



Report No. 2 | March 2015

It's what you know (and where you can go)

Human capital and agglomeration effects on demographic trends in Northern Ontario

northernpolicy.ca

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ISBN: 978-1-988472-41-6

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This report was made possible through the support of our partners Lakehead University, Laurentian University and Northern Ontario Heritage Fund Corporation. Northern Policy Institute expresses great appreciation for their generous support but emphasizes the following:

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This North Superior Workforce Planning Board and Employment Ontario project is funded by the Ontario government.

EMPLOYMENT ONTARIO

The views expressed in this document do not necessarily reflect those of Employment Ontario.

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About Northern Policy Institute

Northern Policy Institute is Northern Ontario's independent think tank. We perform research, collect and disseminate evidence, and identify policy opportunities to support the growth of sustainable Northern Communities. Our operations are located in Thunder Bay and Sudbury. We seek to enhance Northern Ontario's capacity to take the lead position on socio-economic policy that impacts Northern Ontario, Ontario, and Canada as a whole.



Vision

A growing, sustainable, and self-sufficient Northern Ontario. One with the ability to not only identify opportunities but to pursue them, either on its own or through intelligent partnerships. A Northern Ontario that contributes both to its own success and to the success of others.

Mission

Northern Policy Institute is an independent policy institute. We exist for the purposes of:

- The development and promotion of proactive, evidence based and purpose driven policy options that deepen understanding about the unique challenges of Northern Ontario and ensure the sustainable development and longterm economic prosperity of Northern Ontario;
- The research and analysis of:
 - » Existing and emerging policies relevant to Northern Ontario;
 - » Economic, technological and social trends which affect Northern Ontario;
- The formulation and advocacy of policies that benefit all Northern Ontario communities that include Aboriginal, Francophone, remote/rural communities, and urban centres; and,
- Other complementary purposes not inconsistent with these objectives.

Values

Objectivity: Northern Policy Institute is a nonpartisan, not-for-profit incorporated body providing fair, balanced and objective assessments of policy issues in a pan-Northern Ontario context;

Relevance: Northern Policy Institute will support practical and applied research on current or emerging issues and implications relevant to Northern Ontario now and in the future in keeping with the themes and objectives of the Growth Plan for Northern Ontario, 2011;

Collaboration: Northern Policy Institute recognizes the value of multi-stakeholder, multi-disciplinary, and multicultural contributions to the collective advancement of Northern Ontario and works in a collaborative and inclusive approach to provide a full range of policy options for decision makers;

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Accessibility: The work of Northern Policy Institute will be publicly accessible to stimulate public engagement and dialogue, promoting view points on the interests of Northern Ontario and its people.



About the North Superior Workforce Planning Board (NSWPB)

Our Mission

Connecting community partners to improve the quality of life in our communities through workforce development.

The North Superior Workforce Planning Board (NSWPB) is one of twenty-five Workforce Planning zones across Ontario, mandated through the Ministry of Training, Colleges and Universities to identify, assess and prioritize the skills and knowledge needs of community, employers and individual participants/learners in the local labour market through a collaborative, local labour market planning process.

An active and broadly-based volunteer Board of Directors governs its affairs. First established in 1996, NSWPB is recognized by community, economic and municipal leaders as a "partner of choice" in the identification and implementation of local solutions to local labour market issues.

Workforce Planning Boards play a key role in the Ministry of Training, Colleges and Universities' goal of integrating its programs and services. Part of the ongoing strategy to achieve this goal is to first identify and then respond to the diverse regional and local labour market needs through the province.

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Dr. Moazzami has taught Economics and Econometrics at Lakehead University since 1988. He is well known for his research activities particularly related to Northern Ontario. He has written many reports on Northern Ontario's economic development challenges and opportunities. He was commissioned by the Ministry of Northern Development and Mines to undertake a comprehensive study of Northern Ontario's economy as a part of the research conducted for the Growth Plan for Northern Ontario. Included in the study were the identification of growing, declining and emerging industrial clusters in the region. Professor Moazzami has also written extensively on Northern Ontario's Aboriginal people and Northern Aboriginal economy. Dr. Moazzami's expertise and influence reaches beyond Lakehead University and Northern Ontario. He has been a regular guest speaker at the University of Waterloo's Economic Development Program.

Executive Summary

Northern Ontario has undergone substantial demographic and socio-economic changes in recent years. The population declined from 822,445 in 1991 to 775,180 in 2011, a decline of about 0.29 percent per year, while the region's share of the provincial population declined from 8.2 percent in 1991 to 6.0 percent in 2011. The decline can be attributed to low fertility rates among women in Northern Ontario, the out-migration of younger people and young families looking for employment opportunities elsewhere, and the region's inability to attract and keep immigrants, who are an important source of population growth in the rest of Ontario.

At the same time, Northern Ontario's population is aging, which has implications for the composition of the labour force, patterns of saving and household consumption, and levels of sales, production, and investment. Furthermore, its impact falls unevenly on different industries and sectors of the regional economy. An aging population also affects the tax bases from which the provincial and municipal governments draw revenue, and influences demand for government program expenditures such as health care and education.

The cultural and linguistic diversity of Northern Ontario's population is also changing, with the francophone and immigrant populations slowly declining, both in number and as a share of the region's total population, while the Aboriginal population — particularly the off-reserve population — is increasing, again both in number and as a share of the total population. The higher fertility rates among Aboriginal women mean that the Aboriginal population is somewhat younger than other elements of Northern Ontario's population.

Northern Ontario's urban population is growing slowly, but the rural population is in decline in both absolute and relative terms. The majority of the rural population in Northwestern Ontario lives in relatively remote areas with a weak link to an urban centre, while most of the rural population in Northeastern Ontario lives in areas with a moderate link to an urban centre.

Labour force participation rates are higher in urban areas than in rural areas, likely reflecting increased employment opportunities in larger population centres. Unemployment rates are also lower in urban areas than in rural areas, and the unemployment rate increases as the degree of rurality increases, with the highest unemployment rates found in the most remote areas. Similarly, the proportion of the population receiving transfer payments rises with the degree of rurality, as does the dependency ratio — the ratio of the total population to the working-age population. The number of people falling below Statistics Canada's Low Income Cut-off is higher in Northeastern Ontario than in Northwestern Ontario, but stays relatively constant as the degree of rurality rises. Average income is higher in urban areas than in rural areas, and higher in Northeastern Ontario than in Northwestern Ontario. The earnings gap between rural and urban areas can be explained equally by differences in their human capital composition and by agglomeration economies that suggest larger places offer higher productivity and therefore higher average earnings.

Projecting demographic trends out to 2025, the population of Northern Ontario, both urban and rural, is expected to decline, primarily related to factors already affecting the region's population — namely, low fertility rates, the aging of the population, and lack of immigration. Urban Northeastern Ontario will experience the out-migration of younger people, but will attract older people from rural and other areas. The newcomers will bring their children with them, increasing the number of children below age 20. Rural Northwestern Ontario, however, will continue to experience the out-migration of people in almost all age categories, largely as a result of a lack of employment opportunities.

In general, rural and remote populations in Northeastern Ontario have better road access to population centres than Northwestern Ontario, due to Northeastern Ontario's significantly better transportation system. This better access has resulted in a much higher level of educational achievement among Aboriginals in Northeastern Ontario than those in Northwestern Ontario. Access to urban centres also explains much of the urban-rural earnings gap in northern Ontario and likely contributes to other demographic variances that are outlined in this report. Human Capital differences explain between 40% and 70% of the variance in earnings potential depending on where you live. Economic agglomeration, the ability to participate in and benefit from the economies of larger centres, explains the rest.

In developing a human capital index — a measure of the stock of human capital, which is directly related to investment in education, the payoff of which is greater productivity and higher earnings — the study finds that the index declines in Northeastern Ontario as the degree of rurality rises. In Northwestern Ontario, however, rural areas with a moderate or weak link to an urban centre have a higher human capital index than areas with a strong link to an urban centre. The human capital index is lowest in remote rural areas. Since human capital is a main determinant of productivity, employment, and earnings, one approach to ensuring viable and economically sustainable rural areas is to increase investment in education in those areas.

Introduction

Northern Ontario is one of the most important resourceproducing regions in Canada. In 2013, it accounted for almost all the metals production and 23 percent of the non-metals produced in Ontario, and since 2006 the region has consistently produced between 67 and 79 percent of the value of all Ontario's mineral production.

Demographic changes are having a significant impact on social and economic conditions in Northern Ontario. The baby-boom generation, born in the two decades following World War Two, are aging and the oldest of them are retiring now. The generation that came after the baby boomers is much smaller in number. As well, the region is seeing rising average life expectancy, a low fertility rate, and the out-migration of youth. As a result, Northern Ontario's population is aging slowly, a process that will continue into the foreseeable future. This is an important trend, because an aging population affects the composition of the labour force and hence the region's ability to generate output and income. It also affects other aspects of the economy, such as household consumption expenditure patterns, saving rates, and investments. An aging population also affects the tax base, and therefore provincial and municipal revenue, as well as the demand for key budgetary components such as health care, education, and pensions. Another important aspect of an aging population is the relationship between those who are economically active and those who are economically dependent — that is, between the working population and the young and elderly.

This study focuses mainly on the different demographics of rural and urban Northern Ontario, and examines the demographic changes that are taking place among the total population of the region and among its francophone, Aboriginal, and immigrant populations. I begin by analysing demographic change in Northern Ontario, looking separately at its Northwestern and Northeastern regions. I then examine demographic trends in Northern Ontario's rural and urban areas, followed by a look at various socio-economic characteristics of these rural and urban areas. Next comes an analysis of demographic trends among the francophone, Aboriginal, and immigrant populations of Northern Ontario. I then look at factors that explain earnings differentials between Northern Ontario's urban and rural areas. I develop a human capital index for these areas, and test whether the current earnings gap relates to the human capital composition of rural and urban areas or reflects agglomeration economies that is, the concept that larger urban centres offer firms a productive advantage that is not usually available in rural areas. This is followed by projections of the future rural and urban population of Northwestern and Northeastern Ontario, as well as an age profile of those who have migrated to and from rural and urban areas. The study closes with a summary and conclusion.

Data Sources

For the most part, the data are based on detailed information on individual census subdivisions in Northern Ontario obtained through special tabulations from Statistics Canada. All data prior to 2011 are based on census information. Except for the total and francophone populations, which are based on the 2011 census, the data are based on the Statistics Canada's 2011 National Household Survey (NHS). In fact, both the census and the NHS provide information on Canada's population for various geographic regions and for numerous common topics, but the NHS estimates are derived from a sample survey, and therefore are subject to sampling error amplified by a relatively high non-response error due to the survey's voluntary nature. For the sake of consistency, I have tried to use census data wherever possible.

