Burning Concerns:

Assessing Residential Indoor Wood Burning Bylaw Outcomes for Vulnerable Populations within Metro Vancouver

Using data analysis & GIS mapping to assess the impact of residential indoor wood burning regulation & public education on vulnerable populations

August 2025

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Disclaimer

This report was produced as part of the UBC Sustainability Scholars Program, a partnership between the University of British Columbia and various local governments and organisations in support of providing graduate students with opportunities to do applied research on projects that advance sustainability and climate action across the region.

This project was conducted under the mentorship of Metro Vancouver staff. The opinions and recommendations in this report and any errors are those of the author and do not necessarily reflect the views of Metro Vancouver or the University of British Columbia.

Territorial Acknowledgment

The author would like to begin by acknowledging that the land on which this work took place is the unceded territory of the Coast Salish Peoples, including the territories of the xʷməθkwəy̓əm (Musqueam), Skwxwú7mesh (Squamish), and səlilwətaɬ/Selilwitulh (Tsleil-Waututh) Nations.

List of Abbreviations:

ADA - Aggregate dissemination area
CA - Census Agglomeration
CMA - Census Metropolitan Area
CSD - Census Subdivision
CT - Census Tract
DA - Census Dissemination Areas
ER&E - Metro Vancouver Environmental Regulation and Enforcement
MVRD - Metro Vancouver Regional District
$PM_{2.5}$ - Fine particulate matter
RIWB - Residential Indoor Wood Burning
UCB - Urban Containment Boundary

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Executive Summary

This report examines spatial patterns of public education and participation for Metro Vancouver's Residential Indoor Wood Burning (RIWB) Bylaw 1303, with a focus on identifying gaps in engagement among vulnerable and marginalized populations. Bylaw 1303 was adopted in 2020, with the aim of reducing emissions from RIWB and mitigating the impacts of wood smoke on health and the environment. The analysis presented in this report used 2021 Statistics Canada Census data to examine how declared wood-burning devices, woodsmoke complaints, and Environmental Regulation and Enforcement (ER&E) outreach areas are distributed across the region. These spatial distributions were compared with socioeconomic and demographic characteristics to identify participation trends and assess equity implications.

Census tracts in which residents participated in the RIWB system and received ER&E outreach exhibited, on average, higher rates of official language speakers, single detached dwellings, and higher median income. These findings highlight probable disparities in engagement with Bylaw 1303, suggesting potential barriers for certain communities, including language and housing-related factors. This analysis supports a need to develop an environmentally just approach to policy implementation, highlighting opportunities for further public education and outreach activities targeted at equity-deserving groups.

1 Introduction

1.1 Background and Project Objectives

Residential indoor wood burning is responsible for more than a quarter of emissions of $PM_{2.5}$ within the Metro Vancouver region. This air contaminant is associated with respiratory and cardiac issues, particularly for infants, the elderly, and people with existing heart and lung conditions. Wood smoke also contains toxic air contaminants and the potential for harm may increase depending on the type of material being burned. The health impacts of residential indoor wood burning come with significant costs. The monetized value of total health impacts attributed to home firewood burning has been estimated to be $18 billion nationally in a study by Health Canada (Health Canada, 2023). Furthermore, marginalized groups may experience poorer health outcomes from exposure to degraded air quality than the rest of the population (Giang & Castellani, 2020; Health Canada, 2023).

As climate-related pressures on air quality increase, regulatory actions continue moving forward to reduce controllable emissions of air contaminants. Metro Vancouver's Residential Indoor Wood Burning Emission Regulation Bylaw 1303 (Bylaw 1303) aims to reduce emissions from residential indoor wood burning (RIWB) and mitigate the impacts of wood smoke on health and the environment. Bylaw 1303 regulates the discharge of air contaminants from residential indoor wood-burning appliances (devices) such as fireplaces, wood stoves, pellet stoves, and furnaces. Implementing Bylaw 1303 is a Big Move in Metro Vancouver's Clean Air Plan, and is expected to make a significant contribution to achieving the 2030 target of reducing fine particulate matter ($PM_{2.5}$) by 35%, from 2020 levels (Metro Vancouver, 2021).

Metro Vancouver receives enquiries from residents who are concerned about accessing information about the requirements of Bylaw 1303. In addition, marginalized groups may have fewer options to access cleaner heating options that improve air quality. This project may help Metro Vancouver identify potential gaps in the expected community health and environmental protection benefits of Bylaw 1303, with an emphasis on environmental justice considerations. The findings of the project are also expected to provide Metro Vancouver's compliance promotion team with insights into how to provide better service to vulnerable populations.

This project involved comparing the geographic distribution of the regulatory submissions received by Metro Vancouver that are a requirement under Bylaw 1303 and the locations of vulnerable or underserved populations. It used GIS methods to compare the geographic distribution of socio-demographic characteristics with submissions received by Metro Vancouver, along with areas that have received woodsmoke complaints and been the target of outreach activities. The aim was to identify areas of the region at risk of the anticipated

community health and environmental protection benefits of Bylaw 1303 not being fully realized. The work is expected to support Metro Vancouver in assessing the effectiveness of Bylaw 1303 and its implementation with a focus on identifying communities and populations in the region that may be underserved by ongoing education and outreach activities. An anticipated outcome of the project is to provide insights to Metro Vancouver's compliance promotion team so they can be better informed about how to improve service to these communities and populations.

1.2 Public Awareness of Bylaw 1303

Adopted in March 2020, Bylaw 1303 necessitates compliance with best-burning practices, which include using clean seasoned wood, not allowing fires to smoulder, not burning garbage, plastic, or treated wood, properly inspecting and maintaining devices, and burning hot, small fires. Bylaw 1303 also involves a seasonal prohibition, with an annual ban on using residential indoor wood-burning devices from May 15 to September 15, with some exceptions.

To minimize the impacts of residential wood smoke in the region, owners and operators of residential indoor-wood-burning appliances are required to comply with Bylaw 1303 and submit a declaration of compliance with best burning practices. In specified circumstances, owners and operators are also required to register wood-burning devices that are in use. This can be achieved through the Metro Vancouver RIWB Online Declaration and Registration System. There are also operational restrictions, from September 2025, with unregistered devices in urban areas being prohibited from operation except during emergencies or if the device is used in a low income household.

Bylaw 1303 provides a valuable framework for reducing residential woodsmoke and mitigating the negative impacts on public health and the environment. However, it is necessary to consider how the operationalization and enforcement may disproportionately impact various groups, and identify potential gaps in the expected community health and environmental protection benefits. Applying an equity and environmental justice lens to policy implementation is key to ensuring that marginalized and underserved populations are aware of such regulatory changes and implications for their behaviour and health. This project aims to measure the extent to which different socio-demographic groups, including socially vulnerable populations, have been reached by the MVRD outreach activities. Additionally, it aims to explore whether marginalized populations are possibly disproportionately exposed to wood smoke from residential indoor wood burning.

A 2024 report, compiled by the Mustel Group for the BC Lung Foundation, included findings from a province-wide survey regarding the use of wood-burning appliances, and specific

insights regarding Metro Vancouver and Bylaw 1303. The report, indicated that residents in Metro Vancouver and the Fraser Valley were the least "likely to be concerned about the health-related impacts of chimney smoke, but the most likely to express concern for impact to the environment" (Mustel Group, 2024). When asked to rate the perceived level of air pollution from four potential contributors, residents of Metro Vancouver were less likely to view wood burning as a high contributor to air pollution than residents living in rural areas. In quantifying awareness of Bylaw 1303, the authors found that only 16% of Metro Vancouver residents report being aware of it. Unsurprisingly, awareness is considerably higher among wood-burning households in the region (29% aware compared with 15% of non-wood-burning households) (Mustel Group, 2024).

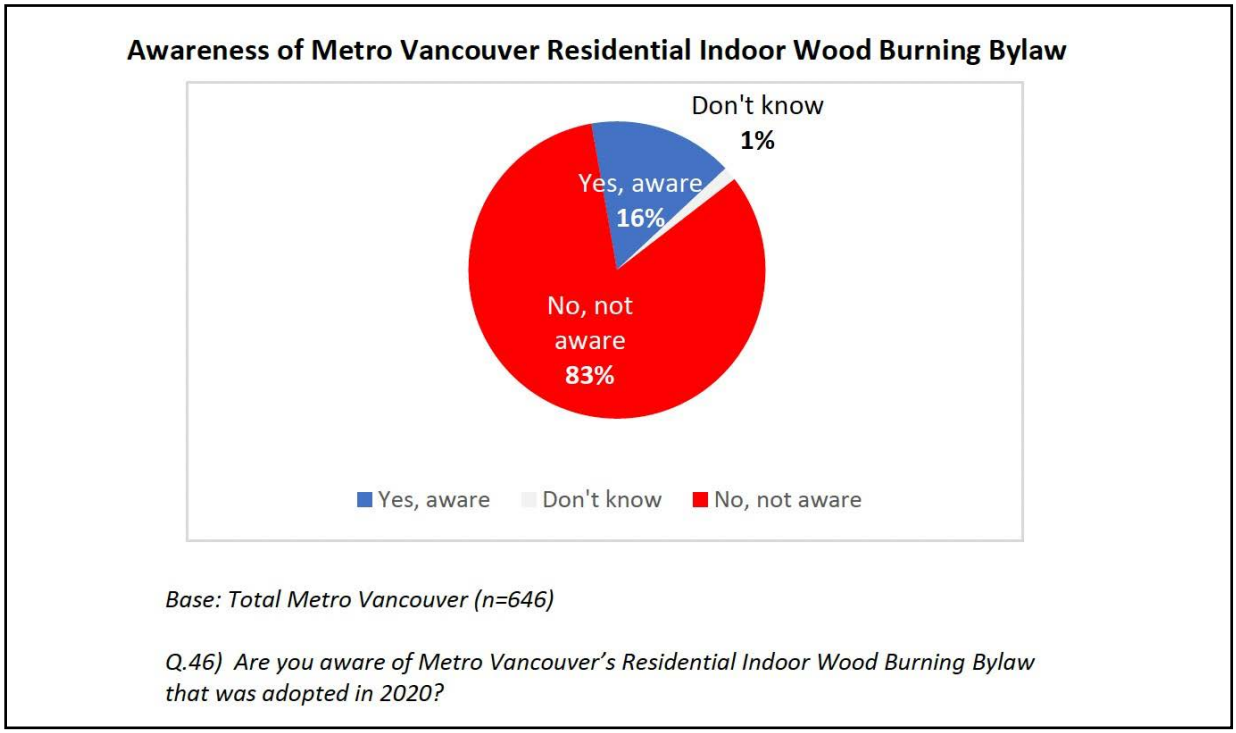

Figure 1. Pie Chart representing the proportion of survey respondents who are aware of the Metro Vancouver Residential Indoor Wood Burning Bylaw. (Mustel Group, 2024).

Additionally, among the 16% of Metro Vancouver residents aware of the RIWB Bylaw, "the majority are aware of the requirement to comply with best burning practices (75%) and the residential wood burning prohibition between May 15 and September 15 every year (60%). However, awareness of the other requirements is lower, with just one-half aware of the need to register wood burning equipment in use (51%), four-in-ten aware of the need to submit a declaration of best burning practices before using an appliance (40%), and just three-in-ten aware of upcoming prohibition on the use of unregistered residential wood burning appliances in urban areas (31%)" (Mustel Group, 2024).

These findings highlight a limited awareness of Bylaw 1303 across large swaths of Metro

Vancouver's population at the time the survey was conducted, with a narrow public understanding of the extent to which woodsmoke poses a risk to air quality. While the report prepared for the BC Lung Foundation offers insights at the regional level and compares Metro Vancouver with other areas of B.C., this analysis focuses on identifying spatial patterns at a finer geographic scale. Specifically, evaluating the spatial distribution of multiple socio-demographic variables within Metro Vancouver, and their level of engagement with Bylaw 1303.

1.3 Vulnerability

In addition to geographic hazards and physical exposure that contribute to risk, social vulnerability is shaped by underlying societal conditions and socio-demographic characteristics. Established characteristics of social vulnerability include age, gender, race, and socioeconomic status (Cutter et al., 2003). Other characteristics identify special needs populations or those that lack the normal social safety nets, such as the physically or mentally challenged, non-English speakers, and unhoused populations. The quality of housing types, infrastructure, and the built environment is also important in understanding social vulnerability (Cutter et al., 2003).

While social vulnerability is often described in terms of individual characteristics, it is inherently linked to systemic social inequalities, conditions that shape differential exposure to harm, and constrain adaptive capacity across population groups. (Cutter et al., 2003). It is often the outcome of deeply rooted inequities, predisposing certain populations within a community to bear a disproportionate burden of environmental risks (Journeay et al., 2022). By evaluating the underlying characteristics of social systems, it is possible to anticipate where people are likely to live within a community, as well as their differential exposure to known hazard threats and varying levels of access to resources and services.

Other factors that influence social vulnerability include lack of access to resources (including information, knowledge, and technology); limited access to political power and representation; social capital, including social networks and connections; beliefs and customs; building stock and age; physically limited individuals; and type and density of infrastructure. It also includes place inequalities - those characteristics of communities and the built environment, such as the level of urbanization, growth rates, and economic vitality, that contribute to the social vulnerability of places (Cutter et al., 2003).

2 Methodology

2.1 Data Sources: Statistics Canada, Census of Population (2021)

The Statistics Canada Census of Population (2021) was used to derive socio-demographic data for Metro Vancouver at the Census Tract level. The comprehensive dataset was downloaded and filtered to include tracts within the Vancouver Census Metropolitan Area, which approximates the administrative boundaries of Metro Vancouver. These tabular datasets were then spatially joined with the corresponding cartographic boundary files for mapping and spatial analysis.

2.1.1 Census Geography

The census geographic units of Canada are defined by Statistics Canada and used to conduct the Census of Population every five years. In British Columbia, the 27 provincial regional districts serve as Census Subdivisions (CSD). The Metro Vancouver Regional District (MVRD) is the province's most populous subdivision with 2,642,825 residents in 2021 (Statistics Canada, 2023). Due to its large population, the MVRD is afforded the designation of a Census Metropolitan Area (CMA). A CMA is a grouping of census subdivisions or municipalities that comprise a large urban area, with a population of at least 100,000. A Census Agglomeration (CA) is a smaller version of a CMA, with a core population of at least 10,000 but less than 100,000. CMAs and CAs are further subdivided into Census Tracts (CT) and Census Dissemination Areas (DA). DAs are the smallest standard geographic area for which all census data are disseminated. (Statistics Canada, 2023). Aggregate Dissemination Areas (ADA) are created by grouping existing dissemination geographic areas, including CTs, CSDs, or DAs.

2.1.2 Geographic Scale

CTs are small, relatively stable geographic areas that usually have a population of fewer than 7,500 persons (Statistics Canada, 2023). This geographic scale was utilized as it supports the identification of localized spatial patterns within municipalities across Metro Vancouver, while remaining sufficiently broad for visual clarity and ease of interpretation. There are 535 CTs located in Metro Vancouver. **Figure 2** displays the distribution of CTs within the MVRD administrative boundaries, along with the Urban Containment Boundary (UCB). **Figure 3** displays population density across the Metro Vancouver CTs.

CT boundaries are initially delineated by a committee of local specialists (such as municipal planners) in conjunction with Statistics Canada. Once established, CT boundaries are maintained regardless of whether the core population of the CMA or CA in which they are

situated declines below 50,000 (Statistics Canada, 2023). Changes to CT boundaries are discouraged to ensure data comparability between censuses, with revisions occurring only when essential. For example, road construction, railroad abandonment, community redevelopment, neighbourhood growth and municipal annexations may contribute to changes in boundaries, often with input from local specialists. A CT may be split into two or more new CTs (usually when its population exceeds 7,500). CT splits are usually done in a way that allows users to re-aggregate the splits to the original CT for historical comparison (Statistics Canada, 2023).

According to Statistics Canada (2023), a series of rules is used to delineate CTs. The initial delineation rules are ranked in the order of the following priorities:

1. CT boundaries must follow permanent and easily recognizable physical features. However, street extensions, utility or transportation easements, property lines and former municipal limits may be used as CT boundaries if physical features are not in close proximity or do not exist.
2. Starting with the 2016 Census, CT boundaries must follow the boundaries of the census subdivision (CSD) types associated with the on-reserve First Nations population.
3. The population of a CT usually ranges between 2,500 and 7,500, with a preferred average of 5,000. CTs on reserves, in the central business district, in major commercial and industrial zones, or in peripheral areas can have populations outside this range.
4. CTs should be as homogeneous as possible in terms of socioeconomic characteristics, such as similar economic status and social living conditions, at the time of their creation.
5. The shape of CTs should be as compact as possible.
6. CT boundaries respect aggregate dissemination area (ADA), census metropolitan area (CMA), census agglomeration (CA) and provincial boundaries, but do not necessarily respect CSD (municipality) boundaries.

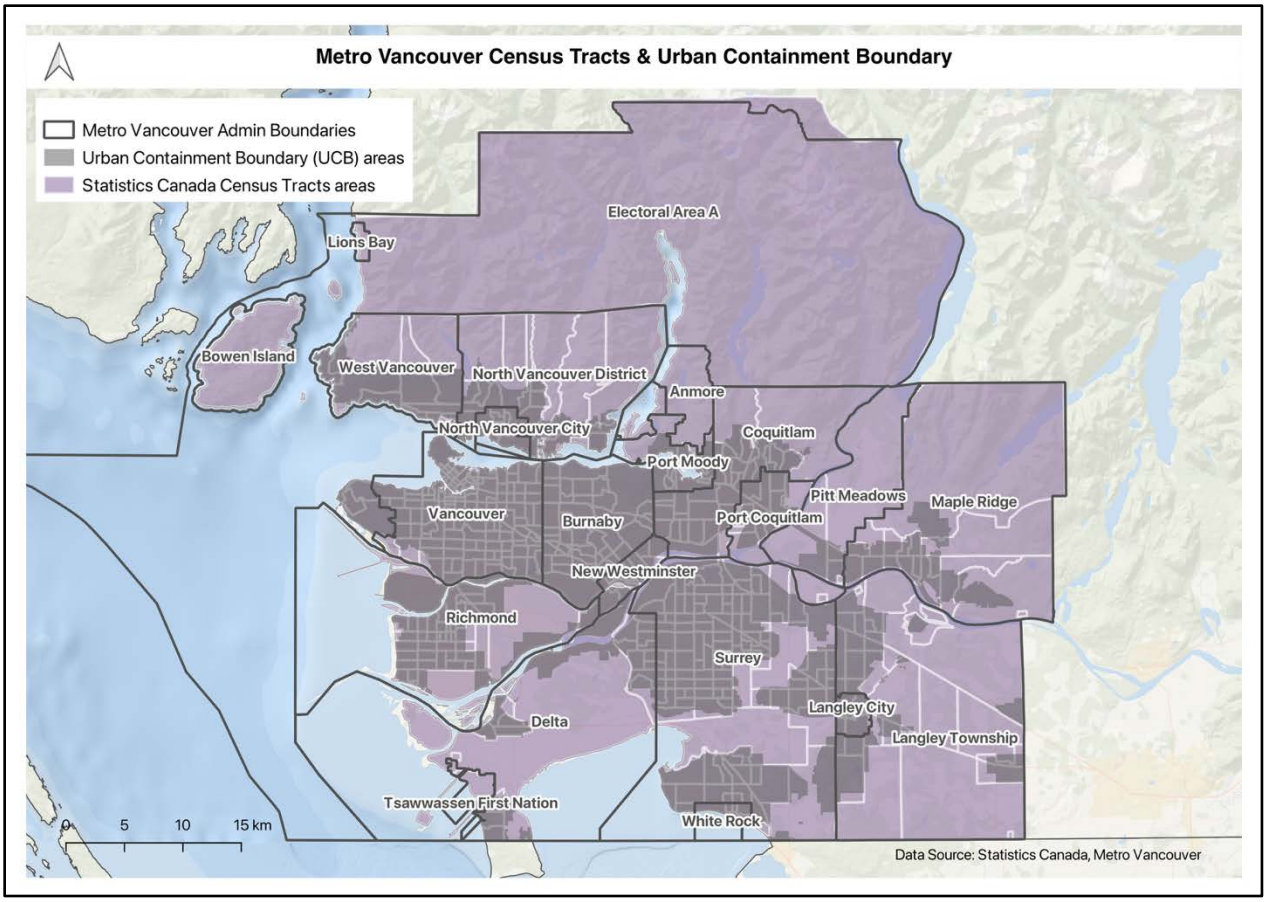

Figure 2. Map displaying Metro Vancouver Reginal District administrative boundaries, Urban Containment Boundary (UCB), and Statistics Canada Census Tract (CT) boundaries.

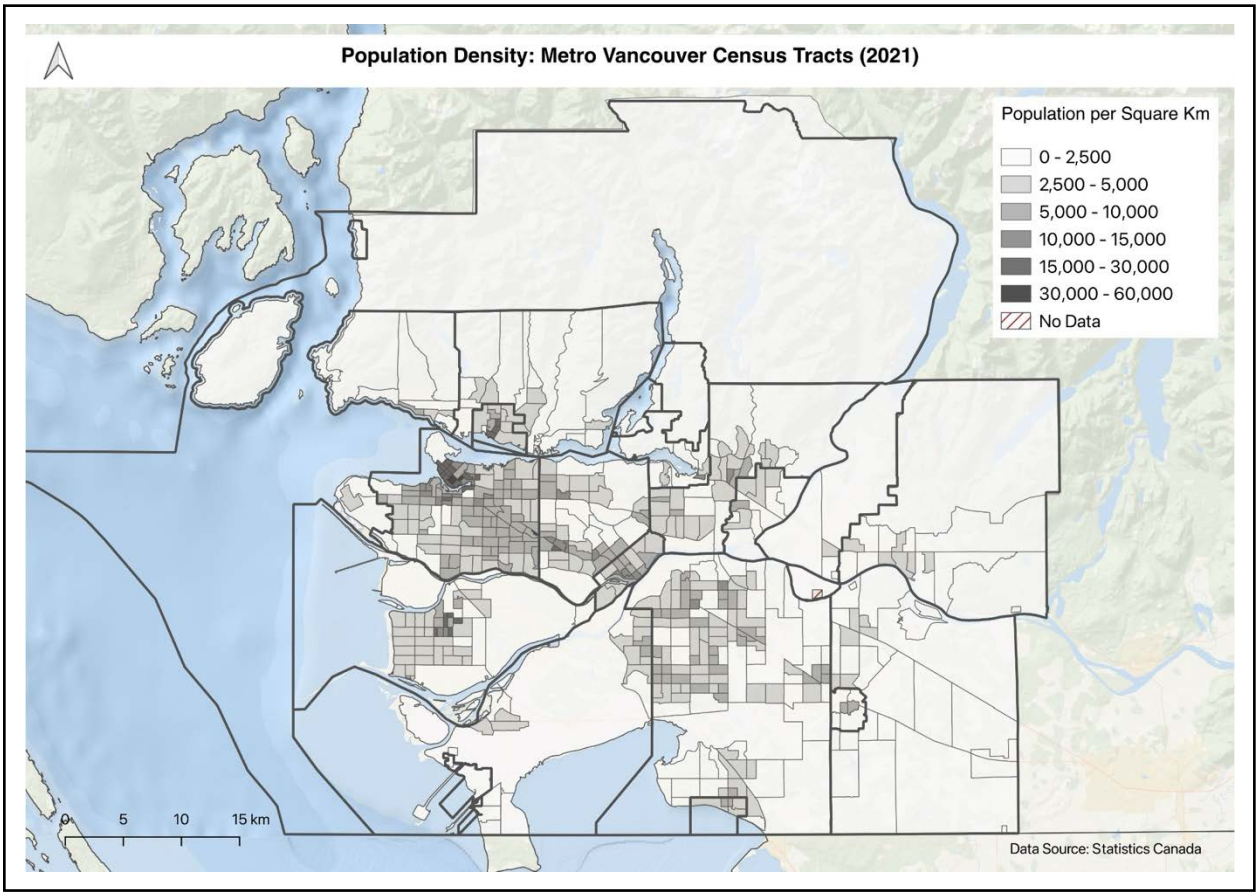

Figure 3. Census tract-level distribution of population density in Metro Vancouver. Data are derived from the Statistics Canada, 2021 Census of Population.

2.1.3 Naming Conventions for Census Tracts

Each CT is assigned a seven-character numeric 'name' (including leading zeros, decimal point and trailing zeros). To uniquely identify each CT in its corresponding CMA or CA (census agglomeration, the three-digit CMA or CA code must precede the CT name (Statistics Canada, 2023). For example:

CMA/CA code and CT name	**CMA/CA name**
933 0005.00	Vancouver CMA (B.C.)

