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Income Inequality and Polarization in the City of Toronto and York Region

Part I: Examining levels and trends from spatial and non-spatial perspectives

Alan Walks, Mihaela Dinca-Panaitescu, and Dylan Simone

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Executive Summary

This publication represents Part I of a larger report, which rounds out a comprehensive package produced over the last three years by the United Way of Toronto and York Region (UWTYR) and the Neighbourhood Change Research Partnership (NCRP) to advance understanding of the complex issues of income inequality and polarization and how they are expressed at different geographic scales.

Part I, published here, examines changes in income inequality and polarization in the City of Toronto and York Region over the period 1980 through 2012. It provides the first comprehensive picture of income inequality and polarization for York Region, and also the most recent picture of income polarization for the City of Toronto, using the most reliable data currently available. It additionally puts that knowledge into a broader context of other regions within the Greater Toronto Area (GTA), as well as other large metropolitan areas, and examines changes over time since 1980. The report begins by looking at measures of income inequality and polarization that tell the story of the general distribution of income in these two places among households and individuals over time. It then looks at how income inequality and polarization are expressed geographically among neighbourhoods in these places.

The findings reveal a general pattern of increasing income inequality and polarization in both the City of Toronto and York Region, although at different levels, and to differing degrees. Non-spatial income inequality and polarization have grown more rapidly among households than among individuals, suggesting that individuals are increasingly forming households with members of their own income group. This portends heightened class differentiation at the household level, with significant consequences for future life chances, regardless of spatial location. The increase in socio-spatial inequality and polarization has generally been more rapid than the increase in their non-spatial counterparts. This suggests that changes in the degree and structure of income segregation are not merely a function of widening income distributions, but also a result of sorting of individuals and households in space based on incomes.

Growing socio-spatial income inequality and polarization are problematic because they become embedded in the built environment and the social tapestry of cities, making the new conditions difficult to ameliorate.

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1. About the Report

This publication represents Part I of a larger report, which rounds out a comprehensive package produced over the last three years by the United Way of Toronto and York Region (UWTYR) and the Neighbourhood Change Research Partnership (NCRP) to advance understanding of the complex issues of income inequality and polarization and how they are expressed at different geographic scales. The following products of this package have already been published:

- A backgrounder to help readers interpret research and media commentary on income inequality and polarization (Dinca-Panaitescu and Walks, 2015)
- A comprehensive review of key factors contributing to the growth of income inequality in Canada (Procyk, 2014)
- A comprehensive portrait of income inequality and polarization in Canada's largest Census Metropolitan Areas from 1971 through 2006 (Walks, 2013)
- A report on the impact of growing income inequality on access to opportunity in the City of Toronto (UWTYR, 2015)

This report is organized into two parts:

- **Part I**, published here, focuses on the levels and trends of income inequality and income polarization in the City of Toronto and York Region, among individuals, households, and neighbourhoods, and puts that knowledge into a broader context of other regions within the Greater Toronto Area (GTA), as well as other large metropolitan areas.
- **Part II** will provide a comprehensive portrait of the changing income distribution and income gaps among key socio-demographic groups, with the same focus on the City of Toronto and York Region, and explain the implications of our findings for policy.

Here in Part I, we examine income inequality and polarization at two levels for both the City of Toronto and York Region. Income inequality is distinctive from income polarization, with inequality reflecting greater unevenness and dispersion of incomes, while polarization reflects a declining middle (see Dinca-Panaitescu and Walks, 2015; Walks, 2013). We begin by looking at measures of income inequality and polarization that tell a story about the general distribution

of income in these two places among households and individuals over time. We then look at how income inequality and polarization are expressed geographically among neighbourhoods in these places.

This report provides the first comprehensive picture of income inequality and polarization for York Region, in addition to the most recent picture of income polarization for the City of Toronto, using the most reliable data currently available. It is also the first time that this information has been presented within the broader context of the GTA.

2. Income Inequality and Polarization in Canada: The State of the Literature

Income inequality has risen around the globe, affecting more than three-quarters of member countries in the Organisation for Economic Co-operation and Development (OECD). It has increased not only in countries with traditionally high levels of inequality, such as the United States and the United Kingdom, but also in those with traditionally lower levels, such as Sweden and Finland. It also differs markedly among OECD countries, with Canada ranking in the middle of the group, but experiencing a more rapid increase in inequality since the mid-1990s than most other nations (OECD, 2011).

2.1 Non-Spatial Income Inequality and Polarization

Income inequality and income polarization are often confused. Measures of income inequality look at how income is distributed across the entire population. Inequality exists when one group receives income that is disproportionate to its size. If income is transferred from a richer person to someone poorer, inequality decreases (or if transferred from a poorer to a richer person, inequality increases). Polarization, meanwhile, reflects the decline of the population share of middle-income group and the re-concentration into two distinct groups – the rich and the poor – creating a hollowed-out middle. Rising polarization is associated with claims about the "disappearing middle class." While it is difficult to precisely define and measure a middle class for research purposes, it is possible to define and measure a group in the middle of the income spectrum. Tracking such a measure over time establishes whether or not the proportion of people in the middle-income group is increasing or decreasing (see Dinca-Panaitescu and Walks, 2015).

Much of the Canadian literature on income inequality focuses on patterns of non-spatial income inequality at the national level (Fortin, Green, and Lemieux, 2012; Frenette, 2009; Frenette, Green, and Milligan, 2007; Heisz, 2007, 2016; Myles, 2003; Osberg, 2008; Veall, 2012).

Non-spatial income inequality and polarization measures describe differences among individuals, families, or households throughout a city, region, or nation, without taking into account where these individuals, families, or households live, except as a general identifier for the whole group (see Dinca-Panaitescu and Walks, 2015). Different measures of inequality calculated using various types of income all tell a similar story. Income was more equally distributed

during the 1970s and 1980s, compared with both the present day and to the period before the Second World War. By the mid-1990s, however, income inequality had begun to rise. After-tax income inequality at the national level showed a marked increase between 1995 and 2000 and settled at a higher level through the 2000s (Heisz, 2016). Income inequality increased, even though real incomes rose across all income groups and rates of low income fell (through to 2005), because the incomes of higher-income individuals and households have grown faster than of those of their lower-income counterparts. Lower levels of inequality in the 1970s and early 1980s were the result of an increase in incomes at the bottom end of the income distribution (compared with the 1950s and 1960s), paired with slower increases at the top end. The rise in inequality that began in the 1990s reversed this trend, with rapidly rising incomes at the top end and smaller gains at the bottom (Frenette, Green, and Milligan, 2006; Picot and Myles, 2005; Saez and Veall, 2005).

Underpinning this change were large increases in market income inequality that occurred during the recessions of the 1980s and 1990s, although at the time, they were offset by a tax-and-transfer system that was redistributive enough to prevent an increase in after-tax income inequality. However, during the second half of the 1990s, the equalizing effect of the tax-and-transfer system was minimized because of lower taxes and reduced spending on social assistance and Employment Insurance programs, which were not offset fully by new child benefit programs. Coupled with rising inequality in employment incomes, after-tax income inequality rose as a result (Frenette, Green, and Milligan, 2009; Heisz, 2007; Heisz and Murphy, 2015).

There are interprovincial and regional differences in the evolution of non-spatial income inequality in Canada over the past two decades, which derive in part from differences in foreign trade, as well as changes within the manufacturing industry and in the rate of economic innovation (Breau, 2007, 2015; Breau and Rigby, 2010). The income share of the top 1 percent is greater and has increased faster in Ontario, Alberta, and British Columbia than it has in the rest of Canada (Breau, 2014; Fortin and Lemieux, 2015; Veall, 2012). Since the mid-2000s, relative wage growth at the bottom of the distribution occurred in most provinces (Alberta and British Columbia are notable exceptions), while relative wage growth in the top 10 percent of the distribution was concentrated in Ontario and British Columbia (Fortin and Lemieux, 2016).

Canadian literature on inequality in urban areas is sparse. The limited number of urban studies point to overall increases in urban inequality. Bolton and Breau (2012) were among the first to analyze, in a non-spatial sense, the reasons for changes in income (earnings) inequality among Canadian metropolitan areas. They found that between 1995 and 2005, rising income inequalities within Canadian metropolitan areas can be explained by changing occupational and industrial profiles caused by deindustrialization and by rising immigration rates, although increasing female labour-force participation has tempered the trend. Breau (2014) also examined the social characteristics of the top 1 percent of income earners in Canadian cities. One of the authors of this report (Walks, 2013) has also calculated a series of non-spatial income inequality measures for the 15 largest metropolitan areas. That report showed that income inequality as measured using three different inequality indices grew fairly consistently over the period (particularly since 1980), although that report analyzed data from the public micro-sample files (PUMF) which involve only a small sample of all urban residents in Canada and which cap top incomes (see Walks, 2013).

There is limited research on income polarization in Canada, even though the gold standard of polarization measures is a Canadian invention (Wolfson, 1992, republished as Foster and Wolfson, 2010). Wolfson analyzed income change from the late 1970s through the 1990s using this index (Wolfson, 1986, 1997). Further research using the Wolfson index by Morissette, Myles, and Picot (1993) found that polarization in earnings rose for both women and men over the 1980s. Waithe, Zafiriou, and Niekamp (2000) found that income polarization among farm and non-farm families rose at roughly the same rate as income inequality, while Araar (2008) used the Wolfson index to determine the degree to which government fiscal redistributive policies and mechanisms help counter the tendency toward higher inequality and polarization, finding that the beneficial effects of such policies and mechanisms increased slightly over the 2000s.

The only research we are aware of that examines income polarization (as opposed to inequality) in Canadian cities is by Walks (2013). That study used the census public-use microdata files (PUMFs) to calculate indices of polarization among households, showing that income polarization among households increased in large Canadian metropolitan areas. But these data impose limitations for analysis of income inequality and polarization. In particular, top incomes are capped in the PUMFs, the sample is small (2 percent of the population), and the method for producing the PUMFs has changed over time, which may affect the results obtainable with the data.

For these reasons, we analyze the raw long-form census data (which is a 20 percent sample of the entire Canadian working-age population) to calculate accurate and updated measures of income inequality and polarization, instead of the PUMFs. This report represents, to our knowledge, the first and only study of income polarization for smaller urban geographies in Canada to use the original long-form census microdata to calculate relevant measures.

2.2 Socio-Spatial Income Inequality and Polarization

Spatial (or “socio-spatial”) income inequality and polarization measures describe the extent to which individuals, families, or households are geographically concentrated and segregated by income in a region or a city (for more details see Dinca-Panaitescu and Walks, 2015; Walks, 2013). Growing spatial income inequality and polarization are problematic because they become embedded in the physical and social geography of cities. Segregation based on income can spur additional segregation. When wealthy households concentrate in wealthy municipalities and poorer households in poorer municipalities, the latter places often find their property tax capacity eroded at the same time that social problems increase and social spending is redirected in ways that further discourage wealthier households from moving to such places.

At the neighbourhood scale, increasing concentrations of high-income households improve the performance of local schools, which then further attract high-income households and sometimes funding beyond the government funding formulas, both of which raise local school quality even more. Meanwhile, social problems increase within the school systems in neighbourhoods with increasing concentrations of low-income households, particularly schools without access to similar funds. Social service capabilities are also significantly stretched to respond to higher demands in these neighbourhoods. These processes all exacerbate neighbourhood

differentiation. When neighbourhoods experience gentrification, meanwhile, the social infrastructure that has been built up in a place to service low-income households may be wasted or diverted to servicing higher-income households, while poorer households get displaced and often end up in neighbourhoods that lack such infrastructure (see Walks and Maaranen, 2008a).

Increasing income segregation also affects housing affordability. In neighbourhoods with an increasing concentration of wealthy households, the value of property rises faster than in neighbourhoods not experiencing such concentrations. This situation makes it increasingly difficult for poorer households to live there. Likewise, in neighbourhoods with increasing concentrations of poorer households, property values fall relative to other neighbourhoods. In the latter case, landlords, realizing that the rents are not increasing relative to other places, are likely to under-maintain their properties, leading to the concentration of lower-quality rental stock in these places. This spiral helps to lock in the low-income status of these neighbourhoods and makes them even less desirable to those whose incomes give them a choice of where to live.

Furthermore, when under-maintenance of rental properties reaches an extreme level in a neighbourhood, these properties either become unlivable or are gentrified – redeveloped or converted to owner occupation (Smith, 1996). Both options involve the potential disappearance of rental units for poorer households. Gentrification is particularly likely in neighbourhoods close to jobs and robust social services (the evolution of gentrification in Toronto and its problematic effects are demonstrated by Walks and Maaranen, 2008a, 2008b). This outcome emphasizes the importance of limiting the gentrification of low-income neighbourhoods and preventing the displacement of poorer households.

The result of rising income segregation may therefore lead to a self-fulfilling prophecy in which poorer neighbourhoods become poorer, while wealthy neighbourhoods become wealthier. At the same time, redistributive policies have the added benefit of reducing the incentive for wealthy households to self-segregate.

There is a long history of examining socio-spatial inequality among neighbourhoods in Canadian metropolitan areas. Seminal papers by Bourne (1993) and MacLachlan and Sawada (1997) not only framed the issues of neighbourhood income inequality and polarization in the context of occupational restructuring, particularly in relation to deindustrialization and gentrification, but set the stage for using inequality and early (pre-Wolfson) polarization metrics in subsequent studies (Myles, Picot, and Pyper, 2000; Walks, 2001). More recent studies have shown that socio-spatial income differences arise from changes in the level of inequality among individuals and households, as well as from spatial sorting of families and individuals based on income. Both processes are at work in different proportions in the largest metropolitan areas, although changes in base incomes (earnings) appear to be a more important factor (Chen, Myles, and Picot, 2012).

Most existing studies, with few exceptions, are available only at the CMA level and require updating. This report looks at smaller geographic areas and provides, for the first time, a comprehensive portrait of spatial income inequality and polarization in York Region, as well as the most up-to-date portrait for the City of Toronto currently available.

