

STRENGTHENING
RURAL
CANADA



RENFORCER LES
COMMUNAUTÉS
RURALES DU CANADA

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STRENGTHENING RURAL CANADA:

Fewer & Older: The Population and Demographic
Dilemma in Rural British Columbia

**A paper prepared for the Strengthening Rural Canada initiative by:
Dr. Bakhtiar Moazzami on behalf of Essential Skills Ontario and Decoda Literacy Solutions**

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**The opinions and interpretations in this publication are those of the author and do not necessarily
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Dr. Bakhtiar Moazzami
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EXECUTIVE SUMMARY

The main objective of the present report is to analyze past, present and future demographic changes in the province of British Columbia which is one of the fastest growing provinces of Canada. With a population of 4,400,057 in 2011, BC is the third largest province in Canada behind Ontario and Quebec. The province's population density equals 4.77 persons per square kilometre compared to a population density of 3.73 in Canada. However, population density varies significantly across the province. It reaches as high as 5,249 persons per square kilometre in the city of Vancouver, which is the highest population density in Canada.

With the exception of the 2001-2006 period, British Columbia has consistently experienced an above national population growth rate since 1881. However, given a relatively low fertility rate and aging population, the majority of the population growth has been due to international and interprovincial migration. In fact, throughout the province's history the proportion of the population born outside BC has exceeded the proportion born within. The province has attracted immigrants more consistently since confederation in 1867 than any other Canadian province.¹

The federal government sets the target levels of immigration in Canada. For example, the target level is set at 240,000 to 265,000 during 2013-2015. The target range has increased over the past 20 years and is presently about 0.75 percent of population each year.² According to Census data, about 1.4 million immigrants came to Canada during 2001-2011. About 43.8 percent of the new immigrants chose Ontario as their place of residence. About 13.7 percent selected BC as their place of residence.³ Historically, BC has attracted more immigrants than any other province except Ontario.

The natural increase (births - deaths) has been declining over time. It contains a negative time trend reflecting the aging of the population. However, the net inflow of immigrants has always been positive and contains a positive time trend. During 1971-2014, an average of about 22,323 immigrants came to BC every year. Also, inter-provincial migration has been cyclical but mostly positive. On average, about 12,746 people came to BC from other provinces every year during 1971-2014.

A low fertility rate along with rising life expectancy has resulted in aging of BC's population. The baby boomers were followed by much smaller generations primarily due to a declining fertility rate. During the same period, average life expectancy at birth increased from 71.13 years in 1960 to 81.24 years in 2012.

As a result, the share of individuals below the age of 20 has declined from 36.9 percent in 1971 to 20.9 percent in 2011 while the share of seniors rose from 9.3 percent in 1971 to 16.4 percent in 2011.

Aging of the population is also reflected in rising median age in British Columbia from 27.8 in 1971 to 41.1 years in 2011. During the same period, the median age in Canada rose from 26.2 to 40.6 years. The median age is the age that divides a population into two numerically equal groups whereby half the people are younger than the median age and half are older.

¹ Since the early 20th century, BC has attracted more immigrants than any other province except Ontario.

² Ministry of Finance, *Ontario Population Projections Update 2012-2036*, Spring 2013.

³ This is net of those who left the province.

An important aspect of demographic change in British Columbia relates to the diversity of the population. The share of the Francophone population declined from 1.4 percent in 2001 to 1.3 percent in 2011. The share of the Aboriginal population increased from 4.3 percent to 5.4 percent during 2001-2011. Similarly, immigrants comprised 26.1 percent of the provincial population in 2001. Their share increased to 27.3 percent in 2011.

The share of the Aboriginal population living on reserves rose from 1.1 percent in 2001 to 1.2 percent in 2011. During the same period, the share of the Aboriginal population living off reserve increased from 3.2 percent in 2001 to 4.2 percent in 2011. The Aboriginal population is younger and has a higher fertility rate than the rest of the population. In addition, as we will see later, a higher percentage of them live in rural areas compared to other visible minorities.

Part II of the study focusses on rural-urban demographics and examines how demographic changes have impacted four population groups, namely total provincial population, Francophone, Aboriginal and immigrant population.

The study uses detailed socio-economic information on all census sub-divisions (CSDs) in BC obtained from 2001 and 2011 census custom tabulations. Using Statistics Canada's Statistical Area Classification (SAC) system, one can classify all 743 CSDs in the province of British Columbia into 74 within Census Metropolitan Areas (CMAs) and 137 within Census Agglomerations (CAs) which are considered as urban areas. The other 532 CSDs are classified as rural and small towns with different degrees of rurality.

The population size of CSDs in BC varies significantly from less than a hundred to 223,218 in Burnaby, 468,251 in Surrey and 603,502 in Vancouver.

Excluding the three major urban centers, the average number of residents in the remaining CSDs in urban regions are about 13,540 people. The average number of people living in CSDs declines considerably when we move to rural and small towns. Areas designated as having a stronger link with urban centres appear to have a relatively larger population base. Conversely the remote regions have the lowest average number of residents.

BC's population increased by 14.0 percent during 2001-2011. The urban population grew by 16.9 percent or 1.7 percent per year while the rural and small town population declined by 2.9 percent during 2001-2011. In other words, all the provincial population growth occurred in urban areas. Some of the above rural and urban population changes may be due to the reclassification of boundaries.⁴ In their analysis of rural and small town Canada, Mendelson and Bollman also found that when the reclassification of boundaries is taken into account, Canada's RST population was 18.0 percent smaller in 1996 compared with 1976.⁵

⁴ The reclassification of boundaries from rural and small towns to urban areas are likely to affect CSDs that are in the commuting zone of CMAs and CAs and not those that are farther away from urban areas, i.e., those with zero, weak or moderate MIZ classification. Mitchell attributes the growth of rural areas close to metropolitan regions to the decision of urban residents to combine an urban workforce 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." See Mitchell Clare J.A., *Population Growth in Rural and Small Town Ontario: Metropolitan Decentralization or Deconcentration?* Canadian Journal of Regional Science, 2009, 377-392.

⁵ Mendelson Robert and Ray D. Bollman (1998), *Rural and Small Town Canada Analysis Bulletin*, Vol. 1, No. 1, Cat. No. 21-006-XIE.

BC's population living in rural and small towns has not only declined in absolute terms but also has dropped in relative terms. The share of BC's population living in RST areas declined from 14.6 percent in 2001 to 12.4 percent in 2011. Mendelson and Bollman also found that the share of Canada's population living in RST areas declined from 34.0 percent in 1976 to 22.0 percent in 1996.⁶ Mitchell also 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.⁷ She also finds that during the last census period of the millennium (1996-2001), more than 50 percent of the country's smallest settlements lost residents.⁸

The rural population living in areas designated as strong or weak MIZ declined while those in moderate and no MIZ areas increased during 2001-2011. As mentioned above, a part of this change can be due to reclassification of boundaries especially in areas having strong urban influence. It appears that all the gain in rural areas designated as moderate and no link to urban centres are offset by a greater population loss in the areas designated as strong and weak link to urban centers.

BC is unique in a sense that it consists of many remote municipalities with a few hundred residents. It includes about 419 Indian reserves, many of them in remote areas. Therefore, it is of interest to examine the geographical distribution of the population living in smaller communities.

Almost 50 percent of the rural population in areas with less than 10,000 population are located in weak MIZ areas with limited access to urban or population centres. The only exception are the rural areas with less than 1,000 population, where more than 26.2 percent live in remote rural regions while 36.0 percent live in weak MIZ areas.

Focussing on different population groups, the study finds that the Francophone population in BC rose by 0.9 percent during 2001-2011. Francophones appear to be much older than the provincial population in BC. Overall, the average age of the Francophone population was about 49.2 years in 2011 compared to the provincial average of about 40.2 years. Similarly, the median age in BC equaled 41.6 years compared to the median age of 51.7 for the Francophone population in 2011. The majority or 83.3 percent of Francophones live in urban areas. Only 16.7 percent live in rural areas. About 2.8 percent live in rural areas with a strong link to urban centres, 5.7 percent in rural regions with a moderate link, 8.0 percent in weak linked areas and less than 1.0 percent in remote communities.

The on-reserve Aboriginal population has increased by 12.7 percent during 2001-2011. During the same period, the off-reserve Aboriginal population increased by about 46.0 percent. Overall, the Aboriginal population increased from 169,695 in 2001 to 232,290 in 2011, a growth rate of about 36.9 percent.

The majority or 80.2 percent of the off-reserve Aboriginal population live in urban centres. About 10.8 percent live in rural areas with a weak link to urban centres and 5.3 percent live in rural regions with a moderate link to urban centres. The majority or 65.3 percent of the on-reserve population live in rural areas. About 14.1 percent of them live in areas with a moderate link to urban centres. About 27.2 percent live in areas with a weak link to population centres. Finally, about 22.4 percent of the on-reserve Aboriginal population live in remote areas with no link to urban centres.

⁶ Ibid, p. 7.

⁷ Mitchell Clare J.A., *Population Growth in Rural and Small Town Ontario: Metropolitan Decentralization or Deconcentration?*, Canadian Journal of Regional Science, 2009, 377-392.

⁸ Ibid, p. 377.

The immigrant population increased by about 18.2 percent during 2001-2011. This amounts to a growth rate of 1.8 percent per year. The average age of immigrants rose from 46.5 years in 2001 to 48.5 years in 2011 which is much greater than the provincial average of about 40.2 years. The median age of the immigrant population equaled 49.2 years compared to the provincial median of 41.6 years in 2011. Most or 94.9 percent of immigrants live in urban centres. Only 61,045 or about 5.1 percent of immigrants live in rural areas. About 20.0 percent of those living in rural areas are in strong MIZ regions. About 37.4 percent are in areas with a moderate link and 41.5 percent are in rural regions with a weak link to urban centres. Very few immigrants live in remote rural regions.

Part II of the study also examines various socio-economic characteristics of rural and urban British Columbia based on detailed 2011 census custom tabulations and pays special attention to the degree of rurality.

The unemployment rate among individuals aged 15 to 64 equaled 8.6 percent in BC compared to the national average of 8.2 percent in January of 2011. The unemployment rate among individuals aged 15 to 64 years in urban BC equaled 7.6 percent compared to 10.6 percent in rural and small town areas in 2011. The unemployment rate rises as the degree of rurality increases and reaches a high of 28.1 percent in remote rural areas. The unemployment rate is higher in areas with less than 3,000 population irrespective of how far or close they are to urban centres. For example, the unemployment rate in CSDs with 3,000 population within commuting distance from urban regions equaled 12.6 percent compared to the average unemployment rate of 7.6 percent in urban centres.

The labour force participation rate equaled 75.9 percent in BC compared to the national average of 76.8 percent in January 2011. The labour force participation rate declines from a high of 75.7 percent in urban regions to 63.6 percent in remote rural areas.

An average of 6.4 percent of individuals in BC's urban areas receive transfer payments. The urban dependency rate rises to 11.8 percent when we focus on areas with less than 1,000 population within a commuting distance from urban areas. In general, the dependency rate is higher in smaller areas irrespective of how close they are to population centres. The dependency rate rises to 15.4 percent in remote rural regions.

The level of educational achievement in urban areas is much higher than in rural regions. In general, the level of educational achievement appears to decline as the distance between rural areas and population centres increases. About 39.0 percent of the remote rural population does not have a high school diploma. Similarly, the percentage of individuals with a college diploma declined from 17.6 percent in urban areas to about 12.0 percent in remote rural regions respectively. The percentage of individuals with a university degree also declines as we move away from urban centres.

The average earnings in urban areas equaled \$42,074 compared to \$37,396 in rural areas. The average earnings declines as the degree of rurality rises. It equals \$33,396 in remote rural regions. This is about 79.0 percent of average earnings in urban centres. The same trend appears when we examine full-time and full-year earnings. Irrespective of the distance from urban centres, the average earnings in areas with less than 3,000 population is generally lower than the average earnings in bigger centres.

In addition, employment earnings are different among different population groups. What factors influence earnings? There are at least two competing explanations for this observed earnings difference. One potential explanation emphasizes the importance of human capital in explaining the earnings gap among employed people in rural and urban regions. The rationale is that workers in larger urban areas have higher human capital and are therefore more productive resulting in higher wages commensurate with the

worker's human capital level. Those living in rural areas have lower human capital and therefore lower earnings. This explanation emphasizes the importance of human capital in explaining earnings potential. In general, workers with higher human capital are more productive and therefore receive greater compensation.

Another potential explanation is the presence of agglomeration economies which refers to the idea that larger urban centres provide firms with a productive advantage that is not usually available to firms in rural areas. The productive advantage relates to the benefits firms obtain from locating near each other. Therefore, workers in urban centres have higher productivity that leads to higher earnings. Agglomeration economies relate to the concept of economies of scale and network effects. The cost per unit of output is expected to decline as close proximity results in greater specialization and division of labour, access to shared infrastructure as well as lower input costs. This is due to competing multiple suppliers and availability as well as diversity of labour and market size.

In order to examine the influence of human capital on earnings, we need to specify and measure a proxy for human capital for each of the CSDs (Census Sub-Divisions) in British Columbia. To obtain a human capital index, we first estimate returns to different levels of schooling in BC.

The estimated returns to schooling rise as the level of educational attainment increases reflecting higher productivity of individuals with advanced level of education. Then, we use the estimated returns to schooling or productivity coefficients as weights to calculate a weighted average index of the share of individuals with different levels of schooling for each of the CSDs in the province of British Columbia.

The study finds that about 85.6 percent of the earnings gap between rural areas with a strong link to population centres and urban regions are accounted for by differences in the human capital composition of their employed workforce. Also about 49.1 percent of the earnings gap is attributed to the differences in the human capital composition of the employed people in areas with moderate link to population centres and urban regions. Similarly, 50.8 percent of the earnings gap between urban and rural areas with a weak link to population centres is accounted for by differences in their human capital composition. Finally, about 100.0 percent of the earnings gap between remote areas with no link to population centres and urban areas is explained by differences in their human capital composition.

Part III of the report makes projections of the rural and urban population from the base year of 2011 to 2025. The study shows that the total fertility rates in urban and rural BC equal 1.42 and 1.76 compared to 1.54 and 2.11 for Canada, respectively. These rates are significantly below the generational replacement rate of 2.1.

Assuming that the 2001-2011 trend will continue into the future, the study projects the population in urban BC to grow from 3,854,139 in 2011 to 4,393,325 in 2025, a growth rate of 14.0 percent. The share of individuals under the age of 20 is expected to decline from 21.9 percent in 2011 to 19.3 percent in 2025. On the other hand, the share of seniors is expected to rise from 14.8 percent in 2011 to 18.6 percent in 2025, an increase of about 3.8 percent.

The growing population in BC is primarily due to a significant in-migration (provincial and international) that urban areas have been experiencing in the past. Overall, about 432,706 people appear to have migrated to BC during 2001-2011. Most of the newcomers are young. They come from other provinces, rural areas and other countries. The out-migration of those aged 80 and over is either due to the out-migration of those individuals from the province or is related to factors not explained by the average provincial mortality rates.

BC's rural and small town population declined from 562,210 in 2001 to 545,918 in 2011, a decline of about 2.9 percent during 2001-2011 or 0.3 percent per year. This is in contrast to the total urban population that grew about 16.9 percent and the provincial population that grew about 14.0 percent during the same period.