2.1.4 Census Characteristics

The census data was subset to nine characteristics of interest, with a focus on population groups who may be under- or overrepresented in engagement related to RIWB activities. These characteristics pertain to age group, income level, rates of non-official language speakers, indigenous identity, housing form, and tenure. The analysis aims to identify the spatial

distribution of socially vulnerable populations who may be disproportionately affected by non-compliance with Bylaw 1303. The specific census characteristics evaluated in this analysis are identified in **Table 1** below. These characteristics are derived from both the short-form and long-form census questionnaires, which are administered to 100% and 25% of private dwellings, respectively.

Table 1 : Census Characteristics		
Census Characteristic Name	**Census Characteristic ID**	**Unit of Measurement**
Distribution (%) of the population by broad age groups - 100% data		
Age 0 to 14	Characteristic ID: 35	Percentage (%)
Age 65 and Over	Characteristic ID: 37	Percentage (%)
Age 85 and Over	Characteristic ID: 38	Percentage (%)
Occupied private dwellings by structural type of dwelling - 100% data		
Single-detached house	Characteristic ID: 42	Percentage (%)
Income statistics for economic families in private households - 100% data		
Median total income of the economic family in 2020 ($)	Characteristic ID: 302	CAD ($)
Knowledge of official languages for the total population, excluding institutional residents - 100% data		
Neither English nor French	Characteristic ID: 387	Percentage (%)
Indigenous identity for the population in private households - 25% sample data		
Indigenous identity	Characteristic ID: 1403	Percentage (%)
Private households by tenure - 25% sample data		
Owner	Characteristic ID: 1415	Percentage (%)
Renter	Characteristic ID: 1416	Percentage (%)

According to Statistics Canada, a single-detached house refers to a single dwelling not attached to any other dwelling or structure (except its own garage or shed). A single-detached house has open space on all sides and has no dwellings either above it or below it. A mobile home fixed permanently to a foundation is also classified as a single-detached house (Statistics Canada, 2023). Other structural dwelling types identified by Statistics Canada but not included in this analysis include semi-detached house, row house, apartment or flat in a duplex, an apartment in a building that has fewer than five storeys, an apartment in a building that has five or more storeys, or mobile dwellings.

Economic family refers to a group of two or more persons who live in the same dwelling and are related to each other by blood, marriage, common-law union, adoption or a foster relationship. In the context of economic families, total income refers to receipts from certain sources of all of its family members, before income taxes and deductions, during a specified reference period. For the 2021 Census, the reference period for income data is the calendar year 2020, unless otherwise specified (Statistics Canada, 2023)

Knowledge of official languages refers to whether the person can conduct a conversation in English only, French only, in both or in neither language. For a child who has not yet learned to speak, this includes languages that the child is learning to speak at home (Statistics Canada, 2023).

Indigenous identity for the population in private houses includes the percentage of persons who “identify as First Nations (North American Indian), Métis and/or Inuk (Inuit) and/or those who report being Registered or Treaty Indians (that is, registered under the Indian Act of Canada), and/or those who report having membership in a First Nation or Indian band” (Statistics Canada, 2023). Statistics Canada specified that “users should be aware that the estimates associated with this variable are more affected than most by the incomplete enumeration of certain reserves and settlements in the Census of Population” (Statistics Canada, 2023).

Tenure refers to whether the household owns or rents their private dwelling. The private dwelling may be situated on rented or leased land or be part of a condominium. A household is considered to own their dwelling if some member of the household owns the dwelling, even if it is not fully paid for. A household is considered to rent their dwelling if no member of the household owns the dwelling. A household is considered to rent that dwelling even if the dwelling is provided without cash rent or at a reduced rent, or if the dwelling is part of a cooperative. For historical and statutory reasons, shelter occupancy on Indian reserves or settlements does not lend itself to the usual classification by standard tenure categories. Therefore, a special category, 'dwelling provided by the local government, First Nation or

Indian band,' has been created for census purposes. (Statistics Canada, 2023).

2.2 Data Sources: Metro Vancouver RIWB Datasets

Three internal Metro Vancouver datasets were used to measure instances and locations of public engagement with the bylaw, including **1) submissions of wood-burning appliances**, **2) outreach areas**, and **3) woodsmoke complaints** received. The locations of these activities were derived from internal Metro Vancouver datasets, comprised of anonymized address locations and associated attribute data (such as date, status, etc.). Address data was provided at the 100- block level to protect the privacy of residents, and no identifying information was used during the analysis.

2.2.1 Submissions

Submissions refer to the approximate locations where owners and operators of residential indoor wood-burning appliances have submitted a declaration of compliance with best burning practices or registered the wood-burning device, if applicable. A total of 3,665 submissions were considered in this analysis. CTs with submissions include those with at least one submission to the RIWB System, which includes declarations and registrations. When a declaration was submitted with a registration for a home, this was counted as one submission.

2.2.2 Outreach Areas

Outreach Areas refer to the approximate locations in which outreach has been performed by Environmental Regulation and Enforcement (ER&E) staff. This includes the distribution of rack cards and door hangers, in-person conversations and phone calls with staff, but does not include bulk emailing. The outreach areas dataset comprised 510 observations. This dataset was accessed on June 19, 2025.

2.2.3 Woodsmoke Complaints

Woodsmoke complaints identify approximate locations of suspected sources of smoke. The complainant has provided an address for the suspected origin point of the residential woodsmoke. These addresses are subjective and not necessarily reflective of the precise origin point. Additionally, not all observations in the dataset represent unique complaints, seeing as the same individual may report the same complaint multiple times. For example, the CT with the greatest number of complaints (165) is located along the boundary of Coquitlam and Pitt Meadows and included multiple entries for one suspect address, from one complainant.

2.3 Mapping

Mapping activities were carried out using QGIS and Google Earth Pro. Each of the anonymized Metro Vancouver datasets was spatially referenced and prepared for mapping using the geocoding feature in Google Earth Pro. This process involved using the anonymized address, municipality, and Forward Sortation Area (FSA) to generate approximate point locations, which were then aggregated and summarized by CT. The output product was a series of polygons with a count attribute representing the prevalence of each activity within the spatial delineation of the Statistics Canada datasets.

2.4 Statistical Analysis

A t-test of means was conducted to compare socio-demographic characteristics between CTs with and without each RIWB activity. The CTs were grouped based on the presence or absence of submissions, outreach areas, and woodsmoke complaints. This analysis assessed whether differences in mean census tract values between these groups were statistically significant for each socio-demographic characteristic.

3 Results

3.1 Census Data Distribution

Figure 4 visualizes the distribution of each census characteristic across the Metro Vancouver CTs in a series of histograms. Each histogram corresponds to a unique census characteristic where the y-axis represents the number of CTs with a given value. Several of the CT characteristics were found to have a relatively normal distribution, while others were more skewed. For example, a high number of CTs had a very low percentage of single detached dwellings and Indigenous identifying population.

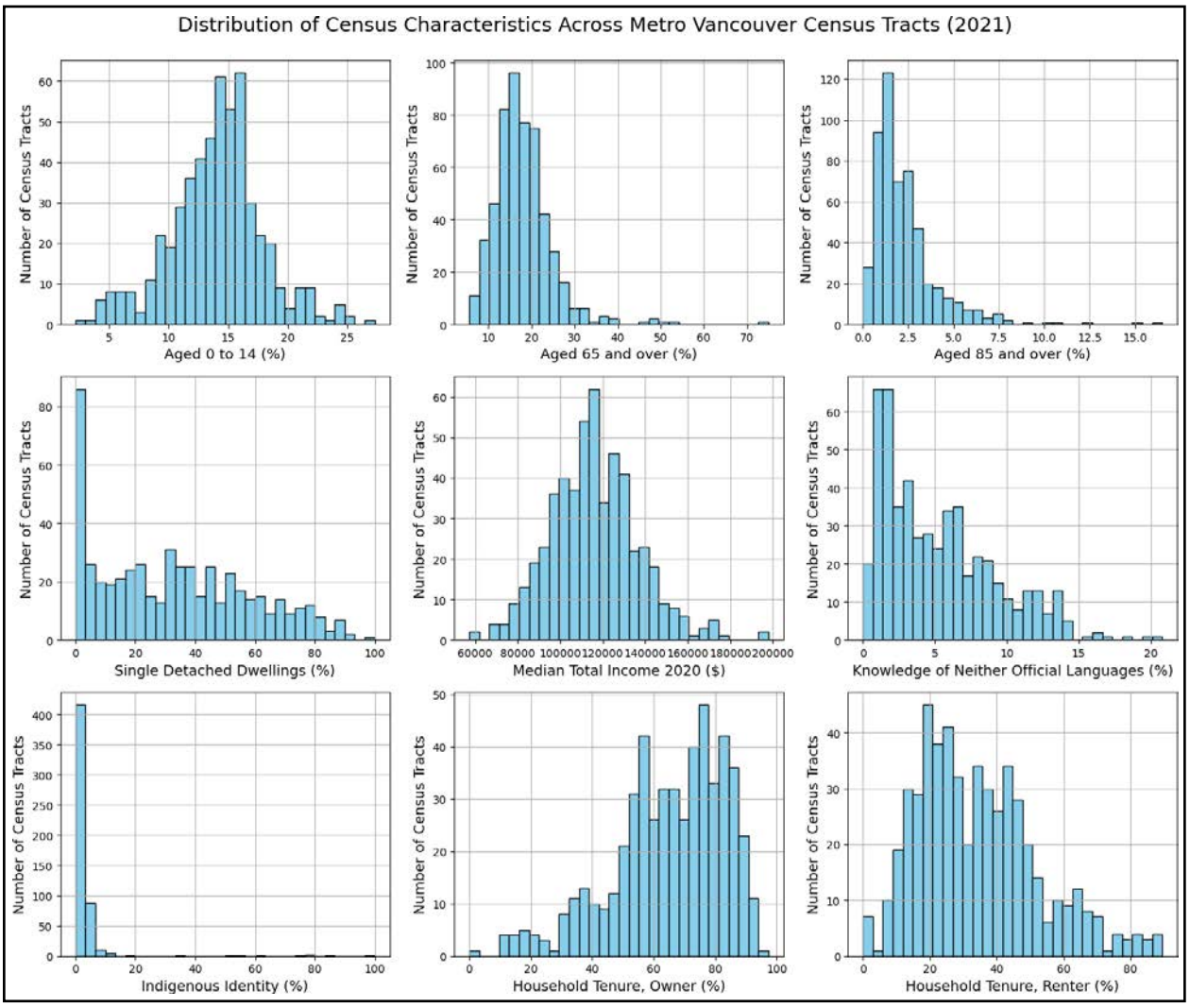

Figure 4. Histograms representing the distribution of each census characteristic included in this analysis across the Metro Vancouver Census Tracts. Data are derived from the Statistics Canada, 2021 Census of Population.

3.2 Maps: Census Data

3.2.1 Aged 0 to 14

Three broad age groups were identified to evaluate the proportion of children and older adults in each CT: those aged 0 to 14, 65 and over, and 85 and over. **Figure 5** represents the CT-level distribution of population aged 0 to 14 Metro Vancouver. The mean value for all Metro Vancouver CTs is 14.04% and there are six CTs with no data available. The CTs with the largest proportion of children in this age demographic are in Coquitlam, with 25.40% and 27.3% each. There are 12 CTs with less than or equal to 5% population in this age group, 10 of which are located in the City of Vancouver, primarily near the downtown peninsula.

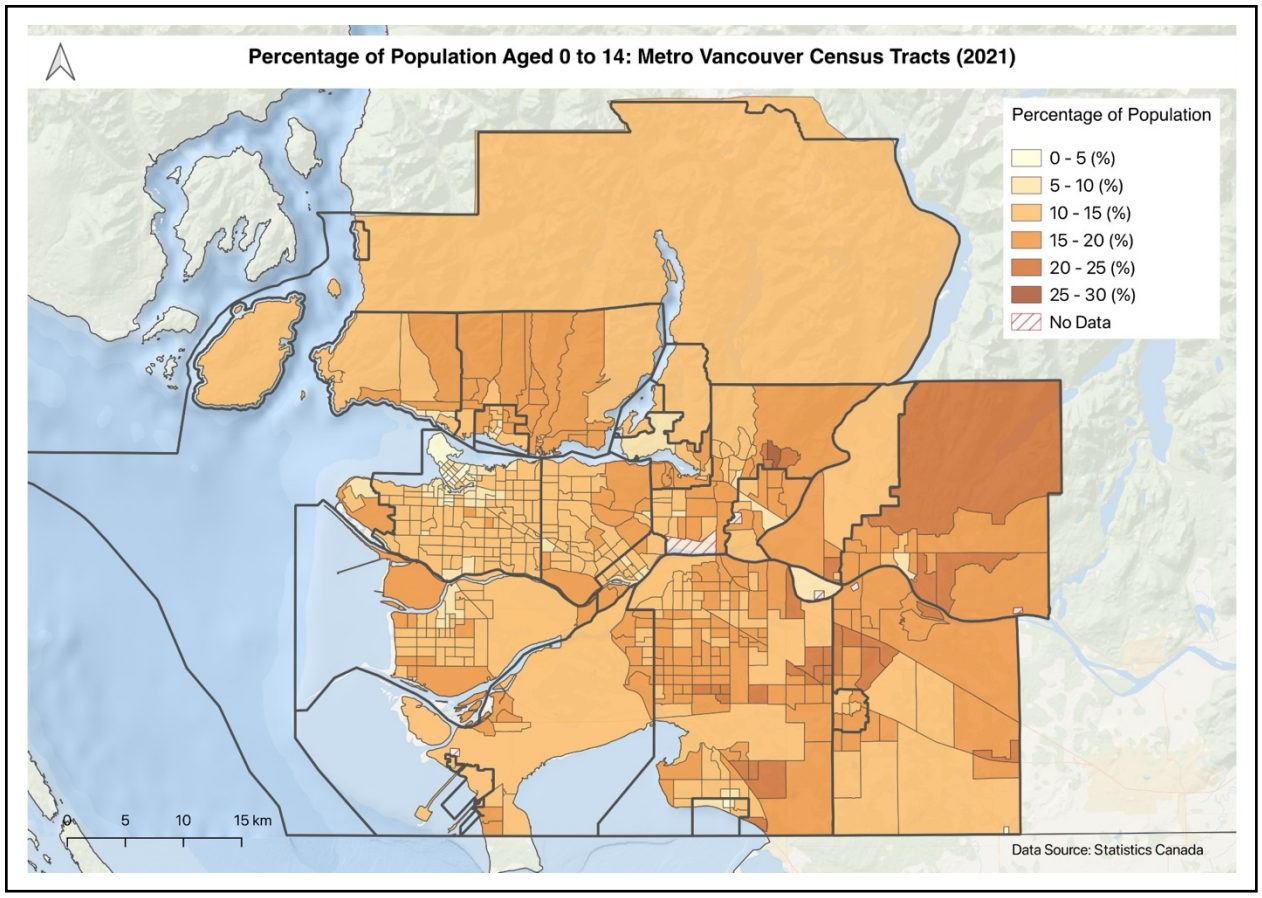

Figure 5. Census tract-level distribution of population aged 0 to 14 in Metro Vancouver. Data are derived from the Statistics Canada, 2021 Census of Population.

3.2.2 Aged 65 and Over

Figure 6 represents the CT-level distribution of population aged 65 and over in Metro Vancouver. The mean value for all Metro Vancouver CTs is 17.96% and there are six CTs with no data available. The CT with the highest proportion is the Matsqui 4 Indian reserve, situated adjacent to Langley Township, with a percentage of 75%. The other CTs with greater than 50% of the population aged 65+ are located in West Vancouver and Surrey, near the boundary with White Rock.

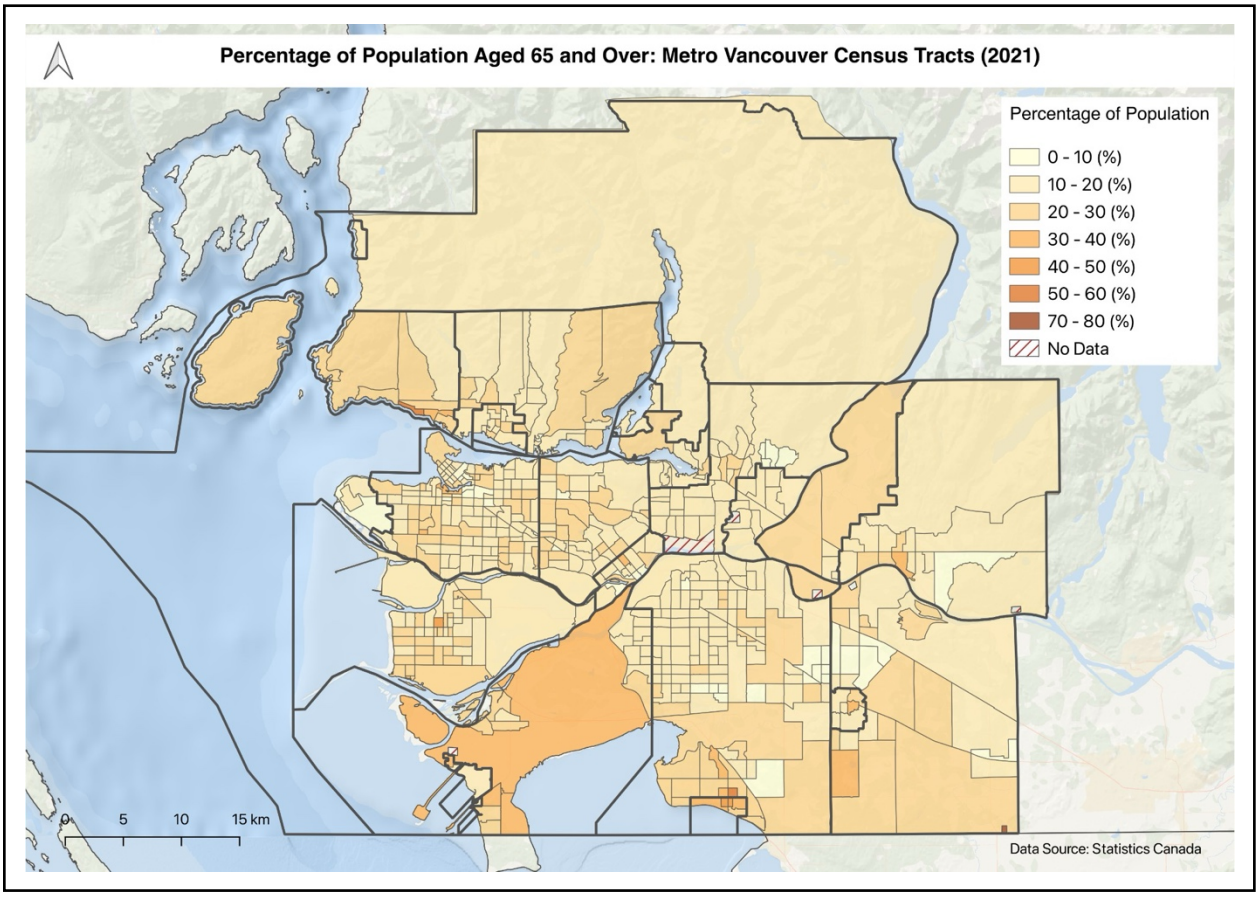

Figure 6. Census tract-level distribution of population aged 65 and over in Metro Vancouver. Data are derived from the Statistics Canada, 2021 Census of Population.

3.2.3 Age 85 and Over

Figure 7 represents the CT-level distribution of population aged 85 and over in Metro Vancouver. The 85 and over group is a subset of the 65 and over category. The mean value for all Metro Vancouver CTs is 2.23% and there are six CTs with no data available. The CTs with the highest proportion of the population aged 85+ are located in South Surrey and West Vancouver, with 16.5% and 15.4% respectively. The vast majority of CTs (371 of 535) have a percentage of less than or equal to 2.5%.

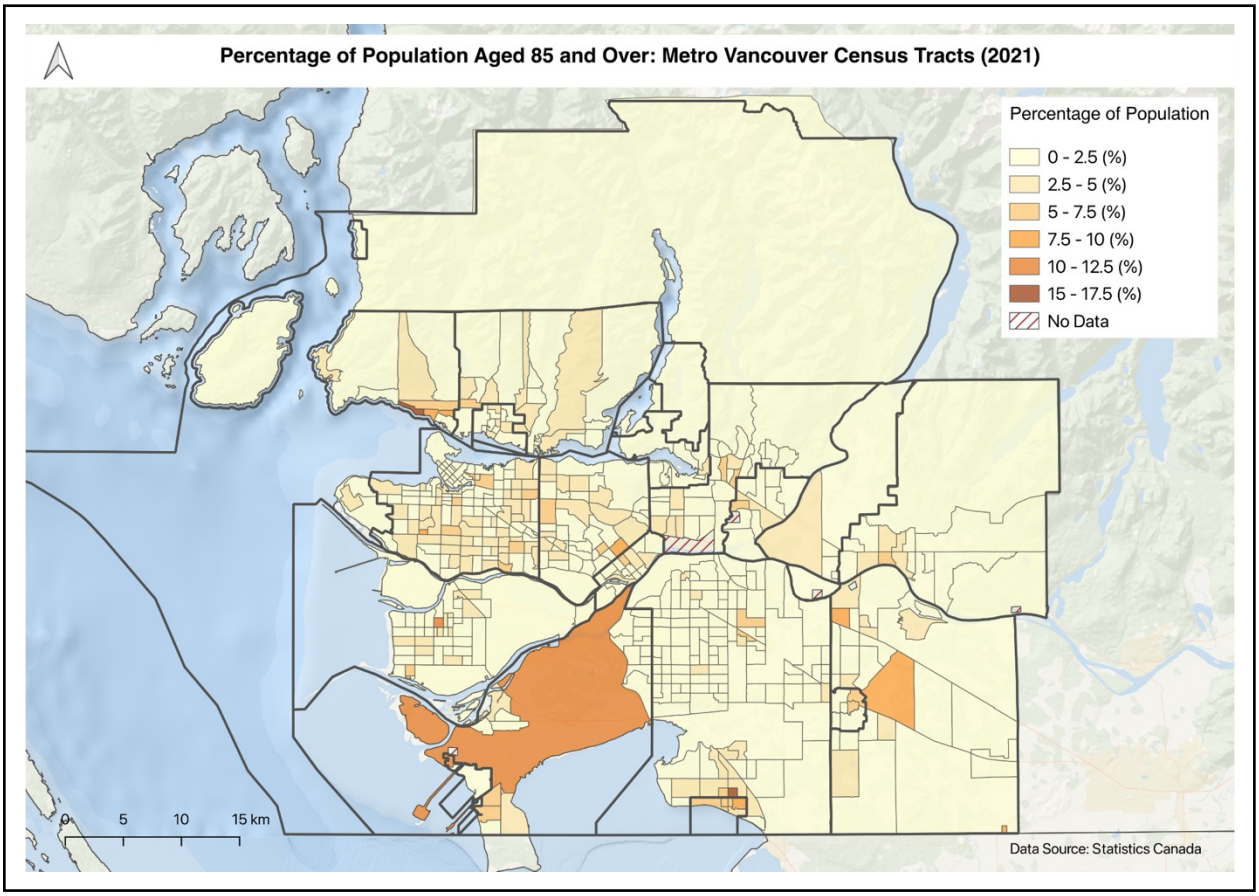

Figure 7. Census tract-level distribution of population aged 85 and over in Metro Vancouver. Data are derived from the Statistics Canada, 2021 Census of Population.

3.2.4 Structural type of dwelling: Single Detached House

Figure 8 represents the CT-level distribution of single detached dwellings in Metro Vancouver. The mean value for all Metro Vancouver CTs is 32.79% and there are six CTs with no data available. There are 66 CTs with less than 1% single detached homes, 21 of which report 0%. There are 20 CTs that report greater than 80% single detached dwellings.

