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UNDERSTANDING THE MAIN DRIVERS OF MÉTIS CORE HOUSING NEED IN BC

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RÉSUMÉ

En Colombie-Britannique, 17 % des ménages métis éprouvent des besoins impérieux en matière de logement (BIL) (Big River Analytics, 2021). Ces ménages vivent dans des logements **inabordables** (ils doivent y consacrer plus de 30 % de leur revenu), de qualité non convenable (logement nécessitant des réparations majeures) ou de taille non convenable (pas assez de chambres). Ils ne peuvent pas se payer un autre logement de qualité et de taille convenables dans leur collectivité (SCHL, 2019). La Nation métisse de la Colombie-Britannique (NMCB) entend réduire de 50 % sur cinq ans les BIL des Métis dans la province. Pour mesurer les progrès vers l'atteinte de cet objectif et élaborer des options, des initiatives et des programmes stratégiques fondés sur des données, la NMCB met sur pied une stratégie de recherche à plusieurs phases.

En 2021, la NMCB a effectué une évaluation de base des besoins en matière de logement. Cette évaluation a permis de comparer la proportion de ménages métis éprouvant des BIL en Colombie-Britannique. Maintenant, nous utilisons les données d'enquête recueillies par la NMCB pour l'évaluation de base des besoins en matière de logement. Cette évaluation vise à mieux comprendre les **déterminants** qui prédisent les BIL des Métis et les **mécanismes** qui les expliquent. Elle vise aussi à comprendre les **relations** entre les trois indicateurs des BIL (problèmes d'abordabilité, de qualité et de taille) et les **outils stratégiques** qui pourraient combler leurs BIL.

Nous constatons que **le revenu, le loyer médian, le mode d'occupation et le nombre de membres métis du ménage sont des facteurs clés des besoins des Métis en matière de logement en Colombie-Britannique**. Plus particulièrement, les ménages métis à faible revenu par rapport au coût du logement dans leur marché local sont plus à risque d'éprouver des BIL. Nous constatons que le loyer médian explique en grande partie la variation des besoins en matière de logement dans les régions de la NMCB. Selon le mode d'occupation, les Métis qui sont propriétaires de leur logement sont plus susceptibles que les locataires de vivre dans un logement de qualité ou de taille non convenable. Par contre, ils sont moins susceptibles de vivre dans un logement inhabitable. Enfin, plus le ménage compte de Métis, plus la probabilité qu'il éprouve des BIL et se trouve dans un logement de taille non convenable est grande. Cette constatation reste vraie même si nous prenons en compte le nombre total de personnes dans le ménage et le revenu du ménage. La discrimination en matière de logement et l'écart de richesse entre les Métis et les personnes non métisses pourraient être les mécanismes qui expliquent pourquoi le nombre de Métis dans un ménage est un déterminant des besoins en matière de logement.

Nous examinons également les facteurs déterminants des besoins des Métis en matière de logement dans une perspective d'analyse comparative entre les sexes plus (ACS+). **Les écarts de BIL entre les ménages métis dont le soutien économique est de sexe féminin ou masculin sont influencés par le revenu**. Les ménages qui comptent plus d'hommes comme soutien sont moins nombreux à avoir des BIL que ceux qui en comptent moins, car leur revenu est généralement plus élevé. Nous constatons également que **les femmes**

métisses monoparentales sont plus susceptibles d'éprouver des BIL que les autres types de ménages, même en prenant en compte l'écart de revenu.

En examinant les relations entre les trois indicateurs des besoins en matière de logement, nous constatons que **les Métis semblent faire des compromis et tolérer un type de besoin en matière de logement afin d'en éviter un autre**. Par exemple, dans leur quête d'un logement de taille convenable, les Métis peuvent devoir emménager dans un logement inabordable. Nous constatons également que seulement 0,8 % de tous les ménages métis de la Colombie-Britannique et 1,6 % des ménages métis ayant des besoins en matière de logement vivent dans un logement en deçà des trois normes (abordabilité, qualité et taille). Ce résultat indique que presque tous les Métis sont en mesure d'obtenir un logement qui répond à au moins un de leurs besoins en matière d'abordabilité, de qualité ou de taille. Cependant, il démontre que certains ménages sont forcés de choisir sur quelles normes de logement ils sont prêts à faire un compromis. Nous constatons que 50,35 % de tous les ménages métis de la Colombie-Britannique éprouvent au moins un type de besoins en matière de logement, mais que la plupart d'entre eux n'éprouvent pas de BIL.

Afin de mieux comprendre les compromis que font les ménages métis, **nous examinons comment ces derniers perçoivent leur propre situation de logement en fonction de leur satisfaction autodéclarée**. Parmi ces ménages métis éprouvant des BIL, 46 % sont soit extrêmement satisfaits, soit plutôt satisfaits de leur logement dans son ensemble. Nous constatons que les locataires ont tendance à être moins satisfaits que les propriétaires-occupants, qu'ils aient ou non des besoins en matière de logement. Finalement, les ménages métis qui ont des besoins non satisfaits en matière d'accessibilité, comme les rampes d'accès ou les barres d'appui, ont aussi tendance à être moins satisfaits que ceux qui n'ont pas de besoins non satisfaits en matière d'accessibilité, même s'ils n'ont pas de BIL.

Enfin, pour comprendre les outils stratégiques permettant de répondre aux besoins des Métis en matière de logement, **nous examinons trois types de soutien. Nous constatons que chacun a une incidence différente sur les besoins en matière de logement**. Les ménages métis qui reçoivent des subventions au loyer vivent dans des logements plus abordables que les ménages ayant le même revenu total, mais ne recevant pas de subventions au loyer. En revanche, l'aide au revenu a une incidence sur les besoins en matière de logement semblable à celle de l'emploi et des autres revenus. Nous constatons que les ménages qui reçoivent de l'aide au revenu vivent dans des logements plus chers que les ménages qui reçoivent des subventions au loyer. Finalement, nous constatons que les ménages occupant des logements hors marché (y compris les logements subventionnés ou sans but lucratif et les coopératives d'habitation) risquent moins d'éprouver des besoins en matière de logement. Ils sont plus susceptibles d'occuper des logements abordables et ont tendance à être plus satisfaits de leur logement.

EXECUTIVE SUMMARY

Seventeen percent of Métis households in British Columbia (BC) live in core housing need (Big River Analytics, 2021), meaning they live in homes that are unaffordable (they cost more than 30% of their income), inadequate (in need of major repairs), and/or unsuitable (without enough bedrooms), and they cannot afford alternative suitable and adequate housing in their community (Canada Mortgage and Housing Corporation, 2019). Métis Nation British Columbia (MNBC) intends to reduce Métis core housing need in BC by 50% over five years. To measure progress towards this goal and to develop data-driven policy options, programs, and initiatives, MNBC is undertaking a multi-phase research strategy.

In 2021, MNBC conducted a baseline housing needs assessment that benchmarked the proportion of Métis households living in core housing need in BC. Now, we use survey data collected by MNBC for the baseline housing needs assessment to better understand the **determinants** that predict Métis core housing need and the **mechanisms** which explain them, the **relationships** between the three indicators of housing need (unaffordability, inadequacy, and unsuitability), and the **policy tools** that could lift Métis out of core housing need.

We find that **income, median rent, housing tenure, and the number of Métis in a household are key determinants of Métis housing need in BC**. More specifically, Métis households with a low income relative to the cost of housing in their local housing market are at higher risk of facing housing need. We find that median rent explains a lot of the variation in housing need across MNBC regions. Looking at housing tenure, Métis who own their dwelling are more likely than renters to live in inadequate housing, but they are less likely to live in unaffordable or unsuitable housing. Finally, a larger number of Métis in a household increases the likelihood of being in housing need, even when accounting for the total number of people in the household and the household income. Housing discrimination and wealth gaps between Métis and non-Métis people could be the mechanisms that explain why the number of Métis in a household is a determinant of housing need.

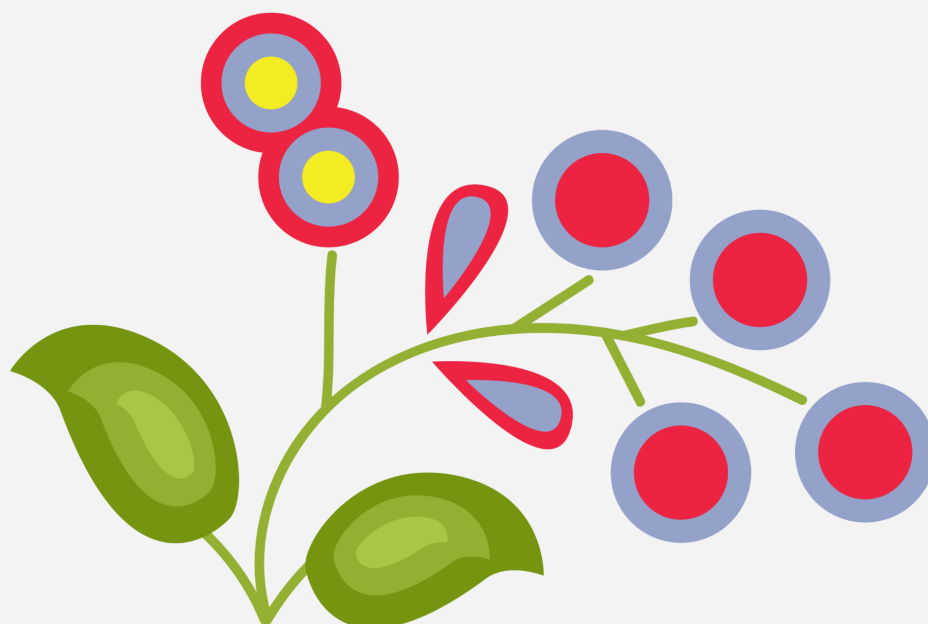
We also explore the determinants of Métis housing need through a Gender-Based Analysis Plus (GBA+) lens. **Differences in core housing need between Métis households with male and female earners are driven by differences in income**. Households with more male earners are in lower rates of core housing need than households with fewer male earners, because they tend to have a larger income. We also find that **Métis lone-parent households are more likely to be in core housing need than other household types**—even accounting for differences in income.

By examining the relationships between the three indicators of housing need, we find that **Métis appear to be making tradeoffs, enduring one type of housing need in order to avoid another**. For example, in pursuit of suitable housing, Métis may be having to move into unaffordable housing. We also see that only 0.8% of all Métis households in BC and 1.7% of Métis households in housing need are below all three of the affordability, adequacy, and suitability standards. This

finding suggests that almost all Métis are able to secure housing that meets at least one of their affordability, adequacy, or suitability needs, but that some households are made to choose which housing standards to compromise on. We note that 50.5% of all Métis households in BC are experiencing at least one type of housing need, but most of them are not in core housing need.

In order to better understand the tradeoffs households are making, **we explore how Métis households view their own housing situation through their self-reported satisfaction.** Of those Métis households in core housing need, 46% are either “extremely satisfied” or “somewhat satisfied” with their housing overall. We find that renters tend to be less satisfied than homeowners, regardless of whether they are in housing need. Finally, Métis households that have unmet accessibility needs such as ramps or handrails also tend to be less satisfied than those without unmet accessibility needs, even if they are not in core housing need.

Lastly, to understand the policy tools for addressing Métis housing need, **we examine three types of support and find that each type of support has a different impact on housing need.** Métis households that receive rent subsidies live in more affordable housing when compared to households with the same total income who are not receiving rent subsidies. In contrast, income assistance has a similar impact on housing need as employment and other income, and we see households receiving income assistance living in more expensive housing than households receiving rental subsidies. Finally, we find that households in non-market housing (including government, nonprofit, and cooperative housing) are less likely to be in housing need, more likely to be in affordable housing, and tend to be more satisfied with their housing.



TERMS AND CONCEPTS

Core Housing Need: A household is considered to be in core housing need if it meets two criteria: (i) the household is below one or more of the adequacy, suitability, and affordability standards, and (ii) the household would have to spend more than 30% of its before-tax household income to access local housing that meets all three standards (Canada Mortgage and Housing Corporation [CMHC], 2019).

Housing Need: A household is in housing need if it falls below one or more of the adequacy, suitability or affordability standards. In other words, the household lives in unaffordable, inadequate, and/or unsuitable housing, but would not have to spend more than 30% of its before-tax household income to access local housing that meets all three standards.

Adequate Housing: Housing is considered adequate when it isn't in need of major repairs. Major repairs include defective plumbing or electrical wiring, or structural repairs to walls, floors, or ceilings (CMHC, 2019). Housing is considered **inadequate** when it is in need of major repairs.

Affordable Housing: Housing is considered to be affordable when housing costs less than 30% of before-tax household income (CMHC, 2019). Housing is considered **unaffordable** when the household needs to spend more than 30% of before-tax income on housing costs.