The rest of this report is structured as follows:

- Chapter 3 provides an initial picture of the distribution of income across both the City of Toronto and York Region. Maps of average individual income by neighbourhood outline places in which incomes are higher or lower than the CMA average, while comparisons of the distribution of income in 1980 and 2012 provide context for interpreting the indices of income inequality and polarization that follow.
- Chapter 4 describes the levels and trends of non-spatial income inequality and polarization among individuals and households in the City of Toronto and York Region. Findings are also discussed in the context of other regions within the GTA, the Toronto CMA, and other large Canadian cities.
- Chapter 5 describes the levels and trends of socio-spatial income inequality and polarization among neighbourhoods for the City of Toronto and York Region. The same regions and cities are used to provide context for interpreting the results.
- Chapter 6 summarizes the key findings of Part I and introduces Part II of the larger report.

3. The Distribution of Income in the City of Toronto and York Region: An Initial Picture

Toronto and York Region represent two of the five regional municipalities that make up the Greater Toronto Area (GTA) (see Appendix 1).[1] This report compares the trends unfolding in the City of Toronto and in York Region with those in the Toronto CMA and the other GTA regional municipalities.

Before getting into the analyses, it is important to highlight some differences between the City of Toronto and York Region. First, the City of Toronto is larger, with more than 540 census tracts used as proxies for neighbourhoods, and a more varied socio-economic landscape (compared to York Region, where there are 186 census tracts with income data).

Toronto's social and geographic landscape includes the primary central business district (CBD) in the CMA, as well as the majority of areas within the GTA that were developed before the Second World War, and the majority of neighbourhoods developed during the early postwar period, from the late 1940s through the early 1960s, at a time when industry was growing. These postwar areas are often called the "inner suburbs." Many of the neighbourhoods in these inner suburbs have seen declining incomes since the 1970s, whereas a number of previously low-income neighbourhoods within the inner city have experienced gentrification (Hulchanski, 2010; Walks, 2001; Walks and Maaranen, 2008a, 2008b). The City of Toronto average household income was just over $93,000 in 2012, and it had a large share of households with incomes under $50,000 (44.6 percent). Roughly 17.6 percent of households had incomes of $125,000 and above (Figure 1) (data from Environics Analytics, 2012).

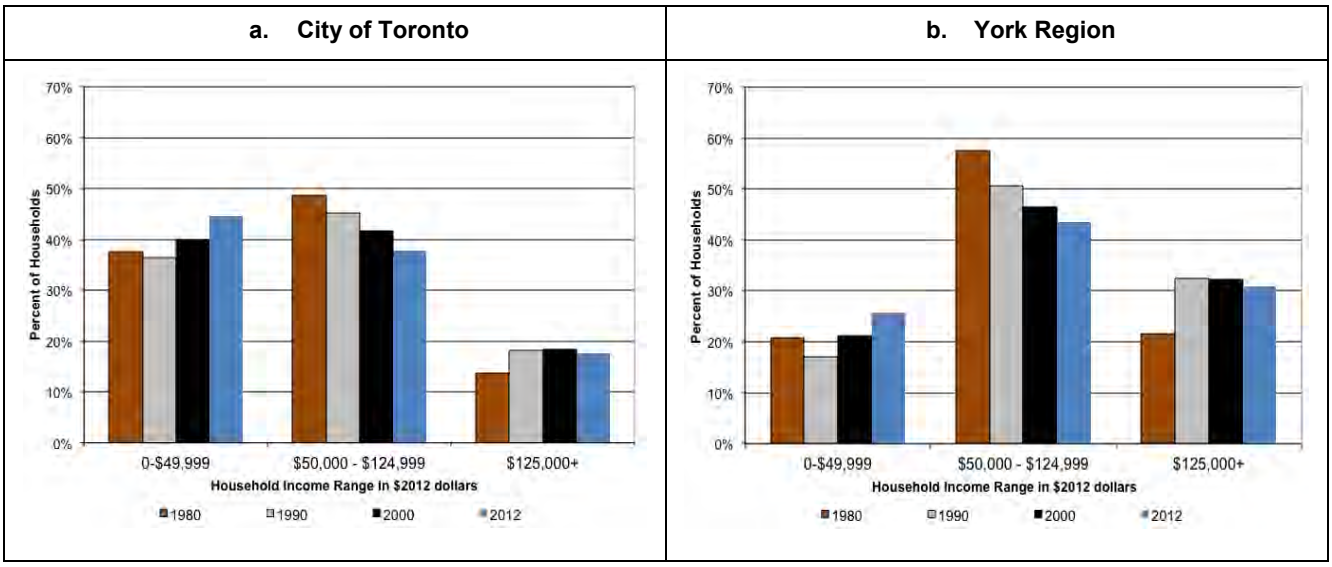
By contrast, although it has a few small settlements that pre-date the Second World War, York Region was mostly developed from the mid-1960s onwards, and is often categorized as part of the "outer suburbs." As with other regional municipalities in the "905" belt, named for the telephone area code (Halton, Peel, York, and Durham), it was largely constructed at a time when

1 The GTA consists of the City of Toronto and four regional municipalities: York, Halton, Peel, and Durham. Toronto is a single-tier municipality; the other four are upper-tier municipalities within which there are three or more lower-tier municipalities. The GTA is larger than the Toronto Census Metropolitan Area (CMA), as it includes the Oshawa CMA (in Durham Region) and the City of Burlington (in Halton Region, but formally part of the Hamilton CMA, not the Toronto CMA).

the automobile was assumed to constitute the main form of mobility. Many neighbourhoods were planned to be solely residential in form and function, and industry was situated away from residential areas. York Region has changed significantly since 1980 from a predominantly rural area to a diverse mix of urban, suburban and rural spaces. It is currently experiencing a period of accelerated population growth that is projected to continue over the next 25 years. The Region's demographics are also changing. The number of seniors and newcomers in the population is growing. With over 200 distinct ethnic origins, the Region is becoming increasingly diverse (York Region, 2014b; 2015a).

While during the 1980s many of its municipalities were developed for high-income households living in large detached housing, a greater diversity of housing types has been built after 1995. York Region is generally wealthy, with an average household income of approximately $115,000 in 2012, well above the Canadian average household income of $71,000, and higher than the City of Toronto average household income of $93,000. Over 30 percent of households in York Region have annual incomes of $125,000 or over in 2012, while approximately one-quarter of households have incomes less than $50,000 (data from Environics Analytics, 2012).

Figure 1: Distribution of household income: (a) City of Toronto (b) York Region



Source: Calculated by the authors from inflation-adjusted custom data ordered from Statistics Canada for the 1981, 1991, and 2001 Censuses of Canada, and from special tabulations purchased from Environics Analytics for household income in 2012.

Notes: See Appendix 2 for information on how the inflation-adjusted cut-points between the income ranges as specified by Environics Analytics for the 2012 data have been determined in relation to the custom 1980–2000 census data.

Both the City of Toronto and York Region have seen a polarization of income, in which there are fewer households with middle incomes (that is, incomes between $50,000 and $124,999) in each subsequent decade since 1980 (Figure 1). In the City of Toronto, this trend has meant a decline in the middle-income share of all households from approximately 49 percent in 1980 to just under 38 percent in 2012. While middle-income households make up a larger proportion of households in York Region, the drop has been just as striking, from 57.6 percent in 1980 to 43.5 percent in 2012. In both the City of Toronto and York Region, this decline has been accompanied by growth

in the number of lower-income households, and a flat-lining (or slight shrinkage) of higher-income households ($125,000 and up).

It is notable that although the national (Canadian) studies of income inequality show that inequality has grown mostly due to rising incomes at the top of the distribution, within both the City of Toronto and York Region, high-income households have largely stagnated since 1990. Thus, the growth in income inequality and income polarization within both the City of Toronto and York Region is more the result of a shift away from middle incomes and toward lower incomes, although part of the story is also higher average incomes among the high-income group.

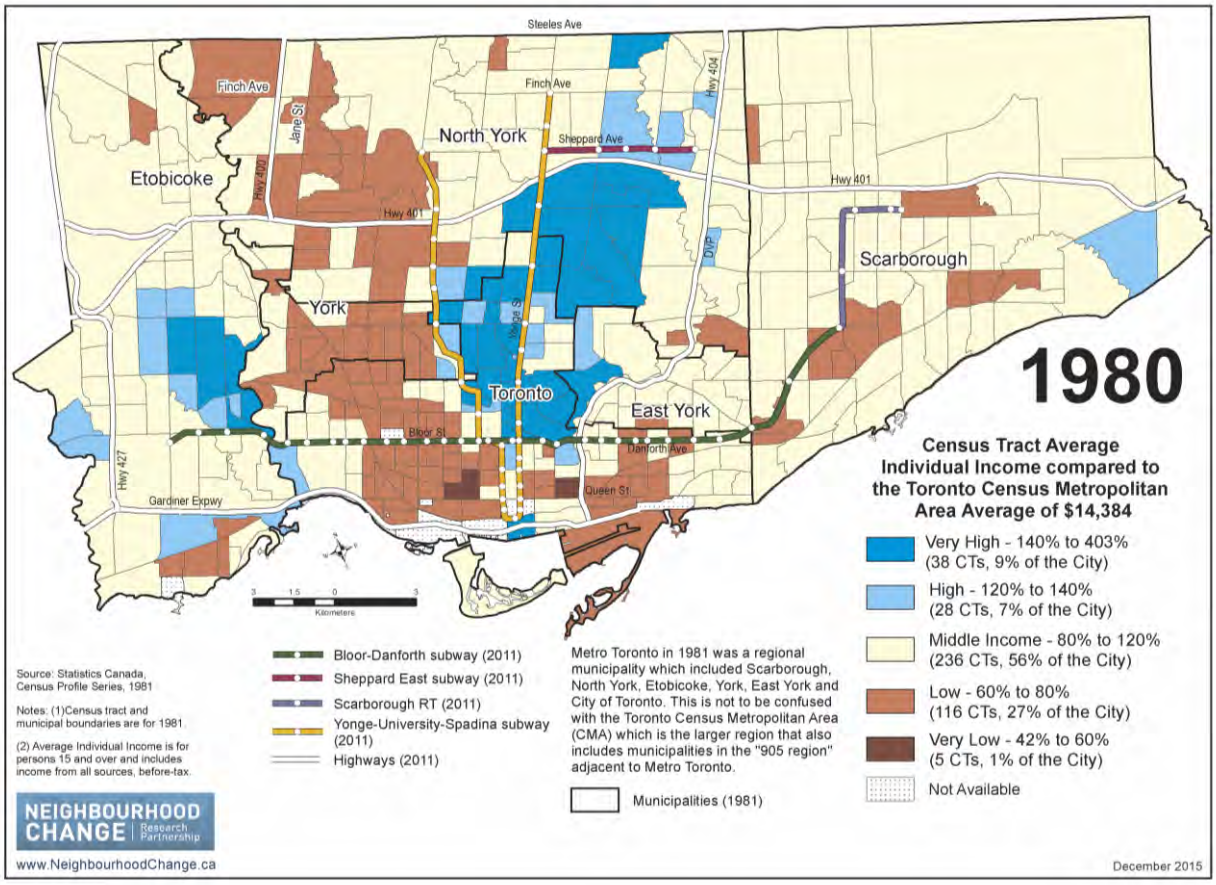
Corresponding with the shifts in the income groups shown in Figure 1 have been changes in the spatial distribution and the socio-spatial polarization of income groups at the neighbourhood level. Maps 1 and 2 (City of Toronto) and Maps 3 and 4 (York Region) show the changes in the socio-spatial distribution of income from 1980 to 2012, the latter being the most recent year for which reliable data are available.[2] Both the City of Toronto and York Region have clusters of high-income and low-income neighbourhoods.

Both places have seen a decline in the proportion of their census tracts with middle-income households. In the City of Toronto, this share dropped from 56 percent to 30 percent from 1980 to 2012, while in York Region this shifted from 77 percent to 66 percent over the same period. Thus, both municipalities are showing signs of rising income segregation and socio-spatial polarization.

The situation in the City of Toronto is most stark. In 1980 (Map 1), other than the group of very-high-income neighbourhoods clustered at the centre of the city (in the contiguous set of neighbourhoods from Rosedale, Forest Hill, North Toronto, Lawrence Park, to York Mills and the Bridle Path), and around central Etobicoke (the Kingsway), very little of the city elsewhere had high incomes. Likewise, other than the classic “U” of poverty spanning the original Grand Trunk Railway line from both the northwest and northeast of the city, the vast majority of neighbourhoods in Etobicoke, North York, and Scarborough were in the middle-income category.

2 See Appendix 1 for more details regarding the Canada Revenue Agency, the source for 2012 data, which is a better data source than the non-mandatory 2010 National Household Survey.