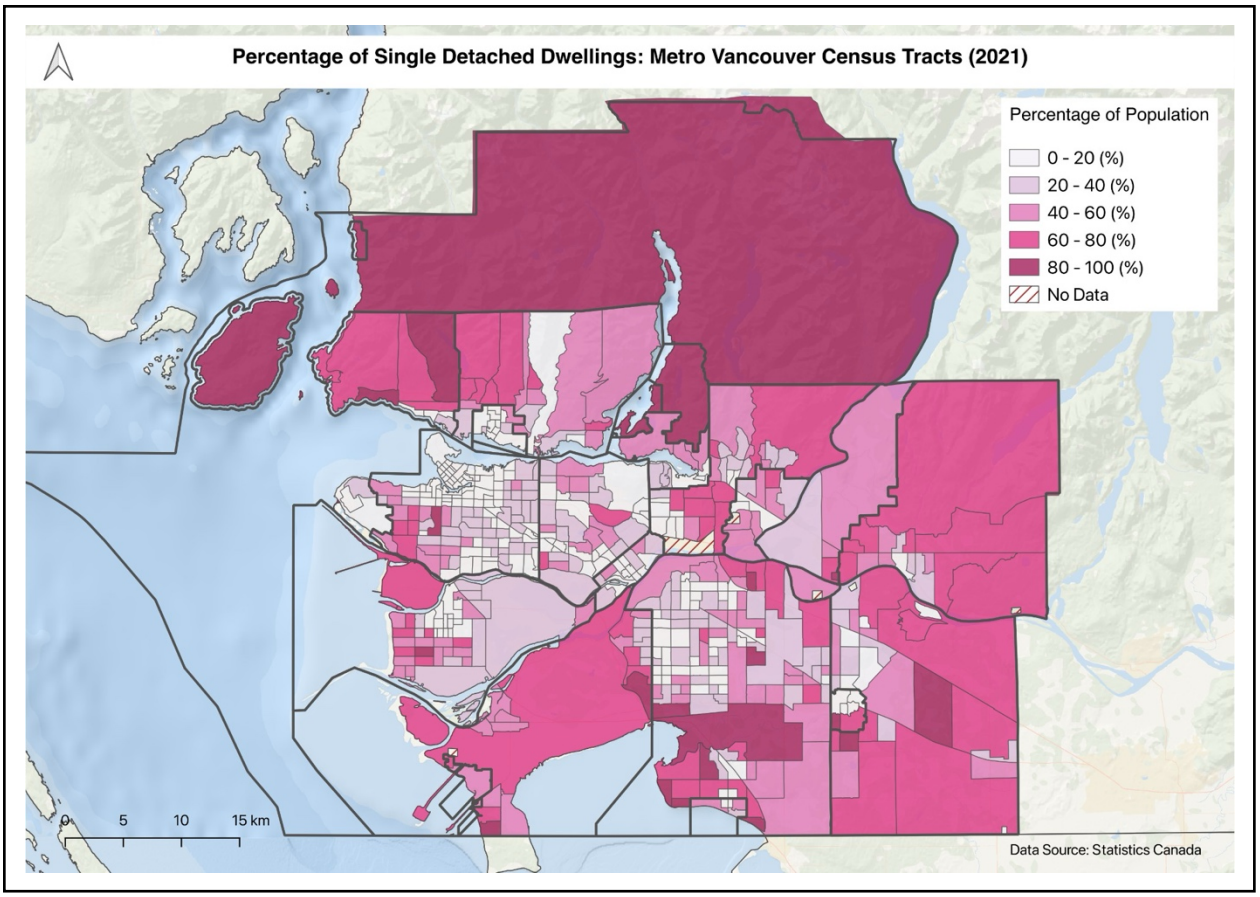

Figure 8. Census tract-level distribution of single detached dwellings in Metro Vancouver. Data are derived from the Statistics Canada, 2021 Census of Population.

3.2.5 Median Total Income

The CT-level median total income of economic family in private households in 2020 ($) is represented for Metro Vancouver in **Figure 9.** The mean value for all Metro Vancouver CTs is $115,789.89 and there were 13 CTs with no data available. The highest earning CTs, with median total incomes of greater than $180,000, are located in West Vancouver's Dundarave neighbourhood and the City of Vancouver's Shaughnessy neighbourhood. The lowest earning CTs with median incomes below $60,000 are located in Richmond Centre and on the Matsqui 4 Indian reserve.

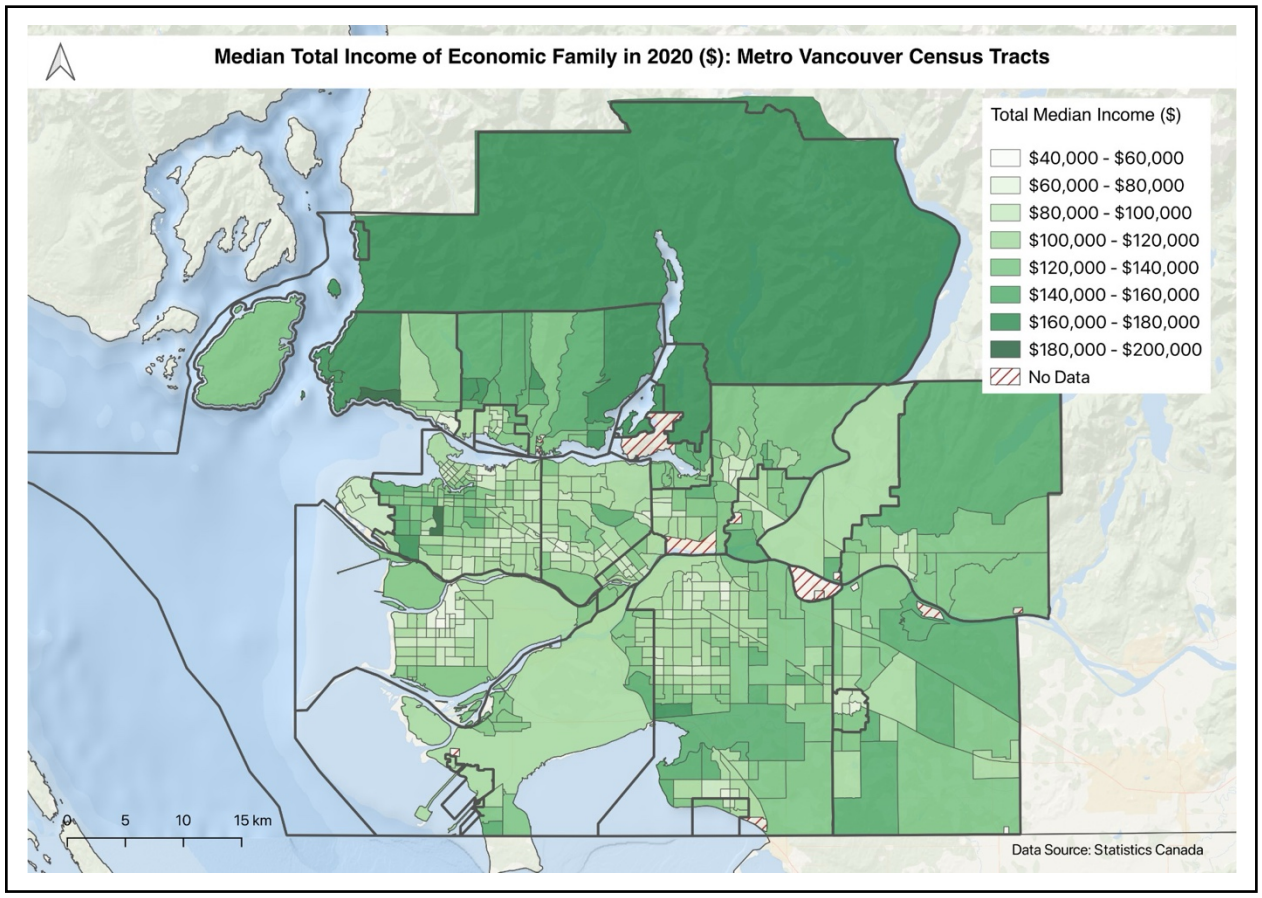

Figure 9. Census tract-level median total income of the economic family in Metro Vancouver. Data are derived from the Statistics Canada, 2021 Census of Population.

3.2.6 Knowledge of Neither Official Language

Figure 10 displays the CT-level proportion of the total population with knowledge of neither official language (English nor French), excluding institutional residents, in Metro Vancouver. The mean value for all Metro Vancouver CTs is 5.26%, and there are 6 CTs with no data available. The areas with greater than 15% of non-official language speakers are primarily situated in Richmond and the City of Vancouver's east side. Particularly the neighbourhoods of Strathcona, Kensington-Cedar Cottage, and Victoria-Fraserview. Surrey, Burnaby, and Coquitlam contain several CTs where the rate of non-official language speakers is between 5 - 15%. Many Metro Vancouver areas and municipalities are comprised exclusively of CTs where fewer than 5% of the population does not speak an official language. These include Anmore, Belcarra, Bowen Island, Langley, Lions Bay, Pitt Meadows, Port Coquitlam, Port Moody, and White Rock.

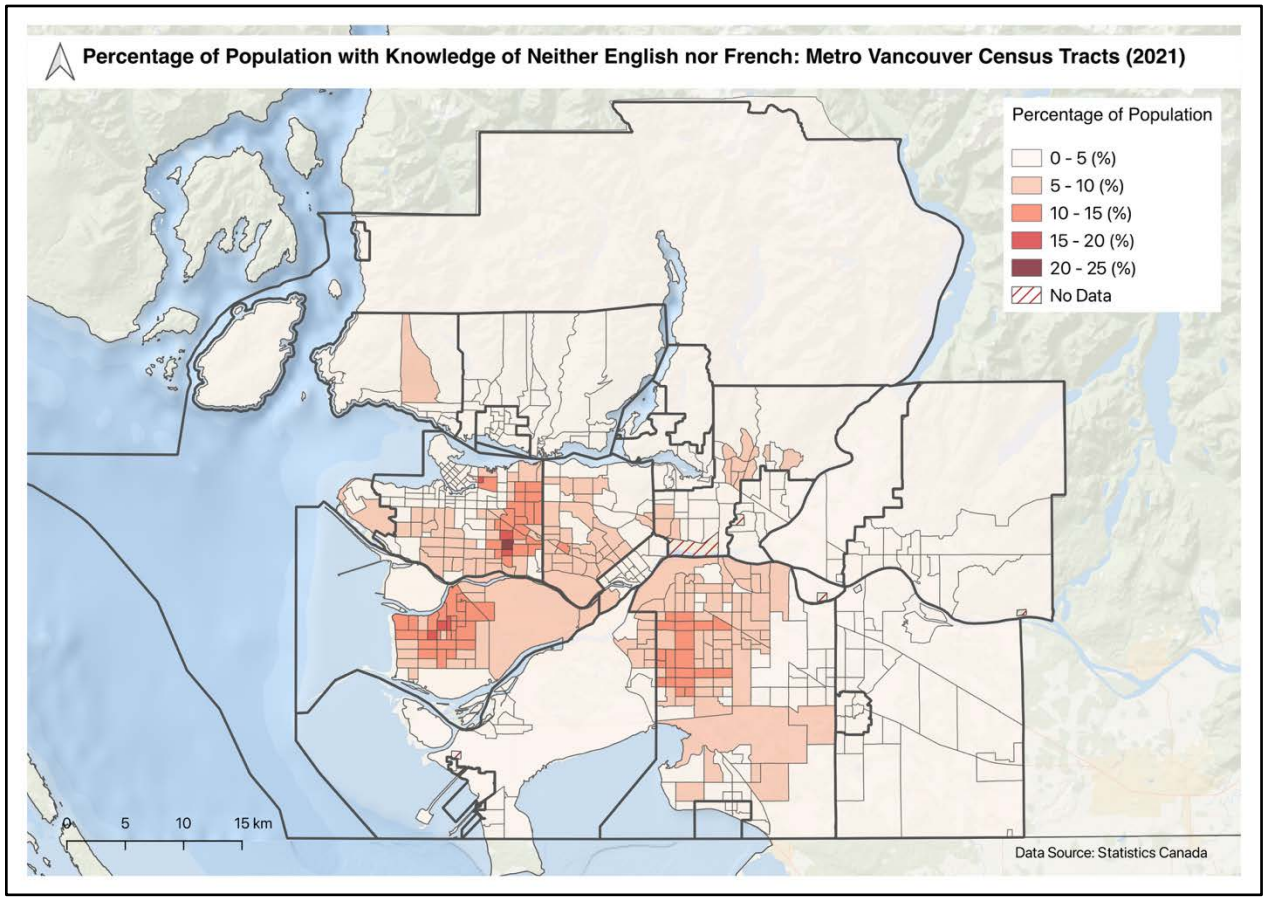

Figure 10. Census tract-level distribution of non-official language speakers (English nor French) in Metro Vancouver. Data are derived from the Statistics Canada, 2021 Census of Population

3.2.7 Indigenous Identity

Figure 11 represents the CT-level distribution of the population identifying as Indigenous in Metro Vancouver. The mean value for all Metro Vancouver CTs is 3.5% and there are 6 CTs with no data available. There are a few outliers with significantly higher percentages, with 5 CTs with proportions greater than 70% Indigenous identifying peoples.

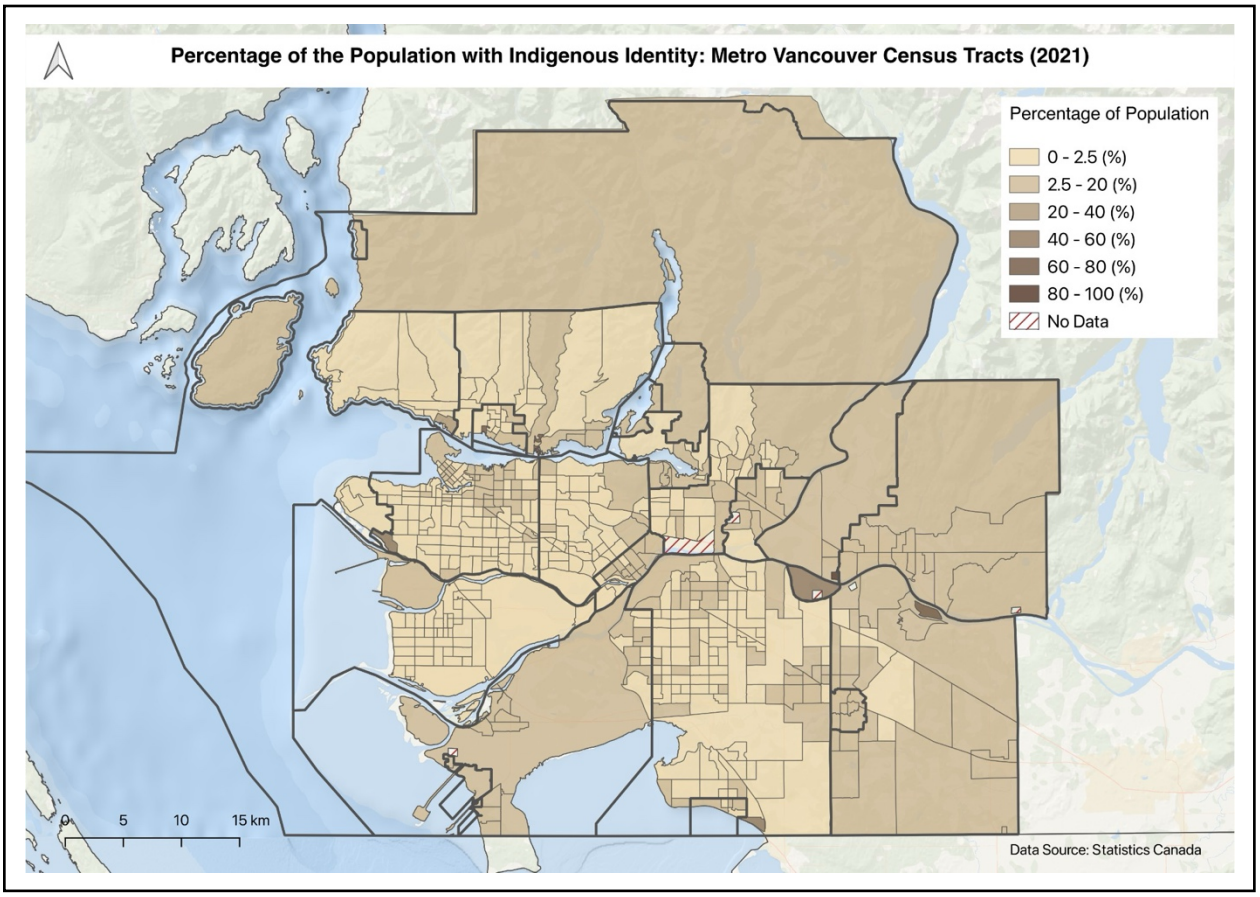

Figure 11. Census tract-level distribution of population with Indigenous identity in Metro Vancouver. Data are derived from the Statistics Canada, 2021 Census of Population, 25% sample data.

3.2.8 Private Households by Tenure, Owner

Figure 12 represents the CT-level distribution of owners by household tenure in Metro Vancouver. The mean value for all Metro Vancouver CTs is 65.00 % and there are 6 CTs with no data available. CTs with the highest proportions of homeowners tend to be located away from the downtown peninsula in the City of Vancouver.

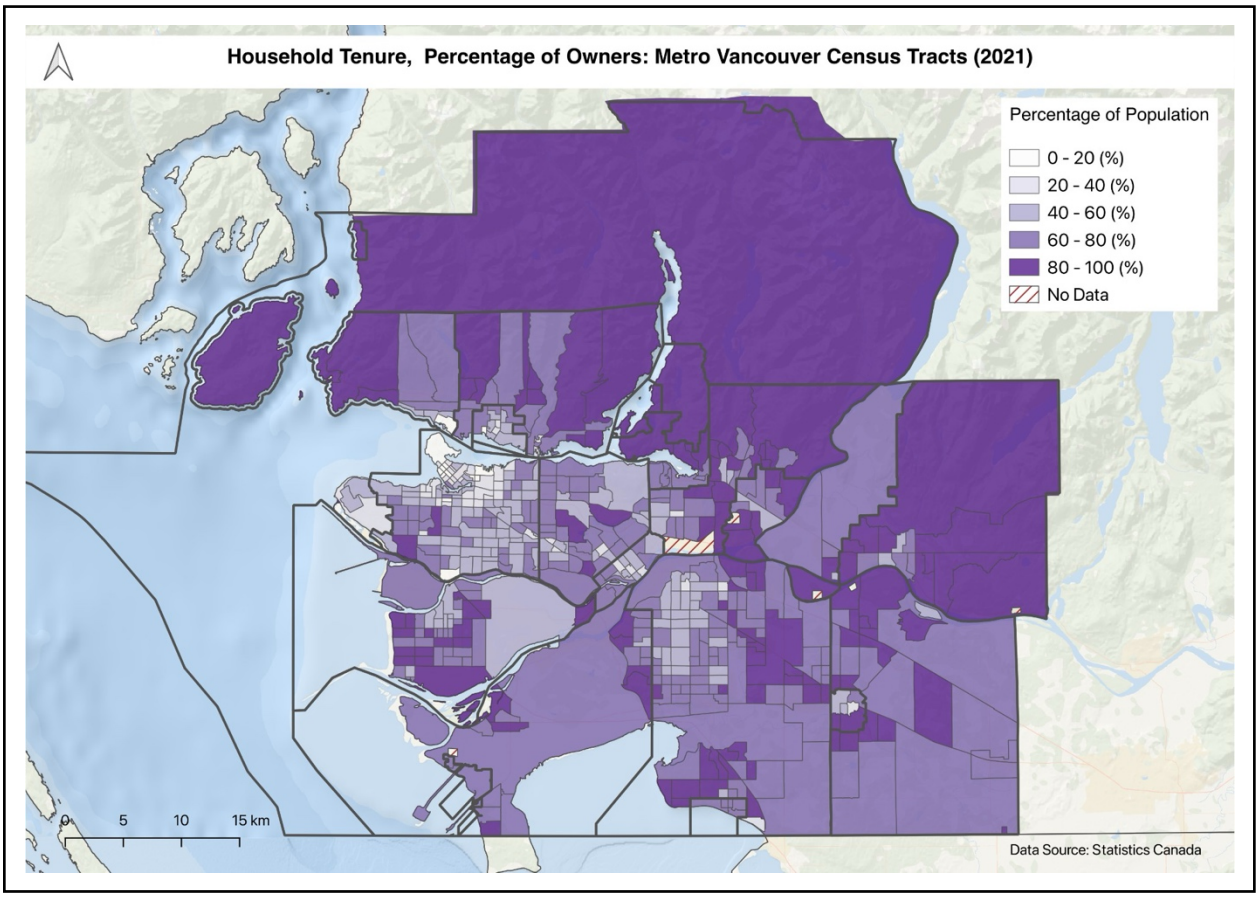

Figure 12. Census tract-level distribution of owners by household tenure in Metro Vancouver. Data are derived from the Statistics Canada, 2021 Census of Population, 25% sample data.

3.2.9 Private Households by Tenure, Renter

Figure 13 represents the CT-level distribution of renters by household tenure in Metro Vancouver. The mean value for all Metro Vancouver CTs is 34.08% and there are 6 CTs with no data available. CTs with higher rates of renters are located in the City of Vancouver, particularly near the downtown peninsula.

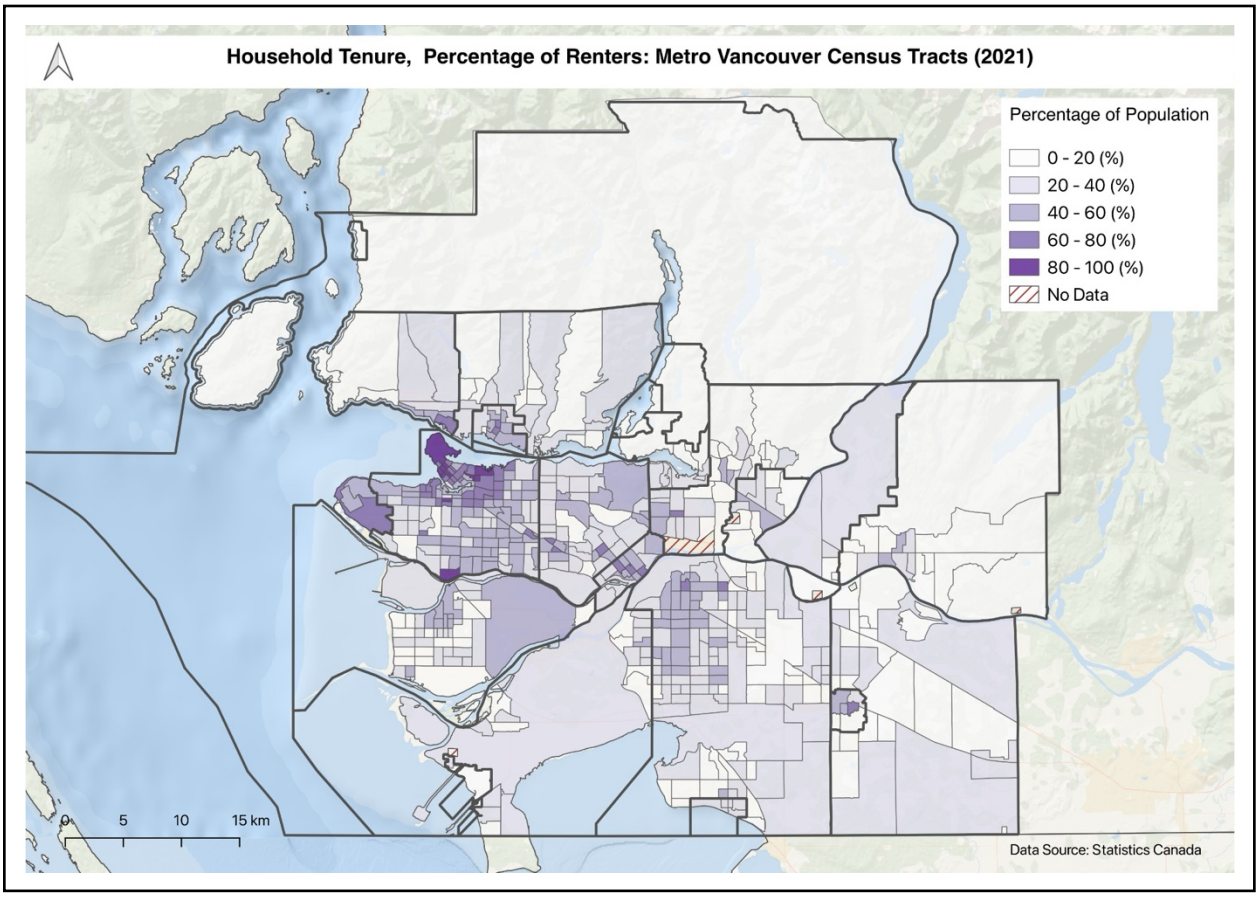

Figure 13. Census tract-level distribution of renters by household tenure in Metro Vancouver. Data are derived from the Statistics Canada, 2021 Census of Population, 25% sample data.