Suitable Housing: Housing is considered suitable when there are enough bedrooms for the size and make-up of resident households according to National Occupancy Standard requirements (CMHC, 2019). Housing is considered **unsuitable** when there are not enough bedrooms for the size and composition of the household according to National Occupancy Standard requirements. Enough bedrooms means one bedroom for each: cohabiting adult couple; unattached household member 18 years of age and over; same-sex pair of children under age 18; and additional boy or girl in the family (CMHC, 2019). If there are two opposite sex children under 5 years of age, they can share a bedroom. A one-person household can occupy a bachelor unit with no bedroom.

— 1.0

INTRODUCTION

— 1.1

BACKGROUND

As defined by the Canada Mortgage and Housing Corporation (CMHC), a household is deemed to be in core housing need if (i) it falls below standards for housing affordability (the household spends more than 30% of its pre-tax income on shelter costs), housing adequacy (the household's dwelling is in need of major repairs), and/or housing suitability (there are not enough bedrooms for the size and composition of the household), and (ii) if the household would need to spend more than 30% of its pre-tax household income to access local housing that meets all three standards (CMHC, 2019).

Métis Nation British Columbia (MNBC) aims to reduce Métis core housing need in British Columbia (BC) by 50% over five years. To measure progress towards this goal and to develop data-driven policy options, programs, and initiatives, MNBC is undertaking a multi-phase research strategy. In Phase 1, we benchmarked the proportion of Métis in BC living in core housing need in 2021. This baseline was established through the design and enumeration of the MNBC Housing Needs Survey and subsequent analysis of Métis housing affordability, adequacy, and suitability rates at the provincial, regional, household, and individual levels. The MNBC Housing Needs Survey was enumerated in 2021 by convenience sampling, collecting 2,059 complete responses. More information about the survey is available in Appendix A. The analysis in Phase 1 provided MNBC with preliminary information on the state of Métis core housing need in BC, which is summarized in [The Voice of Métis: Housing Needs Assessment](#), a report produced for MNBC (Big River Analytics, 2021).

Now in Phase 2 Part 1, we use data collected through the MNBC Housing Needs Survey to dig deeper into the determinants of housing need for Métis in BC, the mechanisms through which these determinants drive housing need, and the relationships between housing affordability, adequacy, suitability, and core housing need. The insights documented in this report contribute to our understanding of the best possible avenues to address core housing need for Métis in BC and can inform Phase 2 Part 2, in which we will cost various policy interventions and compare different pathways to reducing Métis core housing need by 50% over five years.

— 1.2

RESEARCH OBJECTIVES

Our research objectives in Phase 2 Part 1 of MNBC’s multi-phase research strategy are to:

1. Identify the key determinants of Métis core housing need in BC.
2. Understand the mechanisms by which determinants drive core housing need.
3. Analyze the relationships between housing affordability, adequacy, suitability, and core housing need (through a Gender-Based Analysis Plus (GBA+) lens where appropriate).

Key determinants of housing need are those factors and household characteristics that most accurately explain which households are in housing need and which are not. Identifying the key determinants of Métis core housing need provides us with a better understanding of what characteristics are associated with housing need and who to target for housing interventions. For example, while households with all female earners are more likely to be in core housing need than those with all male earners, we find that this difference is not determined by sex but by income, because households with female earners tend to have lower incomes than other households. More precisely, we find that a female earner is not more likely to be in core housing need than a male earner, provided they have the same level of income. We use a combination of machine learning methods and regression analysis to define a set of key determinants of Métis core housing need in BC.

Mechanisms are the avenues through which determinants impact core housing need. For example, the number of Métis in a household is a determinant of Métis housing need. However, being Métis does not directly cause people to be in housing need. Rather, housing discrimination against Métis and wealth gaps between Métis and non-Métis people are the underlying mechanisms explaining why the number of Métis people is a determinant of housing need. We conduct analysis on each housing need indicator and connect our findings to existing housing studies to understand the mechanisms behind key determinants of core housing need.

We analyze **two types of relationships** between core housing need and the three indicators of housing need (unaffordability, inadequacy, and unsuitability). First, we explore how many Métis households are in each type of housing need but are not in core housing need because they could access local housing that would meet housing standards. Second, we examine the share of Métis households that face multiple types of housing need. We find evidence of a tradeoff between types of housing need. To better understand these tradeoffs, we also study how satisfied Métis in BC are with their housing, including comparing the overlap between housing need and housing satisfaction. Lastly, we use our findings on the determinants, mechanisms, and relationships behind housing need and core housing need to explore how different **policy tools** can address Métis housing need and core housing need in BC. We conclude by presenting and validating our research findings with MNBC in December 2022.

— 2.0

APPROACH

We designed our research approach with the recognition that Métis housing need is a complex issue. The housing need faced by different subgroups (e.g., types of families, renters vs. owners, income groups, gender) varies substantially. Furthermore, the distinct cultural and socioeconomic context of the Métis population in BC suggests that there may be unique drivers of core housing need for this population that do not align with insights from housing research on the overall population in North America.

Considering the complexity of studying Métis core housing need in BC, we have taken an exploratory and flexible approach to this research. We began with a comprehensive literature review to gather insights about housing need overall and to identify unique elements of housing that apply to Indigenous communities. We then used multiple statistical methods to conduct an exploratory analysis of the data. This exploratory analysis identified unique groups within the data, assessed the key determinants of housing need, and looked at the relationships between the housing need indicators. Insights from the exploratory analysis motivated our research questions and hypotheses about the mechanisms driving housing need.

While addressing our three primary research questions, we saw results that encouraged us to look more closely at certain aspects of housing need. One additional research avenue was to analyze the overlap between housing need and housing dissatisfaction, and specifically identify if there are certain groups who tend to have large discrepancies between these measures. We also conducted some analysis on the effects of policy interventions on the types of housing need and the levels of satisfaction of Métis households in BC.

A detailed explanation of our methods can be found in Appendix B and C.



— 3.0

LITERATURE REVIEW

— 3.1

PURPOSE OF THE LITERATURE REVIEW

This section provides a summary of relevant literature on housing standards and core housing need, specifically discussing determinants of core housing need and the relationship between housing need indicators. The information gathered from this literature review has informed the direction of our statistical and econometric analysis, assisted us in understanding relationships identified in our analysis, and supported the development of our regression specifications.

There is limited literature that explicitly explores Métis core housing need. However, understanding core housing need for households across Canada and North America and for Indigenous households more generally may provide insight into the determinants influencing core housing need for Métis in BC. The literature review included academic research and reports conducted in Canada and the United States to understand the determinants of core housing need and the relationships between housing need indicators. We also include research on international housing markets to gather information about specific relationships between housing need indicators that have yet to be researched in the North American literature.

Articles were identified through a web-based search using combinations of search terms including *determinants*, *core housing need*, *housing affordability*, *adequacy*, and *suitability*. After reading the abstract and introduction, articles were selected if they considered:

- 1) The determinants of core housing need broadly,
- 2) The determinants of each type of housing need, and/or;
- 3) The relationship between different housing need indicators.

A secondary review of the literature was conducted to contextualize the findings from the analysis. This review focused specifically on the relationship between the housing satisfaction and dwelling affordability, adequacy, suitability and accessibility. Relevant articles were identified through a web-based search, using terms such as *satisfaction and housing*, *satisfaction and affordability*, and *accessibility and housing satisfaction*. Articles were selected if they reviewed these relationships in North America or in housing markets similar to Canada.

— 3.2

SUMMARY OF RELEVANT FINDINGS

The literature provides a general overview of housing standards and core housing need in Canada and contextualizes Métis core housing need in BC. We find that the percentage of households in core housing need in Canada has decreased from 11.6% in 2018 to 10.1% in 2021 (Statistics Canada 2020; Statistics Canada 2022). The majority of households are in core housing need due to challenges with housing affordability, and are more likely to rent their dwelling, live alone, be seniors, or be Indigenous (Statistics Canada 2020; Statistics Canada 2022; Wali 2019; CMHC 2021). Further, households with the lowest income and educational attainment are most likely to live in housing below standard, that is housing that is unaffordable, inadequate, or unsuitable (Public Health Agency of Canada 2018).

Indigenous households in Canada continue to be an overrepresented group in core housing need, however different Indigenous groups experience core housing need in different proportions (Wali 2019). Métis households in Canada have the lowest reported proportion of households in core housing need in comparison to other Indigenous households in Canada (Wali 2019). From 2011 to 2016, the proportion of both Indigenous and non-Indigenous households living in core housing need declined, with a greater proportion of Indigenous households emerging from core housing need than non-Indigenous households (Wali 2019).

The selected literature explores the determinants of housing unaffordability, inadequacy, and unsuitability. Household income is identified as pushing households into core housing need (Rea et al. 2008; Luffman 2006). Rea and co-authors find that households at the bottom 20% of the income distribution are more likely to spend more than 30% of their total income on shelter costs (2008). They identify Indigenous households as more likely to live in unaffordable housing due to low income relative to their shelter costs, in comparison to non-Indigenous households. Further, they find that renters, living alone, being a woman-lone parent, being an immigrant, and living in Toronto or Vancouver increase the likelihood of living in unaffordable housing (Rea et al. 2008).

When exploring the differences in housing affordability between renters and homeowners, Luffman finds that renters in Canada are more likely to have unaffordable housing, live closer to metropolitan areas, and have lower incomes than owners. Low-income renters are more likely to have unaffordable housing than owners with an equivalent income. Further, the difference between renters and owners is exacerbated by the source of household income, where renters receiving government support are more likely to have unaffordable housing than households with consistent salaries. The author notes challenges associated with disentangling the relationship between larger cities, high shelter costs, and income (Luffman 2006). Okkola and Brunelle support Luffman's finding that renters are more likely to be in unaffordable housing, identifying housing tenure as the largest predictor of housing affordability stress, with renters and mortgaged homeowners facing the most affordability stress (2018).

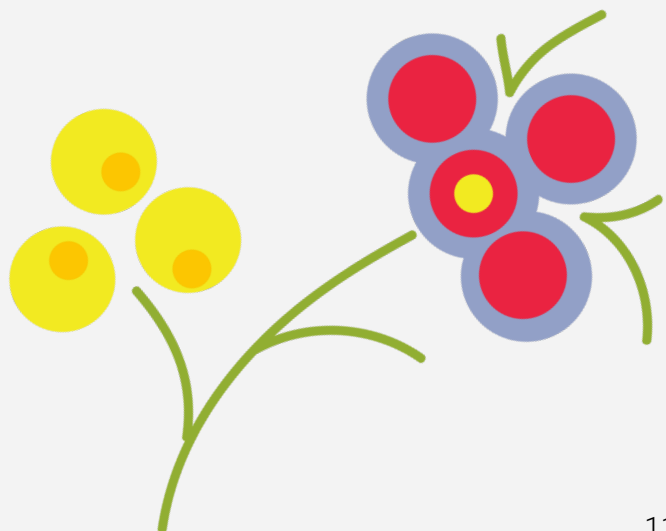
Households in regions with greater economic activity, whether it be a metropolitan hub or areas experiencing local economic booms, are more likely to experience housing unaffordability at greater rates (Moore and Skaburskis 2004; Bunting, Walks and Filion 2004; Okkola and Brunelle 2018). Households in metropolitan areas are less likely to have affordable housing compared to households in rural areas (Moore and Skaburskis 2004; Buntin, Filion and Walks 2004). In metropolitan areas that are growing and expanding, Okkola and Brunelle attribute the increase in housing unaffordability to the increasing cost of housing outpacing the increase in income (2018). We note that the relationship between cost and income may be different for older, established metropolitan areas, such as Vancouver.

The selected literature on the determinants of housing adequacy identifies income and ethnicity as determining factors (Kutty 1999; Mundra and Sharma 2014). Kutty finds that having a higher income increases the likelihood of living in adequate housing. However, the race of a household maintainer has an additional impact on housing adequacy (1999). Mundra and Sharma further explore ethnicity as a determinant and find that regardless of income, education, or housing tenure, households where earners are visible minorities are significantly more likely to live in inadequate housing than non-minority households (2014). These findings suggest that there are other immeasurable factors affecting the housing adequacy of minority households, such as cultural preferences to spend less on home maintenance or a trend of minorities living in neighbourhoods with relatively more inadequate housing (Mundra and Sharma 2014).

From a review of the literature, we find that housing suitability is influenced by similar factors as affordability and adequacy, including proximity to a metropolitan area and housing tenure. Moos, Revington, and Wilkin suggest that there is a tradeoff between housing suitability and time willing to commute to a metropolitan area (2018). Education and housing tenure are found to be key determinants of housing suitability for immigrant and visible minority households in Canada and the United States (Kutty 1998; Li 2017). Notably, affordability is shown to have a significant negative impact on overcrowding, a measure of suitability (Cai and Lu 2015). However, these effects may be overstated as the report evaluates the housing standards of low income households, primarily with male earners, and may only be applicable to the Chinese housing market.

