

Understanding Neighbourhood Income Mixing in Canadian Cities: The Income Divergence Index (D-index)

To what extent do Canadian households live in mixed-income neighbourhoods? How can neighbourhood income mixing be measured? CMHC commissioned Statistics Canada to develop an indicator of income mixing at the census tract level. This new data will support countrywide efforts for studying socially inclusive housing and neighbourhoods.

Project Overview

This research built on the literature on income inequality measures to explore several options for measuring income mixing within geographic units. Three different measures appeared to be good candidates: (i) the dissimilarity index, (ii) the information theory index, and (iii) the divergence index (D-index). Each measure was then applied using geographically detailed income data derived from tax records.

Findings

- The D-index most effectively describes income sorting across and within neighbourhoods.
- When it comes to understanding income mixing at the local level, three factors appeared to be important. They are the sorting of households: (i) across census tracts, (ii) across dwelling types within census tracts, and (iii) across apartment buildings in these same census tract-based neighbourhoods.
- In all Canadian census metropolitan areas (CMAs), the sorting of households across census tracts represented the main source, among the three studied, of income mixing within CMAs. This means that poor and richer households tend to be concentrated in different neighbourhoods. This implies less income mixing at the CMA level.

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- present major findings of the research

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Why develop the D-index?

The federal government has committed to a renewed and reengaged role in affordable housing through the National Housing Strategy (NHS), which was launched in November 2017. One of the central tenets of the new Strategy is the promotion of socially inclusive housing and neighbourhoods. To fill important data gaps and to gather information on social inclusion as it relates to housing and the built environment, CMHC has initiated and funded the development of an indicator of neighbourhood income mixing called the Income Divergence Index, or simply D-index.

How to get access to the data

On July 2020, Statistics Canada released the D-index in the Canadian Statistical Geospatial Explorer.¹ Moreover, as of October 2020, a linkage between this dataset and the Canadian Housing Survey became available in microdata format, available through Statistics Canada's Research Data Centres.

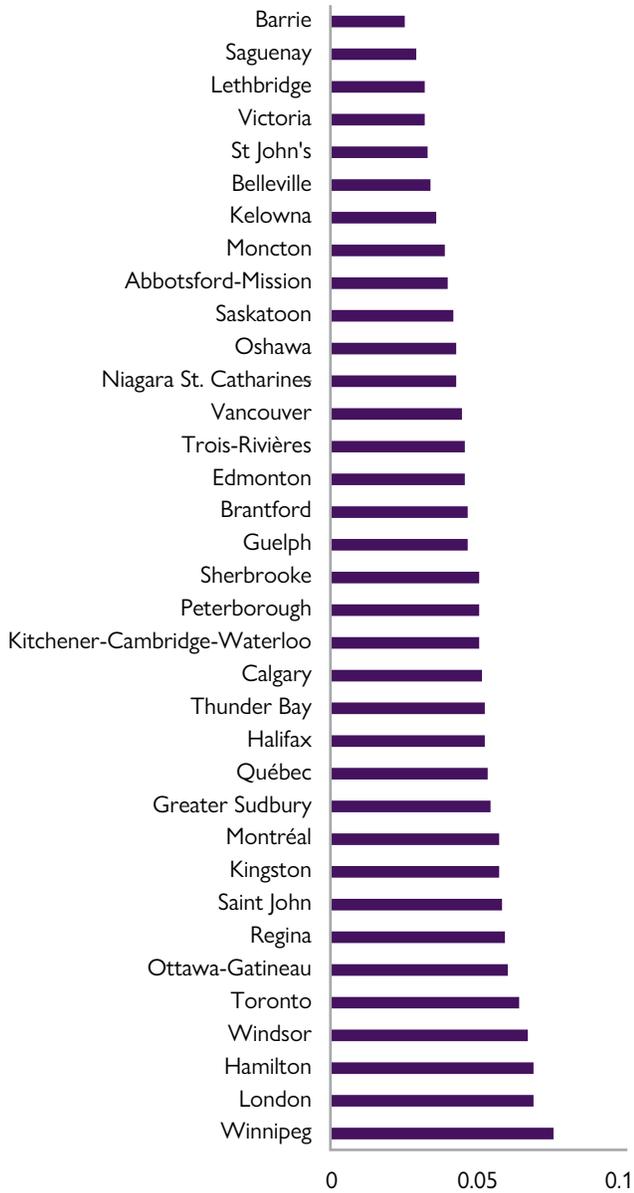
The D-index is currently available for years 2014 and 2016. An update of the index using income data derived from 2018 tax records will be linked to the Canadian Housing Survey and made available through Research Data Centres this year.