3.3 Maps: Metro Vancouver RIWB Data

3.3.1 Submissions

Figure 14 displays the count of RIWB submission for each Metro Vancouver CT. Of the 535 CTs, 154 contained no RIWB submissions, and 381 contained at least one submission. Only seven CTs contained over 50 submissions. The CT with the highest number of submissions was Bowen Island, with 186 submissions among a population of 4,256. Of those CTs with the highest number of submissions, five were located in the City of Vancouver. Three CTs along Vancouver's False Creek South, and in the neighbourhoods of Fairview and Kitsilano, reported 112, 86, and 52 submissions, respectively. Two neighbouring CTs in the South Vancouver Neighbourhood of Killarney, and located along the boundary of Burnaby and the Fraser River, reported 56 and 53 submissions each. In Richmond, only one CT reported over 50 submissions, with 80. 92 CTs contain between 11 and 50 submissions, including large swaths of the City of Vancouver's west side, West Vancouver, North Vancouver, and Electoral Area A. 282 CTs contain between 1 and 10 submissions, with 72 containing only a single submission. The majority of CTs in Langley (City and Township), Surrey, Pitt Meadows, Maple Ridge, Port Coquitlam, and New Westminster fall into this category.

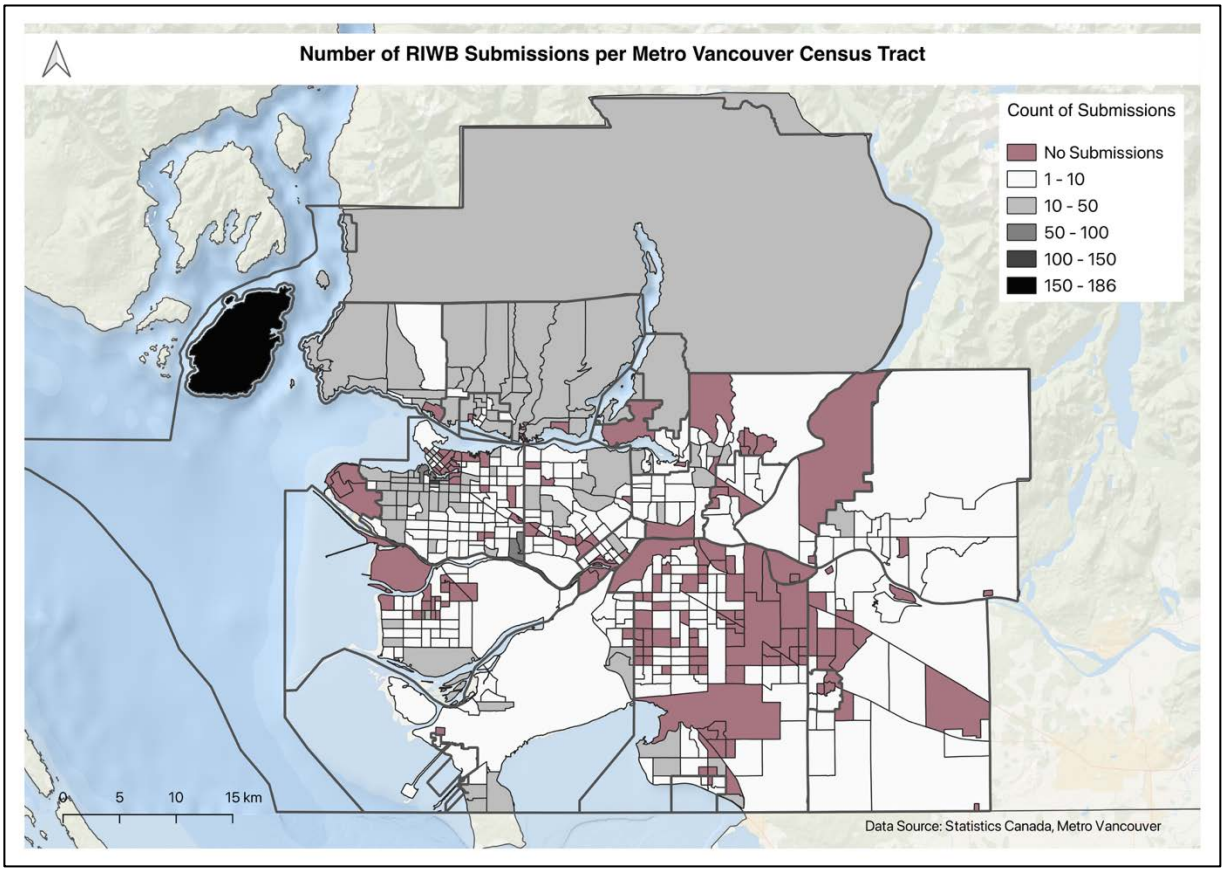

Figure 14. Census tract-level count of RIWB submissions in Metro Vancouver. Data are derived from the Statistics Canada 2021 Census of Population and Metro Vancouver.

Figure 15 displays the RIWB submission for each Metro Vancouver CT, normalized by population. This provides insight as to the number of submissions relative to the number of residents living in a given area. For example, a relatively high submission rate was observed on the Semiahmoo Reserve, 1 mile SE of White Rock. The location of the reserve corresponds with a CT occupying 129 hectares, with a reported population of 71 residents. There were 17 submissions reported within the CT.

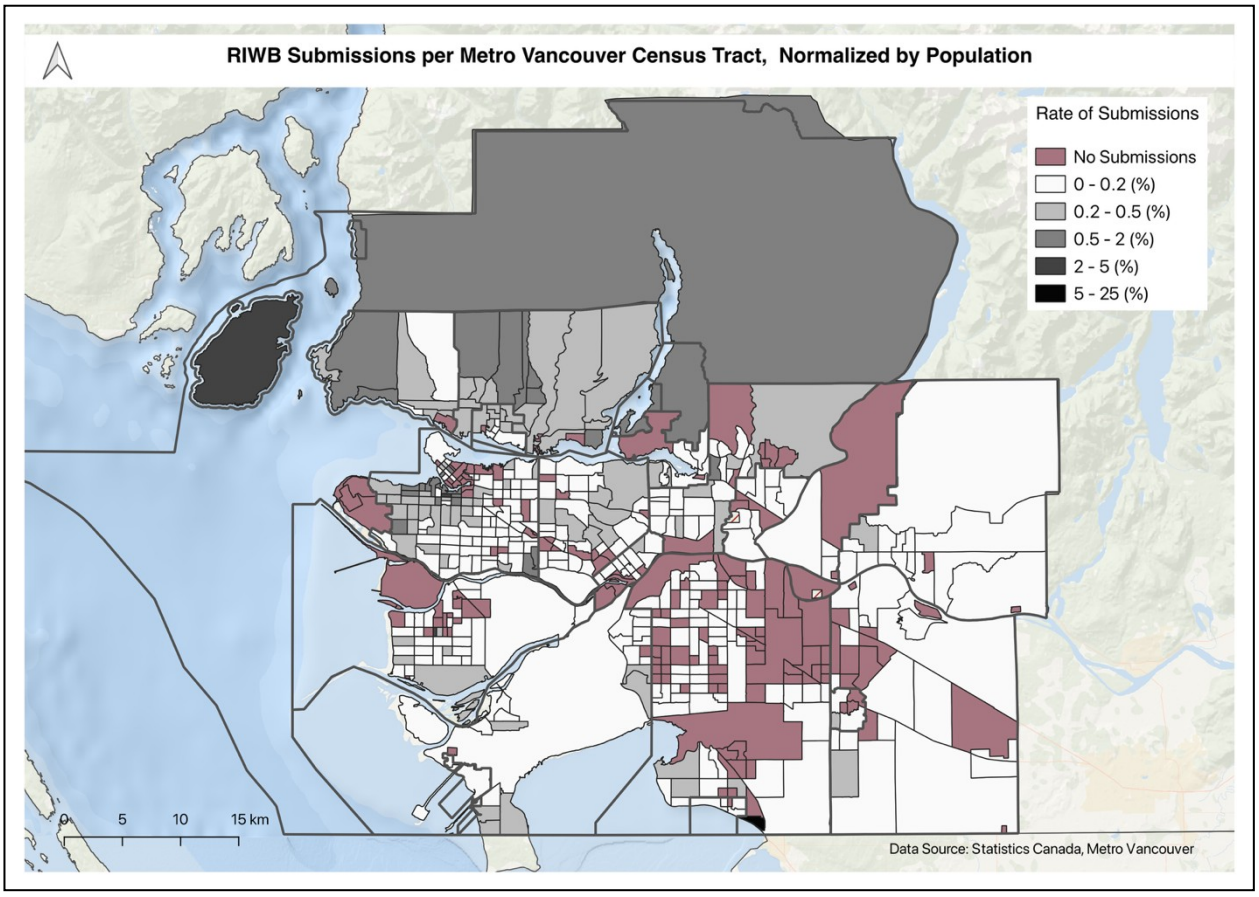

Figure 15. RIWB submissions in Metro Vancouver, normalized by Census Tract population. Data are derived from the Statistics Canada 2021 Census of Population and Metro Vancouver

In addition to the anonymized address, the RIWB dataset identifies the “status” of the submission, specifying whether each incidence included a declaration, a registration, or was restricted in September 2025. “Restricted” refers to fireplaces or wood-burning devices that will be restricted in 2025 because the owner or operator didn’t submit the necessary documentation, or the their wood-burning device does not meet the certified emission standards. The proportion of these respective classes can be visualized in **Figure 16**.

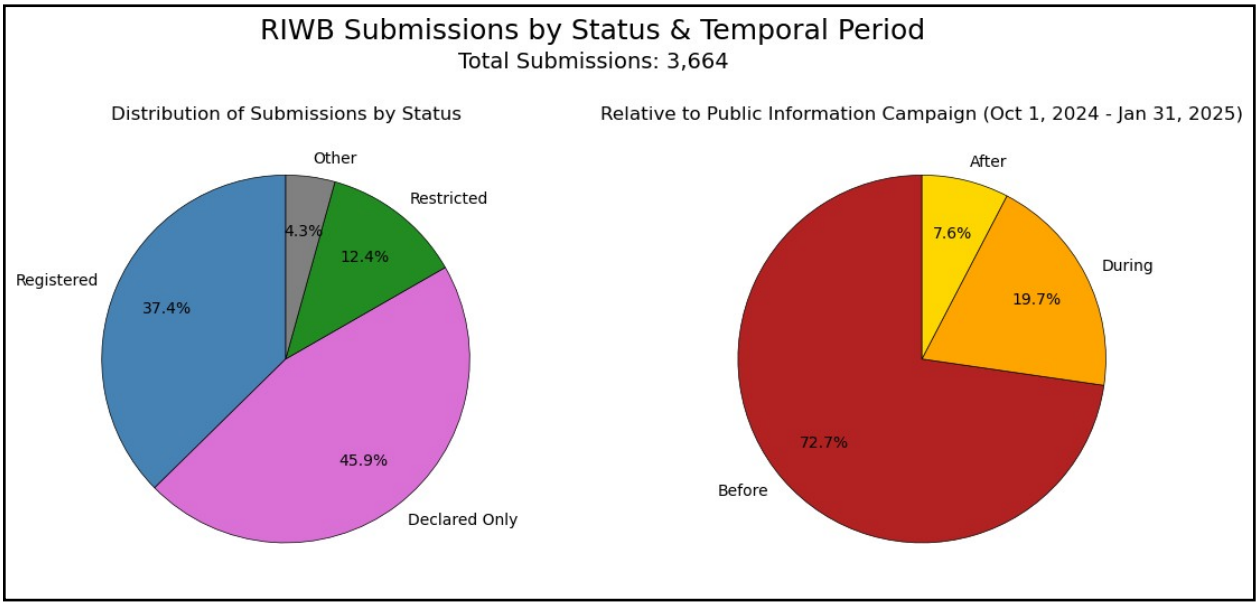

Figure 16. Pie charts representing the total RIWB submissions classified my status and temporal period relative to the Fall 2024 public information campaign. Data are derived from Metro Vancouver.

The greatest proportion of submissions, 45.9%, are solely declarations, while 37.4% account for registrations. 12.5% of the submissions were restricted in September 2025. The 4.3% of submissions with a status of “Other” refer to those classified as “Draft”, “Incomplete”, or “Submitted”. “Draft” indicates that resident is still in the process of completing the registration. “Submitted” refers to the appliance status when it is awaiting review by ER&E staff. “Incomplete” means that the resident has not submitted any supporting documentation for their wood-burning device (not applicable for fireplaces).

Submissions are also classified temporally, representing whether they occurred before, during, or after the Fall 2024 public education campaign, which took place from October 1st, 2024, to January 31st, 2025. Regarding the timeframe during which the submission was received, 72.7% were before the Fall 2024 public education campaign, 19.7% were during, and 7.6% were received afterwards.

3.3.2 Outreach Areas

Of the 535 CTs, 349 contained no outreach areas, and 186 contained at least one outreach area (**Figure 17**). 158 CTs contained between 1 and 5 outreach areas. 26 CTs contained between 6 and 10 outreach areas. Two CTs contained between 11 and 15 outreach areas; one in the City of Vancouver's Kitsilano neighbourhood with 15 outreach areas and one in the NE corner of New Westminster with 11 outreach areas.

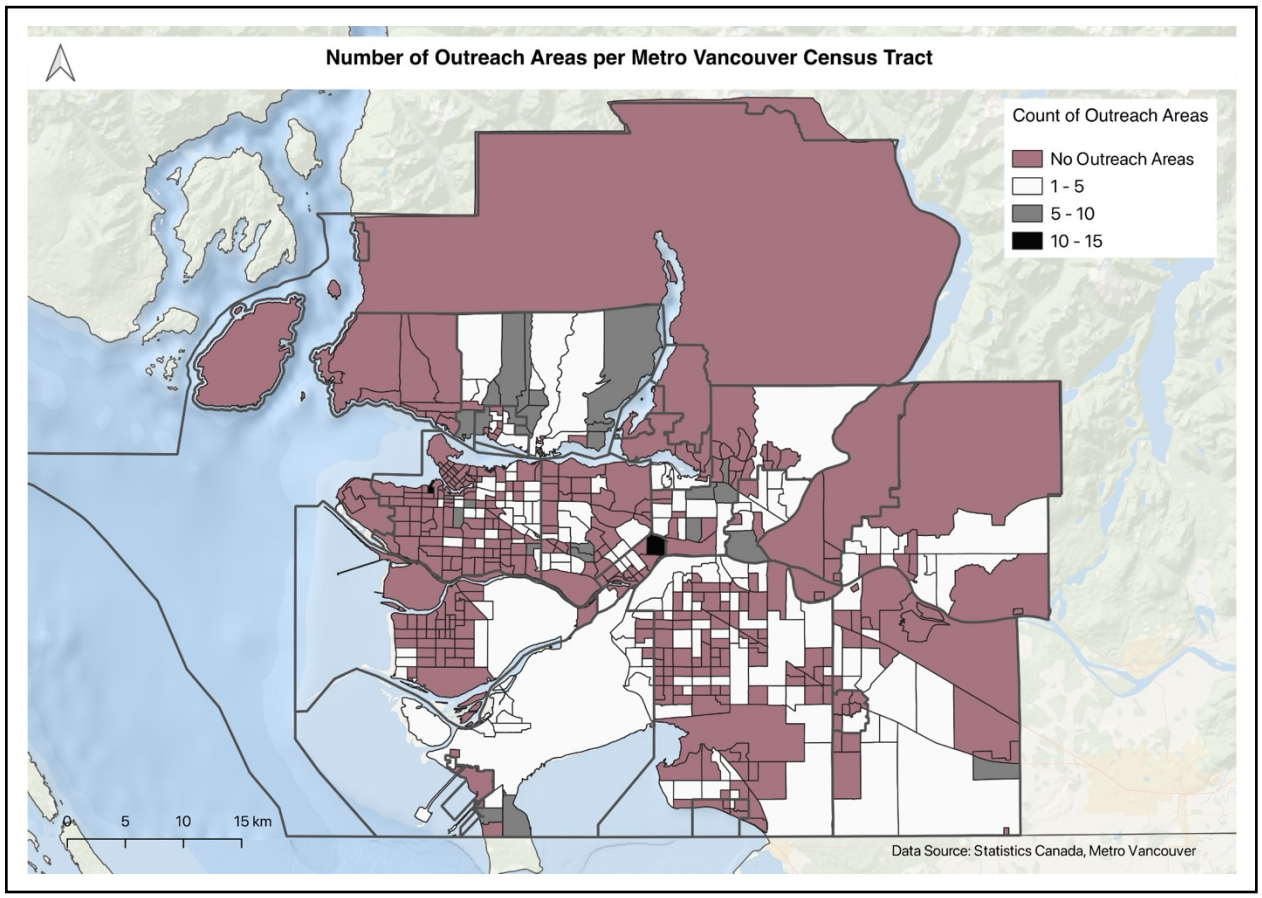

Figure 17. Census tract-level count of RIWB outreach areas in Metro Vancouver. Data are derived from the Statistics Canada 2021 Census of Population and Metro Vancouver.

3.3.3 Woodsmoke Complaints

Of the 535 CTs, 261 contained no woodsmoke complaints, and 271 contained at least one complaint (**Figure 18**). The dataset comprised 1548 complaints. 164 CTs reported between 1 and 3 complaints. 93 CTs reported between 4 and 12 complaints, dispersed across Metro Van. Sixteen CTs reported between 16 and 64 complaints. These CTs were dispersed across Metro Vancouver, located in the City of Vancouver, Delta, Langley Township, New Westminster, North Vancouver, Port Moody, Richmond, and Surrey.

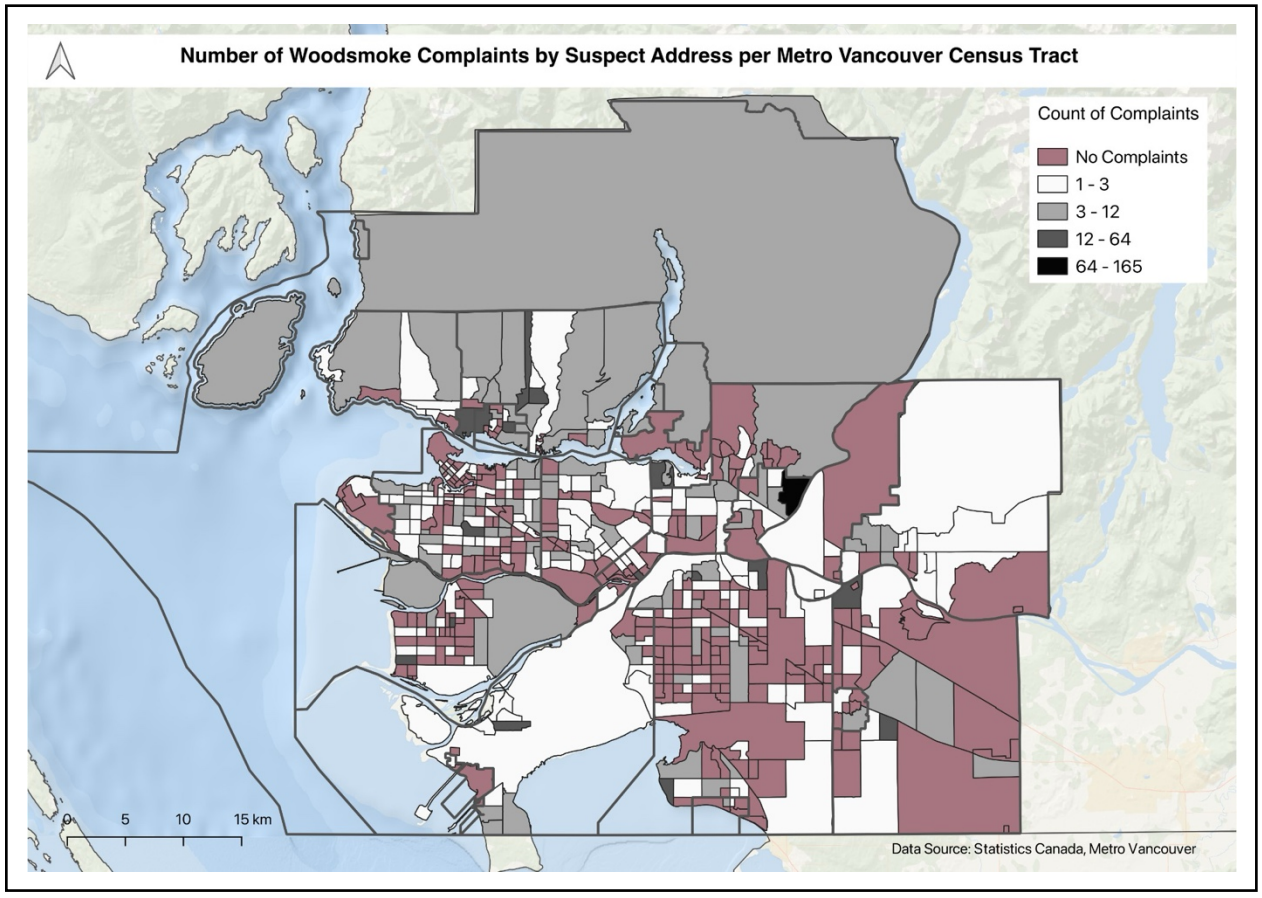

Figure 18. Census tract-level count of woodsmoke complaints in Metro Vancouver. Data are derived from the Statistics Canada 2021 Census of Population and Metro Vancouver.

3.4 Statistical Analysis

3.4.1 Aggregated Results

Figure 19 shows the number of CTs classified by the presence or absence of each RIWB activity. The y-axis indicates the number of CTs, while the x-axis shows a binary grouping based on whether the activity was present or absent. The bar graph on left displays submissions. Of the total 535 CTs within Metro Vancouver, 381 contained at least one RIWB submission. The middle facet displays ER&E outreach areas, with 186 CTs containing at least one outreach area. Finally, the rightmost bar graph accounts for woodsmoke complaints, with 274 CTs containing at least one complaint.

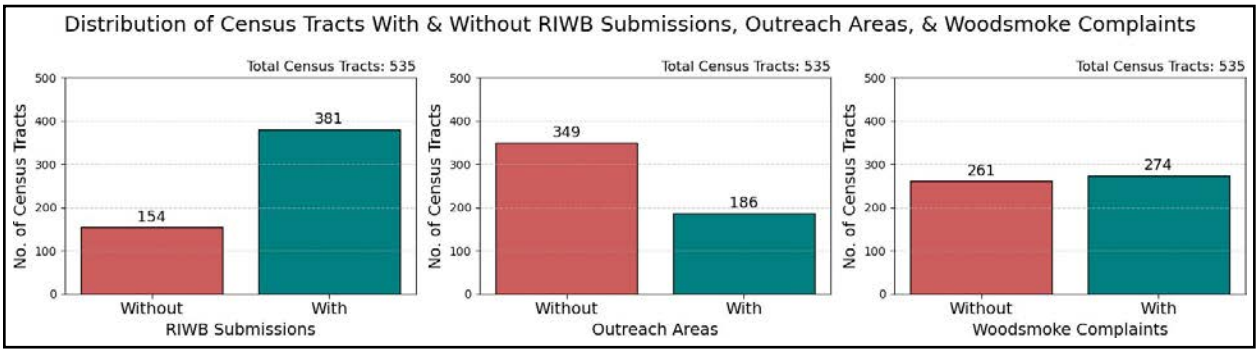

Figure 19. Bar graphs representing the number of census tracts characterized by the absence or presence of each RIWB activity: submissions, outreach areas, and woodsmoke complaints.

3.4.2 Submissions

Table 2 presents the census characteristics that showed a statistically significant difference in mean values between CTs with submissions and those without (p-value < 0.05). These results are also visualized in **Figure 20.** Among the nine socio-demographic attributes assessed, eight exhibited a notable spatial relationship with the presence or absence of submissions. Further descriptive statistics and results, including t-statistics and p-values, are included in the statistical appendix, Appendix A.

Table 2: Mean Census Tract Values by Submission Status			
Census Characteristic	Mean of CTs **without** submissions	Mean of CTs **with** submissions	Difference in Means
* Age: 0 to 14 (%)	14.61%	13.82%	0.79%
Age: 65 and Over (%)	16.38%	18.57%	2.19%
Age: 85 and Over (%)	1.92%	2.41%	0.49%
Single Detached Dwelling (%)	24.60%	36.22%	11.62%
Median Total Income ($)	$109,970.42	$117,963.16	$7,992.74
No Official Languages Spoken (%)	5.85%	5.03%	0.82%
Indigenous Identity (%)	5.68%	2.68%	3.00%
* Tenure: Owner (%)	64.15%	65.34%	1.19%
* Tenure: Renter (%)	33.29%	34.39%	1.10%
Asterisk (*) adjacent to census characteristic and gray shading indicates a non-statistically significant result (p-value > 0.05)			

Based on this analysis, the presence of submissions was associated with tracts characterized by a larger proportion of older adults, a greater percentage of residents living in single-detached homes, and economic families earning a higher income. CTs with no submissions were found to have a greater percentage of residents who speak neither official language, as well as a lower proportion of the population who identify as Indigenous.