The selected literature also included extensive discourse on the use of suitability as an indicator of core housing need. Unlike other indicators for core housing need, housing suitability as defined by CMHC may not be an appropriate measure in minority communities and households, as it presumes a historically colonial view of what families and households should look like (McCandles, 2020; McCartney, Herskovits and Hintelmann, 2020). This literature is relevant to the analysis of housing suitability among Métis households in BC, as there may exist different preferences for family structures and households among Métis. Consequently, we see this as an opportunity to develop Métis-specific housing indicators in the future.

When explicitly exploring the relationship between housing satisfaction and core housing need, having more rooms (a measure of suitability) and having more accessible housing both increase satisfaction (Balestra and Sultan 2013; James III 2007; Scheckler, Molinsky and Airgood-Obrycki 2022). When exploring the determinants of housing satisfaction, we identify housing tenure and age as being the most relevant (Lu 1999; Elsinga and Hoekstra 2005; Fonberg and Schellenber 2019; Diaz-Serrano 2009; Grigolon et al. 2014; Balestra and Sultan 2013). Diaz-Serrano attributes homeowners' satisfaction with their housing to the fulfillment of homeownership aspirations, and Lu finds that individuals who have lived in their housing longer are more satisfied (2009; 1999). Younger households are less likely to be satisfied with their housing (Balestra and Sultan 2013; Grigolon et al. 2014). However, the inherent relationship between age, homeownership, and housing mobility requires further exploration in a Canadian context.



— 4.0

FINDINGS

KEY FINDINGS

Determinants of Housing Need:

- Income, median rent, housing tenure, and the number of Métis individuals in a household are key determinants of housing need for Métis in BC:
 - Métis households with a low income relative to the cost of housing in their local housing market are at higher risk of facing housing need.
 - Median rent explains a lot of the variation in housing need across MNBC regions.
 - Renters face different types of housing need than homeowners. Métis who own their dwelling are more likely than Métis renters to live in inadequate housing, but they are less likely to live in unaffordable or unsuitable housing.
 - A larger number of Métis in a household increases the likelihood of being in housing need, even when accounting for the total number of people in the household, the household income, and other determinants.
- Differences in core housing need between Métis households with male and female earners are driven by differences in income. Households with more male earners are in lower rates of core housing need than households with a lower share of male earners because they tend to have a larger income.
- Métis lone-parent households experience greater rates of core housing need than other household types, independent of differences in income.

Relationships Between Housing Need Indicators:

- The majority (66.0%) of Métis households living in housing need are not in core housing need. In other words, these households would not have to spend more than 30% of their before-tax income to access local housing that meets standards of affordability, adequacy, and suitability.
- Most Métis households (81.1%) in housing need are below only one of the affordability, adequacy, or suitability standards, and only 1.7% are below all three.

Housing Satisfaction:

- Of those households in core housing need, 46% are either “extremely satisfied” or “somewhat satisfied” with their housing overall.
- Unmet accessibility needs (e.g. ramps, handrails, transfer aids, etc.) predict being dissatisfied with housing despite not being in core housing need.

- Renting predicts lower satisfaction with housing for Métis households in BC, regardless of their housing need.

Housing and Income Policy:

- Métis households that receive rent subsidies live in lower-cost housing on average than households receiving the same amount of money from employment and other income or from income assistance.
- Métis households in non-market housing (e.g., co-ops, government, or nonprofit) tend to have lower core housing need and higher satisfaction than those in market housing.

— 4.1

DETERMINANTS OF HOUSING NEEDS

In Phase 1 of this multi-phase research project, we developed high-level statistics that showed trends in Métis housing need in BC.

Findings From Phase 1:

- Métis households in BC live in core housing need at rates higher than the overall population.
- Métis households in BC live in unaffordable, inadequate, and unsuitable housing at rates higher than the provincial average.
- Métis lone-parent households, households living in basement suites, and households in the Lower Mainland have a higher likelihood of living in unaffordable, inadequate, and/or unsuitable housing.
- Métis individuals of a gender other than male or female, those who have a disability, and those aged 0-20 are more likely to be in unaffordable, inadequate, and unsuitable housing.

Source: [The Voice of Métis: Housing Needs Assessment](#) (Big River Analytics, 2021).

In Phase 2, we've been able to look more closely at the determinants of housing need amongst the Métis population in BC. We use a machine learning approach to identify the factors and household characteristics that most accurately explain who is in housing need and who is not. This approach allows us to understand the relationships in the data more deeply by considering multiple variables at once, pinpointing the most important determinants at the heart of housing need. For example, we can look at the housing effects of income and housing tenure independently, controlling for the trend that renters generally have a lower income than homeowners. Considering multiple variables at once also leads us to explore different areas than

Phase 1. For example, while we account for the age of household earners in our findings, we find that age is not among the key determinants of Métis housing need or core housing need.

In this analysis, we considered a wide range of variables as potential determinants of housing need. A complete set of the variables we considered, and which ones were selected can be found in Appendix D. The determinants of core housing need that we identify are median rent, income, receiving a housing subsidy (specifically for households with an infant or with no male earners), and the household composition variables of having a senior and/or an infant in the household, being a female lone-parent household, and having an infant and only male earners.¹ Further, the number of Métis in a household is a determinant of housing unaffordability, inadequacy, and unsuitability, while housing tenure (renting vs. owning) is a determinant of inadequacy and unsuitability, and the number of earners in a household is a determinant of unsuitability.

Next, we highlight key determinants of housing need and discuss the mechanisms that may be driving this housing need.

Finding: Métis households with a low income relative to the cost of housing in their local housing market are at higher risk of facing housing need.

For Métis in BC, two closely interrelated determinants of housing need are a household's income and the median rent in its local area. We would expect income and median rent to predict unaffordable housing because housing affordability is measured as the ratio of shelter costs to income. However, we find that income and median rent are also important in determining inadequacy and unsuitability. The importance of income and median rent across all housing need indicators suggests that households with a low income relative to the cost of housing in their local housing market are at higher risk of facing housing need.

This set of determinants suggests a mechanism driving core housing need. When households have a relatively low income compared with local median rents, they may face the choice between affordable housing and suitable or adequate housing, resulting in tradeoffs between the types of housing need. We explore these tradeoffs more closely in Section 4.2.

Finding: Median rent explains a lot of the variation in housing need across MNBC regions.

In Phase 1, [*The Voice of Métis: Housing Needs Assessment*](#) (Big River Analytics, 2021), we looked at regional differences in housing need and found that the highest proportion of Métis living in unaffordable housing is in the Lower Mainland region (48%), the highest proportion of Métis living in unsuitable housing is in the Kootenay (9%) and Lower Mainland (9%) regions, and the highest proportion of Métis living in inadequate housing is in the Northwest (30%). Our analysis of the

¹ Median rent data are sourced from CMHC (2021) and matched by nearest urban centre and number of bedrooms to 2021 MNBC Housing Need Survey responses.

determinants of housing need has highlighted that median rent explains a lot of the variation in housing need between different regions. However, even when accounting for median rent, living in the Lower Mainland still increases the likelihood of being in core housing need. This finding is consistent with work by Okkola and Brunelle (2018) who find that housing costs outpacing income is a major driver of affordability stress in metropolitan areas.

Finding: Renters face different types of housing need than homeowners.

Housing tenure also arises as an important determinant of housing need for Métis in BC, and we see that renters face different types of housing need than homeowners. Métis who own their dwelling are more likely than Métis renters to live in inadequate housing. Métis renters, on the other hand, are more likely to live in unaffordable housing and unsuitable housing than Métis homeowners. Higher rates of unaffordable housing among renters is consistent with findings in the literature (Luffman 2006).

The mechanism driving the effect of housing tenure is primarily income. Renters have lower incomes on average than homeowners. However, we see that housing tenure also has an effect independent of income. This effect could be explained by renters' housing costs being more volatile in response to changes in the market. Owners who purchased their homes many years ago will face housing costs based primarily on the price at the time of purchase. Renters are more susceptible to changes in the housing market if they face evictions or move more often. When housing prices rise rapidly, as they have been across BC, more renters face high shelter costs. Additionally, the flexibility to move, relative to owners, may make it easier for renters to move away from housing that has become inadequate.

Finding: A larger number of Métis in a household increases the likelihood of being in housing need.

The number of Métis in a household is a key determinant of housing affordability, adequacy, and suitability. Even when accounting for the total number of people in a household, along with all other potential determinants we consider in this report (see Table A2 in Appendix D for the full specification), the number of Métis in a household increases the likelihood of being in core housing need and each type of housing need. In other words, if we compare two households with the same number of people and the same income, the one with a greater share of Métis will be more likely to be in housing need.

To understand the mechanism at work here, we consider the scenarios where differences in the share of Métis could arise and what the implications could be. With a consistent number of people in the household, changes in the number (or proportion) of Métis will look different in a family vs. non-family household. In a family household, the proportion of Métis could differ based on whether one or both parents are Métis, or whether extended family members living in the

household are Métis. In non-family households, the proportion of Métis in the household will be driven by the composition of roommates.

The effects of the number of Métis in a household are independent of income, suggesting that income differences between Métis and non-Métis wouldn't be the driver of this effect. Possible explanations for the effect of the number of Métis on housing need are wealth differences that affect household buying power or discrimination in the housing market. Cohen (2004) has documented the occurrence of housing discrimination against Indigenous people by landlords and Belanger and Awosaga (2012) have documented the effect of "NIMBY-ism" on reducing housing options for Indigenous renters.

The importance of the number of Métis in predicting unsuitable housing could be because of cultural differences between Métis and non-Métis. The literature on suitability (McCandles, 2020; McCartney, Herskovits and Hintelmann, 2020) suggests that suitability may not be an appropriate measure for minority communities because it presumes a colonial view of what families and households should look like. Households with a larger share of Métis individuals choosing to live in 'less suitable' housing even when accounting for income could be an indication that the suitability measure misses important values of those households. We investigate the effectiveness of the suitability measure further in Section 4.3.

Our initial analysis of housing need determinants highlighted some important family composition variables. Certain lone-parent household compositions and the sex of earners (people earning income) arise as determinants of housing need. We looked into the mechanisms through which these determinants drive housing need more closely using regression analysis, specifically looking at household composition through a GBA+ lens. In our exploration of the effects of a household having male vs. female earners, and the effects of being a lone parent household, we attempt to isolate each effect by accounting for other determinants of core housing need. The complete specifications can be seen in Appendix tables A6 and A7.

Finding: Differences in core housing need between Métis households with male and female earners are driven by income.

When income is not accounted for, households that have more earners who are male are in lower rates of core housing need than households with a lower share of male earners. This effect is independent of factors like median rent, number of people, and other determinants of housing need. However, when we account for income, there is no difference in housing need between these groups. This suggests that the difference between housing need for households with male versus female income earners is driven primarily by differences in income.

Our data from the 2021 MNBC Housing Needs Survey records household income, not the individual pay of household earners. Because of this, we cannot directly observe a pay gap between male and female household earners. However, Canada has among the highest gender

pay gaps in the world (OECD 2022). Women make less than men for a variety of reasons including differences in job type, tenure, and parental leave, and the difference is particularly prevalent for Indigenous women (Moysier, Statistics Canada, 2019). Our findings suggest that this difference in income is the main driver of the differences in core housing need between Métis households with male and female earners.

Finding: Métis lone-parent households experience greater rates of core housing need, independent of differences in income.

Households that have a lone parent are in higher rates of core housing need than other households. The result holds when we account for income, indicating that the effect of being a lone-parent household is independent of other trends in housing need. This result suggests that, in addition to having lower incomes and less adults earning money than other family households, lone-parent households face other challenges that result in core housing need.

Rea et al. (2008) find that female lone-parent households are more likely to be in unaffordable housing in Toronto and Vancouver. We also examine whether the likelihood of being in core housing need is different between male lone-parent households and female lone-parent households, but our results are inconclusive.

Part of the explanation for lone-parent households facing more housing need is that their incomes are lower on average. However, our findings show that there is an additional effect, independent of income. This suggests that housing supports which go beyond income or cost based supports, and target the specific needs of lone-parent families could be highly beneficial for supporting these households in getting out of housing need.

