

Red River Métis Health Knowledge Authority

Riel and Resilient: the impact of climate change on Red River Métis health



Winnipeg, Manitoba, Canada 2023

Manitoba Métis Federation

Health & Wellness Department

Authors:

Tetiana Shcholok

Frances A. Chartrand

Kemunto Matini

Olena Kloss

Wajihah Mughal

Publication Information

Published by the Manitoba Métis Federation-Health & Wellness Department, 2023. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the proper written permission of the publisher.

How to cite this publication:

Shcholok, T., Matini, K., Mughal, W., Chartrand, F.A., & Kloss, O. (2023). 'Riel and Resilient: the impact of climate change on Red River Métis health'.

Additional copies of this report can be downloaded from the MMF's HWD website:

<http://health.mmf.mb.ca>

Health & Wellness Department

Manitoba Métis Federation

150 Henry Avenue

Winnipeg Manitoba R3B 0J7

Telephone: (204) 586-8474

A Message from the Minister of Health & Wellness

FOREWORD FROM MINISTER FRANCES CHARTRAND

It is with immense gratitude and a deep sense of purpose that I address the resilient and vibrant Red River Métis Citizens, our esteemed staff, and our invaluable funders through these words.

The idea of distinctions-based healthcare is crucial to the Manitoba Métis Federation. It recognizes the history and culture of the Red River Métis as rights-bearing Indigenous People and addresses systemic inequalities. As the National Government of the Red River Métis, The MMF is dedicated to providing culturally sensitive and respectful distinctions-based healthcare to our Citizens. We aim to nurture a healthier and prosperous future for our Community and create relevant programs and support for our Citizens.

To the Red River Métis Citizens, you have shown time and commitment to the betterment of our Community's health and well-being. Your voices, stories, experiences, and active participation in research are the foundation upon which we build a future of improved health outcomes and holistic well-being.

To the remarkable staff from the Health and Wellness Department who facilitate research and program development for our Citizens I extend my deepest thanks. It is through your efforts that we have been able to gather meaningful data, provide a safe space for dialogue, and offer a platform for the voices of our Red River Métis Citizens to be heard.

No endeavor of this magnitude can be achieved without the support of those who believe in our vision. To our esteemed funders, your belief in our mission has enabled us to take strides toward implementing distinctions-based healthcare that not only acknowledges the unique needs of our Community but also paves the way for equitable and accessible services.

In closing, I want to reiterate my deepest gratitude to each and every one of you. Your participation, dedication, and support have transformed research from a mere endeavor into a beacon of hope and progress.

With heartfelt appreciation,

Minister Frances Chartrand



Acknowledgments

The Manitoba Métis Federation-Health & Wellness Department wishes to thank the following individuals for their contributions in the production of this report:

The President and Cabinet of the Manitoba Métis Federation (MMF) for their ongoing support.

The funding for this publication was made possible through the Public Health Agency of Canada (PHAC).

Le financement de cette publication a été rendu possible grâce l'Agence de la santé publique du Canada.

Disclosure

The results and conclusions in this report are those of the authors and no official endorsement by the University of Manitoba or other parties is intended or should be inferred. For the purposes of this study, approvals were obtained from the Manitoba Métis Federation, National Government of the Red River Métis, to work with Métis Citizens in various regions.

Table of Contents

Publication Information.....	2
A Message from the Minister of Health & Wellness.....	3
Acknowledgments.....	4
Disclosure.....	4
List of Figures.....	6
List of Tables.....	6
Abbreviations.....	7
List of Tables.....	8
Executive Summary.....	8
Section 1: Introduction.....	10
1.1 Project Context.....	10
1.2 The Red River Métis.....	10
1.3 The Manitoba Métis Federation.....	11
1.4 Manitoba Métis Federation–Health & Wellness Department.....	15
Section 2: Preliminaries.....	17
2.1 Background and Previous Knowledge.....	17
2.2 Goal and Objectives.....	19
Section 3: Methods and Methodology.....	20
Section 4: Findings.....	21
4.1 Survey Data.....	21
4.2 Thematic Analysis of Survey Responses.....	22
4.2.1 Concepts of Environment.....	23
4.2.1.1 The role of the environment in health and well-being of Red River Métis.....	23
4.2.1.2 Perception of the positive environment.....	25
4.2.2 Climate change and Red River Métis health and well-being.....	29
4.2.3 Environment and Infectious Diseases.....	32
4.2.3.1 How the environment affects the body’s response to infectious diseases.....	34
4.2.3.2 Changes in the environment that can prevent infectious disease spread.....	36
4.2.4 Traditional Red River Métis lifestyle promotes balanced environment and improved health.....	38
4.2.4.1 Métis traditional lifestyles and infection prevention..	39
Section 5: Conclusion and Recommendations.....	42
Section 6: Limitations.....	44
References.....	45

List of Figures

- 1.2.1 Artistic Rendering of the National Homeland of the Red River Métis..... 11
- 1.3.1 MMF Governance Structure in Manitoba.....14
- 4.2.1 The importance of the environment in the health and well-being of Red River Métis..... 23
- 4.2.2 The level of concern about climate change in Red River Métis Citizens..... 29
- 4.2.3.1 Community awareness of the association between the quality of the environment and infectious diseases..... 33
- 4.2.3.2 Environmental components implicated in prevention of infectious diseases....36
- 4.2.4 Practicing traditional Red River Métis lifestyle is beneficial for health and well-being..... 39

List of Tables

- 4.1.1 Demographic and Socio-economic Characteristics of Red Métis Participants....21

Abbreviations

COVID-19: Coronavirus Disease 2019

HWD: Health and Wellness Department

IV: Intravenous

MMF: Manitoba Métis Federation

PHAC: Public Health Agency of Canada

RSV: Respiratory Syncytial Virus

S.A.D: Seasonal Affective Disorder

SD: Statistical Deviation

SGRIA: Self-Government Recognition and Implementation Agreement

UN: United Nations

UNDRIP: United Nations Declaration on the Rights of Indigenous Peoples

Executive Summary

Climate change has become a global concern due to its devastating impact on various aspects of human life. It is well-documented that significant environmental changes have multifaceted effects on health and well-being. Importantly, Indigenous communities often become the first respondents to changes in the ecosystem due to their traditional close relationship with nature and the environment. For the Red River Métis, the environment has been a crucial determinant of both physical and mental health. The living philosophy of the Red River Métis is rooted in maintaining equilibrium between humans and the environment, from traditional food harvesting practices to healing with natural remedies. Consequently, it is predicted that shifts in the climate and associated disruptions in normal natural cycles will have a prominent negative effect on the health and well-being of Red River Métis people. The Health and Wellness Department of the Manitoba Métis Federation developed the *Riel and Resilient: the impact of climate change on Red River Métis health* project with the goal to determine the effects of environment-related hazards on the Red River Métis population.

This project aims to synthesize distinctions-based and culturally relevant evidence for developing strategies to mitigate the negative impact of climate change on the Red River Métis Community. This research initiative involved direct engagement with Red River Métis Citizens that represented the seven Manitoba Métis Federation Regions and gathering their perspectives and concerns through a self-administered, cross-sectional survey. We used this approach to assess socio-demographic characteristics, perceptions about positive environment, the level of concern about climate change and associated health hazards; the role of the environment in transmission and severity of infectious diseases; and to understand how practicing the traditional Red River Métis lifestyle can restore environmental balance and prevent negative health outcomes. Data collected from the survey were coded and analyzed using descriptive statistics. Additionally, the answers to open-ended questions from the survey were used for content analysis to categorize repeating comments and identify overarching themes.

Within the frame of this project, we gathered and analyzed the perceptions of Red River Métis Citizens on the following themes:

1. The importance of the environment to the health and well-being of Red River Métis.
2. The perception of the positive environment.
3. The impact of climate change on health and well-being.
4. How the environment affects the body's response to infectious diseases.
5. Experiences with infectious diseases.
6. Changes to the environment that could prevent infectious diseases.
7. Métis traditional lifestyles and infection prevention.

A mixed-methods approach grounded in the Red River Métis Life Promotion Framework was used to minimize bias and to fully capture participants' voices and perspectives. The present project's outcomes will help direct culturally informed policy and program development for Red River Métis Citizens and may also inform such work for other Indigenous and under-served populations. Indeed, the information collected through this project will guide the development of the Red River Métis Climate Change Strategy and influence future climate change initiatives.

Section 1: Introduction

1.1 Project Context

Considering the limited emphasis on distinction-based Red River Métis research, this project's goal is to compile information that is tailored to our People. Our primary objective is to assess how Red River Métis Citizens perceive climate change and its effects on their overall health and well-being. The results obtained from this study will serve as crucial input for shaping policy choices and directing upcoming research endeavors aimed at improving the health and wellness of Red River Métis Citizens.

