

Beyond More Houses: A Multimethod Secondary Analysis of Federal Housing Programs,
Household Crowding, and Health in First Nations Communities in Saskatchewan

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By

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Abstract

Housing is a social determinant of health and specific equity concern for First Nations Peoples living on-reserve in Canada. Lasting results of discriminatory colonial structures and federal government control on-reserve include challenges with housing quality and quantity. Some First Nations face distressing levels of housing shortages and household crowding. This study was a multimethod secondary analysis of data collected in two community-based research studies with First Nations in Saskatchewan. The main research question was “What relationships exist between federal housing programs, household crowding, and health among First Nations Peoples living on-reserve in Saskatchewan?” Specific sub-questions were “How do First Nations Peoples in two communities in Saskatchewan describe challenges and solutions related to household crowding on-reserve?” and “What is the relationship between household crowding and (a) overall physical health, (b) overall mental health, and (c) chronic and infectious respiratory diseases among First Nations Peoples living on-reserve in two communities in Saskatchewan?” I undertook a qualitative secondary analysis of 34 interviews with First Nations adults living on-reserve to answer the first sub-question, where I identified four themes: (1) *designing for kinship*, (2) *relieving system pressure*, (3) *planning instead of reacting*, and (4) *renovating alongside building*. I completed a quantitative secondary analysis of interviewer-administered surveys from 831 First Nations adults living on-reserve to answer the second sub-question, where I identified the household crowding measure was significantly associated with chronic bronchitis diagnosis. Integration of findings to answer the overarching research question emphasized that federal housing systems need to change to improve housing status and related health outcomes on-reserve. Suggested federal-level changes include the provision of sufficient and sustained funding and support of First Nations’ control.

Treaty/Land Acknowledgement

This thesis was conceptualized and completed in Treaty 6 Territory, the traditional and ancestral territory of First Nations Peoples and the Homeland of the Métis. Throughout my Master of Nursing degree, I lived and worked on the land now known as Saskatoon, derived from the Cree name *misâskwatômina* (“Saskatoon berries”) (Wolvengrey, 2005). I am a treaty person who contemporarily benefits from the treaties that led to settlers and their descendants gaining access to these lands and resources. As a visitor on Treaty 6 Territory, I relied heavily on connections to this land – particularly the earth, water, and trees – to maintain my mental wellbeing while completing my schooling during the Coronavirus Disease 2019 (COVID-19) pandemic. I acknowledge and am endlessly grateful for the Indigenous Peoples who deeply cared for this land long before my ancestors arrived on Turtle Island, making these connections possible. I am committed to caring for the land, as it cares for me, through mindful connection, expressions of gratitude, and sustainable actions (e.g., composting).

This thesis has left me with a deeper understanding of the greater systems shaping housing on and off-reserve and how I inequitably benefit from such. With this work, I aim to add a drop in the bucket that ripples toward First Nations Peoples retaining control of housing on-reserve with ultimate hopes of mitigating housing disparities such Peoples continue to experience because of colonization.

Personal Acknowledgements

This thesis is a result of the efforts of many. First, to the four First Nations communities that partnered in the studies that led to this work and the overarching research groups, thank you for having me as a part of your teams. I gained so much understanding, perspective, and value from being involved in these collaborative relationships – I hope the work I’ve done in this thesis, in part, reciprocates this learning. Second, to my committee – Drs. Wanda Martin (supervisor), Shelley Kirychuk, Lori Bradford, and Donna Rennie – thank you for all your feedback, challenging questions, and engagement – I learned an immense amount working with you through this process. Third, I was fortunate to have the support of a statistician for the quantitative analysis in this thesis – Dr. Chandima Karunanayake – thank you for your time, patience, and explanations. Fourth, I am thankful for the funding I received, which allowed me to pursue this work for an extended period and relieved some stress when it mattered greatly.

Lastly, to my supportive network of family and friends: I came to this work as a well-supported daughter of two parents (Lisa, Tim) who always encouraged me to take on new experiences; a sibling to three (Margaret, Ross, Victor) with whom I learned how to listen, keep trying, and that perspectives vary. I also came to this work with a group of friends who helped me critically consider my position as a descendent of settlers (Kerry, Jacqueline) and sustain my mental and emotional wellbeing during a move across provinces, the COVID-19 pandemic, and a new academic adventure (Sarah, Annabelle, and a long list of others unnamed). Finally, there were two I spent time with daily – my partner, Kasper, and my dog, Bruce – who were along for an immeasurable number of head-clearing walks and provided endless affection and support. I would not be here, in this state of wellbeing, without any of you – thank you.

Positionality Statement

I came to this work as a descendent of multi-generation settlers. I am a daughter of heterosexual parents and a middle child of four children. I lived in two houses growing up, both of which my parents owned: the first in an urban setting, and the second in a more rural setting. I lived with my parents full-time until I went to study at university at age 18 and part-time for a few years following completion of my first university degree. I exerted choice and autonomy when picking housing to rent on my own. I am a White, cisgender woman; a middle-class, heterosexual, non-disabled, English-speaking, young adult, and Canadian. I have university degrees in Physical and Health Education and Nursing. I have been involved in academic research for the past seven years, first with children with cancer, then youth with mental illness, and now with First Nations communities. These characteristics and experiences shape how I view the world and this work. Although I have sought resources with Indigenous authors and involved partnering First Nations communities and multidisciplinary scholars (through my advisory committee) in this work, what follows remains shaped by my lens (Figure 0.1).

Figure 0.1
Core Positional Influences

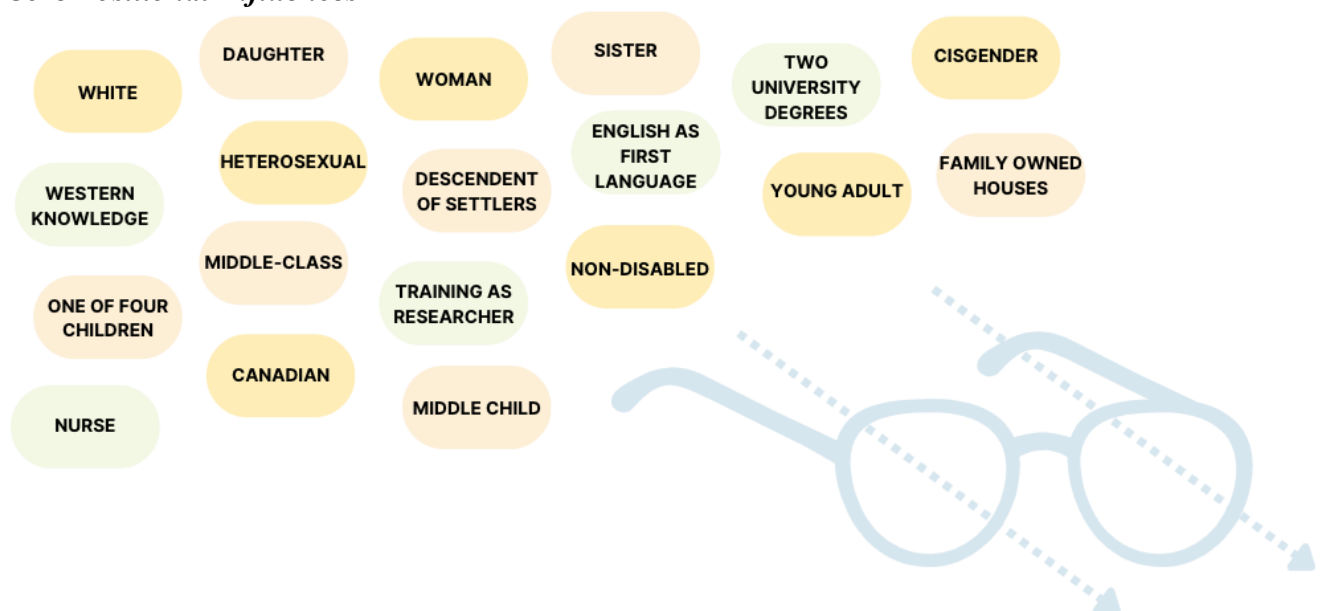


Table of Contents

PERMISSION TO USE I

ABSTRACT II

TREATY/LAND ACKNOWLEDGEMENT III

PERSONAL ACKNOWLEDGEMENTS IV

TABLE OF CONTENTS VI

LIST OF TABLES XI

LIST OF FIGURES XII

KEY TERMS XIII

LIST OF ABBREVIATIONS XVI

1. FRAMING THE ISSUE 1

 1.1 Problem Statement 2

 1.2 Research Question, Purpose, and Aims 2

 1.3 Parent Projects 3

 1.4 Research Significance 3

 1.4.1 Calls to Action 3

 1.4.2 Significance to Nursing 4

 1.5 Thesis Overview 4

 1.6 Chapter Transition 5

 1.7 Historical Background 5

 1.7.1 Indigenous-Settler Relationship 6

 1.7.2 Treaties 11

 1.7.3 Focus on Assimilation 14

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

1.7.4 Closing Statements	16
1.8 Summary.....	16
2. LITERATURE REVIEW.....	19
2.1 Federally Created Housing System	19
2.1.1 Underlying Structural Factors	19
2.1.2 Evolution of Programs Impacting Housing On-Reserve.....	21
2.1.3 Current Housing System.....	24
2.2 Housing Conditions	28
2.2.1 First Nations Reserve Communities	29
2.2.2 Housing Status On-Reserve.....	30
2.2.3 Challenges with Available Housing Metrics	35
2.3 Housing-Related Health Disparities	35
2.3.1 Physical Wellbeing.....	36
2.3.2 Mental Wellbeing	38
2.3.3 Cultural Determinants of Wellbeing	38
2.3.4 Need for Additional Research	39
2.4 First Nations-Led Solutions.....	39
2.5 Conclusion.....	40
2.6 Summary.....	41
3. THEORETICAL FRAMEWORK & CONCEPTUAL MODEL	43
3.1 Theoretical Framework	43
3.2 Conceptual Model: Housing & Health Disparities.....	44
3.2.1 Structures	46

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

3.2.2 Mechanisms to Impact Housing	46
3.2.3 Housing Aspects	47
3.2.4 Mediators/Moderators	48
3.2.5 Health Outcomes	48
3.3 Applying the Conceptual Model	49
3.4 Summary.....	49
4.1 Community Centred Design.....	51
4.2 First Nations Lung Health Project.....	52
4.3 Research Purpose and Aims	53
4.4 Research Questions	54
4.5 Research Design	54
4.5.1 Community-Based Participatory Research Approach.....	55
4.5.2 Secondary Analysis	56
4.5.3 Part 1: Qualitative Secondary Analysis.....	57
4.5.4 Part 2: Quantitative Secondary Analysis.....	60
4.6 Ethical Considerations.....	61
4.7 Summary.....	62
5. QUALITATIVE SECONDARY ANALYSIS	64
5.1 Abstract.....	64
5.2 Introduction	65
5.3 Background.....	65
5.4 Methodology.....	68
5.4.1 Methods	69

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

5.4.2 Data Analysis.....	69
5.4.3 Rigor	70
5.5 Results	71
5.5.1 Designing for Kinship	72
5.5.2 Relieving System Pressure	75
5.5.3 Planning Instead of Reacting.....	77
5.5.4 Renovating Alongside Building	79
5.6 Discussion.....	81
5.6.1 Limitations.....	87
5.7 Conclusion.....	87
5.7.1 Acknowledgments	88
6. QUANTITATIVE SECONDARY ANALYSIS.....	89
6.1 Abstract.....	89
6.2 Introduction	89
6.3 Background.....	90
6.4 Methodology.....	93
6.4.1 Survey Data	94
6.4.2 Statistics.....	95
6.5 Results	95
6.6 Discussion.....	100
6.6.1 Limitations.....	108
6.7 Conclusion.....	108
6.7.1 Acknowledgments	109

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

7. BRINGING IT TOGETHER: DISCUSSION & CONCLUSION.....	110
7.1 The Foundation.....	110
7.1.1 Revisiting Critical Social Theory	110
7.1.2 Revisiting the Conceptual Model	112
7.1.3 Qualitative Secondary Analysis	113
7.1.4 Quantitative Secondary Analysis	114
7.2 Overarching Research Question	115
7.3 Significance to Nursing Practice, Research, & Education	117
7.3.1 Nursing Practice	118
7.3.2 Nursing Education	121
7.3.3 Nursing Research.....	119
7.4 Strengths & Limitations	121
7.5 Conclusion.....	122
REFERENCES.....	124
APPENDIX A	145

List of Tables

Table 5.1 Demographics for Participating Community Members 71

Table 6.1 Descriptive Analyses of Participant Individual Factors 97

Table 6.2 Descriptive Analyses of Housing Factors and Household Crowding 98

Table 6.3 Univariate Analysis with Odds Ratios (OR) and 95% Confidence Intervals (CI)
Assessing Associations Between Household Crowding (>2 People Per Bedroom) and Individual
Health Factors (Overall Health, Infectious Respiratory Diseases, Chronic Respiratory Diseases)
..... 100

Table 6.4 Adjusted Odds Ratio (AdjOR) Estimates With 95% Confidence Intervals (CI) Based
on Multivariate Analyses Examining Associations Between Crowding and Physical Health
(Model I), Pneumonia (Model II), and Chronic Bronchitis (Model III) 101

List of Figures

Figure 0.1 Core Positional Influences v

Figure 3.1 Main Components of Conceptual Model 45

Figure 7.1 Relationships Explored in Analyses 113

Figure 7.2 Federal Housing Programs, Household Crowding, and Health On-Reserve: A
Strengths-Based Conceptual Model of the Relationships 116

Key Terms

Aboriginal: A colonial legal, political, and cultural label constructed by the Canadian government in reference to Indigenous Peoples (Alfred & Corntassel, 2005). This term is only used for proper nouns in this thesis.

Colonialism: The political, social, and economic domination of one nation over another territory or group of peoples and the associated system that maintains such status (Schaefer, 2015).

Colonization: Colonization is the process of enacting colonialism (Wilson, 2018). In Canada, colonization occurred when Europeans migrated to the territory and enacted legislation that granted them power over Indigenous Peoples (Wilson, 2018).

Cultural Competency: The ability to provide care to individuals with diverse values and beliefs, including tailoring care to meet cultural needs (Curtis et al., 2019).

Cultural Humility: The acknowledgment that one does not know another's cultural practices without asking, and the associated desire to learn about such practices (First Nations Health Authority [FNHA], 2020a). Cultural humility is a precursor for cultural safety (FNHA, 2020a).

Cultural Safety: About recognizing and addressing the power imbalances that are inherent within the health care system (Curtis et al., 2019). A responsibility of the healthcare provider (vs. the care recipient); requires providers engage in critical self-reflection to examine their biases, assumptions, and prejudices, which may impact the quality of care they are providing (Curtis et al., 2019). Whether care feels culturally safe is determined by the care recipient, rather than the provider (Curtis et al., 2019).

First Nation: Term introduced in 1970s as replacement for "Indian Band"; can refer to a single Band or, in the plural form, many Bands (Joseph, 2018).

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

First Nations: Describes Indigenous Peoples who are not ethnically Métis or Inuit (First Nations & Indigenous Studies, 2009).

Health: Traditionally considered to mean the absence of disease (World Health Organization [WHO], 2022). I use health throughout this thesis to refer to a view of wellbeing informed by Western understanding, or a state of complete physical, mental, and social wellbeing (WHO, 2022).

House: Refers to the physical building, shelter, or dwelling unit (McCartney, 2016). I intentionally use this term throughout this thesis as opposed to home, which can encompass the feelings that the physical structure can support (McCartney, 2016).

Indigenous Peoples: Collectively refers to those “Indigenous to the lands they inhabit” (Alfred & Corntassel, 2005, p. 597). The Government of Canada (2021c) defines this term as the original residents of North America and their descendants. The Canadian Constitution includes three groups under this description: First Nations, Métis, and Inuit (Government of Canada, 2021c).

Non-Status First Nations: First Nations who, for varying reasons, never signed treaties or fell under the jurisdiction of the Indian Act (Stonechild, 2005).

Reserve: Tract of land set aside under the Indian Act and treaty agreements for the exclusive use of a First Nations band (Hanson, 2009). Reserve lands are held by the Crown (Hanson, 2009).

Settler Colonialism: A type of colonialism in which an outside nation establishes settlements, and, over time, enacts legislation that grants them power over another territory or group of peoples and the systems that maintain such status (Douglas, 2013; Free, 2018). There is a history of settler colonialism in Canada with Europeans and Indigenous Peoples (Douglas, 2013; Free, 2018).

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

Social Determinants of Health: Non-medical factors that influence health outcomes; the conditions in which people live, work, and play and wider forces and systems shaping conditions of daily life (WHO, 2020). Housing is a social determinant of health (WHO, 2020).

Status First Nations: A specific legal identity that First Nations can register with under the Indian Act; the Indian Act defines who qualifies (Crey & Hanson, 2009; Stonechild, 2005).

Wellbeing: Indigenous conceptualizations of health go beyond the absence of disease and are often called wellbeing. Wellbeing is relational and broadly described as a balance between emotional, spiritual, mental, and physical aspects (Douglas, 2013; King et al., 2009).

List of Abbreviations

AFN	Assembly of First Nations
CBPR	Community Based Participatory Research
CCD	Community Centred Design
CR	Community Researcher
CMHC	Canada Mortgage Housing Corporation
COVID-19	Coronavirus Disease 2019
CST	Critical Social Theory
CFMP	Capital Facilities and Maintenance Program
FNHA	First Nations Health Authority
FNIGC	First Nations Information Governance Centre
FNLHP	First Nations Lung Health Project
FNMHF	First Nations Market Housing Fund
ISC	Indigenous Services Canada
NOS	Canada National Occupancy Standard
RCAP	Royal Commission on Aboriginal Peoples
RHS	First Nations Regional Health Survey
SSCAP	Standing Senate Committee on Aboriginal Peoples
TA	Thematic Analysis
TRC	Truth and Reconciliation Commission of Canada
UNDRIP	United Nations Declaration on the Rights of Indigenous Peoples

1. Framing the Issue

Housing challenges for First Nations Peoples living on-reserve in Canada are significant and longstanding (Indigenous and Northern Affairs Canada [INAC], 2017; Standing Senate Committee on Aboriginal Peoples [SSCAP], 2015b). First Nations Peoples have a long history of independently planning, designing, and implementing sustainable housing systems aligned with land and culture (Government of Canada, 2017; Stout, 2018). Settlers' attempts at assimilation laid the foundation for the modern state of reserves, wherein many First Nations Peoples live in substandard and unsuitable housing (INAC, 2017; Olsen, 2016; Stout, 2018).

Housing quality and quantity are substandard on-reserve, with many houses needing major repairs and prevalent housing shortages across the country (First Nations Information Governance Centre [FNIGC], 2015; Statistics Canada, 2017b). The substandard housing on-reserve negatively impacts the health and wellbeing of First Nations Peoples through multiple pathways (National Collaborating Centre for Aboriginal Health [NCCAHA], 2017). For example, housing shortages on-reserve may lead to household crowding, which is associated with outcomes such as increased transmission of infectious diseases, moisture in houses, and stress (NCCAHA, 2017).

According to Census data, nearly half of registered First Nations Peoples in Saskatchewan live on-reserve (Government of Canada, 2021d). Housing conditions are most grim in the prairies, where the number of inadequate houses is increasing, and the highest rates of household crowding are reported (INAC, 2017). Estimates of the number of people per house on-reserve in Saskatchewan are as high as 8.43 (SSCAP, 2015b). Housing disparities on-reserve need addressing as they contribute to the grave and persistent health disparities that First Nations Peoples experience in Canada (NCCAHA, 2017).

1.1 Problem Statement

Nearly half of the houses on-reserve across Canada are inadequate (NCCAH, 2017; SSCAP, 2015b). The lack of adequate housing for First Nations Peoples on-reserve contributes to health disparities and violates the human rights of all Indigenous Peoples and Canadians (Government of Canada, 2019; United Nations [UN], 2008). Indigenous Peoples are the fastest-growing segment of Canada's population (Statistics Canada, 2017a), making adequate housing for First Nations Peoples on-reserve an increasingly prominent and pressing issue.

1.2 Research Question, Purpose, and Aims

The overarching question for this thesis was “What relationships exist between federal housing programs, household crowding, and health among First Nations Peoples living on-reserve in Saskatchewan?” The purpose of this work was to contribute to the growing conversation about how greater structures and systems have impacted the health of generations of First Nations Peoples living on-reserve. The intended output was information that could be used to advocate for First Nations-led solutions for housing on-reserve. An additional goal was to contribute to increased self-determination, improved housing conditions, and support the wellbeing of First Nations Peoples living on-reserve. Alignment with the Truth and Reconciliation Commission of Canada [TRC] (2015) Calls to Action was imbedded and critical.

The specific aims of this thesis were to explore how First Nations Peoples describe housing challenges and solutions for household crowding on-reserve and the relationship between household crowding and health among First Nations Peoples living on-reserve. I met these aims through secondary analyses of data gathered in the parent projects (outlined below).

1.3 Parent Projects

This thesis includes analyses of data gathered in two parent projects: the (1) Community Centred Design project and (1) First Nations Lung Health Project. In brief, two different multidisciplinary teams of researchers from the University of Saskatchewan collaborated with four First Nation communities in Saskatchewan (two for each project) to create and conduct these projects. Parts of each project focused on the impact of housing on the wellbeing of First Nations Peoples living on-reserve. The methods chapter of this thesis includes an in-depth discussion of these projects.

1.4 Research Significance

The research included in this thesis is significant as the aims align with the TRC (2015) calls to action and nurses' responsibility to act on the social determinants of health. Discussion of the targeted calls to action and significance to the nursing profession continues below.

1.4.1 Calls to Action

The TRC (2015) provided ninety-four calls to action to progress reconciliation between Indigenous and non-Indigenous Peoples in Canada. Efforts to improve the housing of First Nations on-reserve fall under two calls. Call 18 requires that the impact of government policies on Indigenous Peoples' health status in Canada is recognized and that the healthcare rights of Indigenous Peoples are realized (TRC, 2015). Impacts of the federally created housing system and the health of First Nations Peoples living on-reserve are discussed thoroughly in the second chapter of this thesis. Call 43 is also relevant for First Nations housing on-reserve. It requests that all levels of government adopt and follow the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) (TRC, 2015). The UNDRIP states that Indigenous Peoples have the right to improvements in housing and self-determination (United Nations, 2008). Efforts to

improve housing on-reserve support reconciliation; nurses can bolster the progression of such efforts with their involvement.

1.4.2 Significance to Nursing

Multiple professional standards and competencies state that nurses are responsible for promoting health equity by acting on the social determinants of health (CNA, 2017; Community Health Nurses of Canada, 2019). There is an urgent need for nurses and other public health professionals to act on housing and see it as a tool to reduce health disparities (Swope & Hernandez, 2019). The nursing profession has a pertinent role in the intersectoral action needed to combat the housing and health inequities that First Nations Peoples experience on-reserve. This thesis is a contribution to these efforts.

1.5 Thesis Overview

To begin understanding the relationships between federal housing programs, household crowding, and health among First Nations Peoples living on-reserve, I explored the literature for structural factors that influence federal housing programs. The remainder of this chapter focuses on the structures of colonization, treaties, and assimilation. In the second chapter, I share a literature review focused on historical and contemporary federal housing policies and programs, housing conditions, and housing-related health disparities on-reserve. Frameworks and methods are explained in chapter three and four, respectively. The fifth and sixth chapter include the results of the secondary analyses. While the final chapter of this thesis ties these analyses together, discussing a deeper understanding the relationship between federal housing programs, household crowding, and health through a conceptual model and focuses on the implications and limitations of this work.

1.6 Chapter Transition

The first section of this chapter framed the area of research for this thesis – broadly, housing and related health disparities on-reserve. The following section provides a historical background for this area of research. Although I focused on contemporary challenges in this thesis, the historical context shaped this current reality.

1.7 Historical Background

This historical background is a critical piece of this thesis. It is not possible to understand the current housing concerns First Nations Peoples face in what is now known as Canada without first considering the structural foundations that continue to shape this reality (Royal Commission on Aboriginal Peoples [RCAP], 1996). As King (2013) states in his award-winning book, *The Inconvenient Indian: A Curious Account of Native People in North America*, “The history I offered to forget...turns out to be our present. It may well be our future” (p. 192). Thus, this section provides a concise history of Indigenous Peoples in Canada, with specific connections to First Nations¹ housing on-reserve.

Importantly, this brief background does not represent the depths of the history of Indigenous Peoples in what is now known as Canada. As I am a descendent of settlers, this historical background is primarily understood and described through a non-Indigenous view of history. More specifically, I have predominantly learned about history through a Western scientific lens, where there is a linear view of time and reliance on written documentation for understanding (RCAP, 1996). To balance this view, I have primarily drawn from Indigenous voices (Joseph, 2018; King, 2013; RCAP, 1996; Stonechild, 2005). Additionally, due to the need for a Master’s thesis to be concise, this historical background is focused on particular factors that

¹ I use First Nations Peoples in this section more specifically when discussing housing, as this group of Indigenous Peoples can live on-reserve, which is the focus of this thesis (Joseph, 2018).

have shaped the context for contemporary housing on-reserve. The three main topics follow: (1) the Indigenous-settler relationship, (2) treaties, and (3) focus on assimilation. Despite my attempt to provide sufficient background for this thesis, this is not a comprehensive recount of history. Collectively, non-Indigenous people living in Canada need to learn more about the history on this land to move toward reconciliation (TRC, 2015).