— 4.2

RELATIONSHIPS BETWEEN HOUSING NEED INDICATORS

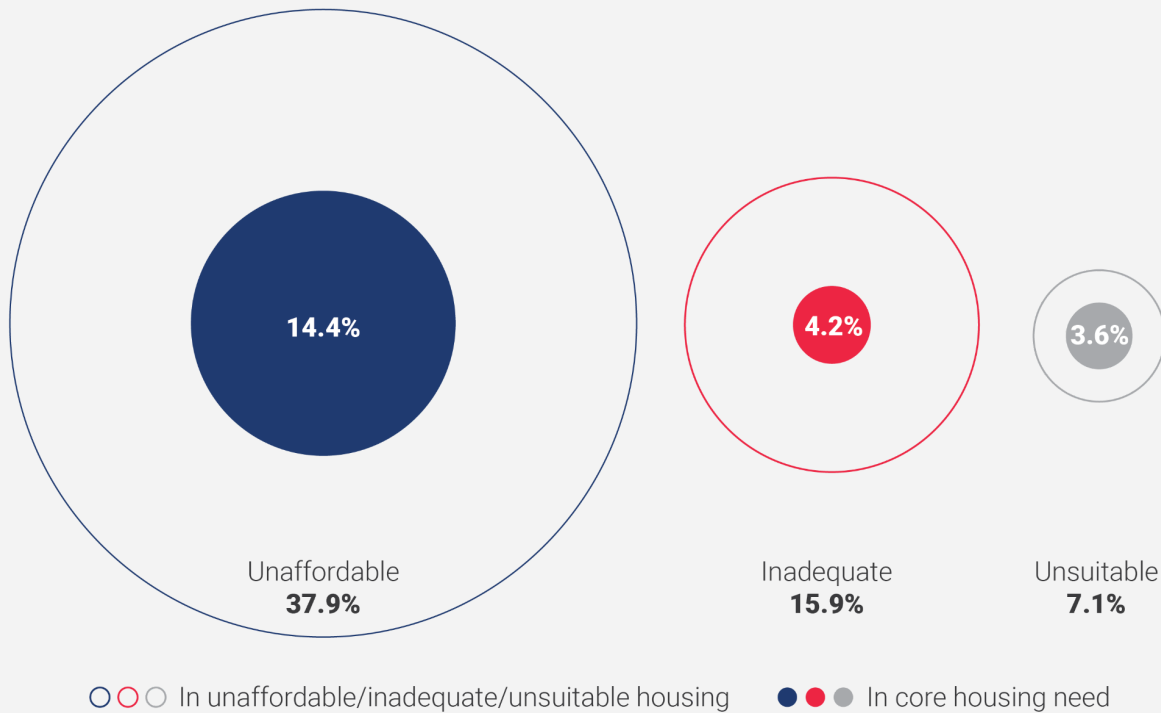
One of the central research objectives of this project is to understand the relationship between the types of housing need experienced by Métis households in BC. By exploring the coincidence and correlation between housing need indicators (unaffordability, inadequacy, unsuitability), and by looking at the proportion of households experiencing housing need who are also in core housing need, we can gain insight into the mechanisms driving housing need and the severity of housing need being experienced across the Métis population in BC.

Finding: The majority of Métis households (66.0%) living in unaffordable, inadequate, or unsuitable housing are not in core housing need.

Of those Métis households living in unaffordable, inadequate, and/or unsuitable housing, 66.0% are not in core housing need. In other words, 66.0% of Métis households in housing need could, in theory, access local housing that is affordable, adequate, and suitable. The proportion of Métis in core housing need by housing need indicator is shown in Figure 1.

Core housing need excludes households that have enough income to pay the local median rent for housing that is suitable, adequate, and affordable. For example, a household paying rent that exceeds 30% of its income but whose income is sufficient to afford the rent for an alternative, adequate, and suitable unit in the local housing market is not considered to be in core housing need. However, median rent, the measure of housing market costs employed by CMHC (2019) and used in this report, is an imperfect way of measuring the cost of available housing in a household's region. Given the very low vacancy rates across BC, households may not be able to access suitable housing at the median rent price, a problem that can be made worse through housing discrimination. Rental prices are rising in BC and, when rent prices are rising, median rent (which includes occupied units rented below market price) tends to be lower than the median rent of available units. Given that these limitations are likely excluding households that are facing major housing challenges, we continue our analysis by looking at households in housing need, whether they are in core housing need or not.

Figure 1: Proportion of Métis Households in Core Housing Need in BC, by Housing Need Indicator, 2021

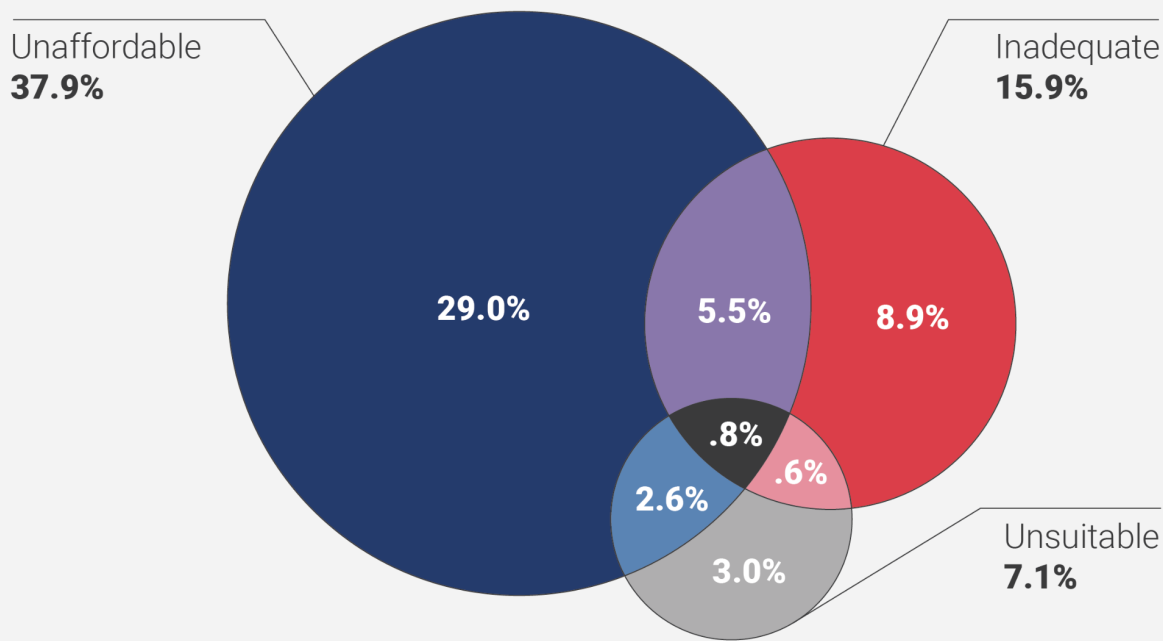


Source: MNBC Housing Needs Survey (2021). **Note:** Percentages are weighted to match Métis population by income and region. These percentages exclude any respondents who did not respond to one or more of the questions related to unaffordability, inadequacy, unsuitability or core housing need. As a result, percentages vary slightly from [Phase 1](#) (Big River Analytics, 2021).

Finding: Most Métis households (80.1%) in housing need are below only one of the affordability, adequacy, or suitability standards, and only 1.7% are below all three.

The coincidence, or overlap, between housing need indicators allows us to gain a deeper understanding of the housing conditions Métis households face. Figure 2 shows the overlap of unaffordable, inadequate, and unsuitable housing among Métis households in BC. We see that households tend to fall below only one of the standards for affordability, adequacy or suitability. More precisely, 50.5% of all Métis households in BC are experiencing at least one type of housing need, and 9.5% are experiencing two or more types of housing need. Only 0.8% are experiencing all three types of housing need. If we consider only those Métis households in housing need, we find that 81.1% are below only one of the affordability, adequacy, or suitability standards, and only 1.7% are below all three. As so few Métis households are in all three types of housing need, we do not have enough data to make conclusive statements about the characteristics these households might share.

Figure 2: Unaffordable, Inadequate, and Unsuitable Housing Overlap Among Métis Households in BC, 2021



Source: MNBC Housing Needs Survey (2021). **Note:** Percentages are weighted to match Métis population by income and region. These percentages exclude any respondents who did not respond to one or more of the questions related to unaffordability, inadequacy, unsuitability or core housing need. As a result, percentages vary slightly from [Phase 1](#) (Big River Analytics, 2021).

Being in one type of housing need is not associated with being in other types of housing need. For example, a household is less likely to be in unsuitable housing if they are already in unaffordable housing. Further, there are determinants of housing need that increase the likelihood that a household will be in one type of need while decreasing the likelihood of being in other types of need. Being a renter, for example, increases the likelihood of being in unaffordable housing but decreases the likelihood of being in inadequate housing.

These results support the understanding that one mechanism driving housing need is that households make tradeoffs between housing affordability, adequacy, and suitability. For example, a household could stay in less adequate or less suitable housing to keep costs down, improving their affordability. Similarly, households might choose to upgrade to more suitable or adequate housing, compromising their affordability. James (2020) examines how in an increasingly unaffordable housing market, people are increasingly willing to trade off affordability for better locations and larger sizes of housing. James (2020) finds these tradeoffs are particularly prevalent among younger people who, as we have seen in [Phase 1](#) results, are more likely to be in housing need (Big River Analytics, 2021).

As discussed in Section 4.1, it is likely that all three housing need indicators are driven by having a low income relative to the price level of housing in the region. Whether a household can access housing that is affordable, adequate, and suitable depends on its ability to compete for this housing in the local market. When a household cannot afford housing that meets all three standards of affordability, adequacy and suitability, it will make choices about which to give up first. The high proportion of households living in unaffordable housing indicates that affordability is the most commonly sacrificed of these three indicators.

— 4.3

HOUSING SATISFACTION

To better understand the determinants of and mechanisms driving core housing need, as well as the tradeoffs involved between types of housing need, we look into how satisfied Métis in BC are with their housing. We use the same machine learning approach to identify the determinants of housing satisfaction that we used to find the determinants of core housing need in Section 4.1.

There is overlap between the determinants of overall housing satisfaction among Métis in BC and the determinants of core housing need. Income is associated with higher overall housing satisfaction. Renters tend to have lower overall satisfaction than homeowners. Receiving a rental subsidy, which decreases the risk of being in core housing need, increases overall housing satisfaction. However, not all key determinants of Métis core housing need are as important for satisfaction. For instance, the local market cost of housing is not a determinant of overall housing satisfaction. Moreover, there are factors that impact satisfaction, but not core housing need: having an unmet accessibility need (e.g. ramps, handrails, transfer aids, etc.) is associated with lower overall satisfaction. In Appendix D, Table A5 shows the full list of variables we considered, which were selected as determinants, and their estimated impact on Métis housing satisfaction.

Next, we look at Métis households' satisfaction with the affordability, adequacy and suitability of their housing. A high degree of satisfaction with housing affordability is determined by having a higher income (including rent subsidies and income assistance), a lower number of Métis in the household, a lower median rent, homeownership, having no unmet accessibility needs, and older household residents. High satisfaction with housing adequacy is determined by a lower number of Métis in the household, homeownership, having no unmet accessibility needs, and, for seniors, receiving a rental subsidy. Finally, high satisfaction with suitability is determined by homeownership, higher income (including rent subsidies and income assistance), fewer Métis children in the household, and certain family composition variables (such as not being a lone parent household).