In 2016, according to the D-index, Winnipeg was classified as the CMA with the least neighbourhood income mixing in Canada, while Barrie was classified as the one with the most mixing. The level of income mixing depends on the degree households sort across neighbourhoods and within neighbourhoods across dwelling types (apartment buildings and other dwelling types) and individual apartment buildings.

Regarding the three largest CMAs: overall, Vancouver is more neighbourhood-income-mixed than Montréal and Toronto. Toronto is the least income-mixed among the three. This classification does not reflect housing prices within each CMA, but rather the extent to which neighbourhoods house people with different income backgrounds.

¹ <https://www150.statcan.gc.ca/n1/pub/71-607-x/2020010/71-607-x2020-app-eng.htm>, retrieved May 2021.

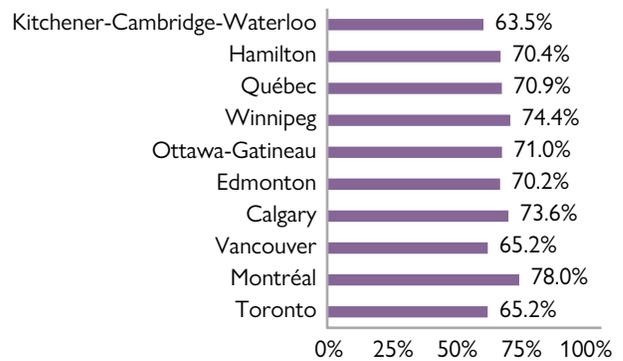
Figure 1: Average neighbourhood income mixing, Canadian census metropolitan areas, 2016



Source: Statistics Canada, authors' compilation based on the 2016 taxation year T1 Family File

Considering the relative degree of household sorting across neighbourhoods: among the three largest CMAs, Montréal is the one where the sorting of households across census tracts contributed most to the level of neighbourhood income mixing in the CMA. In Montréal, 78% of the average income mixing of the CMA was due to poor and richer households tending more to live in different neighbourhoods. Surprisingly, the corresponding figures are lower for Toronto and Vancouver (65% for each of them).

Figure 2: Relative importance of the sorting of households across census tracts, ten largest CMAs, 2016

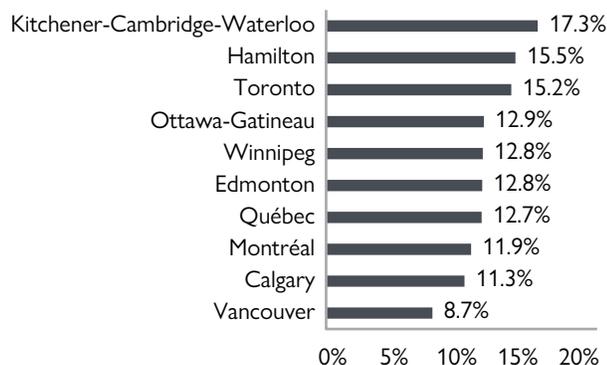


Source: CMHC, adapted from, Statistics Canada, authors' compilation based on the 2016 taxation year T1 Family File

If, in a given census tract, households with different incomes lived in different dwelling types, this would imply a lower degree of income mixing in the neighbourhood, even if the neighbourhood were home to households in all of the income groups. This would be sorting across dwelling types.

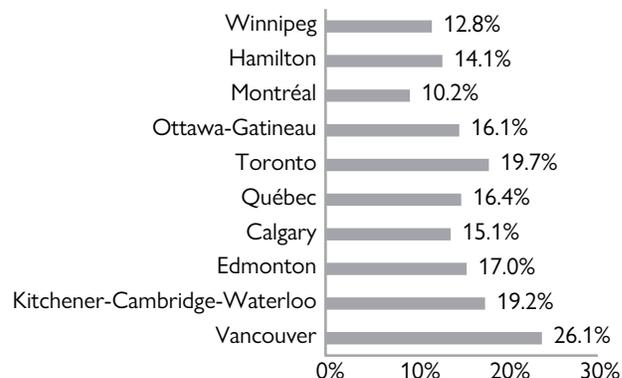
In Toronto, 15.2% of the lack of neighbourhood income mixing in 2016 was due to poor and richer households living in different types of dwellings, even within the same neighbourhoods. The corresponding figure was 11.9% for Montreal, and only 8.9% for Vancouver.