The decline of BC's rural population is partly due to low fertility rates. As mentioned above, the total fertility rate in rural BC equals 1.76 which is below the generational replacement rate of 2.1. Assuming that the 2001-2011 trend will continue into the future, BC's rural population is expected to decline from 545,894 in 2011 to 479,466 in 2025, a decline of about 12.2 percent or 0.9 percent per year. All age categories except for seniors will experience decline during the forecast period. The share of the population under 19 years of age will decline from 21.6 percent in 2011 to 19.3 percent in 2025. Similarly, the share of those in prime working age of 20 to 44 and between 45 and 64 years of age will decline from 26.2 and 34.3 percent in 2011 to 23.9 and 30.7 percent respectively in 2025. The share of seniors is expected to rise from 17.9 percent in 2011 to 28.6 percent in 2025, a rise of 10.7 percent.

To examine the potential factor explaining the declining rural population in BC, we used the 2001 population to forecast its 2011 level assuming zero net migration flows. Comparing the actual 2011 population with the expected 2011 population in the absence of migration provides us with information regarding the level of migration by age during 2001-2011.

The study finds that the urban population in BC has been rising due to high levels of immigration combined with in-migration that the province has been experiencing. At the same time, the rural population has been declining in relative and absolute terms due to a low fertility rate as well as out-migration of youth.

The study shows that the provincial population is aging. The share of individuals below the age of 20 has declined from 36.9 percent in 1971 to 20.9 percent in 2011 while the share of seniors rose from 9.3 percent in 1971 to 16.4 percent in 2011. Aging of the population is also reflected in the rising median age in British Columbia from 27.8 in 1971 to 41.1 years in 2011. During the same period, the median age in Canada rose from 26.2 to 40.6 years. The median age is the age that divides a population into two numerically equal groups whereby half the people are younger than the median age and half are older.

The study attempts to explain the existing earnings gap between rural and urban regions. For this, the report develops a human capital index for various population groups as well as for different rural and urban regions. The human capital index developed in this study reflects productivity levels associated with different levels of educational attainment. It is found that a significant share of the earnings gap is explained by differences in the human capital composition of the workers in different areas.

The study shows that the stock of human capital declines as one moves towards more rural areas. It is also found that the on-reserve and off-reserve Aboriginal people have the lowest human capital composition index indicating relatively low levels of educational achievement among various population groups. Recent studies have shown that the lack of human resources represent the greatest challenge to rural development in Canada. In fact, multinational and multi-locational firms in Canada have difficulty finding qualified workers in rural areas.⁹

⁹ For example see B. Moazzami, *Multi-national and Multi-locational Enterprise Initiative: Survey of Northern Ontario Companies and Analysis of the Results*, prepared for Federal Economic Development Initiative for Northern Ontario (FedNor), March 2012.

Based on various studies by the Ontario Ministry of Education, Human Resources and Skills Development Canada and other government agencies, Miner Management Consultants provides estimates of the percentage of new jobs requiring post-secondary education in the coming years.

What is the actual skill availability of the working age population in urban and rural BC at the present time? The 2011 National Household Survey and focusing on the working-age population aged 15 to 64 shows the percentage of the working age population who have post-secondary credentials. The skill levels in urban BC are very similar to that in Canada (57%).

The skill levels in rural areas of BC are significantly below the skill requirements in 2011. Continuation of this skill mismatch will result in what is referred to as people without jobs and jobs without people in rural BC in the coming years. This situation is especially critical when it comes to the Aboriginal people and those living in rural areas.

A recent survey of 150 chief executives of leading businesses in all sectors and regions in Canada reported that companies were unable to fill approximately 11,000 jobs during 2011-2013. BC ranked fifth in difficulty finding qualified workers after Alberta, Quebec, Ontario and Saskatchewan. Many of the respondents stated that they expect shortages to increase over the next five to 10 years as the population ages and the economy expands.¹⁰

Given that the stock of human capital affects productivity and earnings capacity of the rural as well as urban population, one approach to maintaining or even increasing earnings and production capacity is to enhance productivity by increasing investment in education in rural areas. In fact, apart from increasing productivity and earnings, investment in education has significant positive social and economic consequences as well. The goal should be to reduce the gap between the human capital level in rural and urban BC and the skills requirements of the future jobs.

A companion study to the present report shows that a higher level of educational achievement in BC increases the likelihood of working full-time weeks as well as increasing the number of weeks worked per year; lowers the probability of dependency on government transfers and 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. Higher level of schooling is also associated with higher productivity and earnings.

Having found human capital as the main determinant of productivity, earnings and other socio-economic determining factors of well-being, a companion study to the present report investigates returns to investment in education for men and women in BC. It finds that the rates of returns to investment in education are well above the returns for other forms of investment. This suggests that investment in secondary and post-secondary education yields relatively high ex-post rates of returns over and above the earnings foregone and length of time invested. The report finds that the rates of returns to investment in a high school diploma, trade and college certificate are higher for men. On the other hand, the returns to investment in a university education are greater for women.

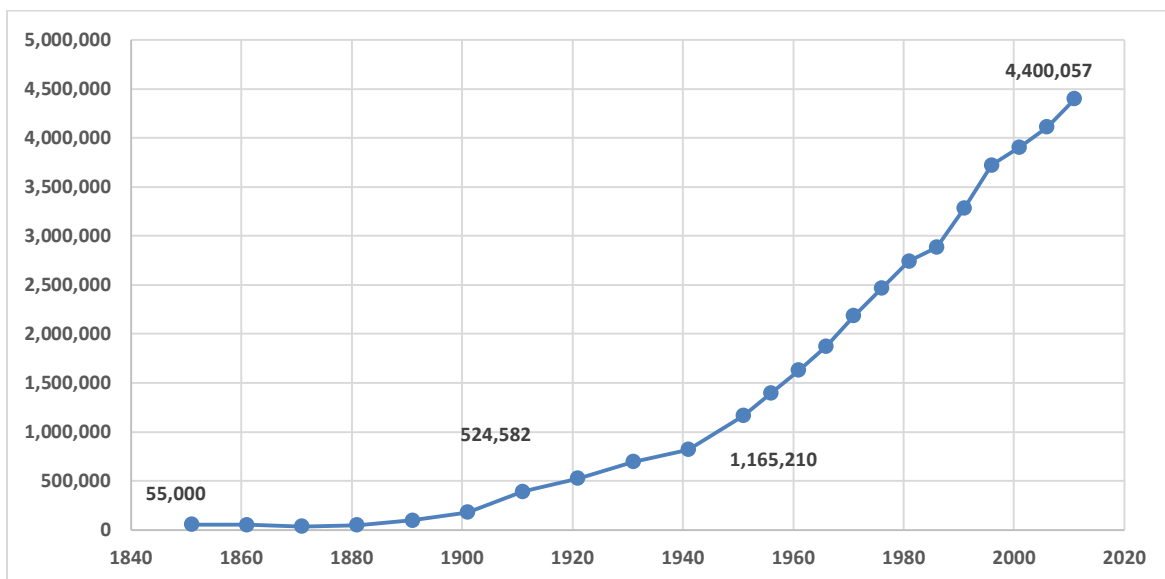
¹⁰ The Canadian Council of Chief Executives, *Second Survey Report: Skills Shortages in Canada*, March 2014.

PART I: POPULATION TRENDS IN BRITISH COLUMBIA ■ ■ ■

British Columbia has been one of the fastest growing provinces of Canada. With a population of 4,400,057 in 2011, BC is the third largest province in Canada behind Ontario and Quebec. With a land area of 922,509.29 square kilometres, the province's population density equals 4.77 persons per square kilometre compared to a population density of 3.73 in Canada. In fact, the city of Vancouver has the highest population density of 5,249.1 persons per square kilometer in Canada.

The province's population has grown from about 524,582 in 1921 to more than a million people in 1951 and 4,400,057 in 2011 (Figure 1.1).

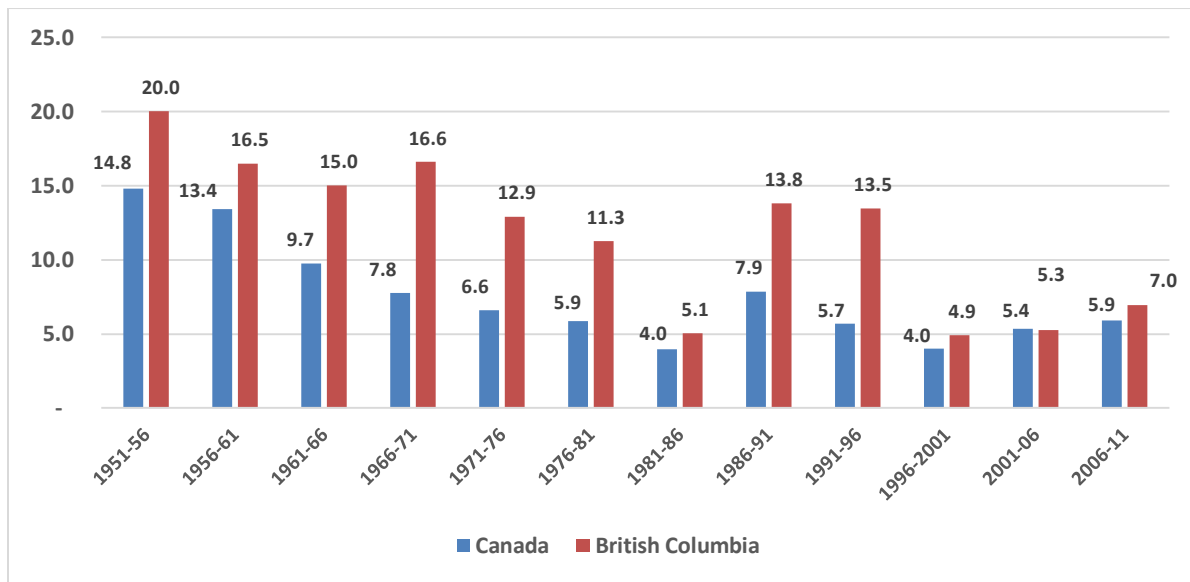
Figure 1.1: Population Trends in British Columbia



Except for the 2001-2006 period, BC has consistently experienced an above national population growth rate since 1881 (Figure 1.2). However, given a relatively low fertility rate and aging population, the majority of the population growth has been due to international and interprovincial migration. In fact, throughout the province's history the proportion of the population born outside BC has exceeded the proportion born within. The province has attracted immigrants more consistently since confederation in 1867 than any other Canadian province.¹¹

¹¹ Since the early 20th century, BC has attracted more immigrants than any other province except Ontario.

Figure 1.2: Population Growth Rate in Canada and BC



Demographic changes have significant impact on social and economic conditions in the province. Individuals grow older as they move through the life cycle. The baby boomers, born in the two decades following World War II, are aging and the first group of them are retiring now. The generation that came after the boomers is much smaller. As a result, the overall provincial population is aging slowly and this process will continue into the foreseeable future.

One important aspect of this aging population relates to the relationship between economically active and economically dependent age groups, i.e. between the working population on the one hand and the young and elderly on the other. 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.

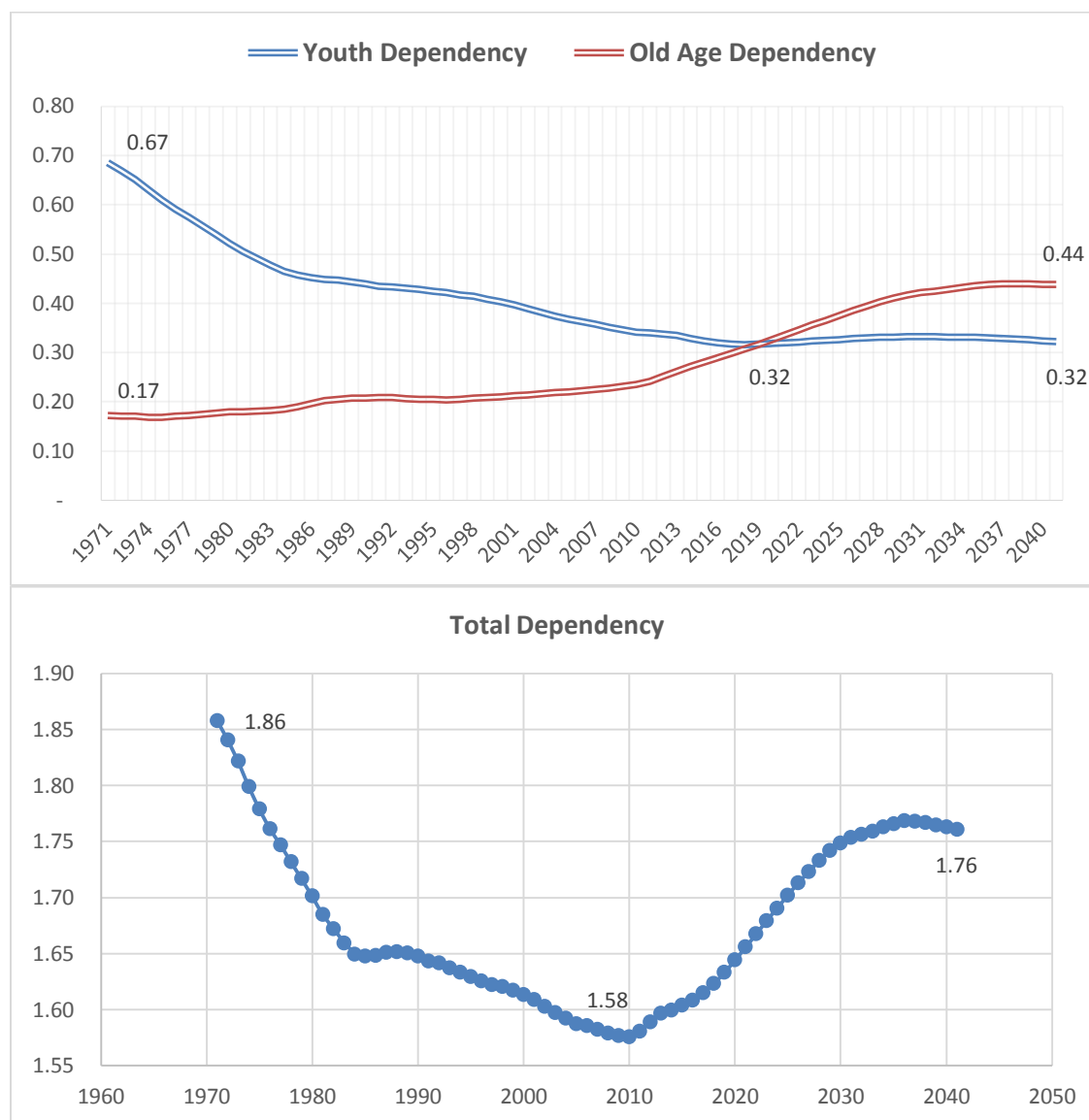
We examine three dependency ratios, namely old age dependency, youth dependency and total dependency ratios. We define old age dependency as the number of persons aged 65 years and over relative to the number of people aged 20 to 64 (roughly the population of working age). Similarly, we define youth dependency as the ratio of the number of persons aged 20 years and under relative to the working age population (20 to 64). The total dependency ratio is defined as the ratio of total population relative to the working age population. Using historical and projected population statistics based on Statistics Canada and BC Stats, Figure 1.3 shows the dependency ratios during 1971-2040.