We also use the satisfaction data to observe whether dissatisfaction and housing need (including core housing need) are experienced by the same households. Comparing satisfaction with

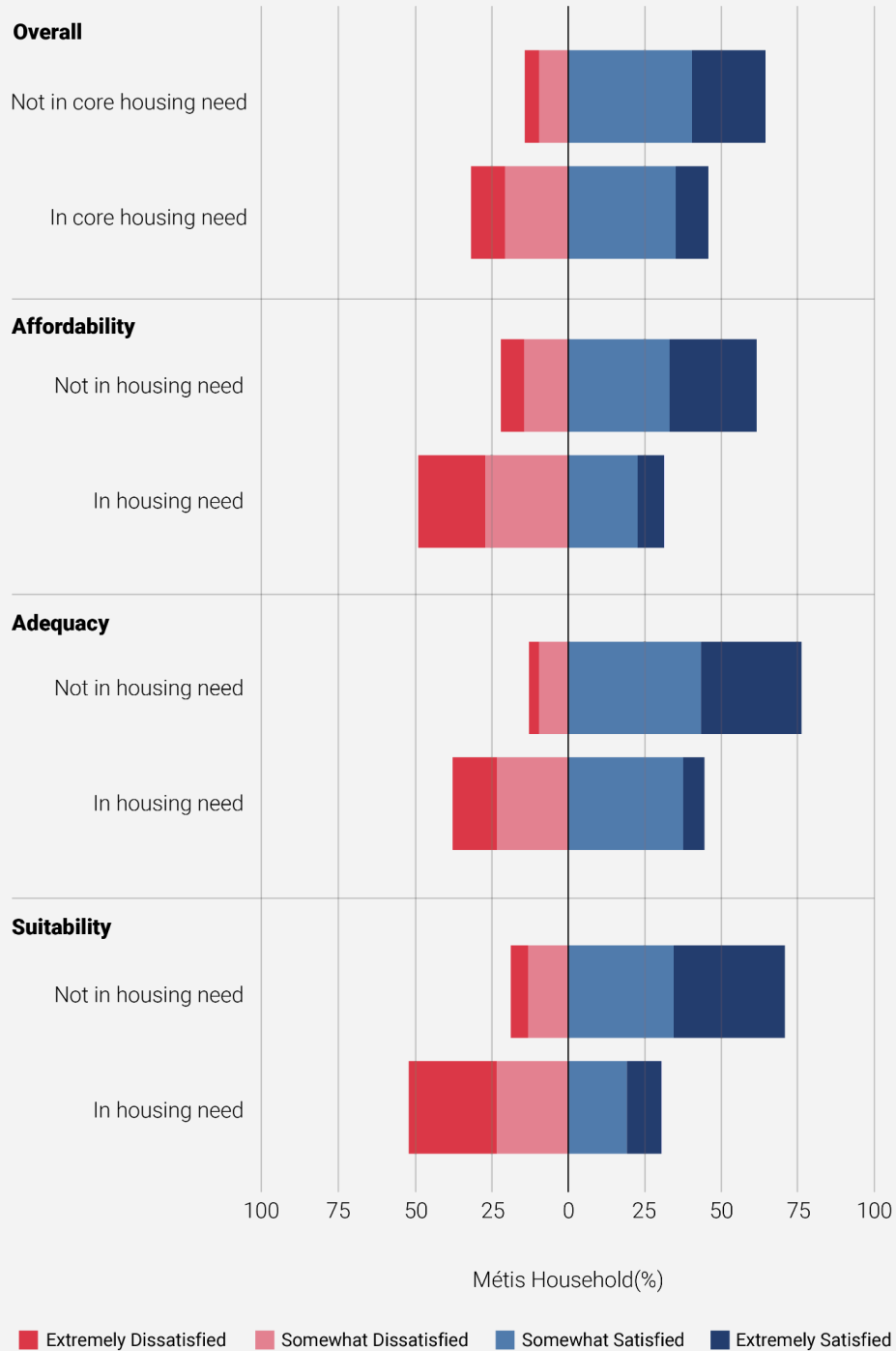
housing need indicators allows us to understand whether the definitions effectively capture the housing experiences of Métis households in BC. More specifically, we would expect those in housing need to generally be dissatisfied, whereas those not in housing need to be satisfied.

Figure 3 shows the level of self-reported overall housing satisfaction and satisfaction by housing need indicator of Métis households in BC. We compare Métis households in housing need to those Métis households that are not in housing need. We find there are a substantial number of Métis households that are somewhat or extremely satisfied with various elements of their housing, despite being in housing need or core housing need. The largest percentage of respondents showing this discrepancy are the group in core housing need, of whom nearly half (45.6%) are satisfied with their housing overall.

There are smaller but notable groups who are not in housing need but are dissatisfied with their housing. The largest discrepancy is in the measure of affordability: nearly 25% of those in affordable housing are dissatisfied with the affordability of their housing.

These discrepancies may be partially due to biases in responses about satisfaction: different people may mean different things by “somewhat satisfied” compared to “neither satisfied nor dissatisfied.” However, by looking for patterns in the discrepancies, we can gain more in-depth information about the housing situation of different groups. In our analysis, we specifically look for groups who have high levels of discrepancies between their levels of housing need and self reported satisfaction. We then attempt to isolate the most important characteristics explaining discrepancies in satisfaction by accounting for a range of determinants of satisfaction. The complete specifications can be seen in Appendix tables A8 to A11. By identifying factors that predict discrepancies between Métis satisfaction and housing need, our research shows the possibility of creating new housing need indicators that better match Métis satisfaction. If future studies are able to capture these factors into Métis specific housing need indicators, they may be able to better reflect how Métis view their own housing conditions.

Figure 3: Métis Households' Satisfaction with Housing, By Housing Need Indicator and Overall, BC, 2021



Source: MNBC Housing Needs Survey (2021). **Note:** Percentages are weighted to match Métis population by income and region. "Overall" presents Métis self-reported satisfaction with their overall housing. "Adequacy" presents Métis self-reported satisfaction with the quality, or condition, of their housing. "Suitability" presents Métis self-reported satisfaction with the size of their housing.

Finding: Unmet accessibility needs (e.g. ramps, handrails, transfer aids, etc.) predict being dissatisfied with housing despite not being in housing need.

Métis households with unmet accessibility needs (e.g. ramps, handrails, transfer aids, etc.) are more likely to be dissatisfied with their housing even when they are not technically in housing need or core housing need.

When considering what mechanism drives this satisfaction discrepancy, we find that the effect of accessibility is independent of income and housing tenure. The average income of Métis households with unmet accessibility needs is lower (\$65,304.26) than the overall Métis population (\$73,406.90). Notably, a lower percentage of those with unmet accessibility needs are renters (40.8%) compared with the overall Métis population (46.3%). Households with unmet accessibility needs have lower satisfaction partially because of having lower incomes, and this effect should be somewhat counterbalanced by having a higher home ownership rate, however there is an additional effect decreasing the satisfaction of these households that cannot be explained by income or housing tenure.

Other studies have found that for households with accessibility needs, satisfaction does not align with the definition of adequacy (Scheckler et al 2022) and that there is a high willingness to pay for accessibility features in homes (Aitken et al 2022). These findings, compared with our own insights into the discrepancy between satisfaction and housing need for households with unmet accessibility needs, suggest that accessibility may be an issue of its own that is poorly captured by the definition of housing need. When considering the design of a housing strategy for Métis in BC, it will be important to consider households with accessibility needs, even if they are not included in the definition of core housing need.

Finding: Renting predicts lower satisfaction with housing for Métis households in BC, regardless of housing need.

Renting predicts lower satisfaction for both those who are in housing need and those who are not. The effects of renting are independent of other determinants such as income, number of Métis in the household, and accessibility. This finding is consistent with the work of Okkola and Brunelle who find that renting is the largest predictor of housing affordability stress (Okkola & Brunelle 2018). Furthermore, there is extensive literature documenting that homeowners experience higher satisfaction (Diaz-Serrano 2009, Fonberg and Schellenberg 2019). One mechanism that is affecting satisfaction, but not housing need, could be that renters have less housing security. They may face more uncertainty about being able to stay in their homes, which lowers their satisfaction across the board. The low satisfaction of renters suggests that it may be worth focusing additional attention on supporting Métis households that are renters when working to reduce core housing need by 50%. It may be worthwhile to conduct further research into what would improve the housing satisfaction of renters.

— 4.4

HOUSING AND INCOME POLICY

In this section we build on the findings from our three main research objectives of Phase 2 Part 1 to investigate housing and income policies and the effect they have on housing need.









Policy interventions such as income assistance, rent subsidies, and non-market housing can affect housing need by changing the shelter-to-income-ratio of a household, providing financial space for a household to upgrade to more suitable or adequate housing, or helping to cover the costs associated with repairing or expanding housing. Designing policies to alleviate housing need can be challenging, as the policies can't always dictate how households spend additional income.

To explore the effects of different policy interventions, we compare households that are receiving income assistance, those receiving rent subsidies, and those receiving neither. On average, those receiving rent subsidies and income assistance will have lower levels of employment and other income (including pension and benefits, income from employment and self-employment, and investment income) than those who are not receiving rent subsidies or income assistance. We attempt to isolate the effects of policy interventions by accounting for income levels, in addition to other determinants of housing need. The complete specifications, showing all the variables we account for, can be seen in Appendix tables A12 and 13.

To compare the three types of households, we add the value of rent subsidies received to the income of a household, theoretically comparing households whose combined income assistance, rent subsidy value, and employment/other income is the same. By adding the value of income assistance and rental subsidies to total income, we can account for the effect of the cumulative budget a household has to afford housing and other goods, and compare the outcomes when that budget comes partially from rent subsidies or income assistance.

As an example, consider the three households presented in Figure 4. These households have the same combined value of employment and other income, income assistance, and rent subsidies. Households B and C are receiving support through income assistance and a rent subsidy respectively, whereas Household A's entire budget comes from employment and other income. By comparing the shelter cost and housing suitability and adequacy of these income-equivalent households, we can learn about how households respond to receiving different types of income.

Figure 4: Shelter Costs of Income-Equivalent Métis Households in BC, By Type of Income, 2021

	Employment & Other Income (monthly)	Income Assistance (monthly)	Rent Subsidy (monthly)	Group Trend
		—	—	Higher Shelter Cost
			—	Higher Shelter Cost
		—		Lower Shelter Cost

Source: MNBC Housing Needs Survey (2021). **Note:** Employment and other income includes income from all sources other than income assistance and rent subsidies..

Finding: Métis households that receive rent subsidies live in lower-cost housing than households receiving the same amount of money from employment and other income or income assistance.

We find that, of the three households in Figure 4, Household C (receiving a rent subsidy) would live in housing that is lower cost (at the unsubsidized rate) on average. Because the income level is held constant for these comparison groups, lower housing costs mean that those receiving rent subsidies have better housing affordability than those receiving the equivalent amount of support through income assistance, or those earning 100% of their income from sources other than assistance or rent subsidies. In contrast, households receiving some of their income from income assistance resemble the households who receive no supports at all. They live, on average, in housing with the same shelter cost.

This finding suggests that the channel of support (income assistance vs. rent subsidies) changes how a household spends the additional income. Rent subsidies can be portable (allowing the household to move and still receive assistance) or non-portable. Households receiving

non-portable rental subsidies may have lower shelter costs because they are unable to move to higher-cost housing without losing their subsidies. Even among households receiving portable rent subsidies, the design of rental subsidy programs may discourage moving to higher-cost housing (i.e., not being easily transferable or only being available for lower-cost units). Alternatively, households could make different choices in response to the assistance type they get. We account for differences in household characteristics between the three household types (in addition to income) by accounting for the determinants of housing need identified in Section 4.1. From this analysis, we see that rent subsidies appear to be more effective for targeting affordability than income assistance, but may offer less freedom for the household to make decisions about their housing.

Finding: Métis households in non-market housing (co-ops, government or nonprofit) tend to have lower core housing need and higher satisfaction.

Living in non-market rentals (including government, nonprofit and cooperative housing) increases Métis households' likelihood of living in affordable housing and decreases their likelihood of being in core housing need. Living in non-market housing also improves the likelihood of being satisfied with the affordability, adequacy, and suitability of housing.

The increased satisfaction and decreased core housing need for Métis households living in non-market housing are driven partially by the lower shelter cost of these units, but we see that there is an effect independent of shelter cost as well. A possible explanation for the impact on satisfaction is that non-market housing can provide more security for households, counteracting some of the dissatisfying effects of being a renter.

Policy Considerations:

1. Support the creation of more non-market housing for Métis households to reduce housing need and increase housing satisfaction.
2. Rent subsidies are effective to address housing unaffordability but, to reduce all types of Métis housing need, supports should allow households the flexibility to use the assistance to address unsuitability or inadequacy.

APPENDICES

A. MNBC Housing Needs Survey

The data used in this analysis is from the MNBC Housing Needs Survey, which was distributed to establish the degree to which Métis households live in core housing need in 2021. MNBC and Big River Analytics designed the MNBC Housing Needs Survey. The survey included questions on Indigenous identity, gender, age, income, housing tenure, disability status, dwelling type, family household status, number of children in the household, shelter costs, the number of bedrooms in each dwelling, and the number of major repairs needed.

The enumeration took place between July 15 to August 17, 2021. The survey was enumerated via convenience sampling, whereby the survey was distributed through MNBC social media channels and email newsletters to reach an adequate sample size. Respondents were asked if they self-identify as Métis. We received 2,059 complete responses from self-identified Métis households across BC, with the distribution of responses across BC accurately mirroring the distribution of Métis in each region according to Statistics Canada, as shown in Table A1 (2021).

Table A1: Number of Responses by MNBC Region

Region #	MNBC Region Name	Respondents		Métis households	
		#	%	#	%
1	Vancouver Island & Powell River	478	23	7,385	23
2	Lower Mainland	715	35	11,895	36
3	Thompson & Okanagan	432	21	6,440	20
4	Kootenay	116	6	1,450	4
5	North Central	199	10	2,975	9
6	Northwest	51	2	1,030	3
7	Northeast	68	3	1,525	5
TOTAL		2,059	100	32,700	100

Source: MNBC Housing Needs Survey (2021); Statistics Canada (2021). **Note:** The “Respondents” column indicates the number and percentage of respondents to the MNBC Housing Needs Survey from each MNBC Region. The “Métis households” column indicates the total number and percentage of Métis households in each MNBC Region (Statistics Canada, 2021).