Map 1: Average Individual Income by Census Tract in the City of Toronto, 1980

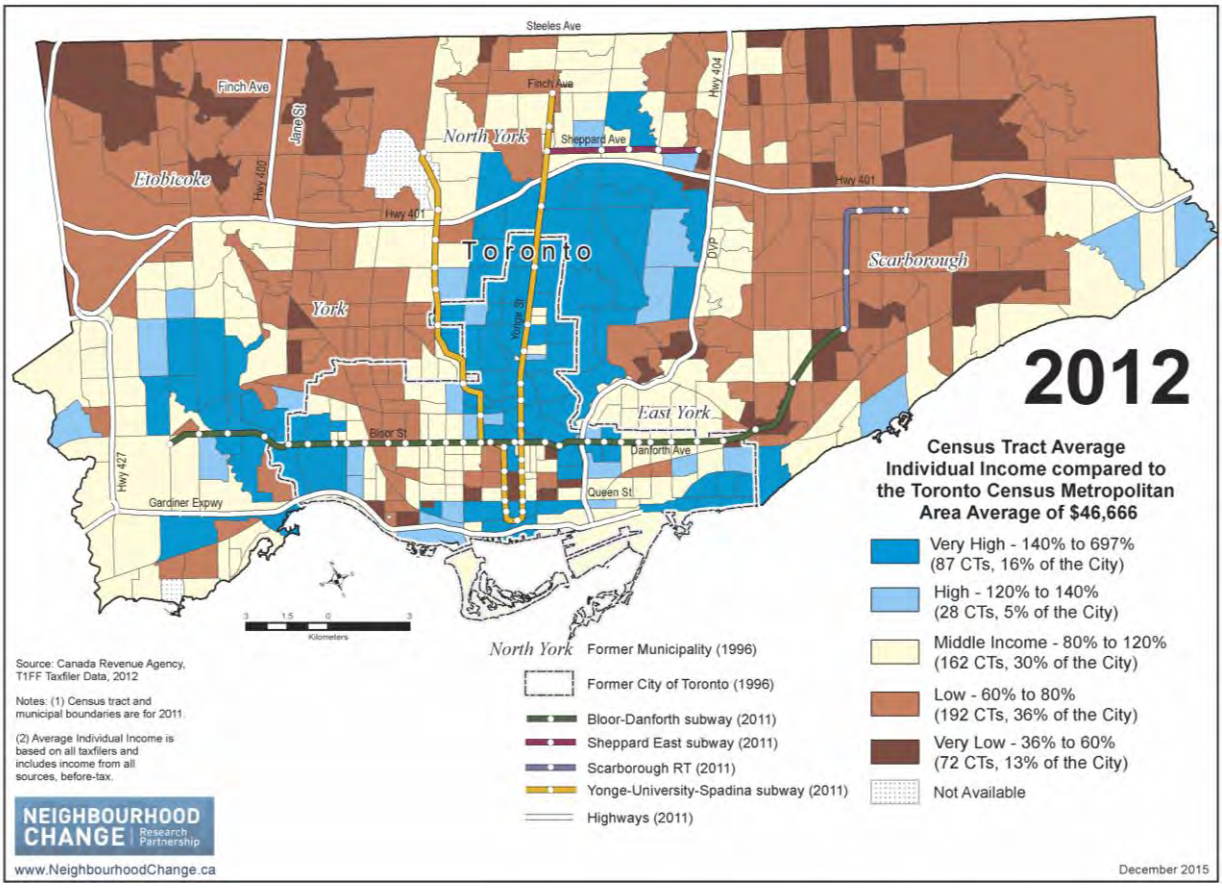


Source: Census of Canada 1980. Neighbourhood Change Research Partnership. Map created by Richard Maaranen.

By 2012 this situation had changed considerably (Map 2). High-income neighbourhood clusters have extended beyond their original boundaries on all sides, including into High Park, the Beaches, Riverdale, and Cabbagetown and along the waterfront. Recently a number of census tracts along the waterfront and close to the CBD have been developed with new condominium buildings (Rosen and Walks, 2013, 2015), and this area now has many very high-income census tracts. High- and very high-income neighbourhoods together make up about 21 percent of the city's neighbourhoods.

Meanwhile, many neighbourhoods in the inner suburbs now have low- or very-low average incomes. While there are small clusters of these neighbourhoods within the old inner city (in south Parkdale and along the rail corridor north of Parkdale, in the east of downtown around Regent Park, in the original Chinatown just west of downtown, and in St. Jamestown), by 2012 the vast majority of low-income neighbourhoods were located in the inner suburbs. Much of Scarborough away from the lake, the northern half of Etobicoke, and much of North York north of Highway 401 have low-income census tracts. Almost half (49 percent) of the city's neighbourhoods are low- or very low-income neighbourhoods.

Map 2: Average Individual Income by Census Tract in the City of Toronto, 2012



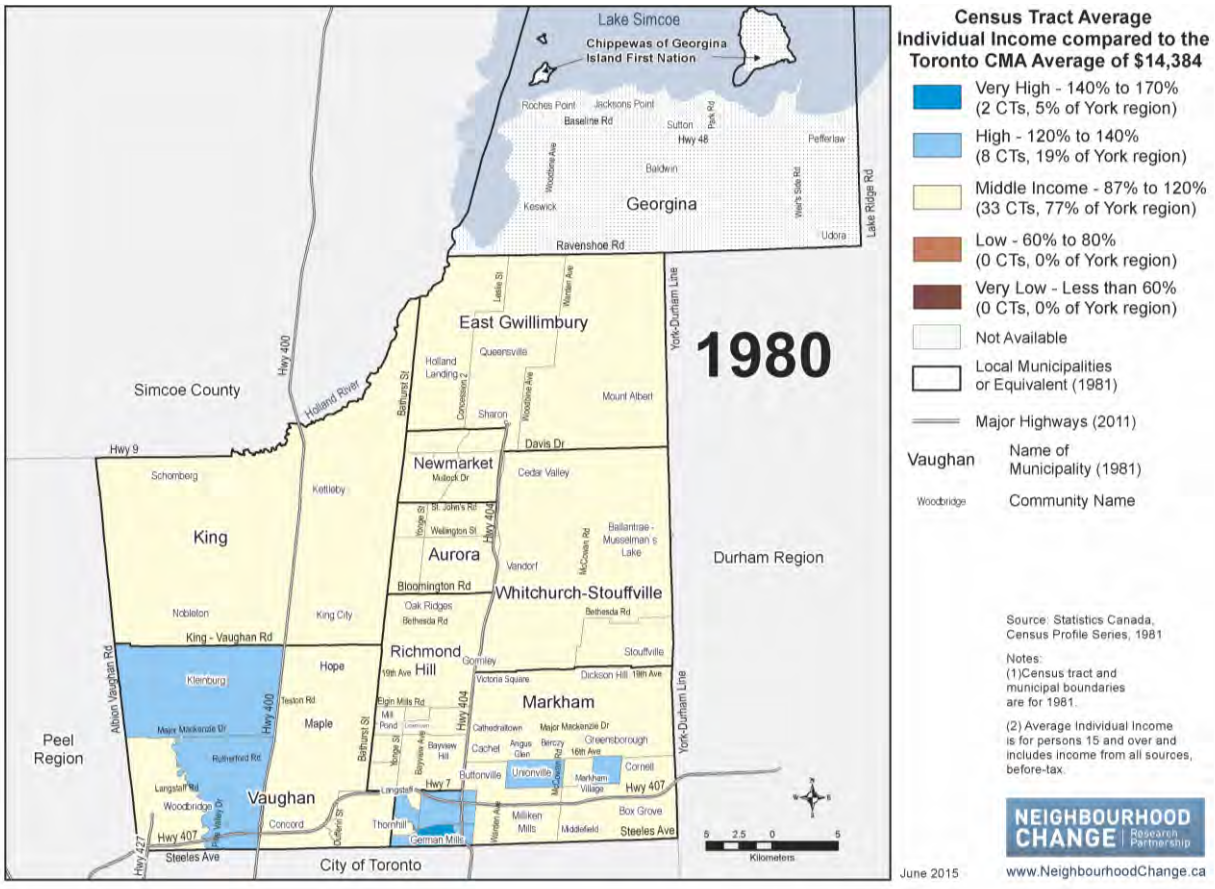
Source: Canada Revenue Agency, Tax-filer Data 2012. Neighbourhood Change Research Partnership. Map created by Richard Maaranen.

The clear spatial patterning of neighbourhood income change, characterized by gentrification close to the core coupled with suburban decline, is what prompted Hulchanski (2010) to write of three different “cities” within the City of Toronto.

Map 3 reveals a picture of York Region in 1980 almost completely dominated by middle-income areas. At the time, the region had no low- or very low-income neighbourhoods and consisted mostly of new, largely middle-income commuter-based suburbs.

While maintaining its middle-income suburban function, York Region has witnessed a divergence in incomes over time. By 2012 (Map 4) low- and very low-income neighbourhoods together made up 16 percent of the region's neighbourhoods. With the exception of a small cluster in southern Markham, these neighbourhoods are largely scattered around the region. This is not to say that poverty is not present, but merely that it is not highly clustered. Indeed, research has suggested the presence of hidden homelessness and other forms of acute poverty among immigrants in York Region (Preston et al., 2009). At the other end of the spectrum, approximately 19 percent of neighbourhoods are classified as high- or very high-income neighbourhoods. Some of these are large, mostly rural areas, with some clear clustering of high-income in King, Aurora, and parts of Vaughan. Nonetheless, York Region still presents a clear suburban contrast to the spatial divisions evident within City of Toronto.

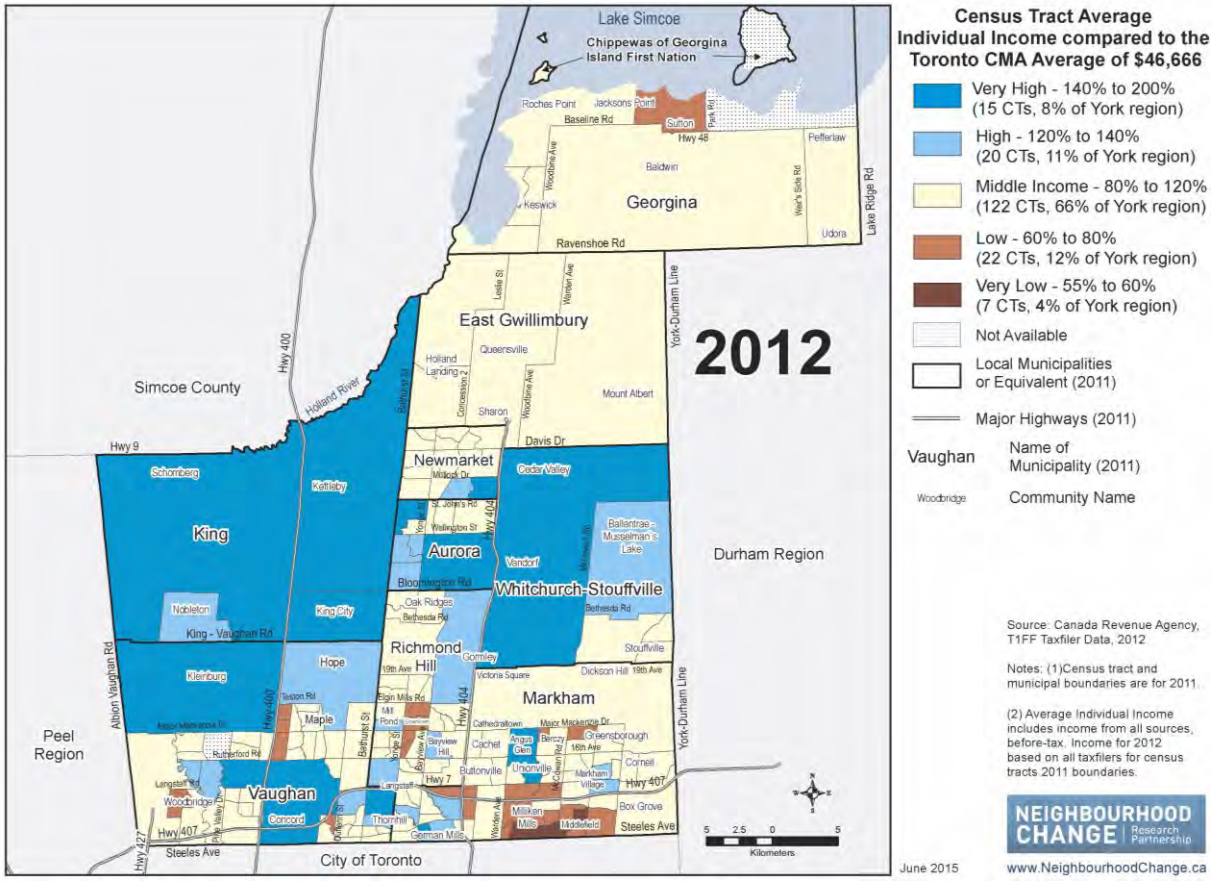
Map 3: Average Individual Income by Census Tract in York Region, 1980



Source: Census of Canada 1980. Neighbourhood Change Research Partnership. Map created by Richard Maaranen.

These pictures of the spatial distribution of income are a result of two different processes. First, income is distributed unevenly among individuals largely due to differing salaries and wages earned from employment or self-employment, but also due to investment incomes, and different types of transfers from different levels of government (as noted, the income examined in this report is before-tax and after-transfers; see Appendix 2). Those individuals combine in different ways to make up households, which include not only family households, but also non-family households (mainly single-person households, but also households in which people who are not family members share living space). Second, individuals and households are unevenly distributed among different neighbourhoods via processes of neighbourhood selection based on housing affordability, job accessibility, school quality, and other factors. The resulting distributions reflected in the maps are a result of both sets of processes.

Map 4: Average Individual Income by Census Tract in York Region, 2012



Source: Canada Revenue Agency, Tax-filer Data 2012. Neighbourhood Change Research Partnership. Map created by Richard Maaranen.

4. Non-Spatial Income Inequality and Polarization in the City of Toronto and York Region

While visualizations of income distributions are helpful, a fuller understanding of the level of inequality in a place requires robust universal measures that take into account the entire income distribution. We now turn to such measures of income inequality and polarization in the City of Toronto and York Region, beginning with an analysis of income inequality. This chapter analyzes non-spatial income inequality and polarization among individuals and among households; we consider socio-spatial inequality and polarization among neighbourhoods in chapter 5.

Note that in this report we analyze two types of income-reporting units. It is possible that the picture of inequality painted using these two units could reveal divergent trajectories. The first income-reporting unit is the individual aged 15 or older. Individual income largely reflects differences among people in take-home pay and government transfers. This measure is often thought to disproportionately reflect the wage structure and the relative position of workers within the labour market (the production sphere).

The second reporting unit is the household. Household income aggregates the income received by all members of the same household. This income pays for household expenses as well as most food, utility costs, school expenses, and even many transportation costs. It is therefore considered to be the best form of income for reflecting inequalities in the consumption sphere.

4.1 Non-Spatial Income Inequality in the City of Toronto and York Region

Here we outline, using the most accurate inequality measure, how the level of income inequality among individuals and households has changed over time in the City of Toronto and in York Region. This is the first time that income inequality has been examined within York Region and the most recent picture for these two places is presented in the larger context of the GTA.

Rising inequality amongst individuals and households helps explain why inequality has also increased among neighbourhoods (discussed in chapter 5). Even if no one were to move, if the distribution of income becomes less equal over time, unless every neighbourhood has exactly the same mix of income groups (a virtual impossibility), the level of income inequality among neighbourhoods will also necessarily rise.

Note: Non-spatial inequality is calculated in this report using the Gini coefficient based on total income, also called before-tax (but after government transfers) income. After-tax income was not reported until the 2006 census, and therefore before-tax (after transfers) income is the only measure that allows for comparisons over time. This report focuses on trends over time, which are largely unaffected by income type.