1.7.1 Indigenous-Settler² Relationship

Two key parts of the Indigenous-settler relationship discussed in this section are how the relationship changed over time and the significance of the land. The different periods in the relationship provide a framework for viewing the shift from customary to more European-style housing. Subsequently, understanding the relationships with the land gives context for considering locations assigned to First Nations.

1.7.1.1 Shifts in Relationship. The relationship between Indigenous and non-Indigenous Peoples on the landmass now called Canada has significantly shifted over time. The description of this relationship shared here is primarily informed by the Report of the RCAP (1996). This Report incorporated information from research and consultation with Indigenous communities to describe the historical and contemporary relationships between Indigenous and non-Indigenous peoples in Canada (RCAP, 1996). Indigenous voices were included in the Report through representation in the commissioners (four of seven were Indigenous), public hearings held at Indigenous communities across Canada (96 Indigenous communities were visited), and numerous other research studies and submitted documents (Government of Canada, 2010; RCAP, 1996).

² I use the term settler in this background to refer to those who played a role in colonization. In contrast, I use the term non-Indigenous to collectively refer to those who are not Indigenous to the land now called Canada.

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

The RCAP (1996) describes four main stages of the relationship between Indigenous and non-Indigenous peoples. These stages follow in brief: (1) an initial period when Indigenous peoples and Europeans lived completely separate lives, on different continents, not knowing each other (until ~1500); (2) a period of increasing contact where, generally, Indigenous Peoples and Europeans respected each other as distinct, separately governed groups, cooperating in some areas of mutual benefit (e.g., commercial, military, etc.) (until ~1780s in the Maritimes, ~1830 in Ontario, ~1870 in British Columbia); (3) a period of colonization where settlers tilted power in their favour, displaced, and attempted to assimilate Indigenous Peoples into what had become mainstream society; (4) a modern period with increasing knowledge of the wrong-doings of settlers and their descendants (until 1996). Given that it has been more than 20 years since the RCAP document was published, I would like to add the following: (5) a current period where there is continued awakening to the impacts of colonization and associated forced assimilation on Indigenous Peoples³, and calls to action for non-Indigenous peoples to participate toward reconciling this relationship (ongoing) (TRC, 2015).

This brief overview of the relationship between Indigenous Peoples and Europeans – who became then settlers – in Canada provides a foundation for this housing discussion. However, it includes substantial generalizations. The timeline and type of relationship between Indigenous Peoples and Europeans varied greatly depending on many factors including proximity to coastlines or what is now the United States border, involvement in the fur trade, access to resources, and viability of the land. The challenges with generalizing the history of this relationship are aptly described by the RCAP (1996):

³ For example, see news articles about the unmarked graves found at residential schools across the country in 2021 and 2022.

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

It is clear that any attempt to reduce so long and complex a history of interrelationship... is necessarily a simplification of reality. It is as though we have taken many different river systems, each in a different part of the country, each viewed from many different vantages, and tried to channel them into one stream of characteristics that would be most typical of the river as it has flowed through Canada (p. 43).

Knowing the general shifts in the relationship between Indigenous Peoples and settlers and their descendants over time provides a framework for considering transitions in First Nations' housing. Before contact with Europeans, First Nations Peoples planned, designed, and built housing aligned with community needs and the land (Stout, 2018). Housing was responsive to local climates, geographies, and lifestyles and used surrounding materials (Stout, 2018). First Nations that followed a semi-nomadic life had portable houses (Government of Canada, 2017; Stout, 2018). Others living in relatively permanent locations created large houses that accommodated multiple families at once (Government of Canada, 2017). Customary First Nations housing structures in North America included shed roof houses, plank houses, longhouses, tipis, wigwams, igloos, and other styles⁴ (Government of Canada, 2017; Stout, 2018). During the period of increasing contact, there is evidence that First Nations gradually modified customary housing to adopt some European-style characteristics, although the timing and pace of this varied across the country (Olsen, 2016). Rather than acting as a direct replacement, it seems both newer European-style and more customary housing co-existed (Olsen, 2016). Where First Nations did adopt more European-style housing, there is evidence

⁴ See the following for examples of these housing structures:
https://www.sfu.ca/brc/art_architecture/nw_coast_architecture/coast-salish-architecture.html,
https://www.sfu.ca/brc/art_architecture/nw_coast_architecture/heiltsuk-architecture.html,
<https://www.thecanadianencyclopedia.ca/en/article/longhouse>, <https://www.thecanadianencyclopedia.ca/en/article/tipi>,
https://www.sfu.ca/brc/art_architecture/nw_coast_architecture/tsimashian-architecture.html

that they initially altered dwellings to suit traditional lifestyles (Olsen, 2016). During the relational period where assimilation was at the forefront, First Nations Peoples became wards of the government displaced to sects of land called reserves (Olsen, 2016). At this point, settlers assumed responsibility for oversight of all functions on-reserve, including housing (Olsen, 2016). As a result of entrenched views that they were superior, settlers' enforced the replacement of customary housing in First Nations communities with European-style, wood frame, single-family houses (McCartney et al., 2018; Olsen, 2016).

Despite having well-established housing practices prior to contact with Europeans and adopting some European characteristics of their own free will, when settlers shifted the relationship to a focus on assimilation, housing style, quality, and quantity suffered. Assimilation is discussed more thoroughly in an upcoming section.

1.7.1.2 Significance of Land. A second key component of the relationship between Indigenous Peoples and settlers for housing is the significance of land. As King (2013) states, "If you understand nothing else about the history...you need to understand that the question that really matters is the question of land" (p. 218). Of particular importance for housing, as time progressed, there was a dramatic shift in the ratio of settler to Indigenous populations and an increased focus on attaining cultivatable and resource-rich land.

The settler population in what is now Canada started to dramatically increase in the 1780s, with swelling immigration and the arrival of Loyalists following the American Revolution (RCAP, 1996). At the same time, the Indigenous population declined, facing epidemics of communicable diseases introduced by the Europeans: measles, pertussis, tuberculosis (TB), diphtheria, syphilis, and influenzas (Douglas, 2013; Reading, 2018; RCAP, 1996). Indigenous Peoples had no prior exposure to such diseases and thus were increasingly

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

vulnerable to infection, which led to a large population loss (Douglas, 2013; Reading, 2018). Following the end of the War of 1812, there are estimates that the non-Indigenous population outnumbered the Indigenous population 10:1 in Upper Canada (RCAP, 1996).

As the non-Indigenous population boomed, there was increasing demand for land. In particular, settlers sought land with the greatest potential for agriculture and resource extraction (RCAP, 1996). Settlers wanted to engage in economic development that was “increasingly incompatible with the rights and ways of life of the Indigenous Peoples on whose land this new economic activity was to take place” (RCAP, 1996, p. 131). Thus, Indigenous Peoples became impediments to settler prosperity (RCAP, 1996). A series of land surrenders, or land purchases through treaties for the settler population, followed (RCAP, 1996). Indigenous Peoples engaged in these land transfers for several reasons, including to receive remuneration for illegal squatting already occurring on their land, loss of livelihood (e.g., the disappearance of buffalo) and a need to engage in the new economy, or the promise of medical assistance in the face of epidemics (RCAP, 1996). Over time, the pace of these land surrenders increased, and Indigenous peoples became more and more displaced (RCAP, 1996). In many cases, Indigenous Peoples were denied access to their traditional lands or hunting areas and relocated to tracts of land chosen by colonial authorities (RCAP, 1996).

The type of land settlers’ targeted, and in contrast, the land assigned to First Nations, is essential for the conversation on housing. Europeans targeted the land with the most significant potential for agricultural production and economic benefit for settlements. In contrast, the tracts of land (reserves) assigned to First Nations were often small; uncultivable; and in variable proximity to traditional lands, waterways, and resources (Joseph, 2018). The relocation of First Nations to reserves – ultimately a means of containment – encouraged sedentary, agriculture-

based communities (Government of Canada, 2017; Joseph, 2018). Thus, with land surrenders, First Nations communities' lost access to resource-rich land and materials traditionally used for building and aspects of nomadic and traditional ways of living. These factors, along with the lack of economic potential of the land assigned to the First Nations, greatly impacted housing on-reserve.

1.7.2 Treaties

All people living in Canada are treaty people (Government of Canada, 2020d). Treaties, or what King (2013) aptly calls “vehicles for acquiring land” (p. 224), continue to have significance for housing on-reserve today. Of particular interest for this chapter are the fundamental differences in approaches and resulting ongoing understandings of treaties between Indigenous and non-Indigenous Peoples in Canada. This discussion provides a foundation for considering who is responsible for housing on-reserve today.

Indigenous Peoples and Europeans both had a long history of treaty-making prior to contact (RCAP, 1996). However, treaty-making traditions and underlying perspectives were unique. For example, Indigenous Peoples engaged in oral traditions and ceremonies and recorded treaty agreements in symbolic ways (e.g., wampum belt), which differed from European approaches (RCAP, 1996). In addition, Indigenous Peoples saw treaties as occurring on a nation-to-nation level, necessary for each member of the nation to know and uphold (RCAP, 1996). In contrast, for Europeans, treaties were for the state or governments to remember and implement; average European citizens knew little about treaties (RCAP, 1996).

Consequently, treaty-making processes changed over time as these two nations engaged in such agreements (RCAP, 1996). The earliest written treaties between Indigenous Peoples and Europeans began in the 1600s and had roots in both societies' practices (RCAP, 1996). In short,

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

such treaties were a way nations co-existed peacefully and shared land and resources in what is now known as Canada (RCAP, 1996). As treaties progressed, the Crown and Indigenous Peoples began to have different views on the intent of such agreements. In general, it appears the Crown saw treaties primarily as real estate transactions designed to free Indigenous lands for settlement and resource use (RCAP, 1996). In contrast, Indigenous Peoples continued to see treaties as nation-linking agreements around sharing the land and working together to maintain peaceful relations (RCAP, 1996).

In the 1850s, settlers introduced a new template for treaties (Government of Canada, 2017). First Nations were approached on behalf of the Crown and encouraged to surrender large tracts of land in exchange for annual cash payments and other benefits (RCAP, 1996). Negotiation for these agreements occurred orally, with the written texts that followed meant to represent the outcome of the conversations (RCAP, 1996). However, there were fundamental differences in the understandings of these treaties, commonly referred to as the numbered treaties.

1.7.2.1 The Numbered Treaties. Although there were variations in the agreements, the common elements of the numbered treaties are the focus of the discussion here. As a whole, First Nations Peoples' oral understandings of the numbered treaties differed from the text (Stonechild, 2005). Two particular areas understood differently between First Nations and the Crown were the *surrender* of land and *authority over* First Nations Peoples (RCAP, 1996).

In general, First Nations understood the land discussed in the treaties as being shared rather than surrendered (RCAP, 1996). Comparatively, the written versions of the numbered treaties state that First Nations' surrendered all land title to the Crown (RCAP, 1996). Despite the term *surrender* appearing in the written agreements, whether this was communicated and

understood by First Nation Peoples has been questioned, particularly as a term for such may not exist in Indigenous languages (RCAP, 1996). Furthermore, First Nations understood the treaty relationship as an agreement to respectfully co-exist as separate nations in partnership with the Crown (RCAP, 1996). In contrast, the written understanding was that the Crown acquired *authority over* all of the people alongside the land (RCAP, 1996). Importantly, it is not clear that Crown representatives communicated these terms orally or that First Nations Peoples understood these concepts appeared in the treaties (RCAP, 1996).

The numbered treaties are particularly significant for the discussion of housing. The written documents included agreements around the assignment of reserves or the tracts of land – stated as being owned by the Crown – set aside for the exclusive use of First Nations (RCAP, 1996). The creation of the reserve system significantly disrupted First Nations Peoples’ self-determination and customary housing structures (Joseph, 2018; Stout, 2018). Equally as important, the numbered treaties also yielded misunderstanding over who held responsibility for housing on-reserve.

1.7.2.1.1 Who is Responsible for Housing On-Reserve? There is ongoing contention around whether the provision of shelter, in the form of housing, is a treaty right (Government of Canada, 2010). The Government of Canada (2019) assumes that assistance for housing on-reserve is provided as a social policy, meaning that aid is provided based on need, the way it is for all other Canadians (INAC, 2017). In contrast, some First Nations argue that housing is a treaty right (Government of Canada, 2010). Although this debate remains unsettled, knowledge of the fundamental differences in approaches to and understandings of the treaties provides context for considering this discussion. Discussion of the responsibility for housing on-reserve and federal housing programs continues in the following chapter of this thesis (literature review).

1.7.3 Focus on Assimilation

Settlers created the Indian Act and related colonial legislation to assimilate First Nation Peoples into what had become mainstream society (RCAP, 1996). As assimilation efforts failed, colonial authorities altered the Indian Act to intervene and control the affairs of First Nations more forcibly (RCAP1996). Of interest for housing, a focus on encouraging First Nations Peoples to move off-reserve set the foundation for lacking support for housing on-reserve. In this way, the house became a means for assimilation. The Indian Act was – and remains – a fundamental legislative framework for First Nations in Canada (Government of Canada, 2020b). This period, where settlers attempted assimilation, and created social and political structures built on racism, ultimately laid the foundation for the current housing system and status of houses on-reserve.

The Indian Act, established in 1876, was used to endorse colonial legislation intended to “get rid of the Indian problem” (Joseph, 2018, p. 24; TRC, 2015). Such legislation included the creation and enforcement of mandatory attendance in the residential school system, whereby children were forcibly removed from their homes and placed in schools that forbid much of their identity: their language, cultural practices, and ways of being (TRC, 2015). Recounts of the conditions of residential schools are horrid, with stories of physical, emotional, and sexual abuse; illness; famine; and child labour (TRC, 2015). Additional legislation under the Indian Act banned cultural practices, required First Nations Peoples to have permission to travel off-reserve, stripped women of Indian status⁵ under certain conditions, and enforced other discriminatory policies (Joseph, 2018). The Indian Act and associated policies created cumulative disadvantages

⁵ The Indian Act introduced the concept of Indian status. The Indian Act only pertains to those with Indian status; only those of First Nations descent are eligible to obtain Indian status (Joseph, 2018). The term “Indian” is outdated; however, “Indian status” remains in federal legislation (The Indian Act) to denote those First Nations Peoples who registered as Indians with the Government of Canada (2021e).

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

for First Nations Peoples; marginalization, loss of culture, lower socioeconomic status, intergenerational trauma, and deep and persistent health inequities are among consequences of this structural racism today (Kim, 2019; Manitowabi & Maar, 2018; Reading, 2018; Wilk et al., 2017).

When thinking about housing on-reserve, it is critical to understand that settlers and their descendants, who subsequently formed the Federal Government in Canada, were focused on assimilation. As a key part of assimilation efforts, First Nations Peoples were encouraged to move off-reserve through enfranchisement⁶, whereby individuals gave up Indian status in exchange for full Canadian citizenship (Crey, 2009; Joseph, 2018). Importantly for housing, enfranchised individuals were the only First Nations Peoples that could own property off-reserve (Assembly of First Nations [AFN], 2020; Joseph, 2018). However, giving up Indian status meant being legally removed from band lists so that enfranchised individuals, and any descendants, no longer received the associated benefits (AFN, 2020). Enfranchisement was initially voluntary, with little uptake, before it became enforced under the Indian Act (Joseph, 2018). At that point, enfranchisement automatically occurred when individuals got a university education, joined the medical or legal profession, or married a non-Status man as a woman (AFN, 2020; Crey, 2009). Overall, enfranchisement was unpopular and impacted fewer First Nations Peoples than the Federal Government had hoped (Joseph, 2018). As such, the majority of First Nations Peoples remained living on-reserve. Despite this, a structure for supporting housing on-reserve was lacking. Although the Federal Government had made First Nations Peoples wards of the state and thus retained control over housing, the system they created for such was vastly underfunded,

⁶ Enfranchisement appeared in the Indian Act in varying forms (voluntary, and then enforced) from 1876-1985. In 1985, with Bill C-31, the Federal Government altered the Indian Act to remove enfranchisement clauses (AFN, 2020).

inappropriate, and ineffective (Olsen, 2016). Additionally, with their focus on assimilation, housing supported by the Federal Government was generally culturally inappropriate, acting as a tool for assimilation on-reserve itself (McCartney et al., 2018; Olsen, 2016; Semple, 2020; Stout, 2018). The system created by the Federal Government for housing on-reserve took primary influence from assimilation efforts, which have ultimately led to the housing inequities seen on-reserve today (Olsen, 2016).

1.7.4 Closing Statements

The concise history provided in this section lays a foundation for discussions in upcoming chapters. With a base understanding of the relationship between Indigenous Peoples and settlers, treaties, and the focus on assimilation, one can take a more critical view of the evolution of federal-level housing programs and the status of housing on-reserve. Although my intent was to provide enough information to inform how one views the coming chapters, is imperative to remember that the history shared here is a high-level summary. A complete history would make it clearer that the story of Indigenous Peoples across Canada is one of “adaptation and survival” (Stonechild, 2005, para. 1). In the face of colonial legislation, First Nations Peoples have continued to exert resistance, from passive non-cooperation (e.g., refusing to engage in enfranchisement) to organized opposition (e.g., the confrontation at Oka) (RCAP, 1996; King, 2013). Despite a history of physical, cultural, social, and political displacement, Indigenous Peoples have reclaimed languages, lands, and traditional practices (RCAP, 1996). Furthermore, specific to housing, examples of First Nations-led innovations and infrastructure reclamation are increasing across the country (SSCAP, 2015b).

1.8 Summary

The main points discussed in this chapter follow:

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

- First Nations Peoples living on-reserve in Canada experience significant and longstanding housing challenges. Such challenges impact wellbeing; for example, housing shortages are linked to household crowding, which is associated with illness.
- This thesis is an exploration of the relationships between federal housing programs, household crowding, and health among First Nations Peoples living on-reserve in Saskatchewan through two secondary analyses of data gathered in two parent projects. This research aligns with the TRC calls to action and nurses' responsibility to act on the social determinants of health.
- Looking at historical structures that shaped housing on-reserve can help with understanding its' evolution:
 - As the relationship between Indigenous Peoples and Europeans/settlers changed over time, so did housing. Before the focus on assimilation, some Indigenous Peoples incorporated European-style characteristics into their houses; during the assimilation period European-style houses become more enforced.
 - As the non-Indigenous population boomed, Indigenous peoples became seen as impediments to prosperity. The Crown, and then the Federal Government, targeted land with the greatest potential for agricultural production and economic benefit for settlers; First Nations received plots of land (reserves) with variable access to resources and cultivatable or traditional lands. The type of land assigned impacted economic opportunities and available building materials for housing.
 - First Nations Peoples' oral understandings of the numbered treaties differed from written versions; First Nations Peoples saw the land as being shared vs. *surrendered* and their nation-to-nation relationship as continuing vs. the Crown

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

acquiring *authority over* them. There are ongoing contentions over whether the provision of shelter through housing is a treaty right due to these differing understandings.

- The intent of the Indian Act and associated colonial legislation was to assimilate First Nations Peoples into what had become mainstream society. Enfranchisement was a tactic to encourage First Nations to move off-reserve, while the Federal Government retained financial control over housing; overt and covert attempts at assimilation provided a foundation for the housing inequities seen on-reserve today.

2. Literature Review

With this literature review, I aimed to provide additional context for studying the relationships between federal housing programs, household crowding, and health among First Nations Peoples living on-reserve. These three areas were the focal points of my search, which I completed using targeted websites (e.g., Government of Canada, National Collaborating Centre for Indigenous Health, First Nations Information Governance Centre), academic databases (e.g., Medline), and citation tracking through Web of Science. As I reviewed the literature brought forward in my searches, I recognized a need to discuss broad areas in this chapter. For example, discussions of the current federal housing programs seemed incomplete without viewing their evolution. In addition, household crowding does not occur in isolation from other housing conditions on-reserve. As such, structurally, this chapter includes literature that falls within the following three areas: (1) federally created housing system, (2) housing conditions, and (3) housing-related health disparities on-reserve.

2.1 Federally Created Housing System

The Federal Government established a housing program in 1996 that continues to guide their relationship with First Nations on-reserve. This program is a part of a much larger system the Federal Government created and imposed over many years. This section includes a brief mention of key structural factors and the evolution of federal housing policies and programs to the current day.

2.1.1 Underlying Structural Factors

While there may be numerous structural factors instrumental in federal housing programs and the resultant housing conditions on-reserve, two are foundational: the displacement of First

Nations Peoples onto reserves and the Indian Act. I introduced these factors in the first chapter of this thesis. Here, I focus on how these factors relate to federal housing programs more directly.

2.1.1.1 Displacement onto Reserves & The Indian Act. With displacement onto reserves and the Indian Act, First Nations lost ability to exert control over what happened on their land and to their Peoples, particularly with housing. Legislation that gave authority for “Indians, and Land reserve for the Indians” to the Crown (Government of Canada, 2021a) and the focus on assimilation led to a change from nation-to-nation relationships “to one in which Indians were considered wards of the Crown” (Joseph, 2018, p. 138). With Indians⁷ as wards of the Crown, the Government of Canada retained the power to make decisions about reserve land and the people living on it (Crey & Hanson, 2009; Joseph, 2018). The Indian Act specifically gave the Federal Government control over various aspects that impacted housing on-reserve, including all financial transactions, who could live on-reserve, and oversight of housing (Olsen, 2016).

2.1.1.2 Impacts on Housing Programs. Olsen (2016) considered displacement onto government-owned land and the wardship enforced by the Indian Act to be two instrumental factors in the evolution of housing programs and their associated outputs. In short, Olsen (2016) proposed that these factors led to the Federal Government retaining much of the decision-making power over housing on-reserve. Furthermore, with these underlying structural influences, the Federal Government is seen to have continually introduced housing programs that have kept First Nations Peoples dependent on government assistance, particularly financially (Olsen, 2016).

⁷ “Indians” is used here to refer to those with Indian status under the Indian Act.

2.1.2 Evolution of Programs Impacting Housing On-Reserve

Despite the Government of Canada introducing different programs for housing on-reserve over time, the approach and much of the output have remained the same. Across historical housing programs, the Government of Canada has retained control over most decisions and created a financial system that led to First Nations' dependence (Olsen, 2016). As a result, some see opportunities for adequate housing on-reserve as insufficient (Olsen, 2016; Semple, 2020). This section includes an overview of federally created programs impacting housing on-reserve, beginning with historical housing programs and leading to the current housing system.

2.1.2.1 Historical Housing Programs. This section includes brief descriptions of historical periods that follow First Nations' displacement to reserve land and associated federally created housing programs. Discussion of these periods proceeds alongside the three main areas of financial housing support the Federal Government has administered over time: (1) band capital accounts and welfare, (2) loans, and (3) subsidies and grants. This section almost exclusively draws from a comprehensive dissertation based on a novel review of the development and impact of federally created housing programs on-reserve from 1930-1996 (Olsen, 2016).

2.1.2.3 Band Capital Accounts and Welfare. Olsen (2016) found the Federal Government's main historical approach to supporting housing on-reserve was to provide small packages of building materials to individuals that Indian agents⁸ deemed as deserving. Payment for such materials came from the bands' capital accounts or, in extreme cases, welfare funding,

⁸ In brief, Indian Agents were individuals employed by the Federal Government who enforced the Indian Act at the community level. They engaged in gatekeeping, both physically when the pass system was in place, and in terms of communication with higher level authorities (Olsen, 2016).

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

both of which the Federal Government controlled. Choice in the process was non-existent, and there was no support for building the physical structure once materials arrived.

In the early 20th century, Olsen (2016) found that First Nations Peoples living on-reserve generally relied on their resources, skills, and labour to build housing, while Indian agents focused on providing building materials for those who were very poor. In the 1930s, poverty deepened on and off-reserve with the Great Depression, resulting in widespread housing crises. In response, the Federal Government enacted national housing policies to make mortgages more accessible off-reserve in 1935 and 1938, thereby stimulating the housing market and economy through job creation. The Federal Government made no changes to their approach to housing on-reserve during this time; mortgages remained entirely inaccessible on-reserve due to federally legislated restrictions. As a result, the housing crisis on-reserve deepened; band accounts became depleted, and welfare funds became more restrained as First Nations populations increased. Welfare assistance became reserved for the “most destitute” (p. 65), and those who were approved received “only enough to build a rough unfinished shack” (Olsen, 2016, p. 112). Dependence on the Federal Government for housing on-reserve increased; as reserve residents received the same one-size-fits-all package, housing on-reserve began to take on a standardized form (Olsen, 2016).

2.1.2.4 Loans. In the mid-1950s, Olsen (2016) found the Federal Government increased their focus on supporting housing on-reserve through loans. Early attempts were unsuccessful; banks continued to find it challenging to provide mortgages on-reserve even after revisions to the Indian Act in 1956. When the Federal Government attempted to use bands' capital accounts for housing loans, administrative structures and clear policies were lacking, leading to a lack of

repayment. As such, as noted by Olsen (2016) and recent federal-level reports, the backlog of houses and dire housing conditions on-reserve continued into the 1960s (INAC, 2016b).

2.1.2.5 Subsidies and Grants. In the 1960s, Olsen (2016) noted that the Federal Government began to focus on subsidies and grants. While retaining control over the design and delivery of housing on-reserve, the government withdrew all previous administrative support, leaving bands to manage the federally created housing program. Marketed by the government as increased self-determination, bands now had increased responsibilities to administer, finance, and manage a housing program for which the Federal Government retained the legal authority.

Over time, the Federal Government implemented additional housing programs, focusing on loans, subsidies, and grants. When evaluated, many of these programs have lacked input from First Nations, underwhelmed expectations, and insufficiently supported adequate housing opportunities on-reserve (INAC, 2017; Olsen, 2016).