B. Exploratory Methods

We began the analysis for this report with exploratory techniques including clustering, principal components analysis (PCA), ridge regression, lasso, and comparing satisfaction to housing need. These exploratory methods identified the key determinants of Métis core housing need in BC and provided valuable information for specifying the models in our more targeted analysis.

Clustering and Principal Component Analysis

We use clustering and PCA methods to identify groups within the data that share unique relationships between variables and the relationship between core housing need and satisfaction. Exploring groups within the data informs our understanding on the coincidence of housing need, the relationship between housing need and satisfaction, and the characteristics that determine housing need.

To determine how to best separate the data into groups we used k-means clustering analysis, which separates observations into clusters, or groups, that have the lowest variance within the cluster. We applied the clustering analysis to make three comparisons:

1. Comparisons of different types of housing need to each other;
2. Comparison of each type of housing need to the corresponding level of satisfaction, and;
3. Comparisons of principal components.

A principal component is a unit vector of weights for each variable in a dataset. The first principal component is the vector that captures the most variation within the data, that is, it captures the greatest differences between households. The second principal component captures the most variation in the data, excluding what has already been captured by the first component. By capturing the differences between households, these principal components can reflect larger themes that group variables together. Comparisons based on principal components will allow us to identify groups within a wide array of household characteristics.

While not directly impacting our results, the clustering methods inform our interpretations of our findings on the relationships between types of housing need (4.2) and housing satisfaction (4.3).

Ridge Regression

We then used ridge regression, a machine learning method, to examine how a wide array of household information fits together to predict housing need. Specifically, we used ridge regression to determine how a wide variety of variables predict overall core housing need, type of housing need, and overall housing satisfaction. This exploratory analysis included 63 variables, an array of which were interaction terms to measure the relationships between demographic variables.

We use Ridge Regression as a model selection tool that can effectively resolve the colinearity problem. Ridge regression is useful when dealing with a dataset with many similar variables, where the effect of one variable is likely to be misattributed to other variables that capture the same variation. Ridge regressions introduce a term that penalizes coefficient size; the bigger the effect, the larger the penalty term. Because coefficient size is penalized, if many similar variables are included in the regression, the estimated effect will be spread out across all of the similar variables. Therefore, if a variable has a very small estimated effect, we are more certain that this is due to the variable not being as important, instead of there being too many similar variables.

Ridge regressions are also designed to predict out-of-sample outcomes. The ridge regression method uses a machine learning process to determine the size, or weight, of the penalty term that most accurately predicts outcomes. The predictive power of each weight of the penalty term is repeatedly tested by excluding a portion of the data, running the ridge regression, then seeing how well it predicts the excluded data, until the weight that most accurately predicts excluded data is chosen. This means that the effects estimated using ridge regressions are predictions for the core housing need of all Métis in BC, not just those that answered the Housing Needs Assessment survey. The ridge regression results are displayed in the Technical Results appendix tables A2 and A3.

Lasso

To identify the most important determinants of core housing need, we employed a machine learning approach called lasso. Lasso is similar to ridge regression, however lasso penalizes the number of variables selected rather than the magnitude of effects. As a result, lasso selects only the most important predictors of core housing need and satisfaction. After assessing the variables selected by lasso, we examined the correlation of variables selected to the variables not selected, to check which other variables could also serve as predictors, and then used a post-lasso operator (an ordinary least squares regression) to produce causal estimates between variables selected and indicators of core housing need and satisfaction. The post-lasso regression results are displayed in the Technical Results appendix tables A4 and A5.

Comparing Core Housing Need and Satisfaction

Prior to conducting analysis on our specific research questions concerning the mechanisms driving housing need, we compared core housing need with housing satisfaction levels. Self-reported satisfaction data further informs our understanding of core housing need for specific demographics and households. Understanding the determinants of inconsistencies between core housing need and satisfaction, for example, those who are in core housing need but are satisfied with their housing affordability, adequacy, and/or suitability, can be useful in designing targeted housing interventions and understanding unique mechanisms affecting the housing decisions of certain groups.

To compare satisfaction and core housing need, we measured the correlation between being in each type of core housing need and responding ‘extremely dissatisfied’ or ‘somewhat dissatisfied’ to the corresponding satisfaction question. In cases where the correlation between core housing need and satisfaction are relatively low, we used regression analysis to evaluate if income, family composition, or other variables explain these discrepancies.

C. Regression Analysis

Gender-Based Regression Analysis

We conducted regression analysis to better understand how gender relates to housing need. Specifically, we perform sensitivity checks to identify the determinants of core housing need related to the gender of household earners and the gender of lone parents. In a sensitivity check, we add new variables across different regressions, in order to test how much the estimated impact of gender or being a lone parent can be explained by other factors. For each specification, we included relevant controls that arise as determinants of core housing need through lasso.

To examine determinants related to the gender of household earners, we first conduct a regression with the share of household earners that are male, without controlling for income. Then, we control for income, to test whether the impact of gender on housing need is determined by income. The results are shown in Table A6 of the Technical Results appendix.

When examining the impacts of being a lone-parent household, we test whether the impacts are gendered by running two regressions: the first does not separate lone-parent households by gender, the second separately estimates the impacts of lone-parent households male earners and those without. The results are shown in Table A7 of the Technical Results appendix.

Policy Regression Analysis

Using the results of our exploratory techniques, we constructed a series of regression specifications to test hypotheses about how policy tools address housing need. These targeted regressions provide insights into the mechanisms involved in income policies, differences between groups in the data, and the effectiveness of various housing and income supports. Specifically, we assessed the effect of rent subsidies, income assistance, and renting from non-private landlords on core housing need.

We first evaluated how households’ behaviour differs when they receive a rental subsidy, compared with other households who have the equivalent amount of total income without a subsidy. In this series of regressions, we controlled for the determinants of core housing need such as the number of earners, the number of Métis individuals in the household, whether someone is a lone parent, and disability status. This addressed the correlational effect that those in housing need are more likely to receive rental assistance. Additionally, for each specification,

we included relevant controls that arise as determinants of housing need through lasso. In choosing this set of controls, we looked closely at the criteria for income assistance and rent subsidy programs in BC, so that we could isolate the variables that determine who is receiving these income supports. While we cannot control for all unobservable variables, the use of lasso to select a set of controls means that an unobserved variable would need to be uncorrelated with all 63 terms in lasso to introduce significant bias into the model.

The specification is as follows:

$$Y_i = \beta_0 + \beta_1 R_i + \beta_2 C_i + u_i \quad (1)$$

where R_i is a dummy for whether the respondent is receiving rent assistance, C_i is a set of controls and Y_i is the dependent variable of interest for that specification, either shelter cost, suitability, or adequacy.

Next, we evaluated the effect of income assistance on core housing need. Similar to the specification assessing rent subsidies, we controlled for income plus assistance (including the value of income assistance) and observed differences in shelter cost, suitability, and adequacy between those who are receiving some of their income from assistance and those who are not. This series of regressions, shown in Equation (2), is similar to that in Equation (1).

$$Y_i = \beta_0 + \beta_1 I_i + \beta_2 C_i + u_i \quad (2)$$

where I_i is a dummy for whether the respondent is receiving income assistance, C_i is a set of controls, and Y_i is the dependent variable of interest for that specification, either shelter cost, suitability, or adequacy.

We also combined the equations (1) and (2) into a single specification, which allowed us to compare the effects of income subsidies and rent subsidies which may overlap. The resulting specification is:

$$Y_i = \beta_0 + \beta_1 R_i + \beta_1 I_i + \beta_3 C_i + u_i \quad (3)$$

Finally we evaluated the differences in core housing need of households who rent from non-private landlords such as a government or non-profit, and those who live in a housing co-op. This analysis indicates whether those in non-market housing do have lower shelter costs and better suitability and adequacy compared with others at equivalent income levels.

Given that low-income households are more likely to qualify for non-market housing, we controlled for income, as well as determinants of core housing need, such as the number of Métis individuals in the household, number of earners, and whether the maintainer is a lone parent. When looking at suitability and adequacy, we used two different specifications, one with control for income and another with control for shelter cost. We also compared the magnitude of these

impacts with rent subsidy and income assistance effects by controlling for shelter costs to address the lower rent likely paid in non-market housing.

We used the following specification:

$$Y_i = \beta_0 + \beta_1 N_i + \beta_2 C_i + u_i \quad (4)$$

where N_i is a dummy for whether the respondent is renting from a non-private landlord, C_i is a set of controls, and Y_i is the dependent variable of interest for that specification (shelter cost, suitability, or adequacy). For this analysis, we excluded owners and only drew comparisons between renters.

All the regression specifications shown were adapted and extended to collect a more nuanced understanding of the data. Specifically, we included:

1. Interaction terms between rent subsidies, income assistance, and renting from non-private households to understand their joint effects;
2. GBA+ specific effects based on the findings from PCA and lasso, and;
3. Regional analysis.

The full specifications and regression results are included in Table 10 of the Technical Results appendix.



D. Technical Results

This appendix displays regression results for the methods detailed in the Exploratory Methods and Regression Analysis appendices. Tables A2 and A3 show the ridge regression results predicting housing need and satisfaction with indicators of housing need. Tables A4 and A5 show the post-Lasso regressions on housing need and satisfaction with housing need. Tables A6 and A7 display the gender-based regression analysis results. Tables A8 to A11 show regressions on housing need satisfaction. Finally, Tables A12 and A13 show the policy regressions.

Table A2: Ridge Regressions on Housing Need

	Core Housing Need	Inadequate Housing	STIR	Beds Needed
Intercept	6.278	0.213	0.301	-0.75
Number People	0.010	0.004	4.01E-05	1.33E-04
Number Métis	0.003	0.018	1.23E-04	3.84E-04
Lone Parent	0.016	0.012	4.16E-04	1.35E-03
Male Earner Share	0.003	0.000	-1.14E-04	-5.23E-04
No Male Earners	0.029	-0.001	9.95E-05	4.25E-04
Only Male Earners	0.026	-0.007	-1.16E-04	-5.47E-04
Senior	-0.048	-0.002	-2.74E-04	-8.28E-04
Number Seniors	0.003	-0.012	-2.32E-04	-6.73E-04
Infant	-0.045	-0.013	2.25E-04	1.11E-03
Number Infants	0.044	-0.038	1.98E-04	1.03E-03
Number Métis Children	-0.009	0.010	1.38E-04	3.78E-04
Renting	0.003	-0.029	2.57E-04	2.22E-03
Infant and Senior	0.291	-0.130	-4.13E-05	2.81E-03
Lone Parent and Senior	-0.152	-0.024	-2.05E-04	2.17E-03
Lone Parent and Male Earner Share	-0.081	-0.001	9.46E-05	8.72E-04
Lone Parent and Infant	-0.017	0.050	0.001	3.15E-03
Infant and Male Earner Share	-0.024	-0.045	1.01E-04	1.20E-03
Senior and Male Earner Share	-0.025	0.003	-3.96E-04	-1.18E-03
Renting and Male Earner Share	0.029	-0.001	1.45E-04	1.33E-03
Lone Parent and No Male Earners	0.074	0.019	4.73E-04	1.41E-03
Infant and No Male Earners	-0.054	0.029	3.20E-04	1.04E-03
Senior and No Male Earners	-0.081	-0.009	-1.34E-04	-4.76E-04
Renting and No Male Earners	-0.012	-0.043	1.98E-04	1.70E-03
Lone Parent and Only Male Earners	0.136	0.018	-1.95E-05	6.35E-04
Infant and Only Male Earners	-0.013	-0.020	9.11E-05	1.17E-03

Senior and Only Male Earners	-0.015	-0.011	-3.81E-04	-1.14E-03
Renting and Only Male Earners	-0.028	-0.031	1.14E-04	1.20E-03
Infant and Renting	0.106	0.021	4.16E-04	2.80E-03
Senior and Renting	0.005	-0.032	1.23E-04	7.11E-04
Subsidy	-0.031	-0.028	-2.21E-04	1.60E-03
Lone Parent and renting	0.015	-0.028	4.11E-04	1.93E-03
Subsidy and Infant	0.279	0.072	-0.001	3.85E-03
Subsidy and Senior	0.043	-0.005	-1.79E-04	1.04E-03
Subsidy and Lone Parent	0.013	0.115	2.66E-05	1.58E-03
Subsidy and Male Earner Share	0.076	-0.041	-2.44E-04	1.45E-03
Subsidy and No Male Earners	-0.098	-0.024	-2.24E-04	1.63E-03
Subsidy and Only Male Earners	-0.224	-0.015	-2.44E-04	1.14E-03
Income	-2.06E-06	-1.47E-07	-5.20E-09	-2.52E-08
Income ²	1.36E-12	-0.167	-3.43E-14	-1.73E-13
Income ³	1.17E-16	-1.83E-17	-2.75E-19	-1.45E-18
Log Income	-0.284	-0.002	-3.49E-04	-1.64E-03
Median Rent	4.20E-04	-1.09E-05	4.90E-07	2.13E-06
Median Rent ²	5.07E-08	-7.15E-10	1.92E-10	8.27E-10
Median Rent ³	-2.36E-11	1.39E-12	9.29E-14	3.96E-13
Number Earners	0.007	0.013	8.80E-06	-2.98E-05
Number Earners ²	-0.004	1.79E-04	2.08E-06	3.02E-05
Avg Age Earners	8.46E-05	4.78E-04	-9.05E-06	-4.41E-05
Avg Age Earners ²	-1.46E-06	1.70E-06	-9.38E-08	-4.26E-07
Avg Age Earners ³	-8.81E-08	-1.82E-08	-1.15E-09	-4.91E-09
Log Avg Age Earners				
Unmet Accessibility Need	-0.015	0.087	8.56E-06	-1.01E-04
Supports Amount	-3.08E-05	-1.36E-06	-3.97E-08	5.24E-08
Supports Amount ²	2.28E-10	-2.39E-11	-7.69E-13	-2.91E-13
Supports Amount ³	6.79E-15	-6.00E-16	-2.02E-17	-8.81E-18
Log Supports Amount				
Supports as Percent of Income				
Supports as Percent of Income ²				
Supports as Percent of Income ³				
Income Plus Supports	-1.88E-06	-1.33E-07	-5.26E-09	-2.52E-08
Income Plus Supports ²	2.08E-12	-1.56E-12	-3.46E-14	-1.73E-13
Income Plus Supports ³	1.14E-16	-1.77E-17	-2.77E-19	-1.45E-18
Log Income Plus Supports	-3.03E-01	-0.002	-3.55E-04	-1.64E-03

Source: MNBC Housing Needs Survey (2021). **Note:** Each regression included a weighted sample of 1,501 households. Scientific notation is used for numbers smaller than 0.001. Variables without estimates were not selected as predictors in the machine learning process.