Figure 3: Relative importance of the sorting of households across dwelling types, ten largest CMAs, 2016



Source: CMHC, adapted from, Statistics Canada, authors' compilation based on the 2016 taxation year T1 Family File

Figure 4: Relative importance of the sorting of households across apartment buildings, ten largest CMAs, 2016



Source: CMHC, adapted from, Statistics Canada, authors' compilation based on the 2016 taxation year T1 Family File

Even if households from different income groups live in the same type of dwelling, it might be the case that richer households live in higher-quality buildings, while poorer households find themselves living in older dwellings. One example could be richer households living in very expensive condominiums, while poorer ones live in old and poorly maintained buildings.

Among the 10 largest CMAs in Canada, Vancouver is the one where the sorting across apartment buildings contributed most to the lack of neighbourhood income mixing in the CMA. In Vancouver, 26.1% of the lack of neighbourhood income mixing was due to higher-income households sorting into higher-income buildings and lower-income households sorting into lower-income buildings.

Interestingly, the degree of sorting across apartment buildings was higher in Toronto (19.7%) than in Montréal (10.2%).

Implications for the Housing Industry

With the D-index, it is now possible to identify neighbourhoods where developing affordable housing might help achieve the highest impact in terms of geographically based income mixing. Furthermore, this research shows that improving neighbourhood income mixing in Canada means reducing the sorting of households across three dimensions: (i) census tracts, (ii) dwelling types, and (iii) apartment buildings.

For Further Reading

Neighbourhood, Dwelling and Apartment Building Income Mixing: Measures and Experimental Estimates Across Census Metropolitan Areas

<https://www150.statcan.gc.ca/n1/pub/11-633-x/11-633-x2020001-eng.htm>

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Full Report

*Update of Indicators of Income Mixing:
2018 T1 Family File-based Income Mixing Measures*

https://eppdscrmssa01.blob.core.windows.net/cmhcprodcontainer/sf/project/archive/research_6/update-of-indicators-of-income-mixing--2018-t1-family-file-based-income-mixing-measures.pdf

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Alternative text and data for figures

Figure 1: Average neighbourhood Income Mixing, Canadian Census Metropolitan Areas, 2016

Census metropolitan areas	D-index
Winnipeg	0.078
London	0.071
Hamilton	0.071
Windsor	0.069
Toronto	0.066
Ottawa–Gatineau	0.062
Regina	0.061
Saint John	0.06
Kingston	0.059
Montréal	0.059
Greater Sudbury	0.056
Québec	0.055
Halifax	0.054
Thunder Bay	0.054
Calgary	0.053
Kitchener–Cambridge–Waterloo	0.052
Peterborough	0.052
Sherbrooke	0.052
Guelph	0.048
Brantford	0.048
Edmonton	0.047
Trois-Rivières	0.047
Vancouver	0.046

St. Catharines–Niagara	0.044
Oshawa	0.044
Saskatoon	0.043
Abbotsford–Mission	0.041
Moncton	0.04
Kelowna	0.037
Belleville	0.035
St John's	0.034
Victoria	0.033
Lethbridge	0.033
Saguenay	0.03
Barrie	0.026

Source: Statistics Canada, authors' compilation based on the 2016 taxation year T1 Family File

Figure 2: Relative importance of the sorting of households across census tracts, ten largest CMAs, 2016

Census metropolitan areas	Importance of sorting across census tracts
Toronto	65.2%
Montréal	78.0%
Vancouver	65.2%
Calgary	73.6%
Edmonton	70.2%
Ottawa–Gatineau	71.0%
Winnipeg	74.4%
Québec	70.9%
Hamilton	70.4%
Kitchener–Cambridge–Waterloo	63.5%

Source: CMHC Adapted from, Statistics Canada, authors' compilation based on the 2016 taxation year T1 Family File

Figure 3: Relative importance of the sorting of households across dwelling types, ten largest CMAs, 2016

Census metropolitan areas	Importance of sorting across census tracts
Vancouver	8.7%
Calgary	11.3%
Montréal	11.9%
Québec	12.7%
Edmonton	12.8%
Winnipeg	12.8%
Ottawa–Gatineau	12.9%
Toronto	15.2%
Hamilton	15.5%
Kitchener–Cambridge–Waterloo	17.3%

Source: CMHC Adapted from, Statistics Canada, authors' compilation based on the 2016 taxation year T1 Family File

Figure 4: Relative importance of the sorting of households across apartment buildings, ten largest CMAs, 2016

Census metropolitan areas	Importance of sorting across apartment buildings
Vancouver	26.1%
Kitchener–Cambridge–Waterloo	19.2%
Edmonton	17.0%
Calgary	15.1%
Québec	16.4%
Toronto	19.7%
Ottawa–Gatineau	16.1%
Montréal	10.2%
Hamilton	14.1%
Winnipeg	12.8%

Source: CMHC Adapted from, Statistics Canada, authors' compilation based on the 2016 taxation year T1 Family File