, First Nations patients were more likely to present with acute myocardial infarction as the indication for coronary angiography, as opposed to an elective presentation, compared to non-First Nations patients (28.8% vs 25.0%; $P < 0.01$), which may suggest a delay in cardiovascular screening and/or CVD diagnosis. However, First Nations patients were younger, and therefore less likely to be screened compared to older patients, and may not have had diagnosable obstructive coronary artery disease before; acute myocardial infarction thus may have been the first clinical manifestation of their coronary artery disease. A 10-year province-wide analysis of coronary angiography utilization in Alberta found that First Nations people were less likely to receive coronary angiography within 24 hours of having an acute myocardial infarction (adjusted OR 0.73; 95% CI: 0.62-0.87) compared to non-First Nations patients, which was not explained by

Table 2. Considerations for successful engagement in indigenous health research as recommended by Hyett et al.²⁵ and modified to evaluate the presented research

Consideration	Number (%) of articles
Historical context presented	7 (30.4)
Present-day context presented	15 (65.2)
Ethical guidelines and protocols reported	12 (52.2)
Indigenous methods and methodologies	0 (0.0)
Community-based research	12 (52.2)
Deficit- vs strength-based research	15 (65.2)
Research allyship	Unknown*

* Research allyship is defined as the development of relationships with Indigenous peoples and communities to whom the researchers are held accountable. This could not be determined based on the research presented as this mostly pertains to the "behind the scenes" of the research that was conducted and is not consistently reported.

either socioeconomic status or distance to the nearest cardiac catheterization laboratory.³⁵ For those who did receive coronary angiography, no significant difference occurred in the time from diagnosis to intervention between First Nations and non-First Nations patients. Furthermore, in Calgary, Alberta, First Nations patients with acute myocardial infarction were as likely as Caucasian patients to present at the emergency department within 2 hours after symptom onset (49% vs 45%), and more likely to see a healthcare provider within 72 hours prior to presenting to the emergency department (21% vs 12%),³⁶ suggesting that delays in care are not universal across the care continuum, across all Indigenous peoples, or across all specialties.

Disparities in care

Even when they do receive care, variations exist in the utilization rates of, and outcomes after, cardiovascular care for Indigenous peoples in Canada. Across various surgical specialties, including cardiac surgery, Indigenous peoples had a 30% higher rate of death during or immediately after surgery compared to non-Indigenous patients (pooled HR 1.30; 95% CI: 1.09-1.54).¹⁹ In addition, even after adjusting for confounders, higher rates of complications were noted after cardiac surgery among Indigenous patients, compared to rates among non-Indigenous patients (infectious complications: adjusted OR 1.63, 95% CI: 1.13-2.34; pneumonia OR 2.24, 95% CI: 1.58-3.19). The reasons for this are unknown and likely multifactorial, but they may include delayed presentations and unconscious biases, although the meta-analysis was limited by the observational design of studies and the potential for misclassification bias. In Manitoba, Métis people were found to have higher prevalence rates of cardiovascular risk factors, such as diabetes, and CVD, such as ischemic heart disease, but disproportionately lower healthcare utilization rates and poorer outcomes compared to those of non-Métis people.³⁷ In Alberta, the utilization of cardiology services among Indigenous peoples was substantially lower compared to that of non-Indigenous peoples (0.28% vs 0.93% of the population; $P < 0.01$), despite their higher CVD burdens.³⁸ Between 1996 and 2015, an increase in the volume of percutaneous coronary interventions and coronary artery bypass grafting, as well as cardiovascular prescriptions, was observed among First Nations people in Ontario, with a

notable reduction in cardiovascular events.³⁹ This finding holds promise that the gap is closing between the CVD burden and met cardiovascular care needs.