Table A3: Ridge Regressions on Housing Satisfaction

	Overall Satisfaction	Adequacy Satisfaction	Affordability Satisfaction	Suitability Satisfaction
Intercept	1.489	0.664	0.157	0.669
Number People	0.006	-8.13E-05	-1.13E-04	-3.11E-05
Number Métis	-0.038	-2.99E-04	-3.69E-04	-2.09E-04
Lone Parent	0.021	-0.002	-0.002	-0.001
Male Earner Share	-0.036	2.94E-04	3.59E-04	4.69E-04
No Male Earners	0.088	-2.76E-04	-3.08E-04	-4.48E-04
Only Male Earners	0.046	3.16E-04	3.73E-04	4.66E-04
Senior	0.062	0.001	0.002	0.002
Number Seniors	0.087	0.001	0.002	0.001
Infant	0.043	-4.80E-04	-0.001	-0.002
Number Infants	0.053	-0.001	-0.001	-0.002
Number Métis Children	-0.066	-4.07E-04	-4.43E-04	-4.90E-04
Renting	-0.388	-0.002	-0.003	-0.002
Infant and Senior	0.713	0.003	-0.002	0.003
Lone Parent and Senior	0.046	3.05E-04	0.002	-0.004
Lone Parent and Male Earner Share	-0.152	-0.002	-0.001	-0.001
Lone Parent and Infant	-0.196	-0.004	-0.005	-0.004
Infant and Male Earner Share	0.049	1.33E-04	-0.001	-0.001
Senior and Male Earner Share	0.158	0.002	0.003	0.002
Renting and Male Earner Share	-0.273	-0.001	-0.002	-0.002
Lone Parent and No Male Earners	0.016	-0.002	-0.002	-0.001
Infant and No Male Earners	-0.075	-0.001	-0.001	-0.002
Senior and No Male Earners	-0.079	4.63E-04	0.001	0.001
Renting and No Male Earners	-0.172	-0.002	-0.002	-0.002
Lone Parent and Only Male Earners	-0.111	-0.002	-0.001	-3.30E-04
Infant and Only Male Earners	-0.111	-1.88E-05	-0.001	-0.001
Senior and Only Male Earners	0.133	0.001	0.003	0.002
Renting and Only Male Earners	-0.002	-0.001	-0.002	-0.002
Infant and Renting	-0.404	-0.003	-0.003	-0.003
Senior and Renting	-0.187	3.37E-05	-0.001	-3.06E-04
Subsidy	0.156	-0.001	0.002	-3.60E-04
Lone Parent and renting	0.097	-0.002	-0.002	-0.001
Subsidy and Infant	3.91E-04	-0.006	-0.001	-0.008
Subsidy and Senior	0.484	0.002	0.003	4.42E-04
Subsidy and Lone Parent	0.154	-0.002	0.001	-0.001

Subsidy and Male Earner Share	0.122	-2.58E-04	0.003	0.001
Subsidy and No Male Earners	0.197	-0.001	0.002	-0.001
Subsidy and Only Male Earners	0.251	-3.54E-04	0.002	0.001
Income	5.04E-07	2.95E-08	2.20E-08	2.60E-08
Income ²	9.21E-12	2.08E-13	1.55E-13	1.85E-13
Income ³	1.16E-16	1.78E-18	1.32E-18	1.59E-18
Log Income	-0.044	1.86E-03	0.001	0.002
Median Rent	-4.17E-05	-1.06E-06	-2.37E-06	-1.33E-06
Median Rent ²	-3.10E-08	-4.46E-10	-9.41E-10	-5.03E-10
Median Rent ³	-2.03E-11	-2.29E-13	-4.58E-13	-2.32E-13
Number Earners	0.013	1.98E-04	2.76E-04	3.82E-04
Number Earners ²	0.004	2.01E-05	4.09E-05	5.86E-05
Avg Age Earners	-0.002	3.35E-05	6.59E-05	6.35E-05
Avg Age Earners ²	1.26E-05	3.58E-07	6.76E-07	6.47E-07
Avg Age Earners ³	5.15E-07	4.53E-09	8.26E-09	7.76E-09
Log Avg Age Earners				
Unmet Accessibility Need	-0.271	-0.001	-0.001	-0.001
Supports Amount	-2.57E-05	-1.88E-07	-4.42E-08	7.39E-08
Supports Amount ²	-7.31E-11	-4.14E-12	-4.83E-13	3.06E-12
Supports Amount ³	-1.55E-15	-1.10E-16	-1.28E-17	8.18E-17
Log Supports Amount				
Supports as Percent of Income				
Supports as Percent of Income ²				
Supports as Percent of Income ³				
Income Plus Supports	2.95E-07	2.93E-08	2.20E-08	2.61E-08
Income Plus Supports ²	8.80E-12	2.07E-13	1.55E-13	1.86E-13
Income Plus Supports ³	1.22E-16	1.77E-18	1.32E-18	1.59E-18
Log Income Plus Supports	-0.033	0.002	0.001	1.63E-03

Source: MNBC Housing Needs Survey (2021). **Note:** Each regression included a weighted sample of 1,501 households. Scientific notation is used for numbers smaller than 0.001. Variables without estimates were not selected as predictors in the machine learning process. Satisfaction is reported on a scale from -2 to 2.

Table A4: Post-Lasso Regressions on Housing Need

	Core Housing Need	Inadequate Housing	STIR	Beds Needed
Intercept	9.143***	0.150***	1.637***	0.943
Number People	0.009			
Number Metis		0.041***	0.022***	0.143***
Lone Parent				
Male Earner Share				
No Male Earners	0.023			
Only Male Earners	0.02			
Senior	-0.062*			
Number Seniors				
Infant	-0.077+			
Number Infants				
Number Metis Children	-0.007			
Renting		-0.054*		0.670***
Infant and Senior	0.303+			
Lone Parent and Senior				
Lone Parent and Male Earner Share				
Lone Parent and Infant	0.005			
Infant and Male Earner Share		-0.136*		
Senior and Male Earner Share				
Renting and Male Earner Share				
Lone Parent and No Male Earners	0.076*			
Infant and No Male Earners	0.02			
Senior and No Male Earners	-0.048			
Renting and No Male Earners	-0.02	-0.032		
Lone Parent and Only Male Earners	0.073			
Infant and Only Male Earners	0.115+			
Senior and Only Male Earners				
Renting and Only Male Earners				
Infant and Renting				
Senior and Renting	0.024	-0.083**		
Subsidy				
Lone Parent and Renting				
Subsidy and Infant	0.321**			
Subsidy and Senior				
Subsidy and Lone Parent		0.129		

Subsidy and Male Earner Share				
Subsidy and No Male Earners	-0.123*			
Subsidy and Only Male Earners	-0.104			
Income				-0.001
Income ²				2.29E-08
Income ³	-1.28E-14	2.79E-16		-1.33E-13
Log Income	-7.944			
Median Rent	0.001***		1.055E-04***	0.001***
Median Rent ²				
Median Rent ³	-1.093E-10***			
Number Earners				-0.008***
Number Earners ²	-0.002			
Avg Age Earners				
Avg Age Earners ²			4.32E-06	
Avg Age Earners ³	-1.36E-07		-3.17E-07	
Log Avg Age Earners				
Unmet Accessibility Need	-0.016	0.130***		
Supports Amount	-4.20E-04			
Supports Amount ²				
Supports Amount ³	1.01E-13			
Log Supports Amount				
Supports as Percent of Income				
Supports as Percent of Income ²				
Supports as Percent of Income ³				
Income Plus Supports				0.001
Income Plus Supports ²				-2.11E-08
Income Plus Supports ³	1.31E-14	-3.57E-16		1.24E-13
Log Income Plus Supports	7.034		-0.134***	
Num.Obs.	1919	1950	1954	1665
R2	0.491	0.049	0.22	0.322
R2 Adj.	0.483	0.045	0.218	0.318
AIC	774.2	1573.5	-1875.4	4591.6
BIC	946.5	1634.8	-1836.3	4656.6
Log.Lik.	-356.095	-775.758	944.681	-2283.818

Source: MNBC Housing Needs Survey (2021). **Note:** "+" p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001. Standard errors are robust. Scientific notation is used for numbers smaller than 0.001. Variables without estimates were not selected as predictors in the machine learning process.

Table A5: Post-Lasso Regressions on Housing Satisfaction

	Overall Satisfaction	Adequacy Satisfaction	Affordability Satisfaction	Suitability Satisfaction
Intercept	0.810***	0.902***	0.298	0.702***
Number People	0.009			
Number Métis	-0.034	-0.035	-0.051	0.143***
Lone Parent		-0.115	0.009	
Male Earner Share				
No Male Earners				
Only Male Earners				
Senior		0.216		
Number Seniors	0.009	-0.146		
Infant				
Number Infants				-0.074
Number Métis Children	-0.075	-0.062		-0.105*
Renting	-0.637***	-0.463***	-0.516***	-0.489***
Infant and Senior		1.093*		1.275+
Lone Parent and Senior			0.948	-0.982
Lone Parent and Male Earner Share			-0.399	
Lone Parent and Infant		-0.033	-0.42	-0.492
Infant and Male Earner Share			-0.11	
Senior and Male Earner Share	0.346***	0.119	0.280**	
Renting and Male Earner Share	-0.175*	-0.108	-0.063	-0.158
Lone Parent and No Male Earners				
Infant and No Male Earners				
Senior and No Male Earners				
Renting and No Male Earners				
Lone Parent and Only Male Earners		-0.231		
Infant and Only Male Earners				
Senior and Only Male Earners				
Renting and Only Male Earners				
Infant and Renting	-0.264	-0.089		
Senior and Renting			-0.443**	
Subsidy	0.385**		1.066***	0.118
Lone Parent and Renting				0.355*
Subsidy and Infant		-0.261		-1.390**
Subsidy and Senior	0.382+	0.626***		
Subsidy and Lone Parent				

Subsidy and Male Earner Share				
Subsidy and No Male Earners				
Subsidy and Only Male Earners				0.770*
Income				
Income ²				
Income ³	3.279E-16***	4.132E-16***	-7.87E-16	1.94E-14
Log Income				
Median Rent				-2.639E-04**
Median Rent ²			-1.18E-07	
Median Rent ³	-3.572E-11*	-3.096E-11*	-3.96E-11	
Number Earners			0.085*	0.044
Number Earners ²				0.010
Avg Age Earners				
Avg Age Earners ²			6.42E-06	1.21E-04
Avg Age Earners ³	4.59E-07	4.95E-07	1.54E-06	3.47E-07
Log Avg Age Earners				
Unmet Accessibility Need	-0.305***	-0.415***	-0.293***	-0.292***
Supports Amount				2.43E-04
Supports Amount ²		-9.99E-10		-4.58E-10
Supports Amount ³				
Log Supports Amount				
Supports as Percent of Income				
Supports as Percent of Income ²				
Supports as Percent of Income ³				
Income Plus Supports				
Income Plus Supports ²				
Income Plus Supports ³			1.10E-15	-1.90E-14
Log Income Plus Supports	7.034		-0.134***	
Num.Obs.	1919	1603	1954	1665
R2	0.491	0.145	0.22	0.322
R2 Adj.	0.483	0.138	0.218	0.318
AIC	774.2	4751.5	-1875.4	4591.6
BIC	946.5	4826.8	-1836.3	4656.6
Log.Lik.	-356.095	-2361.732	944.681	-2283.818

Source: MNBC Housing Needs Survey (2021). **Note:** "+" p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001. Standard errors are robust. Scientific notation is used for numbers smaller than 0.001. Variables without estimates were not selected as predictors in the machine learning process. Satisfaction is reported on a scale from -2 to 2.