Using before-tax (but after-transfers) income does take into account the redistributive aspects of many public policies (except taxes) because this type of income includes both market income and government transfers (such as employment insurance benefits, social assistance, workers' compensation, GST tax credits, child tax benefits, and public pensions). This income measure shows how the system tempers inequality at the lower end of the income distribution.

At the same time, international studies (OECD, 2011, 2014) and Canadian research (Banting and Myles, 2013; Frenette, Green, and Milligan, 2009; Heisz, 2007; Heisz and Murphy, 2016) have demonstrated the fading impact of the redistributive effects of the tax-transfer system since the early 1990s. This means that if after-tax income had been available for analysis before 2006, the trends in income inequality using that data would likely have shown an even more pronounced increase in inequality since the mid-1990s. While the level of income inequality measured using before-tax income is higher than that using after-tax income, one could argue that our use of before-tax (after-transfers) income actually provides a more conservative estimate of the rate of increase in income inequality, as it does not show the regressive effects of tax changes since the 1990s that have contributed to rising income inequality.

For more details on Gini coefficients and other measures of income inequality, see Dinca-Panaitescu and Walks (2015) and Walks (2013).

Levels of inequality among individuals and households are analyzed from 1980 to 2005, with data from the 2010 National Household Survey presented separately.[3]

Figure 2 shows the level of income inequality using both (a) individual income and (b) household income. The City of Toronto and York Region are compared with the Toronto CMA as a whole, as well as with the central City of Montreal (represented here by Montreal Island, and thus not affected by the mergers and de-mergers that occurred in the early 2000s), and the City of Vancouver. The boundaries for both the latter central cities have been held constant for each study year, to allow for comparisons over time.

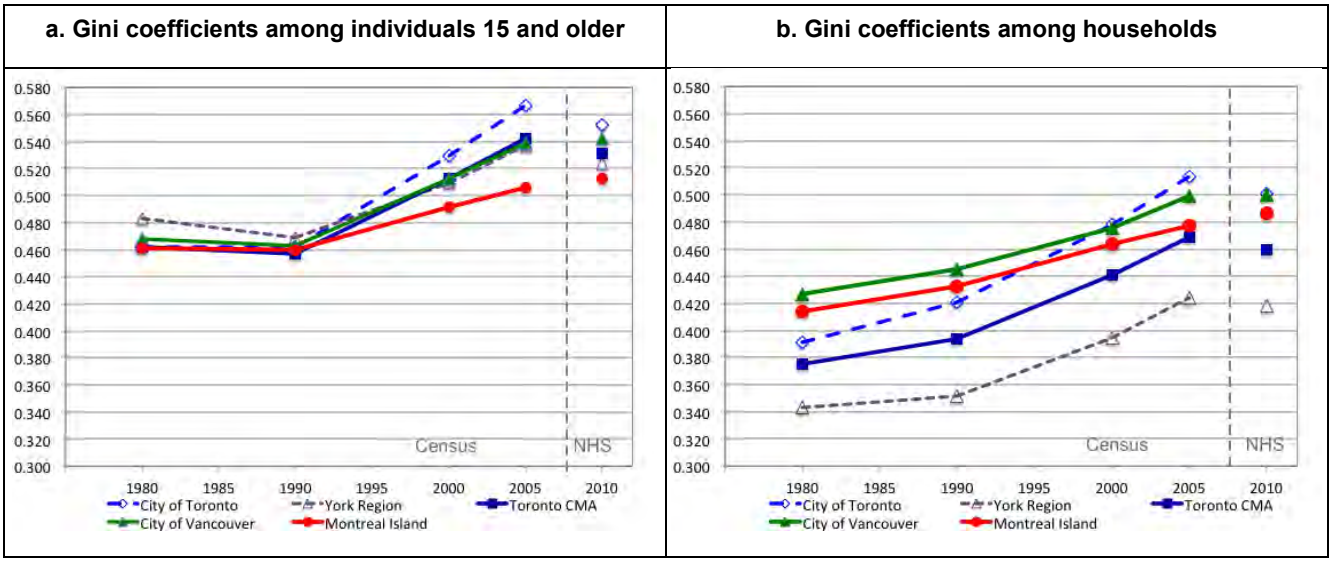
The patterns in Figure 2a and 2b differ considerably. Figure 2a shows that income inequality among individuals remained relatively flat over the 1980s, but starting in 1990 it increased at a relatively constant rate. Both the levels and trends over time of income inequality in each place

3 Data from the 2010 National Household Survey is not comparable with that from the long-form census, because a different methodology was used, which resulted in the survey reaching a different population. The graphs in this chapter present this data separated by a broken line to suggest that it cannot be included in trend analysis that uses previous census cycles.

are fairly similar. While Gini coefficients were higher for the City of Toronto after 1990, they were still close to those for the Toronto CMA. York Region showed higher levels of inequality in 1980, which declined by 1990, before rising again almost perfectly in step with the level of inequality across the Toronto CMA as a whole. The 1980s and 1990s was a time during which York Region grew very rapidly, and in turn, changed dramatically in its social make-up. Inequality rose more slowly in Montreal than elsewhere.

These patterns are contrasted with the trajectory of income inequality among households (Figure 2b). In this case, the levels of inequality over time are consistently much higher in the City of Toronto and much lower in York Region compared with those of the Toronto CMA, which runs roughly up the middle. This contrast is revealing and highlights two factors. First, there is a greater variety of household sizes in the City of Toronto and a lower variety in York Region in comparison with the Toronto CMA as a whole, because there are many more single-person households in the City of Toronto. Second, this discrepancy can also occur if households in the City of Toronto are more likely to have multiple members earning a high income, and likewise if households containing members with low incomes are also more likely to have other members with low incomes. York Region, meanwhile, is more likely to have households with only one high-income earner and more households that contain a greater variety of incomes. At the same time, multiple-family households grew rapidly in York Region, particularly during the 2000s (by 65 percent between 2001 and 2011).

Figure 2: Non-spatial income inequality among individuals and among households



Source: Calculated by the authors directly from the long-form census microdata for each census year and 2010 NHS accessed through the Toronto Statistics Canada Research Data Centre.

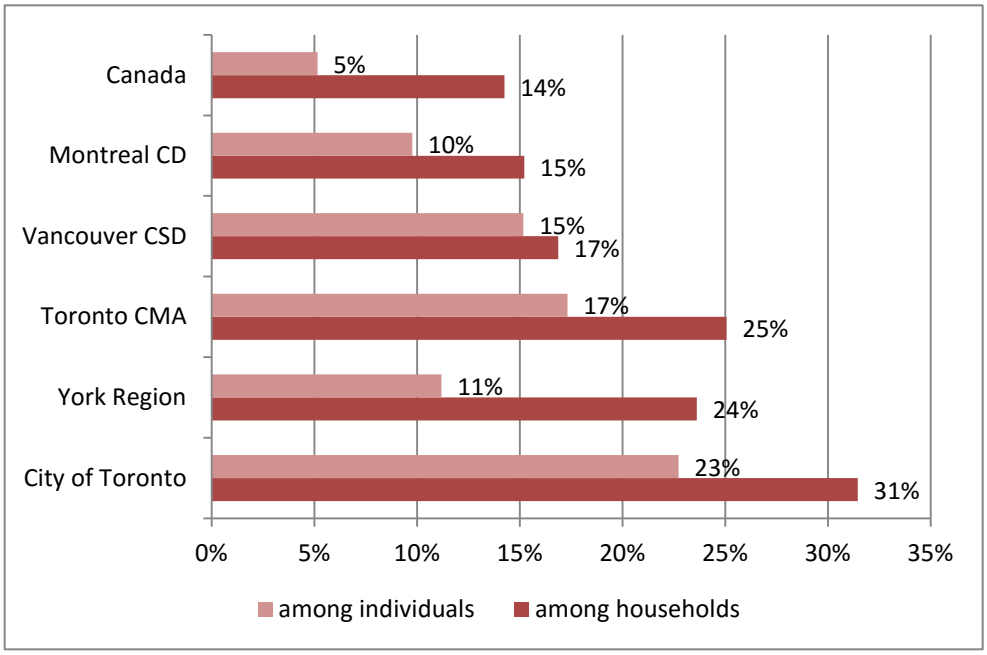
While Figure 2a, showing inequality among individuals, suggests that labour market inequality operates in much in the same way everywhere, Figure 2b suggests that individuals do not form households in the same way everywhere. The City of Toronto has more differentiation of household sizes and individuals increasingly form households with members of their own income

group in comparison with York Region or the Toronto CMA as a whole. As income inequality is also rising among households, particularly after 1990s, Figure 2b further suggests rising inequalities in the abilities of households to pool incomes for consumption purposes. It is this latter measure that particularly suggests that life chances among households may be diverging.

Under both measures, in 2010 the City of Toronto held the top (least equal) position, while the trajectory of the Toronto CMA lies between that of the City and that of York Region.

Figure 3 shows the percentage change in the level of non-spatial income inequality. In each place, income inequality increased at a faster rate than the national rate. At the national level, income inequality among individuals rose by 5 percent and among households by 14 percent from 1980 to 2005. The Toronto CMA as a whole and both the City of Toronto and York Region within it reveal faster increases in income inequality than do other large cities in Canada, especially among households. Between 1980 and 2005, income inequality among individuals increased by 11 percent in York Region and 23 percent in the City of Toronto. The increase was even greater among households: 24 percent for York Region and 31 percent for the City of Toronto.

Figure 3: Percentage change in non-spatial income inequality among individuals and among households, 1980–2005



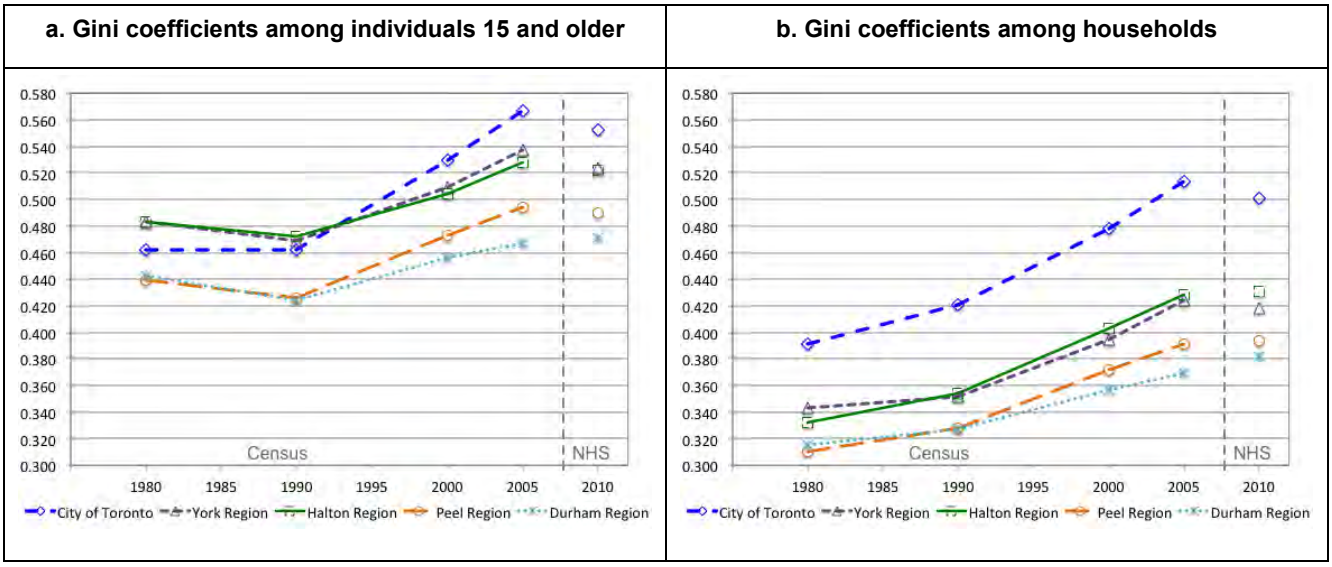
Source: Calculated by the authors directly from the long-form census microdata for each census year, accessed through the Toronto Statistics Canada Research Data Centre.

We also looked at the levels and trends of non-spatial income inequality in the City of Toronto and York Region in comparison with those of the other GTA regions – Halton, Peel, and Durham. Figure 4 shows that the City of Toronto has higher levels of inequality than the other four regions. This is not surprising, given its history of inequality, its larger diversity of family

and household types, and the higher proportion of tenants among the population. The levels and trajectory of inequality over time in York Region, meanwhile, are most similar to those in Halton. Both regions have disproportionately large cohorts of high-income earners and households, and disproportionately low proportions of tenants. Interestingly, both York and Halton Regions began with higher levels of income inequality among individuals in 1980, but those levels declined in line with the CMA average in 1990, and rose more slowly afterward.

The Regions of Peel and Durham, meanwhile, show lower levels of income inequality than York or Halton when either individual or household incomes are examined. Furthermore, changes in inequality in Peel have moved roughly in tandem with those of York and Halton (although at a lower level), while income inequality has increased more slowly in Durham than elsewhere. In all regions, however, income inequality rose between 1990 and 2005. The 2010 NHS Gini coefficients are likewise similarly high (relative to earlier years) for all regions.

Figure 4: Non-spatial income inequality among individuals and among households, GTA regions



Source: Calculated by the authors directly from the long-form census microdata for each census year and the 2010 NHS accessed through the Toronto Statistics Canada Research Data Centre.