The Population Groups

As noted, the report focuses on the following four population groups in Northern Ontario:

- 1. the total population;
- 2. the francophone population, defined as individuals whose mother tongue is French;
- the Aboriginal population, defined by Statistics Canada as persons who reported identifying with at least one Aboriginal group — that is, North American Indian, Métis, or Inuit, and/or those who reported being a Treaty Indian or registered Indian, as defined by the Indian Act, and/or those who reported they were members of an Indian band or First Nation; and
- 4. the immigrant population, defined as persons who are, or have ever been, landed immigrants in Canada.

The Geographical Specification of Northwestern and Northeastern Ontario

Northern Ontario is subdivided into Northwestern Ontario, consisting of the census districts of Rainy River, Kenora, and Thunder Bay, and Northeastern Ontario, which is the census divisions of Cochrane, Timiskaming, Algoma, Sudbury, Nipissing, Manitoulin, Parry Sound, and Greater Sudbury. The federal government and the Federal Economic Development Initiative for Northern Ontario include Muskoka district in their definition of Northeastern Ontario, even though it is geographically in Southern Ontario; however, the provincial government removed Muskoka from the jurisdictional area of the Ministry of Northern Development and Mines and the Northern Ontario Heritage Fund in 2004.

Population Trends in Northern Ontario

Northern Ontario's population is fluid and changing continuously. It is renewed by births and augmented by immigration, while declining due to many factors, including deaths, the out-migration of youth, relatively low fertility rates, and an inability to attract and/or retain immigrants. The region's population declined from 822,445 in 1991 to 775,180 in 2011, a drop of 0.29 percent per year, with both Northwestern and Northeastern Ontario experiencing decline (see Figure 1). The population change was not uniform over the period, however, growing at an annual rate of about 0.1 percent during the 1991–96 period, then declining significantly thereafter due to unfavourable economic conditions (Figure 2).¹¹ The growth rate was positive during the 2001–06 period, but turned negative from 2006 to 2011.

The population followed a similar cyclical trend in both subregions of Northern Ontario except that population decline was greater in the Northwest than in the Northeast over the 2006–11 period. Overall, Northeastern Ontario experienced positive population growth between 2001 and 2011, while Northwestern Ontario's population declined.



Figure 1: Population, Northwestern and Northeastern Ontario, 1991–2011



The recession that started in 1988 marked the beginning of a new era in Northern Ontario. The post-1988 period was characteristically different from the preceding period in a number of important ways. First, unlike previous recessions, the 1988 recession coincided with intense investment in capital equipment in the resource-based industries. Significant labour shedding in the base sectors resulted. Therefore, the period of recovery that started in the early 1990s was not accompanied by employment growth in the base industries. In other words, unlike in previous recessions, reduced employment in the base industries in the post-1988 period was not a transitory phenomenon. It was rightly referred to as the "jobless recovery" in the early 2000s. Declining employment opportunities resulted in out-migration of youth, lowering the regional population as well as the birth rate.

Northern Ontario's share of the total Ontario population also declined, from 8.2 percent in 1991 to 6.8 percent in 2001 and to 6.0 percent in 2011 (see Figure 3). The declining population share is due to the fact that Northern Ontario's population has been trending downward while the overall provincial population has been rising (Ontario's population grew from 10.1 million in 1991 to 12.9 million in 2011).



Figure 3: Northwestern and Northeastern Ontario's Share of Ontario's Total Population, 1991–2011



As Figure 4 shows, in 2011 the total fertility rate — defined as the average number of children a woman will have over the course of her life — was 1.61 for Canada and 1.55 for Ontario as a whole.¹¹ In Northeastern and Northwestern Ontario, it was 1.60 and 1.77, respectively, with the higher rate in Northwestern Ontario reflecting the relatively greater share of Aboriginals in the subregion's population. Figure 4 also shows that the fertility rate in Northern Ontario is higher than the provincial and national averages for women below age 28 and lower for those above that age. Thus, not only are women in Northern Ontario having a greater number of children than the provincial and national averages; they are having them earlier in life. Nevertheless, fertility rates are still significantly below the generational replacement rate of 2.1.

Figure 4: Average Fertility Rate, by Age, Northwestern and Northeastern Ontario, Ontario, and Canada, 2011



The implication of relatively low fertility rates in Northern Ontario and Ontario as a whole is that natural increase (births minus deaths) has become a less important factor in regional population growth. Conversely, immigration and interregional migration have become increasingly significant factors. The target level of immigration to Canada, which is set by the federal government, was 240,000 to 265,000 per year over the 2013–15 period, representing 0.75 percent of the population each year (Ontario 2013). According to census data, about 1.4 million immigrants came to Canada over the 2001–11 period, while net immigration to Ontario — defined as the number of immigrants who came minus those who left the province — over the period equalled 586,990. Northeastern and Northwestern Ontario, however, had negative net immigration over that time, losing 30,565 and 15,820 immigrants, respectively.

¹¹ Fertility rates were obtained from Statistics Canada's Health unit, calculated using 2011 census population information.

Coupled with a relatively low fertility rate and the out-migration of youth and immigrants from Northern Ontario is rising life expectancy. For Canada as a whole, average life expectancy at birth increased from 71.13 in 1960 to 81.24 in 2012. As a result, in Northern Ontario, the share of individuals below age 20 declined from 29.5 percent in 1991 to 22.2 percent in 2011, while the share of seniors rose from 11.5 percent in 1991 to 17.4 percent in 2011 (Figure 5). The aging of the population is also reflected in the rising average age of Northern Ontarios, who are also older than the provincial average (Figure 6); moreover, the population is younger in Northwestern Ontario than in Northeastern Ontario. This is partly due to Northwestern Ontario's relatively larger share of Aboriginal people, who are proportionately younger than non-Aboriginal people.



Figure 5: Share of Youth and Elderly in Northern Ontario's Population, 1991–2011

Population less than 20 Population 65+

Figure 6: Average Age of Population, Northwestern Ontario, Northeastern Ontario, and Ontario, 2001 and 2011



Slower population growth and an aging population affect the composition of Northern Ontario's labour force, and hence the region's ability to generate output and income. In fact, the aging population affects virtually all aspects of the regional economy, including patterns of saving and household consumption, and sales, production, and investment levels. Furthermore, its impact falls unevenly on different industries and sectors of the regional economy. The aging population also affects the tax bases from which the provincial government draws revenue, and influences demand for government program expenditures such as health care and education. What health-care-related services and facilities will be needed to meet the requirements of a rapidly aging regional population? How many doctors, nurses, and other health care providers will need to be trained and attracted to the region to replace aging health care providers and satisfy the growing demand for health care services? Policy makers will have to address these important questions in the coming years.

The relationship between the working and non-working components of the population is usually captured by a dependency ratio. This is defined as the ratio of the total population, which is essentially the number of mouths to feed, to the working-age population — that is, the population 20 to 64 years of age. This ratio is a crude measure of the burden or cost associated with demographic change in terms of raising and educating children as well as taking care of the elderly at any given time.

Figure 7 shows that the dependency rate in the two subregions of Northern Ontario is higher than for Ontario as a whole, which suggests that there are more dependent persons per each working-age individual in Northern Ontario than the provincial average. The dependency rate in Northern Ontario has been declining since the baby boomers came of working age about four decades ago, changing their status from dependents to providers, but as that generation moves into old age, the ratio will once again start to increase.



Figure 7: Ratio of Total Population to Working-Age Population, Northwestern Ontario, Northeastern Ontario, and Ontario, 1991–2011

The makeup of Northern Ontario's population, including the composition of the dependent population, changed significantly over the 1991–2011 period. During the 1990s, younger people dominated the dependent population: as Figure 5 shows, in 1991, 29.5 percent of the dependent population were children below age 20 and only 11.5 percent were seniors. By 2011, however, 22.2 percent of the dependent population were children below age 20, while 17.4 percent were seniors. This trend will continue as the baby boomers move into retirement, with the dependent population eventually consisting largely of the elderly, rather than younger people.



Figure 8: Shares of Francophones, Aboriginals, and Immigrants in Northern Ontario's Population, 2001 and 2011

^{2001 2011}

Another aspect of demographic change in Northern Ontario relates to the cultural and linguistic diversity of the population (Figure 8). In Northeastern Ontario, the francophone population declined from 130,085 in 2001 to 120,045 in 2011, a drop of 7.7 percent. As a result, their share of Northeastern Ontario's population declined from 23.6 percent in 2001 to 21.8 percent in 2011. The francophone population is concentrated in the cities of Sudbury (29 percent of the total population), North Bay (32 percent), and Timmins (41 percent), and in a number of smaller towns such as Cochrane (45 percent), Elliot Lake (20 percent), Hearst (89 percent), Kapukasing (66 percent), Kirkland Lake (18 percent), New Liskeard (32 percent), and West Nipissing (72 percent).

Figure 8 also shows that the francophone population in Northwestern Ontario declined from 8,330 in 2001 to 6,750 in 2011, or by 19.0 percent, while the francophone share of Northwestern Ontario's total population declined from 3.6 percent in 2001 to 3.0 percent in 2011. Northwestern Ontario's francophone population is concentrated in Atikokan (3 percent of the total population), Greenstone (32 percent), Ignace (10 percent), Manitouwadge (16 percent), Marathon (13 percent), and Thunder Bay (3 percent).

It should be noted that Statistics Canada's 2011 NHS reports the francophone population as 114,765 and 5,960 in Northeastern and Northwestern Ontario, respectively, while the 2011 census reports higher numbers.

The total Aboriginal population in Northeastern and Northwestern Ontario increased from 41,005 and 36,425, respectively, in 2001 to 57,715 and 41,265, respectively, in 2011. The Aboriginal share of the total regional population increased from 9.9 percent in 2001 to 12.8 percent in 2011. In general, the Aboriginal population is younger and has a higher fertility rate than the non-Aboriginal population. In addition, as we will see later, a higher percentage of the Aboriginal population lives in rural areas compared with other visible minorities.¹¹

The immigrant population declined from 34,845 and 19,935 in Northeastern and Northwestern Ontario, respectively, in 2001, to 30,565 and 15,820 in 2011. The share of immigrants in the total regional population declined from 7.0 percent in 2001 to 6.0 percent in 2011.



¹¹ Most of the untapped mineral resources in Northern Ontario are located in rural regions. Their development requires Aboriginal and non-Aboriginal cooperation as well as developed infrastructure, both of which are currently absent in Northern Ontario.

Demographic Trends in Northern Ontario's Rural and Urban Areas

Demographic changes have not been uniform across rural and urban regions of Northern Ontario. The urban population experienced growth, while the rural population declined during the 2001–11 period. Changing demographics and fluctuating populations in rural areas have important implications for resource development. Canada's economic prosperity has been based on a staples economy relying on the export of natural resources, with particular importance for economic development of peripheral and rural regions (see Moazzami 2004). For example, Northern Ontario accounted for all the metals and about 23 percent of the non-metals produced in Ontario in 2013, and the region has consistently produced between 67 and 79 percent of the value of all provincial mineral production since 2006. Many of Ontario's new mineral resource developments — such as the Red Lake Gold operations and the Ring of Fire area — are located north of the 50th parallel, and their development necessitates infrastructural development as well as Aboriginal and non-Aboriginal collaboration.