1.2 The Red River Métis

As a rights-bearing Indigenous People, the Red River Métis share a distinct identity and a unique history in the expansive western plains, with a focal point in the Red River Valley of West Central North America (**Figure 1.2.1**). This Indigenous Community, consisting of Citizens and individuals eligible to become Citizens, is situated within Manitoba and in various locations both inside and outside Canada. In this context, the Red River Métis Community goes beyond the conventional notion of a geographically specific "brick and mortar" community, such as a village or settlement. The Red River Métis Community embodies a collective identity, culture, and history, which includes interconnected political, social, entrepreneurial, economic, and kinship networks, among other attributes.

In 1869, the National Committee of the Red River Métis, under the leadership of President John Bruce and Secretary Louis Riel, justly proclaimed the jurisdiction and authority of the Métis People over the entirety of the Métis Homeland, a region often called the North-West Territory at that time. Following negotiations with representatives from Canada, this Territory was integrated into Canada. Subsequently, in 1870, the Red River Métis are the founders of the province of Manitoba and the key negotiating partners in the Confederation of Canada.

Following a period of peaceful governance in the province, the Red River Métis experienced a Reign of Terror, which led to many being forcibly dispersed across the

Métis Homeland and even beyond, predominantly moving westward and northward in their quest for safety and stability. Up to the present day, the Red River Métis continue to grapple with the enduring consequences of the broken promises outlined in the Manitoba Act of 1870, the Reign of Terror, the dispersal, as well as the legacy of Residential and Day Schools and the Sixties Scoop. Consequently, Red River Métis still find themselves disproportionately represented within the foster care system and among those who are unemployed, incarcerated, and suffering from chronic illnesses.



Figure 1.2.1. Artistic Rendering of the National Homeland of the Red River Métis

1.3 The Manitoba Métis Federation

Many years following the Reign of Terror and the widespread dispersal, the Red River Métis Community-initiated efforts to regroup and reorganize, with the goal of enhancing the well-being of Red River Métis Citizens who had endured a history of traumatizing and strikingly unjust treatment. Almost a century after the National Committee of the Red River originally gathered to assert their jurisdiction, the Red River Métis established the

Manitoba Métis Federation (MMF) as a non-profit entity in 1967, utilizing the only available avenue for representation at that time. The present governance structure is depicted in **Figure 1.3.1**.

In 1981, the MMF initiated a legal case on behalf of the Red River Métis, asserting that the federal government had failed to fulfill the land grant provision specified in section 31 of the Manitoba Act of 1870, in accordance with the honor of the Crown. After a span of thirty-two years, in 2013, the Supreme Court of Canada ruled that the federal government had a constitutional obligation, as outlined in section 31, to honor its commitment to the Red River Métis. In response to this ruling, in 2016, Canada and the MMF signed a memorandum of understanding and the *Framework Agreement for Advancing Reconciliation* on November 15, 2016, with the aim of progressing exploratory discussions on reconciliation.

In 2021, Canada and the MMF signed the *Manitoba Métis Self-Government Recognition and Implementation Agreement (SGRIA)* to “recognize, support, and advance the exercise of the Manitoba Métis’[also known as the Red River Métis] right to self-determination, and its inherent right to self-government recognized and affirmed by section 35 and protected by section 25 of the Constitution Act, 1982, in a manner that is consistent with the United Nations Declaration on the Rights of Indigenous Peoples, through a constructive, forward-looking, and reconciliation-based arrangement that is premised on rights recognition and implementation.” This same year, Canada’s *United Nations Declaration on the Rights of Indigenous Peoples Act (UNDRIP; the Act, 2016)* received royal assent and came into force. Both the Act and the SGRIA commit Canada to working with the MMF to implement the UN Declaration, to advance reconciliation with the Red River Métis, and to advance the Red River Métis right to self-government and self-determination.

Currently, in order to become a Citizen of the Manitoba Métis Federation, individuals must meet the following criteria:

- 1) Self-identify as Red River Métis.
- 2) Demonstrate an ancestral link to the Historic Red River Métis Community.
- 3) Receive acceptance from the present-day Red River Métis Community.

Additionally, Canada's endorsement of the *UN Declaration on the Rights of Indigenous Peoples* represents a significant milestone, underlining the Indigenous peoples' rights to self-determination, preservation of culture, and well-being. This declaration emphasizes the vital role of Indigenous communities in health-related decision-making. Nevertheless, Canada's disjointed healthcare system has, over time, led to inconsistent services for the Red River Métis, a situation worsened by the absence of health legislation that acknowledges their unique needs. To bridge this gap and uphold Indigenous rights, there is a pressing need for the development of legislation specifically tailored to address the distinct health requirements of the Red River Métis. These historical factors have culminated in the establishment and persistence of the MMF's Health and Wellness Department (HWD).

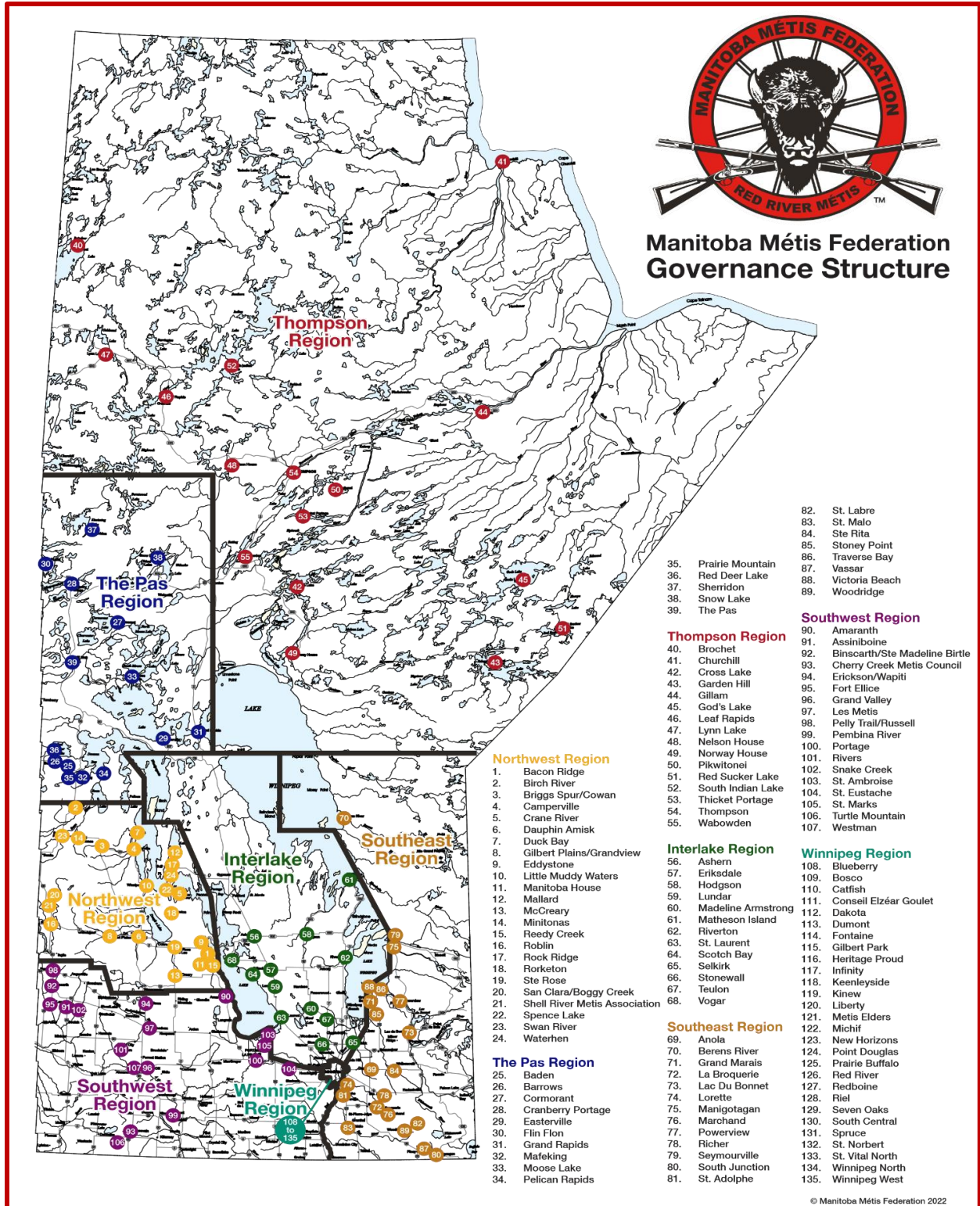


Figure 1.3.1. MMF governance structure within Manitoba, 2022

1.4 Manitoba Métis Federation–Health & Wellness Department

In 2005, recognizing the historical health challenges faced by the Red River Métis, the MMF founded the HWD. Today, the HWD remains dedicated to the ongoing effort to enhance the health and well-being of Red River Métis Citizens. The department is unwavering in its commitment to cultivating and applying culturally rooted, distinction-based, holistic knowledge. This dedication is directed toward improving the overall quality of life and well-being of the Red River Métis Community through initiatives focused on prevention, health service delivery, research, and innovation.