The youth dependency ratio has been declining partly due to low fertility rates and partly due to the baby boomers becoming of working age and changing their status from dependent to providers. The population projections suggest that the youth dependency ratio is expected to stay relatively stable in the coming years. The youth dependency rate in BC in 2014 (0.33) is slightly lower than the national average of 0.35 reflecting a smaller share of the youth population or a relatively larger share of the working age population in BC.

On the other side of the spectrum, the old age dependency rate has been rising as the population is getting older and baby boomers move into old age. This ratio is expected to continue rising in the future,

albeit at a declining rate. The old age dependency rate in BC in 2014 (0.27) is slightly greater than the national average of 0.25 reflecting a higher share of seniors in BC.

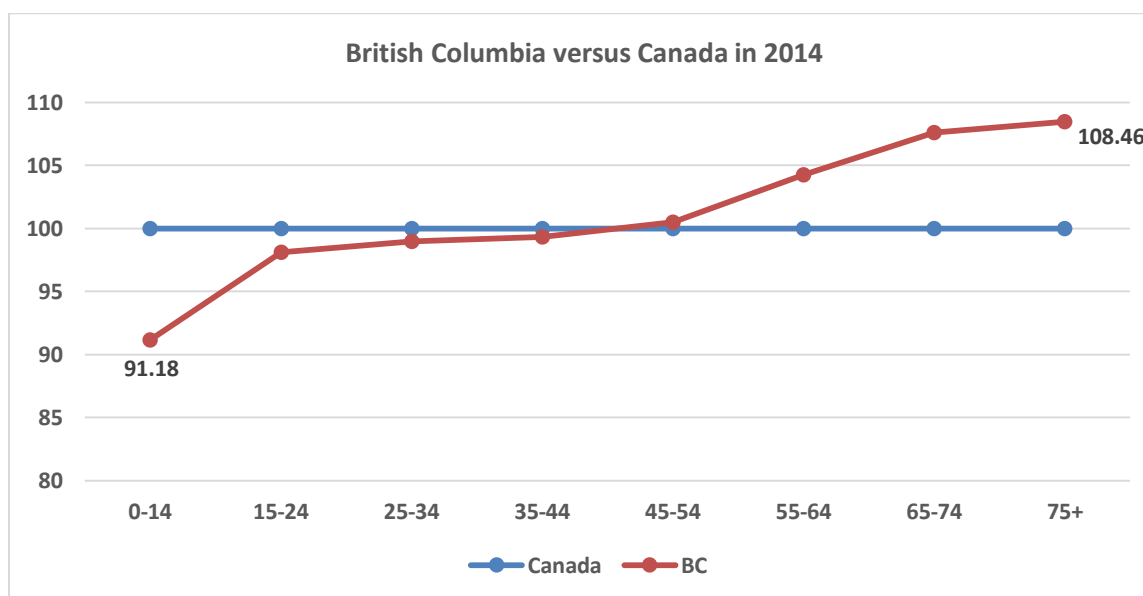
Figure 1.3: Dependency Ratios, Historical and Projected, British Columbia



The total dependency rate declined during 1971-2010, but started rising thereafter reflecting a rising proportion of baby boomers entering retirement age. The total dependency rate in BC was very close to the national average in 2014. In 2010, there were 1.6 dependent persons per each working age individual. This ratio is expected to rise to 1.8 dependents per working age person. Assuming jobs are available for the working age population, a rising dependency ratio suggests that the province faces reduced production capacity, therefore increasing the costs associated with the rising proportion of dependents.

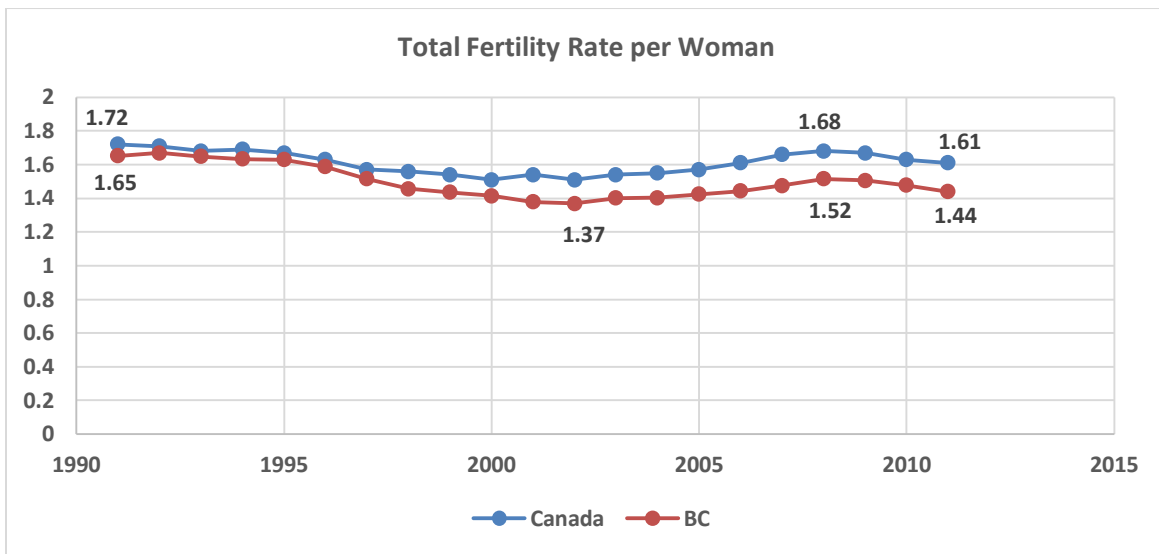
The above dependency trends suggest that the age distribution of the population in British Columbia is different from that in Canada. As Figure 1.4 shows, compared to the national average, which is indexed to 100, there are a relatively lower percentage of youth and a higher share of seniors in BC.

Figure 1.4: Relative Age Distribution



BC's share of the Canadian population has increased steadily during the past eighty years. It rose from 6.7 percent in 1931 to 8.3 percent in 1951 and from 11.6 percent in 1981 to 13.4 percent in 2011. The rising population share has happened despite the fact that the total fertility rate in BC has been consistently smaller than the Canadian rate. The total fertility rate is defined as the average number of children that a woman will have over the course of her life. In Canada, the total fertility rate reached 3.94 in 1959. It declined below the generational replacement rate of 2.1 in 1972 and reached its historical low of 1.49 in 2000. As Figure 1.5 shows, it increased to a high of 1.68 in 2008, but declined to 1.61 in 2011. In BC, the total fertility rate has consistently been below the Canadian rate and reached its recent low of 1.37 in 2002 but rose to 1.44 in 2011. The lower fertility rate in BC compared to Canada suggests that the rising population share in BC is not due to natural population change. Examination of the data suggests that BC has been experiencing net positive inter-provincial and international migration.

Figure 1.5: Fertility Rates in Canada and British Columbia during 2000-2011



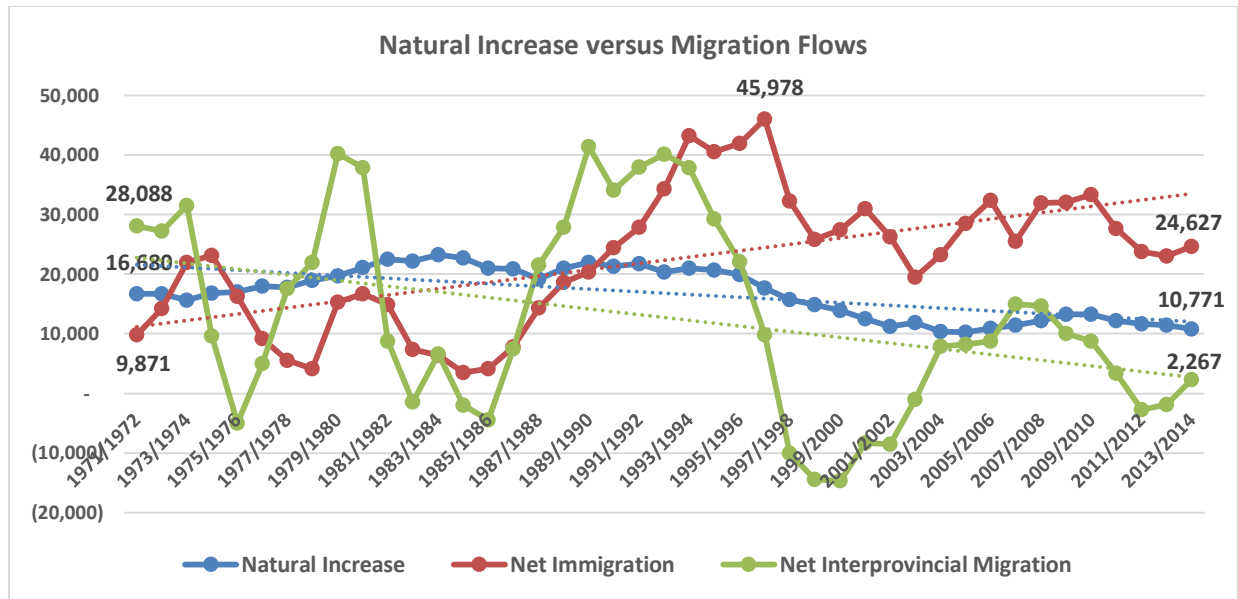
The federal government sets the target levels of immigration in Canada. For example, the target level is set at 240,000 to 265,000 during 2013-2015. The target range has increased over the past 20 years and is presently about 0.75 percent of population each year.¹² According to Census data, about 1.4 million immigrants came to Canada during 2001-2011. About 43.8 percent of the new immigrants chose Ontario as their place of residence. About 13.7 percent selected BC as their place of residence.¹³ Historically, BC has attracted more immigrants than any other province except Ontario.

Figure 1.6 shows various components of population change in BC. It shows that the natural increase (births - deaths) has been declining over time. It contains a negative time trend reflecting the aging of the population. However, the net inflow of immigrants has always been positive and contains a positive time trend. During 1971-2014, an average of about 22,323 immigrants came to BC every year. Also, inter-provincial migration has been cyclical but mostly positive. On average, about 12,746 people came to BC from other provinces every year during 1971-2014.

¹² Ministry of Finance, *Ontario Population Projections Update 2012-2036*, Spring 2013.

¹³ This is net of those who left the province.

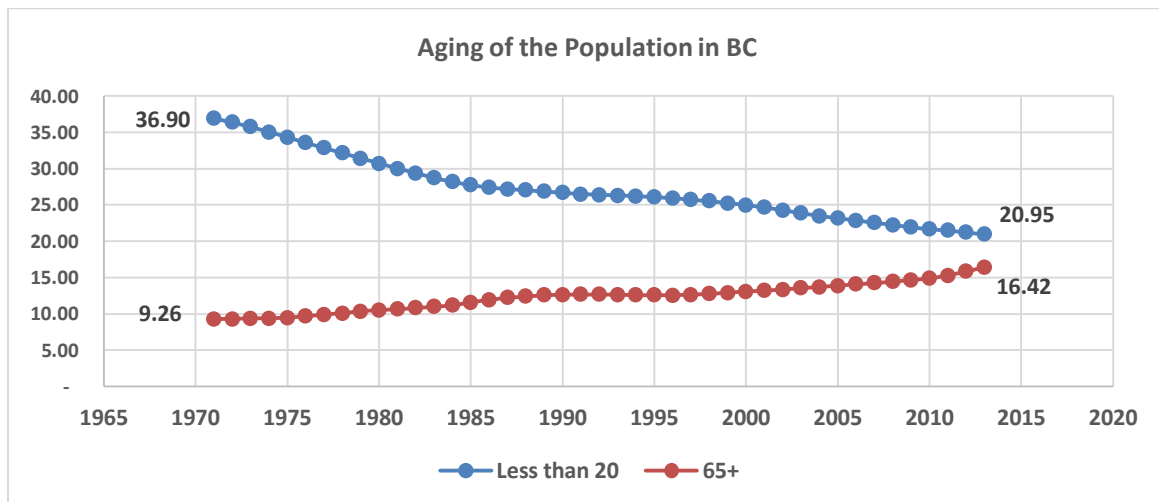
Figure 1.6: Components of Population Change in BC



A low fertility rate along with rising life expectancy has resulted in aging of BC's population. The baby boomers were followed by much smaller generations primarily due to a declining fertility rate. During the same period, average life expectancy at birth increased from 71.13 years in 1960 to 81.24 years in 2012.

As a result, as is shown in Figure 1.7, the share of individuals below the age of 20 has declined from 36.9 percent in 1971 to 20.9 percent in 2011 while the share of seniors rose from 9.3 percent in 1971 to 16.4 percent in 2011.

Figure 1.7: Changing Composition of BC's Population



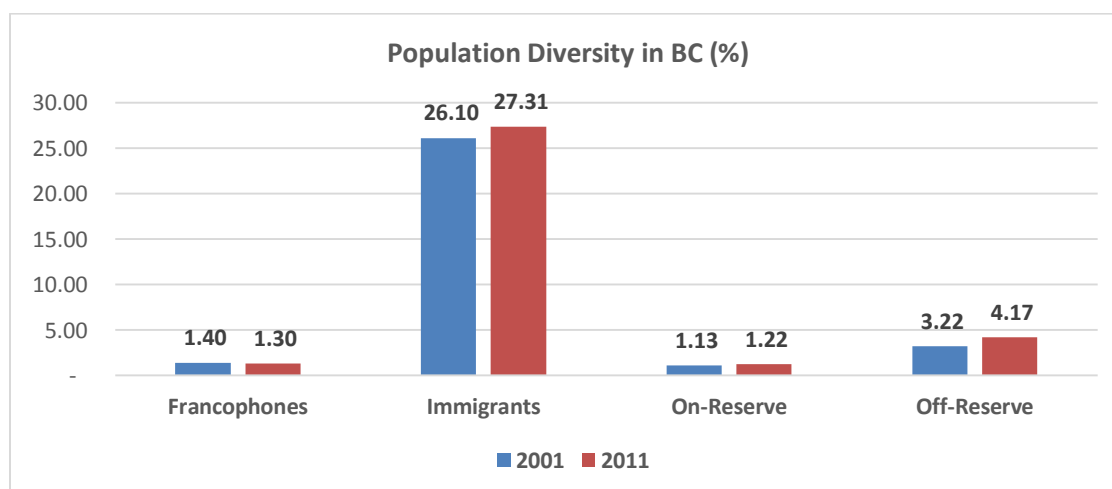
Aging of the population is also reflected in rising median age in British Columbia from 27.8 in 1971 to 41.1 years in 2011. During the same period, the median age in Canada rose from 26.2 to 40.6 years. The median age is the age that divides a population into two numerically equal groups whereby half the people are younger than the median age and half are older.

Aging of the population affects the labour force and hence BC's ability to generate output and income. In fact, aging population affects virtually all other aspects of the economy. It affects patterns of saving and household consumption and investment. It influences sales, production, and investment levels and its impact falls unevenly on different industries and sectors of the economy. 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. What healthcare related services will be required to meet the requirements of a rapidly aging provincial population? How many doctors, nurses and other type of healthcare providers do we need to train to replace the aging healthcare providers while satisfying the growing demand for healthcare services? How much of each type of services and facilities do we require? These are important questions that policy makers need to address in the coming years.