Before examining demographic changes in rural and urban regions, one needs to define the term "rural." There is an age-old debate regarding whether "rural" is a geographical concept, a social representation, or a culture and a way of life. This report focuses on the geographical concept, in which there are at least six different definitions of rural areas, each emphasizing different criteria, such as population size, population density, and labour market context. Different definitions result in different estimates of the rural and urban population. One definition, commonly used by Statistics Canada, defines an urban area as having a "minimum population of 1000 persons and a population density of at least 400 persons per square kilometre" (Statistics Canada 2001, 13).¹¹ Statistics Canada suggests, in fact, that "the appropriate definition should be determined by the question being addressed; however, if we were to recommend one definition. This is the population living in towns and municipalities outside the commuting zone of larger urban centres (i.e. outside the commuting zone of centres with a population of 10,000 or more)" (du Plessis et al. 2002, 1).

According, this study defines rural and small town to refer to the population living outside Census Metropolitan Areas (CMAs) and Census Agglomerations (CAs). A CMA has an urban core population of at least 100,000 and includes all neighbouring census sub-divisions where 50 percent or more of the employed labour force living in the census subdivisions commutes to work in the urban core, or where 25 percent or more of the employed labour force working in the census subdivisions commutes to work from the urban core. A CA has an urban core population of between 10,000 and 99,999 people. The same commuting flow thresholds apply as for CMAs.

Statistics Canada's recently developed concept of the metropolitan influenced zone (MIZ) disaggregates rural areas into four types of zones based on the degree of metropolitan influence, as indicated by the degree of commuting to any CMA or CA. These are defined as follows:

- a strong MIZ is one where at least 30 percent of the total employed labour force living in the census subdivision works in any CMA/CA urban core;
- a moderate MIZ is one where at least 5 percent, but less than 30 percent, of the total employed labour force living in the census subdivision works in any CMA/CA urban core;
- a weak MIZ is one where more than 0 percent, but less than 5 percent, of the total employed labour force living in the census subdivision works in any CMA/CA urban core; and
- an area that is not an MIZ is where no one or fewer than 40 people in the resident labour force commute to the urban core of any CMA or CA.

Based on this classification, one can classify the 278 census subdivisions in Northern Ontario into 2 CMAs (Greater Sudbury and Thunder Bay) and 6 CAs (Sault Ste. Marie, North Bay, Timmins, Kenora, Elliot Lake, and Temiskaming Shores). The rest of the census subdivisions are rural areas with different degrees of rurality. The data set on these 278 census subdivisions includes information on average socio-economic characteristics such as average employment earnings, average full-time earnings, population by highest level of educational attainment, employment by industry and occupation, population by ethnicity, the employed labour force, and labour force participation and unemployment rates.

¹¹ The problem with this classification is that it can result in some small rural areas, such as the Attawapiskat First Nation, being designated as urban.

Demographic Trends in Urban and Rural Northern Ontario

Figure 9 shows that the urban population in Northeastern and Northwestern Ontario grew, while the rural and small town population declined, between 2001 and 2011. Some of these population changes, however, might be due to the reclassification of boundaries.¹¹ In their analysis of rural and small town Canada, for example, Mendelson and Bollman (1998) find that, when the reclassification of boundaries is taken into account, Canada's rural and small town population was 18.0 percent smaller in 1996 than in 1976.



Figure 9: Northern Ontario's Urban and Rural Populations, 2001 and 2011

Figure 9 also shows that the population living in rural and small towns in Northeastern and Northwestern Ontario declined from 41.8 and 35.6 percent, respectively, in 2001 to 38.9 and 32.4 percent, respectively, in 2011. This trend, in fact, holds for Canada as a whole: Mitchell (2009, 377) reports that, between 1971 and 2001, the percentage of the population residing in rural and small towns declined by about one-fifth, to only 20.3 percent, and that, during the last census period of the twentieth century (1996–2001), more than 50 percent of the country's smallest settlements lost residents.

Figure 10 shows that the majority of the rural population in Northwestern Ontario lives in relatively remote areas with a weak link to urban centres, and that 15.2 percent have no link at all to an urban centre. In Northeastern Ontario, in contrast, most of the rural population lives in areas with at least a moderate link to urban centres, and only 2.7 percent live in remote regions with no link to an urban centre. Figure 10 also shows that the share of the rural population living in areas designated as strong to weak MIZ declined in Northwestern Ontario over the 2001–11 period, while the share living in remote rural areas increased significantly. This is consistent with the decline in the rural population and the growth of the Aboriginal population, many of whom live in remote rural areas. The distribution of the rural population in Northwestern Ontario stayed relatively constant over the period.

To test the sensitivity of rural-urban demographics to the definition of the rural area selected, I examined the ruralurban population distribution in Northern Ontario in 2011 using Statistics Canada's often-used alternative definition of rural population as persons living in centres with fewer than 1,000 people (Figure 11). By this definition, the size of the rural population declines significantly relative to the population as determined by the definition shown in Figure 9, from 178,452 and 87,090 in Northeastern and Northwestern Ontario, respectively, to 36,369 and 26,743, respectively. In other

¹¹ The reclassification of boundaries from rural and small towns to urban areas is likely to affect census sub-divisions that are in the commuting zone of CMAs and CAs, not those that are farther away from urban areas — that is, those with an MIZ that is zero, weak, or moderate. Mitchell (2009) attributes the growth of rural areas close to metropolitan regions to the decision of urban residents to combine urban employment with the benefits of rural living. She states that, as a greater number of ex-urbanites relocate to the countryside, "municipalities formerly classified as rural and small town soon became engulfed by the expanding sphere of urban influence" (386).

Figure 10: Northern Ontario's Rural Population by Degree of Rurality, 2001 and 2011



Northwestern Ontario

words, the size of the rural population declines by about 60–70 percent if one adopts the latter definition of rural areas. The distribution of the rural population, however, does not change significantly depending on the definition of "rural."

Like Figure 10, Figure 11 shows that the majority of the rural population in Northwestern Ontario lives in areas designated as having a weak or no link to urban centres, while the majority of the rural population in Northeastern Ontario lives in areas with a moderate or weak link to urban centres.

The data also reveal that the total population living in census subdivisions with fewer than 1,000 people did not change significantly in Northeastern Ontario over the 2001–11 period. In Northwestern Ontario, however, the population of census subdivisions with fewer than 1,000 people almost doubled over the period, with rural areas with a weak link to an urban centre experiencing the highest increase, followed by remote areas with no link to an urban centre.



Figure 11: Northern Ontario's Rural Population in Census Subdivisions with Fewer than 1,000 People, by Degree of Rurality, 2011

[■] N.E.O. ■ N.W.O.

The Age Distribution of Northern Ontario's Population

Table 1 and Figure 12 show the age distribution of Northern Ontario's population over the 2001–11 period.¹¹ They indicate a trend of an aging population in both subregions, with the number of the young and of prime working age (those between the ages of 0 and 44) declining and those ages 45 and older increasing. As a result, as Table 1 shows, the median age of the population rose in both subregions over the period. As noted, an aging population increases demand for public services catering to the needs of the elderly, such as health care. It also has important implications for the labour force and for the ability of Northern Ontario to generate output and income, as well as affecting other aspects of the economy, such as household income, spending, savings, and investment behaviour, and, in turn, provincial tax revenue.

Table 2 shows that, over the 2001–11 period, the urban population increased by 3.1 and 1.0 percent in Northeastern and Northwestern Ontario, respectively. The number of people between 35 and 44 years of age in urban areas declined in both regions. This is probably related to the decline of children below age 14 in both regions. As is the case for the total population, the urban population is also aging; even though the population increased between 2001 and 2011, the percentage share of younger people declined, as shown in Figure 13. For example, the number of individuals under age 19 declined by 11.7 in Northeastern Ontario and by 13.8 percent in Northwestern Ontario, while the number of those ages 65 and over rose by 21.5 and 13.9 percent in Northwestern and Northeastern Ontario, respectively. The aging of the population is also reflected in the rise of the median age of the urban population from 39.1 and 38.8 years in 2001 to 42.9 and 43.2 years in 2011 in Northeastern and Northwestern Ontario, respectively.

Table 1: Age Distribu	tion of Northern On	tario's Population,	2001 and 2011						
Age					% Change,				
Category	2001	%	2011	%	2001–11				
	Northeastern Ontario								
0–14	102,295	18.79	83,570	15.16	-18.30				
15-24	70,385	12.93	67,965	12.33	-3.44				
25–34	60,335	11.09	58,965	10.70	-2.27				
35–44	90,170	16.57	65,160	11.82	-27.74				
45–54	83,045	15.26	92,630	16.81	11.54				
55–64	61,095	11.23	83,540	15.16	36.74				
65–79	63,505	11.67	74,435	13.51	17.21				
80+	13,440	2.47	24,895	4.52	85.23				
Total	544,270	100.00	551,160	100.00	1.27				
Median	39.50		45.92		16.27				
age									
		North	nwestern Ontc	nrio					
0–14	48,115	20.76	37,665	16.81	-21.72				
15–24	31,290	13.50	29,595	13.21	-5.42				
25–34	28,680	12.37	24,730	11.04	-13.77				
35–44	38,860	16.77	27,395	12.23	-29.50				
45–54	34,145	14.73	36,815	16.43	7.82				
55–64	21,310	9.19	32,345	14.44	51.78				
65–79	23,175	10.00	25,495	11.38	10.01				
80+	6,205	2.68	10,005	4.47	61.24				
Total	231,780	100.00	224,045	100.00	-3.34				
Median	37.2		41.87		12.54				
age									

Table 3 and Figure 14 show the age distribution of the rural population in Northern Ontario in 2011 and 2011. Northeastern Ontario's rural population declined by 2.4 percent over the period, while the decline in Northwestern Ontario was a much greater 9.5 percent. The number of people between the ages of 0 and 44 declined in both subregions, but the number of those ages 45 and older increased. The share of seniors in rural areas increased from 14.8 and 10.2 percent in 2001 in Northeastern and Northwestern Ontario, respectively, to 19.3 and 13.6 percent, respectively, in 2011. As Table 3 shows, the median age of the rural population increased in both subregions.