The HWD is composed of a dedicated team organized into four distinct functional areas:

Health Research: This team was established in 2005 and focuses on qualitative research to gain insights into the perspectives and experiences of Red River Métis Citizens regarding their health and access to healthcare. The goal is to gather lived experiences through consultations, group discussions, and individual interviews, ultimately creating culturally appropriate and safe health insights specific to the Red River Métis Community.

Clinical Services: This unit includes Nurses, Registered Foot Care Nurses, Registered Dietitians, and Support staff. They work to implement strategies developed by the health research and policy and health information team, with the aim of enhancing the health of Red River Métis Citizens by providing essential clinical services.

Policy & Health Information: Established in January 2022, this team is responsible for developing Red River Métis-specific information to support policies, programs, and services designed for Red River Métis Citizens.

Community Programming: Formed in 2022, this team's role is to empower the HWD to address the health needs of Citizens through various programs. By engaging with the community and actively listening to their concerns, they tailor health initiatives to ensure relevance, accessibility, and a positive impact on the overall well-being of all Citizens.

All these areas are overseen by our leadership and management team. Over the past few years, the MMF's HWD has significantly expanded its capabilities to address the health-related needs of Red River Métis Citizens. During the challenging times of the COVID-19 pandemic, the HWD actively supported Citizens by establishing vaccine clinics, strengthening mental health services, and adapting to virtual engagements to maintain the connection with the Red River Métis Community. Our unwavering commitment to collaborating with Red River Métis Community has led to our growth, the acquisition of knowledge, and the discovery of innovative methods to support the health of Red River Métis people.

At MMF's HWD, we also provide Health Consultations, offering an opportunity for Citizens to actively contribute to shaping the Department's policies and initiatives. We highly value their knowledge, expertise, and input on various health-related topics, including the development of federal health legislation, access to medical transportation services, vaccine hesitancy, mental health, and addiction. Through their participation in focus group discussions, our Citizens offer crucial insights on how MMF can enhance healthcare for the Red River Métis. The healthcare inequity experienced by our Citizens roots in long-standing denial of the Red River Métis rights and long history of practicing “one size fits all” model of healthcare with complete absence of distinctions-based approach.

Section 2: Preliminaries

2.1 Background and Previous Knowledge

People have long suspected that the climate of their land could naturally change over time. However, with population growth, extensive usage of natural resources, and overproduction of greenhouse gases and other pollutants, these changes became far more impactful than humanity anticipated. Global warming has a multitude of effects on the environment. Research conducted between 2015 and 2020 has revealed the unmistakable influence of climate change in 76 instances of floods, droughts, storms, temperature anomalies, and significant escalation of the likelihood of wildfires in 114 countries (Kulp & Strauss, 2019). According to the United Nations, more than 12 million hectares of land undergo desertification each year leading to more than 155 million people being pushed into acute food insecurity (UN World Food Programme, 2021). The rising mean annual temperature is becoming increasingly deadly, as reported by The Lancet (Watts, et al., 2020). Over the past two decades, there has been a 53.7% rise in heat-related mortality in individuals aged 65 and older. This global trend resulted in the premature deaths of 296,000 people in 2018 alone (Watts, et al., 2020).

In Canada, the average annual temperature has surged by 1.7 °C from 1948 to 2016, which is roughly twice the global rate of increase. Northern Canada saw an even more significant increase of 2.3°C, about three times the global rate. These changes have direct and indirect effects on individual and community health and well-being. For instance, elevated temperatures facilitate the expansion of forest and agricultural pests into previously unaffected regions, endangering local crops and natural wildlife habitats. Additionally, warmer, and drier conditions heighten the risk of droughts and wildfires. Northern communities experience unpredictable sea ice conditions, infrastructure damage resulting from permafrost thaw, and a shortened winter road season (Government of Canada, 2019). Additionally, climate change facilitates the spread of air- and water-borne infections. A warmer environment with shorter and milder winters is more suitable for climate-driven infections causing the expansion of their geographical range. This puts populations at higher risk of contracting viral, fungal, bacterial, or parasitic infections (Government of Canada, 2022). Further, in 2022, a study determined

that climatic hazards have worsened 58% of the 375 infectious diseases that affect people worldwide. This means that 218 of these diseases have been made more severe due to climate-related factors (Mora, et al., 2022).

Climate change disproportionately impacts Indigenous populations globally. Their unique cultural connection to the natural environment often makes them the first to notice ecosystem changes. Climate change poses a significant threat to the natural resources that are vital for people's livelihoods, sources of traditional food, and cultural practices (Jantarasami, et al., 2018). Numerous Indigenous communities have already experienced trauma resulting from colonization, forced displacement, and the erosion of their traditional cultural practices. Climate change, by affecting their natural environment, is exacerbating this trauma in certain regions (Jantarasami, et al., 2018). Importantly, many Indigenous communities in Canada already lack access to safe drinking water. This issue is especially prevalent in northern communities (McDonald, et al., 2023). Increased water contamination due to climate change leads to enhanced water-borne disease outbreaks and illnesses. Previous scoping reviews reported that the incidence of gastrointestinal infections in Indigenous communities was 26 times greater than that in the rest of Canada. Moreover, these cases are more likely to be underreported, primarily due to varying perceptions of risk and health within these communities (Eggertson, 2008; Geng, 2015; Patrick, 2011).

Throughout history, the Red River Métis have maintained a profound connection to their environment, including the lands and waters situated within their National Homeland. In modern times, many Red River Métis Citizens continue to engage closely with and depend significantly on their environment for their livelihood, sustenance, and the preservation of their traditional Red River Métis culture (Manitoba Métis Federation, Ministry of Environment and Climate Change, 2023). Maintaining traditional family-like relationships within the community and not having adequate access to clean water promotes the spread of climate-driven infectious diseases.

The need to investigate the effects of climate change on the health and well-being of the Red River Métis Community is driven by their increased vulnerability to climate-related hazards. Consequently, this study's primary objectives include understanding the Red

River Métis Community's viewpoints on how the environment affects their physical and mental health, their attitudes towards climate change and its impacts on their well-being, as well as assessing changes in the spread and severity of infectious diseases linked to shifting climate conditions. Acquiring this information is essential for developing distinctions-based interventions and equitable healthcare policies. Amplifying the voices of Red River Métis Citizens allows us to tackle the intersections of racial identity and socio-economic challenges, which, in turn, promotes a more inclusive and efficient approach to public health.

2.2 Goal and Objectives

The overarching goal of this project is to determine the effects of environment-related hazards on the Red River Métis population. This project aims to synthesize distinctions-based and culturally relevant evidence for developing strategies to mitigate the negative impact of climate change on the Red River Métis Community.

The specific objectives of this study were to:

1. To gauge the opinions of Red River Métis on the role of the environment in promoting their health and well-being, and their perception of a positive environment.
2. To analyze the views of the Red River Métis Community on climate change and its impact on their physical and mental health.
3. To investigate how Red River Métis Citizens perceive the connection between the quality of the environment and the spread and severity of infectious diseases.
4. To determine the level of community awareness concerning infectious diseases and identify the interventions necessary to enhance the safety of Citizens.
5. To understand how practicing traditional Métis lifestyles can support efforts to promote health and wellbeing and prevent diseases.

Section 3: Methods and Methodology

A cross-sectional survey was conducted to understand the participants' experiences and perceptions of the role of the environment in infectious diseases. The survey consisted of 12 questions, four of which used a Likert scale to measure the participants' concerns regarding climate change, the connections between the environment and health, and Red River Métis ways of life promoting health and wellbeing. The responses to Likert-scale questions were analyzed using descriptive statistics and percentages were calculated for each category.

The remaining questions were opened and focused on infectious disease prevention, positive environments, climate change, and health and participants' experience with infectious diseases. Participants' responses to open-ended questions were subjected to qualitative content analysis. These responses were coded line-by-line. Then related codes were organized into broader themes that reflect the perspectives present in the participants' responses. In addition to completing the survey, participants completed a demographic questionnaire that collected information on their age, sex, gender identity, marital status, MMF region, and household income. This information was analyzed, and percentages were calculated for each category.

Section 4: Findings

4.1 Survey Data

A total of 144 participants were recruited during regular HWD Health Consultations. Females were 79.2% (n=114) of the study population, and the mean age of the respondents was 63 ±15.75 years old. Most of the survey participants fell within the age brackets of 65-74 years (29.9%, n=43), 55-64 years (18.8%, n=27), and more than 75 years (12.5%, n=18). The participants represented seven regions (Interlake, Northwest, Southeast, Southwest, The Pas, Thompson, and Winnipeg), with the majority residing in Winnipeg, Southeast, and Southwest regions (25%, 20.1%, and 15.3% respectively). Married individuals accounted for 43.8% (n=63) of participants, and 27.8% (n=40) earned \$30,000-\$59,999 annually (**Table 4.1.1**).