Across Canada, patients with acute myocardial infarction coming from areas with high percentages of First Nations residents were less likely to undergo percutaneous coronary intervention and coronary artery bypass grafting, compared to patients from areas with fewer First Nations residents, even though First Nations residents were more likely to be hospitalized.⁴⁰ An analysis of all cardiac surgical patients in Manitoba between 1995 and 2007, weighted against province-wide demographics and epidemiologic CVD data, found that Indigenous peoples were less likely to undergo any type of cardiac surgery, compared to non-Indigenous peoples (63.6 vs 97.7 per 10,000 population; $P < 0.01$).⁴¹ This effect was more prominent among urban Indigenous peoples (21.0 vs 78.0 per 10,000 population; $P < 0.01$) and persisted for isolated coronary artery bypass grafting (46.2 vs 71.9 per 10,000 population, $P < 0.01$). In Alberta, although no differences were found in the likelihood of undergoing medical management, percutaneous coronary intervention, or coronary artery bypass grafting, First Nations people with acute myocardial infarction had worse long-term outcomes than did non-First Nations patients after medical management (adjusted HR 1.38; 95% CI: 1.07-1.77) or percutaneous coronary intervention (adjusted HR 1.38; 95% CI: 1.06-1.80), but not coronary artery bypass grafting (HR 0.91; 95% CI: 0.56-1.47).³⁵ Among the Métis people in Ontario, the number of 1-year readmissions after treatment for acute exacerbation of heart failure was double that of the general population (32% vs 15%; $P = 0.02$), whereas they were comparable for acute coronary syndrome, atrial fibrillation, and cerebrovascular disease.^{4,42} At 1 year, the mortality rate for atrial fibrillation was 3.3 times higher for Métis people compared to the general population (standardized rate 31.0% vs 9.4%; $P = 0.01$), although mortality after acute coronary syndrome, heart failure, and cerebrovascular disease was comparable.⁴² However, in Saskatoon, comparable pre-hospital survival and survival to hospital discharge were observed for First Nations and non-First Nations patients having an out-of-hospital cardiac arrest, implying that healthcare disparities may not be perpetuated consistently in urban and emergency settings across Canada.⁴³

Evaluation of engagement of Indigenous peoples in research

Included studies were evaluated for the observed (ie, implicitly or explicitly reported) engagement of Indigenous communities in their research. A majority of articles ($N = 15$; 65.2%) presented the modern-day context, but few ($N = 7$; 30.4%) discussed historical contexts underlying their research question or results. Most studies used administrative or clinical databases or chart reviews, whereas no study used Indigenous methods or methodologies. Table 2 summarizes the considerations and frequency thereof across the included studies.

Discussion

The findings from this rapid review suggest that, although the literature on the topic is scarce, clear disparities in access to

and outcomes after cardiovascular care exist between Indigenous peoples and non-Indigenous peoples in Canada, most prominently in delays in receiving care and poorer long-term outcomes. However, the literature is limited to mostly Alberta, Manitoba, and Ontario, as well as First Nations people, suggesting an immediate need for a greater understanding of existing disparities.

Although cardiovascular care disparities facing Indigenous peoples in Canada are poorly studied to date, our findings are consistent with those in the existing literature. A previous scoping review has illustrated that research is limited on the prevalence, pathophysiology, diagnosis, and treatment of cardiovascular diseases in indigenous women in Canada.²⁰ Furthermore, Indigenous peoples present more commonly for acute health care but report lower levels of satisfaction with and access to health care, illustrating the need for both a better understanding of gaps across the care continuum and the development of a culturally safe environment.³³ We found that contemporary issues pertaining to systemic barriers and the social determinants of health of Indigenous peoples in Canada are generally well described, although a minority of articles discussed the historical context and drivers of current disparities and inequities. Additionally, none of the identified studies applied indigenous methods or methodologies in conducting their research, limiting the integration of traditional medicine and a qualitative understanding of Indigenous peoples' barriers to and lived experiences with cardiovascular care in Canada, based on the current review.

We found a concentration of literature with data from Alberta, Manitoba, and Ontario, where the majority of Indigenous peoples in Canada live (15.5%, 13.3%, and 22.4% of the total Indigenous population in Canada, respectively).⁴⁴ In addition, the majority (56.5%) of studies focused on First Nations people. First Nations people make up 58.4% of all Indigenous peoples.⁴⁴ However, a point to note is that in most Canadian provinces and territories, available administrative healthcare data do not capture race and ethnicity, although data linkages with First Nations status data are feasible, which may be a reason for this dominant trend in the literature.