An important aspect of demographic change in British Columbia relates to the diversity of the population (Figure 1.8). The share of the Francophone population declined from 1.4 percent in 2001 to 1.3 percent in 2011. The share of the Aboriginal population increased from 4.3 percent to 5.4 percent during 2001-2011. Similarly, immigrants comprised 26.1 percent of the provincial population in 2001. Their share increased to 27.3 percent in 2011.

The share of the Aboriginal population living on reserves rose from 1.1 percent in 2001 to 1.2 percent in 2011. During the same period, the share of the Aboriginal population living off reserve increased from 3.2 percent in 2001 to 4.2 percent in 2011. The Aboriginal population is younger and has a higher fertility rate than the rest of the population. In addition, as we will see later, a higher percentage of them live in rural areas compared to other visible minorities.

Figure 1.8: Aboriginal, Francophone and Immigrant Population in BC



PART II: DEMOGRAPHIC + SOCIO-ECONOMIC TRENDS IN RURAL + URBAN BRITISH COLUMBIA

The objective of this part of the report is to examine population trends in rural and urban British Columbia. Various socio-economic characteristics of the rural and urban population are analyzed. The earnings gap between rural and urban BC has been widening. We examine whether this gap is associated with agglomeration economies (geographic concentration of economic activity in larger centres) or reflects differences in their human capital composition.

In analyzing demographic changes in British Columbia, we pay special attention to the following four population groups:

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

How have the recent demographic changes affected these four population groups? Has the impact been the same for rural as for urban areas? How many people live in rural and urban areas in the province? What are the main socio-economic characteristics of these population groups? Is the population growing or declining in these regions? Have demographic changes been similar in rural and urban areas? These are questions we seek to explore in this part of the study.

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. The staple theory is one model commonly used to explain economic development of Canada's peripheral and rural regions.

Before examining demographic changes in rural and urban British Columbia, we need to define the term 'rural'. There has been an age-old debate regarding whether rural is a geographical concept or a social representation or a culture and a way of life. This report focusses on the geographical classifications of rural regions. 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.

Statistics Canada suggests that "the appropriate definition should be determined by the question being addressed; however, if we were to recommend one definition as a starting-point or benchmark for understanding Canada's rural population, it would be the 'rural and small town' 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).”¹⁴

Based on the above information, one can define rural and small town (RST) to refer to the population living outside Census Metropolitan Areas (CMAs) and Census Agglomerations (CAs). A CMA is a grouping of census subdivisions comprising a large urban core and the surrounding urban fringes that are closely integrated with the core. To qualify as a CMA, an area has to have an urban core population of at least 100,000 and includes all neighbouring Census Sub-Divisions (CSDs) where:

1. 50% or more of the employed labour force living in the CSD commutes to work in the urban core, or
2. 25% or more of the employed labour force working in the CSD commutes to work from the urban core.

A CA is a smaller version of a CMA and has an urban core population between 10,000 and 99,999 people. The same commuting flow thresholds also apply in the description of CAs. Therefore, rural and small town refers to the non-CMA/CA population.

Alternatively, Statistics Canada often defines rural population as persons living outside centres with a population of 1,000 and outside areas with 400 persons per square kilometer. In analyzing rural-urban population trends, this report uses both definitions, i.e., rural and small towns as well as areas with less than 1,000 population.

Using recently developed Statistical Area Classification (SAC), one can group various census subdivisions in a province according to whether they are a part of a census metropolitan area or a census agglomeration in which case they are referred to as urban areas or a part of census metropolitan influenced zones referred to as rural areas with different degrees of rurality. Statistics Canada defines various metropolitan influenced zone (MIZ) categories as follows:

1. *Strong MIZ* includes CSDs with a commuting flow of 30 percent or more. In other words, at least 30 percent of the total employed labour force living in the CSD works in **any** CMA/CA urban core;
2. *Moderate MIZ* includes CSDs with a commuting flow of between 5 and 30 percent. This means that at least 5 percent, but less than 30 percent of the total employed labour force living in the municipality works in **any** CMA/CA urban core;
3. *Weak MIZ* includes CSDs with a commuting flow of more than 0 percent, but less than 5 percent suggesting that more than 0 percent, but less than 5 percent of the total employed labour force living in the municipality works in **any** CMA/CA urban core;
4. *No MIZ* includes CSDs with either fewer than 40 people in the resident labour force or where no people commute to the urban core of **any** CMA or CA.

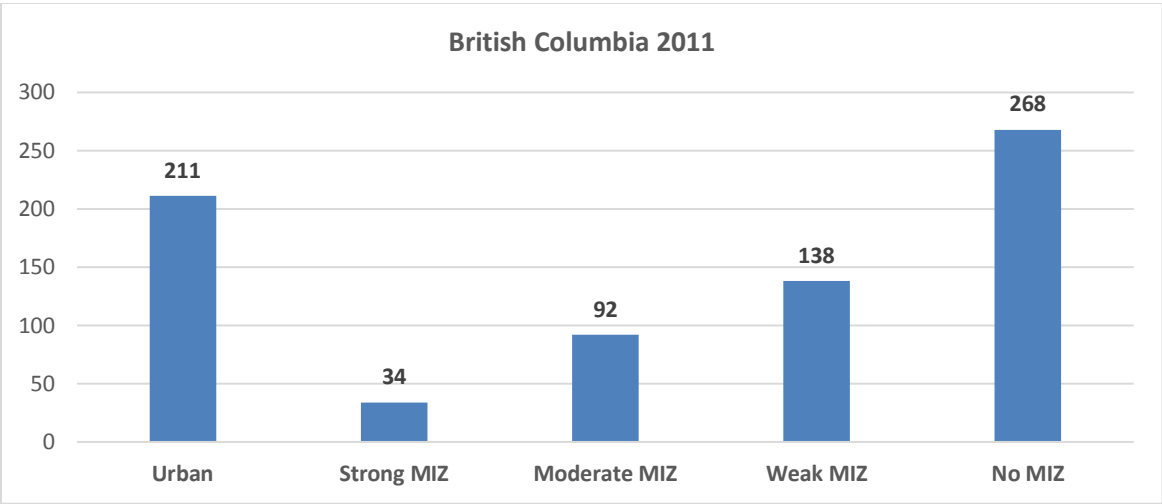
¹⁴ Pleassis, V.D., R. Badhiri, R.D. Bollman and H. Clemenson, *Definitions of “Rural”*, Statistics Canada, Agriculture Division, December 2002, Catalogue NO. 21-601-MIE – No. 061.

Demographic Trends in Urban and Rural BC

The data used in this part of the study is based on detailed socio-economic information on all census subdivisions in British Columbia obtained from 2001 and 2011 census custom tabulations. The data set 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, employed labour force and the participation and unemployment rates for each CSD. It also shows the statistical area classification for each CSD which allows us to designate a CSD as urban or rural along with its degree of rurality.

Based on the above classification, one can classify all 743 CSDs in the province of British Columbia into 74 within CMAs and 137 within CAs which are considered as urban areas and the other 532 CSDs are classified as rural and small towns with different degrees of rurality. Figure 2.1 shows the geographical distribution of 743 CSDs in 2011 into urban and rural and small towns with different degrees of rurality.

Figure 2.1: Geographical Distribution of Census Subdivisions



The population size of CSDs in BC varies significantly from less than a hundred to 223,218 in Burnaby, 468,251 in Surrey and 603,502 in Vancouver. Figure 2.2 shows the average population size of various CSDs in BC. We have excluded Vancouver, Surrey and Burnaby from calculating the average population sizes to prevent biasing the results due to a relatively large number of residents in those three communities. We have also excluded smaller CSDs for which population data was not available.

Figure 2.2: Average Population Size of CSDs by Geography

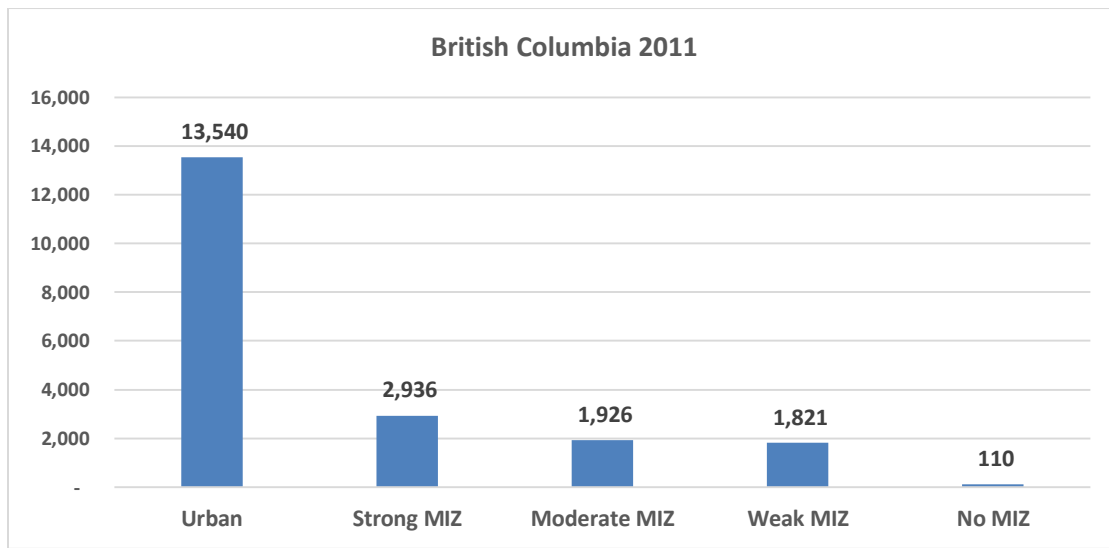


Figure 2.2 shows that, excluding the three major urban centers, the average number of residents in the remaining CSDs in urban regions are about 13,540 people. The average number of people living in CSDs declines considerably when we move to rural and small towns. Areas designated as having a stronger link with urban centres appear to have a relatively larger population base. Conversely the remote regions have the lowest average number of residents.

Using the above urban and rural and small town classification, Table 2.1 shows the population change in rural and urban BC during 2001-2011.

Table 2.1: Urban and Rural Population in BC

BC	2001	%	2011	%	Percentage Change 2001-2011
Urban	3,297,135	85.43	3,854,139	87.59	16.89
Rural	562,210	14.57	545,918	12.41	-2.90
Total	3,859,345	100.00	4,400,057	100.00	14.01

We note that the sum of individual CSD population data for 2001 shown in Table 2.1 is slightly lower than the total provincial population based on the 2001 census report (3,868,875). The reason is that the 2001 Census did not report population statistics for some of the smaller CSDs. However, for the sake of consistency, we use population statistics based on the aggregation of individual CSD data to analyze urban-rural population changes in this part of the study.

Table 2.1 shows that BC's population increased by 14.0 percent during 2001-2011. The urban population grew by 16.9 percent or 1.7 percent per year while the rural and small town population declined by 2.9 percent during 2001-2011. In other words, all the provincial population growth occurred in urban areas. Some of the above rural and urban population changes may be due to the reclassification of boundaries.¹⁵

¹⁵ The reclassification of boundaries from rural and small towns to urban areas are likely to affect CSDs that are in the commuting zone of CMAs and CAs and not those that are farther away from urban areas, i.e., those with zero,

In their analysis of rural and small town Canada, Mendelson and Bollman also found that when the reclassification of boundaries is taken into account, Canada's RST population was 18.0 percent smaller in 1996 compared with 1976.¹⁶

Table 2.1 also shows that BC's population living in rural and small towns has declined in relative terms. The share of BC's population living in RST areas declined from 14.6 percent in 2001 to 12.4 percent in 2011. Mendelson and Bollman also found that the share of Canada's population living in RST areas declined from 34.0 percent in 1976 to 22.0 percent in 1996.¹⁷ Mitchell also 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.¹⁸ She also finds that during the last census period of the millennium (1996-2001), more than 50 percent of the country's smallest settlements lost residents.¹⁹

Using an alternative definition often used by Statistics Canada that defines urban as areas with a population of at least 1,000 and a population density of at least 400 persons per square kilometre, Figure 2.3 shows historical population trends in rural and urban areas in BC.

Figure 2.3: Trends in Rural & Urban Population in BC

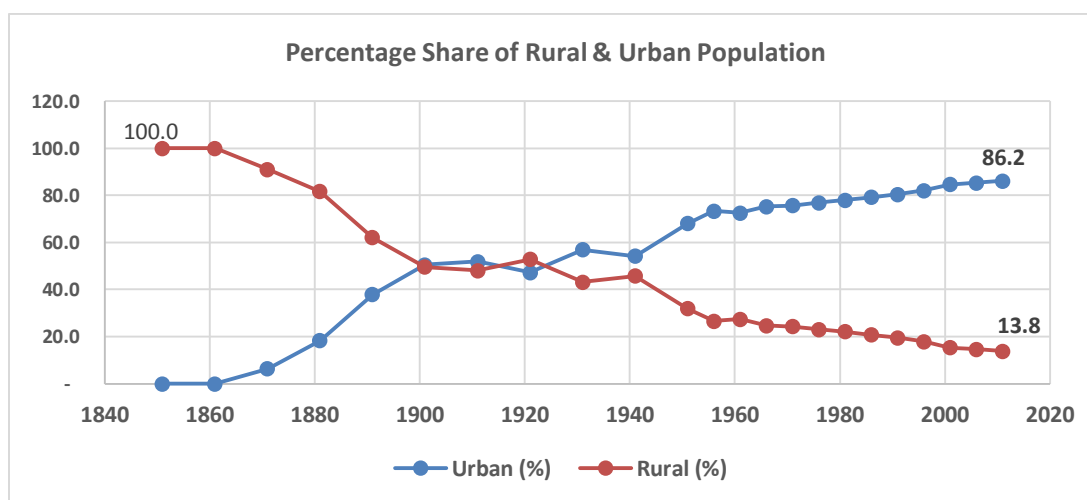


Figure 2.3 shows that the share of rural areas based on the alternative definition equals 13.8 percent in 2011 which is greater than the one in Table 2.1 (12.4%). One of the reasons for this apparent anomaly is that many of the smaller census subdivisions fall within the CMAs or CAs and therefore are classified as urban areas based on the rural and small town definition. Another reason is that many larger areas with

weak or moderate MIZ classification. Mitchell attributes the growth of rural areas close to metropolitan regions to the decision of urban residents to combine an urban workforce 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." See Mitchell Clare J.A., "Population Growth in Rural and Small Town Ontario: Metropolitan Decentralization or Deconcentration?" *Canadian Journal of Regional Science*, 2009, 377-392.

¹⁶ Mendelson Robert and Ray D. Bollman (1998), *Rural and Small Town Canada Analysis Bulletin*, Vol. 1, No. 1, Cat. No. 21-006-XIE.

¹⁷ Ibid, p. 7.