CTs with submissions had higher proportions of older adults, with those aged 65 and over higher by 2.19%, and those aged 85 and over higher by 0.49%. The average proportion of single-detached homes was 11.62% higher in CTs with submissions. Additionally, the total median income of the economic family was found to be on average $7,992.74 higher among CTs with submissions. On average, the proportion of residents who do not speak an official language was 0.82% higher in CTs with no submissions. The average proportion of Indigenous identifying people was also 3.00% greater in CTs with no submissions.

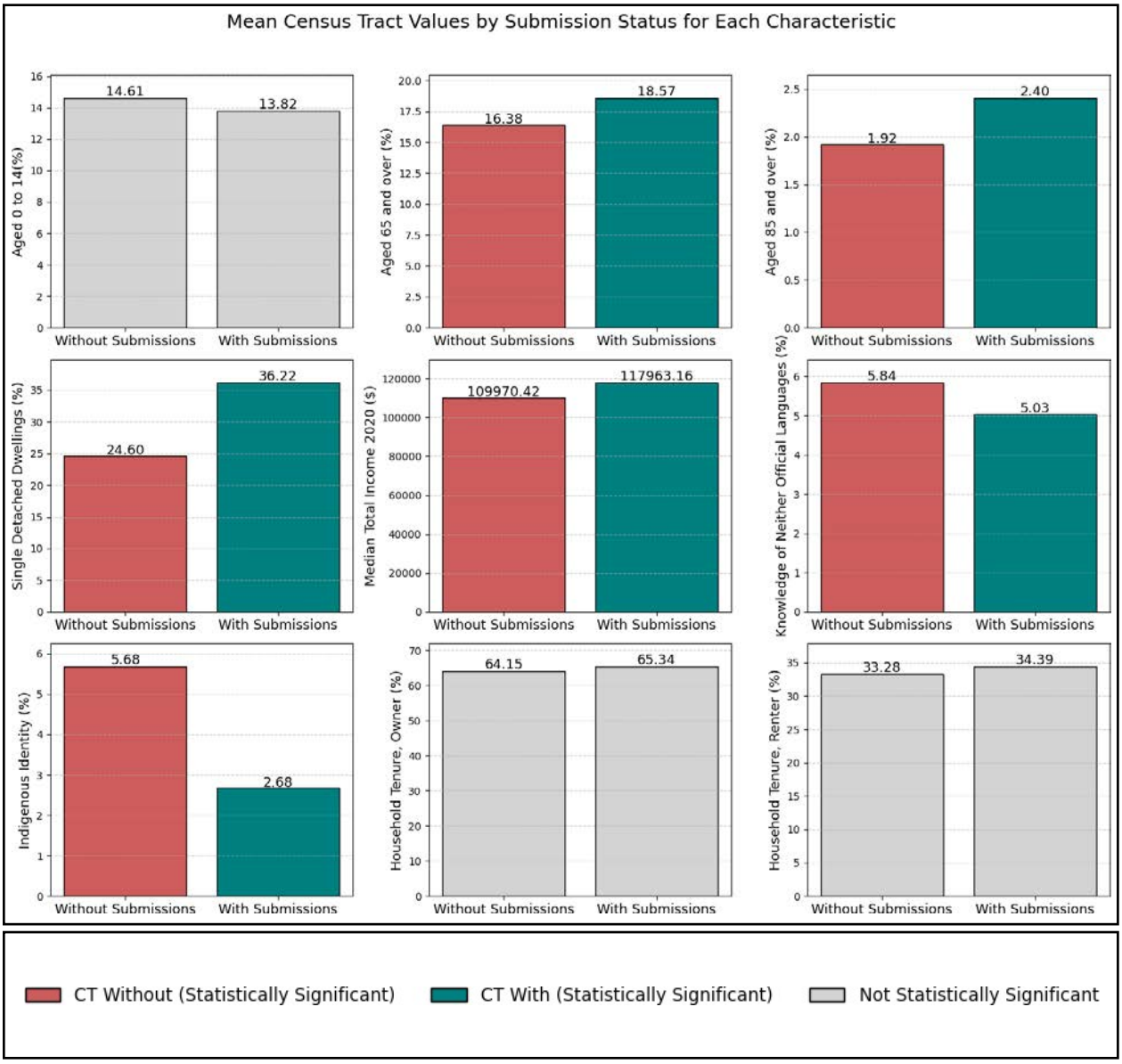

Figure 20. Bar graphs representing the mean census tract value in the absence or presence of RIWB submissions for each census characteristic.

3.4.3 Outreach Areas

Table 3 presents the census characteristics that showed a statistically significant difference in mean values between CTs with outreach areas and those without (p-value < 0.05). These results are also visualized in **Figure 21**. Among the nine socio-demographic attributes assessed, eight exhibited a notable spatial relationship with the presence or absence of outreach areas. Further descriptive statistics and results, including t-statistics and p-values, are included in the statistical appendix., Appendix A.

Table 3: Mean Census Tract Values by Outreach Status			
Census Characteristic	Mean of CTs **without** outreach areas	Mean of CTs **with** outreach areas	Difference in Means
Age: 0 to 14 (%)	13.69%	14.69%	1.00%
* Age: 65 and Over (%)	17.87%	18.12%	0.25%
* Age: 85 and Over (%)	2.20%	2.41%	0.21%
Single Detached Dwelling (%)	29.98%	38.48%	8.50%
Median Total Income ($)	$113,326.79	$120,236.56	$6,909.77
No Official Languages Spoken (%)	5.68%	4.48%	1.20%
Indigenous Identity (%)	4.03%	2.58%	1.45%
Tenure: Owner (%)	63.27%	68.22%	4.95%
Tenure: Renter (%)	35.34%	31.77%	3.57%
Asterisk (*) adjacent to census characteristic and gray shading indicates a non-statistically significant result (p-value > 0.05)			

Based on this analysis, the presence of outreach areas was associated with tracts characterized by a larger proportion of children aged 0 to 14, a greater percentage of residents living in single-detached homes, economic families earning a higher income, and homeowners. CTs with no outreach areas were found to have a greater percentage of residents who speak neither official language, as well as a lower proportion of the population who identify as Indigenous, and a higher proportion of renters.

CTs with outreach areas had higher proportions of children aged 0 to 14, by an average of 1%. The average proportion of single-detached homes was 8.5% higher in CTs with outreach areas. Additionally, the total median income of the economic family was found to be, on average $6,909.77 higher among CTs with outreach areas. On average, the proportion of residents who do not speak English or French was 1.20% higher in CTs with no outreach areas. The average proportion of Indigenous identifying people was also 1.45% greater in CTs with no outreach areas. Finally, CTs that included outreach areas had, on average, a 4.95% higher proportion of homeowners and a 3.57% lower proportion of renters compared to CTs without outreach areas.

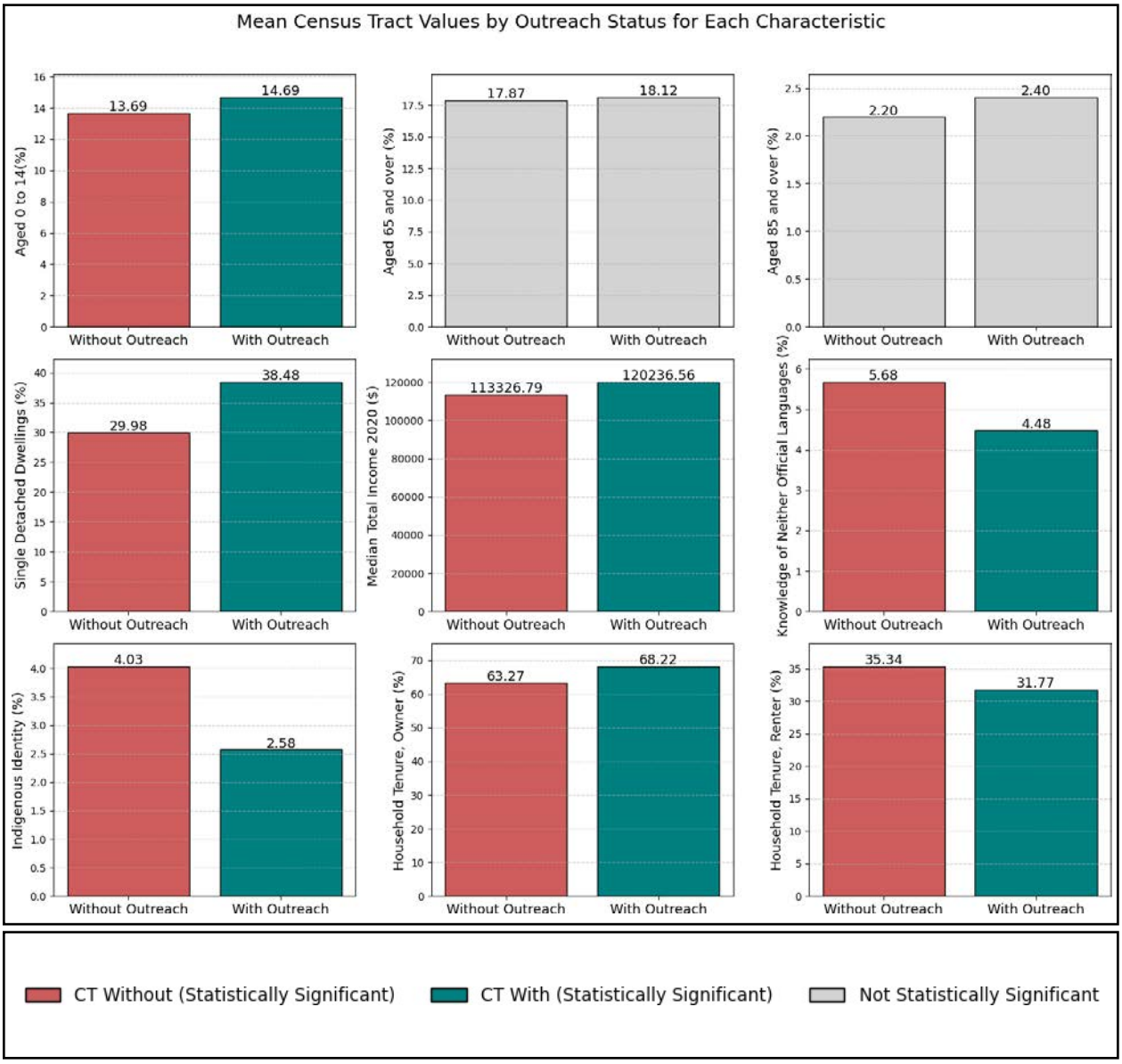

Figure 21. Bar graphs representing the mean census tract value in the absence or presence of outreach areas for each census characteristic.

3.4.4 Woodsmoke Complaints

Table 4 presents the census characteristics that showed a statistically significant difference in mean values between CTs with woodsmoke complaints and those without (p-value < 0.05). These results are also visualized in **Figure 22**. Among the nine socio-demographic attributes assessed, five exhibited a notable spatial relationship with the presence or absence of woodsmoke complaints. Further descriptive statistics and results, including t-statistics and p-values, are included in the statistical appendix, Appendix A.

Table 4: Mean Census Tract Values by Complaint Status			
Census Characteristic	Mean of CTs **without** complaints	Mean of CTs **with** complaints	Difference in Means
* Age: 0 to 14 (%)	14.32%	13.78%	0.54%
Age: 65 and Over (%)	17.08%	18.79%	1.71%
Age: 85 and Over (%)	2.01%	2.51%	0.50%
Single Detached Dwelling (%)	28.89%	36.80%	7.91%
Median Total Income ($)	$112,450.60	$118,880.81	$6,430.21
No Official Languages Spoken (%)	5.91%	4.65%	1.26%
* Indigenous Identity (%)	4.27%	2.82%	1.45%
* Tenure: Owner (%)	64.78%	65.22%	0.44%
* Tenure: Renter (%)	33.58%	34.56%	0.98%
Asterisk (*) adjacent to census characteristic and gray shading indicates a non-statistically significant result (p-value > 0.05)			

Based on this analysis, the presence of woodsmoke complaints was associated with tracts characterized by a larger proportion of older adults, a greater percentage of residents living in single-detached homes, and economic families earning a higher income. CTs with no woodsmoke complaints were found to have a greater percentage of residents who speak neither official language.

CTs with woodsmoke complaints had higher proportions of older adults, with those aged 65 and over higher by 1.71%, and those aged 85 and over higher by 0.50%. The average proportion of single-detached homes was 7.91% higher in CTs with woodsmoke complaints. Additionally, the total median income of the economic family was found to be on average $6,430.21 higher among CTs with woodsmoke complaints. On average, the proportion of residents who do not speak English or French was 1.26% higher in CTs with woodsmoke complaints.

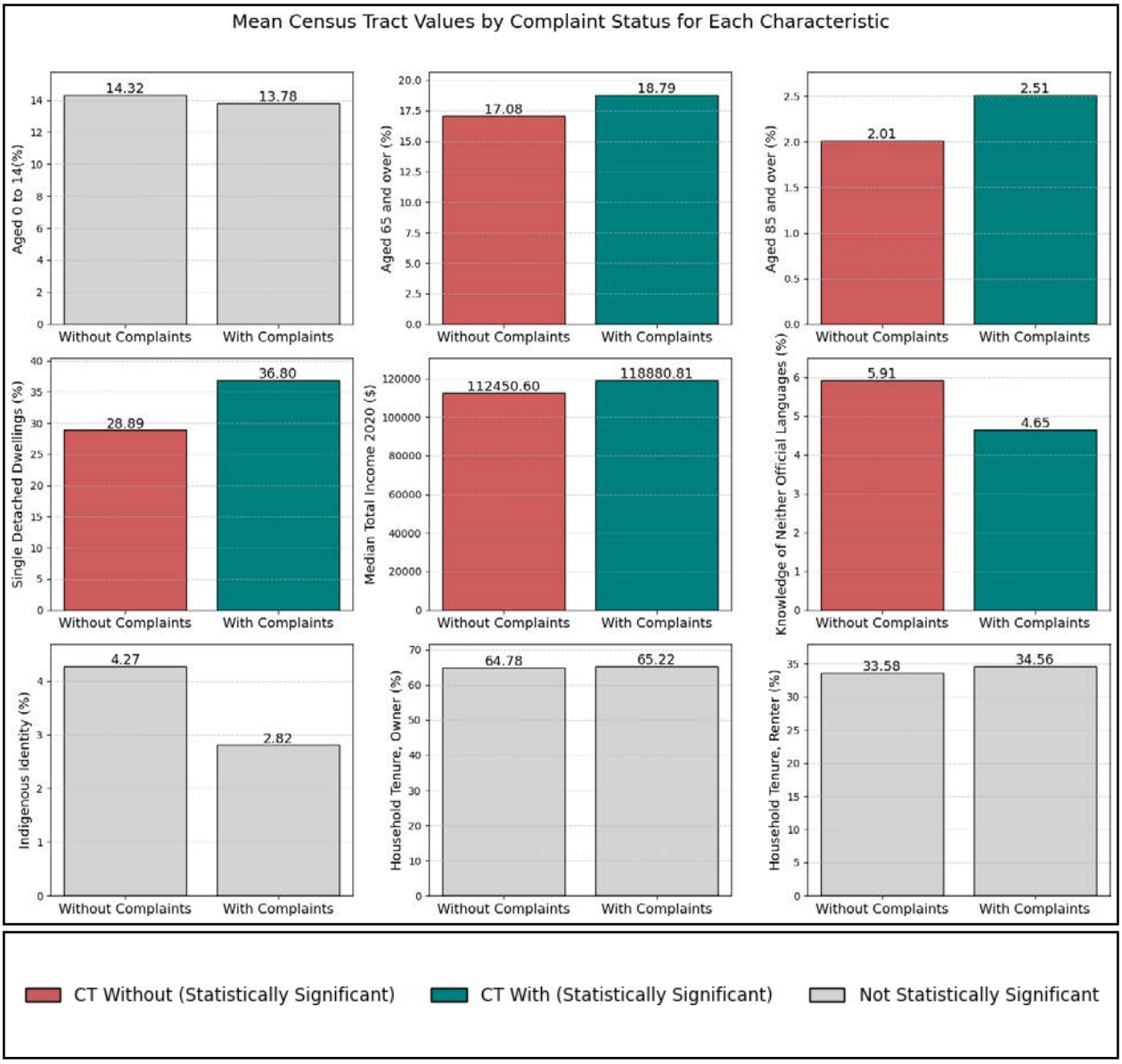

Figure 22. Bar graphs representing the mean census tract value in the absence or presence of woodsmoke complaints for each census characteristic.

4 Discussion

4.1 Summary & Interpretation of Key Findings

A notable trend from the analysis is that CTs containing submissions, outreach areas, and woodsmoke complaints, are on average, characterized by higher rates of single-detached dwellings, higher median incomes, and higher proportions of residents who speak English or French. This pattern highlights potential inequities, suggesting that there may have been less engagement with the bylaw among lower-income groups, those living in denser dwelling types, or those who do not speak an official language. While this phenomenon may be partially attributed to a higher or lower number of wood-burning devices associated with certain characteristics, it is important to ensure that future outreach activities consider these findings to support equitable engagement.

While there was not found to be a significant relationship amongst CTs with more older adults and outreach areas, both CTs with submissions and complaints were found to have a greater proportion of adults aged 65+ and 85+. While this may suggest that seniors are more likely to engage with the RIWB systems, those demographic groups may also be disproportionately affected by non-compliance. Conversely, while CTs with outreach areas have higher proportions of children aged 0 to 14, this did not translate to more submissions or complaints. While it is possible that less engagement with the bylaw reflects less exposure to woodsmoke, it is also possible that there are families with young children who have not engaged with the bylaw.

There was found to be a strong, significant relationship between the average rate of single detached dwellings and the presence of RIWB activities. On average, there are over 10% more single detached homes in CTs with submissions. However, there was also a higher rate of single detached homes in CTs with outreach areas. While wood-burning devices may be more prevalent among single-detached dwellings, it is equally important to strive for engagement with residents in all dwelling types. There are likely additional factors contributing to this phenomenon, however, it could suggest a need for targeted outreach in CTs with higher rates of diverse housing types. For example, additional public education in areas with higher density and multi-unit dwellings could support Bylaw 1303 awareness and promote compliance across a range of housing types.

Similarly, there was found to be strong, significant relationship between median total household income and the presence of all RIWB activities. CTs in which RIWB activities were present exhibited, on average, higher median total income earned by economic families. This suggests greater participation in the RIWB system, in the form of submissions and complaints, amongst wealthier groups. CTs with outreach areas also exhibited higher incomes, suggesting

that ER&E staff, on average, reached higher earning populations and lower-earning CTs were under-represented. This highlights the potential need for targeted outreach and public education in areas with lower income populations, to ensure equitable participation across socioeconomic groups.

There was found to be less engagement in CTs that have more non-English speakers. The analysis provides ER&E staff with valuable insights into participation gaps among socially vulnerable populations underrepresented in the RIWB system. CTs with lower rates of English and French speakers tended to be lacking RIWB activities, suggesting that language may be a barrier to participation. In contrast, RIWB submissions and woodsmoke complaints were present in CTs with higher rates of English and French speakers. Further, the findings suggest that non-English or French speakers are also less likely to have been reached by outreach activities. This highlights a socio- demographic group who may have been left out of bylaw implementation. Future Environmental Regulation and Enforcement activities could include targeted outreach in additional languages, to promote accessibility and equitable participation. For example, identifying CTs that have a higher proportion of non-English or French speaking residents and conducting public outreach in alternative languages.

On average, CTs with higher proportions of Indigenous identifying populations were lacking in RIWB submissions and outreach areas. While there were some outliers, such as the Semiahmoo Reserve, this suggests that Indigenous populations exhibited less participation in the RIWB system. Further, Indigenous populations were less likely to be reached by ER&E outreach. As with the findings of the language analysis, this highlights a traditionally underserved demographic group who could be further engaged through targeted outreach and public education.

There was not found to be a significant difference in average household tenure rates between CTs based on submissions or woodsmoke complaints. However, there were significant results pertaining to the relationship between household tenure type and outreach areas. CTs with outreach areas were found to have higher rates of home ownership. Conversely, CTs without outreach areas were found to have higher rates of renters. This suggests that ER&E outreach disproportionally reached homeowners and renters may have been underrepresented.

4.2 Constraints and Opportunities for Future Analysis

Future analysis could include the evaluation of further census characteristics or socio-demographic variables. For example, determining which non-official languages are most prevalent in CTs with lower rates of participation for RIWB activities could help inform targeted outreach. Additionally, further exploration of dwelling types and built form may provide insight

as to which housing categories are disproportionately represented in engagement. This could involve assessing additional structure types such as semi-detached dwellings, row houses, or apartments. The period of construction or building age could also be included in future analysis.

Regarding the limitations of the Metro Vancouver datasets, ER&E staff conducted additional public education beyond the outreach areas analyzed in this study. This included engagement with strata management companies, which were not accounted for in the mapping due to the project's limited scope and time constraints. Additionally, because the anonymized address data was provided at the 100-block level, it is possible that some of the submissions, outreach areas, or woodsmoke complaints were inadvertently counted in a neighbouring CT. This source of error could be addressed in future analysis by mapping the true address location prior to classifying by CT, however this may require additional privacy considerations in order to maintain anonymity.

A limitation of this analysis is the spatial resolution. While CTs served as a suitable unit for the intended mapping outputs, future analyses could benefit from using finer spatial units, such as DAs. This would allow for more detailed insights within areas of interest and support more localized interpretations of the data. A further limitation of this analysis is the temporal scope. For the purposes of this assessment, 2021 Census data was used because it is the most current socio-demographic information available from Statistics Canada. It also best approximates the time period during which the Bylaw 1303 implementation and ER&E outreach activities occurred. The census characteristics evaluated are representative of the socio-demographic conditions in 2021, but do not account for fluctuations over time, or changes that have occurred in the meantime.

Finally, the potential for exposure to wood smoke can only be inferred from this type of analysis. The scope of this study did not include any analysis of woodsmoke emissions or ambient air quality measurements of woodsmoke indicators.

5 Conclusion

This analysis reveals important equity considerations regarding public participation and involvement in Metro Vancouver's Bylaw 1303. The RIWB regulation provides a valuable framework for mitigating the negative environmental and health impacts of residential woodsmoke and $PM_{2.5}$ exposure. CTs across the region exhibit varied socio-demographic trends, with higher concentrations of socially vulnerable or underserved groups concentrated in certain areas. Mapping and spatially assessing these patterns allows for the identification of areas where targeted outreach for equitable bylaw engagement can be conducted in the

future. This includes areas in which larger proportions of residents are not aware of the bylaw, have not been engaged in public education, or who may be disproportionally affected by non-compliance. Ensuring that socially vulnerable populations in Metro Vancouver have equitable access to information concerning Bylaw 1303 supports an environmentally just approach to bylaw implementation. For example, working towards making the RIWB system and outreach activities accessible to non-English speakers. Additionally, targeted outreach to communities with larger shares of residents in multi-unit housing or low-income households would help mitigate participation gaps. Such efforts would provide opportunities for underserved communities to participate and benefit from the protections offered by Bylaw 1303. In turn, they would strengthen the reach and overall effectiveness of the bylaw, helping to promote accessibility and equity.

6 References

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7 Appendices

7.1 Appendix A: Statistical Appendix

The following section includes additional descriptive statistics and results derived from the statistical analysis. Boxplots display the distribution of census tract-level characteristics for areas with and without RIWB each of the three RIWB activity: **1) submissions (Figure 23)** ; **2) outreach areas (Figure 24)** ; and **3) woodsmoke complaints (Figure 25).** In each boxplot, the central line represents the median value, the box spans the interquartile range (IQR; 25^{th} – 75^{th} percentile) and the whiskers extend to 1.5 times the IQR. Points beyond the whiskers represent potential outliers. **Tables 5**, **Table 6**, and **Table 7** display mean CTs values, t-statistics, and p-values from each of the t-tests, for each of the respective RIWB activities identified above.