Despite Canada's universal health coverage system, some barriers and gaps in accessing healthcare services remain.⁴⁵ These gaps may be especially pronounced for specialized services, such as cardiology and cardiac rehabilitation, and complex, centralized care, such as cardiac surgical care and interventional cardiology.¹³⁻¹⁶ For example, no cardiac centres offer interventional cardiology or cardiac surgery in the Northwest Territories, Yukon, or Nunavut, requiring patients with acute cardiovascular events to travel to nearby provinces.⁴⁶ Similarly, within provinces, the distribution of services often requires patients, including mainly remote indigenous communities, to seek air travel to reach the care they need. For example, in Northwest Ontario, approximately 10% of air ambulance flights are for cardiovascular emergencies.⁴⁷

Inequity and disparities for Indigenous peoples in access to, utilization of, and outcomes after cardiovascular care in

Canada can be improved through a variety of means, including but not limited to the following 4 areas.

Increased recognition of the central role of traditional medicine. Improving comprehensive access to cardiac care for Indigenous peoples in Canada requires recognition of the central role of traditional medicine and engagement with Indigenous peoples communities to explore how cardiac healthcare services can become not only more accessible but also more ethical and culturally safe.⁴⁸ Indigenous peoples approach health by incorporating emotional and spiritual health, in addition to physical and mental health, and considering one's environment as being interconnected with health. Thus, healthcare practitioners must listen and respond to these holistic approaches in order to best support Indigenous peoples' cardiovascular health and bridge the gap between Western and indigenous medicine.⁴⁹ Some healthcare programs in Canada integrate indigenous knowledge and practices as part of healthcare delivery. For example, the Centre for Addiction and Mental Health (CAMH) in Toronto involves indigenous social workers, elders, and traditional healers, as well as indigenous ceremonies and cultural programming to support patients' physical, mental, emotional, and spiritual health.

Physician-patient concordance and intersectionality. In Canada, Indigenous peoples remain under-represented in the health workforce: although Indigenous peoples make up 4.9% of the population in Canada, only 1.2% of health workers identify as Indigenous peoples.⁵⁰ Evidence suggests that sex, race, and ethnicity concordance between health workers and patients may improve outcomes^{51,52}; however, little is known regarding the effects of physician-patient concordance in terms of Indigeneity and intersectionality, which may be particularly important. Medical schools and health profession programs, such as the Northern Ontario School of Medicine, can facilitate the training of Indigenous peoples and non-indigenous individuals living in northern, rural, and remote parts of the country.⁵³ Such programs may result in retention within the region, which may promote physician-patient concordance in various ways.

Context-specific and culturally appropriate management guidelines. In addition to the incorporation of indigenous medicine into the management of Indigenous peoples with CVD, contextual guidelines must be formulated for the management of CVDs.⁵⁴ For example, rheumatic heart disease has become rare in Canada, although it is still prevalent among Indigenous peoples; yet, health workers are unfamiliar with the condition—specifically, it is not a reportable illness, and disease surveillance by public health authorities remains limited.⁵⁵ Without contextual guidelines and practice recommendations, delays in the diagnosis and delivery of care may persist, worsening long-term outcomes for patients presenting with such conditions.

Improving health literacy, health promotion, and awareness of health disparities. Although epidemiologic data have become increasingly available on the CVD burdens in Indigenous peoples in Canada, the awareness thereof and health literacy underlying CVDs remain variable. In indigenous newspapers, coverage of CVDs was limited (7.5% of all chronic disease articles), and only a small portion of these articles (23%) included mobilizing information to empower readers to manage their CVD or address existing cardiovascular risk factors.⁵⁶ Programs directed toward increasing health literacy surrounding cardiovascular health and care among Indigenous peoples have been effective in increasing medication adherence for Indigenous peoples with CVDs. A customized and structured intervention trial, incorporating indigenous traditions and best practices in indigenous patients with CVDs presenting at indigenous primary care services in Canada, Australia, and New Zealand improved the understanding of the importance of cardiovascular medications by an absolute difference between 60.1% (from 37.4% to 97.5% for statins) and 71.4% (from 24.5% to 95.9% for angiotensin-converting enzyme inhibitors).⁵⁷ Simultaneously, biases and awareness among healthcare providers must be addressed, as health workers have a poor understanding of the reasons for, and consequences of, low health literacy for indigenous patients.⁵⁸

