

**Supplementary Table 1. Social Determinants of Health – Variables from Statistics Canada 2016 Census of Population**

<b>Measure (Source)<sup>a</sup></b>	<b>Definition of indicator</b>	<b>Notes<sup>b [r]</sup></b>
Population size (100% of census sample)	Total population count of a Dissemination Area	In this measure and where required, Dissemination Area (DA) population counts are adjusted (reduced) to remove residents of Long Term Care Homes (LTCH) <sup>c</sup> .
<b>Socio-demographic</b>		
Household income (100% of census sample) <sup>d</sup>	Decile rank of a Dissemination Area's average total after-tax income, weighted by population	After-tax income is calculated for each household from the income for all household members. Calendar year 2015 is the reference period for all income variables in the 2016 Census. Single-person equivalent is used to account for households of different sizes. To limit variations in the cost of living, the ranking is calculated exclusively from DAs within the same Census Metropolitan Area (CMA).
% recent immigration (25% of census sample)	Numerator: Number of persons within each DA who immigrated to Canada in the 5 year period between 2011 and 2016  Denominator: Total population within the Dissemination Area	2016 Census Dictionary states: 'Immigrant' refers to a person who is, or who has ever been, a landed immigrant or permanent resident. Such a person has been granted the right to live in Canada permanently by immigration authorities.  2016 Census Dictionary states: 'Period of immigration' refers to the period in which the immigrant first obtained landed immigrant or permanent resident status.  Recent immigrant refers to a person who obtained a landed immigrant or permanent resident status up to five years prior to a given census year. In the 2016 Census, this period is January 1, 2011, to May 10, 2016.
% visible minority (25% of census sample)	Numerator: Number of persons who belong to visible minority groups  Denominator: Total population within the Dissemination Area	Visible minority groups are defined by the Employment Equity Act: "persons, other than Aboriginal peoples, who are non-Caucasian in race or non-white in colour". 2016 Census Dictionary states: "The visible minority population consists mainly of the following groups: South Asian, Chinese, Black, Filipino, Latin American, Arab, Southeast Asian, West Asian, Korean and Japanese."
% educational attainment (25% of census sample)	Numerator: Number of persons aged 15 and over who have not obtained a certificate, diploma or degree from a high school, trades school, college, or university.  Denominator: Total of all persons aged 15 and older living in private households in the Dissemination Area.	The certificates, diplomas or degrees included in this measure also capture: high school equivalency certificates; Certificates of Apprenticeship; Journeyperson's designations; trade certificates or diplomas completed at institutes of technology and vocational centres; CEGEP; non-university certificates or diplomas from a private business school or school of nursing; teaching certificates; "non-degree programs of study completed through a university....connected with professional associations in fields such as accounting, banking, insurance or public administration." [2016 Census Dictionary]. Persons included in the numerator have not obtained these types of certificates, diplomas or degrees.
<b>Dwelling-related</b>		
% not living in high-density	Numerator: Number of private households <sup>e</sup> living in dwellings that have	The National Occupancy Standard (NOS) is used to classify the suitability of accommodations. A suitable household is defined as "households where the required number of bedrooms based on the

<p>housing (% suitable housing) (25% of census sample)</p>	<p>“enough bedrooms for the size and composition of the household.” [2016 Census Dictionary]</p> <p>Denominator: Total number of private households within the Dissemination Area</p>	<p>National Occupancy Standard (NOS) does not exceed the reported number of bedrooms in the dwelling.” The number of required bedrooms is determined using the following criteria:</p> <ol style="list-style-type: none"> <li>1. A maximum of two persons per bedroom.</li> <li>2. Household members, of any age, living as part of a married or common-law couple share a bedroom with their spouse or common-law partner.</li> <li>3. Lone-parents, of any age, have a separate bedroom.</li> <li>4. Household members aged 18 or over have a separate bedroom - except those living as part of a married or common-law couple.</li> <li>5. Household members under 18 years old of the same sex share a bedroom - except lone-parents and those living as part of a married or common-law couple.</li> <li>6. Household members under 5 years old of the opposite sex share a bedroom if doing so would reduce the number of required bedrooms. This situation would arise only in households with an odd number of males under 18, an odd number of females under 18, and at least one female and one male under the age of 5.</li> </ol> <p><a href="https://www23.statcan.gc.ca/imdb/pUtil.pl?Function=getNote&amp;Id=141809&amp;NT=01">https://www23.statcan.gc.ca/imdb/pUtil.pl?Function=getNote&amp;Id=141809&amp;NT=01</a></p>
<p><b>Occupation-related</b></p>		
<p>% essential services not amenable to remote working (25% of census sample)</p>	<p>Numerator: Number of persons in the labor force who have occupations in one of the following categories: Manufacturing/utilities, Trades/transport/equipment operators, Sales/services, Health, Resources/agriculture/production</p> <p>Denominator: Total labor force population aged 15 years and over in private households in the Dissemination Area</p>	<p>Occupations are assigned according to the National Occupancy Classification (2016). Occupation was chosen over “Industry” to better represent the type of work performed and skill-level required by a population rather than the industry that provides the employment. Numerators may be defined separately (“or”) or added together in different combination sets (“and”). “Labor Force” is all persons in private households aged 15 years and older who were either employed or unemployed during the week of Sunday, May 1 to Saturday, May 7, 2016.</p>