4.1.1. Demographic and Socio-economic Characteristics of Red Métis Participants

Demographics	Percent (%)	n
Age group in years:		
16-24	3.5	5
25-34	5.6	8
35-44	11.8	17
45-54	11.8	17
55-64	18.8	27
65-74	29.9	43
75+	12.5	18
Prefer not to answer	6.3	9
Mean age, years ± SD	63 ±15.75	
Sex:		
Male	20.1	29
Female	79.2	114
Prefer not to answer	0.7	1
Gender:		
Male	20.1	29
Female	78.5	113
Non-binary	0.7	1
Prefer not to answer	0.7	1

Region:		
Interlake	11.1	16
Northwest	16.0	23
Southeast	20.1	29
Southwest	15.3	22
The Pas	9.7	14
Thompson	1.4	2
Winnipeg	25.0	36
Prefer not to answer	1.4	2
Marital status:		
Single	20.1	29
Common-law union	6.9	10
Married	43.8	63
Separated	2.8	4
Divorced	10.4	15
Widowed	15.3	22
Prefer not to answer	0.7	1
Income level:		
\$1-\$14,999	6.3	9
\$15,000-\$29,999	15.3	22
\$30,000-\$59,999	27.8	40
\$60,000-\$79,999	17.4	25
\$80,000+	22.9	33
Don't know	2.1	3
Prefer not to say	8.3	12

4.2 Thematic Analysis of Survey Responses

Participants were asked predetermined questions regarding their opinions about the impact of the environment on their health and well-being, their perceptions of climate change, and the role of the environment in the spread of infectious diseases. Content analysis was used to categorize repeating comments and identify overarching sub-themes per each question.

4.2.1 Concepts of Environment

4.2.1.1 The role of the environment in health and well-being of Red River Métis

When asked about the impact of the environment on their health and well-being, 88% of the Red River Métis Citizens reported it to be extremely important. Furthermore, an additional 9% of respondents acknowledged that it was somewhat important (**Figure 4.2.1**).

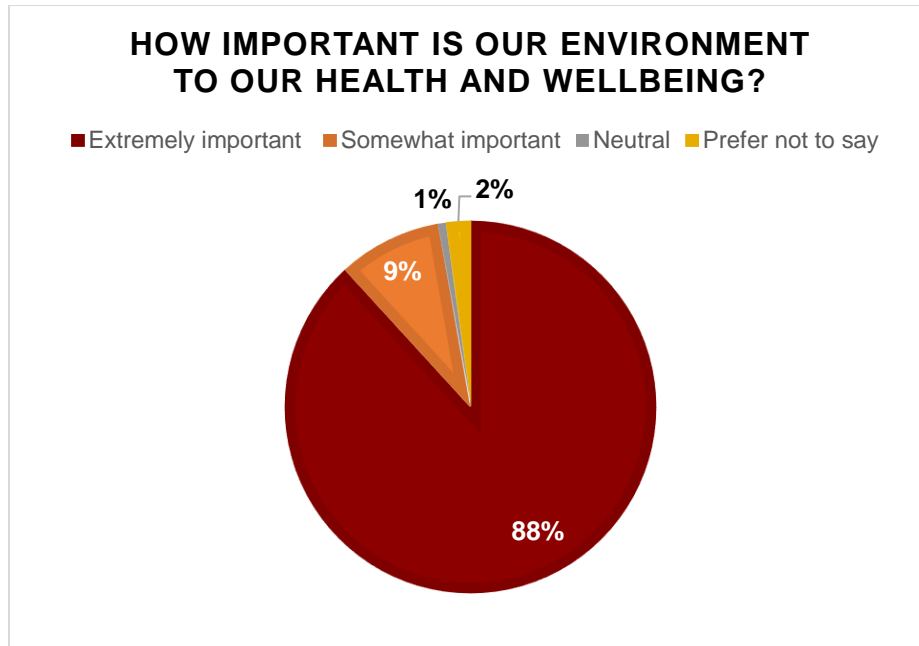


Figure 4.2.1 The importance of the environment in the health and well-being of Red River Métis

Red River Métis Citizens were asked to further expand on why the environment was important to their health and well-being. The responses fell into three broad themes focusing on the impact of the environment on the health of individual Red River Métis Citizens, their communities, and Red River Métis culture.

Individual health

Participants stressed that the environment was extremely important to their individual physical, mental, and emotional health. They discussed the impact of both the physical (i.e., water, air, food) and social environment (i.e., working conditions, housing) equally.

“Without a safe/positive environment, you will not be healthy - physically, emotionally and mentally.” Red River Métis Citizen, MMF’s Northwest region

“Our waters, forests, oceans and natural environment is being destroyed and we are experiencing the effects through insecurity in clean and safe drinking water, healthy food.” Red River Métis Citizen, MMF’s Winnipeg region

“Pollution, chemicals are physically toxic. Filth, anger, isolation and hate are mentally toxic” Red River Métis Citizen, Winnipeg MMF’s region

“When our environment is healthy, we have a better chance to fight off infections.” Red River Métis Citizen, MMF’s The Pas region

Community health

Red River Métis Citizens talked about the impact of the environment on the health of their families and communities. They noted the importance of a positive environment and safe and healthy communities. Many participants expressed concern over the impact of environmental degradation and pollution on future generations and thought that more should be done to protect the environment.

“...although I’m grateful to have the opportunity to affordable housing, there was the crime, violence, and limited space for children to play in a safe environment. Because of these factors many children are influenced by what they grew up seeing and were surrounded by.” Red River Métis Citizen, MMF’s Winnipeg region

“The lack of respect and care for living things and the world we live in puts us all at risk and leaves little for future generations to thrive.” Red River Métis Citizen, MMF’s The Pas region

“I want a healthy place for my nieces and nephews to grow up in.” Red River Métis Citizen, MMF’s Interlake region

Cultural health

There is a strong connection between Red River Métis cultural practices and the environment. Participants’ responses reflected the importance of this connection. Further, they mentioned that their connection with the environment was passed down to them by older generations.

“I am most connected to the earth from my grandparents. I go to the earth to heal.” Red River Métis Citizen, Southeast MMF’s region

“We are not above nature; we are part of it. We are killing it and ourselves.” Red River Métis Citizen, MMF’s Winnipeg region

“If we don’t look after the environment now, who will? Will we have wild meat and berries to eat in the future?” Red River Métis Citizen, MMF’s The Pas region

“[The] environment affects our way of life.” Red River Métis Citizen, MMF’s Interlake region

4.2.1.2 Perception of the positive environment

We adopted a theme analysis approach to scrutinize the answers provided by Red River Métis Citizens in response to open-ended questions concerning the constituents of a positive environment. This analysis unveiled nine subthemes that collectively encompassed the fundamental factors contributing to a healthy environment, as perceived by our respondents.

Living close to nature

The majority of the respondents described the ability to reside outside of the urban areas with easy access to nature and wildlife as a principal component of their ideal environment. According to our Citizens, this facet could yield positive influences across multiple dimensions of their lives. Specifically, they noted potential improvements in mental well-being, the preservation of the traditional Red River Métis way of life, and a reduction in the physical and emotional stress associated with densely populated urban areas.

“Not spending too much time in the city, I need a lot of time in the bush and on the farm.” Red River Métis Citizen, MMF’s Winnipeg region

“...access to wild life and nature in abundance.” Red River Métis Citizen, MMF’s Winnipeg region

“I live in the rural area where you have more options to look and do things that are healthy. Like hunt, walking, spending time outside.” Red River Métis Citizen, MMF’s Southeast region

“I feel more safe in the bush.” Red River Métis Citizen, MMF’s The Pas region

“...opportunities to live in my preferred location (i.e. rural setting) close to an environment I grew up in.” Red River Métis Citizen, MMF’s The Pas region

Active lifestyle

Numerous participants underscored the significance of maintaining the capacity for physical activity, irrespective of their residential setting. This encompassed the availability of open spaces for exercise and the assurance of ample, secure walking trails in both urban and rural settings.

“Green space, nature paths to walk on, bike paths for exercise.” Red River Métis Citizen, MMF’s Southwest region

“Being outdoors as much as possible, no matter the season. Being active.” Red River Métis Citizen, MMF’s Interlake region

“I can go for a walk without fear...” Red River Métis Citizen, MMF’s Southwest region

Sustainable nutrition

Red River Métis Citizens frequently emphasized the importance of access to affordable, uncontaminated, nutritious, and locally sourced food as a fundamental aspect of their ideal environment.