4.2 Non-Spatial Income Polarization in City of Toronto and York Region

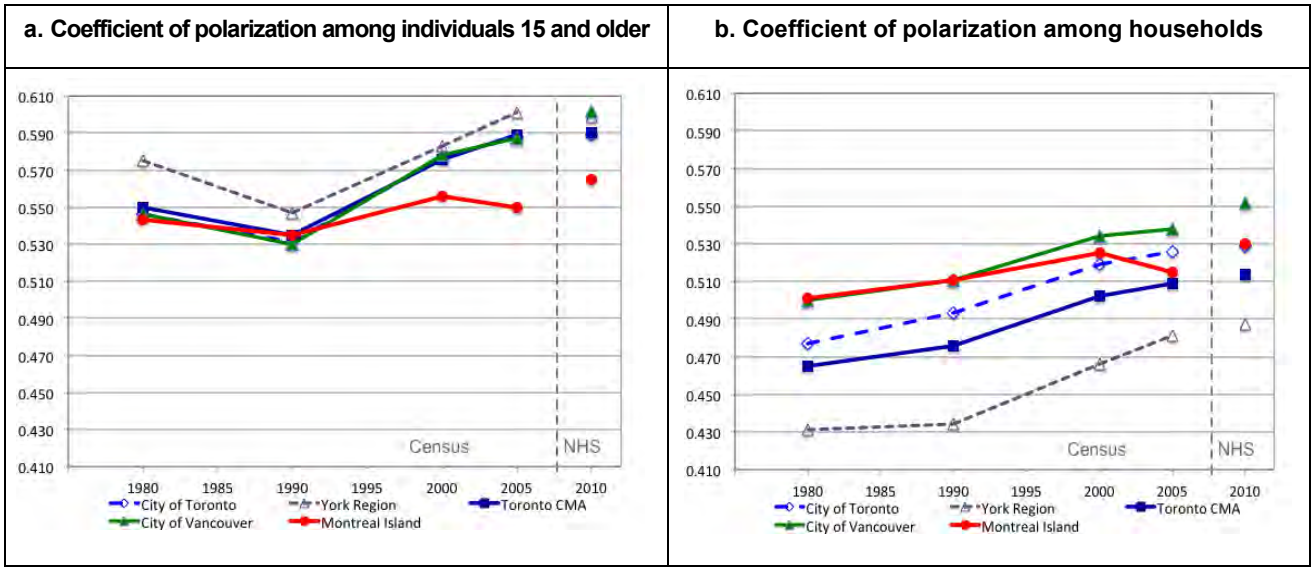
Income polarization is different from inequality, although measures of both inequality and polarization typically move in the same direction, as many of the underlying changes in income distribution are responsible for both phenomena. However, polarization may produce even more intractable problems than inequality, as polarization involves the increasing division of society into two separate and distinct groups – one rich and the other poor. As polarization increases, these groups become more internally similar, making it more difficult for each group to understand the other and increasing the gap between the interests of each group in relation to the other (Duclos, Esteban, and Ray, 2004). Polarization necessarily involves the erosion of the middle, whereas inequality may or may not involve changes in the middle of the income distribution (see Dinca-

Panaitescu and Walks, 2015; Walks, 2013). The distribution of household income across the three income ranges shown in Figure 1 indicates that both the City of Toronto and York Region have been experiencing declining middle-income shares, and thus income polarization. It is important to measure polarization, like inequality, using a universal indicator that takes into account the entire income distribution simultaneously.

The analyses in this report use the coefficient of polarization developed by one of the authors to measure income polarization (Walks, 2013). We selected this measure because of its balanced sensitivity to both high and low ends of the income distribution, its ease of calculation, and the familiarity of the authors with its use and limitations, and also because it can be used for estimating levels of both non-spatial and socio-spatial polarization (see Walks, 2013).

Figure 5a shows the trajectory over time of income polarization among individuals, which is similar to the trajectory observed for inequality. Income polarization decreased during the 1980s, before increasing at roughly the same rate from 1990 onward. Analyses of income polarization among individuals, however, reveal that York Region had the highest level in each study year. This finding makes sense if we think about how incomes are structured among individuals and households in this region. Polarization refers to a situation in which income earners concentrate into two distinct groups – one relatively high income and another relatively low income. Suburban areas like those in York Region often contain households in which there is one relatively high-income earner, while other members of the household may have lower incomes, for instance, when a spouse or teenage member holds a part-time job. When these individuals are pooled together, the result is high levels of polarization among individuals.

Figure 5: Non-spatial income polarization among individuals and among households



Source: Calculated by the authors directly from the long-form census microdata for each census year and 2010 NHS accessed through the Toronto Statistics Canada Research Data Centre.

Meanwhile, levels of income polarization among individuals in the City of Toronto are almost identical to those of the Toronto CMA as a whole and the City of Vancouver in each study year.

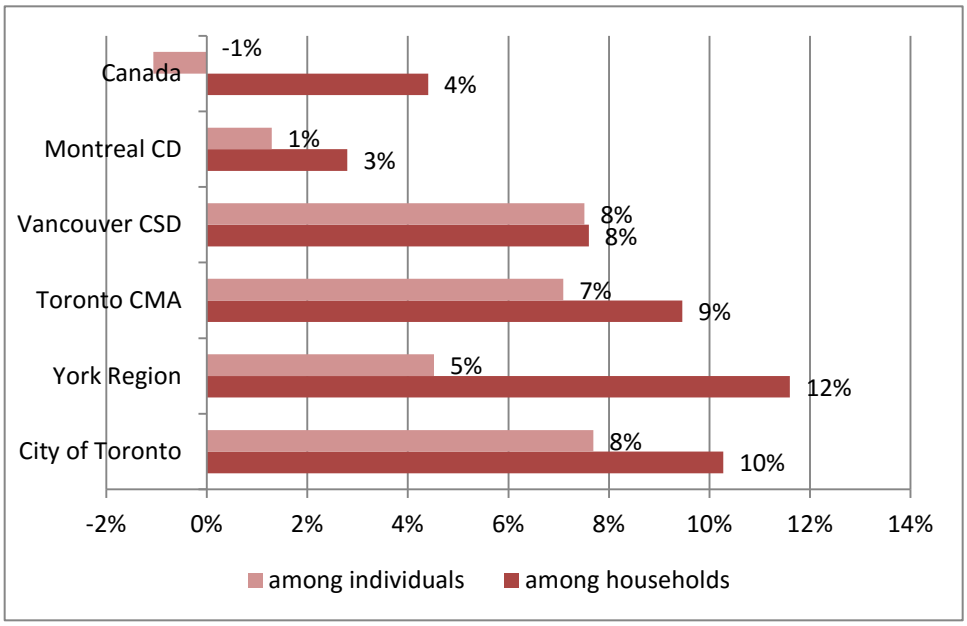
Only Montreal diverges somewhat from these trends, as its polarization levels have grown more slowly and intermittently. In 2010, analyzing individual incomes, York Region retains a top position among other study places, surpassed slightly only by the City of Vancouver.

Unlike the trends of income polarization among individuals, the picture of polarization among households shows a smooth and steady increase across time for each place (Figure 5b). Income polarization among households is the lowest in York Region in each study year. This might be expected for the same reasons individual incomes are most polarized in York – households with multiple earners, in which one earner brings in a relatively high income while other members of the same household have relatively low incomes. This situation makes each household more likely to have an aggregated income that is similar to other households, as a significant proportion of income diversity is masked through the combining of individual incomes within a household. The more households that fit into this category, the lower the level of income polarization among households, while the level of income polarization among individuals remains high.

The City of Toronto, meanwhile, has higher levels of income polarization than the Toronto CMA, but lower levels than other large central cities in Canada (the City of Vancouver, and except for 2005, the Island of Montreal). The diversity of household sizes is higher in the City of Toronto (and in other central cities), where many single-person households reside, often as renters, and there are also potentially greater class differences among households. These differences are due to either a greater mix of occupations and tenures within the City (as a large proportion of rental apartments are located within the boundaries of the City of Toronto) and/or to class sorting among families. Families with one high-income earner are more likely to also have another high-income household member in the central cities, while households with one low-income earner are more likely to also have other members with low or no income, as is the case with lone-parent households.

Figure 6 compares changes in the level of income polarization in York Region and the City of Toronto to those of the Toronto CMA and other central cities over the period 1980 to 2005. Polarization in each place, except for Montreal, increased at a faster rate than in Canada as a whole. At the national level, polarization among households increased by 5 percent, and among individuals declined by 1 percent between 1980 and 2005. Polarization increased at double this rate among households in the City of Toronto (10 percent) and even faster in York Region (12 percent). Among individuals, the rate of increase was slower, but still much higher than the national increase. It is of concern that York Region has seen its level of income polarization among households increase faster than those of other areas over the period 1980 to 2005. This trend requires further analysis (to come in Part II of this report).

Figure 6: Percentage change in non-spatial income polarization among individuals and among households, 1980–2005

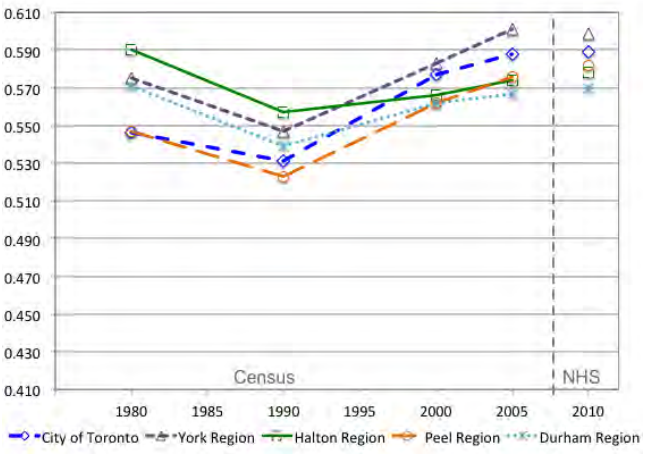
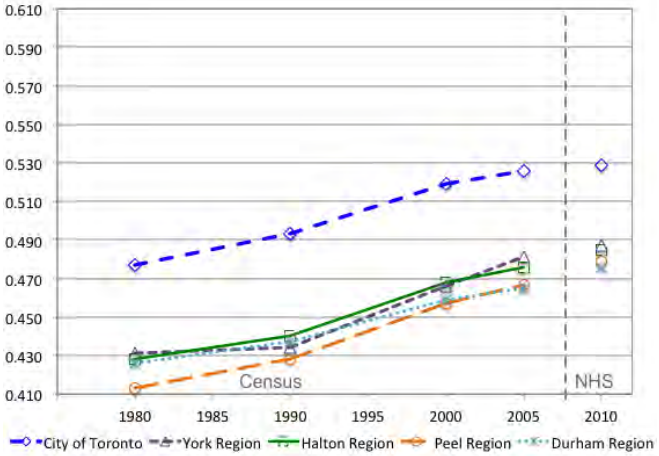


Source: Calculated by the authors directly from the long-form census microdata for each census year accessed through the Toronto Statistics Canada Research Data Centre.

The levels and patterns of income polarization in the City of Toronto and York Region are compared with the other three regions of the GTA (Figure 7). The trajectories are similar for each income type, even if the levels shift. Similar to non-spatial income inequality, the trajectory of non-spatial income polarization among individuals shows a decline between 1980 and 1990, followed by a steady increase after 1990 (Figure 7a). Notably Halton, while beginning with the highest level of income polarization, saw polarization increase at the slowest rate after 1990 (with Durham showing the second-slowest increase). At the same time, income polarization among individuals in York Region rose at the fastest rate of all regions, leading since 2000 and maintaining the top position in 2010.

Among households (Figure 7b), the trajectory of income polarization is very similar across all five regions. The trajectory for the City of Toronto is detached considerably from the other regions in each year, with levels consistently 10 to 11 percent higher than the others. The four 905 regions show very similar levels and trends of income polarization to each other, especially since 1990 onward.

Figure 7: Non-spatial income polarization among individuals and among households, GTA regions

a. Coefficient of polarization among individuals 15 and older	b. Coefficient of polarization among households
	

Source: Calculated by the authors directly from the long-form census microdata for each census year and 2010 NHS accessed through the Toronto Statistics Canada Research Data Centre.

In summary, although at different levels, the general patterns of increasing income inequality and income polarization are very similar in the City of Toronto and York Region. When measured among individuals aged 15 and above, both income inequality and polarization declined over the 1980s, but then increased continuously in each place. Among households, there was no decline over the 1980s. Instead, household income became less equally distributed and more polarized in each decade, again in a fairly continuous fashion. While the City of Toronto has higher levels of income polarization among households, York Region has the highest levels of polarization among individuals, largely due to the household structure in York Region, with more family households and fewer single-person households, and with larger families and potentially more part-time employment among secondary earners within households.

These findings illustrate why in measuring income disparities, it is better to use household incomes, as the diversity of incomes contained within households is of much less consequence than disparities between households when it comes to long-term life chances or the ability to afford daily necessities.

5. Socio-Spatial Income Inequality and Polarization in the City of Toronto and York Region

The previous chapter looked at changes in non-spatial income inequality and income polarization measured among individuals or households in a given place. This analysis showed that income inequality and income polarization have increased in both the City of Toronto and York Region over the study period. However, a rise in inequality does not automatically translate into a rise in income segregation. This chapter uses the same indices of inequality and polarization, but measured socio-spatially among neighbourhoods, with census tracts used as proxies for neighbourhoods. Both inequality and polarization provide a picture of the degree of residential segregation by income.