2.1.2.6 Lasting Impacts. Many parts of the Federal Government's early approaches to supporting housing on-reserve have led to its current state. As Olsen (2016) found, First Nations had no control over any financial transactions or housing support on-reserve for decades. Band capital and revenue accounts were always used first, with welfare funding as a last resort (Olsen, 2016). As Olsen (2016) asserted, welfare funds were unstable as they depended on the country's economic conditions, and were used only in the direst circumstances. Furthermore, Indian agents funded band accounts primarily by selling band-owned land, often below fair value (Olsen, 2016). According to Olsen (2016), not only did First Nations experience additional dispossession of land from this funding system, but the amount of land available to sell was finite. Additionally, despite federal-level decisions to use band capital accounts to pay for building materials for residents and provide housing loans, band accounts were intended for communal

versus individual expenses (Olsen, 2016). Thus, the Federal Government created a housing system that led to financial dependence and was unsustainable and inappropriate from the time of conception.

Secondly, as Olsen (2016) found, the Government of Canada created two separate housing systems in the 1930s: one driven by increasingly accessible financial support and private construction industry (off-reserve), and another mainly funded by federal welfare programs (on-reserve). It was not until 1958-1959, after many years of needing more and better houses, as Olsen (2016) stated, the Federal Government made their first attempt at a formal on-reserve housing policy and provided funds to cover some labour for building. This inequitable housing system that the Federal Government created has directly impacted the housing conditions that remain on-reserve today.

2.1.3 Current Housing System

The Indian Act continues to govern relations between First Nations Peoples and the Federal Government in Canada (Government of Canada, 2020b). Under the Indian Act, the Government of Canada (2020b) holds land title for reserves. As such, First Nations do not own reserve land; instead, they continue to use allotted land that is subject to the legal framework defined in the Indian Act for housing (INAC, 2017). Within this framework, each First Nation now has the right to decide how they manage housing, and, as such, approaches and policies vary across reserves (INAC, 2017). Housing on-reserve generally falls into two broad categories: band-owned or individually-owned, with most housing being band-owned (INAC, 2017). First Nations manage band-owned housing differently; in reserve communities, such housing may be managed directly by the Chief and Council or another group that reports to the Chief and Council

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

(SSCAP, 2015b). Variation also exists in whether financial contributions, such as rent, are collected for such houses (SSCAP, 2015b).

The current policy guiding housing between First Nations and the Government of Canada (2018a) is the On-Reserve Housing Policy, developed in 1996. Despite “First Nations control” (para. 12) appearing as one of the four principles of this policy, the intentions of the Government of Canada to provide First Nations control over housing on-reserve have largely fallen short (AFN, 2018). As such, federally designed and constructed houses that are not culturally reflective remain the norm on many First Nations reserves (Stout, 2018). Although contended (SSCAP, 2015b; Government of Canada, 2010), the Federal Government takes the stance of having no legislative or Treaty obligations to support housing on-reserve (INAC, 2017). Instead, the Federal Government provides housing support to First Nations as a social policy – mainly through funding – as they do for all other Canadians (INAC, 2017; Government of Canada, 2019). Funding support primarily comes through Indigenous Services Canada (ISC) and Canada Mortgage and Housing Corporation (CMHC) (Government of Canada, 2020c). Although there is overlap as the Federal Government funds both, I discuss ISC and CMHC separately below to aid clarity.

2.1.3.1 Indigenous Services Canada. Most First Nations receive an annual allotment of funds from ISC as a part of the On-Reserve Housing Policy (Government of Canada, 2018a). These funds are for housing-related activities, including maintenance and construction – though not “the full cost” (Government of Canada, 2021a, para. 3; INAC, 2017). There is occasionally additional financial support for housing through targeted project funds from ISC, given to selected communities based on need demonstrated through applications (INAC, 2017).

All funding from ISC for housing on-reserve falls within the Capital Facilities and

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

Maintenance Program (CFMP) (INAC, 2016). The CFMP focuses on infrastructure on-reserve in four areas: water and wastewater, education, housing, and other community areas (e.g., roads) (INAC, 2016). To “ensure appropriate expenditure” (INAC, 2016, para. 3), First Nations are subject to outlined criteria when spending this funding. Infrastructure design must follow the CFMP Protocol, including provincial and federal policies and codes and other planning, tracking, and reporting requirements (INAC, 2016). The Protocol also serves as a reference for those helping with planning, design, construction, and operation of infrastructure on-reserve (INAC, 2016). Notably, the Protocol states that a life cycle cost analysis must be done on “all viable options” to “identify which option is the most cost-effective” (INAC, 2016, p. 2). As such, critique of the CFMP exists for its support of the lowest cost alternative for infrastructure design (Vogel, 2019).

2.1.3.2 Canadian Mortgage and Housing Corporation. The Government of Canada also supports on-reserve housing through CMHC (2022), aiming to improve housing affordability for everyone in Canada. A segment of CMHC focuses on housing for Indigenous Peoples, including those that live on-reserve (CMHC, 2018). Canada Mortgage and Housing Corporation (2022a) provides financial support for housing development and renovation, including subsidies and loans (FNMHF, 2018; Government of Canada, 2020c). There is occasionally more targeted funding; for example, the shelter initiative for women and children experiencing family violence and the Rapid Housing Initiative (RHI) for urgent housing needs, both of which included First Nation communities (CMHC, 2020b; CMHC, 2021).

2.1.3.3 Housing Loans. Both ISC and CMHC are involved in securing loans for housing on-reserve. The Indian Act prohibits the seizure of reserve land; thus, there are significant barriers to obtaining private mortgage financing (INAC, 2017). The Government of Canada

introduced Ministerial Loan Guarantees and the First Nations Market Housing Fund (FNMHF) to decrease these barriers (FNMHF, 2018; Government of Canada, 2020c). In 1996, the Federal Government began to provide lenders with security for loans issued on-reserve through Ministerial Loan Guarantees (Government of Canada, 2020c). A First Nations band or an individual on behalf of the band can receive a Guarantee; ultimately, the Guarantees have provided more support for band-owned than individually-owned housing (INAC, 2017). In 2008, the Government of Canada introduced the FNMHF, targeted toward individual borrowers (FNMHF, 2018). Importantly, the First Nation must guarantee the loans for individual borrowers, meaning they are obligated to use their resources if the borrower defaults (FNMHF, 2018). The number of houses resulting from the FNMHF to date is significantly below initial projections (FNMHF, 2018; FNMHF, 2019).

2.1.3.4 Housing System Inadequacies. Funding is the primary federal-level inadequacy mentioned in literature for on-reserve housing. Discussion centers on the insufficiency of the amount of funding and the restrictive nature of the funding.

National level reports have called the financial support provided by the Government of Canada insufficient to address the magnitude of need (INAC, 2017; SSCAP, 2015b). One reason the SSCAP (2015b) speculates for this is the relative stability of federal funding amounts in recent years. From 1996 to 2015, there was a 2% funding cap on annual budget increases relating to First Nations' housing and infrastructure; SSCAP (2015b) found this funding cap inadequate for keeping up with inflation or population growth. Indigenous Peoples continue to be the fastest-growing segment of the Canadian population (Statistics Canada, 2017a).

Although additional funding opportunities exist beyond the annual amount most First Nations receive through the On-Reserve Housing Policy, critique of targeted funding

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

opportunities exists for aspects such as reactivity, unpredictability, and shorter-term funding periods (INAC, 2017; SSCAP, 2015b). The SSCAP (2015b) found funding restrictive and unrealistic, with delays in announcements reducing the funding period, requirements for the return of unspent money, and the imposition of impractical timelines (e.g., require building over fall and winter). The CFMP Protocol that infrastructure developed using federal funds must follow, along with loan securement programs, have been criticized for their rigid eligibility, planning, reporting, and design requirements (Government of Canada, 2018a). Finally, the system as a whole has been called disjointed, as INAC and CMHC each need to be approached separately for funding, which doubles proposals and administrative efforts (INAC, 2017).

Reports share how federal housing programs are not currently meeting the need for housing on-reserve and have consistently been ineffective at decreasing the housing backlog in such communities (INAC, 2017; SSCAP, 2015b). The AFN (2022b) goes so far as to say that “every attempt has failed to address the shortage of units in our communities” (para. 4). Housing shortages are just one of the multiple challenges First Nations face with housing on-reserve today, many of which are rooted in the housing system and associated programs the Federal Government created with lacking input from First Nations.

2.2 Housing Conditions

One can better understand the housing conditions on-reserve with baseline knowledge of the structures and systems of influence. It is important to remember that First Nations communities continue to be restricted – as they have for years – by the system created by the Government of Canada. As Olsen (2016) concludes, the Federal Government bears the weight of the responsibility for the housing outcomes. The two topics explored in this section include an

introduction to First Nations reserve communities in Canada and Saskatchewan and the housing status of such communities.

2.2.1 First Nations Reserve Communities

Over 630 First Nations have registered with the Federal Government in Canada (Government of Canada, 2021b). Of those who participated in the 2016 Census, 977,230 identified as First Nations, and 331,025 reported living on-reserve (Statistics Canada, 2018; Statistics Canada, 2021c). Generally, compared to the non-Indigenous population, Indigenous populations are younger and increasing faster (Statistics Canada, 2018). From 2006 to 2016, the First Nations population in Canada grew by 39.3% (Statistics Canada, 2018); the population as a whole increased by approximately 5% over the same period (Statistics Canada, 2017d).

Most of the First Nations populations in Canada are in the western provinces (Statistics Canada, 2017a). Over 20% of the First Nations households on-reserve that participated in the latest Census were in Saskatchewan (Lgui, 2019). There are 70 First Nations registered in Saskatchewan, and at least one-tenth of the population in the province identifies as First Nations (Government of Canada, 2021d; Statistics Canada, 2017a). According to Census data, in 2016, there were 165,394 Status First Nations in the province, 79,596 (48%) of whom were living on-reserve (Government of Canada, 2021d).

Housing conditions are generally the direst in the prairies, where: a) a higher percentage of First Nations live on-reserve, b) the number of inadequate houses is increasing, and c) the highest rates of household crowding in Canada occur (INAC, 2017; Statistics Canada, 2017b). First Nations living on-reserve in Saskatchewan have historically been the most likely to live in inadequate or unsuitable housing. Based on the latest estimates from the CMHC, 50.5% of households on-reserve in Saskatchewan fall below the adequacy (need for major repairs) or

suitability (enough bedrooms for occupants) standards (Lgui, 2019). Comparatively, 32.4% of all households on-reserve across Canada are substandard (Lgui, 2019). Thus, Saskatchewan First Nations have some of the most significant housing needs in the country.

2.2.2 Housing Status On-Reserve

Concerns with housing on-reserve are longstanding and widespread, with the state of housing on-reserve at a national level being called a “crisis” in recent years (SSCAP, 2015b, p. 3). Common challenges discussed in the literature include high levels of inadequate housing, significant housing shortages, unsuitable and overcrowded housing, inappropriate housing designs, and mold, among others (INAC, 2017; SSCAP, 2015b; Statistics Canada, 2017b; Stout, 2018). Importantly, the SSCAP (2015b) noted that housing conditions across reserves are very diverse. What follows is a generalized review that focuses on the most prevalent housing concerns.

2.2.2.1 Inadequate Housing. Housing inadequacy often refers to the need for major repairs, classified as “dwellings with defective plumbing or electrical wiring, and dwellings needing structural repairs to walls, floors or ceilings” (Statistics Canada, 2017c, para. 3). According to recent estimates, up to 44% of First Nations households on-reserve across Canada require major repairs (FNIGC, 2015; Statistics Canada, 2017b). As points of comparison, 14.2% of the First Nations population living off-reserve, and 6% of the non-Indigenous population in Canada reported the same housing conditions (Statistics Canada, 2017b). Furthermore, from 2011 to 2016, the number of Indigenous Peoples living in a house needing a major repair decreased for all groups except First Nations living on-reserve (Statistics Canada, 2017b). This data remains fairly accurate in Saskatchewan, where more than 40% of households on-reserve are estimated to fall below the adequacy standard (Karunanayake et al., 2018; Lgui, 2019).

2.2.2.2 Housing Shortages. Housing shortages on-reserve are prevalent. The most recent data available from the First Nations Regional Health Survey (RHS) shows that 94.1% of communities have a waiting list for housing (FNIGC, 2015). More than a third of these communities have half of their adult population on the waiting list, with an average waiting time of two years (FNIGC, 2015). The magnitude of the housing shortage across the country remains unclear, with estimates reaching 85,000 units (SSCAP, 2015b). However, the accuracy of external estimates of housing shortages that do not include community input are questionable, and needs are likely greater than estimated (MacTavish et al., 2012). Moffatt (2013) found the lack of available housing on-reserve left First Nations community members feeling forced to seek housing elsewhere. The SSCAP (2015b) echoed this result, finding times when community members felt there were no alternatives but to leave the community.

2.2.2.3 Unsuitable and Overcrowded Housing. Using the housing suitability measurement from the Canadian National Occupancy Standard (NOS)⁹, the latest data show that approximately a quarter of First Nations Peoples across Canada live in crowded housing, when considering populations both on- and off-reserve (FNIGC, 2015; Statistics Canada, 2017b). Census data showed the proportion of First Nations Peoples living in a crowded house was approximately two times higher on-reserve than off-reserve, and over four times higher than the non-Indigenous population (Statistics Canada, 2017b). Between 2011 to 2016, the number of crowded households on-reserve remained nearly unchanged, while values appeared to improve for First Nations Peoples living off-reserve (Statistics Canada, 2017b).

⁹ According to the NOS, a house is unsuitable or crowded when it does not have enough bedrooms for the size or composition of the household members. The minimum requirement is no more than two people per bedroom (Statistics Canada, 2021b).

According to the latest data from the CMHC, 22.7% of households on-reserve in Saskatchewan were below the suitability standard, meaning they were crowded based on the NOS measurement (Lgui, 2019). When using different measurement criteria (>1 person/room), higher rates of household crowding, up to 32.6%, have been reported for particular First Nation communities in the province (Karunanayake et al., 2018). Estimates reach 8.43 for the number of people per house on-reserve in Saskatchewan (SSCAP, 2015b).

2.2.2.4 Inappropriate Housing Designs. Reports describe houses on-reserve as inappropriate for various reasons. In some First Nations communities, one-size-fits-all approaches have been termed inappropriate due to the need for differing designs to accommodate amounts of rainfall or soil conditions (SSCAP, 2015; MacTavish et al., 2012). Such houses have been called geographically inappropriate for the areas in which they are used (SSCAP, 2015; MacTavish et al., 2012). Critics speculate that using houses in areas where they are geographically inappropriate will generally impact structural longevity (SSCAP, 2015; MacTavish et al., 2012).

Houses on-reserve have also been called culturally inappropriate. As the housing system has made many First Nations reliant on the financial assistance of the Government of Canada, housing design on-reserve continues to be influenced by the associated regulations (INAC, 2016). Authors denote that these contemporary policies are grounded in historical assimilation efforts and have resulted in reserve communities largely filled with European-style housing designs (MacTavish et al., 2012; McCartney, 2016; Olsen, 2016). Such designs do not reflect or support the culture of First Nation communities. Depending on the values and beliefs of the community, examples of ways housing designs may be altered to be more culturally appropriate include using local materials to foster connection to the land, intentionally aligning with certain

directions, and incorporating circular elements or space that support traditional forms of food preparation (e.g., butchering wild game meat) (Deane & Smoke, 2010; Larcombe et al., 2020; Shelby et al., 2012). Multiple studies comment on how houses on-reserve lack cultural significance for the people living in them (MacTavish et al., 2012; McCartney, 2016; Stout, 2018).

2.2.2.5 Mold. Mold is a widespread concern for housing on-reserve (SSCAP, 2015b). Mold in housing is associated with excess humidity, lack of ventilation, water leaks, or floods (Government of Canada, 2016). On-reserve, mold has been linked to structural conditions such as inappropriate building materials, housing designs, and ventilation systems (Boutilier, 2013; Stout, 2018; UN, 2008).

Recent data suggests that approximately half of First Nations adults living on-reserve in Canada live with mold or mildew in the house (FNIGC, 2015). Risks for mold growth in such buildings could be even higher; when houses on-reserve have been evaluated in-person, a much greater percentage of houses have been found “prone to mold growth” than those in which mold is directly seen (Boutilier, 2013).

Data collected at a few First Nations in Saskatchewan has shown similar rates to those reported at national levels. Studies presenting such data have reported up to 51% of houses reporting a sign of mold or mildew, 48% reporting a moldy smell, and 59% reporting water damage or damage from dampness in the house (Anwar et al., 2021; Karunanayake et al., 2017; Pahwa et al., 2015). Notably, researchers report that significant variations in rates of mold in houses occur across First Nation communities, with some having much higher rates (Larcombe et al., 2011).

2.2.2.6 Other Challenges. First Nations reserve communities across the country face various additional challenges with housing. Some First Nations report having houses that lack reliable electricity and safe drinking water (FNIGC, 2015). Latest nationwide data showed that more than a third of First Nations adults lived in houses on-reserve with unsafe year-round drinking water (FNIGC, 2015).

Authors have identified wastewater infrastructure as inadequate in various communities; some encounter consistent issues with sewage, while others lack indoor plumbing (Boutilier, 2013; FNIGC, 2015; SSCAP, 2015b; Thompson et al., 2020). Additionally, safety equipment such as smoke detectors, fire extinguishers, and carbon monoxide detectors are lacking in some communities (FNIGC, 2015). The SSCAP (2015b) found housing concerns most acute in remote communities, where costs of transporting building supplies, economic opportunities, and access are a challenge.

2.2.2.7 Intersections of Concern. As much as housing challenges on-reserve have been discussed distinctly in this section, these concerns intersect. The SSCAP (2015b) linked inappropriate housing design and crowding as large families shared were living in single-family houses. Others reported crowding as contributing to deterioration and the need for repairs because of additional use and moisture in the house (Moffatt, 2013; SSCAP, 2015b). Many have connected increased moisture in houses and associated with mold, whether from crowding or inappropriate, absent, or non-functioning fans and ventilation systems (Larcombe, 2011; SSCAP, 2015b). Thus, authors report inappropriate housing designs, housing shortages, and resultant crowding exacerbate the risk for mold growth (Boutilier, 2013; INAC, 2017; SSCAP, 2015b).

2.2.3 Challenges with Available Housing Metrics

The data shared here are only, at best, a part of the story. Participation and the type of housing metrics collected impact survey data. Much of the housing data widely available relies on the Census, in which not all First Nations communities participate (Government of Canada, 2020a). Participation rates have also impacted the RHS, the first national-level survey led by and for First Nations, which collects a broad range of data about First Nations Peoples living on-reserve and their health and wellbeing (FNIGC, 2015).

Regarding housing metrics, typical components of focus such as adequacy, affordability, and suitability, are critiqued for their lack of appropriateness on-reserve (McCartney et al., 2021). As such, First Nations-led efforts to create and gather housing metrics reflective of Indigenous knowledge and experience are arising (CMHC, 2020a), but not yet available. Such efforts are needed to collect data that adequately reflects the reality of those living in housing on-reserve (CMHC, 2020a).

Finally, the data shared in this section do not tell the stories of individual communities. There is wide variation in housing status across reserves and limited data describing such differences at a community level (Larcombe, 2011; SSCAP, 2015b). Despite data often being presented at national and provincial levels, First Nation communities are not homogenous.

2.3 Housing-Related Health Disparities

Housing is a recognized social determinant of health in literature globally and specific to Indigenous Peoples in Canada (Boutilier, 2013; NCCAH, 2017; Swope & Hernandez, 2019; WHO, 2020). Connections between poor housing conditions and health are various and well described in the literature (WHO, 2018). This section primarily draws from literature focusing on Indigenous Peoples in Canada to discuss the impacts of housing on wellbeing. I have used the

FNHA (2020b) model of wellbeing to structure this section. As a result, I discuss the relevance of housing for physical and mental wellbeing and cultural determinants of wellbeing (FNHA, 2020b). I make links to some of the primary housing challenges discussed in the previous section, including household crowding, mold, housing shortages, and inappropriate housing designs.

2.3.1 Physical Wellbeing

The main aspects of physical wellbeing connected to housing in literature are the transmission of infectious diseases, respiratory health, and accidents and injuries. A summary for each topic in this section follows.

2.3.1.1 Transmission of Infectious Diseases. Household crowding is associated with increased transmission of infectious diseases (Larcombe et al., 2011; Moffatt, 2013; Shannon et al., 2018). Tuberculosis (TB), in particular, is discussed as a predominant concern with household crowding (Government of Canada, 2020e). Links between TB transmission and infection on-reserve and crowded and inadequately ventilated houses are well-established (Government of Canada, 2020e; Larcombe et al., 2011; Moffatt, 2013). For example, Larcombe et al. (2011) found latent, current, or past TB rates associated with higher numbers of permanent residents and persons per room in houses on-reserve. The latest estimates have TB rates among First Nations living on-reserve as over 40 times higher than those of the Canadian-born non-Indigenous population, making this a pressing issue (Government of Canada, 2020e). Other infectious diseases discussed as associated with household crowding in the literature include influenzas, gastroenteritis, diarrheal diseases, and COVID-19 (Moffatt, 2013; Shannon et al., 2018; Thompson et al., 2020).

Aside from impacting proximity to others, authors suggest that crowding may lead to increased transmission of infectious diseases because of the impact on sleep (Moffatt, 2013; SSCAP, 2015b; Stout, 2018). Authors suggest that household crowding leads to sleep disruption and deprivation, weakening immune responses (Moffatt, 2013; SSCAP, 2015b; Stout, 2018). One study involving First Nations Peoples living on-reserve in Saskatchewan found crowded living conditions to be a significant predictor of excessive sleepiness in the daytime (Karunanayake et al., 2018), providing additional support for this theory.

2.3.1.2 Respiratory Health. Links between exposure to mold or mold-prone conditions in the house and respiratory issues are plenty in the literature (Anwar et al., 2021; Government of Canada, 2016; Karunanayake et al., 2017; Rennie et al., 2020). One study conducted in First Nation reserve communities in Saskatchewan found dampness in the house and a continuous smell of mold to be related to respiratory symptoms such as a persistent wheeze (Anwar et al., 2021). Other studies have replicated significant associations between the presence of mold or mold-prone conditions and asthma or related symptoms in child and adult populations (Government of Canada, 2016; Rennie et al., 2020). Karunanayake et al. (2017) also found signs of mold or mildew in the house to be associated with bronchitis in children living on-reserve.

2.3.1.3 Accidents and Injuries. The WHO (2018) links the physical characteristics of the house with injuries and mortality. Furthermore, the SSCAP (2015b) states higher rates of accidents, such as fires, and deaths from such accidents occur on-reserve. More specifically, they note the fire death rate on-reserve as 10 times higher than the rest of Canada. Authors have made connections between the rate of such accidents on-reserve and the lack of safety equipment, such as smoke detectors in houses, and rates of household crowding (FNIGC, 2015; SSCAP, 2015b).

2.3.2 Mental Wellbeing

Shannon et al. (2018) found household crowding negatively impacts mental health, leading to outcomes such as stress and unhappiness. In First Nation reserve communities specifically, community members have reported overcrowding to increase family tension (SSCAP, 2015b). Additionally, overcrowding can lead to becoming unhoused, particularly in remote communities (Christensen, 2016; SSCAP, 2015b). Indigenous Peoples have identified a strong relationship between being unhoused, mental wellbeing, and addictions, particularly those that migrate to larger cities (Stewart et al., 2018). Being unhoused is associated with morbidity, mortality, and various health ailments (Hoque, 2018).

Links exist in the literature between the lack of autonomy and control over housing, the imposition of European-style houses, and psychological distress (Moffatt, 2013; Stout, 2018). In contrast, Stout (2018) found that homeownership supports self-esteem and one's sense of control. Studies exploring Indigenous People's conceptualizations of the relationships between housing and health have found the *sense of home* to be related to health and wellbeing (Christensen, 2016; Perreault et al., 2020).

2.3.3 Cultural Determinants of Wellbeing

Discussion about connections between housing and culture for First Nations Peoples in the literature primarily centers on two topics. First, First Nations Peoples have shared that housing shortages have led to community members leaving the reserve, which is associated with loss of language and culture (Moffatt, 2013). Second, many studies discuss the impact of housing design on Indigenous culture (Deane & Smoke, 2010; Larcombe et al., 2020; MacTavish et al., 2012; McCartney, 2016). Researchers have found houses can be a powerful cultural tool, supporting Indigenous cultural practices, values, and beliefs based on how they are designed

(Deane & Smoke, 2010; Larcombe et al., 2020; MacTavish et al., 2012; McCartney, 2016). For example, Larcombe et al. (2020) found that community members wanted houses designed to include traditional food preparation areas; this would support the transfer of traditional knowledge, ultimately supporting cultural identity. Lack of cultural appropriateness of houses for Indigenous Peoples has been linked to detachment from houses due to the lack of cultural significance (MacTavish et al., 2012; McCartney, 2016; Stout, 2018).

2.3.4 Need for Additional Research

In this section, I primarily drew from research conducted with Indigenous Peoples and First Nations Peoples living on-reserve. However, explorations of the connections between housing and health or wellbeing for such Peoples are relatively sparse in the literature. The sparsity of the literature is particularly true when considering the many facets of First Nations models of wellbeing and the diversity amongst communities (FNHA, 2020b; SSCAP, 2015b). Additional research, specific to First Nations in Saskatchewan, may support First Nations-led solutions for housing on-reserve, at local, provincial, or national levels. With this thesis, I seek to address this gap.