Figure 13: Age Distribution of Northern Ontario's Urban Population, 2001 and 2011



Table 2. Aae	Distribution	of Northern	Ontario's Urban	Population	2001-11
TUDIC Z. NGC		OFINORITICITY	Onitano 3 orban	i opolalion,	2001 11

Age					% Change,
Category	2001	%	2011	%	2001–11
		North	eastern Ont	ario	
0–14	67,570	18.69	58,014	15.57	-14.14
15–24	48,450	13.40	49,154	13.19	1.45
25–34	41,215	11.40	43,289	11.62	5.03
35–44	60,460	16.73	46,158	12.39	-23.66
45–54	55,205	15.27	62,409	16.75	13.05
55–64	38,605	10.68	52,999	14.22	37.29
65-79	41,070	11.36	46,570	12.50	13.39
80+	8,860	2.45	14,099	3.78	59.13
Total	361,435	100.00	372,692	100.00	3.11
Median	39.1		42.9		
age					
		North	western Ont	ario	
0–14	25,315	18.67	20,855	15.23	-17.62
15–24	17,760	13.10	18,256	13.33	2.80
25–34	16,690	12.31	15,632	11.42	-6.34
35–44	22,650	16.71	17,087	12.48	-24.56
45–54	20,635	15.22	22,754	16.62	10.27
55–64	13,000	9.59	20,110	14.68	54.69
65–79	15,100	11.14	16,066	11.73	6.40
80+	4,425	3.26	6,182	4.51	39.72
Total	135,575	100.00	136,944	100.00	1.01
Median	38.8		43.2		
age					

Figure 14: Age Distribution of Northern Ontario's Rural Population, 2001 and 2011





Table 3. Age	Distribution	of Northern	Ontario's Rural	Population	2001	and 201
Tuble 0. Age	DISINDUNUN	OFNORTH	Official S Rola	i opolalion,	2001	unu 201

Age					% Change,			
Category	2001	%	2011	%	2001-11			
	Northeastern Ontario							
0–14	34,725	18.99	26,861	15.05	-22.65			
15–24	21,940	12.00	19,294	10.81	-12.06			
25–34	19,115	10.46	15,477	8.67	-19.03			
35–44	29,710	16.25	19,689	11.03	-33.73			
45–54	27,835	15.23	31,518	17.66	13.23			
55-64	22,485	12.30	31,252	17.51	38.99			
65-79	22,430	12.27	27,543	15.43	22.79			
80+	4,575	2.50	6,824	3.82	49.16			
Total	182,815	100.00	178,458	100.00	-2.38			
Median	40.5		47.8					
age								
		Nort	hwestern Or	ntario				
0–14	22,810	23.70	17,056	19.59	-25.22			
15–24	13,535	14.07	11,571	13.29	-14.51			
25–34	11,995	12.46	8,986	10.32	-25.09			
35–44	16,215	16.85	10,501	12.06	-35.24			
45–54	13,510	14.04	14,445	16.59	6.92			
55-64	8,310	8.64	12,708	14.59	52.93			
65–79	8,075	8.39	9,554	10.97	18.32			
80+	1,780	1.85	2,265	2.60	27.22			
Total	96,230	100.00	87,086	100.00	-9.50			
Median	34.8		40.9					
age								

Socio-economic Characteristics of Northern Ontario's Population

Demographic change and economic change are inextricably linked. Individuals migrate from economically depressed areas to those with favourable economic conditions. At the same time, lack of a qualified labour force reduces the ability of residents to participate in the benefits of economic development in their regions, and can also present a barrier to economic development in remote regions, especially Northern Ontario's resource-based communities.

In examining the socio-economic characteristics of Northern Ontario's urban and rural regions, I should note that the average statistics reported in this section are the average of all census subdivisions, not those of the individuals living in those regions. In other words, each census subdivision gets an equal weight in the calculation of the average statistics, irrespective of the number of residents in the subdivision. Therefore, the averages I report here might differ slightly from those reported by Statistics Canada, which are based on individuals rather than on areas.

Figure 15 shows average labour force participation and unemployment rates among individuals between the ages of 15 and 64 in Northern Ontario by the degree of rurality of the area in which they live. It shows that the average labour force participation rate is 73.7 percent in urban centres and 68.6 percent in rural areas in Northeastern Ontario; the rate is about the same in all the more rural areas of the subregion. In Northwestern Ontario, the labour force participation rate is 77.2 percent, somewhat higher than in Northeastern Ontario; in rural Northwestern Ontario, the rate is 63.6 percent, which is lower than in Northeastern Ontario.



Figure 15: Labour Force Participation and Unemployment Rates by Degree of Rurality, Northern Ontario, 2011



In general, one would expect the labour force participation rate to decline as the degree of rurality increases, but this does not appear to be the case in Northern Ontario. The participation rate in remote rural areas of Northeastern Ontario is similar to that in rural areas with a strong link to an urban centre. Moreover, the participation rate in rural areas with a strong link to an urban centre is greater than that in rural areas with a strong link to an urban centre is greater than that in rural areas with a strong link to an urban centre. Moreover, the participation rate in rural areas of Northwestern Ontario with a moderate or weak link to an urban centre is greater than that in rural areas with a strong link to an urban centre. To explain this anomaly, I calculated the employment shares of various resource-related occupations and industries in rural areas. As Figure 16 shows, the percentage of workers employed in mining and manufacturing industries and in primary and processing occupations in 2011 was highest in remote rural regions of Northeastern Ontario. Similarly, a relatively high percentage of workers in rural areas of Northeastern Ontario as well, a relatively high percentage of workers are employed in the resource-related manufacturing and mining sectors of rural areas with a moderate or weak link to an urban centre. In both cases, the relatively high participation rates can be explained by the concentration of resource-based activities in these regions.

Figure 16: Employment Share of Resource-based Industries by Degree of Rurality, Northern Ontario, 2011



Northeastern Ontario



Naulhuus dawa Outania

Figure 15 also shows that the unemployment rate increases as the degree of rurality rises in Northeastern Ontario. On average, in 2011, the unemployment rate was 14.2 percent in rural areas and 12.1 percent in urban areas; in remote rural areas, however, the unemployment rate was 20.0 percent. Figure 16 shows that a relatively high percentage of people in those regions were employed in resource-based industries. These industries are relatively mature, and cannot be a source of much new employment creation. Nevertheless, the high unemployment rate in those regions might be due to a high labour force participation rate in the expectation of obtaining employment in those industries.

In Northwestern Ontario, the unemployment was 9.6 percent in urban areas and 19.6 percent in rural areas in 2011 (the reason for this high rate in rural areas is explored later in the paper). As Figure 15 shows, the unemployment rate in rural areas of Northwestern Ontario with a strong link to an urban centre is higher than that in areas with a weak or moderate link to an urban centre. This reflects the presence of resource-based activities in rural areas that are farther away from urban centres. The unemployment rate in remote rural areas of Northwestern Ontario, however, is about 26 percent, which is highest among all rural areas in Northern Ontario. This reflects the lack of developed resource-based industries in those areas, despite the presence there of large untapped resources.

Figure 17 shows the percentage of the Northern Ontario population ages 15 to 64 who received government transfer payments in 2011. In urban areas, 11.6 percent did so; in rural areas, 14.6 percent received payments in Northeastern Ontario and 17.9 percent in Northwestern Ontario. In Northeastern Ontario, the percentage rose with the degree of rurality, except in remote areas, where only 12.6 percent received transfer payments, due, as noted, to the high percentage of the labour force engaged in resource-based industries in those areas. In Northwestern Ontario as well, the dependency rate increased with the degree of rurality, but here the exception was rural areas with a strong link to an urban centre. This is consistent with the observation above that rural areas in Northwestern Ontario closest to an urban centre have a lower labour force participation rate and a higher unemployment rate. The dependency rate in remote rural regions of Northwestern Ontario was 28.2 percent, the highest of all rural areas in Northern Ontario.

Figure 17: Dependency Rate on Government Transfer Payments, by Degree of Rurality, Northern Ontario, 2011



Northeastern Ontario



Northwestern Ontario





■ N.W.O. ■ N.E.O.

Figure 18 shows the percentage of people in Northern Ontario between the ages of 15 and 64 who fall below Statistics Canada's low income cut-off (LICO), the income threshold below which a family likely devotes a larger share of its income on the necessities of food, shelter, and clothing than does the average family. The LICO can also be interpreted as a measure of both poverty and income inequality.¹¹ By this measure, as Figure 18 shows, the poverty rate in urban Northeastern Ontario was 11.1 percent in 2011 and 6.9 percent in urban Northwestern Ontario, while the rural poverty rate was 10.3 percent in Northeastern Ontario and 9.8 percent in Northwestern Ontario. The rate was relatively constant as the degree of rurality rises in Northern Ontario. Overall, the poverty rate was 10.4 percent in Northeastern Ontario and 9.3 percent in Northwestern Ontario.

With respect to educational attainment, Table 4 shows that the level is much higher in urban areas of Northern Ontario than in rural regions, and that the level declines as the distance between rural areas and urban centres increases. Of the remote rural population of Northeastern Ontario, 35.5 percent did not have a high school diploma in 2011; the percentage rose to 58.3 percent in Northwestern Ontario. Similarly, about 27 percent of individuals in urban areas had a high school diploma, while only 18 or 19 percent did so in remote rural regions. The percentage of individuals with a college or trade certificate was the same in both urban and rural Northeastern Ontario, but in Northwestern Ontario a significantly higher percentage had a college or trade certificate in urban areas than in rural areas.

Figure 19 shows that around 81 percent of individuals ages 15 to 64 in urban Northern Ontario had employment income in 2011; the percentage was slightly higher in Northeastern Ontario than in the Northwest. The percentage Table 4: Highest Level of Educational Attainment of Northern Ontario's Population, by Degree of Rurality, 2011

Age					% Change,
Category	2001	%	2011	%	2001–11
		Nort	heastern On	ntario	
0–14	34,725	18.99	26,861	15.05	-22.65
15–24	21,940	12.00	19,294	10.81	-12.06
25–34	19,115	10.46	15,477	8.67	-19.03
35–44	29,710	16.25	19,689	11.03	-33.73
45–54	27,835	15.23	31,518	17.66	13.23
55-64	22,485	12.30	31,252	17.51	38.99
65–79	22,430	12.27	27,543	15.43	22.79
80+	4,575	2.50	6,824	3.82	49.16
Total	182,815	100.00	178,458	100.00	-2.38
Median	40.5		47.8		
age					
		Nort	hwestern Or	ntario	
0–14	22,810	23.70	17,056	19.59	-25.22
15-24	13,535	14.07	11,571	13.29	-14.51
25–34	11,995	12.46	8,986	10.32	-25.09
35–44	16,215	16.85	10,501	12.06	-35.24
45–54	13,510	14.04	14,445	16.59	6.92
55-64	8,310	8.64	12,708	14.59	52.93
65–79	8,075	8.39	9,554	10.97	18.32
80+	1,780	1.85	2,265	2.60	27.22
Total	96,230	100.00	87,086	100.00	-9.50
Median	34.8		40.9		
age					

was highest in remote rural regions of Northeastern Ontario, reflecting the involvement of many people in resourcebased activities in those areas. In Northwestern Ontario, a relatively higher percentage of individuals in rural areas with moderate and weak link to an urban centre had employment income, again reflecting the fact that many in those regions are involved in resource-based industries.