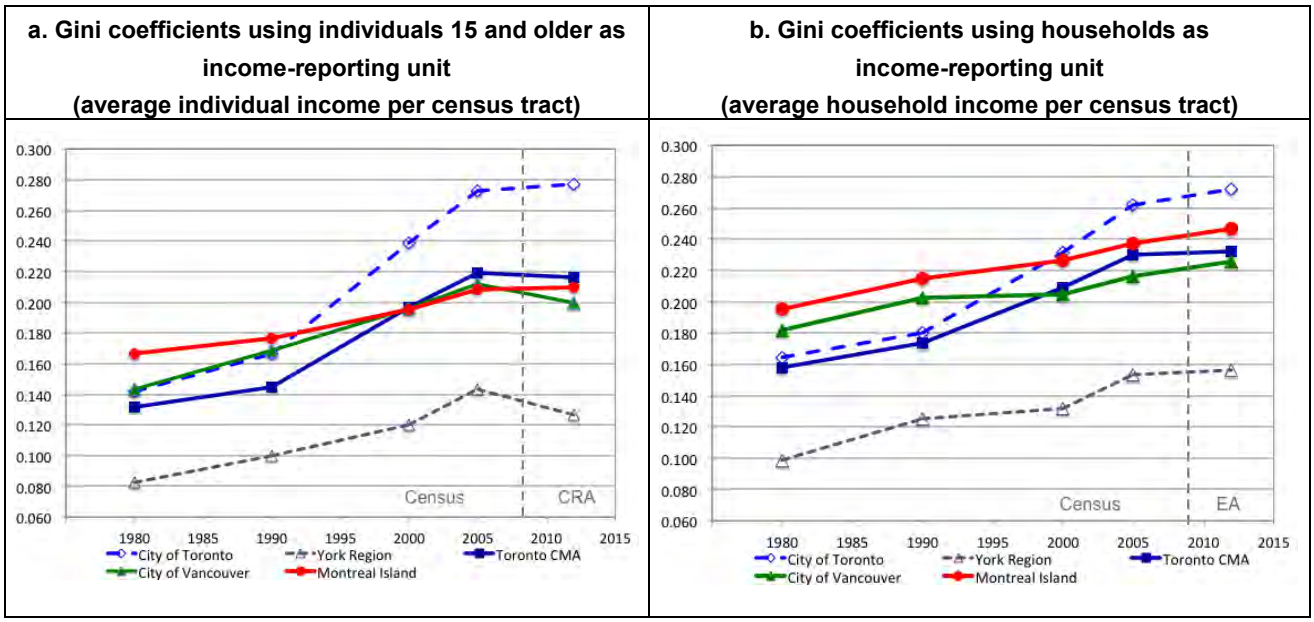
5.1 Socio-Spatial Income Inequality in the City of Toronto and York Region

Socio-spatial income inequality involves analysis of inequalities in the distribution of income among spatial units. In this report, we use the Gini coefficient among neighbourhoods to measure socio-spatial income inequality. Census tracts – representing neighbourhoods – are the basic units of analysis. The average income of the neighbourhood can be measured based on the aggregated incomes of either individuals or households living in that neighbourhood. Therefore, the spatial Gini is calculated and reported using both average individual incomes and average household incomes of neighbourhoods, largely mirroring the analysis reported in chapter 4 above (see Appendix 1).

Note: Due to the cancellation of long-form census and the lack of accuracy of the NHS data at the census tract level, we have used 2012 CRA taxfiler data to calculate spatial inequality using individuals as income-reporting units within a neighbourhood. At the same time, for comparison, we have used data provided by Environics Analytics for 2012 to calculate spatial inequality using households as income-reporting units. Unfortunately, there is no taxfiler data for households, but Environics Analytics used the taxfiler data for individuals and families to estimate relevant average household incomes (see Appendix 2).

Figure 8 shows the change over time in the levels of socio-spatial income inequality in the City of Toronto and in York Region, using both individuals and households as income-reporting units. Regardless of the income-reporting unit, income segregation among neighbourhoods increased in both places, although at different rates. Income segregation within the City of Toronto increased at its fastest rate over the period 1990 to 2005. Meanwhile, the most rapid increases in income segregation in York Region occurred during the 1980s, and again over the 2000–2005 period. Over the most recent period for which there are data, 2005–2012, both places display a flatter trajectory, or even a decline in the case of York Region, when individual incomes are used to examine neighbourhood-based inequality. This could be due to the effect of the 'Great Recession' on incomes among public and private-sector professionals.

Figure 8: Socio-spatial income inequality among neighbourhoods



Source: Calculated by the authors using the census tract profiles from the Census of Canada 1981–2005, special tabulations from Canada Revenue Agency (CRA) for 2012 – Table NID-8, and special tabulations purchased from Environics Analytics (EA) for household income by census tract 2012.

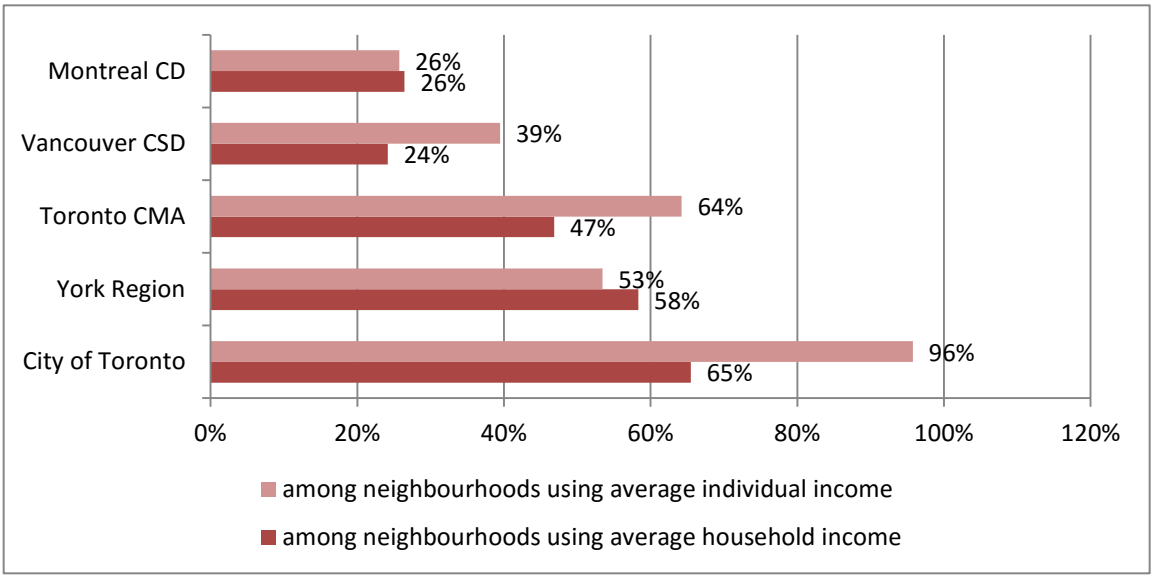
Because York Region has functioned as a collection of middle-class suburbs, with higher-than-average shares of owner-occupied housing and lower proportions of rental housing and social housing (compared with the rest of the Toronto CMA), it has understandably lower levels of socio-spatial income inequality than the City of Toronto or the Toronto CMA as a whole. Meanwhile, the City of Toronto might be expected to show higher levels of income segregation, given that it contains not only a large number of rental units, but also higher-than-average proportions of social housing (9.6 percent in 2001), relative to other areas in the Toronto CMA (3.3 percent) or Canada (4.2 percent) (Suttor, 2014), as well as some of the wealthiest neighbourhoods in the CMA (see Walks and Maaranen, 2008a). Indeed, the City of Toronto contains whole neighbourhoods dominated by rental apartments or social housing apartments, as well as whole neighbourhoods of very high-income households (Kingsway, York Mills, etc.). In

York Region, the clusters of apartments and social housing communities are too small to make up entire neighbourhoods.

Both the City of Toronto and York Region saw the level of income segregation rise at a more rapid rate than elsewhere in Canada. Figure 9 shows how much more segregated both York Region and the City of Toronto had become over the period 1980–2012. The level of socio-spatial inequality as measured using individual incomes within neighbourhoods almost doubled (97 percent) in the City of Toronto over this period. At the same time, the Cities of Vancouver and Montreal, which are the most salient comparators, show increases of 40 percent and 29 percent, respectively. While York Region understandably reveals lower levels of income segregation in each year, it also saw its level of income segregation rise faster than these central cities. Its increase of almost 60 percent is similar when using average individual incomes (57 percent) or household incomes (58 percent).

Both the City of Toronto and York Region are thus experiencing pressures that are increasing the level of income segregation among neighbourhoods at faster rates than elsewhere in Canadian cities.

Figure 9: Percentage change in socio-spatial income inequality using both individuals and households as income-reporting units within neighbourhoods, 1980–2012

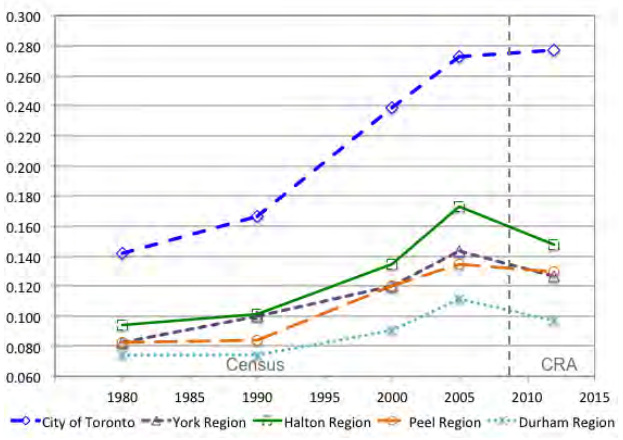
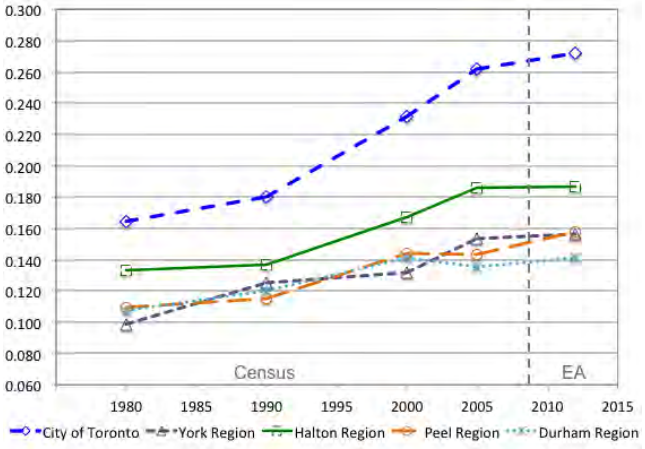


Source: Calculated by the authors using the census tract profiles from the Census of Canada 1981–2005, special tabulations from Canada Revenue Agency (CRA) 2012 – Table NID-8, and special tabulations purchased from Environics Analytics (EA) for household income by census tract 2012.

When comparing the five regions within the GTA, the City of Toronto shows a much higher level of neighbourhood income inequality (Figure 10). The City of Toronto ends the period in 2012 with levels of income segregation (in terms of average individual incomes) double those of the other regions (and almost triple that of Durham). Furthermore, the City has seen much faster increases

in income segregation, whether measured using individual or household incomes, than the other regions. The most rapid increase in income segregation occurred over the period 1990–2005 in most regions. Over the most recent period, 2005–2012, which spans the global financial crisis and the "Great Recession," spatial inequality using individual incomes decreased in each of the four 905 regions, including York Region, while increasing in the City of Toronto. At the same time, income segregation using household incomes during this period changed very little in all these regions. In both cases, Durham Region generally has the lowest levels of income segregation, while Halton has the second-highest levels after the City of Toronto.

Figure 10: Socio-spatial income inequality among neighbourhoods, GTA regions

a. Gini coefficients using individuals 15 and older as income-reporting unit (average individual income per census tract)	b. Gini coefficients using households as income-reporting unit (average household income per census tract)
	

Source: Calculated by the authors using the census tract profiles from the Census of Canada 1981–2005, special tabulations from Canada Revenue Agency (CRA) 2012 – Table NID-8, and special tabulations purchased from Environics Analytics (EA) for household income by census tract 2012.

5.2 Socio-Spatial Income Polarization in the City of Toronto and York Region

Polarization, as noted in the previous chapters, involves both a spread of incomes away from the middle and a re-concentration of incomes within two distinct groups, one richer and the other poorer than the median. Spatially, polarization thus involves not only an increase in the income gap between neighbourhoods, but also the erosion of middle-income neighbourhoods and their transformation into either a rich or a poor neighbourhood.

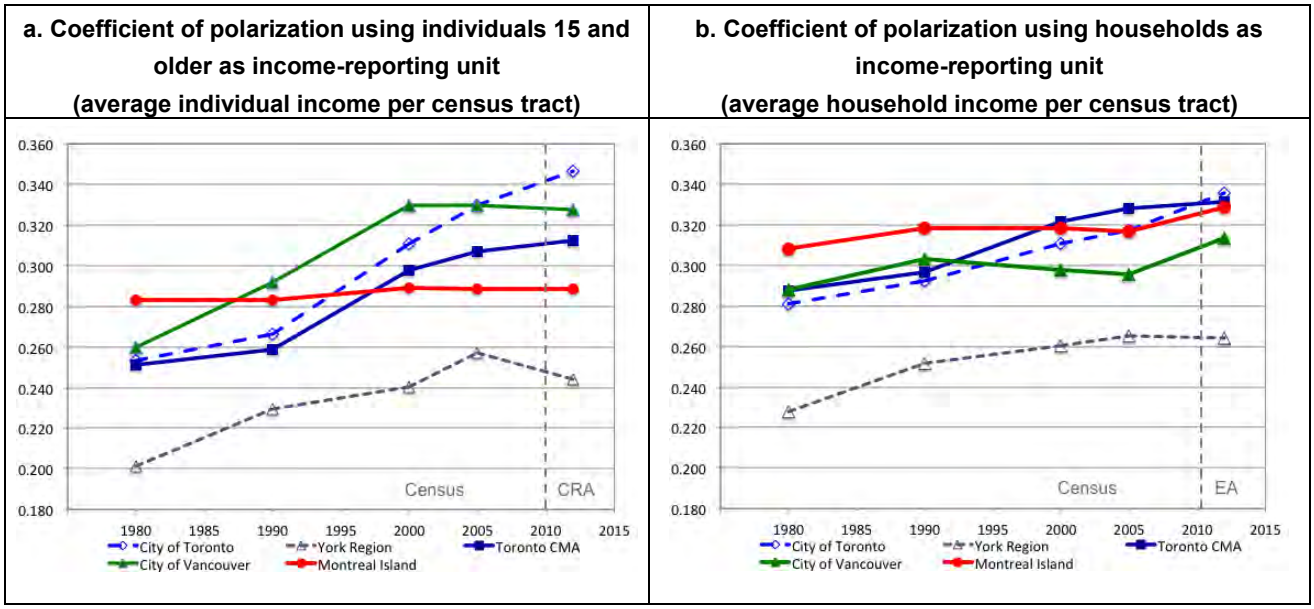
Measures of polarization do not necessarily mean that rich or poor groups of neighbourhoods will be spatially contiguous – it is possible for measures of polarization to increase within a checkerboard pattern in which no poor neighbourhood is next to another poor neighbourhood. However, the maps included in this report as well as the "Three Cities within Toronto" map (Hulchanski, 2010) show that neighbourhood trajectories in Toronto are in fact highly tied to their spatial locations within the metropolis. In Toronto, many contiguous postwar inner-suburban neighbourhoods (in the former municipalities of Etobicoke, North York, and Scarborough) have

"filtered down" together, while many contiguous prewar inner-city neighbourhoods within the former (old) City of Toronto have "filtered up" together. The latter includes both those neighbourhoods that were always wealthy (e.g., Kingsway, Rosedale, York Mills, Forest Hill) but also many formerly poor neighbourhoods that have, since the 1970s, experienced gentrification (Walks and Maaranen, 2008a, 2008b).