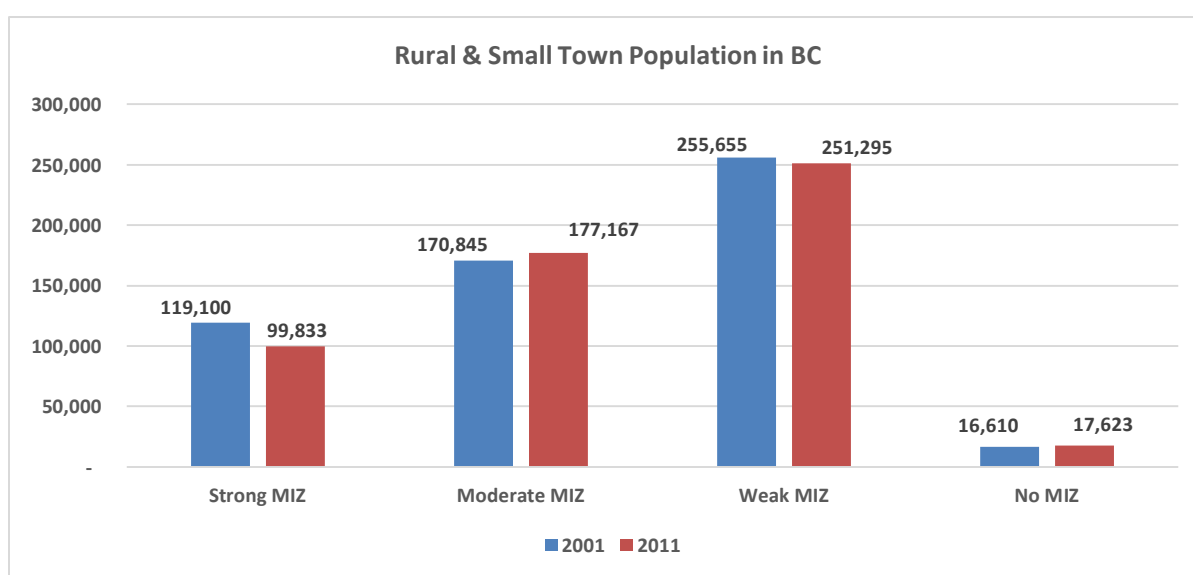
¹⁸ Mitchell Clare J.A., *Population Growth in Rural and Small Town Ontario: Metropolitan Decentralization or Deconcentration?*, *Canadian Journal of Regional Science*, 2009, 377-392.

¹⁹ Ibid, p. 377.

less than 400 persons per square kilometre are classified as rural. However, the fact remains that the rural population has been declining in absolute and relative terms while the urban population has been growing.

Using 2001 and 2011 census custom tabulations, Figure 2.4 shows the distribution of the rural and small town population in BC by degree of rurality. It shows that the rural population living in areas designated as strong or weak MIZ declined while those in moderate and no MIZ areas increased during 2001-2011. As mentioned above, a part of this change can be due to reclassification of boundaries especially in areas having strong urban influence. It appears that all the gain in rural areas designated as moderate and no link to urban centres are offset by a greater population loss in the areas designated as strong and weak link to urban centres. Figure 2.4 also shows that a larger share of rural people live in areas designated as having weak link to urban centres.

Figure 2.4: Rural & Small Town Population by Degree of Rurality



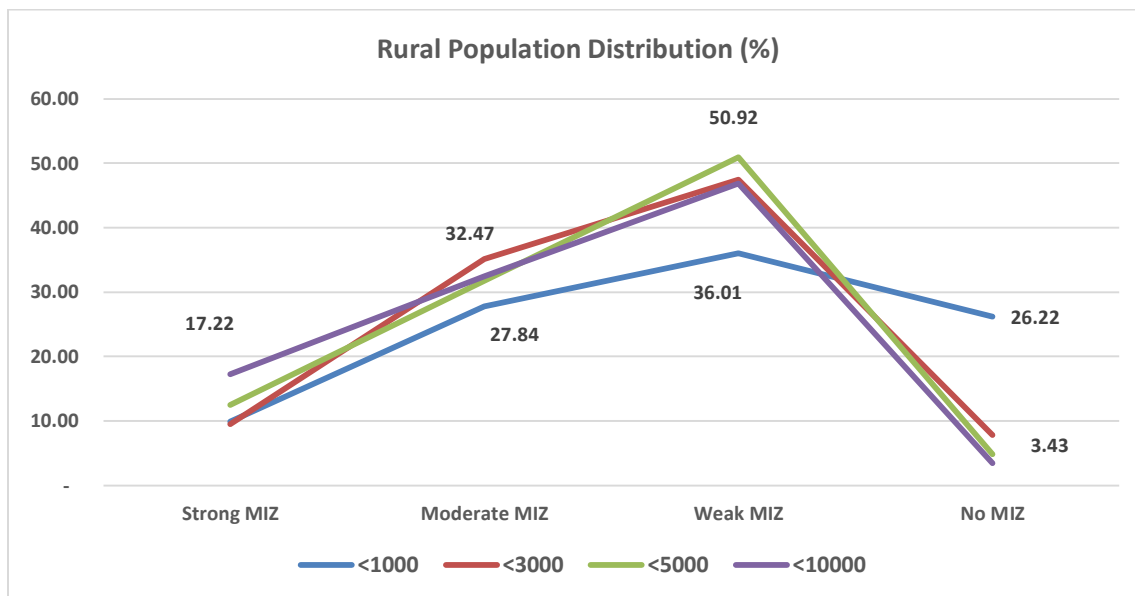
BC is unique in a sense in that it consists of many remote municipalities with a few hundred residents. It includes about 419 Indian reserves, many of them in remote areas. Therefore, it is of interest to examine the geographical distribution of population living in smaller communities. This is done in Figure 2.5. Results show that rural areas closer to urban centres appear to experience population loss while the population in more remote regions is growing, likely due to higher fertility rates or greater participation in the census.

Figure 2.5: Rural-Urban Population in BC



Based on the information provided in Figure 2.5, Figure 2.6 shows the percentage distribution of the rural population among various metropolitan influenced zones.

Figure 2.6: Percentage Share of Rural Population by Geography



Almost 50 percent of the rural population in areas with less than 10,000 population are located in weak MIZ areas with limited access to urban or population centres. The only exception are the rural areas with less than 1,000 population, where more than 26.2 percent live in remote rural regions while 36.0 percent live in weak MIZ areas. Figure 2.7 shows the number of CSDs by population size in 2011.

Figure 2.7: Number of CSDs by Population Size

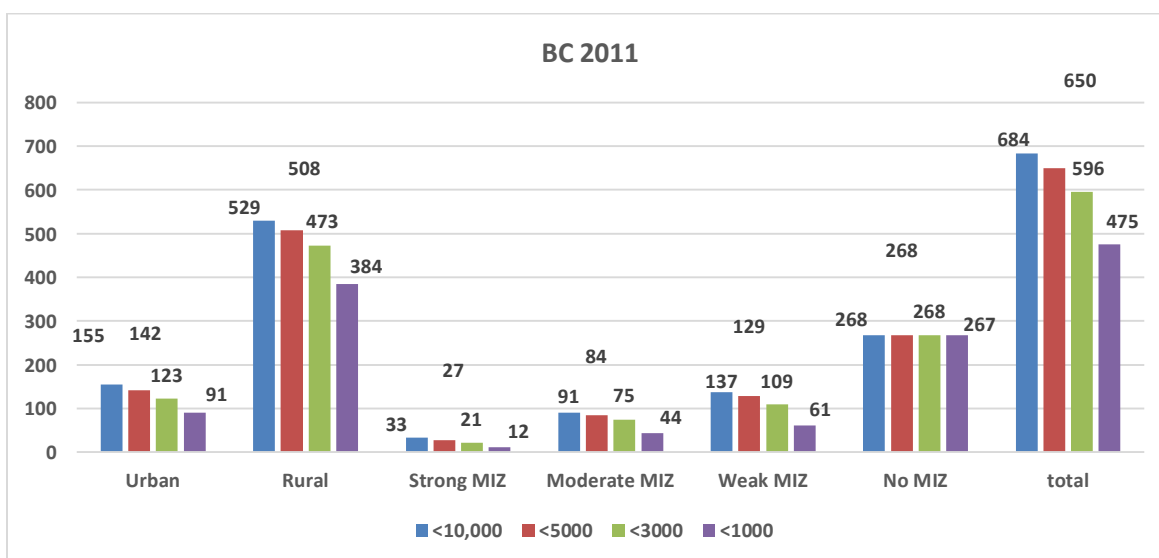


Figure 2.7 shows that almost all of the remote CSDs are small with a population of less than 1,000. The number of CSDs do not change significantly when we reduce the population size from 10,000 to 5,000. In fact, there are only 34 CSDs with a total population of 233,934 in areas with 5,000 to 10,000 population. More than a third or 13 of them are located inside CMAs or CAs and are considered as urban areas, 6 are classified as strong MIZ, 7 as moderate MIZ and 8 as weak MIZ areas. Compared to the total CSDs of about 743 in BC, about 92.1 percent of CSDs have less than 10,000 population, 87.5 percent have less than 5,000 population, 80.2 percent have less than 3,000 and 63.9 percent have less than 1,000 population.

Age Distribution of Population in Rural & Urban BC

Figure 2.8 shows the percentage age distribution of total, urban and rural population in British Columbia during 2001-2011.²⁰ The share of individuals under the age of 20 has declined in all three regions. Rural areas appear to have the highest share of the population under the age of 20. In fact, rural areas have experienced the largest percentage decline in the share of individuals under the age of 20 (5.2%).

The share of the prime working age group (25-44) is highest in urban regions. Rural areas appear to have the lowest share of the prime working age population. It is entirely possible that individuals in that group migrate from rural to urban regions in search of employment and income.

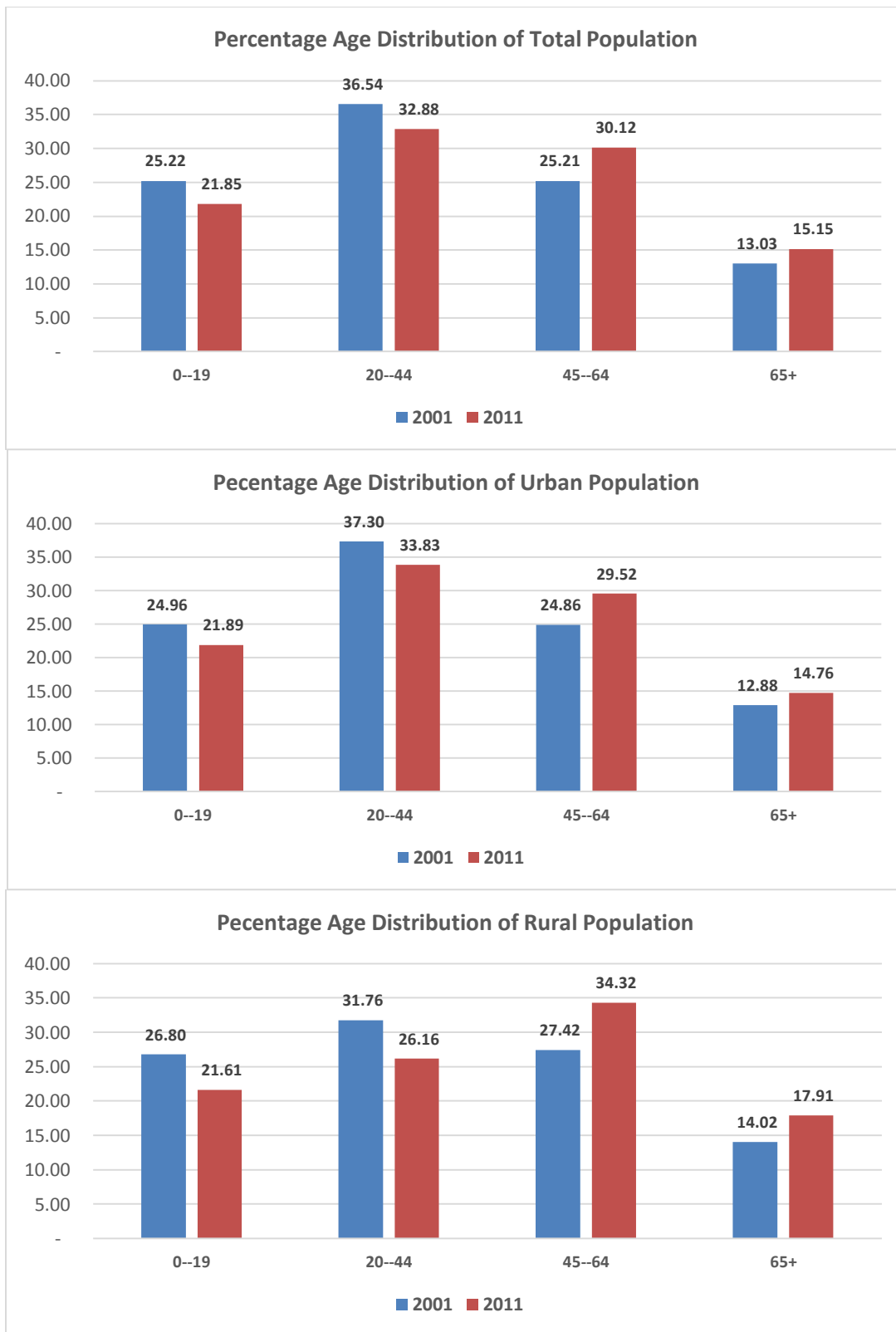
The share of seniors is highest in rural areas and lowest in urban areas. Again, the rural areas have experienced the largest rise in the share of seniors aged 65 years and over (3.9%). This can be related to the migration of younger individuals from rural to urban regions.

An aging population increases demand for services catered to the needs of the elderly such as health care. Data shows that demand for healthcare services and therefore health expenditures rise exponentially as population ages. For example, health expenditures on a person between the ages of 65 to 70 is more than 3 times greater than expenditures required by a person between the ages of 40 to 44.

It has important implications for the labour force and the ability of the rural areas to generate output and income. It also affects other aspects of the economy such as a household's income, spending, savings and investment behaviour. Lower household income also results in lower provincial tax revenue. This happens while demand for public services such as health care are rising.

²⁰ Age distribution of the population is based on population data by single year of age obtained through census custom tabulations.