In addition to the above health system and clinical interventions, the academic community, driven by indigenous researchers and informed by indigenous communities, must actively explore gaps in access to and disparities in cardiovascular care for Indigenous peoples in Canada. In 2006, the *Canadian Journal of Cardiology* published a series of papers on access to echocardiography, cardiac electrophysiology, interventional cardiology, cardiac surgery, and cardiac rehabilitation, yet none explored or commented on access to these cardiovascular services for Indigenous peoples,¹³⁻¹⁶ contributing to the relatively limited amount of literature and poor understanding of the gaps in access to cardiovascular care for Indigenous peoples in Canada. This gap in the literature especially limits our understanding of disparities in terms of intersectionality—although few studies assess the complex effects of sex, gender, Indigeneity, socioeconomic status, and other sociodemographic factors on access to and outcomes after care, barriers are well understood to be particularly large for people who identify themselves as being part of multiple minoritized and/or racialized communities (eg, indigenous women).⁵⁹ Furthermore, the majority of literature on access to care to date has adopted a biomedical lens; incorporating alternative and post-colonial worldviews to research conceptualization, generation, interpretation, translation, and dissemination is essential to better work toward health equity for Indigenous peoples in Canada.¹⁷ Most importantly, healthcare professionals, researchers, and policymakers must reflect upon the longstanding oppression and systemic and epistemic racism rooted in Canada's history that have caused many of the described health and healthcare disparities in Canada. Schultz et al. suggest 4 important first acts of reconciliation to reduce biases and address racism within the healthcare arena, namely the following: (i) become familiar with and act upon the Truth and Reconciliation Commission's calls to action; (ii) self-reflect on one's actions and actively incorporate anti-racism into one's practice; (iii)

become aware of the effects of one's privilege and tackle discrimination that results from such privilege; and (4) establish relationships with, work with, and listen to Indigenous peoples.⁶⁰

Limitations

This study carries several limitations. First, the literature on cardiovascular and surgical care for Indigenous peoples in Canada is limited and of poor quality,^{19,20} which limits the availability of cardiovascular care data as reflected by the findings from this review. As a result, a rapid review of the literature, rather than a systematic review, was performed to rapidly assess the literature and identify gaps in the literature for future Indigenous peoples-led research groups. The literature was heavily skewed toward the description of First Nations communities and patients, studies in Alberta, Manitoba, and Ontario, and screening, access to, and follow-up after coronary angiography, highlighting a need for further understanding of these findings in other indigenous communities, provinces, and CVD and cardiovascular care areas. Second, the literature describing cardiovascular care predominantly takes the lens of Western medicine, likely overlooking access to indigenous medicines and healing as part of the care equation. Third, the search strategy is limited in that not all individual indigenous communities are named (ie, a non-exhaustive list) due to the fact that hundreds of indigenous communities exist across Canada. Unlike systematic reviews, rapid reviews are less comprehensive in their search strategy. However, most article titles and/or abstracts can be assumed to contain a common denominator (eg, indigenous) as included in the search strings. Lastly, our search strategy approaches access to care through a largely biomedical lens; as a result, studies incorporating solely indigenous or culturally appropriate methodologies and methods and not using biomedical terminology to describe access to care may have been missed.

Conclusion

In Canada, Indigenous peoples are more likely to have poorly controlled cardiovascular risk factors and suffer from cardiovascular disease, compared to non-Indigenous peoples. Access to and disparities in cardiovascular care in Indigenous peoples remain poorly studied and understood; however, available research is largely rooted in a biomedical worldview and suggests that delays exist in seeking, reaching, and receiving cardiovascular care, as well as worse outcomes early and late after receiving care. Further community-driven research is required to better elucidate the gaps in access to holistic cardiovascular care in Canada and develop culturally safe and ethically appropriate healthcare and health systems interventions to improve the health of all Indigenous peoples in Canada.

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Supplementary Material

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