With respect to average and full-time income of Northern Ontarians in 2011, Figure 20 shows that average income was higher in urban areas than in rural areas, and higher in Northeastern Ontario than in Northwestern Ontario. As well, in Northeastern Ontario, average income of those in rural areas with a strong link to an urban centre was higher than that of individuals in urban regions; average income did not decline with the rise in the degree of rurality. In Northwestern Ontario, average income with a moderate to weak link with an urban centre, reflecting the presence of resource-based industries in those regions. Are earnings related to the stock of human capital in different regions? Does distance from urban centres influence earnings? I explore these issues later in the paper.

¹¹ In 2011, the LICO was \$22,229 for one person, \$27,674 for a family of two, \$34,022 for a family of three, \$41,307 for a family of four, \$46,850 for a family of five, \$52,838 for a family of six, \$58,827 for a family of seven; each additional person adds \$5,989 to the LICO level.

Figure 19: Population Ages 15-64 with Employment Income, by Degree of Rurality, Northern Ontario, 2011



Northeastern Ontario





Figure 20: Annual Income of Employed Persons, by Degree of Rurality, Northern Ontario, 2011



Northeastern Ontario

Average Income
Full-Time Income



Demographic Trends among Francophones, Aboriginals, and Immigrants in Northern Ontario

The Francophone Population

Table 5, which shows the age distribution of the francophone population in Northern Ontario in 2001 and 2011, indicates that francophones declined by 7.7 percent in Northeastern Ontario and by 19.0 percent in Northwestern Ontario over the period. It should be noted that there is a discrepancy between the francophone population as reported by the 2011 census and that based on Statistics Canada's 2011 National Household Survey. According to the latter, the total francophone population was 114,765 and 5,960 in Northeastern and Northwestern Ontario, respectively, in 2011, while the 2011 census reports a total francophone population of 120,045 in Northeastern Ontario and 6,750 in Northwestern Ontario.¹¹ For consistency, I use data from the 2001 and 2011 censuses.

Table 5 and Figure 21 show that, in Northeastern Ontario, the number of francophones ages 44 and younger declined from 2001 to 2011, while those ages 45 years and older increased. In Northwestern Ontario, the decline occurred in almost all age categories. In other words, the francophone population in Northern Ontario is not only declining; it is also aging rapidly, with the median age of francophones in Northeastern Ontario increasing from 42.2 to 49.2, and in Northwestern Ontario from 44.7 to 51.3 over the period. The francophone population is also older than that of Northern Ontario as a whole (44.7 and 42.4 in Northeastern and Northwestern Ontario, respectively, in 2011). These changes reflect the francophone population's low fertility rate and the out-migration of francophone youth.

Figure 22 shows that, in 2011, about 64 percent of the francophone population in Northeastern Ontario lived in urban centres, 16.7 percent lived in rural areas with a moderate link to an urban centre, and 15.2 percent lived in areas with a weak

Table 5: Age Distribution of Francophones, Northern Ontario, 2001 and 2011

Age Category	2001	%	2011	%	% Change, 2001–11
		No	rthogstorn On	taria	
0_14	10 300	1/0/	13 840	11 55	_28.52
15_24	1/ 845	14.71	12.087	10.07	
15-24 25_34	14,000	11.45	10.749	9.07	-10.07
25-34	14,000	17.21	12 012	0.77	-20.10
35-44	23,223	17.65	13,013	20.04	-40.52
45-54	21,390	10.00	24,054	20.04	05.40
55-64	16,770	12.89	21,078	17.56	25.69
65-/4	12,850	9.88	14,681	12.23	14.25
75+	6,805	5.23	9,702	8.08	42.57
Total	130,080	100.00	120,045	100.00	-7.71
		Nor	thwestern On	tario	
0–14	715	8.58	402	5.96	-43.72
15–24	805	9.66	516	7.64	-35.93
25–34	950	11.40	606	8.98	-36.17
35–44	1,750	21.01	1,043	15.45	-40.41
45–54	1,575	18.91	1,440	21.33	-8.60
55-64	1,085	13.03	1,241	18.39	14.39
65–74	980	11.76	822	12.17	-16.14
75+	470	5.64	680	10.08	44.70
Total	8,330	100.00	6,750	100.00	-18.97

link to an urban centre; these latter individuals were likely to be involved in the mining or forestry industry. Only 1.1 percent lived in remote rural regions. In Northwestern Ontario, in contrast, the majority (53.3 percent) of francophones lived in rural regions in 2011, and 78.8 percent of those in rural regions were in areas with a weak link to an urban centre. Again, these individuals were likely to be working in remote mining activities. Less than 1.0 percent lived in remote rural regions.

¹¹ Two factors explain the differences between the 2011 NHS estimates and the census count. One is the definition of the population in each data source. The target population of the 2011 census includes usual residents in collective dwellings such as hospitals, nursing homes, prisons, and correctional centres, as well as persons living abroad, whereas the target population of the NHS excludes them. The other factor is the higher nonresponse error of NHS data due to the survey's voluntary nature.

Figure 21: Age Distribution of Francophones, Northern Ontario, 2001 and 2011



Northeastern Ontario



Figure 22: Northern Ontario's Francophone Population, by Degree of Rurality, 2011



Northeastern Ontario



The Aboriginal Population

Table 6 shows that both the on- and off-reserve Aboriginal population in Northeastern Ontario increased from 2001 to 2011. The total Aboriginal population in the subregion increased from 41,005 in 2001 to 57,710 in 2011, a growth rate of 40.7 percent. Over the same period, the Aboriginal population in Northwestern Ontario increased from 36,425 to 41,260, a growth rate of 13.3 percent. Unlike in Northeastern Ontario, however, while the off-reserve population in Northwestern Ontario increased by 34.9 percent, the on-reserve population declined by 7.2 percent, due primarily to the migration of Aboriginals from reserves to off-reserve areas. Table 6 also shows that, like the overall population of Northern Ontario, the Aboriginal population is aging, with the median age of both the on- and off-reserve population increasing from 2001 to 2011.

Various factors explain the significant growth of the Aboriginal population in Northern Ontario, including better and more accessible health care, leading to a lower mortality rate and a decline in infant mortality. As well, the fertility rate among Aboriginal women is significantly higher than the regional average. Indeed, a report by the Ontario Ministry of Health states: "Fertility is almost exclusively the source of population growth for Aboriginal peoples in Ontario. Provincially, some in-migration of Aboriginal people takes place from other provinces but does not substantially impact population dynamics among Ontario's Aboriginal peoples although the impact may be greater in some urban areas. Although minimum information is directly available on Aboriginal fertility in Canada, [Indian and Northern Affairs Canada] has reported a total fertility rate (TFR), which is the number of children a woman would have under current prevailing fertility rates, of 2.9 children in 2000 for Registered Indian women. In the same year, the TFR for Canadian women was approximately half that rate at 1.5 children" (Ontario 2009, 15).

The significant growth of the Aboriginal population in Northern Ontario is not due solely to natural demographic processes of fertility, mortality, and migration, however, but also to a "change in reporting" or "ethnic mobility," whereby, from one census to the next, people change the reporting of their identity from a non-Aboriginal to an Aboriginal one (Siggner and Costa 2005). Amendments to the Indian Act in 1985 have been a factor in this ethnic mobility. In addition, Statistics Canada reports the increasing participation of Aboriginal reserves and settlements in more recent census enumerations. In Table 6: Age Distribution of Northern Ontario's Aboriginal Population, 2001 and 2011

Age Category	20	01	20	11	% Ch 200	ange, 1–11
	On-	Off-	On-	Off-	On-	Off-
	reserve	reserve	reserve	reserve	reserve	reserve
		N	ortheaster	n Ontaria		
0–14	3,440	8,380	2,970	10,680	-13.66	27.45
15-24	1,465	5,155	1,905	7,800	30.03	51.31
25-34	1,425	4,240	1,300	5,790	-8.77	36.56
35-44	1,595	5,275	1,545	6,135	-3.13	16.30
45-54	1,075	3,630	1,700	7,140	58.14	96.69
55-64	695	2,310	1,160	5,305	66.91	129.65
65-74	470	1,195	585	2,365	24.47	97.91
75+	230	425	250	1,095	8.70	157.65
Total	10,395	30,610	11,410	46,300	9.76	51.26
Average	29.0	30.2	32.3	33.7		
age						
Median	27.3	29.2	31.3	32.8		
age						
		N	orthwester	n Ontario		
0–14	6,735	5,655	5,680	6,500	-15.66	14.94
15-24	3,380	2,840	3,250	4,310	-3.85	51.76
25-34	2,895	2,695	2,385	3,040	-17.62	12.80
35-44	2,505	2,975	2,190	2,895	-12.57	-2.69
45-54	1,400	1,805	1,975	3,470	41.07	92.24
55-64	940	1,055	1,095	2,115	16.49	100.47
65–74	595	515	610	1,015	2.52	97.09
75+	300	145	215	515	-28.33	255.17
Total	18,740	17,685	17,400	23,860	-7.15	34.92
Average	25.8	27.7	27.4	31.1		
age	00.4	015	041	00.1		
median	22.4	26.5	24.1	29.1		
age						

2006, there were 22 incompletely enumerated reserves, down from 30 in 2001 and 77 in 1996 (Statistics Canada 2008).

Figures 23 and 24 show the geographical distribution of the Aboriginal population in Northern Ontario in 2011. Figure 23 shows that 86.3 percent of the on-reserve population in Northeastern Ontario lived in rural areas, but only 36.0 percent of the off-reserve population did so. As well, three-quarters of those living in rural areas were in locations with a weak link to an urban centre, while less than 9 percent of on-reserve Aboriginals lived in remote rural areas. Of off-reserve Aboriginals in rural Northeastern Ontario, 88.5 percent lived in regions with a moderate or weak link to an urban centre, and only 0.5 percent lived in remote areas. As Table 6 shows, 13.7 percent of the on-reserve population in Northeastern Ontario lived in urban centres in 2011. These urban reserves provide opportunity to engage in commerce with the United States on relatively more favourable terms.

Figure 23: On-reserve and Off-reserve Aboriginal Population, by Degree of Rurality, Northeastern Ontario, 2011



On-Reserve Population



Off-Reserve Population

In contrast to Northeastern Ontario, nearly 96 percent of on-reserve Aboriginals in Northwestern Ontario lived in rural areas in 2011. About 38 percent of rural Aboriginals lived in areas with a weak link to an urban centre, and the majority lived in remote rural areas. Although these areas have potentially significant mineral resources, both the required skilled labour force and developed infrastructure are currently absent.

In general, Aboriginals in Northeastern Ontario have better road access to population centres than those in Northwestern Ontario, due to Northeastern Ontario's significantly better transportation system. This better access has resulted in a much higher level of educational achievement among Aboriginals in Northeastern Ontario than those in Northwestern Ontario

Turning to off-reserve Aboriginals in Northwestern Ontario, Figure 24 shows that the majority lived in urban centres in 2011. Of those living in rural areas, 77.6 percent lived in regions with a weak link to an urban centre. Only 1.5 percent of off-reserve Aboriginals in Northwestern Ontario lived in remote rural areas.