Figure 2.8: Aging Population in British Columbia



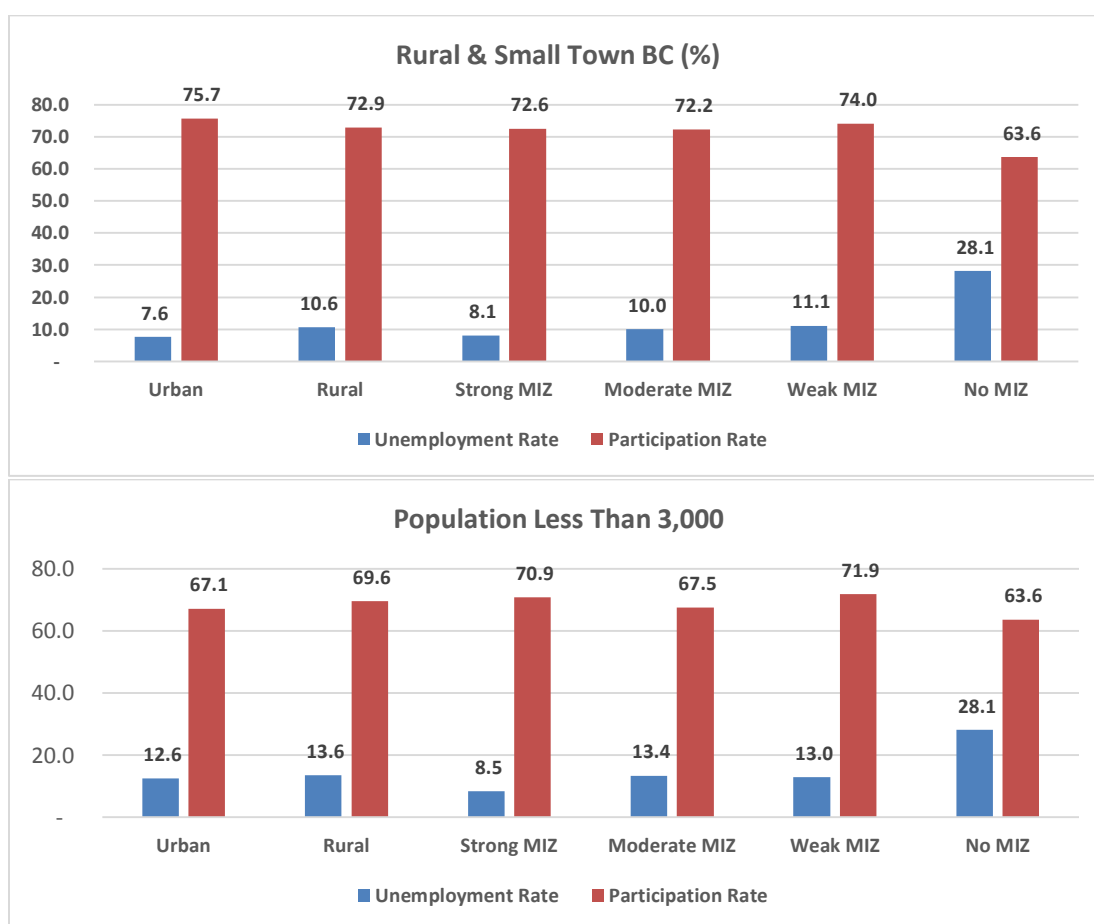
Socio-Economic Characteristics of Rural and Urban Population in British Columbia

Demographic change and economic change are inextricably linked. Individuals migrate from economically depressed areas to those with favorable 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. Lack of a qualified labour force can also represent a barrier to economic development in remote regions. This is especially true in resource-based communities.

This part of the study examines various socio-economic characteristics of rural and urban British Columbia based on detailed 2011 census custom tabulations. We pay special attention to the degree of rurality. We note that the statistics reported in this part are the weighted average statistics over all CSDs. The population in each CSD is used as weight. The averages reported in this part may be slightly different from those reported by Statistics Canada which are based on individual data.

Figure 2.9 shows the average labour force participation and unemployment rates among individuals between the ages of 15 and 64 in urban and rural BC.

Figure 2.9: Participation and Unemployment Rates in Urban & Rural BC



According to Statistics Canada, the unemployment rate among individuals aged 15 to 64 equaled 8.6 percent in BC compared to the national average of 8.2 percent in January of 2011. The labour force participation rate equaled 75.9 percent in BC compared to the national average of 76.8 percent in January 2011. The unemployment rate in BC declined to 7.0 percent in January of 2014 which was below the national average of 7.6 percent while the participation rate stayed relatively constant at 75.0 percent, slightly below the national average of 76.6 percent.

Figure 2.9 shows that the urban unemployment rate among individuals aged 15 to 64 years equaled 7.6 percent compared to 10.6 percent in rural and small town areas in 2011. The unemployment rate rises as the degree of rurality increases and reaches a high of 28.1 percent in remote rural areas. The labour force participation rate declined from a high of 75.7 percent in urban regions to 63.6 percent in remote rural areas. The unemployment rate is higher in areas with less than 3,000 population irrespective of how far or close they are to urban centres. For example, the unemployment rate in CSDs with less than 3,000 population that are located within urban regions equaled 12.6 percent compared to the average unemployment rate of 7.6 percent in urban regions.

Figure 2.10 shows the percentage of population aged 15 to 64 who received government transfer payments in 2010.

Figure 2.10: Dependency Rate on Government Transfer Payments

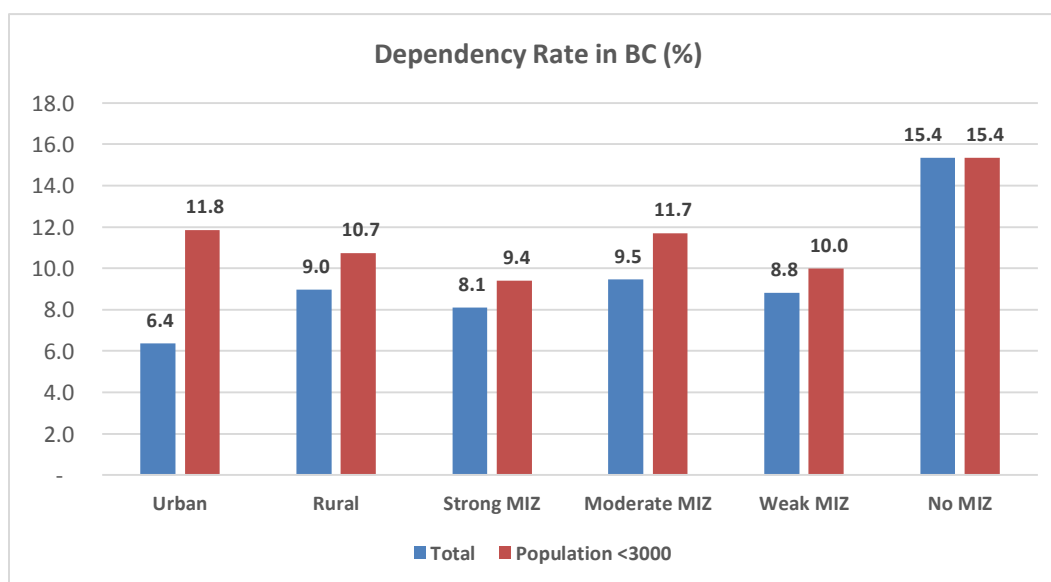


Figure 2.10 shows that an average of 6.4 percent of individuals in BC's urban areas receive transfer payments. The urban dependency rate rises to 11.8 percent when we focus on areas with less than 3,000 population. In general, the dependency rate is higher in smaller areas irrespective of how close they are to population centres. The dependency rate rises to 15.4 percent in remote rural regions.

Table 2.2 shows the share of individuals aged 15 to 64 with their highest level of schooling in various regions in BC in 2010.

Table 2.2: British Columbia Regions by Highest Level of Schooling (%)

BC	No Certificate	High School	Trade	College	University below Bachelor	University at/above Bachelor
Urban	13.69	28.32	9.57	17.60	6.09	24.73
Rural	19.30	29.70	14.36	18.80	3.71	13.69
Strong MIZ	15.94	29.86	15.25	20.49	4.65	13.68
Moderate MIZ	18.28	29.95	13.50	18.57	3.94	15.37
Weak MIZ	19.99	29.88	14.75	18.72	3.31	13.12
No MIZ	39.00	24.07	11.75	11.96	1.75	6.14

Table 2.2 shows that the level of education in urban areas is much higher than that in rural regions. In general, the level of educational achievement appears to decline as the distance between rural areas and population centres increases. About 39.0 percent of the remote rural population does not have a high school diploma. Similarly, the percentage of individuals with a college diploma declined from 17.6 percent in urban areas to about 12.0 percent in remote rural regions respectively. The percentage of individuals with a university degree also declines as we move away from urban centres. We note that the percentages across different levels of schooling do not necessarily add up to 100 percent since the level of educational achievement is not always reported for small rural regions. The above picture stays relatively unchanged when we restrict the sample to areas with less than 3,000 population.

Figure 2.11 shows the percentage of individuals aged 15 to 64 working part-time, part-year or full-time or full-year with employment income in rural and urban BC in 2010. It shows that 85.0 percent of individuals in urban areas worked and earned employment income during the year prior to the 2011 Census. The percentage of the population having employment income declines as we move away from population centres. The only exceptions are rural areas designated as having a weak link to urban centres which report a slightly higher percentage of people with employment income. On average, only 78.9 percent of individuals aged 15 to 64 in remote areas reported any employment income compared to 80.3 percent in rural areas with a strong link to population centres.

Figure 2.11: Population 15 to 64 Years of Age with Employment Income

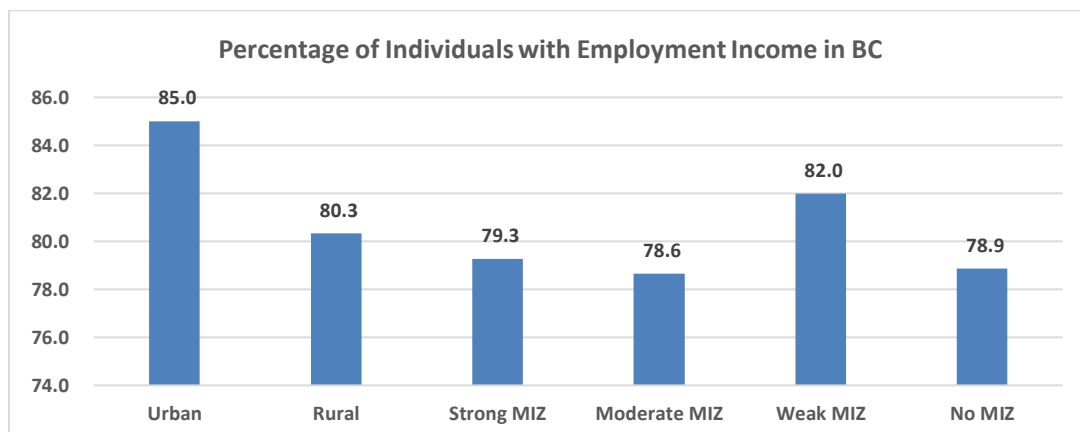
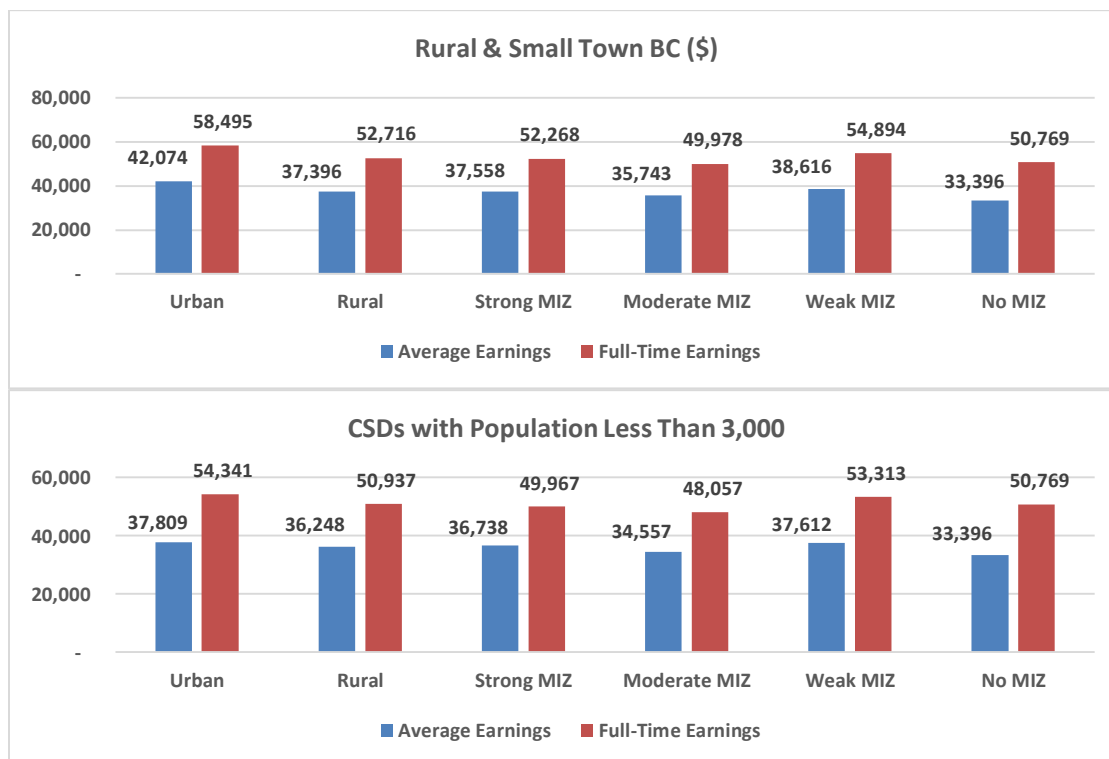


Figure 2.12 shows the average earnings of all who worked as well as those who worked full-time and full-year in 2010. It shows that the average earnings in urban areas equaled \$42,074 compared to \$37,396 in rural areas. The average earnings declines as the degree of rurality rises. It equals \$33,396 in remote rural regions. This is about 79.0 percent of average earnings in urban centres. The same trend appears when we examine full-time and full-year earnings. Irrespective of the distance from urban centres, the average earnings in areas with less than 3,000 population is generally lower than the average earnings in bigger centres.

Figure 2.12: Average Earnings in Rural & Urban BC



As we saw above, the level of educational achievement declines as one moves away from urban centres. The level and composition of human capital are linked to productivity and therefore earnings of individuals. Does lower earnings in rural areas or smaller communities reflect a lower level of human capital in those regions? Or is it the geography, distance from urban regions, industrial or occupational composition of the labour force that influences the earnings gap between rural and urban regions? These are hypotheses that we will explore later in this report.

Demographic Trends Among the Francophone Population in BC

Table 2.3 shows the age distribution of the Francophone population in BC during 2001-2011.

Table 2.3: Age Distribution of Francophone Population in British Columbia

Age Category	2001	2011	Percentage Change
0 - 14 years	2,900	3,265	12.59
15 - 24 years	3,870	2,995	-22.61
25 - 34 years	7,620	7,010	-8.01
35 - 44 years	11,075	7,285	-34.22
45 - 54 years	10,640	10,280	-3.38
55 - 64 years	7,975	10,660	33.67
65 - 74 years	6,080	7,755	27.55
75 years and over	3,820	5,185	35.73
Total - All age groups	53,975	54,440	0.86
Average Age	46.2	49.2	6.49
Median Age	46.3	51.7	11.66

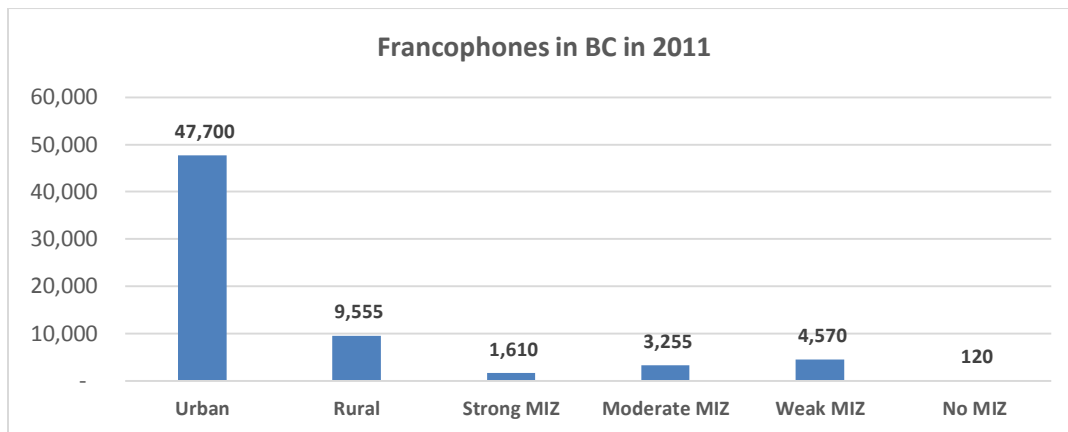
We note that there is a discrepancy between the number of the Francophone population reported by the 2011 National Household Survey (NHS) and the one obtained by adding Francophones in each CSD based on the 2011 Census. According to the NHS, the total Francophone population in BC equaled 54,440 in 2011. However, the total number of Francophones obtained from adding individuals in various CSDs equals 57,255 in BC in 2011.²¹ Given that some of the smaller CSDs have not reported population data, it is likely that the number of Francophones is greater than the one reported above.