7.1.1 Submissions

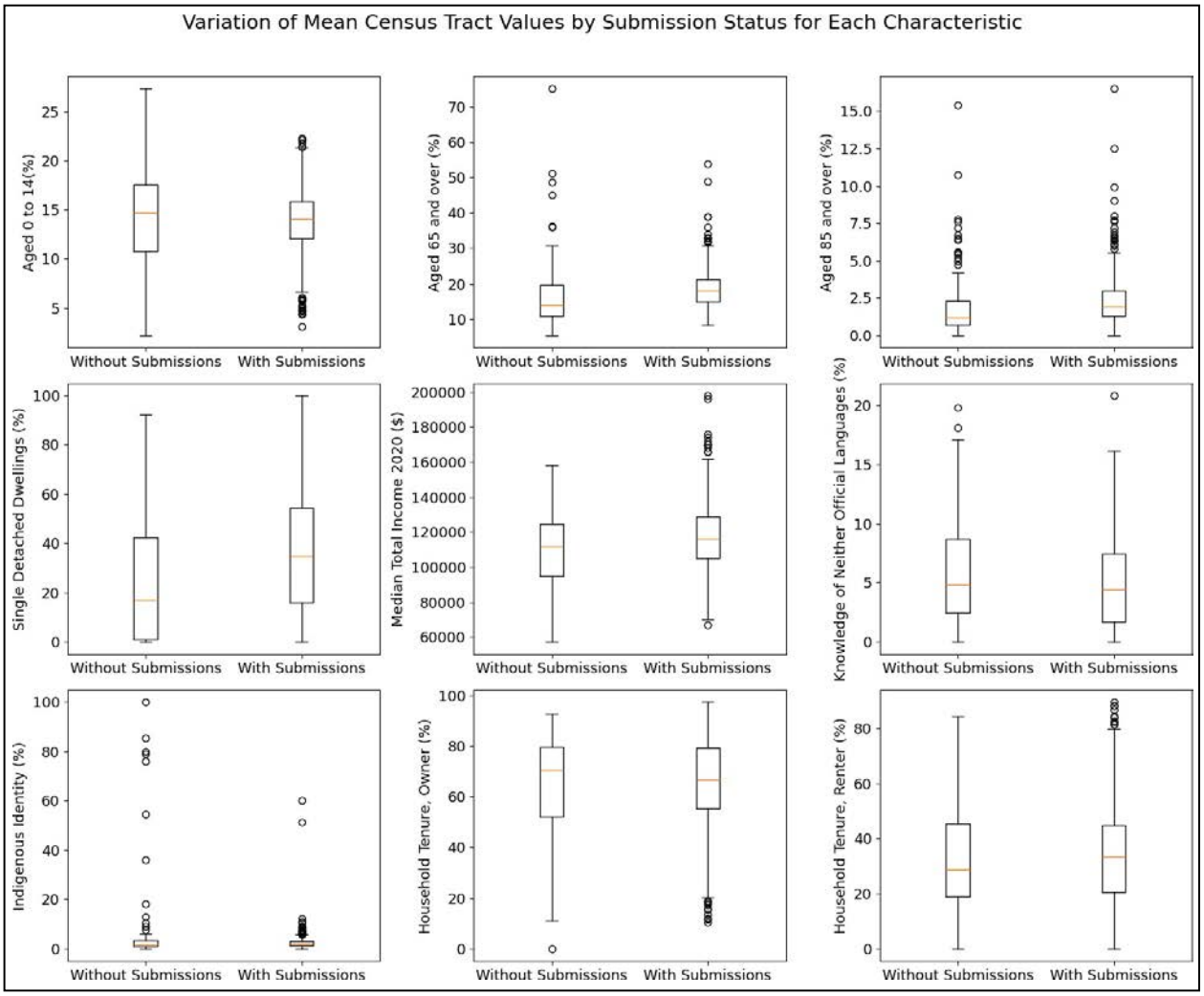

Figure 23. Comparison of mean census tract values by submission status for each census characteristic. Boxplots display the distribution of census tract–level characteristics for areas with and without RIWB submissions. In each boxplot, the central line represents the median value, the box spans the interquartile range (IQR; 25th–75th percentile), and the whiskers extend to 1.5 times the IQR. Points beyond the whiskers represent potential outliers.

Table 5 : t-Test Results, Mean Census Tract Values by RIWB Submission Status				
Census Characteristic	**T-Statistic**	**P-Value**	Mean of CTs **without** submissions	Mean of CTs **with** submissions
Age: 0 to 14 (%)	-1.747	0.082	14.607 %	13.818 %
Age: 65 and Over (%)	2.713	0.007	16.381 %	18.572 %
Age: 85 and Over (%)	2.501	0.013	1.92 %	2.405 %
Single Detached Dwelling (%)	4.778	0	24.596 %	36.221 %
Median Total Income ($)	3.892	0	$109,970.423	$117,963.158
No Official Languages Spoken (%)	-1.986	0.048	5.845 %	5.031 %
Indigenous Identity (%)	-2.274	0.024	5.678 %	2.682 %
Tenure: Owner (%)	0.647	0.518	64.148 %	65.344 %
Tenure: Renter (%)	0.615	0.539	33.285 %	34.394 %

7.1.2 Outreach

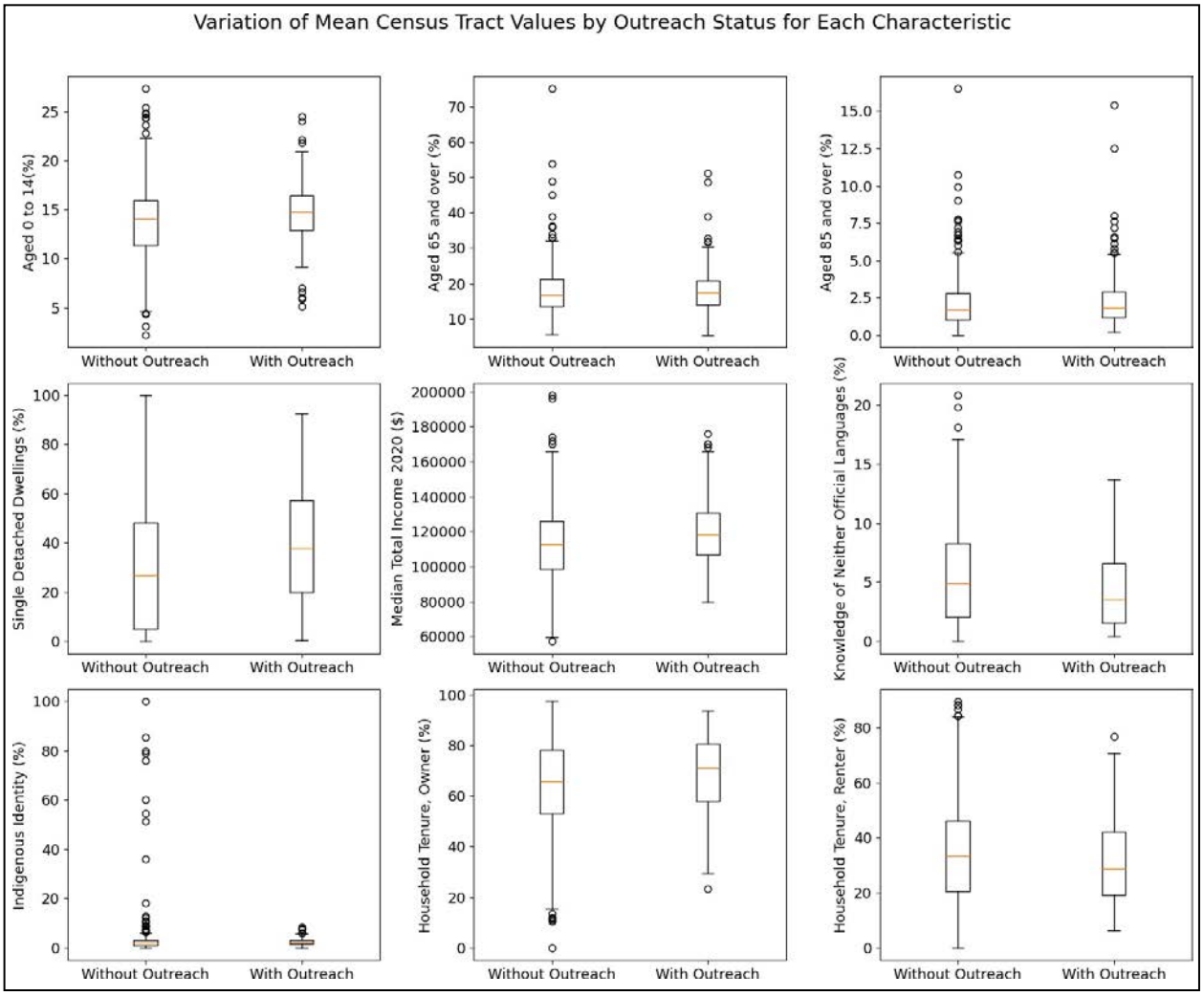

Figure 24. Comparison of mean census tract values by outreach status for each census *characteristic. Boxplots display the distribution of census tract-level* characteristics *for areas with and without outreach areas submissions. In each boxplot, the central line represents the median value, the box spans the interquartile range (IQR; 25th–75th percentile), and the whiskers extend to 1.5 times the IQR. Points beyond the whiskers represent potential outliers.*

Table 6 : t-Test Results, Mean Census Tract Values by Outreach Status				
Census Characteristic	**T-Statistic**	**P-Value**	Mean of CTs **without** outreach areas	Mean of CTs **with** outreach areas
Age: 0 to 14 (%)	3.11	0.002	13.689 %	14.685 %
Age: 65 and Over (%)	0.41	0.682	17.873 %	18.119 %
Age: 85 and Over (%)	1.209	0.228	2.196 %	2.405 %
Single Detached Dwelling (%)	3.849	0	29.98 %	38.48 %
Median Total Income ($)	3.88	0	$113,326.786	$120,236.559
No Official Languages Spoken (%)	-3.579	0	5.682 %	4.478 %
Indigenous Identity (%)	-2.347	0.02	4.033 %	2.575 %
Tenure: Owner (%)	3.251	0.001	63.267 %	68.223 %
Tenure: Renter (%)	-2.345	0.02	35.336 %	31.774 %

7.1.3 Woodsmoke Complaints

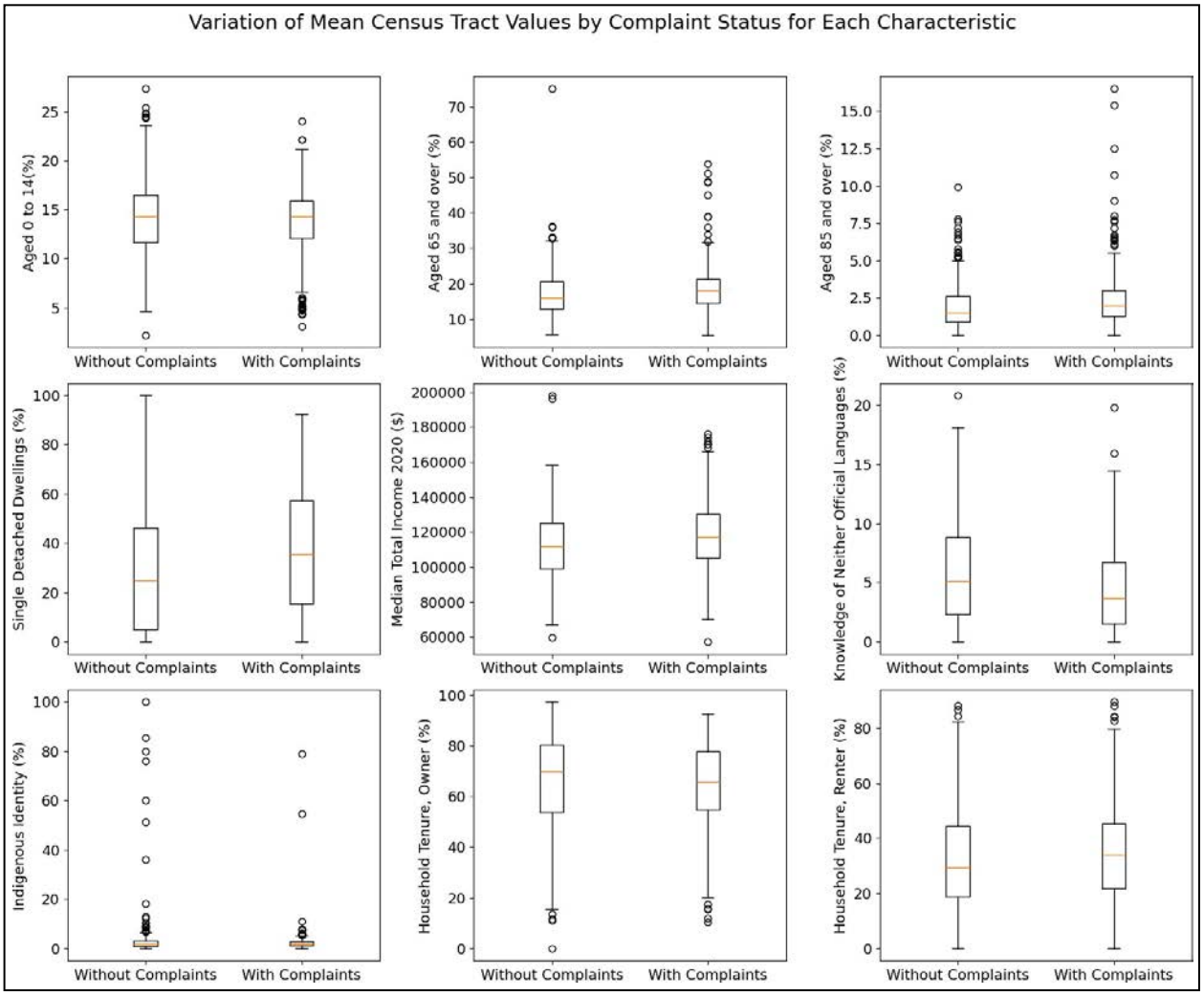

Figure 25. Comparison of mean census tract values by complaint status for each census *characteristic. Boxplots display the distribution of census tract-level* characteristics *for areas with and without woodsmoke complaints. In each boxplot, the central line represents the median value, the box spans the interquartile range (IQR; 25th–75th percentile), and the whiskers extend to 1.5 times the IQR. Points beyond the whiskers represent potential outliers.*

Table 7 : t-Test Results, Mean Census Tract Values by Complaint Status				
Census Characteristic	**T-Statistic**	**P-Value**	Mean of CTs **without** complaints	Mean of CTs **with** complaints
Age: 0 to 14 (%)	-1.595	0.112	14.319 %	13.776 %
Age: 65 and Over (%)	2.878	0.004	17.076 %	18.788 %
Age: 85 and Over (%)	3.136	0.002	2.011 %	2.512 %
Single Detached Dwelling (%)	3.633	0	28.887 %	36.797 %
Median Total Income ($)	3.598	0	$112,450.598	$118,880.812
No Official Languages Spoken (%)	-3.651	0	5.905 %	4.653 %
Indigenous Identity (%)	-1.787	0.075	4.27 %	2.817 %
Tenure: Owner (%)	0.278	0.781	64.782 %	65.223 %
Tenure: Renter (%)	0.626	0.532	33.576 %	34.56 %

7.2 Appendix B: Appendix of Maps

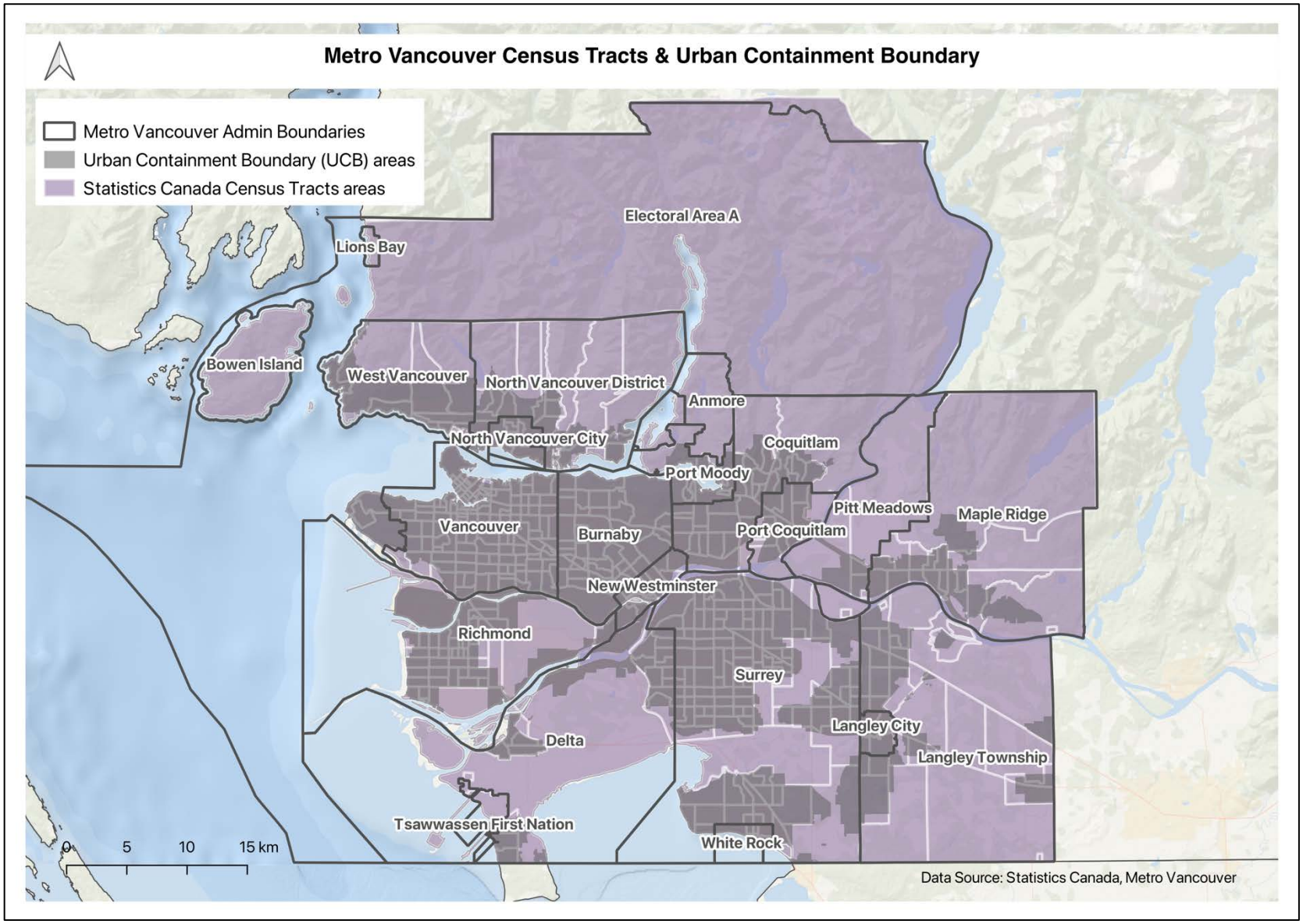

Figure 2. Map displaying Metro Vancouver Reginal District administrative boundaries, Urban Containment Boundary (UCB), and Statistics Canada Census Tract (CT) boundaries.

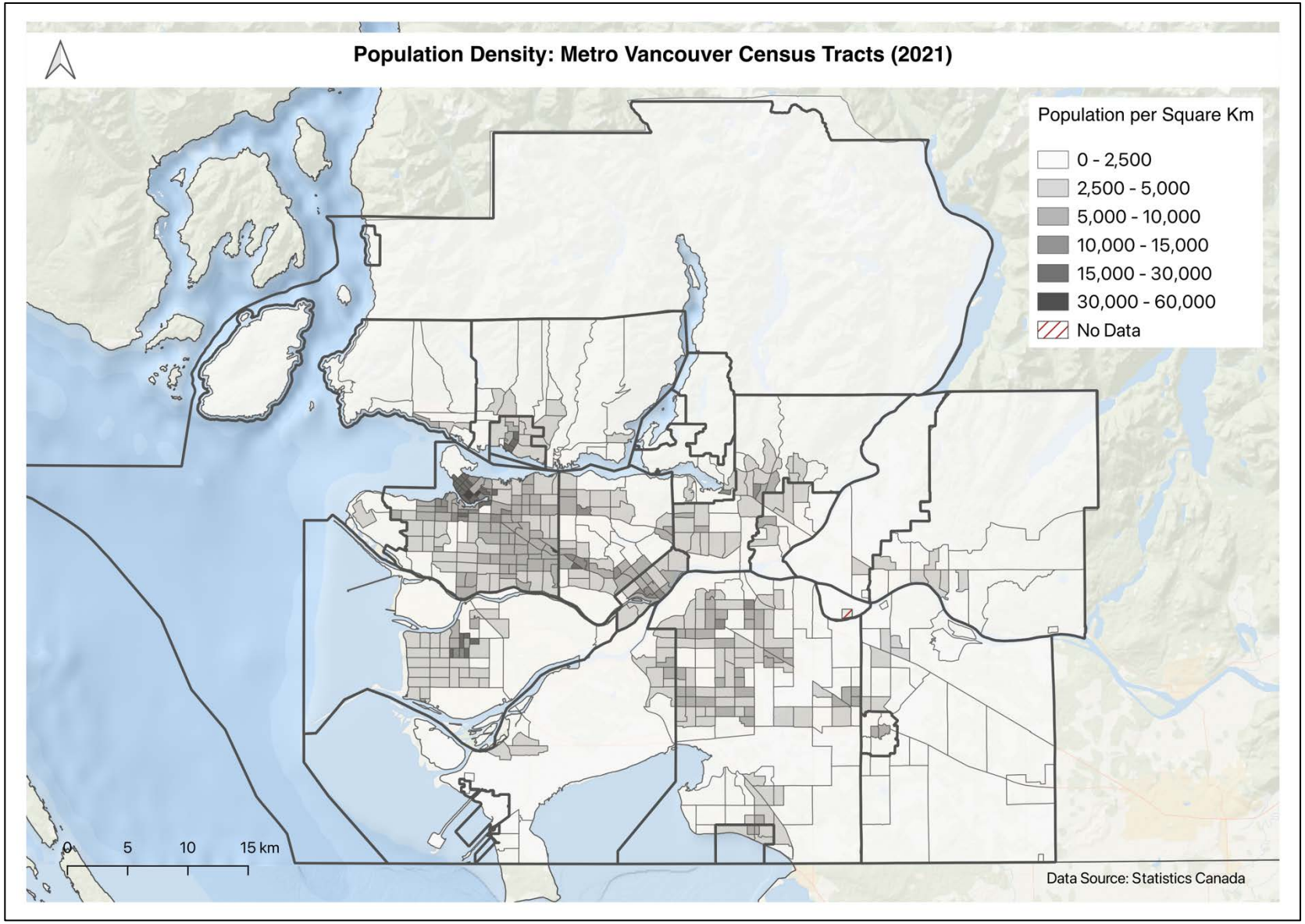

Figure 3. Census tract-level distribution of population density in Metro Vancouver. Data are derived from the Statistics Canada, 2021 Census of Population.