2.4 First Nations-Led Solutions

National-level organizations have called for First Nations to have increased control and management for housing and related infrastructure on-reserve (AFN, 2018). Such calls are rooted in a rights-based approach. Adequate housing is a fundamental human right in Canada (Government of Canada, 2019). Furthermore, Indigenous Peoples have a right to self-determination specified in the United Declaration of Indigenous Peoples (UNDRIP) (United Nations, 2008). The current housing system does not support the realization of either of these

rights on-reserve. As such, scholars have described the housing disparities First Nation Peoples experience on-reserve as fundamentally unjust (Larcombe et al., 2020; Philpott, 2018).

As Olsen (2016) states, “we can be certain that the solutions [for housing on-reserve] will not come from yet another new housing scheme designed by government officials” (p. 360). First Nations-led solutions for housing on-reserve are emerging across the country. When the SSCAP (2015b) traveled to reserves across Canada, they saw First Nations-led innovations in building standards, programs making homeownership more accessible, and housing designs. First Nations are also leading initiatives to support the transfer of housing and infrastructure from the Federal Government to a First Nations Housing and Infrastructure Authority (BC First Nations Housing & Infrastructure Council [FNHIC-BC], 2021).

Recognition of – and action on – the rights of First Nations Peoples is vital to reconciliation (TRC, 2015). First Nation’s control of housing and related infrastructure is key for self-determination (FNHIC-BC, 2021). Along with solutions, First Nations know the housing conditions and impacts of such conditions on wellbeing within their communities. Elevation of First Nations Peoples’ voices is needed to make meaningful changes within the system influencing housing on-reserve.

2.5 Conclusion

In this chapter, I reviewed literature focused on the federally created housing system, housing conditions, and housing-related health disparities. Housing on-reserve continues to be impacted by a housing system rooted in the displacement of First Nations Peoples onto reserves and the Indian Act. As a result, First Nations have experienced little change in the outputs of federal housing programs over time. As a whole, First Nations continue to be strained by challenges with inadequate housing, housing shortages, unsuitable and overcrowding housing,

inappropriately designed housing, and mold on-reserve. Such housing inequities lead to disparities in physical and mental wellbeing and impact cultural determinants of wellbeing. First Nations Peoples must be at the forefront of determining solutions for housing to support their inherent rights and identify innovative ways forward.

2.6 Summary

The main points discussed in this chapter follow:

- First Nations Peoples were displaced to reserve land and became wards of the Crown. Since the enactment of the Indian Act (1876), the Government of Canada has retained the power to make decisions about reserve land and the people living on it.
- The Government of Canada introduced various channels for supporting housing on-reserve over the years, from welfare and band capital accounts to loans and then subsidies and grants, all while retaining much of the decision-making power over housing on-reserve.
- The 1996 On-Reserve Housing Policy is the current federal policy for First Nations housing on-reserve. “First Nations control” appears as one of the four principles; however, First Nations are largely restricted. For example, they must follow the Government’s CFMP Protocol when spending their annual allotment of funds and any additional targeted project funds they receive for housing.
- Prevalent housing concerns on-reserve include inadequate housing, housing shortages, unsuitable and overcrowding housing, inappropriately designed housing, and mold on-reserve. Housing conditions on-reserve are generally the direst in the prairies.

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

- Housing inequities on-reserve lead to disparities in physical wellbeing (increased transmission of infectious diseases, poorer respiratory health, increased accidents and injuries) and mental wellbeing. In addition, houses are often culturally inappropriate.

3. Theoretical Framework & Conceptual Model

I used a theoretical framework and a conceptual model to shape this research. The theoretical framework of critical social theory (CST) informed the lens I viewed this research through. The conceptual model by Swope and Hernandez (2019) helped me conceptualize the relationships I explored in my research. I explain this theoretical framework and conceptual model and how I used them in further detail below.

3.1 Theoretical Framework

Critical social theory (CST) provided the theoretical framework for this research. In CST, reality is historically and contextually situated and there is a focus on the structural forces that create the conditions in which individuals live (Engebretson, 2019; McGibbon & Lukeman, 2019). The use of CST in this study placed the structural conditions that impact Indigenous Peoples' health, such as historical, political, societal, economic, and ideological structures, as the focus rather than proximal determinants (Reading, 2018). As such, CST provided this study with a foundation for critiquing housing programs and other relevant historical structural factors that influence the health of First Nations Peoples.

The health of First Nations Peoples in Canada continues to be shaped by social structures that are a downstream effect of settler colonialism and colonization (Greenwood et al., 2018; Kim, 2019; Reading, 2018). Using CST as a theoretical framework in this research ensured that I focused on the impacts of such oppressive historical and sociopolitical forces (Engebretson, 2019). Additionally, in CST, power is a conscious consideration (Engebretson, 2019); reconciliation with Indigenous Peoples in Canada requires that non-Indigenous people intentionally recognize and reduce the power they hold and in doing so create space for those who are Indigenous (Curtis et al., 2019; TRC, 2015). As CST embeds a critical perspective on

the relationship between power and knowledge, it is well-suited for research with Indigenous Peoples and community-based research (Getty, 2010).

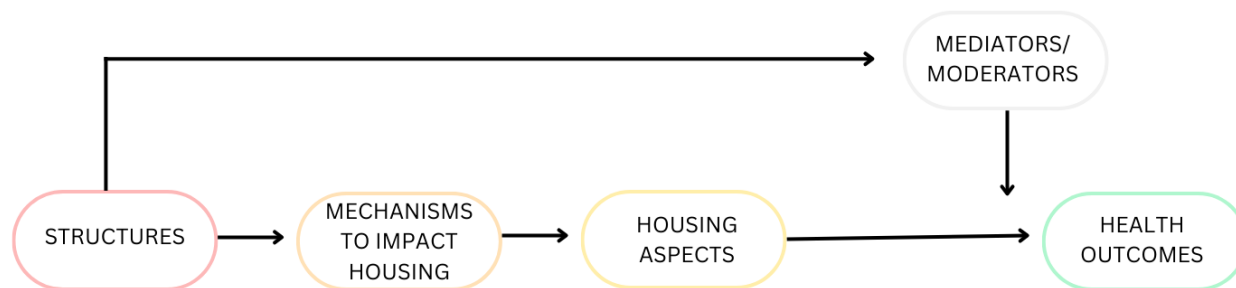
Albeit ideal, critical social theory is used in research as a precursor for supporting social change (McGibbon & Lukeman, 2019). Guided by CST, with this research I aimed to produce knowledge that challenged current housing programs on-reserve and ultimately reduce the health inequities First Nations Peoples experience. The ethical foundations of nursing embed awareness and action surrounding the structural causes of health disparities (Canadian Nurses Association, 2017). The need for nursing to utilize critical perspectives, such as CST, is pressing (McGibbon & Lukeman, 2019). The inclusion of CST as a conceptual framework in this study supported a focus on reconciliation and the extension of nursing knowledge.

3.2 Conceptual Model: Housing & Health Disparities

I drew from the work of Swope and Hernandez (2019) to conceptualize preliminary relationships of interest in this research. Swope and Hernandez (2019) depict a conceptual model of housing and health disparities, focusing on the historical and contemporary sociopolitical injustices that impact both. I chose this model, in alignment with CST, as Indigenous Peoples are impacted by unique and prevalent structural determinants in Canada. Swope and Hernandez (2019) depict relationships from structures to health outcomes, specifying mechanisms through which the structures impact housing, housing aspects, and mediators and moderators between the two. The main components of Swope and Hernandez (2019) are shared in Figure 3.1. I provide a more detailed description of this conceptual model and how I used it below.

Figure 3.1

Main Components of Conceptual Model



Note: This figure is informed by the conceptual model by Swope and Hernandez (2019).

Swope and Hernandez (2019) included “structural inequality in race and class” and “exclusionary policies and practices, both historical and contemporary” (p. 6) as the structures in the model. The three mechanisms were “limited available housing stock”, “unequal distribution of resources by neighborhood”, and “limited ability to develop financial resources through housing equity” (p. 6). The four housing aspects were “neighborhood factors”, “conditions and quality”, “affordability”, and “residential stability” (p. 6). Mediators included demographics, health behaviours, stress, and access to health promotion resources. Health outcomes included multiple facets of health (general, mental, maternal, reproductive, infant, and sexual), and chronic and infectious disease.

Importantly, Swope and Hernandez (2019) model does not solely focus on the perspectives of Indigenous Peoples. Swope and Hernandez (2019) considered the experiences of Indigenous Peoples living in the United States when building their framework. However, the historical and contemporary relationships between Indigenous Peoples and the Federal Government in the United States and Canada differ (King, 2013). In particular, the Indian Act and associated legislation uniquely impact the housing of First Nations Peoples living on-reserve in Canada (Government of Canada, 2020b). The remainder of this section explains what parts of

Swope and Hernandez (2019) conceptual model were relevant for this research based on literature specific to First Nations Peoples living on-reserve in Canada.

3.2.1 Structures

The conceptual model by Swope and Hernandez (2019) depicts upstream, structural determinants. Consideration of structural determinants of health was particularly important for this research. Indigenous Peoples continue to be subject to inequitable political, social, and economic structures within Canadian society, leading to health disparities (Reading, 2018). Many scholars recognize the health of Indigenous Peoples in Canada continues to be shaped by social structures that are downstream effects of settler colonialism and colonization (Christensen, 2016; Kim, 2019; King et al., 2009; Reading, 2018). Within this research I explored overarching structures specific to Indigenous Peoples including colonization, treaties, assimilation, and historical and contemporary policies and practices. Guided by CST and efforts to create social change, I focus more on contemporary federal-level policies and practices throughout the remainder of this thesis.

3.2.2 Mechanisms to Impact Housing

Swope and Hernandez (2019) included three mechanisms connecting structures to housing. An insufficient quantity of houses is a primary mechanism linked to household crowding on-reserve (SSCAP, 2015b). Recent national-level reports surveying housing quality connect significant housing shortages on-reserve across Canada to high levels of household crowding (SSCAP, 2015b). An insufficient quantity of houses is the mechanism I focus on in the following chapters of this thesis.

3.2.3 Housing Aspects

Swope and Hernandez (2019) include four housing aspects that link housing to health. I found housing quality and residential stability to be relevant housing aspects when considered in context of First Nations Peoples' conceptualizations of household crowding on-reserve (Swope & Hernandez, 2019). A deeper discussion of this decision and these housing dimensions follows.

3.2.3.1 Household Crowding & Housing Aspects. Two seminal pieces of literature were primarily relied on to identify relevant housing aspects. McCartney et al. (2021) explored understandings of household crowding on-reserve in Eabametoong First Nation, Treaty 9, Northwestern Ontario, to produce a culturally relevant conceptualization. Although study findings are not directly transferable to other communities, they provided a novel non-Western understanding of household crowding (McCartney et al., 2021). The SSCAP (2015b) completed a comprehensive examination of challenges surrounding housing on-reserve by visiting communities and hearing from First Nations Peoples across the country. Integrating knowledge from McCartney et al. (2021), SSCAP (2015b), and Swope and Hernandez (2019), housing aspects considered relevant for this research were housing quality and residential stability.

3.2.3.1.1 Housing Quality. The SSCAP (2015b) found that household crowding led to a deterioration of the buildings due to the amount of use and moisture build-up. McCartney et al. (2021) found a relationship between the standardization of housing units and household crowding. The standardization of housing units left young adults unable to access housing due to a lack of diversity in the available type of housing (i.e., not appropriate for a single young adult), leading to crowding in the family house (McCartney et al., 2021). Both of these factors relate to the house's physical structure; thus, I saw housing quality as a housing aspect relevant for household crowding on-reserve.

3.2.3.1.2 Residential Stability. McCartney et al. (2021) identified a relationship between mobility, or movement between houses, and household crowding. One source of increased mobility was housing shortages, which led to community members being houseless or provisionally accommodated¹⁰, living between multiple houses, couch-surfing, or living in another temporary situation (McCartney et al., 2021). The SSCAP (2015b) found similar results, directly connecting household crowding to houselessness and describing it as a type of displacement where people move between the houses of family members “until a permanent solution” (p. 18) is found. As such, I saw residential stability as the second housing aspect relevant for household crowding on-reserve.

3.2.4 Mediators/Moderators

Swope and Hernandez (2019) include four mediators or moderators in their model. Swope and Hernandez (2019) model does not include mediators or moderators specific to Indigenous perspectives. Examples of such could be connections to land, language, cultural practices, community, or family (FNHA, 2020b). I used Swope and Hernandez (2019) model within the context of available data in this research to determine mediators. I chose mediators with known clinical significance for health outcomes across cultures: age, sex, and smoking.

3.2.5 Health Outcomes

Swope and Hernandez (2019) provide a list of health outcomes related to housing. There are fundamental differences between Indigenous and non-Indigenous understandings of health and wellbeing (Douglas, 2013). Thus, how health is represented in Swope and Hernandez (2019) model may differ from First Nations’ depictions. Generally, for Indigenous or First Nations

¹⁰ Provisionally accommodated is defined as “those whose accommodation is temporary or lacks security of tenure and finality” (Gaetz et al., 2012, p. 1).

Peoples, authors describe wellbeing as a balance between multiple facets of health (FNHA, 2020b; King et al., 2009). The FNHA (2020b) wellbeing model includes mental, emotional, spiritual, and physical facets. Guided by Swope and Hernandez (2019) model and available data, I evaluated physical and mental facets in this research.

3.3 Applying the Conceptual Model

The conceptual model by Swope and Hernandez (2019) underpinned this research. I evaluated the relationships from structures to health outcomes in the qualitative secondary analysis. In the quantitative secondary analysis, I focused on the relationship between household crowding and health outcomes, with consideration of factors that may mediate this relationship. More specifically, I used household crowding as the independent variable, conceptualized as a downstream impact of housing quality and residential stability. For mediators I included age, sex, and ever having smoked. I included overall physical health, chronic respiratory disease and infectious respiratory disease (physical facets), and overall mental health (mental facets) as the dependent variables. I discuss the relationship I evaluated more in the methods and results chapters.

3.4 Summary

The main points discussed in this chapter follow:

- I used critical social theory as a theoretical framework for this research. Critical social theory encouraged focus on structural forces that create the conditions in which people live and embeds a critical perspective on the relationship between power and knowledge.
- I used Swope and Hernandez (2019) conceptual model of housing and health disparities in this research. The model included a focus on inequitable historical and contemporary structures that shape housing and health outcomes. The model is non-specific to First

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

Nations People living on-reserve, so I explored focused literature to determine relevance of model components for this research. This model and available data determined the relationships I explored.

4. Methods

I completed a concurrent multimethod research study that incorporated two secondary analyses. I conducted the secondary analyses using data collected in two independent research projects: Community Centred Design (CCD) project and the First Nations Lung Health Project (FNLHP). Details of the two parent projects follow. Each project included unique First Nations communities and research team members.

4.1 Community Centred Design Project

Two First Nation communities in Saskatchewan and an interdisciplinary team affiliated with the University of Saskatchewan collaboratively created the CCD project. The CCD project challenged the approach to designing First Nation communities, shifting from financial considerations being the main driver to a more balanced approach. The goal of the CCD project was to support partnering First Nation communities to produce a community housing plans that were driven by the community and incorporated social, environmental, and human health impacts. The CCD project was a cross-sectional multimethod study that included social, health, and engineering sub-teams. The leads of the health sub-team explored how community members described wellbeing related to community design through qualitative semi-structured interviews, where much of the conversations focused on the houses. I was a student researcher on the health sub-team and worked with the project from conception to completion. This project ran from January 2019 to June 2022.

Funding for the CCD project came from Indigenous Services Canada (ISC). I joined the research team when the project received funding. As a brief overview of study processes, the CCD project was a cross-sectional multimethod study that utilized a CBPR approach. Community Researchers (CRs), who were individuals living on the respective reserves, were

employed within each partnering First Nations community and completed all data collection. Data collection methods included individual interviews. Data collection for these methods was complete in December 2021.

4.2 First Nations Lung Health Project

Two different First Nation communities in Saskatchewan and interdisciplinary researchers affiliated with the University of Saskatchewan created the FNLHP (Pahwa et al., 2015). Taking guidance from a national population health framework (Federal Provincial and Territorial Advisory Committee on Population Health, 1994), the FNLHP team aimed to understand how individual and contextual factors influence respiratory health outcomes and develop appropriate community and policy-level interventions with the partnering communities (Pahwa et al., 2015). The FNLHP was a prospective cohort study (Pahwa et al., 2015). Quantitative data was gathered over five years (2012-2017) and included interviewer-administered surveys focusing on household factors and other factors relevant to respiratory health (Pahwa et al., 2015). I joined the FNLHP during data analyses stages and primarily worked with a sub-team focused on housing and health. I was introduced to and welcomed by the team at ongoing meetings as relationships between communities and researchers extended beyond the FNLHP.

Funding for the FNLHP came from the Canadian Institutes of Health Research (CIHR) through a grant titled *Assess, Redress, Re-assess: Addressing Disparities in Respiratory Health among First Nations People (MOP-246983-ABH-CCAA-11829)*. The study team described study processes in detail in previously published work (Pahwa et al., 2015). In short, the FNLHP was a prospective cohort study with an embedded CBPR approach wherein community advisors provided guidance, approval, and oversight at each point of the project (Pahwa et al., 2015). The

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

study team completed cross-sectional data collection in two phases: baseline (2012-2013) and follow-up (2017) (Pahwa et al., 2015). Data collection measures included interviewer-administered surveys focusing on (1) household factors (38 questions) and (2) individual and contextual factors relevant to respiratory health (69 questions) (Pahwa et al., 2015). The study team adapted an American Thoracic Society Questionnaire modified through community input to create the respiratory health survey (Pahwa et al., 2015). Researchers collected participant demographic data at the time of participation (Pahwa et al., 2015). There was an adult and child component to the FNLHP (Karunanayake et al., 2017; Rennie et al., 2020); participants relevant for this thesis included adults (>18 years old) living in households in the two partnering First Nation communities (Pahwa et al., 2015). In total, 759 households (406 baseline, 353 follow-up) and 1704 adults participated in the adult component of the study (874 baseline, 830 follow-up).

Respiratory health data from the child component of the FNLHP has been analyzed and published, with a particular focus on bronchitis (Karunanayake et al., 2017) and asthma (Rennie et al., 2020). In addition, Anwar et al. (2021) published a high-level analysis of the adult and housing data. I specifically focused on the impacts of household crowding on particular health outcomes and used previously unpublished analyses.

4.3 Research Purpose and Aims

The purpose of this research was to examine relationships between federal housing programs, household crowding, and health among First Nations Peoples living on-reserve in Saskatchewan. As such, research aims were to explore how First Nations Peoples describe housing challenges and solutions for household crowding on-reserve, and the relationship between household crowding and health among First Nations Peoples living on-reserve. I met these aims through (1) a secondary analysis of qualitative housing and health data gathered

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

through individual interviews in the CCD project with two partnering First Nation communities in Saskatchewan, and (2) a secondary analysis of quantitative housing and health data gathered through interviewer-administered surveys in the FNLHP with two partnering First Nation communities in Saskatchewan.

4.4 Research Questions

The main research question guiding this study was “What relationships exist between federal housing programs, household crowding, and health among First Nations Peoples living on-reserve in Saskatchewan?” Specific sub-questions follow:

1. How do First Nations Peoples in two communities in Saskatchewan describe challenges and solutions related to household crowding on-reserve?
2. What is the relationship between household crowding and (a) overall physical health, (b) overall mental health, and (c) chronic and infectious respiratory diseases among First Nations Peoples living on-reserve in two communities in Saskatchewan?

4.5 Research Design

This thesis is a concurrent multimethod study with two parts. A multimethod approach is well-suited for studying complex issues, such as the relationship between federal housing programs, household crowding, and health on-reserve; this approach allowed the relationship to be considered from multiple viewpoints, leading to a deeper understanding (Anguera et al., 2018). The CCD and the FNLHP incorporated a community-based participatory research approach, which influenced this thesis.

4.5.1 Community-Based Participatory Research Approach

The names of the First Nations communities that participated in these projects are intentionally omitted, as per community preferences identified through CBPR. A well-referenced definition for CBPR is that by Kellogg Community Health Scholars Program (2001):

“a collaborative process that equitably involves all partners in the research process and recognizes the unique strengths that each brings. CBPR begins with a research topic of importance to the community with the aim of combining knowledge and action for social change to improve community health and eliminate health disparities” (p. 2)

In CBPR, community representatives and researchers are involved as partners in all steps of the research process (Minkler et al., 2012). According to Minkler et al. (2012), key aspects of CBPR are community engagement throughout the research process and using findings to help bring about change. There is no prescriptive set of research methods for CBPR, rather a collection of research principles (Israel et al., 1998; Minkler et al., 2012; Minkler & Wallerstein, 2008).

As I completed two secondary analyses for this thesis, steps of this research that involved community representatives as partners included determining the research questions and knowledge dissemination. The qualitative study idea originated from the partnering communities concerning the connections between community design and health on-reserve. The idea for the quantitative secondary analysis came from the partnering First Nation communities, who previously identified household crowding as a critical factor in the respiratory inequities that community members face (Katapally et al., 2017).

I maintained the CBPR approach in the knowledge translation phase of this thesis. I produced two manuscripts and accompanying posters to share study results with community

members, researchers, and academics. The parent study research teams had received previous guidance from communities to share summary poster pages with the manuscripts, so I followed this process. Manuscripts have undergone community input and approval before being submitted for publication.

4.5.2 Secondary Analysis

I used secondary analysis in this thesis as I analyzed data collected for other primary purposes in the two parent projects. Secondary analysis is a method for re-using existing data to answer additional, distinct research questions and is appropriate for both quantitative and qualitative data (Heaton, 2008; Johnston, 2017; Long-Sutehall et al., 2010). For secondary analyses, it is essential to consider the purpose of the original research and ensure the topics and contexts of the study align (Clarke & Cossette, 2000; Heaton, 2008; Johnston, 2017).

For the qualitative and quantitative secondary analyses in this thesis, I used a specific subset of the data collected in the parent projects, shared with me by the primary researchers with permissions of the communities. Initial intents with the qualitative data were to understand how community members described wellbeing related to community design. The quantitative data centered on understanding living conditions associated with adverse respiratory outcomes (Pahwa et al., 2015). I based the research questions I explored in this thesis on the data collected in the parent projects that was relevant to household crowding. Much of the data I used were previously unpublished, leading to new results.

Secondary analyses are said to be potentially suitable for students undertaking graduate work with more limitations on the length of time for research (Clarke & Cossette, 2000; Heaton, 2008; Johnston, 2017). Additionally, used in appropriate contexts, secondary analyses can produce new results while reducing the burden on study participants (Heaton, 2008). Given the

climate in which I completed this thesis, during the COVID-19 pandemic when public health orders restricted gatherings and travel, I faced limitations in my ability to collect primary data and maintain a CBPR approach. Furthermore, the First Nations communities involved in the parent projects had the added challenge of managing COVID-19 transmission, treatment, and restrictions during this time. Thus, due to alignment in study purposes, my ability to access the data, that most of such data were previously unpublished, and in respect of the challenges with COVID-19, qualitative and quantitative secondary analyses were appropriate methods for this thesis.

4.5.3 Part 1: Qualitative Secondary Analysis

With the first part of this research, I aimed to answer *how do First Nations Peoples describe challenges and solutions related to household crowding on-reserve?* This study was a qualitative secondary analysis of data collected in the CCD project. Additional information about data analysis follows.

4.5.3.1 Individual Interviews. Community Researchers completed individual interviews focusing on housing and health with members of the partnering First Nations communities. Interviews were semi-structured and often completed in participant's houses; the interview guide appears in Appendix A. Sampling was purposive; CRs aimed to include individuals with a range of living conditions and experiences to represent variety within the community best. Participants shared demographic data at the time of participation. The CRs completed thirty-four interviews, with 24 at one community and 10 at another. Number of interviews was determined in partnership by the CRs and the study team. One CR felt that 10 interviews were adequate for representing a breadth of community voices, while the other CR wanted to complete more. All

interviews were audio-recorded and transcribed verbatim. Discussions ranged from eight to 62 minutes in length.

4.5.3.2 Data Analysis & Interpretation. I completed a reflexive thematic analysis (TA) for this study, taking direction from Braun and Clarke (2006, 2019). Reflexive TA is a method for telling a story about the data by generating themes that represent “particular patterns of shared meaning across the dataset” (Braun & Clarke, 2019, p. 8). I chose to use reflexive TA versus another model of TA, as it aligns with the critical social theory underpinnings of this thesis and my constructivist epistemological stance (Braun & Clarke, 2021).

Braun and Clarke (2019) recognize a researcher’s subjectivity as an inherent part of the data analysis process. As a non-Indigenous researcher analyzing data from First Nations Peoples, I grappled with how to do this work in morally appropriate and culturally meaningful ways. I landed on reflexive TA because the subjectivity of data interpretation, which I see as inescapable, is acknowledged in the method. Reflexive TA allowed me to tell a story about the marginalized experiences of First Nations Peoples while recognizing the influence of my perspective as a descendent of settlers who has a Western worldview and has not lived on-reserve (Clarke, 2017).

Braun and Clarke (2006) share six phases for reflexive TA; I describe these phases in the following four subsections: (1) familiarization with the data, (2) codes, (3) themes (generating, revising, defining), and (4) report of the analysis. What I did in each of the six phases follows.