The polarization of the City, in which the number of middle-income neighbourhoods are reduced and replaced by either high- or low-income neighbourhoods, portends a city socially and spatially dividing into different worlds. In this chapter we use the same polarization measure developed by Walks (2013), calculated using neighbourhoods as the units of analysis.

Figure 11 shows the levels of socio-spatial income polarization among neighbourhoods in each study year over time, using both types of income. Polarization increased at a more gradual rate than did inequality. Socio-spatial polarization using individual incomes increased the most rapidly during the 1990s in both the City of Toronto and the Toronto CMA as a whole. It is interesting to note that until 2000, both places either revealed similar levels of socio-spatial polarization (using individual incomes) or the CMA had slightly higher levels (using household incomes). This finding is understandable, given that until the 1990s, and until the gentrification of many older inner-city neighbourhoods, the number of high-income neighbourhoods in the City of Toronto remained relatively small, while the number of middle-income neighbourhoods was relatively large.

Figure 11: Socio-spatial income polarization among neighbourhoods



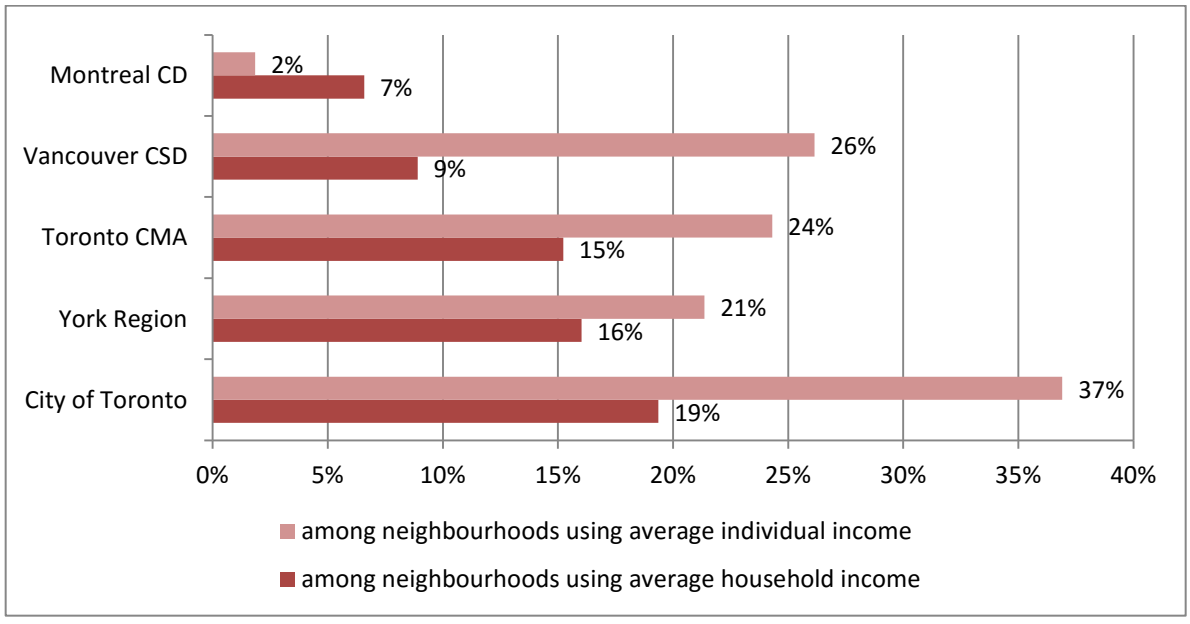
Source: Calculated by the authors using the census tract profiles from the Census of Canada 1981–2005, special tabulations from Canada Revenue Agency (CRA) 2012 – Table NID-8, and special tabulations purchased from Environics Analytics (EA) for household income by census tract 2012.

Additionally, a number of suburban areas elsewhere in the Toronto CMA had very high incomes (including Markham, Oakville, Vaughan, King, and Aurora). Later on, spatial income polarization within the City far surpassed that of the CMA, as the city's formerly middle-income

neighbourhoods became either lower-income neighbourhoods (in the former inner-suburban municipalities) or higher-income neighbourhoods (in gentrifying areas), while in many suburban areas elsewhere in the CMA average incomes have fallen relative to the CMA average. York Region, meanwhile, showed lower levels of polarization overall, since it contains more middle-income neighbourhoods. Furthermore, spatial polarization in York Region increased most rapidly during the 1980s, when many of its municipalities (including Markham, Vaughan, King, and Aurora) were developed for high-income households living in large detached housing, whereas a greater diversity of housing types has been built in York Region since the early 2000s.

Over the period 1980–2012, the City of Toronto has shown a more rapid increase in neighbourhood-based polarization than any other study area (19 percent using household incomes and 37 percent using individual incomes) (Figure 12). In contrast, York Region has seen its level of spatial income polarization increase at roughly the same rate (16 percent using household income and 21 percent using individual income) as the Toronto CMA as a whole (15 percent and 24 percent, respectively) over the same period. The processes driving a rise in socio-spatial income segregation marked by a declining proportion of middle-income neighbourhoods would appear roughly the same in York Region as in other suburban areas of the GTA, whereas the processes leading to neighbourhood-based income polarization in the City of Toronto are somewhat different and more severe.

Figure 12: Percentage change in socio-spatial income polarization using both individuals and households as income-reporting units within neighbourhoods, 1980–2012

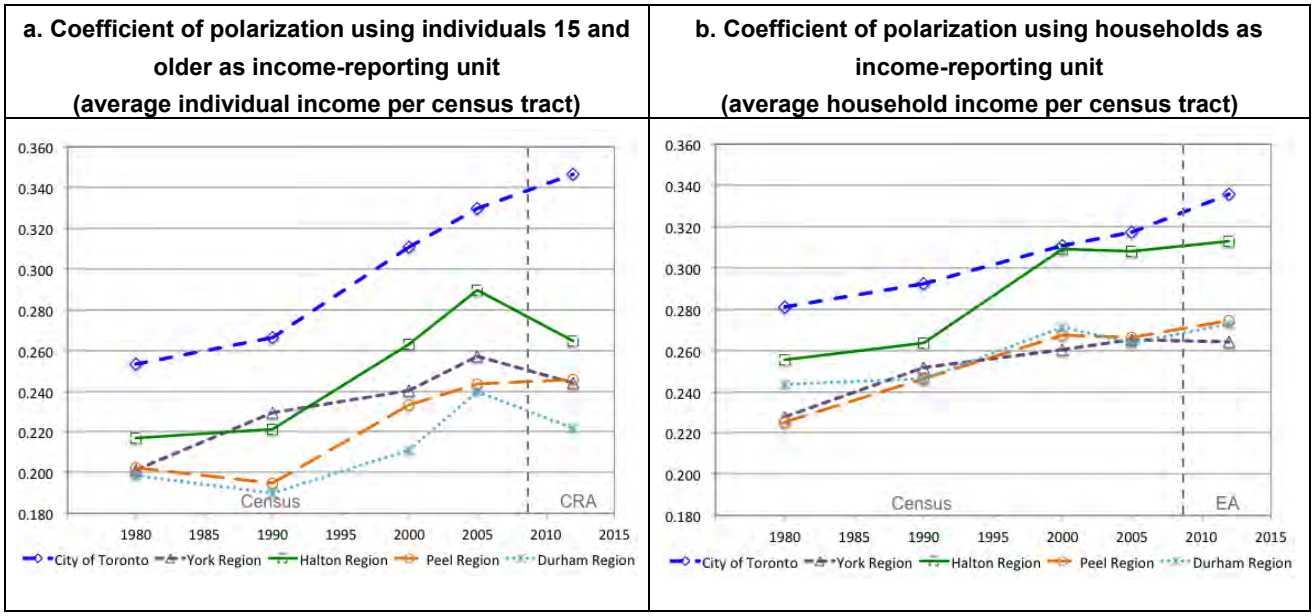


Source: Calculated by the authors using the census tract profiles from the Census of Canada 1981–2005, special tabulations from Canada Revenue Agency (CRA) 2012 – Table NID-8, and special tabulations purchased from Environics Analytics (EA) for household income by census tract 2012.

The trajectories of spatial polarization using individual incomes across the GTA's regions are similar to those for spatial inequality (Figure 13a). While the exact shape of each region's trajectory is slightly different, there is a similar divergence between the City of Toronto, which displays a continuous increase in its levels of socio-spatial polarization since 1990, and the other four regions, where polarization peaked in 2005 and has since declined, settling in 2012 at a level roughly similar to that in 2000.

When household incomes are used, a similarly large difference in the levels of socio-spatial polarization is evident between the City of Toronto and the other regions, except Halton (Figure 13b). Halton experienced a rapid increase in polarization during the 1990s, closely approaching the City of Toronto's level in 2000. York Region had remarkably similar levels of socio-spatial polarization as Peel and Durham. By 2012, all three regions had reached levels of polarization similar to those in 2000. Over the period 2000–2012, while all four regions displayed relatively flat trajectories of polarization, the City of Toronto continued its march upwards.

Figure 13: Socio-spatial income polarization among neighbourhoods, GTA regions



Source: Calculated by the authors using the census tract profiles from the Census of Canada 1981–2005, special tabulations from Canada Revenue Agency (CRA) 2012 – Table NID-8, and special tabulations purchased from Environics Analytics (A) for household income by census tract 2012.

The picture painted by the above analysis is one in which the City of Toronto reveals much higher levels of socio-spatial segregation than the 905 suburbs, whether measured using socio-spatial inequality or socio-spatial polarization. Furthermore, the 905 suburban areas, including York Region, have seen changes in the levels of inequality and polarization slow down, such that by 2012 they were only slightly higher than in the year 2000. Meanwhile, socio-spatial income inequality and polarization have continued increasing in the City of Toronto at similar rates to the 1990s. The City of Toronto is therefore shown to be spatially segregating at much more rapid rates than in York Region or other 905 suburbs.

6. Conclusion

This publication represents the first part of a two-part report on income inequality and polarization in the City of Toronto and York Region. Part I has examined changes in measures of income inequality and income polarization in the City of Toronto and in York Region, from both non-spatial and socio-spatial perspectives. It has put that knowledge into a broader context of Toronto CMA, the other regions within the GTA – Halton Region, Peel Region, and Durham Region – as well as two large Canadian cities, Vancouver and Montreal. This publication provides the first comprehensive picture of income inequality and income polarization for York Region using the most reliable data currently available. It also provides the most recent picture of income polarization for the City of Toronto.

The patterns of change in inequality and polarization differ, depending on whether the analysis is examining non-spatial trends (between households, or between individuals) or socio-spatial trends (between neighbourhoods).

The general patterns of increasing non-spatial income inequality and polarization are very similar in the City of Toronto and York Region, despite differing levels. Income inequality among individuals declined over the 1980s, but starting in 1990 increased continuously in each place. Both levels and trends over time were fairly similar to those of the Toronto CMA and the other comparator cities, suggesting that labour market inequality has operated in much the same way everywhere. Among households, there was no decline over the 1980s, but an increase in inequality in a fairly continuous fashion for each place, while the levels of inequality were consistently much higher in the City of Toronto and much lower in York Region compared with those of the Toronto CMA. This finding suggests that individuals do not form households in the same way everywhere, with the City of Toronto revealing a greater diversity of household types. Both places revealed faster increases in income inequality than other large cities in Canada (Montreal and Vancouver), especially among households.

The trajectory over time of non-spatial income polarization among individuals was very similar to that of non-spatial income inequality. It decreased over the 1980s, before increasing at a relatively constant rate from 1990 onward. York Region revealed the highest level of income polarization among individuals in each study year. Furthermore, income polarization among individuals in York Region rose at the fastest rate of all regions, leading since 2000. However, unlike the trends for income polarization among individuals, the trends among households

showed a smooth and steady increase across time for each place, and in this case York Region displays the lowest levels in each year. Meanwhile, the City of Toronto shows considerably higher levels of polarization among households than the other regions in each study year. This is explained by the greater variety of household types and sizes in the City of Toronto. It is polarization among households that is more worrying from the perspective of service delivery. Rising income polarization is concerning as it may produce even more intractable problems than income inequality, given that polarization involves the increasing division of society into two distinct groups that become more internally similar while simultaneously more different from each other, challenging the possibility of reciprocal understanding and common interests and leading to, among other things, potential political polarization.

The City of Toronto and York Region also revealed increasing socio-spatial income segregation among neighbourhoods, although at different levels. Among GTA regions, the City of Toronto showed the highest levels of socio-spatial income inequality in each study year, ending the period in 2012 with levels of income segregation double those of the other regions. It has also seen much faster increases in income segregation, whether measured with individual or household incomes. The City of Toronto has understandably high levels of income segregation, given that it contains large number of rental units, as well as higher-than-average proportions of social housing than elsewhere in the Toronto CMA or Canada, in addition to containing some of the wealthiest neighbourhoods in the entire CMA. At the same time, York Region has functioned as a middle-class suburb, with higher-than-average shares of owner-occupied housing and lower proportions of rental and social housing. Both the City of Toronto and York Region saw their levels of income segregation increase at a more rapid rate than elsewhere in Canada. The level of socio-spatial inequality measured using individual incomes almost doubled in Toronto over the period 1980–2012. While revealing lower levels, York Region also saw its levels of income segregation rise faster than those of other comparator cities.

The trajectories of socio-spatial polarization for the two places were similar to those of inequality, although polarization increased at more gradual rates. Socio-spatial polarization involves not only an increase in the income gap between neighbourhoods, but also the erosion of middle-income neighbourhoods and their transformation into either a rich or a poor neighbourhood. If the City of Toronto revealed similar trends to the Toronto CMA until 2000; after that it detached considerably, with polarization continuing to rise through to 2012. This partially reflects the gentrification happening after the 1990s, when the number of high-income neighbourhoods within the inner city grew to the detriment of middle-income neighbourhoods.