“... fresh, hot well cooked food, no contamination.” Red River Métis Citizen, MMF’s Southeast region

“Proper healthy food must be available as opposed to cheap junk food.” Red River Métis Citizen, MMF’s Interlake region

“Access to reasonably priced nutritious food, no food scarcity, non reliance on food banks.” Red River Métis Citizen, MMF’s Winnipeg region

Numerous respondents stressed the significance of adhering to traditional Red River Métis food harvesting practices, such as hunting, fishing, and berry picking, as integral components of their envisioned lifestyle.

“Ability to harvest traditional foods.” Red River Métis Citizen, MMF’s Southeast region

“Healthy food security means fresh fruit and vegetables. Wild meat and fish.” Red River Métis Citizen, MMF’s Interlake region

“...eating wild meat is better for you than cattle and wild berries and nuts harvesting is excellent multivitamins.” Red River Métis Citizen, MMF’s The Pas region

Pure water sources

Numerous Citizens spoke about the importance of maintaining the purity of water sources, prohibiting industrial water pollution, and having proper control of water quality and safety.

“The cleanliness of the water. Water is very important to me.” Red River Métis Citizen, MMF’s Southeast region

“Knowing that the lakes are safe is a must for Métis families.” Red River Métis Citizen, MMF’s Northwest region

“Everyone can do their part to clean up, be careful and help out your family household. BUT it mostly is factories, industry, and tree destroyers, mining, etc.” Red River Métis Citizen, MMF’s Winnipeg region

No air pollution

A considerable number of Citizens emphasized the critical importance of purity air purity and strictly limited emissions of industrial pollutants for the environment to be optimal.

“...fresh clean air, water.” Red River Métis Citizen, MMF’s Northwest region

Clean living spaces

The subject of cleanliness and the sanitation of living spaces was frequently raised by our Citizens when delineating their ideal environment. They consistently underscored the necessity of maintaining clean households as a means to prevent various diseases and enhance the process of healing.

“...clean home and access to affordable cleaning supplies.” Red River Métis Citizen, MMF’s Southwest region

“No clutter, everything well sanitized, clean floors, no contamination, no garbage laying around.” Red River Métis Citizen, MMF’s Southeast region

“Cleanliness of yourself, house or home.” Red River Métis Citizen, MMF’s Southeast region

“Sanitizing more, keeping my house cleaner.” Red River Métis Citizen, MMF’s Southwest region

Ability to maintain social contacts

Maintaining connections with their families and friends, participating in community gatherings, having accessible and secure spaces for social interactions, sharing of perspectives, and engaging with Elders formed another vital aspect of the Red River Métis' concept of a positive environment.

“Less isolation, more social contact [...] grandchildren visits.” Red River Métis Citizen, MMF’s Winnipeg region

“Positive relationship with family, friends, partners, coworkers.” Red River Métis Citizen, MMF’s region

“...anywhere people can share information.” Red River Métis Citizen, MMF’s region

“With people I care and love.” Red River Métis Citizen, MMF’s region

“For me, I want to see/meet with and elder/ counselor in a natural setting...”
Red River Métis Citizen, MMF’s region

Accessible medical services

Several Citizens stressed the pressing need for adequate access to healthcare services, irrespective of their place of residence.

“...if I want service I don’t have to travel at least 50 miles.” Red River Métis Citizen, MMF’s Southeast region

“Accessible Health and Mental Health Service.” Red River Métis Citizen, MMF’s Winnipeg region

“Medication for my mental health. The prescription programs, the mobility unit, the prescription glasses programs.” Red River Métis Citizen, MMF’s Winnipeg region

4.2.2 Climate change and Red River Métis health and well-being

To gauge the Red River Métis Citizens' perception of climate change, we inquired about their level of concern regarding this issue. The survey data revealed that over half (58%) of the Citizens strongly agreed that climate change is a matter of concern, while another one quarter (26%) expressed partial agreement. Only 1% of the respondents strongly disagreed with this notion (**Figure 4.2.2**).

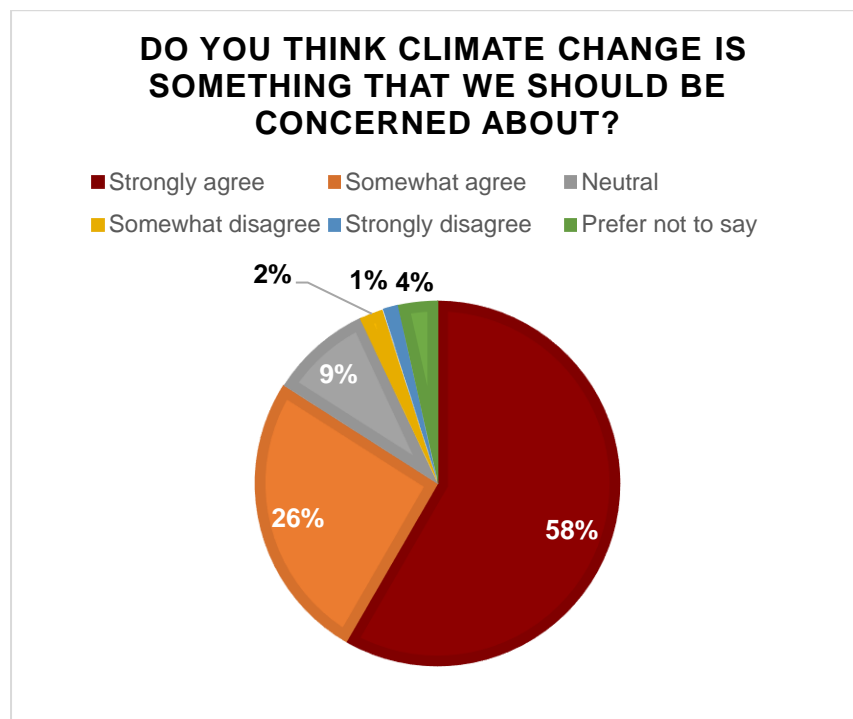


Figure 4.2.2 The level of concern about climate change in Red River Métis Citizens

To discern the connections between climate change and the health and well-being of Red River Métis Citizens, we employed theme analysis. The following sections of this chapter delve into the specific areas where climate change exerts its impact.

Increase in disease spread and severity

Many respondents expressed concern about the heightened spread of existing infectious diseases and the emergence of new, potentially perilous pathogens due to alterations in temperature, humidity, season duration, and other climate change-related factors. Additionally, numerous individuals voiced apprehensions regarding the increased severity of non-infectious diseases, particularly allergic conditions.

“Because of the changes in the world, we will all be affected as more problems appear to be increasing virus, disease increasing like allergy, cancer, diabetes, heart problems.” Red River Métis Citizen, MMF’s Southeast region

“Rapidly changing temperatures, dusts and pollens are heavier and lasting longer. Landfills are extreme, unsightly, and foul smelling causing people to feel ill and causing actual illness.” Red River Métis Citizen, MMF’s Southwest region

“I feel I cannot go outside anymore for fear that I’ll get skin cancer, water contaminated don’t trust what I drink or eat.” Red River Métis Citizen, MMF’s Winnipeg region

“With climate change comes new insects, diseases, illnesses...” Red River Métis Citizen, MMF’s The Pas region

Mental health

Several Citizens voiced their concerns about the adverse impact of abrupt environmental changes on mental health. They highlighted how extreme weather conditions, displacement resulting from natural disasters, the lack of physical activities, and reduced contact with nature were identified as factors predisposing individuals to emotional instability.

“A large number of individuals suffer from S.A.D [Seasonal Affective Disorder]. Many go undiagnosed. Changes in usual seasons making winters longer could have an adverse effect on these individuals.” Red River Métis Citizen, MMF’s Southwest region

“Given something as simple as gardening could be affected. Many people including elders find peace, well-being, and feeling of being “useful” and not bored.” Red River Métis Citizen, MMF’s Southwest region

“More severe weather, stress, worry, outdoor exercise restrictions.” Red River Métis Citizen, MMF’s Southwest region

“Mental Health. Knowing we are in a climate crisis creates major stress in my life.” Red River Métis Citizen, MMF’s Southeast region

Food chain interruption

According to the responses provided by our Citizens, a substantial proportion of them expressed concerns about the ramifications of climate change on food security. Many shared their observations regarding shifts in patterns of wildlife migration, alterations in the duration of seasons, and how these changes have impacted the cultivation and harvesting of crops.