Table A6: Male Earner Share on Core Housing Need

	No Income Control	With Income Control
Intercept	-0.379	2.52E-01
Number People	-0.003	0.008***
Number Métis	0.005	-2.00E-03
Male Earner Share	-0.046**	1.10E-02
Senior	-0.052+	-0.074**
Infant	-0.030	-1.10E-02
Infant and Senior	0.231	2.34E-01
Renting	0.191***	-3.00E-03
Subsidy	0.124*	-0.113*
Median Rent	0.002+	0.003***
Median Rent ²	-8.13E-07	-1.79E-06**
Median Rent ³	1.40E-10	3.621E-10*
Avg Age Earners	-0.030+	-8.00E-03
Avg Age Earners ²	0.001+	2.00E-04
Avg Age Earners ³	-2.94E-06	-1.64E-06
Income		-4.607E-05***
Income ²		3.732E-10*
Income ³		-9.71E-16
Num.Obs.	1923	1923
R2	0.161	0.483
R2 Adj.	0.155	0.478
AIC	1,578.200	653.3
BIC	1,667.200	758.9
Log.Lik.	-773.092	-307.635

Source: MNBC Housing Needs Survey (2021). **Note:** "+" p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001. Standard errors are robust. Scientific notation is used for numbers smaller than 0.001.

Table A7: Lone-Parent Households on Core Housing Need

	Lone Parent - No income Control	Lone Parent - Income Control	Lone Parent Female Only - No income control	Lone Parent Female Only - Income control
Intercept	-0.219	0.31	-0.237	0.34
Lone Parent	0.260***	0.089**	0.135	0.03
Lone Parent and No Male Earners			0.155	0.083
No Male Earners			0.026+	-0.017
Income		-4.511E-05***		-4.588E-05***
Income ²		3.638e-10*		3.747E-10 *
Income ²		-9.35E-16		-9.84E-16
Number People	-0.001	0.009***	-1.13E-04	0.009***
Number Métis	-0.013	-0.009	-0.011	-0.009
Senior	-0.052	-0.073**	-0.045	-0.073**
Infant	-0.014	-0.004	-0.016	-0.005
Infant and Senior	0.266	0.248	0.269	0.244
Renting	0.181***	-0.005	0.178***	-0.004
Subsidy	0.097+	-0.119*	0.089+	-0.121*
Median Rent	0.001	0.003***	0.001	0.003***
Median Rent ²	-5.60E-07	-1.669e-06**	-5.39E-07	-1.667E-06**
Median Rent ³	7.48E-11	3.317e-10*	6.90E-11	3.308E-10*
Avg Age Earners	-0.033+	-0.009	-0.032+	-0.009
Avg Age Earners ²	0.001+	2.25E-04	0.001+	2.29E-04
Avg Age Earners ³	-3.24E-06	-1.76E-06	-3.24E-06	-1.80E-06
Num.Obs.	1919	1919	1919	1919
R2	0.185	0.486	0.189	0.486
R2 Adj.	0.179	0.481	0.182	0.481
AIC	1516.9	639.9	1512	640.8
BIC	1605.9	745.5	1612	757.6
Log.Lik.	-742.47	-300.936	-737.986	-299.408

Source: MNBC Housing Needs Survey (2021). **Note:** "+" p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001. Standard errors are robust. Scientific notation is used for numbers smaller than 0.001.

Table A8: Overall Satisfaction Discrepancies

	In Core Housing Need and Satisfied	Not in Core Housing Need and Dissatisfied
Intercept	50.96+	-3.19
Number Métis Children	0.04	-0.09
Number of People	-0.56	0.08
Number of Métis	0.28**	0.13
Seniors	-0.54	-0.05
Renting	-1.19**	0.91***
Male Earner Share	-0.70	0.01
Seniors and Male Earner Share	1.09	-1.01**
Renting and Male Earner Share	0.39	0.46
Infants and Renting	-0.21	0.39
Subsidy	0.42	-0.61
Subsidy and Seniors	-0.09	-1.94
Income ³	1.70E-14+	-7.04E-16+
Median Rent ³	-8.90E-11	6.90E-11
Avg Age Earners ³	6.81E-07	-1.30E-06
Unmet Accessibility Need	0.16	0.72***
Log Income plus Supports	-4.76+	0.24
Num.Obs.	392	1447
AIC	6386.1	27888.6
BIC	6453.6	27978.3
Log.Lik.	-3176.059	-13927.288
RMSE	0.47	0.45

Source: MNBC Housing Needs Survey (2021). **Note:** "+" p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001. Logistic regression. Standard errors are robust. Scientific notation is used for numbers smaller than 0.01.

Table A9: Affordability Satisfaction Discrepancies

	In Core Housing Need and Satisfied	Not in Core Housing Need and Dissatisfied
Intercept	13.99*	-0.50
Number Métis	-3.87E-03	0.15***
Single Parent	-0.09	-0.45***
Renting	-0.98***	0.59***
Seniors	0.13	0.23**
Male Earners Share	-0.64*	-0.11*
Single Parent and Seniors	2.87	-0.74*
Single Parent and Male Earners Share	-1.41	0.32+
Seniors and Male Earner Share	0.33	-0.49***
Single Parent and Infants	0.06	13.19
Infants and Male Earner Share	-1.10	0.22+
Renting and Male Earner Share	0.37	0.49***
Seniors and Renting	-0.40	0.50***
Subsidy	1.05*	-1.14***
Income ³	1.31E-13	-8.72E-15*
Median Rent ²	7.48E-07	8.64E-07***
Median Rent ³	-4.72E-10	-3.48E-10***
Number of Earners	0.27+	-0.17***
Number of Earners ²	-2.64E-04	1.46E-04
Number of Earners ³	4.65E-06	-5.76E-06***
Unmet Accessibility Need	-0.48	0.73***
Income Plus Assistance ³	-1.30E-13	8.44E-15*
Log Income plus Assistance	-1.37*	-0.02
Num.Obs.	773	1091
AIC	12900.9	22098.1
BIC	13007.8	22213.0
Log.Lik.	-6427.429	-11026.062
RMSE	0.45	0.46

Source: MNBC Housing Needs Survey (2021). **Note:** "+" p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001. Logistic regression. Standard errors are robust. Scientific notation is used for numbers smaller than 0.01.

Table A10: Adequacy Satisfaction Discrepancies

	In Core Housing Need and Satisfied	Not in Core Housing Need and Dissatisfied
Intercept	0.13	-1.85***
Number Métis Children	-0.69***	0.05
Number Métis	-0.06	0.06
Single Parent	0.73***	0.15
Male Earners Share	-0.07	0.32
Seniors	1.72***	-0.39
Number of Seniors	-1.23***	0.35
Renting	-1.34***	1.31***
Infants and Seniors	NA	-12.80
Single Parent and Infants	2.19***	-0.38
Seniors and Male Earners Share	-0.24	-0.58
Renting and Male Earners Share	0.55**	0.05
Single Parent Male Only	-0.55+	0.48
Infants and Renting	1.01**	0.11
Subsidy	0.60*	-0.06
Subsidy and Infant	-15.31	0.75
Subsidy and Seniors	14.75	-1.13
Income ³	1.01E-15***	-7.15E-16***
Median Rent ³	-8.16E-11***	-8.61E-13
Avg Age Earners ³	9.48E-07*	-3.32E-07
Unmet Accessibility Need	-0.35***	0.70**
Assistance Amount ²	5.90E-08	3.22E-07
Num.Obs.	315	1626
AIC	5528.1	24751.5
BIC	5606.9	24870.1
Log.Lik.	-2743.052	-12353.741
RMSE	0.45	0.41

Source: MNBC Housing Needs Survey (2021). **Note:** "+" p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001. Logistic regression. Standard errors are robust. Scientific notation is used for numbers smaller than 0.01.

Table A11: Suitability Satisfaction Discrepancies

	In Core Housing Need and Satisfied	Not in Core Housing Need and Dissatisfied
Intercept	-0.11	-0.44***
Number Métis Children	0.91***	0.15***
Number of Métis	-0.64***	-0.06*
Number of Infants	0.66***	0.46***
Seniors	-3.06***	-0.20**
Single Parents	16.44	0.48***
Male Earners Share	-2.87***	-0.12*
Renting	-0.09	0.79***
Infants and Senior	23.56	-12.16
Single Parent and Senior	-30.12	1.36***
Single Parent and Infant	-1.86*	0.13
Renting and Male Earner Share	3.11***	0.61***
Subsidy	2.04***	-0.17*
Single Parent and Renting	-17.89	-1.12***
Subsidy and Infant	-16.66	NA
Subsidy and Male Earners Only	NA	-2.06***
Income ³	-3.01E-14	-7.52E-15
Median Rent	-1.20E-03***	-9.16E-06
Number of Maintainers	0.78**	0.13+
Number of Maintainers ²	0.06	-0.02
Age of Maintainers ²	-1.99E-03**	5.41E-05
Age of Maintainers ³	4.62E-05***	-3.03E-06**
Unmet Accessibility Need	-1.30***	0.59***
Assistance Amount	-0.01***	1.05E-03***
Assistance Amount ²	2.11E-06**	-1.56E-06***
Income Plus Assistance ³	3.04E-14	7.00E-15
Subsidy Male Only	NA	-2.064***

	In Core Housing Need and Satisfied	Not in Core Housing Need and Dissatisfied
Num.Obs.	120	1481
AIC	1528.6	26242.4
BIC	1598.3	26374.9
Log.Lik.	-739.312	-13096.184
RMSE	0.38	0.44

Source: MNBC Housing Needs Survey (2021). **Note:** "+" p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001. Logistic regression. Standard errors are robust. Scientific notation is used for numbers smaller than 0.01.

Table A12: Rent Subsidies, Income Assistance and Shelter Cost

	Rent Subsidy	Income Assistance
Intercept	104.452	77.678
Rent Subsidy	-272.77***	
Income Assistance		-243.161***
Income Plus Assistance	0.006***	0.006***
Number Métis	84.027***	86.935***
Number of Earners	140.724***	163.741***
Lone Parent	-105.217	-95.041
Median Rent	0.533***	0.523***
Senior	-23.54	-70.547
Infants and Seniors	5.776	32.448
Num.Obs.	994	994
R2	0.327	0.326
R2 Adj.	0.322	0.32
AIC	15678	15680.3
BIC	15727	15729.3
Log.Lik.	-7829.003	-7830.157

Source: MNBC Housing Needs Survey (2021). **Note:** "+" p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001. Standard errors are robust. Scientific notation is used for numbers smaller than 0.001.

Table A13: Rent Subsidies, Income Assistance and Shelter Cost

	Shelter Cost	Beds Needed	Inadequate Housing	Core Housing Need
Intercept	-4326.849***	-0.111	0.027	-0.400***
Market Rentals	379.426***	-0.06	0.04	0.295***
Log Income Plus Assistance	407.265***			
Number Métis	79.666***	-0.014	0.068***	
Number of Earners	135.857***	-0.064		
Lone Parent	-109.799		-0.039	0.098*
Median Rent	0.544***			4.691e-04***
Senior	-19.114			
Infants and Senior	-13.998	2.601*		0.37
Income Plus Assistance		-7.495e-06 ***	-8.455e-07*	
Infant		0.573***		
Median Rent ³		1.634e-10***		
Seniors and Renting			-0.055+	
Unmet Accessibility Need			0.070+	
Infants and Male Earner Share			-0.144*	
Shelter Cost				1.853e-05*
Number of People				0.005
Income Plus Assistance ³				-5.679E-16***
Subsidy				0.123*
Num. obs.	994	882	941	978
R2	0.338	0.146	0.054	0.395
R2 Adj.	0.332	0.139	0.047	0.39
AIC	15662.1	2388.5	628.6	847.1
BIC	15711.1	2431.5	672.2	896
Log.Lik	-7821.031	-1185.229	-305.277	-413.562
Std.Errors	HC3	HC3	HC3	HC3

Source: MNBC Housing Needs Survey (2021). **Note:** "+" p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001. Standard errors are robust. Scientific notation is used for numbers smaller than 0.001.

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