York Region, meanwhile, showed lower levels of polarization overall, and saw these levels increase at similar rates to those of the Toronto CMA. Spatial polarization in the Region increased most rapidly during the 1980s, when many of its municipalities were developed for high-income households living in large detached housing, whereas a greater diversity of housing types has been built in York Region since the early 2000s. The processes driving a rise in socio-spatial polarization marked by a declining proportion of middle-income neighbourhoods appeared similar in York Region to the other suburban areas of the GTA, whereas those underlining growing income polarization in the City of Toronto have resulted from additional processes, like gentrification.

It is concerning that the increase in socio-spatial segregation (inequality and polarization) has generally been more rapid than the increase in non-spatial income inequality and polarization: changes in the degree and structure of income segregation are thus not merely a function of widening income distributions, but are also a result of the sorting of individuals and households in space based on their incomes. This finding suggests that rising income segregation is being driven not only by income changes but also by the presence of feedback effects between growing income inequality in general and the desire of the rich to self-segregate, as well as barriers impacting the spatial mobility among the poor that concentrate them in certain neighbourhoods. The more rapid rise of income segregation when measured using individual incomes (instead of household incomes) also points to the self-segregation of higher-income individuals, including single-person households, in particular neighbourhoods. Research has shown that young adults are increasingly concentrating in central locations in the cores of Canadian cities (Moos, 2014), and in particular in newer condominium buildings in the City of Toronto (Rosen and Walks, 2015). Growing socio-spatial income inequality and polarization are problematic because they become embedded in the social and built environments of cities, with newly created conditions becoming very difficult to ameliorate.

General trends for income inequality and polarization are revealing, but it is important to take into account the differing experiences of various socio-demographic groups. Part II of the larger report represents an attempt to provide more in-depth information on what drives the trends outlined here in Part I, by looking beneath these aggregated measures to investigate how much of an income gap exists among various socio-demographic groups and how these gaps change over time in City of Toronto and York Region.

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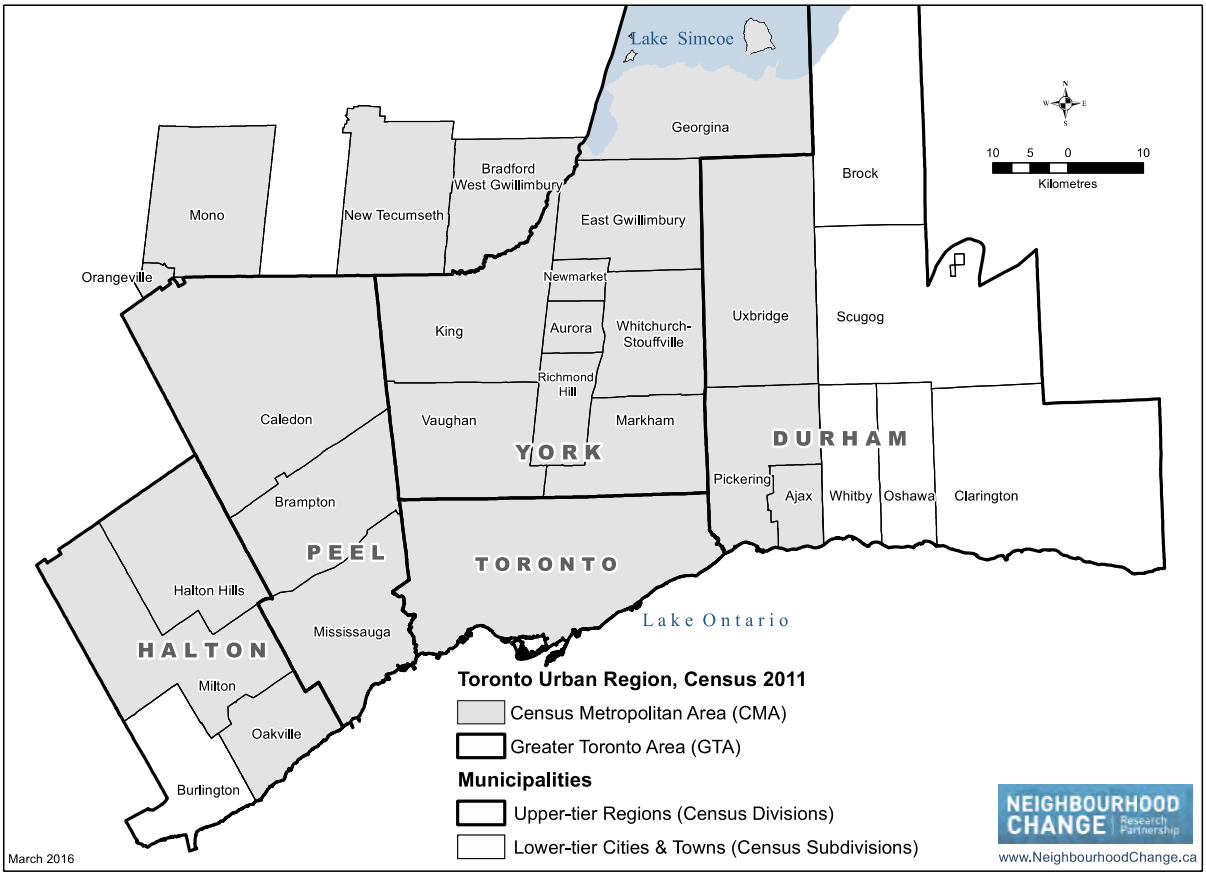
Appendix 1: Toronto CMA and GTA map

The Toronto Urban Region



Source: created by Richard Maaranen from shapefiles provided by Statistics Canada.

Appendix 2: Data Sources and Methods

The analyses in this report focus on documenting levels and trends in income inequality and income polarization in the City of Toronto and York Region using reliable data, much of which is not publicly available. This work was conducted in collaboration with the Neighbourhood Change Research Partnership (NCRP) at the University of Toronto. Non-spatial analyses were conducted at the Toronto Region Statistics Canada Research Data Centre (RDC) and followed vetting rules set by Statistics Canada to maintain anonymity and reliability in the master data files. Access to the raw microdata of the Census of Canada and the National Household Survey was obtained through the RDC Program of Research, a joint initiative for large projects between Statistics Canada, the Social Sciences and Humanities Research Council (SSHRC), and the Canadian Institute of Health Research (CIHR).

The analyses have been conducted in two different ways:

- *Non-spatial* – measures of income inequality and polarization were calculated using individuals and households as the units of analysis. *Where* individuals and households live was not taken into account, except as a general identifier (for example, the City of Toronto as a whole, York Region as a whole).
- *Socio-spatial* – measures of income inequality and polarization were calculated using census tracts as units of analysis. The specific neighbourhoods where individuals and households live are compared. Both individuals and households were used as income-reporting units to calculate the average incomes within neighbourhoods that form the inputs for producing measures of inequality and polarization.

Trends of income inequality and polarization at both socio-spatial and non-spatial levels for the City of Toronto and York Region were also compared with trends for Toronto CMA, the other five regions of the GTA, as well as two other large cities – Montreal and Vancouver.

Income inequality and polarization measures

The Gini coefficient was used to measure income inequality. It is the most accurate measure, as it meets all the criteria for valid measures of inequality (see Dinca-Panaitescu and Walks, 2015; Walks, 2013).

The coefficient of polarization, developed by one of the authors (Walks 2013), was used to measure income polarization. Although other measures of income polarization exist, two of these (Wolfson and ER, indices) cannot be employed for examining differences among places. The third (WT index) is too weighted toward the high end of the income distribution (see Walks, 2013). For consistency, it was decided to use the same index of income polarization for both non-spatial and socio-spatial analyses of polarization. More details on these measures and comparison with other existing measures are provided in previous publications by two of the authors (Dinca-Panaitescu and Walks, 2015; Walks, 2013).

Income measure and income units

Total income was used for both the Gini coefficient and coefficient of polarization calculations. Total income, also called before-tax (but after-transfer) income, includes market income plus government transfers. It is the only measure available in the Census of Canada that allows for comparisons over time. There are no ideal income data available for measuring inequality and polarization. We would prefer to use after-tax income, as this is the actual income that individuals and households receive. However, the Census does not report after-tax income before 2006. Our choice of income definition thus depends on the availability of data. However, the main focus of this study is on trends of inequality and polarization over time, which are largely not affected by income type. Absolute values of inequality and polarization differ, but the shape and direction of the overall trend lines will not differ very much. Indeed, the use of before-tax income may produce a more conservative picture of trends over time (compared to after-tax income), as it does not take into account the fact that the taxation system became less able to counter growing inequality from the mid-1990s onwards (Frenette, Green, and Milligan, 2009; Heisz, 2007; Heisz and Murphy, 2015).

Households and individuals have been used as income-reporting units for both types of analyses. Census tracts represent the unit of analysis for socio-spatial analyses. However, within each census tract both individuals and households were used as income-reporting units, such that the socio-spatial analyses mirror those of the non-spatial analyses.

Neighbourhoods

Census tracts (CTs) were used as a proxy for neighbourhoods, as is the custom in most small-area research conducted in Canada and the United States. Census tracts are small geographic units created by Statistics Canada whose boundaries follow transportation routes, waterways, and other environmental features such as parks. They typically contain between 2,000 and 8,000 people.

For trend analyses of spatial income inequality and polarization, we used the CT boundaries as they existed in each year. We recognize that the number of CTs in a city can change over time, mainly through the addition of new tracts at the fringe of the built-up area (as new subdivisions are constructed) and, more rarely, within the existing fabric when existing areas are redeveloped. The change in number of census tracts may slightly affect measured levels of neighbourhood inequality, in comparison with the results if those new areas had been left out of the analysis and a consistent set of boundaries used. However, most of the CTs remained longitudinally consistent, and using the CT boundaries as they existed each year reflects the

actual situation in any given year. Furthermore, if a new (potentially rich or poor) community is developed in a city, it is a real part of the region, and thus it does not make sense to leave that community out of the analysis of neighbourhood inequality.

Data sources

For the period 1980–2005, adequate data exists in the census. The long-form microdata files for the Census of Canada were used to calculate the non-spatial measures. The census tract profiles published as part of the census were used to calculate the socio-spatial measures. The census microdata provide the most reliable data for analyzing income inequality in Canadian cities, despite the lack of information on taxes before 2006. The almost complete population coverage and very large sample sizes allow for more detailed and robust analyses at smaller geographic scales, which is the focus of this study. In contrast, other data sources often used to characterize inequality in Canada and in international comparisons – the Survey of Consumer Finances (SCF) to 1996 and the Survey of Labour and Income Dynamics (SLID) since 1996 – have far smaller samples, raising issues of non-response specific to voluntary surveys (Frenette, Green, and Milligan, 2006; Frenette, Green, and Picot, 2004). Because of their small sample sizes, these surveys are not valid for use at the scale of Census Metropolitan Areas (CMAs), although they may be appropriate for producing relatively accurate estimates at the level of the nation as a whole, and potentially the provincial level.

Because of the lack of long-form census data after 2006, other data sources are required to complete the analysis for the recent period. For the non-spatial analysis, the National Household Survey (NHS), conducted in 2010, asked many questions similar to those in the long-form census. However, because it was a voluntary survey, it is not as representative as the former long-form census. While Statistics Canada has taken measures to come up with weights that allow the NHS to become representative at the national and provincial levels, the NHS does not provide reliable estimates at the census tract level, particularly for variables such as income. For this reason, while we report the indices of non-spatial income inequality and polarization in 2010 calculated from the NHS, the different methodology makes these results not strictly comparable with those that use census data. The 2010 NHS data, therefore, were not included in trend analysis, but reported separately. However, there is no other dataset we can substitute for non-spatial analyses for recent years, as the SLID does not contain sufficient responses at the CMA or city levels.

For the spatial analysis, we used two datasets to fill the gap arising from the cancellation of the long-form census: the 2012 CRA taxfiler data, and 2012 data from Environics Analytics. These are better alternatives to the 2010 NHS, which is not reliable at the census tract level. First, the 2012 CRA taxfiler data contains information on per-capita total income of all taxfilers aggregated to census tract level. It is a 100 percent sample of everyone who filed taxes, and so has greater coverage even than the long-form census (which is a 20 percent sample). The CRA data is directly comparable with census data, as the former long-form census allowed respondents to either state their income or check a box allowing the census to obtain their income data from the CRA. The vast majority of census respondents checked this box, and thus much of census income data came directly from the CRA. Because taxfilers are individuals, however (who can be grouped into families, but not households), the CRA data do not provide average household incomes. For the latter, we used 2012 data provided by Environics Analytics. Environics Analytics

took the CRA data for individuals aggregated in census tracts, as well as the median family incomes reported for census tracts, and used this information (tested against the general trends established in the SLID and other national surveys), to estimate the average household incomes for census tracts. Because they draw on CRA data, Environics Analytics data are meant to be directly comparable with the former long-form census data. We have found using our tests that the Environics Analytics estimates for average household income at the census tract level to be much more plausible and reliable than the NHS estimates at the local level.

In comparing 1980–2000 census data and 2012 Environics Analytics data for household income, we found that the categories for the household income ranges in Figure 1 were the ones that best fit both the 1980–2000 census data and Environics Analytics household incomes for 2012 at the census tract level. The census data for 1980, 1990, and 2000 involve custom data in which households are grouped in inflation-adjusted income ranges. The cut-points for each of these income ranges in 2000 were inflation-adjusted to 2012 constant dollars using the Bank of Canada deflator. These were compared to the cut-points of each range the Environics Analytics data. The cut-points selected for inclusion in Figure 1 are the ones for which the latter best fit the former (that is, where the census data cut-points line up with the Environics Analytics cut-points). These cut-points are extremely close, within 0.27 percent of each other, but they are not perfect.

The result is that the 2012 Environics Analytics data slightly underestimate the income range of households in the bottom range (by approximately 0.27 percent) and slightly overestimate the range of income in both the middle and top ranges (by approximately 0.27 percent in each case) in comparison with the census data. It is not possible to determine how many more households (if any) should be classified in the bottom range in 2012, nor how many households (if any) should be moved into lower categories from the top or middle category, but the proportions would be very slight in any case. What this means in practice is that the pattern graphed in Figure 1 toward greater inequality should be taken as a potentially conservative estimate, as it is possible that the shift into the bottom category in 2012 is slightly more stark than is shown in Figure 1.