4.5.3.2.1 Phase 1: Familiarization with the Data. I built data familiarity in this study by listening to the interview audio recordings and reading and re-reading the transcripts (Braun & Clarke, 2006). While building my familiarity with the discussions, I kept a log of rough notes that included my early impressions surrounding the specific transcript and the dataset as a whole.

4.5.3.2.2 Phase 2: Codes. Braun and Clarke (2021) describe a code as “an analytic unit or tool, used by researchers to develop (initial) themes” (p. 330). Codes are generally single-faceted, compared to themes which Braun and Clarke (2021) refer to as “multi-faceted crystals” (p. 341). Generating initial codes included going through the transcripts and assigning a name to relevant sections. Thus, this was an inductive analysis, with codes grounded in the data (Braun & Clarke, 2021). I used the research question to guide what observations were relevant.

I used NVivo for all phases with codes and themes (QSR International, 2022). During these phases, I also reflexively questioned and noted any assumptions I was making in interpreting the data (Braun & Clarke, 2019).

4.5.3.2.3 Phase 3, 4, and 5: Themes (*Generating, Revising, Defining*). Braun and Clarke (2019) describe themes as “analytic outputs developed through and from the creative labour of coding” (p. 14). To generate themes, I reviewed the coded parts of the transcripts and looked for broader “patterns of shared meaning underpinned by central organizing concepts” (Braun & Clarke, 2019, p. 2). As I created themes, I organized the relevant data under these themes. Further generation and revision of the themes happened iteratively and reflexively, with a consistent review of the collated data. I reviewed the themes to determine whether they told a convincing story of the data relevant to the research question. In the end, I created final names and definitions for the themes that told each story (Braun & Clarke, 2021).

4.5.3.2.4 Phase 6: *Report of the Analysis*. The report I created of the analysis follows in the next chapter. As shared by Braun and Clarke (2019), my focus was on telling a story of how research participants perceived the challenges and successes related to household crowding on-reserve and how these perceptions may reflect larger systems and inequities. How the results fit within existing literature is also described.

4.5.3.3 Rigor. I attended to rigor and quality in this study. I used a well-explained conceptual framework to develop my research question and provide focus for analyses and discussion (Johnson et al., 2020). As indicated above, I chose to use reflexive TA for data analysis, which was an appropriate research method for the data, my question, and this thesis's theoretical and epistemological underpinnings (Johnson et al., 2020). Reflexivity was embedded in the approach to thematic analysis that I applied (Braun & Clarke, 2019) and included ongoing questioning of my assumptions, note-keeping, and conversations with my supervisor. Finally, I made the research process transparent and included direct quotes in the study write-up in the following chapter (Johnson et al., 2020).

4.5.4 Part 2: *Quantitative Secondary Analysis*

With the second part of this study, I aimed to answer *what is the relationship between household crowding and (a) overall physical health, (b) overall mental health, and (c) chronic and infectious respiratory diseases among First Nations Peoples living on-reserve in Saskatchewan?* This study was a quantitative secondary analysis of data collected in the FNLHP. Additional information about data analysis follows.

4.5.4.1 Secondary Analysis Data & Variables. This secondary analysis included data collected in the follow-up surveys (2017) (N=839). The independent and dependent variables follow: household crowding (independent variable), and overall physical health, overall mental health, chronic respiratory disease, and infectious respiratory disease (dependent variables). The survey questions used to operationalize these variables are included in Appendix B.

I used a persons per bedroom measure to determine household crowding (Statistics Canada, 2021b). More specifically, I divided the number of people per house by the number of bedrooms per house, both of which participants self-reported, and considered a house as crowded

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

if there were more than two people per bedroom. This household crowding measure was informed by the Canadian National Occupancy Standard (NOS), the base requirement of which is no more than two people per bedroom (Statistics Canada, 2021b).

Overall physical and mental health were self-reported on a five-point scale from “poor” to “excellent.” Variables for chronic respiratory diseases included self-report of a diagnosis from a medical professional of (1) asthma, (2) chronic bronchitis, or (3) emphysema. Variables for infectious respiratory diseases included self-report of a diagnosis from a medical professional of (1) pneumonia or (2) tuberculosis during the past 12 months. I included all chronic and infectious respiratory diseases captured in the FNLHP.

4.5.4.2 Statistics. I conducted the statistical analysis using IBM® SPSS® Statistics Version 26 (IBM Corp, 2021). I sought support from the statistician that completed prior analyses for the FNLHP to solidify the statistical approach. I used descriptive statistics to analyze demographic and basic housing information. I used inferential statistics to address the following question: is there a correlation between household crowding (independent variable) and overall physical health, overall mental health, asthma, COPD, chronic bronchitis, emphysema, pneumonia, or tuberculosis (dependent variables)? I report additional details and decisions made during the analysis in the sixth chapter of this thesis (quantitative secondary analysis manuscript).

4.6 Ethical Considerations

The University of Saskatchewan provided Research Ethics Board approval for the use of data collected in the CCD project (Beh Certificate #2009) and FNLHP (Bio Certificate #12-189). I was a listed team member on both studies (Appendix C). All study conduct followed the ethical guidelines outlined by the University of Saskatchewan and the TCPS 2 (Government of Canada,

2018b). I am a non-Indigenous researcher and took multiple steps to create and maintain a respectful relationship with the partnering First Nation communities. First, the First Nations principles of OCAP® guided all data-related activities in this study, meaning the communities remained to have self-determination over how their data was shared and stored (FNIGC, 2020b). I completed the Fundamentals of OCAP® online training course (FNIGC, 2020b). Second, I finished “Building Research Relationships with Indigenous Communities” (Saskatchewan Centre for Patient-Oriented Research, 2020), “NURS 814.3 Aboriginal Health Issues” (University of Saskatchewan, 2021b), “Indigenous Canada” (Coursera Inc, 2021), and “4 Seasons of Reconciliation” (University of Saskatchewan, 2021a) to develop a relevant knowledge base. Third, I followed the *Research involving the Indigenous, Inuit, and Métis peoples of Canada* framework in the TCPS 2 for this research (Government of Canada, 2018b). Finally, this research was done with, by, and for the communities; I continued to seek guidance from the communities as advised by the CCD and FNLHP teams in respect of the CBPR approach.

4.7 Summary

The main points discussed in this chapter follow:

- This thesis was a concurrent multimethod research study with qualitative and quantitative secondary analyses. Two collaborative partnerships between First Nations communities and researchers in Saskatchewan led the parents projects, which both incorporated a community-based research approach.
- The main research question for the multimethod study was “What relationships exist between federal housing programs, household crowding, and health among First Nations Peoples living on-reserve in Saskatchewan?” Specific sub-questions were “How do First Nations Peoples in two communities in Saskatchewan describe challenges and solutions

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

related to household crowding on-reserve?” and “What is the relationship between household crowding and (a) overall physical health, (b) overall mental health, and (c) chronic and infectious respiratory diseases among First Nations Peoples living on-reserve in two communities in Saskatchewan?”

- To answer the first sub-question, I completed a reflective thematic analysis of interview data focussed on housing on-reserve. To answer the second sub-question, I completed a statistical analysis of interviewer-administered survey data focused on housing and health.

5. Qualitative Secondary Analysis

The purpose of this study was to explore how First Nations Peoples describe housing challenges and solutions for household crowding on-reserve. This study is a qualitative secondary analysis of interview data on housing on-reserve. The results of this study are currently being prepared for publication. This chapter is presented in manuscript format including abstract introduction, background, methodology, results, discussion, and conclusion sections. The manuscript is titled “Beyond more houses: Building an understanding of household crowding with two First Nations communities in Saskatchewan.”

5.1 Abstract

Colonial attitudes and approaches have left First Nations with pervasive housing challenges on-reserve in Canada. Housing shortages are one challenge often linked to high rates of household crowding. Household crowding have sustained despite efforts from the Federal Government. This study was a qualitative secondary analysis that included individual, semi-structured interviews with 34 First Nations Peoples from two First Nations Communities in Saskatchewan. Using reflective thematic analysis, the purpose of this study was to tell a story of how First Nations Peoples perceived challenges and solutions related to household crowding on-reserve. How participants’ perceptions may reflect larger systems and inequities was also considered. I identified four themes during analyses: (1) *designing for kinship*, (2) *relieving system pressure*, (3) *planning instead of reacting*, and (4) *renovating alongside building*. Key needs evident across themes included the need for houses designed within community contexts, community control, and additional funding. First Nations’ control of housing systems and sufficient and sustained funding could improve housing conditions on-reserve, supporting wellbeing and meeting rights to self-determination.

5.2 Introduction

First Nations Peoples in Canada continue to experience inequities due to systemic factors despite calls for such to be addressed (AFN, 2022b; Reading, 2018). A prominent inequity, First Nations communities face persistent housing challenges rooted in colonial approaches to housing on-reserve (Olsen, 2016; RCAP, 1996). On-reserve, significant housing shortages are often linked to levels of household crowding (INAC, 2017; SSCAP, 2015b). Household crowding on-reserve negatively impacts various aspects of wellbeing (Hyslop, 2022a; Karunanayake et al., 2018; Larcombe et al., 2011; Moffatt, 2013). However, few solutions for household crowding on-reserve currently exist (McCartney et al., 2021). As the holders of knowledge, culture, and experience, First Nations-led solutions for housing on-reserve are needed to support wellbeing and rights to self-determination (FNHIC-BC, 2021). This study explores how First Nations Peoples view challenges and solutions related to household crowding on-reserve.

5.3 Background

Settlers and descendants have a long history of imposing discriminatory and assimilation-focused policies on First Nations Peoples (RCAP, 1996; TRC, 2015). Such policies, contained within Canada's Indian Act, aimed to strip First Nations of cultural identities through practices such as enforced enfranchisement and attendance at residential schools (RCAP, 1996; TRC, 2015). The lack of First Nations culture represented in the design of housing on-reserve is another result of this system; Western-style housing became increasingly common after the Federal Government took control over all decisions related to housing following the assignment of reserves (McCartney, 2016; Olsen, 2016). The impact of assimilation-focused policies is present and prevalent; First Nations continue to experience inequitable outcomes in many categories of wellbeing due to this systemic discrimination (Kim, 2019; Reading, 2018).

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

For decades, First Nations have lacked opportunities to provide input into federal housing programs (Olsen, 2016). Since enacting the Indian Act (1876), the Government of Canada (2021a) has retained the power to make decisions about reserve land and First Nations Peoples. The federal government controlled all financial and related housing decisions for First Nations communities without input from those affected by such choices for many years (Olsen, 2016). Additionally, when the federal government introduced the first national housing policies (in 1935 and 1938) to make mortgages more accessible and stimulate the job economy off-reserve, no policies were introduced for those on-reserve (Olsen, 2016). This approach left mortgages inaccessible on-reserve and created two entirely different housing systems (Olsen, 2016). First Nations Peoples living on-reserve became increasingly dependent on the federal government for housing, decreasing levels of community control and choice (Olsen, 2016).

Today, most First Nations communities receive some funding for housing through the On-Reserve Housing Policy, initially created in 1996 (Government of Canada, 2018a). Multiple reports have called the funding support provided by the federal government inadequate considering levels of need (INAC, 2017; SSCAP, 2015b). Each First Nation is intended to now have control over housing management on-reserve; however, national-level organizations denote that efforts of the federal government to shift such power have largely fallen short (AFN, 2018). The federal government retains control by subjecting any funding for infrastructure to pre-defined criteria, which include guidelines for planning, design, and identification of “the most cost-effective option” through life cycle analyses (INAC, 2016, p. 2). This approach has resulted in culturally inappropriate housing and a lack of support for First Nations Peoples' rights to self-determination (UNDRIP) (Olsen, 2016; Stout, 2018; UN, 2008). Advocating groups believe First Nations' control of housing is key to achieving this right (FNHIC-BC, 2021).

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

Broadly, housing shortages are a prevalent and pressing issue among First Nations communities in Canada (INAC, 2017; SSCAP, 2015b). In the most recent FNIGC (2015) Regional Health Survey (RHS), 94.1% of First Nations communities had a waiting list for housing. More than a third of these communities had half of their adult population on the waiting list (FNIGC, 2015), demonstrating the significance of such lists. Housing shortages are longstanding; national-level reports recognize federal housing programs as not meeting ongoing needs for housing on-reserve and consistently failing to decrease the housing backlog in such communities (INAC, 2017; SSCAP, 2015b). Indigenous Peoples continue to be the fastest-growing segment of the Canadian population (Statistics Canada, 2017a). The Federal Government's failure to address housing shortages in First Nations communities is a pressing issue.

Recent national evaluations connect housing shortages to levels of household crowding on-reserve (SSCAP, 2015a). Rates of household crowding are regularly highest in the prairie provinces (INAC, 2017). In particular, housing shortages have deepened in Saskatchewan, where the number of new houses each year seems to underwhelm population growth (SSCAP, 2015a). Estimates of the average number of people per house in First Nations communities in Saskatchewan are higher than comparable national rates (Hyslop, 2022a) and are said to reach 8.43 (SSCAP, 2015a). Although preferences for family living arrangements vary between cultures, when household crowding occurs as a result of housing shortages or is combined with poor housing conditions, wellbeing can be negatively impacted (Hyslop, 2022a; Karunanayake et al., 2018; Larcombe et al., 2011; Moffatt, 2013).

As of 2021, an estimated 36,899 new houses are needed to eliminate household crowding on-reserve across the country, costed at nearly ten billion dollars (Institute of Fiscal Studies and

Democracy [IFSD], 2021). Although additional funding is needed, such financing cannot be provided through a federal system that excludes First Nations communities from housing decisions. Given the continued failure of national housing systems to address housing shortages on-reserve (AFN, 2022b), additional efforts are needed to change this system to support First Nations' sovereignty and wellbeing. Such changes could be informed through better understanding the experiences of individuals living on-reserve directly impacted by the housing system and associated housing shortages.

While numeric evaluations provide one view of housing shortages, stories from those who live in and manage housing on-reserve provide more context on the breadth of this challenge. To date, there are few existing qualitative explorations specific to household crowding on-reserve. McCartney et al. (2021) aimed to understand experiences of household crowding on-reserve and demonstrated how national measurement standards were not culturally aligned with a First Nations community in Northern Ontario. Herein, I aim to add greater context to the discussion of household crowding on-reserve, taking a broader view and focusing on First Nations-led solutions. In addition, given that there can be great diversity across First Nations communities (SSCAP, 2015a), there is merit in exploring the concept with different First Nations, particularly in Saskatchewan.

The purpose of this study was to describe how individuals from two First Nations perceived the challenges and solutions related to household crowding on-reserve. The research question guiding this study was “How do First Nations Peoples in two communities in Saskatchewan describe challenges and solutions related to household crowding on-reserve?”

5.4 Methodology

This study was a qualitative secondary analysis of data collected in a cross-sectional

multimethod study utilizing a community-based participatory research approach. This study was conducted in partnership between two First Nations communities in Saskatchewan and a multidisciplinary research team at the University of Saskatchewan. The University of Saskatchewan Behavioural Ethics Review Board provided ethical approval for the study (Beh Certificate #2009).

5.4.1 Methods

Study processes for interviews conducted in the Community Centred Design project are described in previously published work (Hyslop, 2022b). In short, Community Researchers collected cross-sectional data through individual semi-structured interviews. Interview guides included a broad opening prompt inviting the participant to share about the housing in the community; follow-up questions included what the individual liked and disliked, what they would change, and what they felt was important about the housing, as well as how the housing affected wellbeing. There were no direct questions about household crowding. A variety of community members were sought based on age, family size, living location, and housing type. Community members shared demographic data at the time of participation. All interviews were audio-recorded and transcribed verbatim. As per agreements made based on the First Nations Principles of Ownership, Control, Access, and Possession (FNIGC, 2020b), the partnering communities permitted data use in this study.

5.4.2 Data Analysis

I used reflexive thematic analysis (TA), taking direction from Braun and Clarke (2006, 2019). I sought to tell a story about the data by generating themes representing “particular patterns of shared meaning across the dataset” (Braun & Clarke, 2019, p. 8). I chose reflexive TA over another model to align with my constructivist epistemological stance (Braun & Clarke,

2021). As a non-Indigenous researcher analyzing data from First Nations Peoples, acknowledgment of the subjectivity of data interpretation within the method was crucial (Braun & Clarke, 2019). I felt reflexive TA allowed me to tell a story about the marginalized experiences of First Nations Peoples while recognizing the influence of my perspectives as descendent of settlers with a Western worldview that has not lived on-reserve (Clarke, 2017).

I followed the six phases of reflexive TA described by Braun and Clarke (2006). I built data familiarity by listening to the interview audio recordings and reading and re-reading the transcripts (Braun & Clarke, 2006). While building understanding, I kept a log of rough notes that included early impressions surrounding each transcript and the dataset as a whole. I used NVivo for all phases with codes and themes (QSR International, 2022). As a part of the Community Centred Design project, I was one of two reserachers who generated initial codes by going through the transcripts and assigning a name to relevant sections. The process was inductive, with codes grounded in the data (Braun & Clarke, 2021). The research question guided the relevance of observations. To generate themes, I reviewed the coded parts of the transcripts and looked for broader “patterns of shared meaning underpinned by central organizing concepts” (Braun & Clarke, 2019, p. 2). Additional generation and revision of the themes happened iteratively and reflexively, with a consistent review of the collated data. I received feedback on the themes from the researcher involved in initial coding to determine whether they told a convincing story of the data relevant to the research question. Defining themes occurred in the final iteration.

5.4.3 Rigor

I attended to the rigor and quality of this study. As a secondary analysis, such efforts included ensuring the purpose of the original research, topics, and contexts aligned with this

study (Johnson et al., 2020). After investigating the alignment of this work with various types of thematic analysis, I purposefully chose reflexive TA as it was a better fit with the data, question, and my theoretical and epistemological underpinnings. I generated initial codes with the health team lead from the parent project and systematically reviewed transcripts, providing consensus on the interpretation of the data. Finally, reflexivity was embedded in the approach to TA (Braun & Clarke, 2019) and included ongoing questioning of assumptions, note-keeping, and conversations with my supervisor where themes evolved inductively and iteratively.

5.5 Results

Thirty-four community members completed interviews. Interviews stopped when a breadth of voices and a range of living conditions were included that advisors felt represented the community. Demographic information for community members who participated in the study are shown in Table 5.1. Community members identified as four genders; more participants identified as female (58.8%) than any other gender. Over half (53.0%) of the community members were older than 50 years of age. Nearly all (85.3%) of the community members had lived in the community for more than 10 years, and more than half (56%) had three or more people living in their houses. Interview length was 28 minutes on average, with a range of eight to 62 minutes.

Table 5.1

Demographics for Participating Community Members

Variable	Value n (%)
Gender (N=34)	
2SLGBTQ+	1 (2.9)
Non-Binary	1 (2.9)
Female	20 (58.8)
Male	12 (35.3)
Age (N=33) Mean (Range)	50 (18-83)
0-25	2 (5.9)
26-50	14 (41.2)

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

51-75	16 (47.1)
>75	2 (5.9)
Years in Community (N=34) Mean (Range)	33 (4-83)
0-10	5 (14.7)
11-30	14 (41.2)
31-50	9 (26.5)
51-60	4 (11.8)
>60	3 (8.8)
People in House (N=34) Mean (Range)	4 (1-12)
1	5 (14.7)
2	9 (26.5)
3	4 (11.8)
4	4 (11.8)
5	4 (11.8)
6	2 (5.9)
>6	5 (14.7)

Note: Age has one missing value.

Community member descriptions of household crowding were grounded in misalignment between space in the physical structure and the needs of those living in the house. Most common spatial aspects mentioned in relation to household crowding were amount of storage and gathering space and size and number of bedrooms and bathrooms. I generated four themes during analyses that reflected challenges community members shared about household crowding on-reserve and their respective solutions: (1) *designing for kinship*, (2) *relieving system pressure*, (3) *planning instead of reacting*, and (4) *renovating alongside building*.

5.5.1 Designing for Kinship

Many community members discussed housing designs as lacking consideration of community values of kinship. The ability to house others in the community who were in need was important. In multiple instances, community members referenced additional people moving into a house as a reflection of housing shortages and kinship and the family experiencing crowding. As one community member described:

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

I know one thing, they're too small. Really, really, really too small. Because you get people moving here, and they get this house, they've got three little bedrooms in it, living room and a kitchen, which aren't that big. And then you get that family living in there. All of a sudden, other members of that family come moving in and they just all live there. The people that are waiting on a house will move in with their relatives that have a house here and make the house overcrowded [MD4].

This community member portrays the housing design as lacking consideration of overall needs for housing in the community and kinship. When put into context, the houses are designed “too small,” as multiple families are without houses, and providing housing to those in need aligns with community members’ understandings of kinship. Community members collectively share housing out of necessity and to honour kinship values, regardless of whether it leads to crowding, and this is not considered in the design phase.

Community members enacted kinship in two repeated ways: housing additional children and multigenerational living. Multiple community members discussed situations where families took in additional children to ensure they were raised within the community. Community members demonstrated deeply feeling the value of children growing up within the community and respective culture. One community member who housed multiple groups of children articulated the following:

If we didn't take them [the children], they would've ended up in care... And long time ago, before social services and everything, when somebody was not, be it through death, be it through incapable of looking after, in the community, they were always helped. There was no such thing as, okay, let's pawn them off and send them off to somebody

else to look after. It's our responsibility if we want to try to give our kids a good stable, strong foundation to live from [ML7].

This excerpt demonstrates that enacting kinship by helping others within the community when they are in need is an inherent responsibility with a long history. Furthermore, this community member describes how the enactment of kinship in this instance influences the development of a critical foundation needed for wellbeing. In other words, such children learn the cultural value of kinship experientially, which is more important than whether the house is crowded. As this community member continued: “Our house is 900 and I think 35 square feet, is realistically only built for three people, but we make it work. Is it a challenge? You darn right [ML7].” Thus, although the houses are not designed to support kinship, community members demonstrated that families would live in crowded housing if it was a way to share such critical cultural values with coming generations.

Some community members reflected on preferences for multigenerational living. There was an apparent dissonance between housing designs and such ways of living. As one community member said, “I think the houses aren't made to suit families out here, because you have some families that are a couple generations, living in one dwelling and they just don't accommodate everybody that needs to live in that house” [MD6]. This community member perceived that the houses were not designed with thought for who will be living in them. To extend this point, because housing design occurs out of context, families living in alignment with their values and preferences experience household crowding.

Community members demonstrated strong connections to kinship. Housing designs did not support community members to enact kinship, whether through providing housing for those

in need or multiple generations choosing to co-live. Designing for kinship appeared to be a potential way to mediate household crowding on-reserve.

5.5.2 Relieving System Pressure

Community members described how housing shortages led to pressing housing needs in the communities and contributed to household crowding. Many community members referenced housing shortages or the waiting list when discussing the process of getting a house. Community members described the housing waiting lists as impractically long, with people waiting up to 20 years. Processes for getting houses were not entirely transparent to community members; however, there was a common understanding of those in great need receiving housing. As one community member shared:

If we're talking from experience, from what I've seen of other community members and their needs, it's always the ones that are in desperate need of housing. One of the people I know in the community, she said that she was pregnant and sleeping on a couch at her aunt's place. And then two months later she got a house, once it opened up. It wasn't a new house, but it was somebody who was either moved away or it was a vacant house or something. [MD8]

This community member describes an expectant parent who had a deep need for stable housing to support their wellbeing. In response, the community found housing. However, as demonstrated in this example, when housing shortages are so severe that communities are unable to provide housing until members are desperate, families may take the opportunity they have to be housed. Generally, it seemed that the pressure to meet immediate housing needs in the communities – both offering and accepting housing – restricted the ability to consider aspects such as whether a house was an appropriate size beyond the short term.

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

Community members inferred that the pressure in the housing system removed opportunities for family input upstream, even in less dire situations. Generally, community members felt input was lacking, and that some form of consultation with the family moving into the house would allow for better meeting needs. As one community member stated:

I know they're going to get a standard building housing but they should still consult the people with respect to their yard and how many people are going to be living in there. Is it going to be accommodating the whole family or part of the family? [MD19]

This community member shared hope for greater family consultation during the housing allotment process. More specifically, they felt consultation on the number of people to be living in the house could benefit how the housing system functioned. It seemed that in the housing systems' current state, community leaders had so much pressure to provide housing that they may not have had the capacity to consult with the family moving into the house to the extent needed.

It appeared that addressing housing shortages and relieving pressure in the system could be a precursor to communities and members having more choice and control. Having a level of choice or control over housing seemed to positively impact community members' relationships with the house. A few community members had varying levels of choice, one had a privately-owned house, and another was able to wait until a house was available that they wanted. In one community, if a family lived in a house long enough, they could provide the name of a relative to move in once they moved out. Community members who had some level of choice over where they lived demonstrated greater feelings of connection, ownership, and empowerment concerning the house. There was a general belief that having a level of choice could influence how community members cared for the house, demonstrated by a community member who

stated, “I feel like they would take care of their homes more if it was theirs and they had a say on how things were designed [MD8].” This quote demonstrates that having a level of choice could influence how an individual feels about and interacts with the house.

Community members discussed the housing system as being pressured by housing shortages. This pressure restricted the ability of communities to offer, and members to accept, housing that was not crowded. Community members did not feel that they could have upstream input into the house (e.g., size, location, or design) and that some level of control or choice would positively benefit relationships with the house. Relieving system pressure by decreasing housing shortages seemed to be a way to reduce household crowding on-reserve.