Figure 24: On-reserve and Off-reserve Aboriginal Population, by Degree of Rurality, Northwestern Ontario, 2011

"In contrast to Northeastern Ontario, nearly 96 percent of on-reserve Aboriginals in Northwestern Ontario lived in rural areas in 2011. About 38 percent of rural Aboriginals lived in areas with a weak link to an urban centre, and the majority lived in remote rural areas. Although these areas have potentially significant mineral resources, both the required skilled labour force and developed infrastructure are currently absent."

On-Reserve Population







The Immigrant Population

Table 7 shows that the immigrant population in Northeastern Ontario fell from 34,845 in 2001 to 30,565 in 2011, a decline of 12.3 percent. In other words, the region experienced an out-migration of immigrants during the period. As well, the immigrant population in Northeastern Ontario is significantly older than the general population: the median age of the immigrant population was 60.2 in 2001 compared with 39.5 for the total population of the subregion, and rose by 2011 to 63.3 compared with 44.7 for the whole subregion.

The immigrant population in Northwestern Ontario also fell, from 19,935 in 2001 to 15,820 in 2011, a decline of 20.6 percent. Almost all age groups experienced decline except for the very young and the very old. Similar to Northeastern Ontario, the immigrant population in Northwestern Ontario is older than the general population: in 2001, the median age of immigrants was 56.6 compared with 36.5 for the general population; by 2011, the median age of immigrants had risen to 62.5 compared with 40.2 for the total Northwestern Ontario population — a picture that suggests that younger immigrants are outmigrating.

Figure 25 shows that 76.9 percent of immigrants in Northeastern Ontario lived in urban centres in 2011. Of those in rural areas, 52.1 percent lived in locations with a moderate link to an urban centre and 34.1 percent lived in areas with a weak link to an urban centre. Only 0.4 percent of immigrants lived in remote rural regions. Similarly, in Northwestern Ontario, nearly threequarters of the immigrant population lived in urban centres in 2011. Of those in rural areas, 15.4 percent lived in strong influenced zones, 13.1 percent lived in moderate influenced zones, and 65.7 percent lived in areas with a weak link to an urban centre. Only 1.5 percent lived in remote areas.

Table 7: Age Distribution of Northern Ontario's Immigrant Population, 2001 and 2011

Age Category	2001	%	2011	%	% Change, 2001–11				
	Northeastern Ontario								
0–14	735	2.11	825	2.70	12.24				
15–24	950	2.73	960	3.14	1.05				
25–34	1,420	4.08	1,635	5.35	15.14				
35–44	3,595	10.32	2,580	8.44	-28.23				
45–54	6,710	19.26	3,945	12.91	-41.21				
55-64	7,525	21.60	6,895	22.56	-8.37				
65–74	7,885	22.63	6,630	21.69	-15.92				
75+	6,020	17.28	7,105	23.25	18.02				
Total	34,845	100.00	30,565	100.00	-12.28				
		North	western C	Ontario					
0–14	390	1.96	485	3.07	24.36				
15–24	595	2.98	505	3.19	-15.13				
25–34	1,310	6.57	760	4.80	-41.98				
35–44	2,670	13.39	1,480	9.36	-44.57				
45–54	4,270	21.42	2,350	14.85	-44.96				
55-64	3,575	17.93	3,525	22.28	-1.40				
65–74	3,715	18.64	3,190	20.16	-14.13				
75+	3,405	17.08	3,525	22.28	3.52				
Total	19,935	100.00	15,820	100.00	-20.64				

Figure 25: Northern Ontario's Immigrant Population, by Degree of Rurality, 2011



Explaining the Urban-Rural Earnings Gap

There are at least two competing explanations for the observed gap in average employment earnings between urban and rural areas of Northern Ontario. One is the presence in urban areas of agglomeration economies — which refers to economies of scale and network effects of larger urban centres that give firms productivity advantages that are not usually available in rural areas. Cost per unit of output declines as close proximity among firms results in greater specialization and division of labour, access to shared infrastructure, lower input costs due to competing multiple suppliers, and availability and diversity of labour and market size. Higher productivity then also leads to higher wages.

Another explanation emphasizes the importance of human capital in accounting for the earnings gap. The rationale is that, since workers and firms in larger urban areas are more productive, this results in higher wages commensurate with the worker's human capital level. Beckstead et al. (2010), examining the effects of agglomeration economies and human capital composition on urban-rural earnings differences in Canada, argue:

If agglomeration economies are the primary force underlying earnings differences, then the urban-rural earnings gap may be driven by the productive advantages that firms derive from the geographic concentration of economic activity. It is the very nature of urban economies themselves — the dense intertwining of firms and workers – that leads to their advantage. And yet, if it is the skill composition of cities that matters, then the advantage of cities turns on their capacity to educate, as well as attract and retain, highly skilled workers. (2010, 7)

The authors find that rural-urban earnings gaps are associated with both agglomeration economies and differences in human capital composition. Their results suggest that up to one-half of urban-rural earnings differences are related to human capital composition. The rest are likely due to agglomeration economies. Other researchers have also found similar results. For example, Glaeser and Maré (1994) find that wages are 32 percent higher in large cities (of more than 500,000 population) than in the hinterland. The earnings gap falls to less than 4 percent when the authors control for education, experience, and race, and to only 2 percent when they also control for different occupational composition. The urban wage premium is higher for older workers, but the premiums from living in a city are not higher for the more educated or those with more tenure.

In addition to agglomeration economies and the level of human capital, other factors that can influence earnings differentials between regions include skill differences, compensating differentials due to regional amenities, and special occupation and industry factors such as the presence of mining, forestry, and agricultural activities in an area. Also, in Northern Ontario, since the average earnings of Aboriginals are lower than those of the regional population, the increasing share of Aboriginals in the population influences average earnings in the region. The focus of this part of the study, however, is on the role of human capital in explaining the urban-rural earnings gap in Northern Ontario.

Constructing a Human Capital Index

Human capital is the stock of knowledge, creativity, and cognitive abilities embodied in a person that enables him or her to produce economic value. The stock of human capital is directly related to investment in education. The payoff of investment in education and human capital is greater productivity and higher earnings.

Figure 26 shows the highest level of schooling attained by various population groups in Northern Ontario as of 2011. In Northeastern Ontario, 19.0 percent of those between the ages of 15 and 64 do not have a high school diploma, and 22.0 percent do not in Northwestern Ontario. The percentage of those without a high school diploma is greater among the Aboriginal population and lower among the immigrant population. The percentage with a high school or trade certificate is similar in the two subregions. A higher percentage in Northeastern Ontario has obtained a college diploma, while the percentage of university graduates is slightly higher in Northwestern Ontario. A significantly higher percentage of immigrants in both subregions has a university degree.

To estimate the influence of human capital on earnings, one needs to specify and measure a proxy for human capital for each of the census subdivisions in Northern Ontario. To obtain a human capital index, I first estimated a standard earnings model using the 2006 census micro-data file. (See the Appendix for a brief explanation of the methodology used in estimating the human capital index.)

I then used the estimated coefficients as weights to calculate a weighted average index of the share of individuals with different levels of schooling for each of the 160 census subdivisions in Northeastern Ontario and 118 in Northwestern Ontario. The estimated human capital index for urban and rural areas is shown in Figure 27. The index ranges from 1.0 if none of the residents has completed high school to 2.0 if all have university degrees. The figure shows that the human capital index is 1.29 in Ontario as a whole, 1.27 in Northeastern Ontario, and 1.20 in Northwestern Ontario. The urban centres in Northwestern Ontario have a slightly higher human capital index than those in Northwestern Ontario. In fact, the index for urban regions in Northern Ontario is higher than the provincial average. The rural areas in Northwestern Ontario have a lower human capital index than their counterparts in Northeastern Ontario. The human capital index in Northeastern Ontario declines as the degree of rurality rises. This is not the case in Northwestern Ontario, where rural areas with a moderate to weak link to an urban centre register a higher human capital index than those with a strong link to an urban capital index is lowest in remote rural areas, where there is a greater proportion of on-reserve Aboriginals and significant natural resources development that requires skilled workers.

Figure 26: Highest Educational Attainment by Population Ages 15–64, Northern Ontario, 2011



Northeastern Ontario



Figure 27: Human Capital Index, by Degree of Rurality, Ontario and Northern Ontario, 2006



Northeastern Ontario

Northwestern Ontario



Agglomeration Economies or Human Capital? Checking the Data

In general, as noted above, agglomeration economies suggest that larger places offer higher productivity and therefore higher average earnings. Figure 28 shows that there is a positive association between earnings and the population size of an area, but the relationship is not perfect: the estimated correlation coefficient between the average population size of census subdivisions and average income in Northeastern and Northwestern Ontario is 0.841 and 0.487, respectively. (The maximum value the correlation coefficient can take is 1.) It thus appears that other factors affect earnings that are not necessarily captured by population size.

I next examined the relationship between population size, average earnings, and human capital composition in Northern Ontario. Comparison of Figures 28 and 29 shows that the relationship between human capital and average earnings is very close. The correlation coefficient between the two variables is 0.934 and 0.931 in Northeastern and Northwestern Ontario, respectively, which suggests a very high correlation between human capital and average earnings in census subdivisions in Northern Ontario.

Figure 28: Relationship between Population of Census Subdivision and Average Earnings, Northern Ontario, 2006



Northwestern Ontario



Figure 29: Relationship between Population of Census Subdivision and the Human Capital Index, Northern Ontario, 2011







To estimate the role of human capital and agglomeration economies in explaining the urban-rural earnings gap, I estimated a model that includes both variables, as well as other control variables such as the share of a census subdivision's employed workers in occupations unique to primary industry or occupations unique to processing, manufacturing, and utilities. I also included the percentage of workers employed in mining, agriculture, forestry, and manufacturing industries, as well as the share of the Aboriginal population in each census subdivision. As is standard in this literature, I used employment levels as a means to estimate the effect of agglomeration economies. The idea is that employment levels correspond most closely to the population-based characterization of the rural-urban spectrum. Using population size, rather than employment levels, had a marginal influence on the results.

Figure 30 shows that a one percentage point increase in an area's employment results in a 3.1 percent rise in average earnings. Also, a one percentage point rise in a region's human capital index results in a 0.8 and 1.6 percent increase in local average earnings. Average earnings in Northwestern Ontario appear to be more sensitive to a change in the human capital index. Figure 30 also shows that areas that have a high proportion of employment in primary and processing occupations have lower average earnings. The same is true for areas with a higher share of Aboriginals. Areas with higher employment in forestry, mining, and manufacturing industries have higher average earnings. Finally, the figure shows that each percentage point rise in employment in mining increases local average earnings by 0.5 and 1.4 percent in Northwestern Ontario, respectively.