“Conditions are becoming difficult. Floods, fire have destroyed traditional harvesting grounds. Becoming difficult to forage and store food.” Red River Métis Citizen, MMF’s Northwest region

“Bees are needed for successful pollination for trees and plants.” Red River Métis Citizen, MMF’s Southwest region

“...it also affects everything a harvester eats and drinks. Ex: Droughts= less berries, dried up water ways. Climate change also introduced ticks into the porcupine and duck mountains in the 90's killing animals and causing/spreading disease.” Red River Métis Citizen, MMF’s Northwest region

“Climate change affects our food chain, that is traditional area is affected, by destruction of land and some species of animals that we use for food, e.g., caribou, fish, moose, birds.” Red River Métis Citizen, MMF’s Thompson region

Water pollution

Several Red River Métis Citizens emphasized the severe consequences of climate change on the quality of drinking water, which in turn has a direct and adverse impact on both human and animal health.

“If we are living in an environment where the world keeps warming, due to gasses, we will lose water resources.” Red River Métis Citizen, MMF’s Southeast region

“Risk to our home and land, water source.” Red River Métis Citizen, MMF’s The Pas region

“From pollution to littering it not only affects me but future generations. The waters are giving our fish cancerous growths. Things need to change because as our environment dies out so do we.” Red River Métis Citizen, MMF’s Southeast region

Skepticism about climate change

A minority of Red River Métis Citizens held a skeptical stance toward the concept of climate change. Some regarded it as a political manipulation, while others perceived it as a natural and regular occurrence in the realm of nature.

“Not in our power to make large changes.” Red River Métis Citizen, MMF’s Southeast region

“I think climate change is over dramatized and there are bigger things that we should be concerned with directly related to our health.” Red River Métis Citizen, MMF’s Southwest region

“I do not believe in climate change. It is not supported by science.” Red River Métis Citizen, MMF’s Winnipeg region

“The Earth’s climate has always been changing since time began. Why panic about it now?” Red River Métis Citizen, MMF’s The Pas region

4.2.3 Environment and Infectious Diseases

The COVID-19 pandemic reemphasized the significance of environmental factors in the transmission of infectious diseases. During the survey, over 30% of the Red River Métis Citizens reported experiencing symptoms of infectious diseases at the time of the survey

or in the past. Notably, most respondents (69%) expressed either full or partial confidence in their communities' awareness of the impact of the environment on the frequency and severity of infectious diseases. However, more than 20% of the Citizens believed that their communities lacked an adequate level of awareness concerning this issue (**Figure 4.2.3.1**).

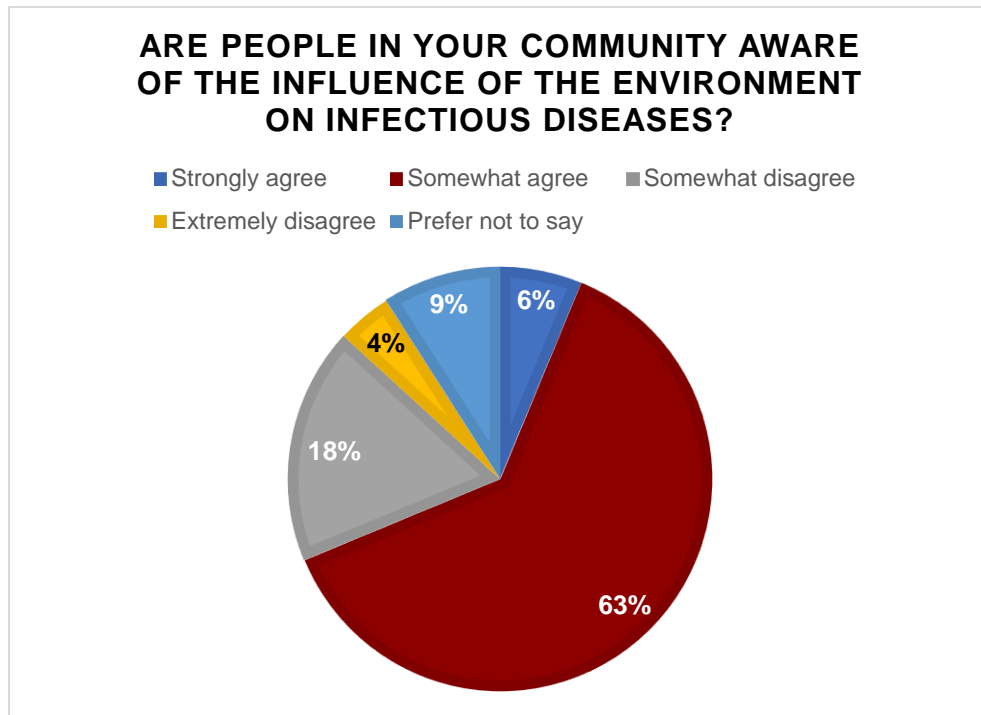


Figure 4.2.3.1 Community awareness of the association between the quality of the environment and infectious diseases

We proceeded to collect the perspectives of our Citizens regarding how the environment influences the progression of infectious diseases. Subsequently, we subjected the responses to a thematic analysis, the details of which are expounded upon in the ensuing chapter.

Participants reported experiencing a variety of diseases including influenza, COVID-19, the common cold, measles, chicken pox, and hepatitis. They recalled contracting them from the physical environment (i.e., contaminated water), IV medication, exposure at work, and from having a compromised immune system. The severity of these diseases varied widely, from resolving without medication to requiring strong medication or hospitalization.

Several participants mentioned the strain that their illness placed on their physical and mental health as well as the financial burden of paying for medications and having to travel to seek treatment, given the lack of coverage for our People. For a few participants contracting an infectious disease left them with chronic impacts on their health.

4.2.3.1 How the environment affects the body's response to infectious diseases

increased disease spread

A significant number of survey respondents held the belief that an environment tainted by pollution acted as a catalyst for the spread of infectious diseases. Conversely, they associated positive environmental conditions, such as clean air and water sources, and comfortable temperatures, with a diminished risk of infection.

"We have a few water main breaks that contaminated the water. I'm positive it has contributed to people testing positive for Helicobacter Pylori within the community." Red River Métis Citizen, MMF's Southeast region

"The environment makes it easier to get sick and sickness is more serious and longer to get well." Red River Métis Citizen, MMF's Winnipeg region

"It affects us because if there is an airborne illness it is more likely to be spread quickly by people because they move around more." Red River Métis Citizen, MMF's The Pas region

Diminished immunity

A multitude of Citizens underscored the pivotal connection between environmental conditions and the resilience of their immune systems. According to their responses, adverse changes in the environment lead to decreased immune system reactivity against pathogens, while simultaneously giving rise to immune auto-aggression, such as allergies and other immune-mediated diseases.

"Quality of environment - black mold, flooding, leaks, environmental contaminants, stress, all compromise bodies defenses." Red River Métis Citizen, MMF's Winnipeg region

"Stress from overcrowding & clutter impacts our immune systems (adrenal function)." Red River Métis Citizen, MMF's The Pas region

“Environment is key. The stronger your immune system is - the stronger you can fight off any infection.” Red River Métis Citizen, MMF’s Winnipeg region

Slower healing

Several participants emphasized the substantial influence of the environment on the healing process. According to their insights, compromised environmental conditions can lead to more severe disease symptoms, protracted healing processes, and increased complexity in rehabilitation efforts.

“If you aren’t comfortable in your environment it is hard for the body to heal. Other people in the environment may cause stress and interfere with the person who is ill. We all should be able to heal in a peaceful environment.” Red River Métis Citizen, MMF’s Winnipeg region

“If you live in a dirty environment your body, etc. will stay dirty which causes healing to be slowed down. If your unhealthy environment your symptoms may get worse. Living in a dirty environment will make you sick due to disease.” Red River Métis Citizen, MMF’s Southeast region

“When we are eating clean food and drinking clean water and living in peace it allows our body to focus on healing. Without having to deal with those barriers.” Red River Métis Citizen, MMF’s Winnipeg region

Compromised mental health

A number of the respondents highlighted the interconnection between environmental stressors, mental health, and an individual's capacity to endure and recover from infectious diseases.

“The general well being if not good will cause depression lending to many other illnesses.” Red River Métis Citizen, MMF’s Interlake region

“...poor air quality or negative environment affects the mind, causes depression and how you manage how you heal.” Red River Métis Citizen, MMF’s Southeast region

“Poor air quality = less time spent outdoors, lack of vitamin D, fresh air, exercise, sunlight = poorer mental health.” Red River Métis Citizen, MMF’s Winnipeg region

4.2.3.2 Changes in the environment that can prevent infectious disease spread

We inquired with our Citizens about the factors they deemed crucial in the prevention of the spread of infectious diseases. A substantial majority of respondents regarded clean drinking water, uncontaminated locally sourced food, proper housing with adequate ventilation, efficient sewer or septic systems, access to hospitals and medical care, education, community awareness, health laws, public policies, and practicing safe sex as nearly equally important in the prevention of contagious diseases (**Figure 4.2.3.2**).