5.5.3 Planning Instead of Reacting

Community members felt that housing managers worked within a reactive housing system, preventing planning for growth and leading to household crowding. The reactive housing system influenced housing allotment, which occurred based on a family’s needs at the time houses became available. Multiple community members discussed the challenges of such a reactive housing system and the associated lack of ability to plan. As one community member stated:

I think when they build homes, we don't necessarily always look at 10, 20 years down the line. We look at just getting a home and putting someone in there and we don't consider that everybody gets old or we don't consider that accidents happen and kids grow. And just a different things that you got to look at when you're building a home. We have to try to think of the future not just one or two years down the line... [ML10].

This community member discussed the difficulty of a housing system that does not consider future growth. Although this community member focuses on housing design, the same housing

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

system appeared to impact housing allotment as well. Longstanding housing shortages occurring in both communities appeared to leave few housing options. Communities could not consider “down the line”; instead, it seemed the housing shortages kept the communities in a reactive pattern, providing housing based on spatial needs at the time. Without other options, as families grew, houses became crowded. Types of family growth community members mentioned varied: some referenced the accumulation of items and the need for more storage space over time, while others discussed how families need additional space as more children are born. Future planning for growth in the community appeared restricted by reactive housing systems.

Housing shortages also seemed to limit the community’s ability to plan for accommodating family growth over time. The communities had tried innovative housing designs, including smaller family units and row housing for Elders. However, the communities seemed to have difficulty executing such plans as originally intended. For example, one community member described the intention to use smaller, transitional houses for young adults. But, these houses became crowded when there were no larger units available as the family grew:

When the duplexes were built, they weren't meant to be permanent houses. They were putting young families in there. They were still families that were waiting to have children. They were meant for a young couple that were together, long term. They were planning a family, they were stable and as their family grew, they were meant to transition to a full-size house... these families are getting bigger and bigger and they're not transitioning anybody out to full size family houses... [MD7]

This quote depicts a strategy the community had been unable to fulfill because of housing shortages. Rather than having young couples live in smaller family units and then move into larger housing when they had children, the smaller units had progressively become more

crowded. Such crowding was directly related to the lack of available houses, which left communities unable to plan.

Community members described housing shortages as creating a reactive housing system. Communities thus seemed focused on allotting housing based on family size at the time of initial occupancy rather than considering future growth. When communities implemented plans that considered future growth, housing shortages stopped them from fulfilling such plans. Addressing housing shortages seemed to be a way to support community planning and impact household crowding on-reserve.

5.5.4 Renovating Alongside Building

Community members discussed the need for renovations due to general wear, insufficient builds, and to accommodate more people in the house. Community members repeatedly referenced poor-quality materials or questionable construction in the houses. In crowded houses, community members noted a cyclical relationship between poor initial structure, amount of use and moisture, increased breakdown, and need for renovations. One community member articulated these connections as follows:

...there's multiple people living in there. And they're all cooking, and they're all bathing, and they're all using the washroom. Contributes to a great amount of moisture in the air, especially in the wintertime. And there's no way these houses are pretty well air-tight. They don't have good air circulation. There's moisture that's going to build up and of course mold, so that's what we're trying to get away from. This mold business. [MD2]

As this community member points out, at any time, more people in the house can lead to higher moisture levels. However, impacts of such moisture on the house can increase exponentially when housing quality is below standard, such as lacking a proper ventilation system.

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

Community members also discussed needing renovations to accommodate more people in the house, including increasing the number of bedrooms or bathrooms. When available, community members often used basements this way. As one community member commented, “With the basement, it's really convenient because you can do add-ons as your family grows [MD9]” demonstrating how access to space to support more people in the house was favourable for reducing crowding. However, it appeared the initial housing design did not consider the potential for additional bedrooms in the basement. Community members had to install larger windows in case of a fire before safely using the space for more sleeping areas; thus, initial housing designs jeopardized the wellbeing of those living in the house and creating additional needs for renovations. It seemed important that the houses could be altered to accommodate more people and alleviate crowding but doing so required multiple renovations.

Many community members mentioned long-term waits for renovations as a prominent concern. The communities had restricted resources for renovations, often only able to help those in direst need. As one community member stated, “They've been developing a lot with new housing, but they've been lacking on the renovations of the older houses, and the houses that should be condemned, should be torn down and rebuilt on the same facility, kind of thing. [ML4]” This community member articulated feelings of defeat and disappointment with renovations that were echoed by others. Household crowding created additional needs in a renovation system that seemed already highly restricted.

Community members described relationships between household crowding and renovations due to the amount of use and increasing needs for space. Houses of poorer initial quality or not designed with convertible space that could accommodate more people if needed led to increased demands for renovations. Such effects were compounded when houses were

crowded, and resources for renovations were limited. Renovating alongside building seemed important for mediating household crowding on-reserve.

5.6 Discussion

This study was an exploration of challenges and solutions related to household crowding on-reserve with First Nations community members. The results described the four main themes I identified during analyses of the 34 interviews. Designing for kinship, addressing housing shortages and in turn relieving system pressure and supporting planning, and renovating alongside building appeared to be solutions for reducing household crowding on-reserve. Across themes, there was evidence of three areas of need that could support the communities to pursue solutions shared by participants: the need for houses designed within community contexts, community control, and additional funding. Household crowding is one of many outcomes that occurs from such needs not being met. Meeting such needs is imperative to support First Nations' wellbeing and fulfill the rights of First Nations Peoples to adequate housing and self-determination.

First Nations need houses designed within community contexts. Important contextual aspects identified in this study included housing availability and culture. According to those that participated in the study, the communities experienced extensive housing shortages. Community members discussed links between extended waits for available housing and sharing housing with community members in need. In another study exploring household crowding on-reserve, First Nations Peoples described the provision of such housing as a common occurrence (McCartney et al., 2021). However, as found in a different study, the number, frequency, and duration of additional people in the house will vary by community (Larcombe et al., 2011).

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

Participants in this study connected the sharing of housing to what I identified as kinship. As Stevenson (2021) states, “In Indigenous societies kinship is an active principle of peoplehood, going beyond reproductive and familial connections” (p. 41). Enacting kinship was essential to community members in this study, demonstrated through providing housing to family members in need, raising additional children within a house, and multigenerational living. McCartney et al. (2021) identified a preference for co-living, both as multigenerational and multiple families, within a First Nations community in Northern Ontario. Whether out of necessity, as an enactment of an inherent understanding, or by preference, participants in this study shared housing with more people than the house was designed for. In such cases, I saw community members’ sense of kinship as transcending avoidance of household crowding. This enactment of kinship is a powerful demonstration of the continuation, reclamation, and deepening of Indigenous practices and principles needed to support Indigenous wellbeing (RCAP, 1996). The resulting experiences of household crowding are a housing design issue; in such situations, the housing design does not align with the families living in the houses. Reconsideration of federal restrictions on housing design may be a step in mediating this challenge.

Given the lack of available housing and the cultural importance of sharing living spaces, housing designed within community contexts might include space that can be converted to support more people. Participants in this study valued having this type of space in the house. Indigenous Peoples in another study noted convertible spaces that create additional sleeping areas to support family members and friends as a critical aspect of housing design (Deane & Smoke, 2010). For many community members in this current study, the basement became a space adapted to accommodate more people when needed. However, initial designs did not consider the basements for such use. Rather, the houses required multiple renovations to make

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

basements safe to evacuate and usable for additional people. Considering convertible space and future basement use during housing design stages could decrease future costs and efforts.

Community members displayed ingenuity by creating additional space for community members to be housed when other options did not exist. A general concern with basement usage is that mold is a predominant and widespread challenge in houses on-reserve (SSCAP, 2015b). Basements are common areas for mold as they are at risk for flooding, especially when houses are built in flood-prone areas (Khalafzai et al., 2021). When involved in housing planning on-reserve, community members can identify flood zones to avoid (Davis et al., 2020). A long history of the Federal Government retaining control over decisions for housing on-reserve has constrained communities from voicing such concerns. Exposure to mold in the house can lead to poor health outcomes, particularly for respiratory health (Anwar et al., 2021; Government of Canada, 2016; Karunanayake et al., 2017; Rennie et al., 2020). Community members should not have to compromise health and wellbeing to enact cultural values and provide necessary housing. Including holistic, contextual, community-developed considerations when determining housing design and placement could mitigate household crowding and support wellbeing on-reserve.

Participants in this study shared feelings of disconnect from the houses, noting that the houses did not feel like they were made for them. These findings are echoed in other studies, as houses on-reserve can lack cultural significance for those living in them (MacTavish et al., 2012; McCartney, 2016; Stout, 2018). Authors have called culturally inappropriate housing designs imposed on-reserve a continued physical manifestation of historical assimilation efforts focused on cultural disconnect (McCartney, 2016; McCartney et al., 2021). On the contrary, others have noted the design of housing can play a role in the development of cultural identity by supporting the transfer of traditional knowledge and skills (Deane & Smoke, 2010; Larcombe et al., 2020;

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

Shelby et al., 2012). Connections to culture are significantly and positively associated with a variety of wellbeing outcomes for First Nations Peoples, from mental to physical wellbeing (Bourke et al., 2018). Along with decreasing household crowding, actively designing houses that support significant community cultural values could improve various aspects of wellbeing.

Efforts are emerging to increase Indigenous community involvement in housing designs on- and off-reserve. Studies evaluating such processes have successfully incorporated cultural aspects into the design (Deane & Smoke, 2010; Larcombe et al., 2020; MacTavish et al., 2012; Shelby et al., 2012; Wood & Clevenger, 2012). Examples of Indigenous cultural elements incorporated into housing designs include embedding connections to the land through the use of local building materials, incorporating particular directions, using circular elements, and including spaces for traditional food preparation (Deane & Smoke, 2010; Larcombe et al., 2020; MacTavish et al., 2012; Shelby et al., 2012; Wood & Clevenger, 2012). Additional multidisciplinary efforts are needed to support the uptake of design processes that involve Indigenous voices, including advocacy for policy changes and increased education (Hyslop et al., 2022). Such processes could support the needs identified in this study for houses designed within community contexts and community control, shifting closer to fulfilling Indigenous rights to self-determination.

First Nations need control over the housing system on-reserve. Many community members in this study felt restricted from exerting choice or control over housing, despite desiring such. When participants did have some level of choice or control, they seemed to express more connection, pride, and empowerment in relation to the house. Although the literature is sparse, feelings of control over housing and mental wellbeing indicators such as self-

esteem are linked (Moffatt, 2013; Stout, 2018). More research exploring the wellbeing impacts of having some control over housing may be useful for continuing to advocate for this change.

Community member feelings of lacking choice or control in this study may have been a downstream effect of a housing system that is externally restricted. As a result of historical federal housing programs, many First Nations remain dependent on the Federal Government for funding. Despite “First Nations control” (para. 12) appearing as one of the four principles of the On-Reserve Housing Policy, the Federal Government continues to enforce restrictions on provided funding. Such restrictions include community plans, culturally inappropriate building designs, and cost-effectiveness evaluation using measures that do not consider wellbeing (INAC, 2016). Multiple leading First Nations organizations have called for increased control of housing on-reserve (AFN, 2018; FNHIC-BC, 2021). Such calls need to be actioned for First Nations to gain control over the housing system and for rights to self-determination to be actualized (FNHIC-BC, 2021).

First Nations are leading efforts to transfer overarching control for housing and associated infrastructure on-reserve from the Federal Government. As a novel course, there are many unknowns around the process; however, it must be led by and for First Nations (FNHIC-BC, 2021). The BC First Nations Housing & Infrastructure Council (2021) is beginning to carve a path toward the transfer of authority for housing and infrastructure in British Columbia; the FNHIC-BC has shared comprehensive reports based on large research projects in recent years involving multiple First Nations and other stakeholders. Additional support is needed to make such a transfer a reality. Being called “reconciliation in action” (FNHIC-BC, 2021, p. 5), the transfer of control of infrastructure systems on-reserve is imperative to support First Nations rights and wellbeing.

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

In this study, housing shortages seemed to create a pressured system that did not allow for community input or future planning. As a result, communities were not able to execute plans or consider long-term spatial needs when providing members with housing. These findings provide additional reasons why addressing housing shortages in First Nations communities is pressing (FNIGC, 2015; INAC, 2017; SSCAP, 2015b). Solutions for how such housing shortages are assessed and addressed, as well as other functions of housing systems on-reserve, can not come from external bodies (Olsen, 2016). First Nations have the knowledge, experience, and ingenuity to lead innovations in housing systems (SSCAP, 2015b). The SSCAP (2015a) traveled to various First Nations communities across the country and identified innovations in First Nations-led financing, planning, and capacity development programs for housing management and inspections, among other successes. However, along with addressing housing shortages, such innovations depend on sufficient funding to execute.

First Nations need additional, stable funding for new housing and renovations on-reserve. Funding for building and renovating community housing was noted as insufficient compared to community need in this study. This inadequacy is a reality for many First Nations communities within the current federal housing system (INAC, 2017; SSCAP, 2015b). Insufficient funding led to the communities providing housing or renovations to those in direst circumstances. Such conditions are documented beginning in the 1930s when the Federal Government controlled all financial decisions for First Nations and would only provide welfare assistance to those who were destitute (Olsen, 2016). The Federal Government's economic system for housing has led to First Nations' dependence (Olsen, 2016). Thus, the continued ability to only provide to those in extreme need is a prevailing legacy of colonization and the associated decisions of the Federal Government. Extensive investment is needed to close the gap in current housing shortages and

meet housing needs for the future (IFSD, 2021). Advocacy bodies see such financial investment and First Nations control as linked (AFN, 2022a). Financial investment must be sustained and sufficient for First Nations to exert the control needed to support the necessary housing systems and, in turn, rights to self-determination, and reconciliation (AFN, 2022a).

5.6.1 Limitations

This study was a secondary analysis. Although I did my best to develop a research question that was answerable from the data, I remained unable to influence primary data collection. In addition, as I gained understanding through listening to audio recordings and reading transcripts, I could not consider non-verbal communication during analysis. The results from this study only represent two First Nations communities; as each community is unique, additional consultation with community members is needed to understand the benefits and solutions to household crowding in varying communities. Finally, I am non-Indigenous. Reflexive TA was a purposeful choice, supporting me to tell the story of household crowding while recognizing the influence of their perspectives as descendants of settlers who have not lived on-reserve (Clarke, 2017). Still, the lack of inside knowledge and inability to check participant understanding, being a secondary analysis, remain notable limitations in the data analysis.

5.7 Conclusion

First Nations Peoples from two communities shared multiple challenges and solutions related to household crowding in this study. Three areas of need across all themes that could support the communities to pursue solutions shared by participants were houses designed within community contexts, community control, and additional funding. Meeting these needs requires large shifts at the federal level. Funding for housing on-reserve provided by the Federal

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

Government remains restrictive, not allowing communities to design housing according to local needs and contexts. Actively designing houses that support significant community cultural values could have many positive benefits, including decreasing household crowding and improving various aspects of wellbeing. The restrictions for housing on-reserve that come with federal funding must be altered with First Nations' determining the necessary changes and gaining control of housing. Such a shift will require unlearning for both the Federal Government and First Nations, as the Federal Government has enforced a restrictive colonial housing system on-reserve for decades. Sufficient and sustained funding is needed from the Federal Government for First Nations' communities to design and build an adequate number of culturally aligned houses. Designing houses within community contexts, shifting control, and providing appropriate funding could create housing systems on-reserve that are supportive of community members' rights and wellbeing. Such efforts are needed to progress toward reconciliation and decrease Indigenous Peoples' health inequities.

5.7.1 Acknowledgments

I would like to thank each community member and Elder that shared experiences, knowledge, and time in the original research study. I would also like to thank the Community Researchers that facilitated the individual interviews and the Chiefs and Band Councils for partnering and steering this work.

6. Quantitative Secondary Analysis

The purpose of this study was to explore the relationship between household crowding and health among First Nations Peoples living on-reserve. This study is a quantitative secondary analysis of interview-administered survey data focussed on housing and health. The results of this study are currently being prepared for publication. This chapter is presented in manuscript format including abstract, introduction, background, methodology, results, discussion, and conclusion sections. The manuscript is titled “Exploring relationships between household crowding and health with two First Nations communities in Saskatchewan.”

6.1 Abstract

Lasting results of federal government control of housing on-reserve include challenges with housing quality and quantity. Some First Nations communities face distressing housing shortages and household crowding. This study is a quantitative secondary analysis exploring how household crowding impacts health on-reserve using the Canadian National Occupancy Standard (NOS) to measure crowding. Cross-sectional survey data were collected in a prospective cohort study with an embedded community-based participatory research approach. First Nations Peoples from two communities in Saskatchewan participated, a total of 831 individuals 18 years and older from 379 households. Household crowding and reports of respiratory diseases in the two communities were high. The household crowding measure was significantly associated with chronic bronchitis diagnosis ($p < 0.05$). A culturally appropriate lens and more context are needed to understand household crowding on-reserve.

6.2 Introduction

First Nations Peoples who live on-reserve face long standing housing challenges (INAC, 2017). Such challenges are rooted in a history of colonization and attempted assimilation in

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

Canada (McCartney, 2016; McCartney et al., 2018; Olsen, 2016). Lasting impacts of decades of federally conceived systems for housing on-reserve, which did not consider First Nations' values and voices and were insufficient in funding, are widespread (McCartney et al., 2018; Olsen, 2016). Many First Nations communities face serious and pervasive challenges with housing quality and quantity. Poor housing on-reserve is a lasting result of discriminatory colonial policies and related structures associated with physical and mental health outcomes (Anwar et al., 2021; Greenwood et al., 2018; Kirychuk et al., 2022; Reading, 2018).

6.3 Background

Housing conditions on-reserve across Canada are diverse (SSCAP, 2015a). However, when looking at national-level data, prominent concerns include inadequate housing quality and quantity (INAC, 2017; SSCAP, 2015a). Common indications of housing quality in literature include the need for major repairs and the presence of mold. Recent national-level estimates show up to 44% of First Nations households on-reserve require major repairs (FNIGC, 2015). Approximately half of First Nations adults living on-reserve report mold or mildew in the house (FNIGC, 2015). Persistent housing shortages demonstrate the inadequacy of housing quantity on-reserve. National-level data on housing waiting lists on-reserve show (1) up to 94% of First Nations communities have a list, (2) approximately a third of communities have half of their adult population on the list, and (3) the average waiting time for a house is two years (FNIGC, 2015). Approximately 35,000 additional houses are needed, beyond those already planned, to meet the current housing needs across First Nations communities in Canada (FNIGC, 2020a). The financial investment required to close gaps in existing and new houses on-reserve nationally is estimated at \$60 billion (IFSD, 2021).

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

A prominent consequence of inadequate housing quality and quantity, housing shortages and household crowding are distressing concerns for First Nations Peoples living on-reserve (SSCAP, 2015a). Federal-level housing programs have consistently failed to meet the number of houses needed in such communities; the AFN (2022b) stated that “every attempt has failed to address the shortage of units in our communities” (para. 4). Using the Canadian NOS, latest national-level data show approximately 12.2% of First Nations Peoples on-reserve live in crowded housing (Lgui, 2019). Household crowding rates on-reserve are consistently highest in the prairie provinces (INAC, 2017). In Saskatchewan specifically, the housing shortage on-reserve has grown over time as the number of new houses has not equaled population growth (SSCAP, 2015a). Latest estimates state 22.7% of First Nations houses on-reserve in Saskatchewan are crowded (Lgui, 2019).

Housing is globally recognized as a social determinant of health and is a specific equity concern for Indigenous Peoples in Canada (First Nations, Métis, and Inuit) (NCCAH, 2017b; WHO, 2018). Indigenous communities in Canada experience inequitable wellbeing outcomes because of discriminatory colonial policies and related structures, including those that have shaped the current housing systems on-reserve (Greenwood et al., 2018; Kirychuk et al., 2022; McCartney et al., 2018; Olsen, 2016; Reading, 2018). For First Nations Peoples living on-reserve, wellbeing inequities are typically more pronounced, particularly in the area of housing (NCCAH, 2017b). Rates of tuberculosis (TB) provide an example of these inequities, with estimated incidence rates per 100,000 population in 2016 showing 34.1 cases for First Nations living on-reserve, 14.5 for First Nations living off-reserve, and 4.8 for Canada as a whole (Vachon et al., 2018).

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

In their global-level systematic review, Shannon et al. (2018) found household crowding was associated with increased risks of tuberculosis (TB), pneumonia, asthma, and acute respiratory illnesses such as respiratory infections. The same authors also found associations between household crowding and influenzas, gastroenteritis, and mental health problems such as unhappiness. A comparable comprehensive study specific to those living on-reserve could reveal health inequities related to housing. A few studies have found links between household crowding and specific health outcomes on-reserve in Canada (Karunanayake et al., 2018; Larcombe et al., 2011; Moffatt, 2013). In such studies, authors found links between household crowding on-reserve and increased TB transmission and diagnosis (Larcombe et al., 2011; Moffatt, 2013) and excessive daytime sleepiness (Karunanayake et al., 2018). Timely discussions are also arising in the literature about the connection between household crowding, lack of clean water, and COVID-19 on-reserve (Thompson et al., 2020). Evaluations of additional outcomes could contribute to a more holistic understanding of the relationships between household crowding and health on-reserve.

Measures of household crowding used in the literature vary. At the federal level in Canada, household crowding is measured as persons per room or persons per bedroom (Statistics Canada, 2019b, 2021b). The NOS incorporates the persons per bedroom measure (Statistics Canada, 2021b). The NOS is used to determine housing needs by CMHC (2019), a primary funding and oversight group for housing on-reserve. Such data informs housing programs and policies in Canada (CMHC, 2019). The base requirement in the NOS is a maximum of two persons per bedroom (Statistics Canada, 2021b). According to the NOS, the number of bedrooms needed for a house to be considered suitable, or not crowded, increases based on additional characteristics of household members (e.g., a parent in a one-parent family needs a separate

bedroom) (Statistics Canada, 2021b). The NOS is a federally conceived standard culturally grounded in Western understandings of family and housing space (McCandless, 2020).

The purpose of this study was to explore relationships between a measure of household crowding and ratings of health and respiratory diseases in two First Nations reserve communities in Saskatchewan. This study was a quantitative secondary analysis using survey data gathered in two First Nations communities in Saskatchewan. The research question was *what is the relationship between household crowding and (a) overall physical health, (b) overall mental health, and (c) infectious and chronic respiratory diseases among First Nations Peoples living on-reserve in two communities in Saskatchewan?*

6.4 Methodology

This study presents data from a prospective cohort study with an embedded community-based participatory research approach, conducted in partnership between two First Nations communities in Saskatchewan and a research team affiliated with the University of Saskatchewan (Pahwa et al., 2015). The University of Saskatchewan Biomedical Ethics Review Board provided ethical approval for the study (Bio Certificate #12-189). The First Nations Lung Health Project (FNLHP) team describes processes for the five-year longitudinal study in previously published work (Pahwa et al., 2015). In short, cross-sectional data collection through surveys administered by Community Researchers occurred in two phases: Phase 1 (2012-2013) and Phase 2 (2016) (Karunanayake et al., 2018; Pahwa et al., 2015). Survey development included guidance from existing questionnaires (e.g., American Thoracic Society Questionnaire) with iterative community input; final surveys included questions on the household, individual, and other contextual factors relevant to overall and respiratory health (Pahwa et al., 2015).

6.4.1 Survey Data

This study used Phase 2 data. One member of each participating household completed the household questionnaire (Pahwa et al., 2015). Household factors evaluated in this study were the number of years (“How long have you lived in this house?”), people (“How many people usually live in your house?”), and bedrooms (“How many bedrooms do you have in your house?”). Participants recorded answers to these questions in a blank space. Number of years in the house was categorized into 5-year spans (e.g., 0-5, >5-10, etc.) during analysis. Household crowding was calculated by dividing the number of people in the house by the number of bedrooms in the house and categorized as less than equal to, or more than, two persons per bedroom as per the NOS (Statistics Canada, 2021b).

Each study participant reported individual and contextual factors (Pahwa et al., 2015). Individual factors considered in this study included age, sex, overall physical health, overall mental health, infectious respiratory diseases (pneumonia, tuberculosis), and chronic respiratory diseases (asthma, chronic obstructive pulmonary disease [COPD], chronic bronchitis, and emphysema). This analysis did not include any contextual factors as defined in the original study (e.g., socioeconomic status) (Pahwa et al., 2015). Overall physical and mental health were reported on five-point Likert scales from poor to excellent, based on the question “In general would you say your physical health is:” and “In general would you say your mental health is:”. These data were further grouped into two categories “good, very good, or excellent” and “poor or fair”, as is done in the First Nations Regional Health Survey (FNIGC, 2018b). The infectious and chronic respiratory diseases pneumonia, tuberculosis, chronic bronchitis, and emphysema were captured with the question “Has a doctor ever said you had any of the following chest illnesses:” with responses of yes/no for “Ever in your life”. Asthma and COPD were yes/no

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

answers to “Did a doctor ever tell you that you had asthma?” and “Has a doctor ever said you had COPD (chronic obstructive pulmonary disease)?”. Age was calculated from the date of birth. Sex was captured as male or female. Smoking status was captured as yes/no to ever having smoked at least 20 packs of cigarettes in one’s lifetime (i.e., “Have you ever smoked cigarettes? [If you have smoked less than 20 packs of cigarettes in your lifetime, answer no.]”).