Figure 30: Relationship between Earnings, Human Capital, and Agglomeration Economies, Northern Ontario, 2011



When estimating the relationship without including the human capital composition index, the agglomeration effect increased significantly to 5.15 percent, suggesting that a one percentage point increase in an area's employment results in a 5.15 percent rise in local average earnings. This estimate is very close to that obtained by Beckstead et al. (2010).¹¹ As noted above, the influence of employment size declines to 3.1 percent when the human capital index is included. In other words, the inclusion of control for human capital reduces the effect of agglomeration economies by 40.6 percent.

These results suggest that the urban-rural earnings gap is influenced both by agglomeration economies and by the composition of human capital. How much of the urban-rural earnings gap is due to differences in human capital composition? To examine this question, I estimated two models, one with only binary variables representing rural areas with different degrees of urban influence. I excluded urban areas, so the estimated coefficients of the binary variables measure the urban-rural earnings gap due to distance from an urban centre. Agglomeration economies suggest that the estimated coefficients of the binary variables should be negative and increasing as the degree of rurality increases.

The second model adds the human capital indicator to the first model, which should explain some of the urban-rural earnings gap and, therefore result in a decline in the estimated coefficients of the binary variables. In other words,



Figure 31: Impact of Human Capital on Rural-Urban Earnings Differentials, by Degree of Rurality, Northern Ontario, 2011



¹¹ Regressing average earnings on employment levels across various geographical units in Canada, they find a similar elasticity of about 5.0 percent. Combes, Mayer, and Thisse (2008) also find the same elasticity across various geographical areas in France.



Figure 32: Impact of Human Capital Composition on Earnings, by Degree of Rurality, Northern Ontario, 2011

the difference between the estimated values of the binary variables from the two models should be attributed to the inclusion of the human capital index. And, indeed, including the human capital index increased the coefficient of determination from 0.23 to 0.61; the results are shown in Figure 31. Note that the estimated coefficients are all negative and highly significant, suggesting a negative earnings gap between urban and rural areas. The figure shows that average earnings of workers in rural areas designated as having a strong MIZ are about 24.0 percent lower than average earnings of those in urban centres. The difference in average earnings declines to 16.0 percent and 13.0 percent, respectively, for rural areas with a moderate and a weak link to an urban centre. In Northwestern Ontario, the earnings gap between remote rural areas and urban centres increases to 41.0 percent.

How much of the above earnings gap is explained by differences in human capital? Figure 32 shows that 32.5 percent of the earnings gap in Northwestern Ontario and 40.0 percent of the gap in Northeastern Ontario between urban and rural areas with a strong link to an urban centre is explained by their human capital composition. Similarly, with respect to urban centres and rural areas with a moderate link to an urban centre, 43.3 percent of the earnings gap in Northwestern Ontario and 46.9 percent of the gap in Northeastern Ontario is explained by differences in the stock of human capital. The rest is explained by agglomeration economies. Figure 32 also shows that 100 percent of the earnings gap between remote rural areas and urban centres in Northeastern Ontario is explained by geography. On the other hand, about 56.3 percent of the earnings gap between remote rural regions and urban centres in Northwestern Ontario is explained by the differences in their human capital composition. Again, the rest is explained by agglomeration economies.

Demographic Change in Northern Ontario: Looking at Population Projections

What population changes is Northern Ontario likely to experience out to 2025? To make such projections, one can turn to the cohort component method.¹¹ Population projections are an extrapolation of historical data into the future based on certain assumptions about future fertility rates, mortality rates, and migration flows. The accuracy of such projections is directly proportional to population size and the historical growth rate of the population, and inversely proportional to the length of the time projection.

The four basic components of population change are births, deaths, in-migration, and out-migration. Births and inmigration add to the population, whereas deaths and out-migration subtract from it. One can write the demographic balancing equation as:

(1) $P_t - P_0 = (Births - Deaths) + (In-migration - Out-migration),$

where P_0 is the initial population and P_t is the population after time t. If population information from two censuses is available and the numbers of births, deaths, and in- and out-migrations are known, then the demographic balancing equation (1) must be exactly balanced. Therefore, the population of a region at any time interval can be calculated using the demographic balancing equation as:

(2) $P_t = P_0 + (B - D) + (I - O)$.

The cohort component technique uses the four components of demographic change to project population growth. The technique projects the population by single year of age and sex. The method takes each age class of the population and ages it over time using survival rates.

Equation (2) reveals that natural population growth (B - D) evolves slowly over time. Net migration (I - O), however, is a much more volatile component of population projections due to fluctuations in interregional migration and changes in immigration. Slower economic activity in recent years, for example, has resulted in lower net migration levels to Northern Ontario. In fact, net interprovincial migration to Ontario has been negative since 2003 due to net losses to Alberta (Ontario 2013). A changing economic environment, however, will influence changes in interprovincial and interregional migration in the coming years.

To employ the cohort component method, I used detailed 2001 and 2011 census population data from Statistics Canada. I also obtained age-specific fertility rates for rural and urban regions in Northern Ontario in 2011. Age-specific fertility rates indicate the probability that a woman in her reproductive years will give birth in a given year. These rates are used to project the number of births that will occur during the projection period. As Figure 33 shows, fertility rates in rural Ontario were higher in 2011 than those in urban Ontario. For women in urban Northeastern Ontario, the fertility rate was 1.55, and for those in rural Northeastern Ontario, it was 1.71. In Northwestern Ontario, the fertility rate in urban areas was 1.45 compared with 2.26 in rural areas. Overall, the fertility rates of women in rural and urban Northern Ontario were higher than the provincial average up to ages 28 to 30, then declined below the provincial average. Overall, the fertility rate was 1.60 and 1.77 in Northeastern and Northern Ontario, respectively, compared with the provincial average of 1.55. In other words, in 2011, women in Northern Ontario were not only having more children, but were having them earlier in life than the provincial average.

The last piece of information needed to undertake population projections is an estimate of net migration. For this, an indirect method is often used. Assuming no migration flows and using one census data, P0, the forecaster projects population at time t, say, Pet. The difference between the actual and expected population at time t equals the net migration from time 0 to time t. Using the demographic balancing equation (2), one can calculate net migration as:

¹¹ This projection method is the most widely used tool by planners since it provides information on the potential growth or decline of a region by age and sex. The Ontario Ministry of Finance also uses the cohort component method for its long-term population projections.

(3) Net migration flows = (In-migration – Out-migration) = $(P_+ - P_0) - (Births - Deaths) = P_+ - P_0$ $(P_0 + Births - Deaths) = P_+ - P_+^e$

Equation (3) is referred to as the "residual method" since it calculates net migration as a residual of the balancing equation. In other words, net migration is set equal to the actual population at any point in time minus the predicted or expected population based on natural population growth. Net migration estimates can be negative in some years, indicating out-migration in a given age group. Alternatively, it can indicate mortality in older age groups.

To determine the number of net migrants to Northern Ontario over the 2001–11 period, I subtracted the expected population in 2011 in the absence of net migration (Po + Births – Deaths) from the actual census 2011 population. I also assumed that the components of demographic change (mortality, fertility, and migration flows) will remain constant throughout the projection period — that is, out to 2025 — and that net migration will be equal to its 2001–11 average. Hypothetically, one can alter the vital statistics and migration estimates to reflect his or her view of the future.

Population Projections for Urban Northern Ontario to 2025

Using the demographic model discussed above, Tables 8 and 9 show population projections for Northern Ontario for 2018 and 2025. The tables show that Northern Ontario's urban population is expected to decline slightly over the period, due to the aging of the population, declining fertility rates, and out-migration of youth. Although immigration has become an important component of population growth in various regions of Canada, Northern Ontario has not been able to attract or retain immigrants. As well, as Figure 34 shows, the number of people below age 19, in their prime working ages (20-44), and between ages 45 and 64 is expected to decline over the period, while the number of seniors ages 65 and older is expected to grow significantly.







Urban Population (thousands)

^{2011 2018 2025}

The relatively stable population structure of Northern Ontario's urban areas is the result of two phenomena: the outmigration of youth to other major centres, and in-migration from other regions. Some of these newcomers are from the region's rural areas and some are from outside Northern Ontario. Figure 35 shows that urban Northern Ontario experienced the out-migration of people ages 20 to 34 over the 2001–11 period, as well as the in-migration of adults between the ages of 35 and 59, who also brought with them their families and young children, resulting in an increase in the number of children below age 19. These adults are likely to be displaced forestry workers moving to urban regions after the collapse of the forestry industry. Figure 35 also shows that Northern Ontario's urban regions also experienced the out-migration of seniors ages 65 and older, who likely were seeking a better climate or better access to medical services or simply were following their children who migrated to other regions.

To see if Northern Ontario's urban population structure would have been different had there been no in- or outmigration, I used the region's 2011 population to forecast its future structure out to 2025 based on the natural factors of fertility and mortality alone. The result, shown in Figure 36, is that the urban population would increase over the period from 2011 to 2018, but thereafter the aging of the population and relatively low fertility rates would result in a declining population. Comparing Figure 36 with the urban population data in Tables 8 and 9 reveals that both Northeastern and Northwestern Ontario would have a greater population in the absence of migration flows.

Figure 35: Net Migration Flows to and from Urban Areas, by Age, Northern Ontario, 2001–11



Northeastern Ontario



Age		Urban			Rural	
Category	2011	2018	2025	2011	2018	2025
0–4	18,449	17,518	16,829	8,393	6,194	5,448
5–9	18,510	17,871	17,387	8,537	7,443	5,926
10–14	21,053	19,057	18,212	9,930	8,908	6,774
15–19	24,614	21,205	20,186	11,099	9,442	8,871
20–24	24,543	24,062	20,315	8,209	9,146	7,540
25–29	21,878	23,493	21,015	7,532	6,555	6,557
30–34	21,415	20,318	21,865	7,952	5,797	5,901
35–39	22,157	23,198	22,934	8,946	7,798	5,658
40–44	24,004	23,137	24,156	10,755	8,501	7,215
45–49	30,774	24,822	24,982	14,844	10,646	8,651
50–54	31,634	28,260	24,382	16,689	13,310	9,932
55–59	27,803	31,462	24,908	16,079	16,787	11,959
60–64	25,189	27,831	29,858	15,172	17,944	17,068
65–69	18,759	23,124	26,510	11,631	14,993	17,404
70–74	15,682	18,298	21,429	9,351	11,449	14,281
75–79	12,126	13,122	15,476	6,574	7,739	9,911
80–84	8,810	7,941	9,014	4,289	4,416	5,316
85-89	4,069	4,454	4,348	1,973	2,097	2,114
90+	1,134	1,291	1,257	502	605	669
Total	372,605	370,462	365,064	178,458	169,769	157,198

Table 8: Northeastern Ontario's Population, by Age Category, 2011 and Projections for 2018 and 2025

Table 9: Northwestern Ontario's Population, by Age Category, 2011 and Projections for 2018 and 2025