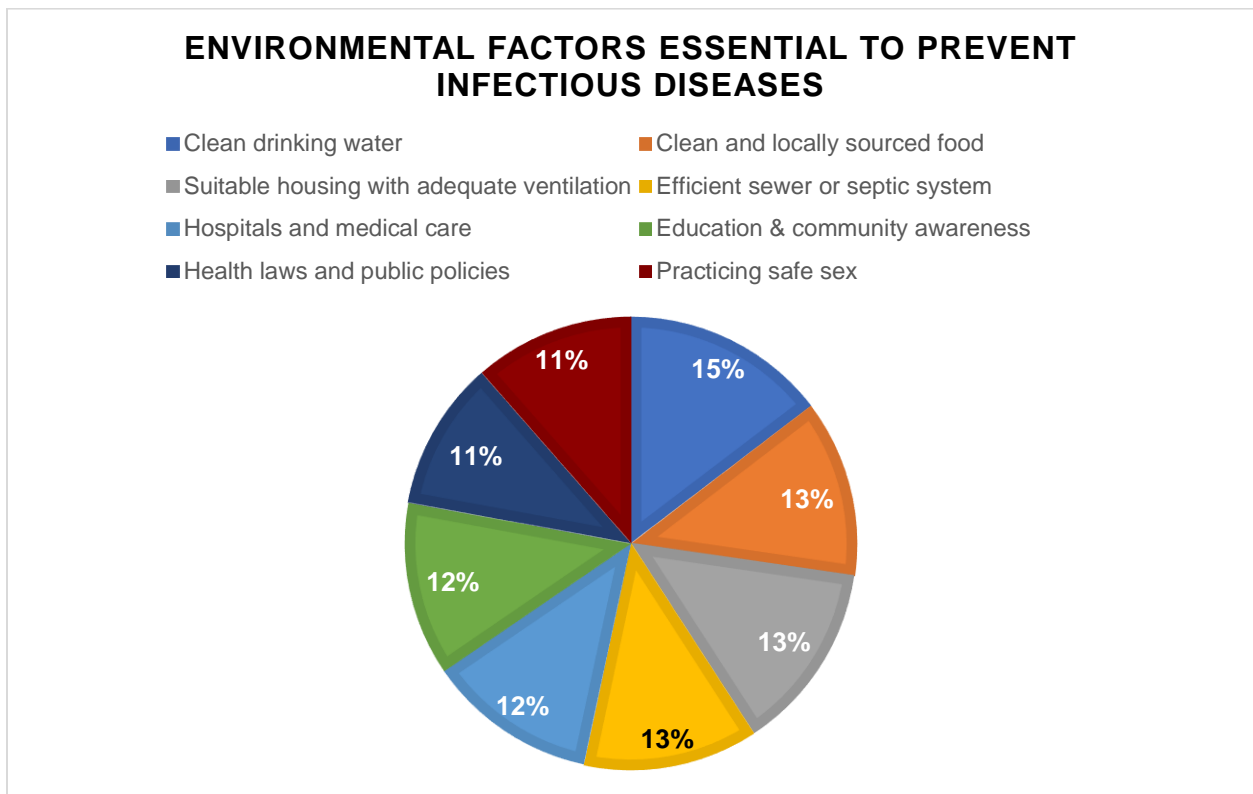


Figure 4.2.3.2 Environmental components implicated in prevention of infectious diseases

We conducted a theme analysis of responses to open-ended questions that probed how the spread of infectious diseases could be reduced through environmental improvements.

Physical environment

Many participants discussed the importance of protecting the physical environment to prevent the spread of infectious diseases. The important changes they identified included ensuring access to clean water, clean air, greater access to green spaces and healthy foods that are free of harmful chemicals. Participants also stressed the need for environmental policy that held polluters accountable and did more to address climate change.

“Make all levels of government accountable for contamination of water and waterways (pollution from industries, farming sewage being dumped into waterways etc.).” Red River Métis Citizen, MMF’s Winnipeg region

“We need more green spaces and places where people feel comfortable being outside, too many people never leave the city” Red River Métis Citizen, MMF’s Winnipeg region

Social environment

Participants also discussed the impact of the social environment on their health and wellbeing. The need to improve sanitation in hospitals and other urban areas was discussed by participants. Citizens also identified providing housing as a way combat the spread of diseases.

“... good sanitary practices where food is offered for consumption or sold at grocery stores. Good sanitation in all medical places.” Red River Métis Citizen, MMF’s Southeast region

“Put an end to homelessness.” Red River Métis Citizen, MMF’s Winnipeg region

“Clean up the city streets and back lanes to help keep our city clean.” Red River Métis Citizen, MMF’s Winnipeg region

Public health interventions

Responses discussed increasing the availability of healthcare services and healthcare providers as a way to help address the burden of infectious diseases in their communities. Additionally, participants identified education regarding environmental

protection and health promoting behaviors, such as handwashing, masks and safer sex, as critical to preventing the spread of disease.

“More awareness - teach people about the disease and the resources that are there to help people through it.” Red River Métis Citizen, MMF’s Southwest region

“Need more health care providers in rural, northern areas.” Red River Métis Citizen, MMF’s Northwest region

“Cleaning hands and sanitizing objects has proven (to me at least) effective. Get vaccines when available.” Red River Métis Citizen, MMF’s Northwest region

4.2.4 Traditional Red River Métis lifestyle promotes, balanced environment and improved health

The revival and promotion of traditional Red River Métis lifestyles were frequently highlighted by our Citizens as integral to their well-being, self-perception, and all facets of their lives. Notably, the vast majority (85%) of the respondents either fully or partially agreed that embracing the traditional lifestyle can contribute to an individual's health and well-being (**Figure 4.2.4**).

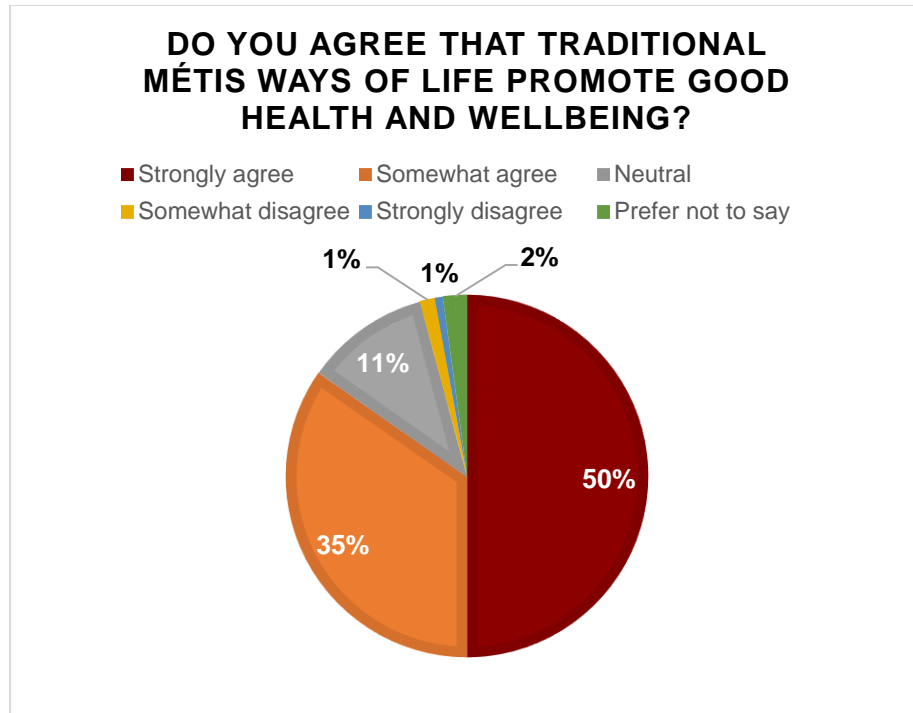


Figure 4.2.4 Practicing traditional Métis lifestyle is beneficial for health and well-being

4.2.4.1 Métis traditional lifestyles and infection prevention

To uncover the connections between the adoption of the traditional Métis lifestyle and the prevention of infectious diseases, we invited our Citizens to express their perspectives by responding to open-ended questions. The following section delves into the subthemes derived from these responses.

Natural medicine

Several Citizens firmly believed that the practice of traditional natural medicine and the preservation of this knowledge play a pivotal role in reducing the severity and improving the outcomes of diseases.

“We need to encourage our medicine keepers to be brave and we need more respect for traditional practices.” Red River Métis Citizen, MMF’s Winnipeg region

“Natural medicines need to be in every care plan.” Red River Métis Citizen, MMF’s Winnipeg region

“Better use of traditional knowledge of the use of home based preparations. Educational circles with knowledge keepers.” Red River Métis Citizen, MMF’s Northwest region

Sustainable nutrition

The Red River Métis Citizens closely linked the practice of traditional food harvesting with improved health outcomes, reinforced immune defenses, and, consequently, a reduction in the spread of infectious diseases.