6.4.2 Statistics

IBM® SPSS® Version 28 (IBM Corp, 2021) was used for data analyses. I used descriptive statistics to present the demographic and housing factors and univariate analysis (Chi-squared or Fisher’s exact test) to identify significant associations between household crowding and reports of overall health, infectious respiratory diseases, and chronic respiratory diseases. Variables with $p < 0.20$ in the univariate analysis became candidates for the multivariate models. Generalized estimating equations were used to create multivariate logistic regression models with individuals (first level) clustering within households (second level). The variables retained in the final multivariate model included physical health, pneumonia, and chronic bronchitis. Age, sex, and ever having smoked were also retained in the model as clinically relevant variables for physical and respiratory health outcomes. Odds ratios (ORs) and 95% confidence intervals (CIs) were used to determine the strength of associations with $p < 0.05$ considered significant. In the univariate models, missing values accounted for <10% across all variables and in the multivariate models, missing values accounted for <5%.

6.5 Results

Study participants consisted of 831 individuals 18 years and older from 379 households. Individual factors of study participants are shown in Table 6.1. There was a roughly even split between female (51.7%) and male participants (48.3%). The mean age of participants was 38

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

(SD 14.8) years. Nearly all participants (90.5%) had smoked more than 20 packs of cigarettes in their lifetime.

Table 6.1

Descriptive Analyses of Participant Individual Factors

Variable	Value
Individual Factor	
<i>Demographic</i>	
	Mean ± SD
Age (n=831)	38.1 ± 14.8
	n (%)
Sex (n=831)	
Female	430 (51.7)
Male	401 (48.3)
Ever Smoked (n=830)	
Yes	751 (90.5)
No	79 (9.5)
<i>Overall Health</i>	
Physical Health (n=828)	
Excellent	41 (5)
Very Good	157 (19.0)
Good	374 (45.2)
Fair	218 (26.3)
Poor	38 (4.6)
<i>Physical Health (n=828)</i>	
Yes (good, very good, or excellent)	572 (69.1)
No (poor or fair)	256 (30.9)
Mental Health (n=827)	
Excellent	109 (13.1)
Very Good	201 (24.2)
Good	404 (48.6)
Fair	98 (11.8)
Poor	15 (1.8)
<i>Mental Health (n=827)</i>	
Yes (good, very good, or excellent)	714 (86.3)
No (poor or fair)	113 (13.7)
<i>Infectious Respiratory Disease</i>	
Pneumonia (n=826)	
Yes	225 (27.2)
No	601 (72.8)
Tuberculosis (n=827)	
Yes	72 (8.7)
No	755 (91.3)

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

Chronic Respiratory Disease

Asthma (n=830)

Yes 124 (14.9)

No 706 (85.1)

COPD (n=789)

Yes 10 (1.3)

No 779 (98.7)

Chronic Bronchitis (n=826)

Yes 79 (9.6)

No 747 (90.4)

Emphysema (n=825)

Yes 24 (2.9)

No 801 (97.1)

Note: Some variables have missing values.

For measures of overall health, the majority (69.1%) of participants reported having good, very good, or excellent physical health and even more (86.3%) reported having good, very good, or excellent mental health. The most commonly reported infectious respiratory diseases were pneumonia (27.2%), asthma (14.9%), and chronic bronchitis (9.6%). The least commonly reported respiratory diseases were COPD (1.3%), emphysema (2.9%), and tuberculosis (8.7%).

Table 6.2 presents housing factors. The majority of participants (61.2%) had lived in the same house for at least five years. Nearly three-quarters of the houses (73.7%) had four or more people living in the house. The mean number of bedrooms in the house was three (SD 1.1). For household crowding, a quarter (25.0%) of participants lived in houses considered crowded (more than 2 persons per bedroom) for this study.

Table 6.2

Descriptive Analyses of Housing Factors and Household Crowding

Variable	Value
Housing Factor	
<i>Years in House (N=797) Mean ± SD (range)</i>	11.8 ± 10.8 (0.1-60)
	n (%)
0-5	309 (38.8)
>5-10	161 (20.2)

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

>10-15	76 (9.5)
>15-20	90 (11.3)
>20	161 (20.2)
<i>People in House (N=796) Mean ± SD (range)</i>	5.3 ± 2.5 (1-15)
	n (%)
1	11 (1.4)
2	70 (8.8)
3	123 (16.1)
4	133 (16.7)
5	119 (14.9)
6	133 (16.7)
7	72 (9.0)
8	45 (5.7)
9 or more	85 (10.7)
<i>Bedrooms in House (N=798) Mean ± SD (range)</i>	3.2 ± 1.1 (1-7)
	n (%)
1	39 (4.9)
2	173 (21.7)
3	297 (37.2)
4	195 (24.4)
5 or more	94 (11.8)
<hr/>	
Household Crowding	
<i>2 Persons Per Bedroom (N=795) Mean ± SD</i>	1.8 ± 0.9
	n (%)
Yes (>2)	199 (25.0)
No (≤2)	596 (75.0)

Note: Some variables have missing values.

Table 6.3 shows the associations between household crowding and reports of overall health and infectious and chronic respiratory diseases. Participants reported significantly more diagnoses of chronic bronchitis when they lived in crowded houses ($p = <0.001$). The associations ($p < 0.20$) between household crowding and physical health, pneumonia, and chronic bronchitis in the univariate analysis were selected for multivariate analysis.

Multivariate analyses were completed for physical health, pneumonia, and chronic bronchitis (Table 6.4) after adjusting for age, sex, and ever smoking. There was a significant association between household crowding and chronic bronchitis ($p = <0.001$). For those who lived in a crowded house, the risk of a diagnosis of pneumonia was nearly one and a half times

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

higher, and the risk of a diagnosis of chronic bronchitis was more than three times higher compared to those who lived in an uncrowded house.

Table 6.3

Univariate Analysis with Odds Ratios (OR) and 95% Confidence Intervals (CI) Assessing Associations Between Household Crowding (>2 People Per Bedroom) and Individual Health Factors (Overall Health, Infectious Respiratory Diseases, Chronic Respiratory Diseases)

(a) Overall Health		Physical Health (Good, Very Good, or Excellent)		Mental Health (Good, Very Good, or Excellent)	
		Yes (%)	No (%)	Yes (%)	No (%)
Household crowding	Yes	128 (23.6)	70 (28.1%)	170 (24.9)	28 (25.9)
	No	415 (76.4)	179 (71.9)	513 (75.1)	80 (74.1)
<i>p</i> Value		0.17		0.82	
Unadjusted OR (95% CI)		0.79 (0.55, 1.13)		0.95 (0.59, 1.53)	

(b) Infectious Respiratory Disease		Pneumonia		Tuberculosis	
		Yes (%)	No (%)	Yes (%)	No (%)
Household crowding	Yes	62 (29.0)	137 (23.7)	22 (31.0)	177 (24.5)
	No	152 (71.0)	442 (76.3)	49 (69.0)	545 (75.5)
<i>p</i> Value		0.13		0.23	
Unadjusted OR (95% CI)		1.31 (0.89, 1.91)		1.38 (0.81, 2.35)	

(c) Chronic Respiratory Disease		Asthma		COPD		Chronic Bronchitis		Emphysema	
		Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)
Household crowding	Yes	30 (24.8)	169 (25.1)	3 (33.3)	184 (24.7)	34 (44.7)	165 (23.0)	8 (34.8)	190 (24.7)
	No	91 (75.2)	504 (74.9)	6 (66.7)	560 (74.4)	42 (55.3)	551 (77.0)	15 (65.2)	578 (75.3)
<i>p</i> Value		0.94		0.70*		<0.001		0.27	
Unadjusted OR (95% CI)		0.95 (0.59, 1.53)		1.38 (0.33, 5.73)		2.70 (1.64, 4.42)		1.69 (0.70, 4.09)	

*Fisher's Exact Test *p* value is reported here as the expected frequency is less than 5 in any cell.

Table 6.4

Adjusted Odds Ratio (AdjOR) Estimates With 95% Confidence Intervals (CI) Based on Multivariate Analyses Examining Associations Between Crowding and Physical Health (Model I), Pneumonia (Model II), and Chronic Bronchitis (Model III)

	Model I Physical Health (Good, Very Good, or Excellent)	Model II Pneumonia	Model III Chronic Bronchitis
Variable (Referent)	AdjOR (95% CI)	AdjOR (95% CI)	AdjOR (95% CI)
Age	0.99 (0.98, 1.00)¹	1.02 (1.01, 1.03)²	1.04 (1.03, 1.06)²
Sex (Female)	1.67 (1.22, 2.28)¹	1.17 (0.86, 1.60)	0.61 (0.37, 1.02)
Ever Smoked (No)	0.56 (0.31, 1.02)	0.65 (0.41, 1.03)	1.13 (0.47, 2.71)
Household crowding (No)	0.78 (0.54, 1.12)	1.47 (0.99, 2.17)	3.38 (2.04, 5.59)²

¹ $p < 0.05$; ² $p < 0.001$

6.6 Discussion

The aim of this study was to explore relationships between one measure of household crowding and health outcomes, using data shared by First Nations Peoples from two communities in Saskatchewan. The results showed high rates of respiratory diseases, people per house, and household crowding. Household crowding was significantly associated with chronic bronchitis when accounting for clustering within households and confounding factors.

Reports of respiratory diseases were higher than expected in this study. The most-reported respiratory diseases in this study included pneumonia, asthma, and chronic bronchitis. National-level surveys for First Nations and non-Indigenous populations (e.g., First Nations Regional Health Survey, Canadian Community Health Survey) group respiratory diseases (i.e., COPD, chronic bronchitis, and emphysema) or do not include pneumonia (FNIGC, 2018c; Statistics Canada, 2019a). Therefore, it is challenging to find comparison rates for the respiratory

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

diseases in this study; each respiratory disease was captured separately and adding values together could inflate results. Where comparisons are available, such as for asthma, rates of diagnosis in this study (14.9%) exceed the latest estimates for First Nations adults (9.6%) (FNIGC, 2018b) and the entire adult population (6.8%) in Canada (Statistics Canada, 2021a).

Even for the least-reported respiratory diseases in this study, such as tuberculosis, rates appear higher than those reported nationally for Indigenous Peoples and other adults across Canada (Government of Canada, 2022). It is difficult to find reports that collectively group latent and active TB, such as the data in this study. Larcombe et al. (2011) captured such data in a smaller study with two First Nation communities in Manitoba and found large variation across communities; none of the houses reported latent or active TB in one community while 59% of the houses reported such in the other. Such results provide an important reminder that although comparisons can be valuable, each First Nations community is unique. As a whole, available comparisons of rates of respiratory diseases shared in this study demonstrate health inequities that require continued investment and partnerships with First Nations communities to address.

Reports of overall physical and mental health in this study differ slightly from national-level surveys for First Nations adults. The First Nations Regional Health Survey (RHS) captured general and mental health in similar categories to those used in this study (FNIGC, 2018a). In the RHS 80.6% of adults reported good or greater general health and 77.5% reported the same for mental health (FNIGC, 2018a). Comparatively, ratings in the current study were lower for physical health and higher for mental health. Such differences may relate to variation among communities or differences in characteristics of those who participated in each study.

Community-based participatory research principles, such as those employed in the original study

that led to this current analysis (Pahwa et al., 2015), can provide important guidance around developing research studies that encourage wide community participation.

In this study, there were an average of five people per house. This value compares to national-level estimates of 3.6 per house on-reserve, and 2.5 people per house across Canada (Lgui, 2019). Nearly three-quarters of the houses (73.7%) in this study had four or more people per house, and nearly all (89.8%) of the houses had three or more people per house, greatly exceeding comparable estimates. Some variation in the number of people per house across communities may relate to cultural factors, as family units vary in Indigenous and Western conventions from connective kinship models to nuclear (Talaga, 2019). The higher number of people per house found in this study may also point to the housing needs in the participating communities.

One-quarter (25.0%) of houses met the measure for household crowding in this study, having more than two people per bedroom. This rate is similar to the latest provincial-level estimates based on 2016 census data, which identified 22.7% of First Nations houses on-reserve below the suitability standard, a measure of household crowding also informed by the NOS (Lgui, 2019). Such rates remain high; the number of participants with household crowding in this study is nearly double the comparable national-level average across reserves (12.2%) (Lgui, 2019). Data on the number of people per house and household crowding in this study align with previous research findings stating that household crowding on-reserve is consistently highest in the prairie provinces (INAC, 2017). Given this repeated finding and reports that the number of habitable houses on-reserve in Saskatchewan has historically underwhelmed population growth (SSCAP, 2015a), there are pressing needs to understand and address housing in culturally appropriate ways in such communities.

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

In this study, the risk of a diagnosis of pneumonia was nearly one and a half times higher compared to those who lived in an uncrowded house when accounting for clustering within households and confounding factors of age, sex, and ever having smoked. A systematic review looking at relationships between household crowding and health outcomes found moderate evidence of a relationship between household crowding and risks of pneumonia (Shannon et al., 2018). Two studies included in this review found a significant association between household crowding and pneumonia using a greater than two persons per bedroom measure (da Fonseca Lima et al., 2016; Verani et al., 2016). Shannon et al. (2018) also found moderate evidence of relationships between household crowding and influenzas and other acute respiratory infections that could lead to pneumonia (Centers for Disease Control and Prevention [CDC], 2020). Thus, the increased risk of pneumonia for those living in crowded houses found in this study could relate to increased proximity to others and the resulting transmission of viruses and bacteria. Cases of pneumonia among First Nations living on-reserve are increasingly concerning with the emergence of highly-transmissible viruses, such as COVID-19 (CDC, 2022). Given findings on the relationship between household crowding and pneumonia, addressing housing needs may have an important impact on health.

In this study, participants living in crowded houses had a significantly higher risk of a diagnosis of chronic bronchitis ($p = <0.001$) when accounting for clustering within households and confounding factors of age, sex, and ever having smoked. Pahwa et al. (2017) explored associations between housing factors and chronic bronchitis in an earlier set of data from the same population. The authors found the smell of mold or mildew in the house to be significantly associated with a diagnosis of chronic bronchitis among First Nations adults living on-reserve. Other researchers have also demonstrated these associations with other respiratory symptoms

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

(Anwar et al., 2021). These associations may explain, at least in part, the relationship with chronic bronchitis discovered in this study, particularly as previous research has linked household crowding on-reserve and increased moisture and mold (SSCAP, 2015a; Larcombe et al., 2011). Household factors such as the presence of mold and mildew were outside the focus of this current analysis. Future research should consider mold and mildew as potential contributors.

More broadly, air quality may be a factor in the relationship found between household crowding and chronic bronchitis in this study. Additional evidence connects environmental tobacco smoke and air pollution to chronic bronchitis (Doiron et al., 2021; Pahwa et al., 2017). In this study, almost all participants (90.5%) had smoked more than 20 packs of cigarettes in their lifetime. Indoor smoking and the number of people smoking in the house are important considerations as this relationship is studied more. In addition, the quality and design of the house influence one's ability to bring fresh air inside, and thus moderate the amount of indoor air pollution. Other researchers have found ventilation systems and kitchen and bathroom fans to be absent or non-functioning in most houses in two First Nations communities (Larcombe et al., 2011). As well, damaged doors and windows restricted the ability of those who live in the houses to manually increase airflow (Larcombe et al., 2011). Exploring such factors in future research may yield a better understanding of the relationship between household crowding and respiratory diseases.

Household crowding was only associated with pneumonia and chronic bronchitis. Other health outcomes evaluated included overall ratings of physical and mental health and infectious (TB) and chronic (asthma, COPD, and emphysema) respiratory diseases. Authors have previously found associations between household crowding and specific mental health challenges (e.g., stress, unhappiness, etc.) (Shannon et al., 2018). As stated by Shannon et al.

(2018), and supported by findings in this study, focusing on clearly defined mental health outcomes may help identify associations with household crowding. The same principles may also apply to physical health, given that I found associations between household crowding and specific respiratory diseases but not overall physical health ratings. Connections between household crowding and TB are well-supported in the literature (Shannon et al., 2018), including that specific to First Nations living on-reserve (Government of Canada, 2020e; Larcombe et al., 2011; Moffatt, 2013). As only 22 people with tuberculosis met the measure for household crowding in this study, there may not have been enough power to detect a significant association in this sample.

The NOS informed how household crowding was measured in this study. More specifically, I used the base requirement of the NOS to define household crowding as more than two persons per bedroom. As such, household crowding was based on bedroom density. Demonstrated by the results of this study, and supported by others (WHO, 2018), the density of people in a space, such as a bedroom, is an important consideration for transmission of infectious diseases. However, when the NOS is applied in its entirety, additional bedrooms may be needed to avoid crowding based on characteristics of those living in the house (e.g., age, sex, relationship) (Statistics Canada, 2021b). As such, the NOS is a socially contextualized standard based on Western understandings of family units (i.e., nuclear) and researchers would benefit from critically considering its application. The following paragraphs expand on considerations that may be important when measuring household crowding with Indigenous Peoples.

Based on its social foundation, the NOS is not reflective of the kinship model of family household units common in First Nations communities (Lauster & Tester, 2010; McCandless, 2020; McCartney et al., 2021; McKay, 2021). Consequently, researchers have questioned use of

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

the NOS as a measure of household crowding in such communities (Lauster & Tester, 2010; McCartney et al., 2021). McCartney et al. (2021) found differences between household crowding using the NOS measure and self-reported crowding in a First Nations community in Ontario. For example, participants perceived houses as crowded when adult children were still in the house due to the lack of available housing in the community, despite having fewer than two persons per bedroom. Lauster and Tester (2010) discovered a similar finding with Inuit households in the Eastern Arctic. Comparatively, McCartney et al. (2021) noted there may be instances where a family's wellbeing is positively impacted by having more than two people in a bedroom, as perspectives on household density and crowding can vary by culture. Such findings suggest that the social assumptions embedded in the NOS may not transfer to Indigenous communities or capture Indigenous understandings of household crowding.

Other studies have demonstrated that ratings of household crowding in First Nations communities vary depending on the measure used (Boutilier, 2013; Larcombe et al., 2011). Authors have noted differences in objective and subjective measures (Boutilier, 2013; Larcombe et al., 2011; McCartney et al., 2021). Objective household crowding measures often imply stability in those who live in the houses, particularly if the measure is only used at one point in time, whereas the number of people in the house in First Nations communities may fluctuate (Larcombe et al., 2011; McCartney et al., 2021; Moffatt, 2013). Reasons for such fluctuations can include mobility related to housing shortages or community gatherings and cultural norms of communality (Larcombe et al., 2011; McCartney et al., 2021; Moffatt, 2013). Thus, different measures of household crowding can offer varying interpretations. Intentionally choosing a measure, recognizing its limitations, and viewing results within the context of the measure used are important for understanding results and implications.

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

Although the NOS can be informative, it is not appropriate to apply across cultures to inform housing needs and related policies (CMHC, 2019; McCandless, 2020). Community-based metrics that embed community values and goals will better reflect housing status and needs (McCartney & McKay, 2019). Efforts to create such metrics are emerging (McCartney & McKay, 2019); continued research and advocacy are needed to develop community-identified housing metrics with different communities. One must view the results of this study in light of the household crowding measure used and recognize that measures beyond bedroom density are needed to gain a holistic understanding of the housing needs in First Nations communities (McCartney et al., 2021). Identifying a preferred measure for household crowding with partnering communities in future research may increase relevance of results.

A final and important point, the NOS focuses on the number of people per bedroom irrespective of factors related to housing design (e.g., bedroom size) and conditions. The Federal Government bears the weight of responsibility for housing designs and conditions on-reserve, which have resulted from years of insufficient funding, low-quality building materials, and lack of First Nations' control (Olsen, 2016). Considerations of housing design and conditions are important when discussing household crowding on-reserve as culturally inappropriate and poor-quality houses are common downstream impacts of the Federal Government's approach (McCartney et al., 2021; Olsen, 2016). National-level reports also relate household crowding to housing shortages on-reserve (SSCAP, 2015a). All three of these housing factors – design, quality, and number of houses – could be improved through additional and sustained federal funding and First Nations' control. The Government of Canada (2019) recognizes access to adequate housing as a fundamental human right. Furthermore, First Nations Peoples have a right to self-determination affirmed in international law (United Nations, 2008). Sufficient funding

and First Nations' control are needed to actualize these rights, move toward reconciliation, and begin to mitigate health impacts of housing, such as those demonstrated in this study.

6.6.1 Limitations

This study used one measure of household crowding, which only speaks to the dimension of household crowding based on bedroom density. Second, and relatedly, as this study was a secondary analysis, the choice of measure for household crowding was limited. In future studies, other measures of household crowding may be more appropriate for research with First Nations living on-reserve. For example, working with the AFN, the Institute of Fiscal Studies and Democracy (2021) used the “number of housing units meant for one family but used by multi-generational families” (p. 49) as their measure of household crowding. Additionally, as the survey solely relied on self-reported data, it is not clear what participants considered to be bedrooms. Of primary concern, participants may have included spaces not purposefully built to be bedrooms (e.g., an unfinished basement used for sleeping) as the question did not specify such. In these cases, this study would underestimate household crowding. Finally, the data were cross-sectional, allowing identification of associations at one point in time, not causal relationships.

6.7 Conclusion

Using a measure of household crowding informed by the NOS, this study demonstrated a statistically significant positive association and increased risks between having more than two people per bedroom and respiratory disease among First Nation respondents living on-reserve. Additional research could help identify factors that mitigate this relationship (e.g., indoor smoking, ventilation, mold, bedroom size, etc.). Relationships between housing and health outcomes require efforts on multiple levels to address, predominantly federally where aspects

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

such as funding and housing design are restricted. The NOS is informed by Western understandings of family units and is not directly applicable in Indigenous communities; critically considering the appropriateness of this measure before using it is advised. Measures for household crowding must be culturally reflective and evaluate multiple facets, beyond bedroom density, to provide a holistic and contextualized understanding of housing needs. Housing metrics used to evaluate housing needs at federal levels and in future research should be determined by First Nations communities. The Federal Government has retained control over First Nations Peoples housing since the assignment of reserves, which has led to housing shortages and culturally inappropriate housing designs. Increased funding and First Nations control are needed to improve housing conditions on-reserve and mitigate health impacts.

6.7.1 Acknowledgments

I am grateful for every community member that contributed time, knowledge, and energy to the original research study. I am deeply thankful for the study participants, Elders, and community members that partnered in and facilitated the study. I would also like to acknowledge the FNLHP team who gave me a warm welcome and made me feel very supported in this work.

7. Bringing it Together: Discussion & Conclusion

The overarching question I sought to answer with this research was “What relationships exist between federal housing programs, household crowding, and health among First Nations Peoples living on-reserve in Saskatchewan?” Study aims included understanding how First Nations Peoples from two communities described housing challenges and solutions for crowding on-reserve, and the relationships between household crowding and health among First Nations Peoples living on-reserve in two other communities. In this chapter, I revisit the theoretical and conceptual frameworks that underpinned this multimethod research study and the qualitative and quantitative secondary analyses before moving to the overarching research question. In answering the overarching research question, I present a conceptual model informed by each of the aforementioned components. In this chapter, I also consider the implications of this work for nursing practice, research, education and strengths and limitations, before providing a conclusion.

7.1 The Foundation

This thesis was underpinned by the theoretical framework of critical social theory (CST) and a conceptual model on housing and health equity by Swope and Hernandez (2019). As a multimethod research study, this thesis included qualitative and quantitative secondary analyses. In this section I revisit each of these components, returning to the foundation before answering the overarching research question.

7.1.1 Revisiting Critical Social Theory

With CST as the theoretical framework for this research, I focused on structural forces that led to household crowding in the participating communities. Mainly, I focused on how the Federal Government shaped housing on-reserve, examining the evolution of past and current

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

federal housing programs, and making connections to housing status. Using CST as a framework also brought considerations of power to the forefront (Engebretson, 2019). First Nations experienced large shifts in power with the introduction of the Indian Act and displacement to reserves (RCAP, 1996). With the power to make decisions over reserve land and the people on it, the Federal Government determined associated housing systems (Olsen, 2016). Despite “First Nations control” (para. 12) appearing as one of the four principles of the current On-Reserve Housing Policy, federal attempts lack success at such an achievement (AFN, 2018; Government of Canada, 2018a). Critiquing the Federal Government’s retention of power over housing on-reserve through the enforcement of prescriptive guidelines for spending federal funding (INAC, 2016), recognizing associated outcomes (e.g., housing reflecting Western values), and continuing to advocate for First Nations’ control were key components of this thesis.