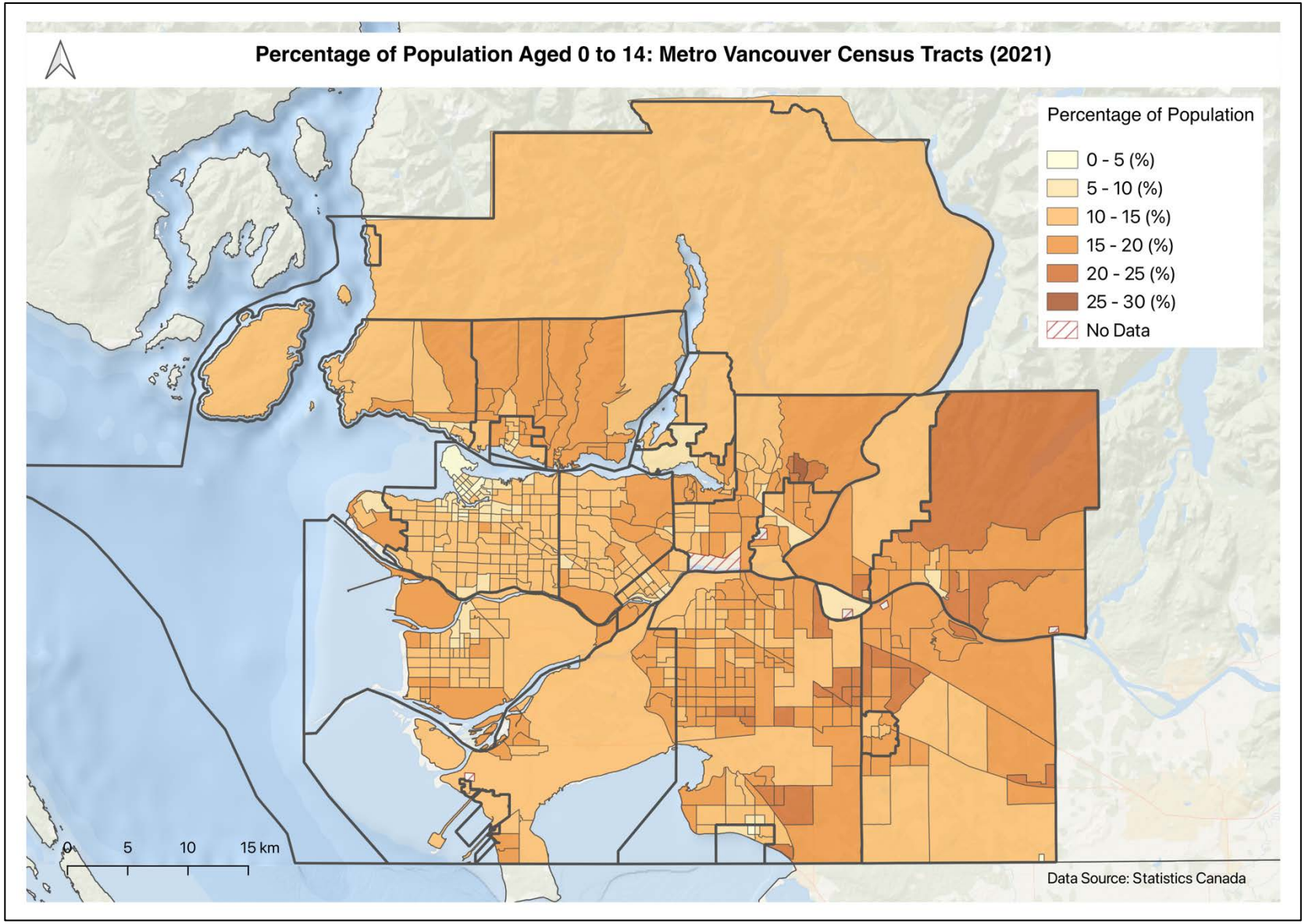

Figure 5. Census tract-level distribution of population aged 0 to 14 in Metro Vancouver. Data are derived from the Statistics Canada, 2021 Census of Population.

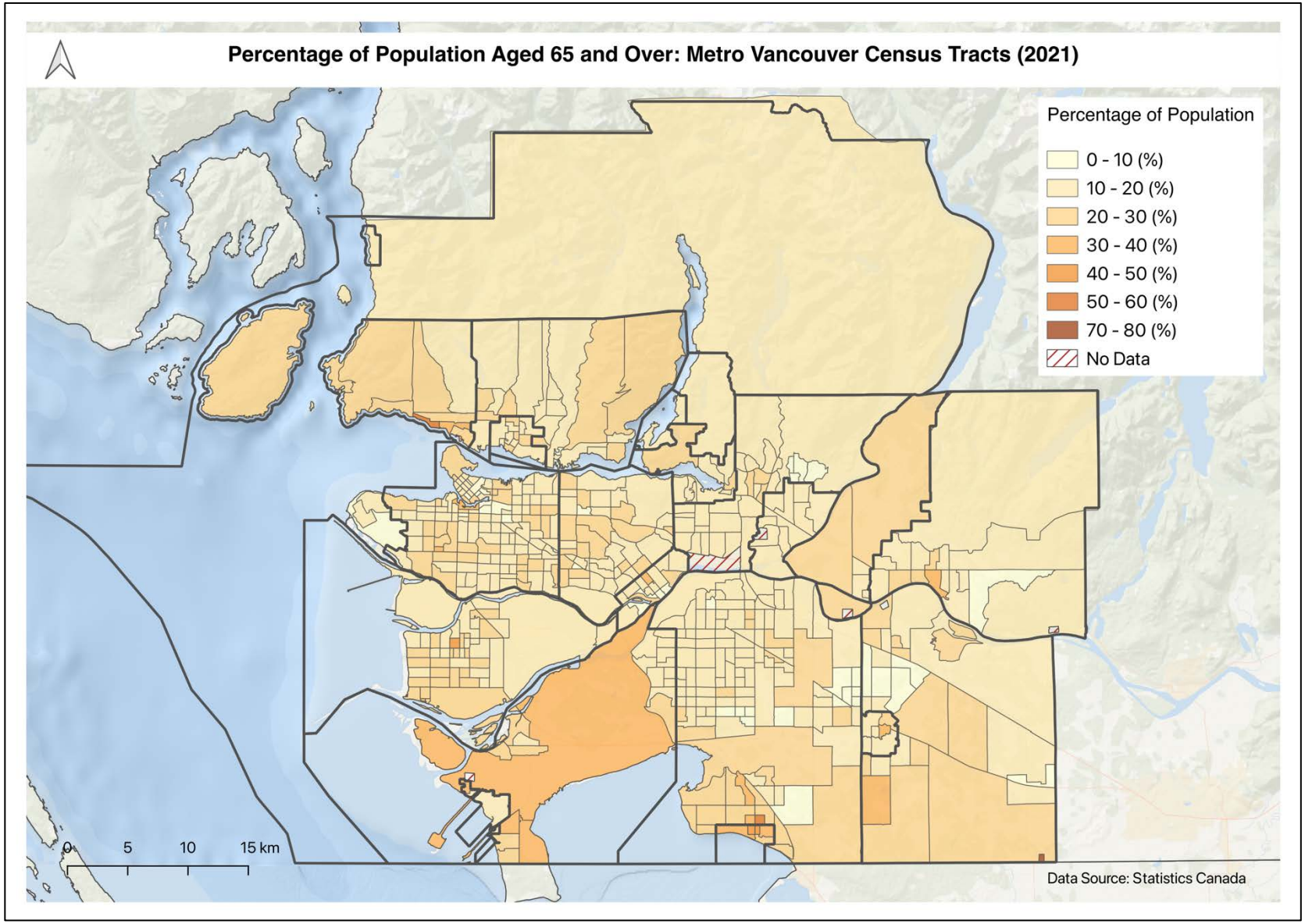

Figure 6. Census tract-level distribution of population aged 65 and over in Metro Vancouver. Data are derived from the Statistics Canada, 2021 Census of Population.

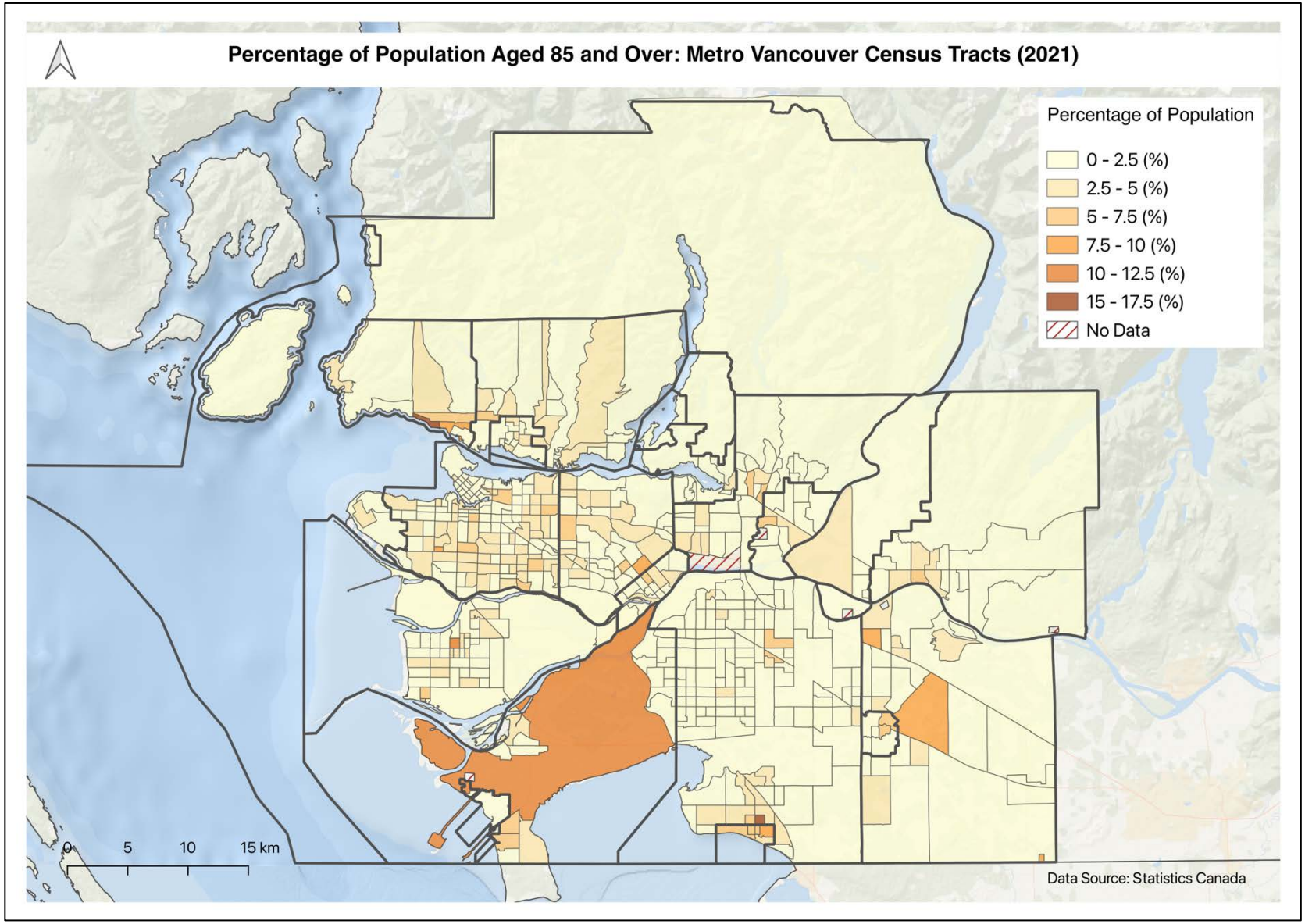

Figure 7. Census tract-level distribution of population aged 85 and over in Metro Vancouver. Data are derived from the Statistics Canada, 2021 Census of Population.

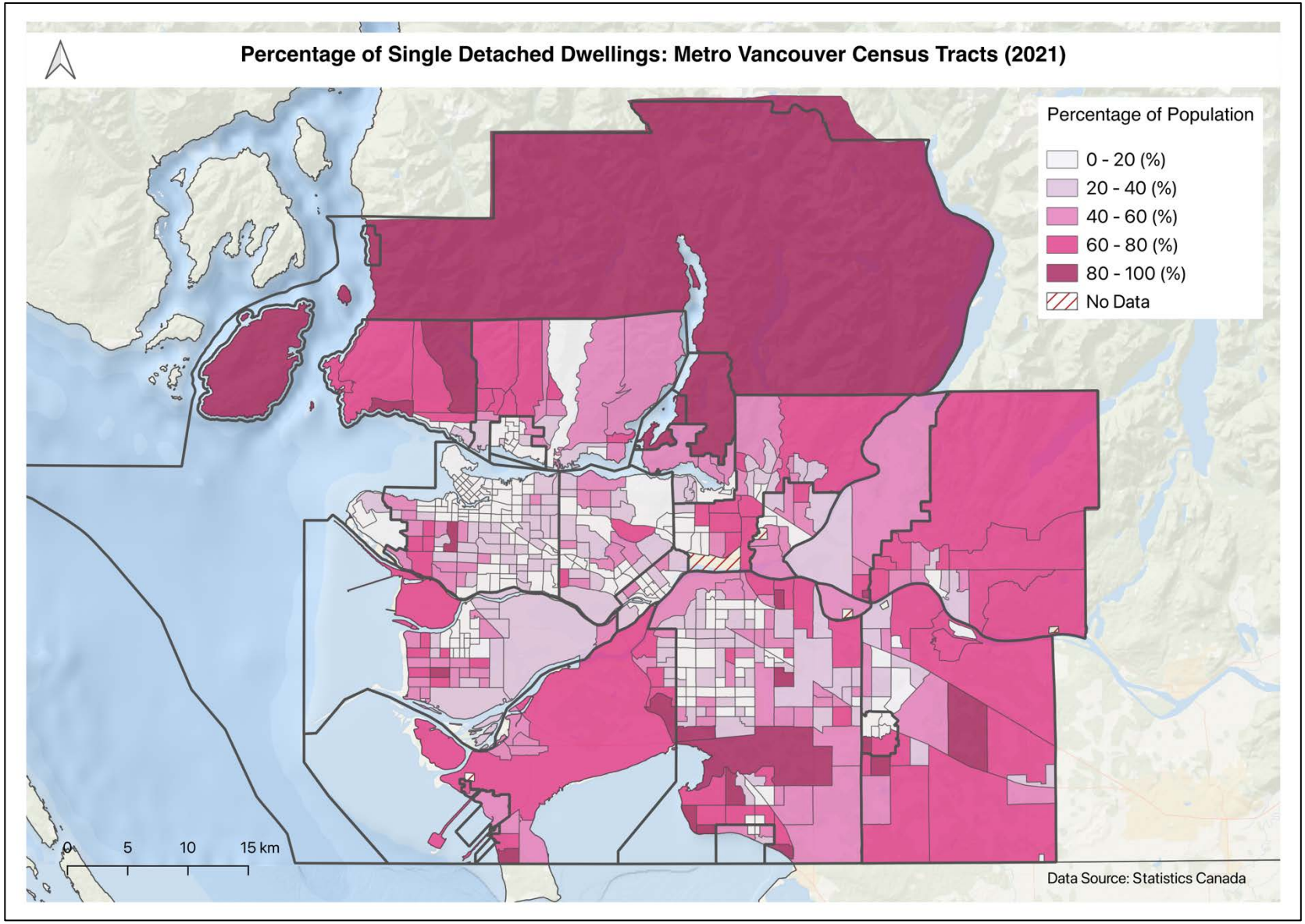

Figure 8. Census tract-level distribution of single detached dwellings in Metro Vancouver. Data are derived from the Statistics Canada, 2021 Census of Population.

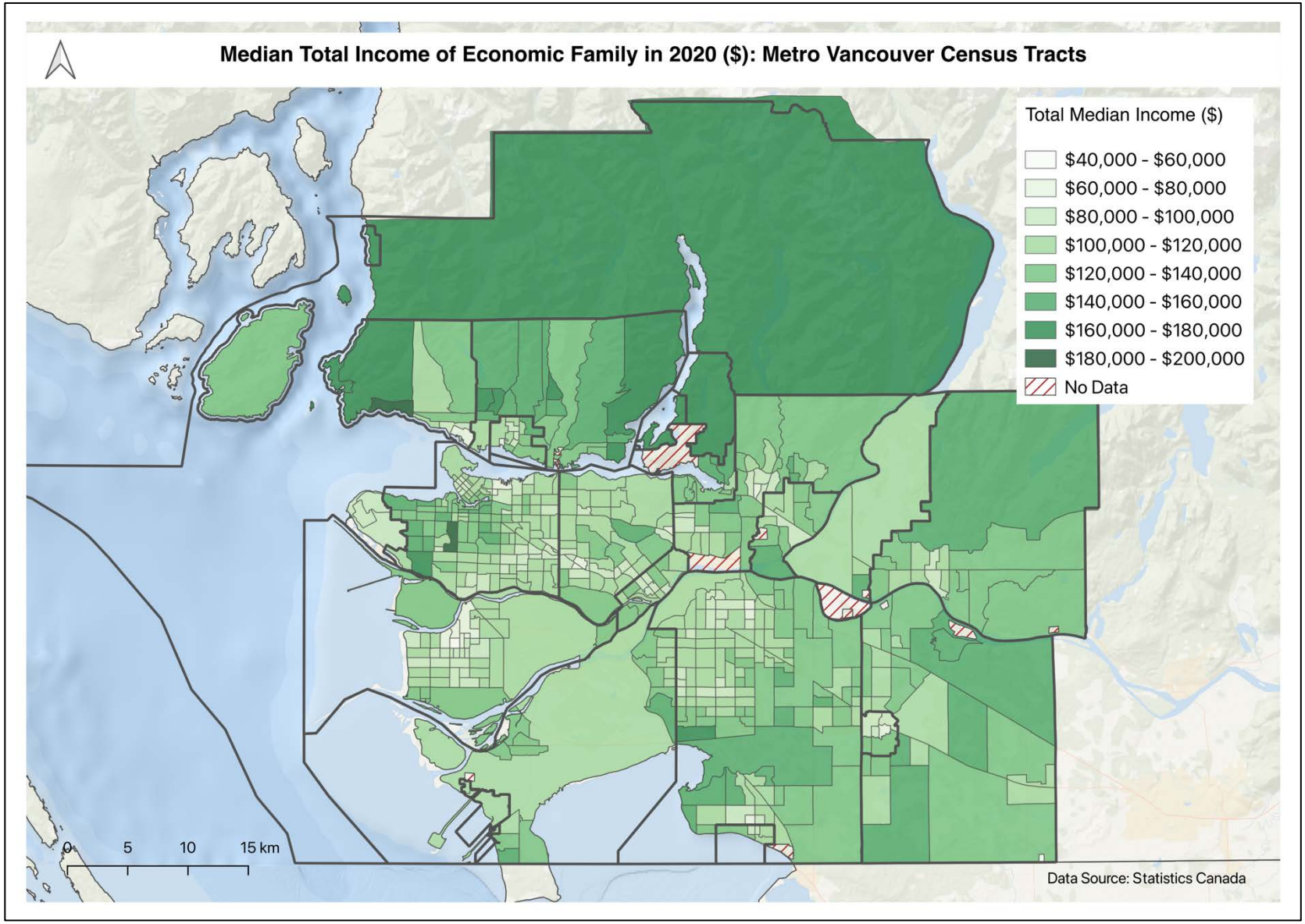

Figure 9. Census tract-level median total income of the economic family in Metro Vancouver. Data are derived from the Statistics Canada, 2021 Census of Population.

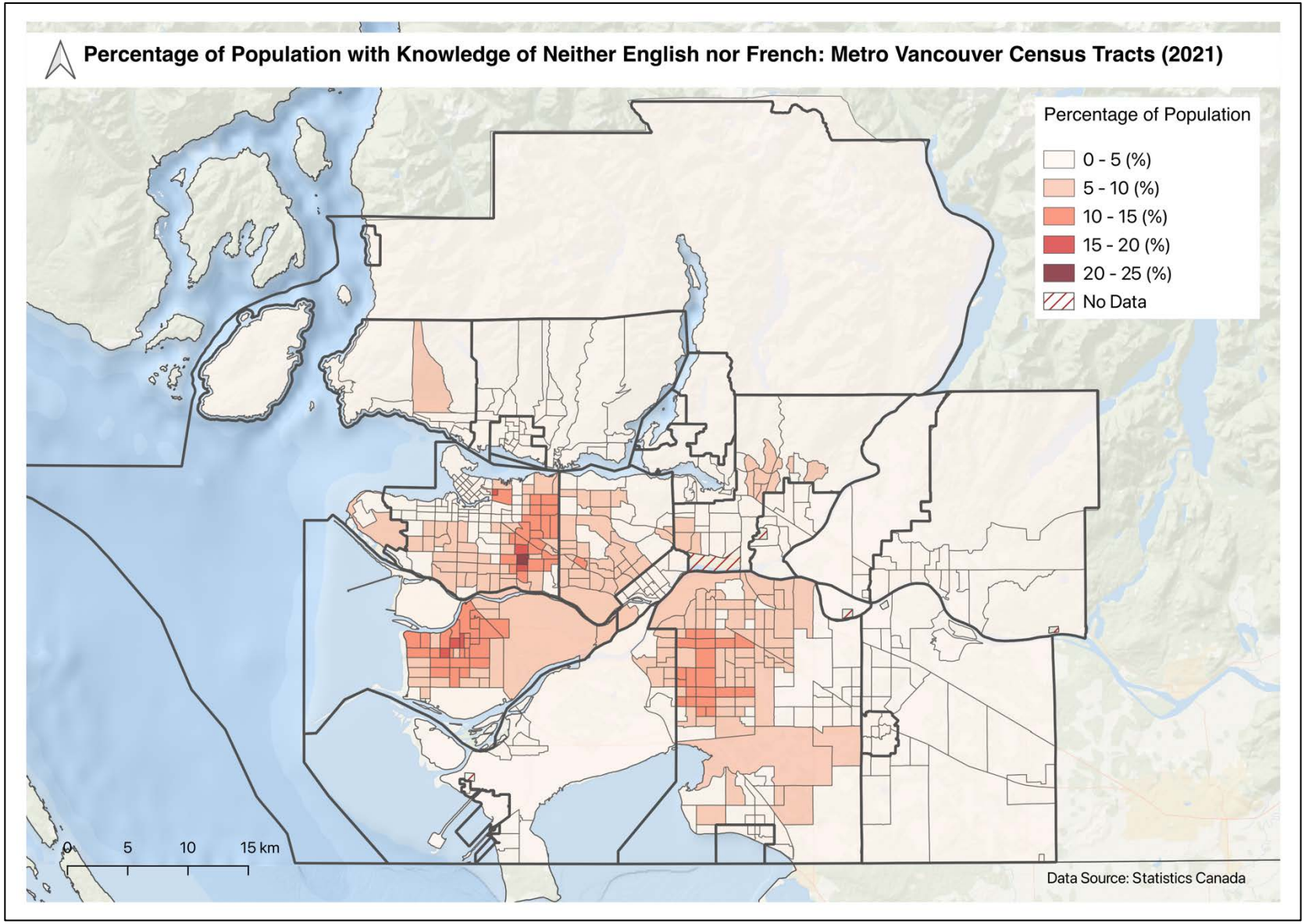

Figure 10. Census tract-level distribution of non-official language speakers (English nor French) in Metro Vancouver. Data are derived from the Statistics Canada, 2021 Census of Population

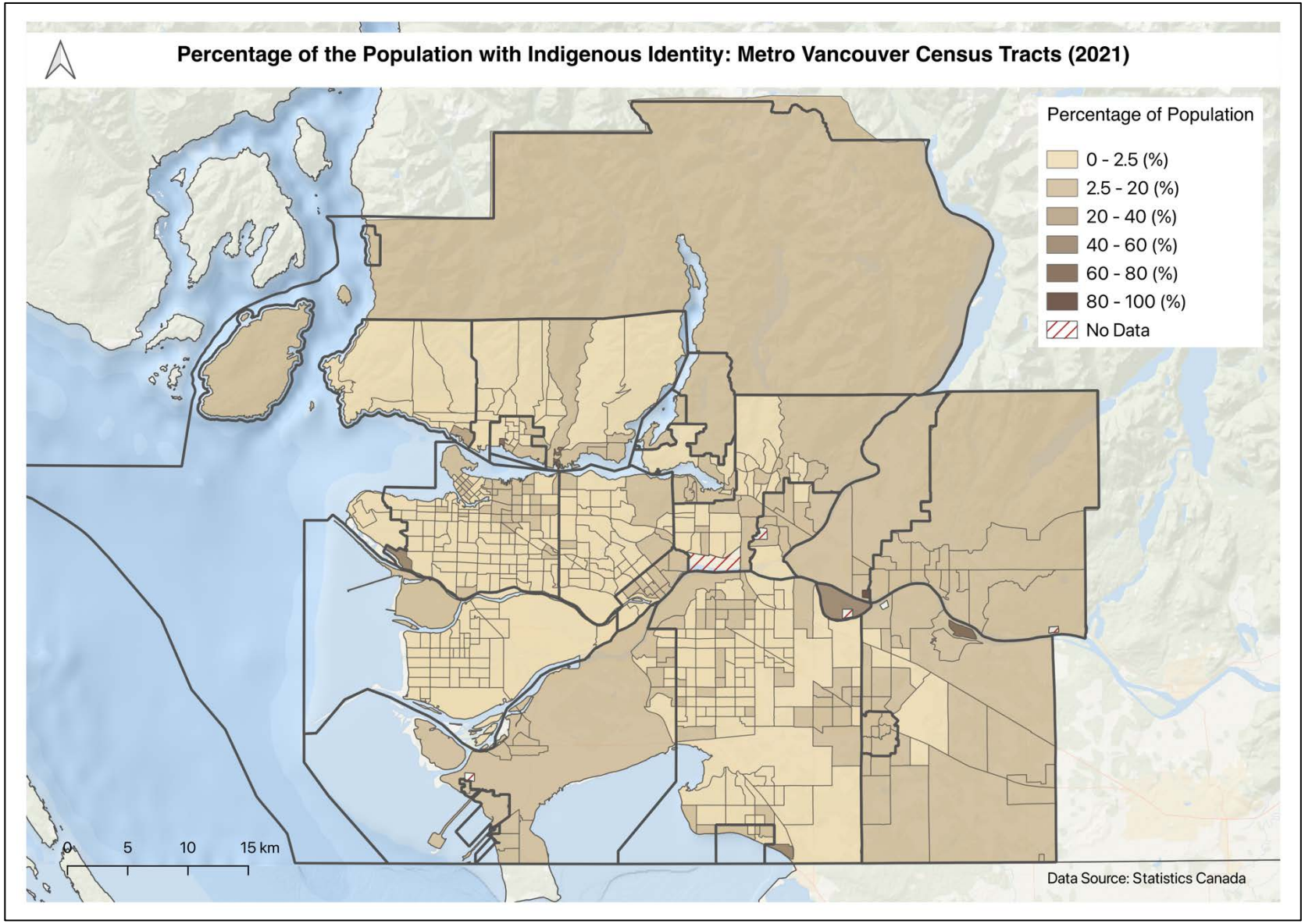

Figure 11. Census tract-level distribution of population with Indigenous identity in Metro Vancouver. Data are derived from the Statistics Canada, 2021 Census of Population, 25% sample data.