Table 2.3 shows that the total Francophone population in BC rose by 0.9 percent during 2001-2011. The Francophone population appears to be much older than the provincial population in BC. Overall, the average age of the Francophone population is about 49.2 years in 2011 compared to 40.2 years for the provincial population. Similarly, the median age in BC equaled 41.6 years compared to the median age of the Francophone population that was 51.7 years in 2011. The median age is the age that divides a population into two equal groups with 50 percent of the people being younger than this age and 50 percent being older. In other words, the median age is the age of a person who separates the higher half of the population from the lower half.

Figure 2.13 shows the geographical distribution of the Francophone population in British Columbia in 2011.

²¹ Two factors explain the differences between the 2011 NHS estimates and Census counts. First is the definition of the population of each data source. The target population for the 2011 Census includes usual residents in collective dwellings such as hospitals, nursing homes, prisons or correctional centres as well as persons living abroad, whereas the target population for the NHS excludes them. The second factor relates to the higher non-response error in NHS data due to the survey's voluntary nature.

Figure 2.13: Francophone Population in Urban and Rural BC



The majority or 83.3 percent of the Francophone people live in urban areas. Only 16.7 percent live in rural areas. About 2.8 percent live in rural areas with a strong link to urban centres, 5.7 percent in rural regions with a moderate link, 8.0 percent in weak linked areas and less than 1.0 percent in remote communities.

Aboriginal Population

Table 2.4 shows the age distribution of the on- and off-reserve Aboriginal population in BC during 2001-2011. It shows that the on-reserve population has increased by 12.7 percent during 2001-2011. During the same period, the off-reserve Aboriginal population increased by about 46.0 percent. Overall, the total Aboriginal population increased from 169,695 in 2001 to 232,290 in 2011, a growth rate of about 36.9 percent.

The average age of the on-reserve Aboriginal people increased from 29.3 years in 2001 to 32.5 years in 2011. The average age of the off-reserve people rose from 27.9 years in 2001 to 30.9 years in 2011. In general, the Aboriginal population is much younger than the provincial population whose average age equaled 40.2 years in 2011.

Table 2.4: Aboriginal Population in British Columbia

Age Category	2001			2011		
	Total	On-Reserve	Off-Reserve	Total	On-Reserve	Off-Reserve
0 - 14 years	51,970	14,025	37,940	60,675	13,205	47,475
15 - 24 years	28,695	7,695	21,000	42,680	8,980	33,700
25 - 34 years	25,400	6,345	19,055	30,430	6,550	23,880
35 - 44 years	27,460	7,320	20,140	29,915	6,475	23,440
45 - 54 years	18,800	5,115	13,690	32,390	7,745	24,650
55 - 64 years	10,150	3,150	7,000	21,775	5,220	16,555
65 - 74 years	4,985	1,850	3,135	10,100	2,765	7,330
75 years and over	2,240	855	1,385	4,330	1,280	3,045
Total - All age groups	169,695	46,350	123,345	232,290	52,225	180,065
Average Age	28.3	29.3	27.9	31.2	32.5	30.9
Median Age	26.7	27.3	26.5	28.9	30.9	28.4

The high Aboriginal population growth is not solely due to the natural demographic process. According to Statistics Canada, the traditional demographic components of growth (fertility, mortality and migration) are not the only factors that have affected the growth of the Aboriginal population in Canada. Another phenomenon that has also affected the size, growth and composition of the Aboriginal population in recent years is referred to as a “change in reporting” or “ethnic mobility.” Ethnic mobility refers to people changing, from one census to the next, the reporting of their Aboriginal affiliations from a non-Aboriginal identity to an Aboriginal identity.²² The passage of Bill C31 in 1986 has been a factor in this ethnic mobility.

According to Statistics Canada, “The Aboriginal population has grown faster than the non-Aboriginal population. Between 1996 and 2006 it increased 45 percent (4.5 percent per year), nearly six times faster than the 8 percent (0.8 percent per year) rate of increase for the non-Aboriginal population.”²³ Statistics Canada also reports that: “Of the three Aboriginal groups, the fastest gain in population between 1996 and 2006 occurred among those who identified themselves as Métis. Their number increased 91 percent, to an estimated 389,785. This was more than three times the 29 percent increase in the First Nations population, whose number reached 698,025. The number of people who identified themselves as Inuit increased 26 percent, to 50,485 in 2006...Several factors may account for the growth of the Aboriginal population. These include demographic factors, such as high birth rates. In addition, more individuals are identifying themselves as an Aboriginal person, and there has been a reduction in the number of incompletely enumerated Indian reserves since 1996.”²⁴

In addition to the above factors, there has been a higher participation in the census in recent years. Statistics Canada reports that some Indian reserves and settlements did not participate in the census as enumeration was not permitted, or it was interrupted before completion. In 2006, there were 22

²² Siggner A. and Rosalinda Costa, *Aboriginal Conditions in Census Metropolitan Areas, 1981-2001*, Statistics Canada, 2005.

²³ Statistics Canada, *Aboriginal peoples in Canada in 2006: Inuit, Metis and First Nations, 2006 Census*.

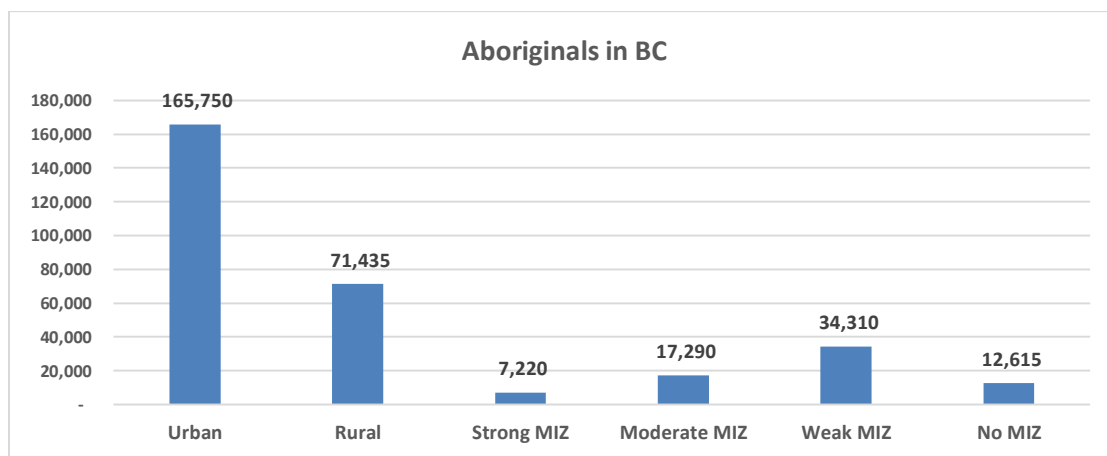
²⁴ Ibid.

incompletely enumerated reserves, down from 30 in 2001 and 77 in 1996.²⁵ Other factors explaining higher Aboriginal population growth include better and more accessible health care leading to a lower mortality rate and decline in infant mortality.

Finally, one of the main factors explaining the rising share of the Aboriginal population relates to their fertility rate. The fertility rate among Aboriginal women has been significantly higher than the regional average. A report by the Ontario Ministry of Health states that: “Although minimum information is directly available on Aboriginal fertility in Canada, INAC 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.”²⁶ Higher fertility rates along with other factors discussed above have resulted in significant growth of the Aboriginal population in British Columbia (Table 2.8).

Figure 2.14 shows the geographical distribution of the Aboriginal population in BC in 2010.

Figure 2.14: Rural and Urban Aboriginal Population in British Columbia



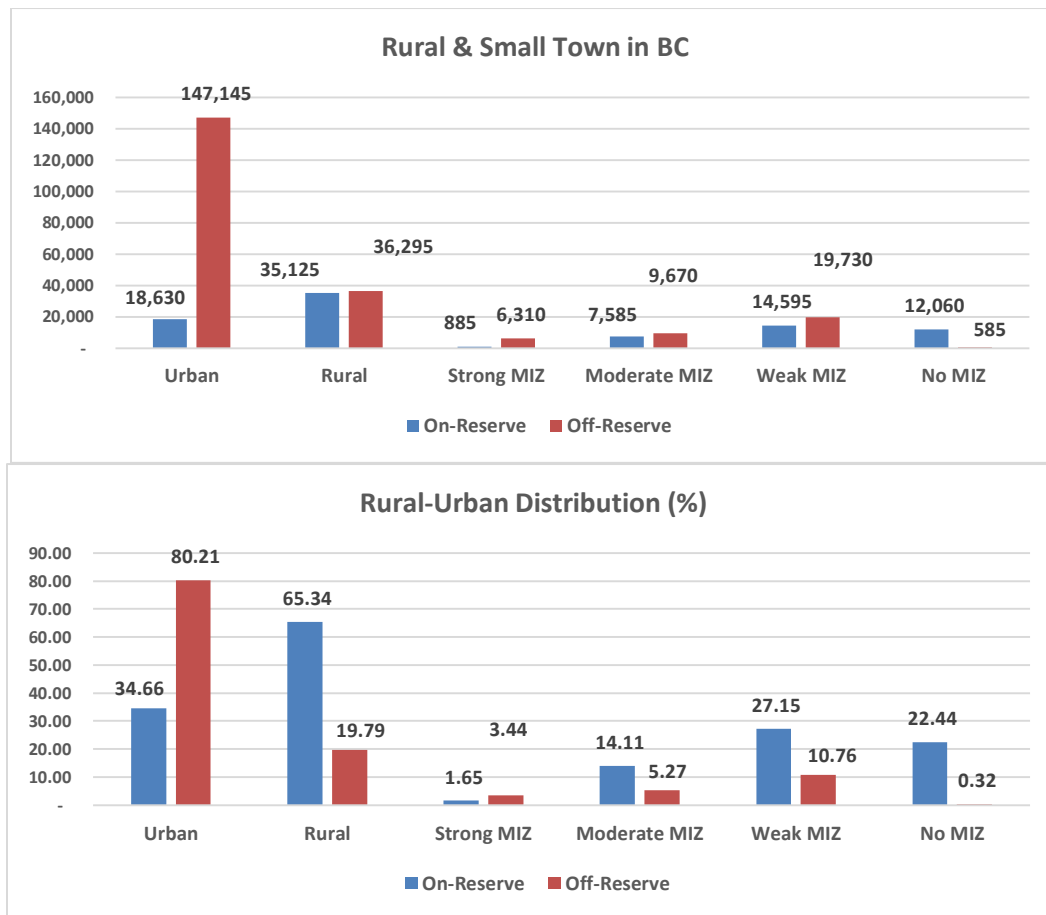
The majority or about 70.0 percent of the Aboriginal population live in urban areas. The rest live in rural and small towns in BC. Figure 2.14 shows that about 30.0 percent of the Aboriginal population lives in rural areas with a majority living in areas designated as having weak link to urban centres.

Figure 2.15 shows the distribution of the on- and off-reserve Aboriginal population in BC in 2010.

²⁵ Ibid.

²⁶ Ministry of Health and Long-Term Care, Health Analytic Branch, *First Nations Peoples in Ontario: A Demographic Portrait*, January 2009, page 15.

Figure 2.15: On-Reserve, Off-Reserve Aboriginal Population



Focussing on the Aboriginal population living in rural and small town BC, the majority or 80.2 percent of the off-reserve Aboriginal population live in urban areas. About 10.8 percent live in rural areas with a weak link to urban centres and 5.3 percent live in rural regions with a moderate link to urban centres. The majority or 65.3 percent of the on-reserve population live in rural areas. About 14.1 percent of them live in areas with a moderate link to urban centres. About 27.2 percent live in areas with a weak link to population centres. Finally, about 22.4 percent of the on-reserve Aboriginal population live in remote areas with no link to urban centres.

Immigrant Population in BC

Table 2.5 shows the age distribution of the immigrant population in BC during 2001-2011.

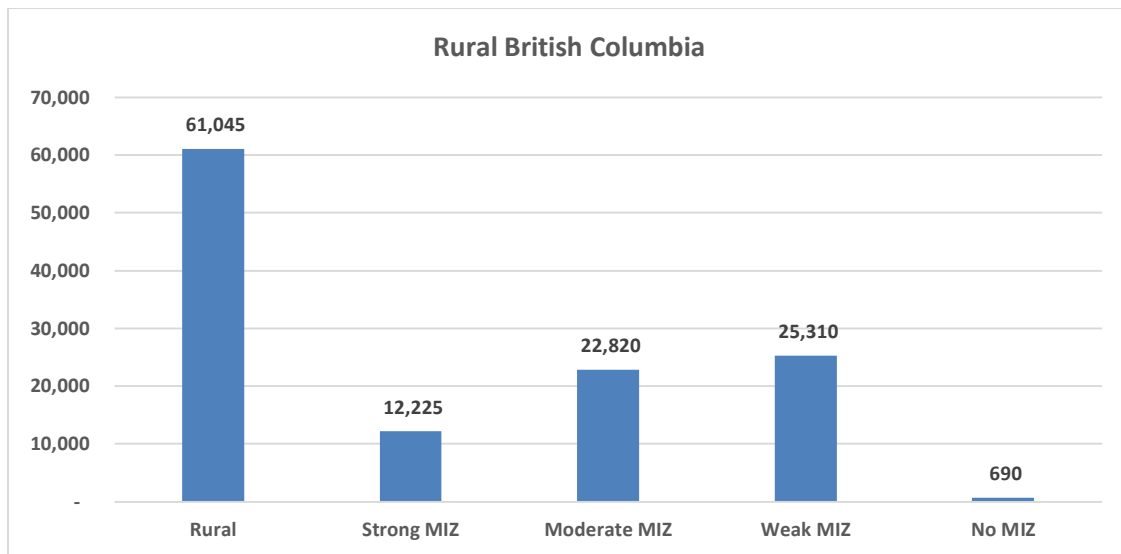
Table 2.5: Immigrant Population in BC

Immigrants	2001	2011	Percentage Change
0 - 14 years	56,060	52,620	-6.14
15 - 24 years	89,355	97,135	8.71
25 - 34 years	131,170	140,745	7.30
35 - 44 years	189,330	202,230	6.81
45 - 54 years	198,755	231,440	16.44
55 - 64 years	144,680	205,135	41.79
65 - 74 years	114,305	145,845	27.59
75 years and over	84,295	116,725	38.47
Total	1,007,945	1,191,875	18.25
Average Age	46.5	48.5	4.30
Median Age	47.0	49.2	4.68

We note that the total immigrant population based on the National Household Survey (Table 2.5) is slightly below the ones obtained from adding the immigrant population in each CSD (1,201,870). Table 2.5 shows that the immigrant population increased by about 18.2 percent during 2001-2011. This amounts to a growth rate of 1.8 percent per year. The average age of immigrants rose from 46.5 years in 2001 to 48.5 years in 2011 which is much greater than the provincial average of about 40.2 years. The median age of the immigrant population equaled 49.2 years in 2011 compared to the provincial median of 41.6 years.