Finally, CST embeds links between power and knowledge (Engebretson, 2019). Olsen (2016) provided an anecdote demonstrating a relationship between power and knowledge within the context of housing on-reserve. She shares a story that reflects on how before understanding the federal housing system has failed First Nations reserve communities for generations, one may think housing status solely reflected the efforts of housing managers, First Nations’ leadership, or those living in the houses (Olsen, 2016). This anecdote provides an example of why knowledge of the operations and impacts of greater housing systems is important; such an understanding makes it clear who is responsible for much of the status of housing on-reserve and where accountability and a release of power is needed – at federal levels. With this thesis, I have focused on extending knowledge around federal-level structures and systems and their influence on housing status and wellbeing on-reserve. I have also identified specific areas where change is needed at federal levels (e.g., restrictive federal guidelines associated with funding, funding

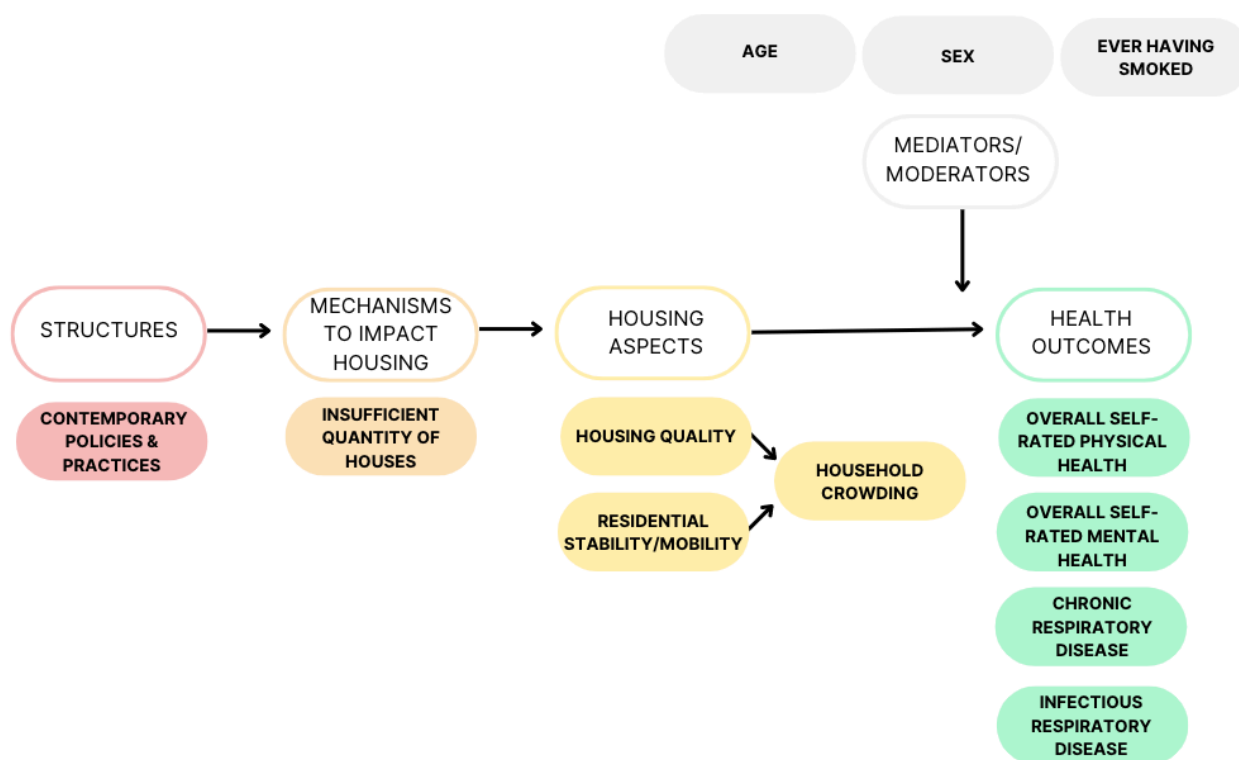
amounts, and stability of funding). Such knowledge can be used to advocate for system-level change by researchers, academics, governing bodies, First Nations communities, and beyond.

7.1.2 Revisiting the Conceptual Model

I used the conceptual model by Swope and Hernandez (2019) in this research. Aligned with CST, Swope and Hernandez (2019) depicted a conceptual model of housing and health disparities focusing on influences of historical and contemporary inequities. The model provided a way to view housing and health outcomes alongside inequitable structures and the mechanisms through which they impact housing. The model informed my background understanding of the relationships between structures, household crowding, and health. I specifically reflected on the model while writing the discussion for the qualitative secondary analysis and used the model to determine what variables to include in the quantitative secondary analysis. In the third chapter of this thesis, I recognized limitations of the model as it was not specific to First Nations Peoples living on-reserve who have unique structural determinants, housing, cultures, and understandings of wellbeing (FNHA, 2020b; King et al., 2009; McCartney et al., 2021). In addition, the model did not explicitly discuss household crowding; I used other research with First Nations Peoples living on-reserve to identify where this concept may fit (McCartney et al., 2021; SSCAP, 2015b). Figure 7.1 provides a visual of the resultant relationships I initially considered in analyses. I share this model here as I return to it when I seek to answer the overarching research question.

Figure 7.1

Initial Conceptualization of Relationships



Note: This figure is informed by the conceptual model by Swope and Hernandez (2019).

7.1.3 Qualitative Secondary Analysis

The qualitative secondary analysis in this thesis included data from interviews that focused on housing with community members from two First Nations. The research question for this part of the study was “How do First Nations Peoples in two communities in Saskatchewan describe challenges and solutions related to household crowding on-reserve?” During analyses, household crowding was recognized as misalignment between space in the physical structure and the needs of those living in it; spatial aspects mentioned in association with household crowding included the amount of storage or gathering space and the size and number of bedrooms and bathrooms. Four themes were generated through analyses, named in reflection of solutions to

challenges linked to household crowding within the current housing system; brief descriptions of the themes follow.

Community members discussed housing designs as lacking consideration of community values of kinship, as such, *designing for kinship* was a proposed solution. Community members described housing shortages as leading to pressing housing needs and *relieving system pressure* by addressing household shortages was a related solution. Community members spoke of housing managers working within a reactive housing system that prevented planning for growth, *planning instead of reacting* was a solution in this context, with addressing housing shortages as a necessary precursor. And finally, community members brought up renovation needs, making *renovating alongside building* a potential solution. Community members discussed impacts of household crowding at individual, family, and community levels. Three areas of need stood out across all themes, which could support communities to pursue shared solutions: the need for houses designed within community contexts, community control, and additional funding.

7.1.4 Quantitative Secondary Analysis

The quantitative secondary analysis in this thesis included data from interviewer-administered surveys focussed on housing and health outcomes (overall physical and mental health and chronic and infectious respiratory diseases). The research question for this part of the study was “What is the relationship between household crowding and (a) overall physical health, (b) overall mental health, and (c) chronic and infectious respiratory diseases among First Nations Peoples living on-reserve in two communities in Saskatchewan?” Main findings included high reports of respiratory diseases, number of people per house, and household crowding, as well as statistically significant relationships between household crowding and chronic bronchitis. The relationship between household crowding and pneumonia may reflect bedroom density, as

proximity to others impacts infectious disease transmission. Additional research could help with understanding the relationship between household crowding and chronic bronchitis; factors to consider in future analyses include mold and air quality (e.g., ventilation and airflow).

Household crowding was measured as more than two people per bedroom in this study, reflecting the base requirement of the Canadian NOS, which the CMHC (2019) (a main provider of funding and oversight of housing on-reserve) uses to determine housing needs. Considering housing as crowded when there are more than two people per bedroom is based on Western conceptions of families and housing space (McCandless, 2020). While I saw the measure as an appropriate evaluation of bedroom density, it is not necessarily reflective of First Nations' understandings of household crowding. The development of community-identified housing metrics could more accurately reflect housing status and needs in First Nations communities while embedding goals and values (McCartney & McKay, 2019).

7.2 Overarching Research Question

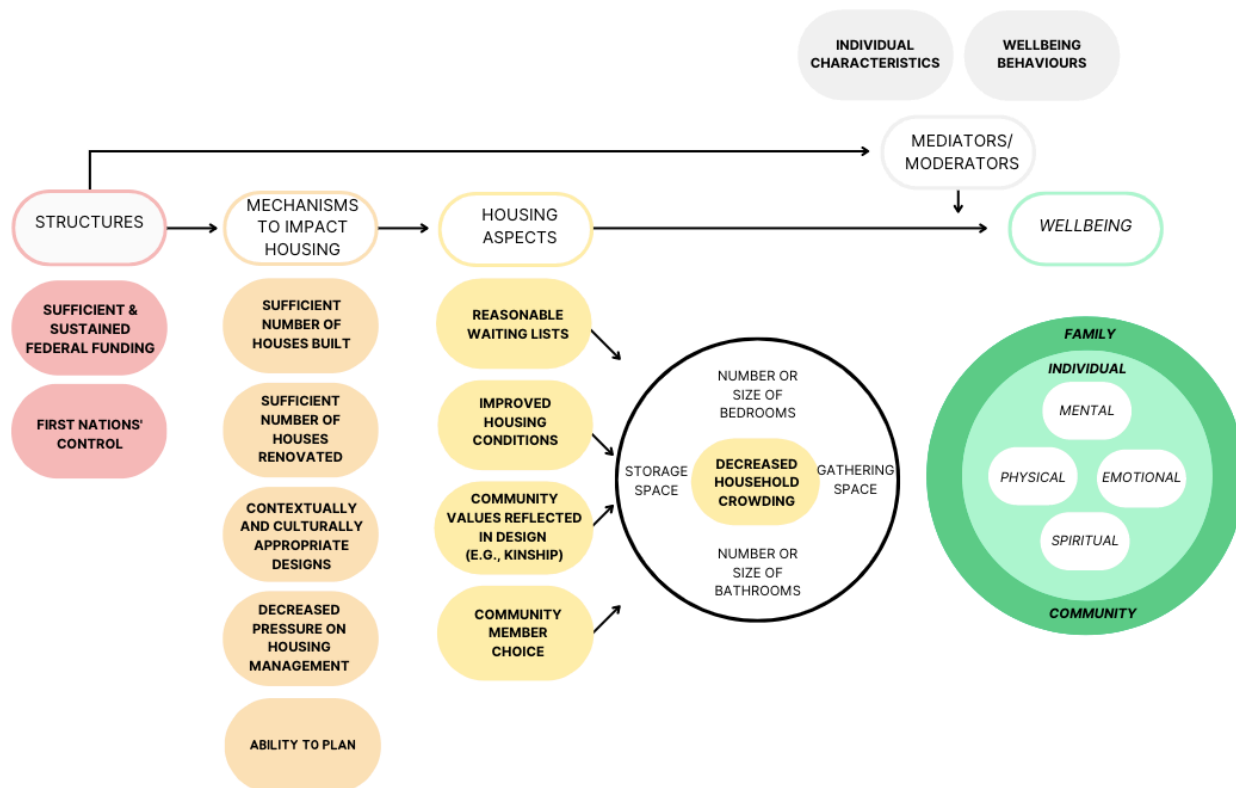
In this section, I provide an answer for the overarching research question and present a conceptual model, primarily informed by the qualitative and quantitative analyses. Figure 7.2 shows the conceptual model: a strengths-based depiction of the relationships between federal housing programs, household crowding, and health among First Nations Peoples living on-reserve in Saskatchewan. Reflecting discussions of community-identified metrics, my interpretations from discussions with community members in the qualitative analysis inform representations of household crowding and health (wellbeing). As the parent study did not directly focus on defining household crowding or wellbeing, this is a preliminary interpretation, supported by literature discussing First Nations' conceptions of wellbeing (FNHA, 2020b). A key point is that

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

metrics will differ when they are grounded in community member knowledge, beliefs, and values. I elaborate on this conceptual model below.

Figure 7.2

Federal Housing Programs, Household Crowding, and Health On-Reserve: A Strengths-Based Conceptual Model of the Relationships



Note: This figure builds off the conceptual model by Swope and Hernandez (2019).

The conceptual model provides a contextually based depiction of the relationships between federal housing programs, household crowding, and health among First Nations Peoples living on-reserve. In this research, the Federal Government's primary involvement in housing was through the provision of funding and restrictions associated with such funding. Potential mechanisms through which housing was impacted included the number of houses built and renovated, contextual and cultural appropriateness of designs, pressure on housing management,

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

and ability to plan. Related housing aspects included waiting lists, housing conditions, whether community values were reflected in design (e.g., kinship), and community member choice.

Household crowding, as alignment between the space of the physical structure and the needs of those living in it influenced by multiple aspects of the house, was a downstream outcome of such factors. Finally, with consideration of external mediators and moderators, the conceptual model ends at wellbeing, represented as a balance of multiple facets (physical, mental, emotional, spiritual) at various levels (individual, family, community) (FNHA, 2020b). Wellbeing components are italicized in this model as defining wellbeing was not a focus of this work. This model provides a starting point for future research aiming to explore household crowding on-reserve and related solutions.

Importantly, the conceptual model is grounded in a strengths-based approach and depicts structural changes needed from the Federal Government to improve relationships between federal housing programs, household crowding, and health on-reserve. Such changes include the provision of sufficient and sustained funding and true First Nations' control. Identifying changes that could have meaningful impacts on housing systems and outcomes on-reserve provides targets for advocacy and future research. The implications of the findings of this thesis are discussed further in the following section.

7.3 Significance to Nursing Practice, Research, & Education

The implications for nursing practice, research, and education are at the forefront of this work. In each area, I focus on individual actions; collective efforts could bolster the impact of such actions. Nurses have a responsibility to promote health equity by acting on social determinants of health, such as housing (CNA, 2017; Community Health Nurses of Canada, 2019). Examples of ways nurses can fulfill such duties follow.

7.3.1 Nursing Practice

In practice, nurses can take action to improve housing for First Nations living on-reserve by educating themselves; developing cultural competency, humility, and safety; and advocating for policy-level changes (Canadian Nurses Association, 2017; Lubik & Kosatsky, 2019). Understanding the history of housing disparities for First Nations on-reserve is a crucial first step (RCAP, 1996; Olsen, 2016). Knowledge of inequitable historical and contemporary structures, such as settler colonialism and how it continues to inform policies and practices, lays a foundation for advocating for change (Reading, 2018). Specifically for housing on-reserve, understanding that federal housing systems have failed First Nations communities for generations makes it clear that efforts are needed at federal levels to change housing status and related wellbeing outcomes. Resources from First Nations' authors must be sought to learn the inequity of historical and contemporary housing systems.

Developing cultural competency, humility, and safety are other implications for nursing practice from this thesis (Curtis et al., 2019; FNHA, 2020a). Differences in values, beliefs, and ways of knowing between Indigenous and Western cultures were pertinent to discussions about housing design and measuring household crowding in this thesis. At large, these discussions centered on how Western beliefs can underly how concepts are approached and that the application of such beliefs across cultures is inappropriate. Nurses need to engage in critical self-reflection to examine their own biases, assumptions, and prejudices, as well as those around them (Curtis et al., 2019). Western biases may be included in intake forms, pamphlets, or other educational materials. For conversations about social determinants of health such as housing to be relevant and meaningful for First Nations Peoples, on top of understanding the history, nurses need to be culturally informed. One way a nurse's practice might be informed by appropriate

cultural understandings and skills, in light of the results of this thesis, could be asking about preferred and current living arrangements before providing education. For example, if the nurse was caring for a child with pneumonia, they could ask about whether others sleep in the same bedroom, and if so, provide relevant information about decreasing infectious respiratory disease transmission (e.g., depending on the context this may be proper handwashing, distancing within the bedroom, wearing a mask, etc.).

Finally, nurses can advocate for structural changes needed to improve housing on-reserve. The dominant structural determinant in this thesis was the federal approach to housing on-reserve. Nurses can specifically advocate for sustained and sufficient federal funding for housing on-reserve and policy changes that support First Nations' control. An example of a relevant policy change would be altering the guidelines that restrict how funding for housing and other infrastructure on-reserve are used (INAC, 2016). Importantly, any changes and the process for shifting control of housing on-reserve must be First Nations-led (FNHIC-BC, 2021). Nurses can also follow the BC First Nations Housing & Infrastructure Council (2021) and other leading groups (AFN, 2022b) to identify and act on additional areas for advocacy.

7.3.3 Nursing Research

Three specific recommendations for nursing research from this work are to engage in community-based participatory research, critically reflect on measurement tools, and undertake policy and housing research. The principles of CBPR can be powerful for fostering collaborative research relationships with Indigenous communities (Tobias et al., 2013). In CBPR there is recognition of centering a research topic of importance to the community, collaboration and equitable participation, and combining knowledge and action to enact change and improve community wellbeing (Kellogg Community Health Scholars Program, 2001). The two parent

studies that provided data for this thesis applied CBPR and I followed processes that aligned with these principles as well. I see CBPR as critical for reconciliation efforts. Throughout this thesis, I advocated for First Nations' control and community-led metrics, both of which are supported through CBPR. Nurses need to continue to use the principles of CBPR when engaging in research with Indigenous Peoples.

How concepts are measured has large implications for associated research. An additional implication for future nursing research from this work is to critically evaluate what culture/s and perspective/s are represented in measurement tools and metrics. Furthermore, consider whether such are aligned with or valuable for the communities with which one is working. In the quantitative secondary analysis, I discussed limits of applications of the NOS with Indigenous communities, given that the measure relies on Western values of housing space and family relationships. When working with communities or other partners, measurement tools and metrics that reflect community values and goals may produce more relevant and accurate results.

A final implication of this work is for nurses to engage in policy and housing research. There are multiple calls for nurses to take a larger part in policy research, commenting on the untapped potential for nurses to inform such change (Anders, 2021; Turdale & Kunaviktikul, 2019). Nurses could influence social determinants of health, such as housing, by engaging in policy work including advocating for and informing policy changes. For similar reasons, nurses are also needed in housing research, particularly with Indigenous Peoples who experience inequitable housing and related health outcomes. Multiple directions for future housing research are included in discussion sections of the qualitative and quantitative analyses.

7.3.2 Nursing Education

The implications of this work for nursing education overlap with those for practice and research, given that schooling precedes both. Critical thinking is an essential skill in nursing fostered through education (Papathanasiou et al., 2014). Specific topics that nursing students could be encouraged to critically consider include the social determinants of health and structural inequities shaping them. Additionally, nursing students could be encouraged to think critically about culture and the dominance of Western views in nursing education, research, and practice. Critical thinking is a necessary precursor to being able to engage in the implications of this work already cited including cultural safety and the choice of appropriate research measurement tools and metrics.

Nurses must also be taught the truth about the history of Indigenous Peoples in Canada and related ongoing discrimination and health inequities (TRC, 2015). Social and structural determinants of health and different conceptualizations of health (e.g., Indigenous conceptions of wellbeing) need to be taught for a more holistic understanding. Finally, nurses would benefit from discussions surrounding policies throughout their education, where they can also begin to develop skills for advocacy and informing policy changes (Turdale & Kunaviktikul, 2019).

7.4 Strengths & Limitations

A notable strength of this thesis is that it was a multimethod research study, enriched by including both qualitative and quantitative analyses. Using a multimethod approach allowed me to consider the relationship between federal housing programs, household crowding, and health on-reserve from multiple viewpoints, leading to a deeper discussion (Anguera et al., 2018). Qualitative research also provides a greater opportunity to incorporate decolonized actions because it shares a broader context based on lived experiences (Thambinathan & Kinsella, 2021).

For example, qualitative research can center other ways of knowing outside of Western scientific (Thambinathan & Kinsella, 2021).

Limitations of this thesis included that this study was comprised of two secondary analyses, so I was unable to influence data collection. Additionally, this meant I largely depended on the relationships the leads of the parent studies had with the communities because of time and capacity restraints of a Master's level thesis and partnering community members. These outcomes were influenced by the COVID-19 pandemic, which restricted my ability to collect data in-person and took a great amount of energy for the communities to manage. Another limitation of this work is my position as someone who is non-Indigenous and cultured in a Western worldview. Furthermore, this research was largely shaped by the conceptual model by Swope and Hernandez (2019) which was grounded in a similar worldview. To lessen these limitations, I relied on Indigenous authors, leadership, resources, and conceptualizations for much of this thesis. Finally, this work was completed with four different First Nations communities (two in each analysis); with cross-sectional data, results only captured a snapshot in time. I hope that this work contributes to ongoing and growing conversations about the truth of housing on-reserve and the needs for change and additional financial support at the federal level. This study may provide a foundation for future research centered on housing with First Nations Peoples living on-reserve, but results cannot be generalized.

7.5 Conclusion

With this thesis, I sought to identify what relationships exist between federal housing programs, household crowding, and health on-reserve. I used critical social theory, a conceptual model by Swope and Hernandez (2019), and qualitative and quantitative secondary analyses to answer the overarching research question of this multimethod study. I identified sufficient and

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

sustained funding and First Nations' control as needed structural changes to support housing and related health outcomes on-reserve. The nursing profession has a pertinent role in the intersectoral action needed to combat the housing and health inequities First Nations experience on-reserve. Nurses can engage in awareness, advocacy, research, critical thinking, and education to continue to do their part in mediating such health inequities.

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FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

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Appendix A

Original Interview Guide

1. Tell me about housing in your community (past, or current where, how many, who lives there, how were they decided on).
2. What do you like or dislike about the housing (placement, density, design, shape, houses, and roads)?
3. What would you change about the current houses or future ones?
 - a. Why would you change them?
 - b. What do you think the changes would do to support people living there, in surrounding areas, and within all members of the Nation?
4. What is important to your community about how housing is designed and built? (Probes: number of houses, design, size, health concerns, roads, flood control, placement on the reserve, landscaping, surrounding areas, density...)?
5. How do you feel the housing affects your wellbeing?
6. Tell me what it is important about your house that makes you feel good?
7. What works really well for you right now with how your house and community is set up?
8. Is there anything you would like to change about the way your house is set up?
 - a. Can you describe what you would change first?
9. If you had unlimited money and time, how would your home and community look?
10. Are there any more concerns or things that you would like to share about housing design?

Appendix B

Selected Survey Questions with Coding

Demographic Information

B-2 Date of Birth: ____ / ____ / ____ (dd/mm/yy)

B-3 Sex: Male (1), Female (0)

Housing Information

A-1 How long have you lived in this house? ____ year(s) ____ month(s)

Household Crowding

A-2 How many people usually live in your house?

A-3 How many rooms are there in your house? (Do not count bathrooms, halls, laundry rooms and attached sheds)

Health Outcomes

B-31 In general would you say your physical health is: Excellent (1), Very Good (2), Good (3), Fair (4), Poor (5)

B-32 In general would you say your mental health is: Excellent (1), Very Good (2), Good (3), Fair (4), Poor (5)

Infectious Respiratory Diseases

B-37 Has a doctor ever said you had any of the following chest illnesses:

a. Pneumonia: During the past 12 months: Yes (1), No (0)

Ever in your life: Yes (1), No (0)

b. Tuberculosis: During the past 12 months: Yes (1), No (0)

Ever in your life: Yes (1), No (0)

Chronic Respiratory Diseases

FEDERAL PROGRAMS, HOUSEHOLD CROWDING, HEALTH

B-24 Did a doctor ever tell you that you had asthma? Yes (1), No (0)

B-37 Has a doctor ever said you had any of the following chest illnesses:

a. Chronic bronchitis: During the past 12 months: Yes (1), No (0)

Ever in your life: Yes (1), No (0)

b. Emphysema: During the past 12 months: Yes (1), No (0)

Ever in your life: Yes (1), No (0)

B-38 Has a doctor ever said you had COPD (chronic obstructive pulmonary disease)? Yes (1)

(if Yes, when (year)), No (0), Don't Know (2)

Appendix C

Most Recent Ethics Approvals



Behavioural Research Ethics Board (Beh-REB) 20-Oct-2022

Certificate of Re-Approval

Application ID: 2009

Principal Investigator: Kerry McPhedran

Department: Department of Civil, Geological and Environmental Engineering

Locations Where Research

Activities are Conducted: University of Saskatchewan, Muskoday First Nation (MuFN), Muskeg Lake Cree Nation (MuLCN), Saskatoon, Canada

Student(s): Derek Eisner
Hamidreza Rashidi
Shannon Hyslop
Tanya LaBelle
Tim Vogel

Funder(s):

Sponsor: Department of Indigenous Services Canada

Title: Community Centered Co-Design in Muskoday First Nation (MuFN) and Muskeg Lake Cree Nation (MuLCN)

Approval Effective Date: 29-Oct-2022

Expiry Date: 29-Oct-2023

Acknowledgment Of: N/A

Review Type: Delegated Review

* This study, inclusive of all previously approved documents, has been re-approved until the expiry date noted above

CERTIFICATION

The University of Saskatchewan Behavioural Research Ethics Board (Beh-REB) is constituted and operates in accordance with the current version of the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans - TCPS 2 (2018). The University of Saskatchewan Beh-REB has reviewed the above-named project. The proposal was found to be acceptable on ethical grounds. The principal investigator has the responsibility for any other administrative or regulatory approvals that may pertain to this project, and for ensuring that the authorized project is carried out according to the conditions outlined in the current approved protocol. This Certificate of Approval is valid for the above time period provided there is no change in experimental protocol or consent process or documents.

ONGOING REVIEW REQUIREMENTS

Any significant changes to the proposed method, or consent and recruitment procedures must be reported to the Chair through submission of an amendment for Beh-REB consideration in advance of implementation.

To remain in compliance, a status report (renewal or closure form) must be submitted to the Beh-REB Chair for consideration within one month prior to the current expiry date each year the project remains open, and upon project completion. Please refer to the Research Ethics Office website for further instructions and current forms.

Digitally Approved on behalf of the Chair
Behavioural Research Ethics Board
University of Saskatchewan



Biomedical Research Ethics Board (Bio-REB) 09-Mar-2022

Certificate of Re-Approval

Ethics Number: 12-189

Principal Investigator: James Dosman

Department: Department of Community Health and Epidemiology

Locations Where Research

Activities are Conducted: Montreal Lake Cree Nation, Canada
SPHERU Research Facility, Canada
Beardy's and Okemasis First Nation, Canada
Canadian Centre for Health and Safety in Agriculture (CCHSA), Canada

Student(s): Saydi Harlton
Shannon Hyslop

Funder(s): Canadian Institutes of Health Research

Sponsor:

Title: Assess, Redress, Re-Assess: Addressing Disparities in Respiratory Health Among First Nations People - Objective 1, stages 2 and 3

Approval Effective Date: 25-Mar-2022

Expiry Date: 25-Mar-2023

Acknowledgment Of:

Review Type: Delegated Review

IRB Registration Number: Not Applicable

* This study, inclusive of all previously approved documents, has been re-approved until the expiry date noted above