Age		Urban			Rural	
Category	2011	2018	2025	2011	2018	2025
0–4	6,513	5,897	5,691	5,568	4,909	4,161
5–9	6,727	6,041	5,864	5,475	5,547	4,680
10–14	7,601	6,718	6,111	6,040	5,280	5,052
15–19	9,113	7,695	6,755	6,475	5,262	4,964
20–24	9,153	8,891	7,242	5,107	5,205	4,218
25–29	8,081	8,536	7,845	4,512	3,914	3,694
30–34	7,560	7,897	7,869	4,475	3,316	3,320
35–39	8,055	7,536	8,190	5,040	4,194	3,073
40–44	9,046	8,133	7,854	5,480	4,357	3,533
45–49	10,895	8,657	8,103	6,822	4,678	3,924
50–54	11,845	9,798	8,351	7,650	5,713	4,139
55–59	10,732	11,666	8,984	6,651	6,872	4,658
60–64	9,399	10,711	10,347	6,065	6,664	5,910
65–69	6,599	9,015	10,615	3,926	5,367	6,247
70–74	5,277	6,790	8,288	3,144	3,960	5,000
75–79	4,204	4,345	6,111	2,497	2,847	3,553
80–84	3,315	2,921	3,288	1,383	1,511	1,735
85-89	2,094	1,764	1,606	694	637	727
90+	736	744	671	83	241	256
Total	136,944	133,753	129,784	87,086	80,473	72,843

Figure 36: Northern Ontario's Urban Population Structure in the Absence of Migration, 2011 and Projections for 2018, 2023, and 2025



Northwestern Ontario



Population Projections for Rural Northern Ontario to 2025

The rural population of Northeastern and Northwestern Ontario declined from 182,825 and 96,225, respectively, in 2001 to 178,458 and 87,086, respectively, in 2011. The projections out to 2025 presented in Tables 8 and 9 show that this trend will continue. In addition, the rural population is expected to continue to age. As Figure 37 shows, the number of people in the younger age categories is expected to decline and the number in the upper age categories is expected to increase. In Northeastern Ontario, the share of people between the ages of 0 and 19 is expected to decline from 21.3 percent in 2011 to 17.2 percent in 2025. Similarly, the share of people in the prime working age category of 20 to 44 is expected to decline from 24.3 percent in 2011 to 20.9 percent in 2025. On the other hand, the share of seniors ages 65 and older is expected to rise from 19.2 percent in 2011 to 31.6 percent in 2025. Similar trends are observed in Northwestern Ontario: the share of children below age 19 is expected to decline from 27.0 percent in 2011 to 25.9 percent in 2025, the share of individuals in the prime working age group is expected to decline from 28.2 percent to 24.5 percent over the period, and the share of seniors ages 65 and older is expected to rise from 13.4 percent in 2011 to 24.1 percent in 2025.

As noted above, the fertility rate of women in rural Northwestern Ontario is 2.26, which is greater than the generational replacement rate of 2.1, so that, without migration flows, Northwestern Ontario's rural population would be expected to grow. Nonetheless, the rural population of the region as a whole has been declining, which suggests that rural Northern Ontario has been experiencing out-migration. To examine the age profile of movers, one needs to estimate the number of people who have migrated into or out of rural Northern Ontario over the 2001–11 period. For this, I used the 2001 population to see what the 2011 population would have been in the absence of migration flows. Comparing the actual 2011 population with the expected 2011 population in the absence of migration provides information regarding the level of net migration by age from 2001 to 2011.

Figure 37: Age Structure of Northern Ontario's Rural Population, 2011 and Projections for 2018 and 2025





Rural Population (thousands)

Δ

As Figure 38 shows, over the period, rural Northeastern Ontario experienced the out-migration of youth ages 15 to 34, but the in-migration of adults age 35 to 69, while Northwestern Ontario's rural areas experienced the out-migration of people in almost all age categories. Two factors potentially explain the significant out-migration from rural Northwestern Ontario: the region's high unemployment rate and the collapse of the forestry industry.

Figure 38: Net Migration Flows to and from Rural Areas, by Age, Northern Ontario, 2001–11





The largest group of movers in both Northeastern and Northwestern Ontario was those between the ages of 20 and 30, likely in search of better employment opportunities in urban areas. This process, however, leaves rural areas without the human capital that is needed if they are to remain productive. As well, young adults who out-migrate from rural areas take their children with them, which is reflected in the decline in the number in the youngest age categories.

To investigate the population structure of rural Northern Ontario that would have emerged in the absence of migration, I used the 2011 rural population to forecast the future structure based on the natural factors of fertility and mortality alone. The result is shown in Figure 39. Had it not been for the out-migration of youth, Northeastern Ontario's rural population would be much greater, although, given relatively low fertility rates and the aging population, the trend would still be negative. The opposite is true for rural Northwestern Ontario, where, as noted, high fertility rates would result in a rising population in the absence of migration.

Figure 39: Northern Ontario's Rural Population Structure in the Absence of Migration, 2011 and Projections for 2018, 2023, and 2025



Northeastern Ontario



Conclusion

The objective of this study was to analyse past, present, and future demographic changes in rural and urban Northern Ontario, focusing on four population groups: the total regional population, francophones, Aboriginals, and immigrants. The entire region has undergone significant demographic changes in recent years. The urban population has been increasing, partly as a result on in-migration from rural areas; in turn, rural areas have experienced decline. However, low fertility rates, the out-migration of youth, and the aging of the population are expected to result in a declining population in both urban and rural areas of Northern Ontario in the coming years.

These trends have important implications for resource development in Northern Ontario — and for Canada as a whole, since the country's economic prosperity has been based on a staples economy that relies on the export of natural resources from peripheral and rural regions such as Northern Ontario. Most of Ontario's potential mineral resources

are located in north of the 50th parallel, and their development necessarily involves partnership between Aboriginals and non-Aboriginals, a developed infrastructure, and a skilled labour force, all of which are currently absent in the region.

These demographic trends also affect the composition of rural Northern Ontario's labour force. Coupled with relatively low labour force participation rates, they affect the ability of rural areas to generate output and income. At the same time, the lack of a skilled labour force reduces the ability of residents of rural Northern Ontario to participate in the benefits of economic development in their areas, and represents an important barrier to economic development in remote regions.

More broadly, the aging population, both rural and urban, has significant budgetary implications for the province as well as for Northern Ontario municipalities. The aging population affects demand for government program expenditures such as health care. What health-care-related services and how many doctors, nurses, and other health care providers will be required to meet the demands of a rapidly aging population? What other services will be needed? Policy makers will have to address such questions in the years to come. "Technological changes have resulted in growing employment opportunities for better educated workers and declining demand for less skilled ones."

A significant earnings gap exists between rural and urban regions of Northern Ontario, an important determinant of which is human capital. Since the stock of human capital affects the productivity and earnings capacity of the rural population, one approach to reducing unemployment and out-migration from rural areas is to invest in human capital in these areas. Apart from increasing productivity and earnings, investment in education would have significant positive social and economic consequences. A higher level of educational achievement increases both the likelihood of working full time and the number of weeks worked per year. It also lowers the probability of dependency on government transfers, reduces the chance of falling below the poverty line, reduces the likelihood of being unemployed, and increases the chance of participating in the labour force. A higher level of schooling is also associated with higher productivity and earnings. Technological changes have resulted in growing employment opportunities for better educated workers and declining demand for less skilled ones. Northern Ontario's Aboriginal peoples, a relatively high percentage of whom live in rural areas, would particularly benefit from investment in education.

Appendix: Estimating a Human Capital Index

To estimate the influence of human capital on earnings, one needs to specify and measure a proxy for human capital for each census subdivision in Northern Ontario. To obtain a human capital index, I first estimated a standard earnings model using the 2006 census Public Use Micro-data File (PUMF), which includes 123 variables and contains records drawn from a 20 percent sample of the Canadian population (844,476 people, 324,973 from Ontario), excluding institutional residents. The PUMF is the best source of information on individual Canadians that can be used to examine the effect of schooling on earnings capacity and other socio-economic indicators of well-being. (The 2011 census micro-data files were not available at the time of writing.)

I employed the Generalized Least Squares (GLS) method, which allows the variation in earnings to increase as earnings increase.¹¹ I used data pertaining to all working persons in Ontario between the ages of 15 and 64 who were not attending school and whose employment earnings were greater than \$1,000 and less than \$1 million. Those with less than a high school diploma were the benchmark group. The standard earnings model estimated using the GLS estimator is of the form:

$InWage = \alpha + \Sigma\beta_iS_i + X_i\delta_i + \varepsilon_i,$

where Si is the highest level of schooling, Xi is other control variables, including age categories, marital status, and so on, and ε is an error term.

The calculated semi-elasticities based on the estimated coefficients of schooling variables are interpreted as percentage returns to investment in education. I then used the estimated return to schooling coefficients as weights to calculate a weighted average index of the share of individuals with different levels of schooling for each census subdivision in Northern Ontario. The estimated human capital index is based on the following formula:

HCI = $\exp{\{\Sigma\beta_i . S_i \text{ shares}\}},$

where exp stands for exponential, β_i is the return to schooling or productivity measure, and Si shares is the share of the population ages 15 to 64 with Si level of education in a given census subdivision. This formulation of the human capital measure is based on Hall and Jones (1999); see also Caselli (2003).

¹¹ For a discussion of different methods of estimating earnings models, their advantages and shortcomings, see Ashenfelter and Card (1999).

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Internally, Northern Policy Institute seeks to be as "flat" as possible with much of the work contracted out to experts in the fields under consideration. This approach avoids the risks associated with large bureaucratic organizations. It also allows Northern Policy Institute to flexibly respond across a wide range of issues while also building up in house and regional expertise by matching bright young minds on temporary placements and project specific work with talented experts who can supply guidance and coaching.

Some of the key players in this model, and their roles, are as follows:

Board: The Board of Directors sets strategic direction for Northern Policy Institute. Directors serve on operational committees dealing with finance, fundraising and governance, and collectively the Board holds the CEO accountable for achieving our Strategic Plan goals. The Board's principal responsibility is to protect and promote the interests, reputation, and stature of Northern Policy Institute.

CEO: Recommends strategic direction, develops plans and processes, and secures and allocates resources to achieve it.

Advisory Council: A group of committed individuals interested in supporting, but not directing, the work of Northern Policy Institute. Leaders in their fields, they provide advice on potential researchers or points of contact in the wider community.

Research Advisory Board: A group of academic researchers who provide guidance and input on potential research directions, potential authors, and draft studies and commentaries. They are Northern Policy Institute's formal link to the academic community.

Peer Reviewers: Ensure specific papers are factual, relevant and publishable.

Authors and Research Fellows: Provide independent expertise on specific policy areas as and when needed.

Standing engagement tools (general public, government stakeholders, community stakeholders): Ensure Northern Policy Institute remains responsive to the community and reflects THEIR priorities and concerns in project selection.







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