“Continue to eat clean food that is low in preservations, grow vegetables, eat fish and wild game, pick berries, whole wheat Bannock.” Red River Métis Citizen, MMF’s Northwest region

“Eating healthy cultural food can be good in preventing disease.” Red River Métis Citizen, MMF’s Interlake region

“Traditional foods and the way they are handled, cooked etc. have little outside influence and chemicals put in the food etc.” Red River Métis Citizen, MMF’s The Pas region

Balanced environment

Several respondents believed that adhering to traditional ways of living fostered a greater sense of equilibrium between the individual and the environment.

“Using Indigenous knowledge about the land, water, wildlife and plants that they all have "being" and therefore should be given the utmost respect. If those entities are treated well then the environment will be well and so we will.” Red River Métis Citizen, MMF’s The Pas region

“Métis respect their environment, don't over produce or hunt.” Red River Métis Citizen, MMF’s Winnipeg region

Community support

Red River Métis people are renowned for their close-knit, family-like community bonds. A considerable number of the surveyed Citizens underscored the significance of traditional community support when facing and conquering diseases.

“A surrounding community can help when another member needs assistance whether that’s food, travel or just to check in.” Red River Métis Citizen, MMF’s The Pas region

“Community and reciprocity are our strengths, supporting one another, resource sharing, networking, overall care and wellbeing of one another. It comes from all of us, not the government.” Red River Métis Citizen, MMF’s Winnipeg region

Section 5: Conclusion and Recommendations

The HWD has a unique opportunity to directly address the health concerns of Red River Métis Citizens and contribute to understanding the effects of climate-related hazards on their quality of life. Through surveys, we have gained valuable insights into the firsthand experiences, perceptions, concerns, and perspectives of Red River Métis regarding the impact of environmental changes on their health and well-being.

The environment was found to play a significant role in the quality of life for Red River Métis Citizens. Participants discussed the importance of a balanced environment for individual and community health, as well as its close connection with Red River Métis culture. We gained insights into our Citizens' preferences for a positive environment. The majority expressed a desire to live in closer association with nature, away from urban areas. Others emphasized the importance of access to clean water sources, safe and nutritious food, fresh air, and cleanliness in their living spaces.

When asked about their attitude towards climate change, most participants expressed high level of concern regarding its potential impact on their health and well-being. Several Citizens raised concerns about the associated increase in the spread and severity of infectious diseases, food and water insecurities, and the resulting devastating impact on mental health. Participants proposed various interventions that could help mitigate the negative effects of climate change on their health. For example, several Citizens called for the development of environmental policies targeting industrial pollution, the promotion of sustainable agricultural practices, urban sanitation improvements, and fostering low-risk behaviors to prevent the spread of waterborne, airborne, and sexually transmitted infections.

Participants' stories will inform recommendations and considerations for future programs and support related to mitigating the impact of climate change. This crisis encompasses multiple interconnected challenges, and addressing it requires progress on various fronts, including the development of climate change policies specific to the Red River Métis Community, improving access to safe and sustainable water and food sources,

and increasing awareness and education on climate-related health hazards. Fortunately, many of these challenges are interconnected, meaning that addressing one issue may lead to positive impacts on others. Efforts to alleviate this crisis should begin with the development of a Red River Métis Climate Change Strategy. By prioritizing the voices of our Citizens in this strategy's development, we can ensure a specific, effective, and culturally rooted approach to improving health outcomes for Red River Métis communities. This strategy will influence future initiatives aimed at mitigating health risks associated with climate change.

This research contributes to the growing body of Red River Métis-specific knowledge, especially in the context of the relationship between climate change and health. By exploring the unique perspectives within the Red River Métis Community, the HWD not only addresses their distinct experiences and cultural contexts but also identifies the specific environmental factors directly affecting their quality of life. This focused approach establishes a foundation for targeted interventions and strategies that can improve healthcare outcomes not only for the Red River Métis population but also for other diverse cultural groups. Strengthening public health messaging through this research empowers the MMF to effectively address climate-dependent health risks, ultimately enhancing the overall health and well-being of Red River Métis Citizens and beyond.

Section 6: Limitations

Sample Size: The Red River Métis Nation is large and diverse; the relatively small sample size of this study limits its generalizability across the greater population. Barriers including the COVID-19 pandemic, geographical limitations, and time constraints may have hindered the recruitment of participants for this study. A larger sample size could have allowed for greater representation across demographics. This includes more participants who identify as male, are aged 16 to 34, and are from the Interlake, The Pas, and Thompson regions.

Red River Métis Beyond Borders: It is critical to note that many Citizens live outside of Manitoba within the National Homeland of the Red River Métis and beyond. However, only participants from the seven MMF Regions in Manitoba were engaged for this study. Therefore, more research on Red River Métis Citizens living throughout the National Homeland and beyond is needed. Recognizing this deficiency is particularly critical as the MMF's Beyond Borders Taskforce found that Red River Métis residing outside of Manitoba have a variety of concerns regarding health, housing, and their access to the land (Manitoba Métis Federation, Beyond Borders Taskforce, 2022). Future research endeavors should aim to capture the experiences of Red River Métis Citizens living across the Nation beyond today's colonial borders.

Community-Based Participatory Research: While this study sought to provide valuable insights into the experiences and perspectives of Red River Métis Citizens, it is important to acknowledge the limitation of not employing a community-based participatory research (CBPR) approach. CBPR emphasizes collaboration between researchers and the community through every step of the research process, fostering a more inclusive and empowering environment. The absence of a CBPR approach in our study may limit the depth of community engagement and the co-creation of knowledge. Future research should adopt CBPR methodologies to ensure a more comprehensive understanding of the Community context.

References

- Eggertson, L. (2008). Despite federal promises, First Nations' water problems persist. *Canadian Medical Association Journal*, 985.
- Geng, J. (2015). *The Examination and Comparison between Reverse and Forward Osmosis: Which Is the Solution for the Future?* Kingston, ON: Queen's University.
- Government of Canada. (2019, April 9). *Changes in temperature*. Retrieved from Government of Canada: <https://www.canada.ca/en/environment-climate-change/services/climate-change/canadian-centre-climate-services/basics/trends-projections/changes-temperature.html>
- Government of Canada. (2022, January 24). *Infectious diseases and climate change*. Retrieved from Government of Canada: <https://www.canada.ca/en/health-canada/services/climate-change-health/infectious-diseases.html>
- Jantarasami, L., Novak, R., Delgado, R. L., Narducci, C., Marino, E. K., McNeeley, S. M., . . . Powys Whyte, K. (2018). *Chapter 15 : Tribal and Indigenous Communities. Impacts, Risks, and Adaptation in the United States: The Fourth National Climate Assessment, Volume II*. Washington, DC: U.S. Global Change Research Program.
- Kulp, S. A., & Strauss, B. H. (2019). New elevation data triple estimates of global vulnerability to sea-level rise and coastal flooding. *Nature Communications* , 10, 4844.
- Manitoba Métis Federation, Beyond Borders Taskforce. (2022). *“What We Heard” Report on the Red River Métis Beyond Borders*. Winnipeg: Manitoba Métis Federation.
- Manitoba Métis Federation, Ministry of Environment and Climate Change. (2023). *Environment & Climate Change*. Retrieved from Manitoba Métis Federation: <https://www.mmf.mb.ca/environment-climate-change>
- McDonald, K., Yenilmez, S., Roote, K., Karim, N., Shah, S., Villeneuve, L., & Wu, J. (2023). *Lack of Clean Drinking Water in Indigenous communities*. Retrieved from The Indigenous Foundation: <https://www.theindigenousfoundation.org/articles/lack-of-clean-drinking-water-in-indigenous-communities>
- Mora, C., McKenzie, T., Gaw, I. M., Dean, J. M., von Hammerstein, H., Knudson, T. A., . . . C, F. E. (2022). Over half of known human pathogenic diseases can be aggravated by climate change. *Nature Climate Change*, 869–875.

- Patrick, R. J. (2011). Uneven access to safe drinking water for First Nations in Canada: connecting health and place through source water protection. *Health Place*, 386-389.
- UN World Food Programme . (2021, May 5). *Acute food insecurity soars to five-year high warns Global Report on Food Crises*. Retrieved from UN World Food Programme (WFP): <https://www.wfp.org/news/acute-food-insecurity-soars-five-year-high-warns-global-report-food-crises>
- United Nations. (2021, June 14). *High-Level Dialogue on Desertification, Land Degradation and Drought*. Retrieved from United Nations: <https://www.un.org/pga/75/event/high-level-dialogue-on-desertification-land-degradation-and-drought/>
- Watts, N., Amann, M., Arnell, N., Ayeb-Karlsson, S., Beagley, J., Belesova, K., . . . al, e. (2020). The 2020 report of The Lancet Countdown on health and climate change: responding to converging crises. *The Lancet*, 129-170.