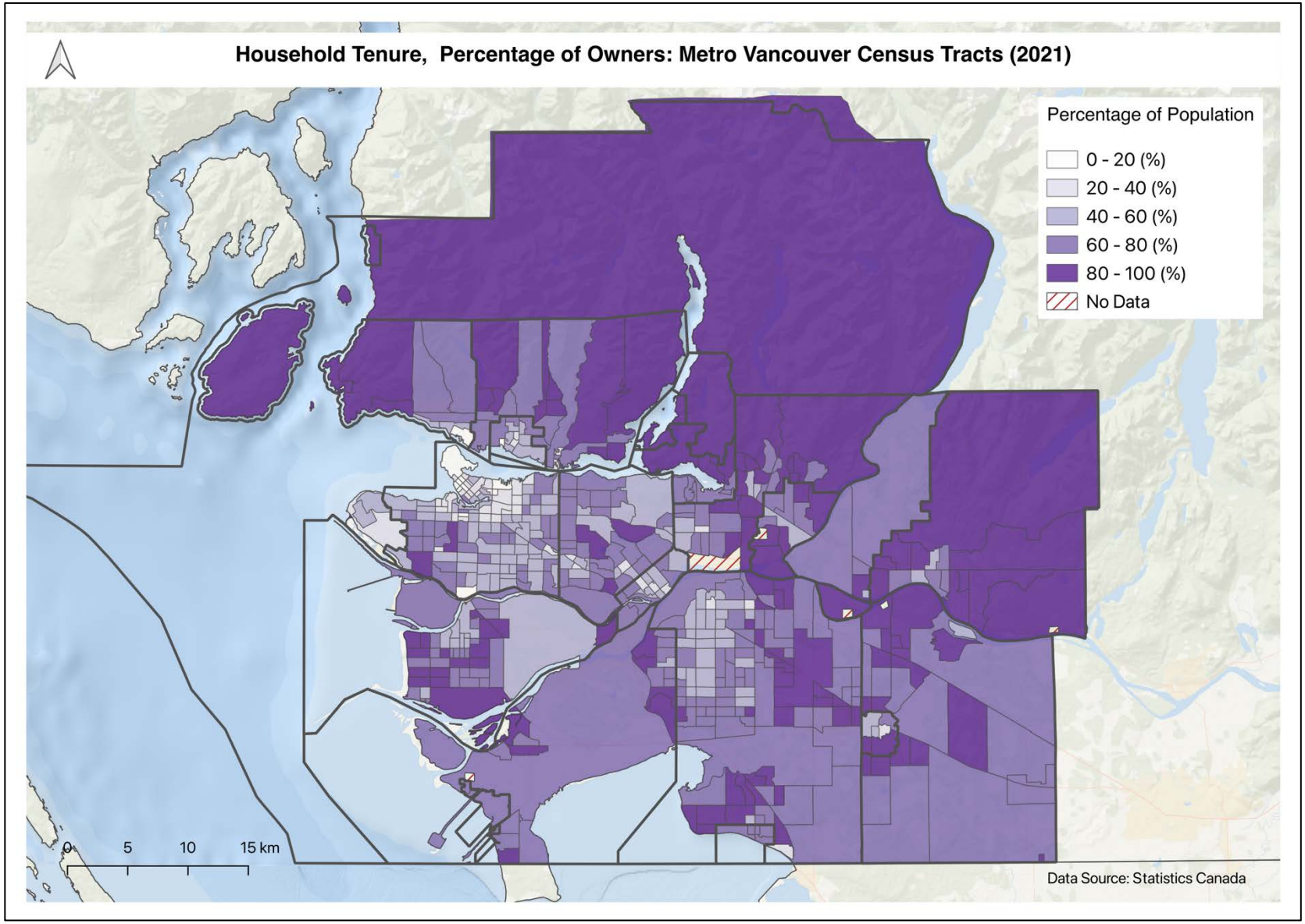

Figure 12. Census tract-level distribution of owners by household tenure in Metro Vancouver. Data are derived from the Statistics Canada, 2021 Census of Population, 25% sample data.

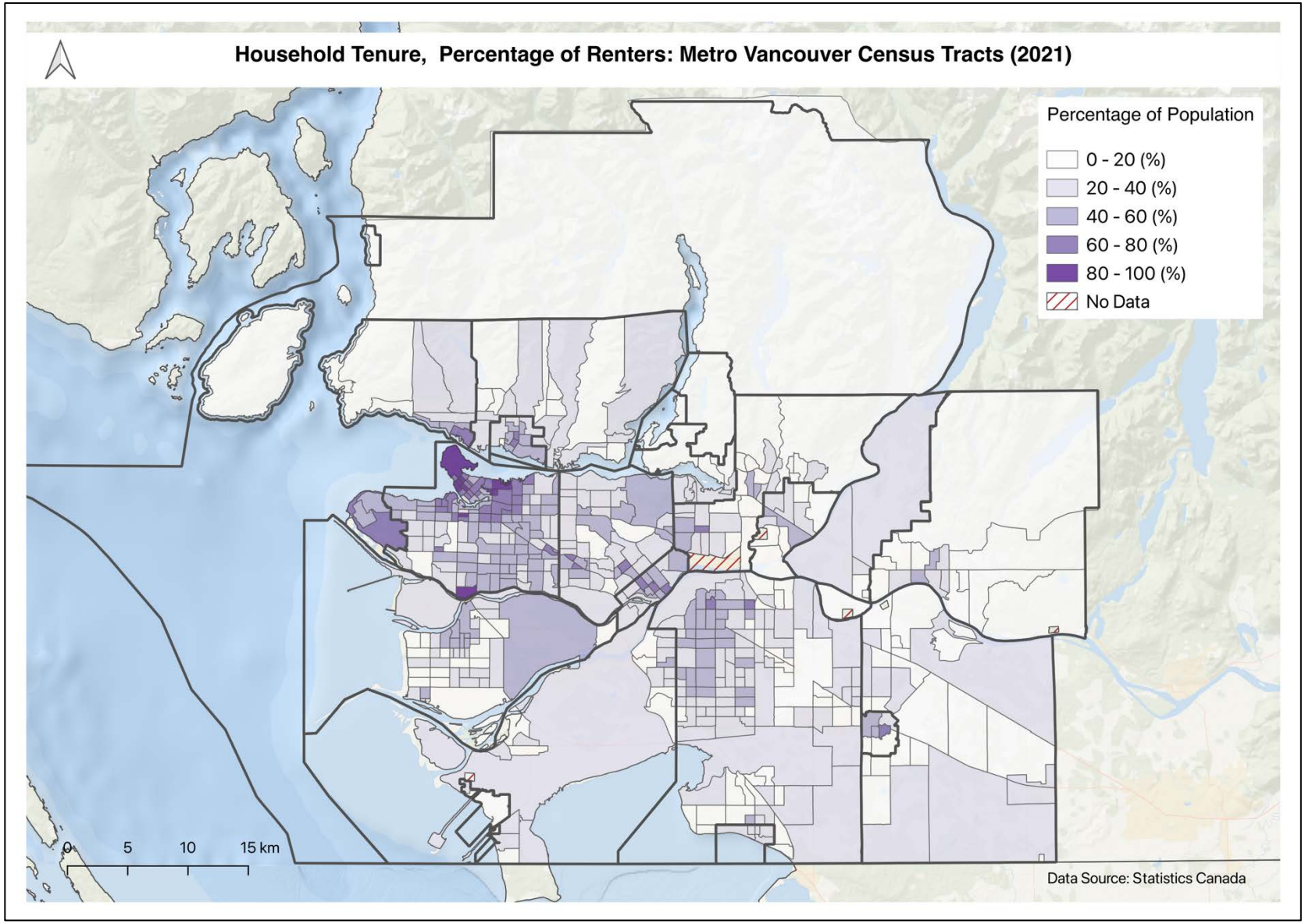

Figure 13. Census tract-level distribution of renters by household tenure in Metro Vancouver. Data are derived from the Statistics Canada, 2021 Census of Population, 25% sample data.

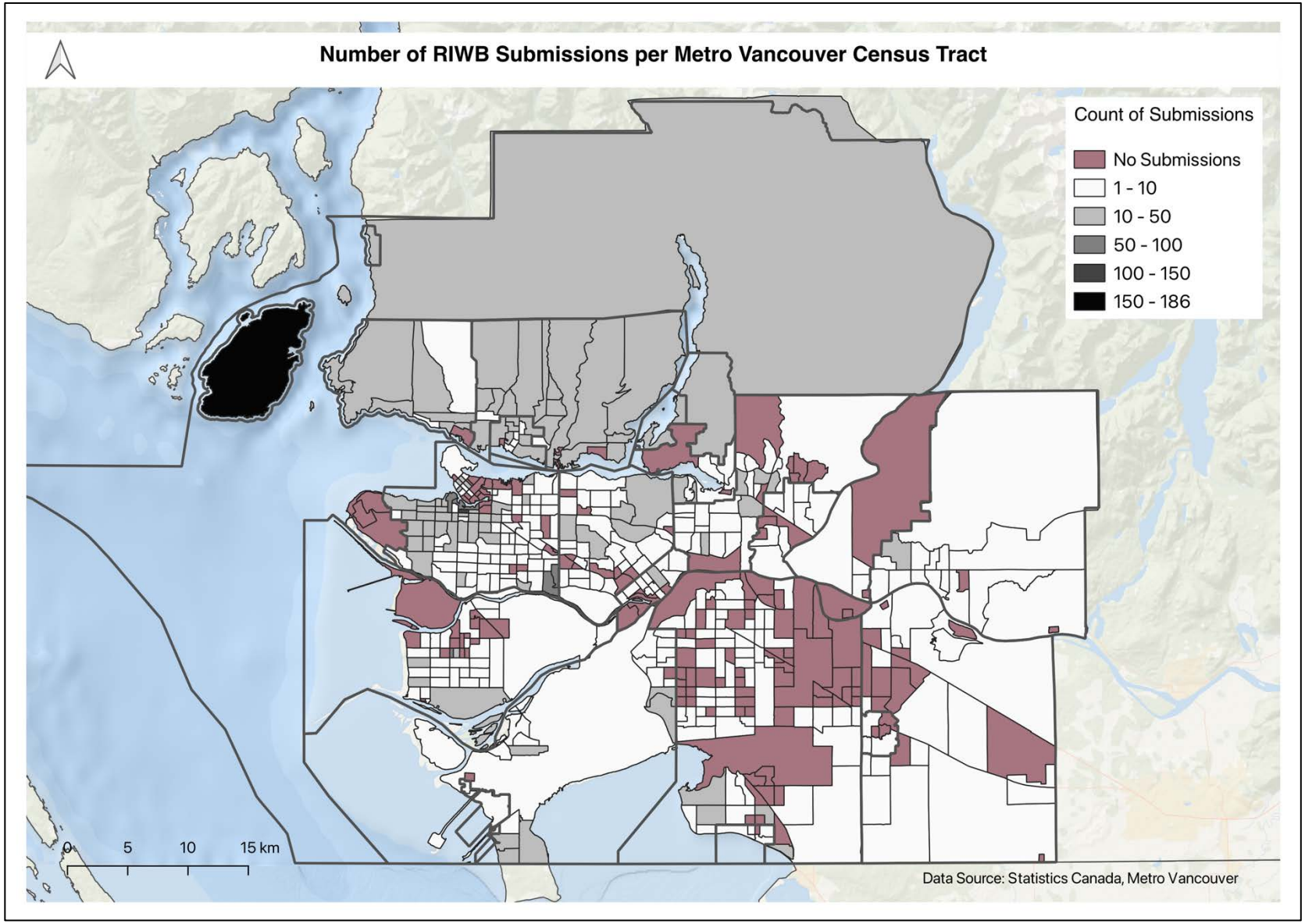

Figure 14. Census tract-level count of RIWB submissions in Metro Vancouver. Data are derived from the Statistics Canada 2021 Census of Population and Metro Vancouver.

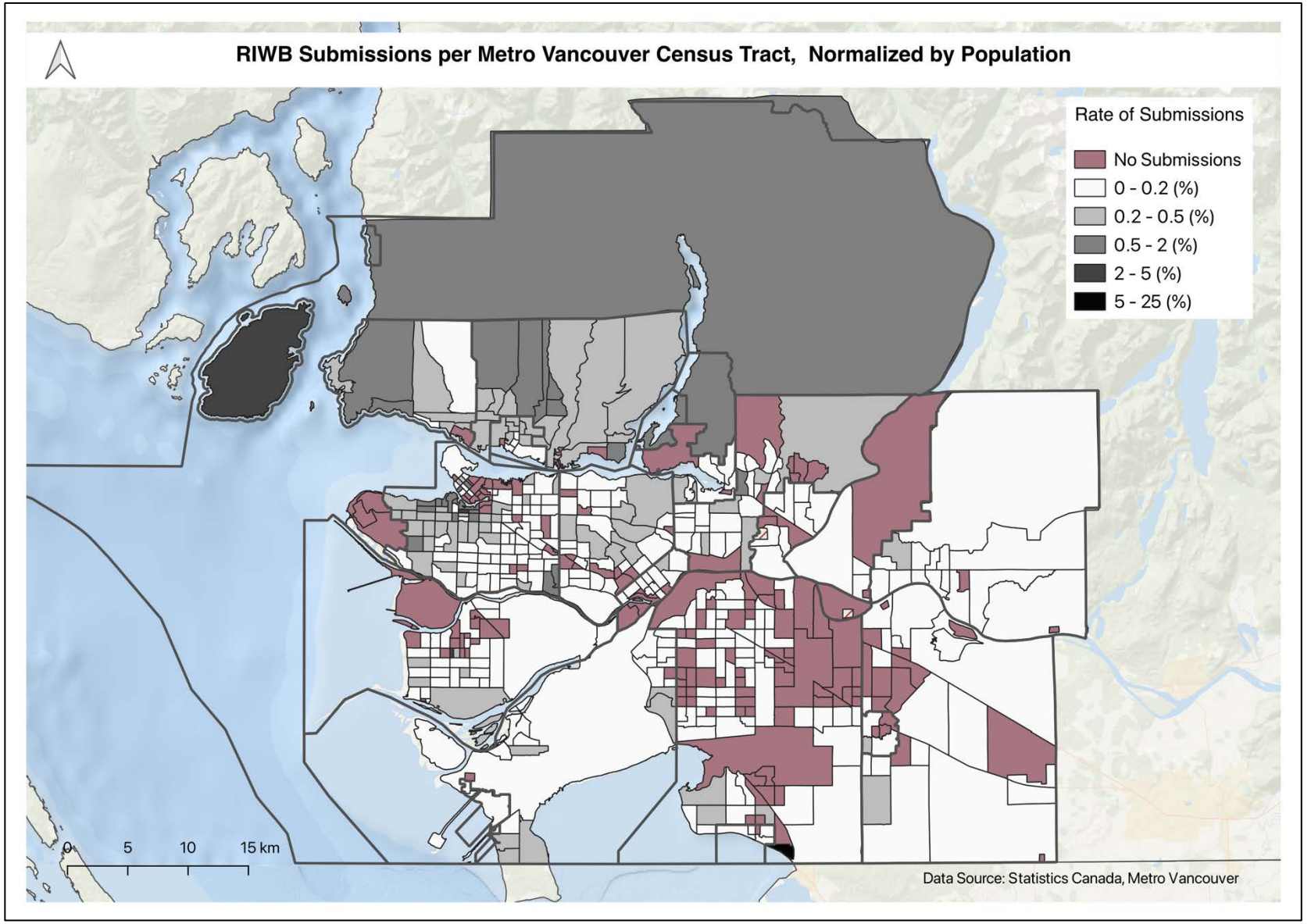

Figure 15. RIWB submissions in Metro Vancouver, normalized by Census Tract population. Data are derived from the Statistics Canada 2021 Census of Population and Metro Vancouver

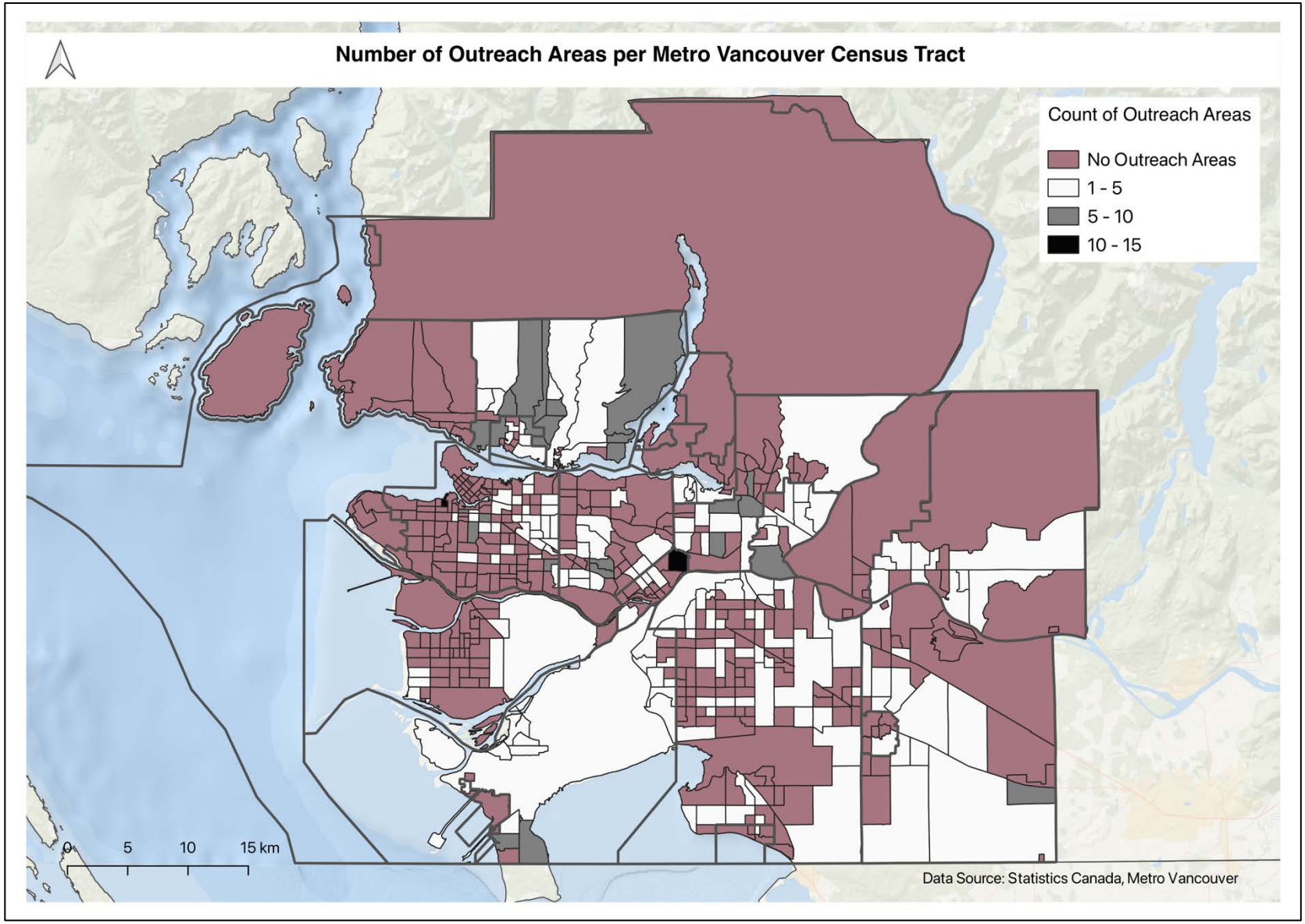

Figure 17. Census tract-level count of RIWB outreach areas in Metro Vancouver. Data are derived from the Statistics Canada 2021 Census of Population and Metro Vancouver.

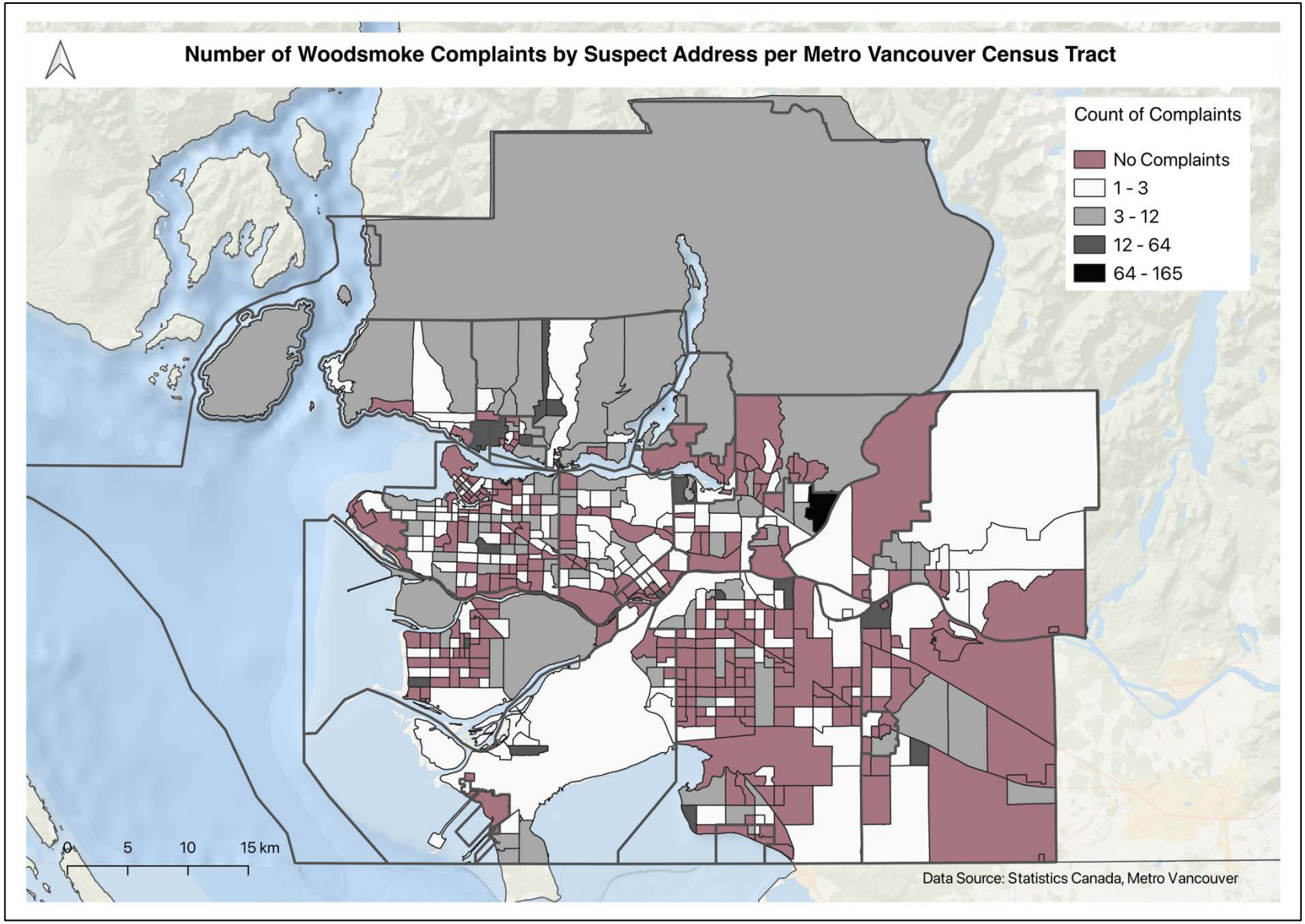

Figure 18. Census tract-level count of woodsmoke complaints in Metro Vancouver. Data are derived from the Statistics Canada 2021 Census of Population and Metro Vancouver.