Sources:

Data tables from: Statistics Canada. 2017. 2016 Census of Population. Census Profile - Age, Sex, Type of Dwelling, Families, Households, Marital Status, Language, Income, Immigration and Ethnocultural Diversity, Housing, Aboriginal Peoples, Education, Labour, Journey to Work, Mobility and Migration, and Language of Work for Canada, Provinces and Territories, Census Divisions, Census Subdivisions and Dissemination Areas (File: 98-401-X2016044). Accessed January 2018.

Dictionary definitions from: Statistics Canada. 2017. 2016 Census Dictionary. Statistics Canada Catalogue no. 98-301-X2016001. Ottawa, Ontario. November 29. (<https://www12.statcan.gc.ca/census-recensement/2016/ref/dict/index-eng.cfm>, accessed November 30, 2020).

Appendix 1, as submitted by the authors. Appendix to: Xia Y, Ma H, Moloney G, et al. Geographic concentration of SARS-CoV-2 cases by social determinants of health in metropolitan areas in Canada: a cross-sectional study. *CMAJ* 2022. doi: 10.1503/cmaj.211249. Copyright © 2022 The Author(s) or their employer(s). To receive this resource in an accessible format, please contact us at [cmajgroup@cmaj.ca](mailto:cmajgroup@cmaj.ca).

Questionnaire used to collect the information: 1) Statistics Canada. Census 2A – 2016. Modified April 23, 2019.

([https://www23.statcan.gc.ca/imdb/p3Instr.pl?Function=assembleInstr&a=1&&lang=en&Item\\_Id=295241](https://www23.statcan.gc.ca/imdb/p3Instr.pl?Function=assembleInstr&a=1&&lang=en&Item_Id=295241)) and 2) Census 2A-L - 2016. Modified April 23, 2019.

([https://www23.statcan.gc.ca/imdb/p3Instr.pl?Function=assembleInstr&a=1&&lang=en&Item\\_Id=295122](https://www23.statcan.gc.ca/imdb/p3Instr.pl?Function=assembleInstr&a=1&&lang=en&Item_Id=295122))

*a*-“Sample” refers to the short-form Census questionnaire (100% sample) or to the long-form questionnaire, received by a random sample of households (25% sample). It is mandatory for recipients to respond to the questionnaires. Statistical inferences for the entire population are drawn from the subset of responses of the long-form questionnaire; these inferences are reported in the tabulated values provided by Statistics Canada. Note that income information was collected solely from administrative data sources (100% sample) and were not part of either questionnaire.

*b*-Additional details about variable definitions may be included the Census Dictionary; please refer to Statistics Canada’s Dictionary for the 2016 Census of Population for complete definitions. Some definitions provided here are taken verbatim from source.

*c*-Due to reporting methods used by CCM+, case counts among “Long-Term Care Residents” may also include cases that are reported for residents of “nursing home[s] or other chronic care facility[ies]”. Adjustments in population counts described here only include adjustments to Dissemination Areas that have one (or more) LTCH facility identified by the Ontario Ministry of Health. The adjustments are made by subtracting the total number of beds in the facility from the population count of the DA.

*d*-Income deciles for the City of Toronto / Toronto Public Health Unit were tabulated from data contained in PCCF+ (version 7B) and adjusted for population size. **Ref: Statistics Canada. 2018. Postal Code Conversion File Plus (PCCF+) Version 7B, Reference Guide. November 2018 Postal codes.**

*e*-Where referenced, “household” refers to a “private household”. The 2016 Census Dictionary states: “Private household” refers to a person or group of persons who occupy the same dwelling and do not have a usual place of residence elsewhere in Canada or abroad.”