Figure 2.16 shows the geographical distribution of the immigrant population in rural BC in 2010. Most or 94.9 percent of immigrants live in urban areas. Only 61,045 or about 5.1 percent of immigrants live in rural areas. Figure 2.16 shows that 20.0 percent of those living in rural areas are in strong MIZ regions. About 37.4 percent are in areas with a moderate link and 41.5 percent are in rural regions with a weak link to urban centres. Very few immigrants live in remote rural regions.

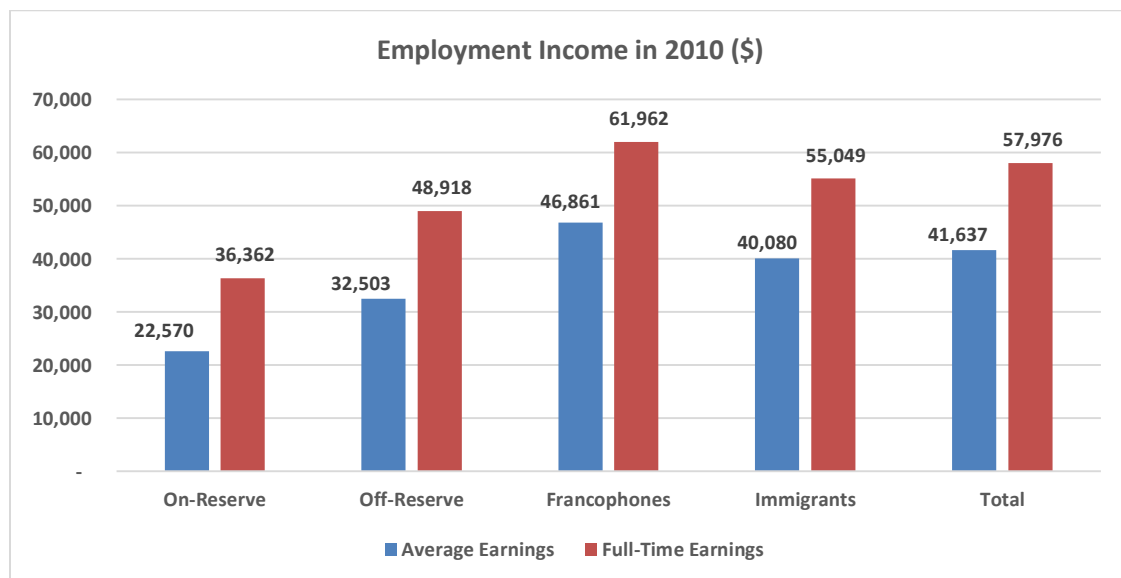
Figure 2.16: Immigrant Population with Place of Residency in 2010



What Factors Explain the Urban-Rural Earnings Gap?

As shown above, the average employment earnings decline as we move away from population centres. In other words, the employment earnings of those living in urban regions are much higher than those living in rural areas. In addition, employment earnings are different among different population groups (Figure 2.17).

Figure 2.17: Earnings among Different Population Groups in BC



What factors influence earnings? There are at least two competing explanations for these observed earnings differences. One potential explanation emphasizes the importance of human capital in explaining the earnings gap among employed people in rural and urban regions. The rationale is that workers in larger urban areas have higher human capital and are therefore more productive resulting in higher wages commensurate with the worker's human capital level. Those living in rural areas have lower human capital and therefore lower earnings. This explanation emphasizes the importance of human capital in explaining earnings potential. In general, workers with a higher human capital are more productive and therefore receive greater compensation.

Another potential explanation is the presence of agglomeration economies which refers to the idea that larger urban centres provide firms with a productive advantage that is not usually available to firms in rural areas. The productive advantage relates to the benefits firms obtain from locating near each other. Therefore, workers in urban centres have higher productivity that leads to higher earnings. Agglomeration economies relate to the concept of economies of scale and network effects. The cost per unit of output is expected to decline as close proximity results in greater specialization and division of labour, access to shared infrastructure, lower input costs due to competing multiple suppliers as well as availability and diversity of labour and market size.

Beckstead et. al. (2010) examined the effects of agglomeration economies and human capital composition on urban-rural earnings differences in Canada.²⁷ They argue that (p. 7): "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." Using the detailed 2001 census micro-data file, they find that rural-urban earnings gaps are associated with both agglomeration economies and differences in human capital composition. Their econometric 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.

Glaeser and Maré (1994) find that wages are 32% higher in large cities (over 500,000 population) than in the hinterland. The earnings gap falls to less than 4% when they control for education, experience and race. The gap falls to only 2% 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 the agglomeration economies and human capital level, there are other factors that can influence earnings differentials between regions. Some of these factors 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. Figure 2.17 shows that the Aboriginal people have lower earnings than the total population. Does that mean that the increased share of the Aboriginal population in an area can also influence the average earnings in a region?

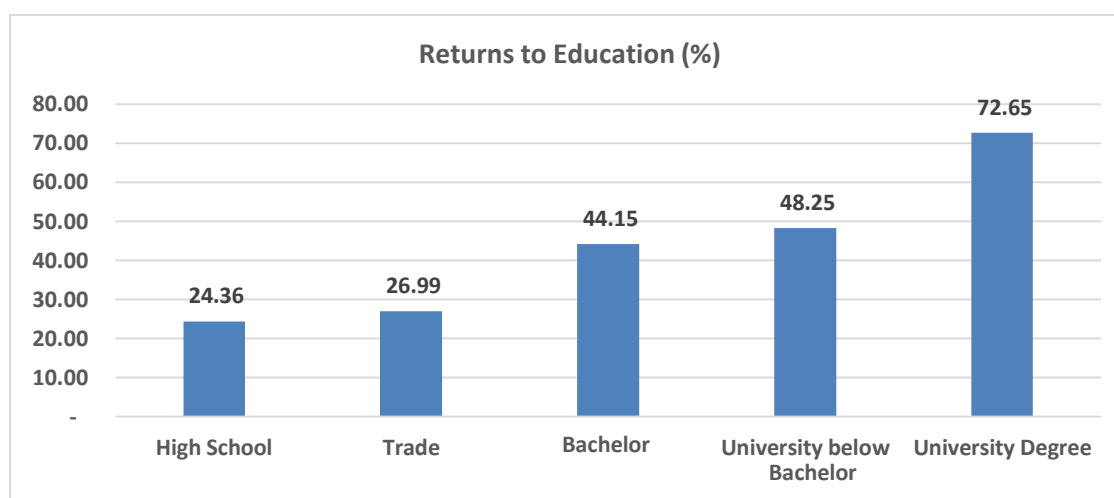
²⁷ Beckstead Desmond, W. Mark Brown, Yusu Gue and K. Bruce Newbols, *Cities and Growth: Earnings Levels Across Urban and Rural Areas: The Role of Human Capital*, Statistics Canada, Catalogue No. 11-622-M – No. 020, 2010.

The objective of this part of the present report is to explore the role of human capital in explaining the earnings gap between rural and urban BC while controlling for other factors that influence earnings differentials.

Constructing a Human Capital Index

In order to estimate the influence of human capital on earnings, one needs to specify and measure a proxy for human capital for each of the CSDs in British Columbia. To obtain a human capital index, we first estimate a standard earnings model using the 2006 census micro-data file.²⁸ We used data pertaining to all working Canadians 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 estimated returns to schooling coefficients are shown in Figure 2.18.

Figure 2.18: Returns to Education in Canada



The estimated returns to schooling rise as the level of educational attainment increases reflecting higher productivity of individuals with increased level of education. Then, we use the estimated returns to schooling coefficients as weights to calculate a weighted average index of the share of individuals with different levels of schooling for each of the CSDs in the province of British Columbia.²⁹ The estimated human capital indexes for urban and rural areas as well as those for various population groups are shown in Figure 2.19. The estimated index ranges from 1 if none of the area's residents have completed high school, to about 2 if all residents have obtained a university degree.

²⁸ The earnings model is of the form: $\ln Wage = \alpha + \sum \beta_i S_i + \sum X_i \delta_i + \varepsilon_i$, where S_i s are the highest level of schooling, X_i s are other control variables which include age categories, marital status, etc. and ε_i is an error term.

²⁹ $HCI = \exp\{\sum \beta_i \cdot S_i \text{ shares}\}$ where \exp stands for exponential and S_i shares are share of the population 15 to 64 with S_i level of education in a given CSD. The formulation of the human capital measure is based on Hall, R.E. and C.I. Jones (1999), *Why do some countries produce so much more output per worker than others?*, the Quarterly Journal of Economics 114 (1), 83-116. Also see Francesco Caselli, "Accounting for Cross-Country Income Differences", First Draft, November 2003.

Focussing on the human capital index for rural and urban BC, Figure 2.19 shows that the index has increased significantly during 2001-2011, except for remote regions where the index declined slightly during the above period. The human capital composition in rural areas is significantly lower than that in urban regions. The human capital index declines as the degree of rurality rises. The index for urban BC is smaller than the national average. On the other hand, the rural index is greater in BC than the national average. Overall, the human capital index in BC is greater than the national average. Also, irrespective of the degree of rurality, the human capital indexes in rural BC are greater than the national indexes, except for remote regions where they are equal.

Figure 2.19: Human Capital Index for Urban and Rural Areas in BC



Focussing on different groups, immigrants have the highest human capital index followed by Francophones. The human capital index for the Aboriginal population is significantly lower than the provincial average.

The index for the off-reserve Aboriginals is greater than that for on-reserve people. Also, the indexes for the Aboriginal people in BC are greater than the ones for the total Aboriginal population in Canada.

Agglomeration Economies or Human Capital: Checking the Data

In general, agglomeration economies suggest that larger places offer higher productivity and therefore higher average earnings. Figure 2.20 shows the relationship between the population size and average earnings in various CSDs in British Columbia.

Figure 2.20: Relationship between Population Size and Average Earnings in British Columbia CSDs

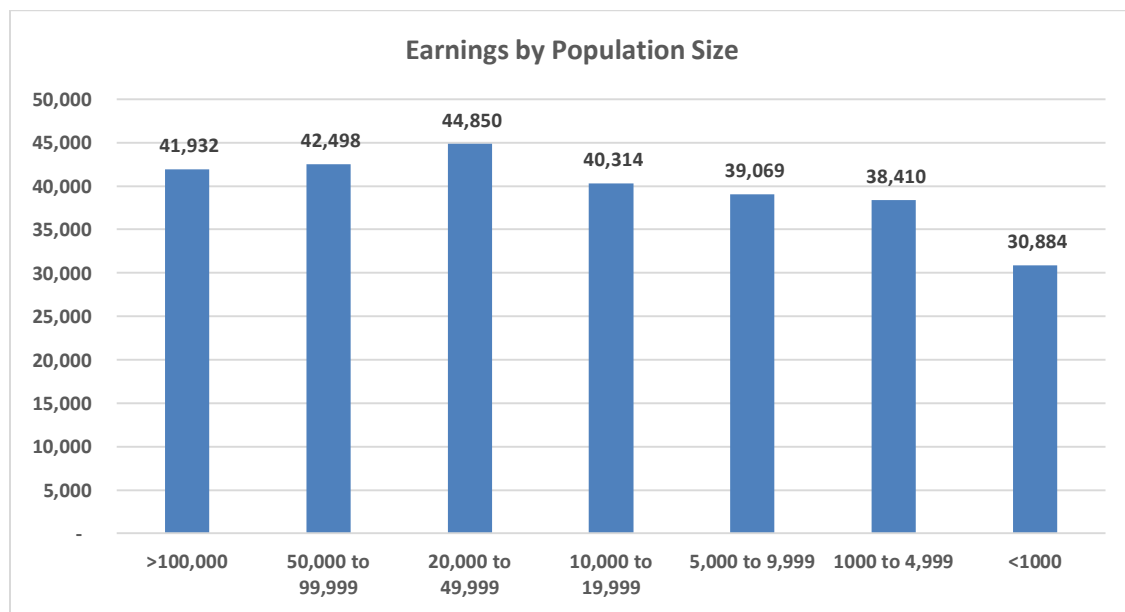
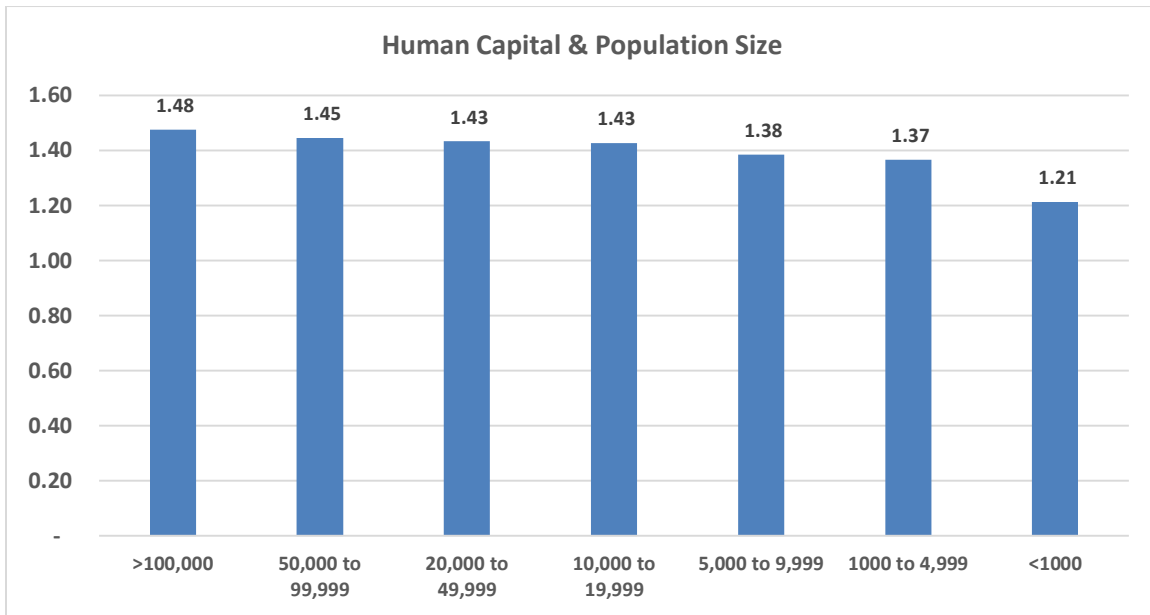


Figure 2.20 shows a positive association between earnings and population size of an area. However, the relationship is not perfect. The estimated correlation coefficient between average population size and average earnings is 0.41. It appears that there are other factors affecting earnings that are not necessarily captured by the population size. Similar results appear when the population size categories are changed.

Next, we examine the relationship between population size, average earnings and human capital composition in British Columbia. Figure 2.21 shows the relationship between population size and human capital index. Comparison of Figures 2.20 and 2.21 shows that the correlation between human capital and average earnings (0.94) is much greater than the one between average earnings and area size (0.41). The correlation coefficient of 0.94 suggests a very high association between human capital and average earnings in various regions of British Columbia. However, it also suggests that there are other factors besides human capital that influence earnings in different CSDs.

Figure 2.21: Area Size and Human Capital Index in British Columbia in 2010

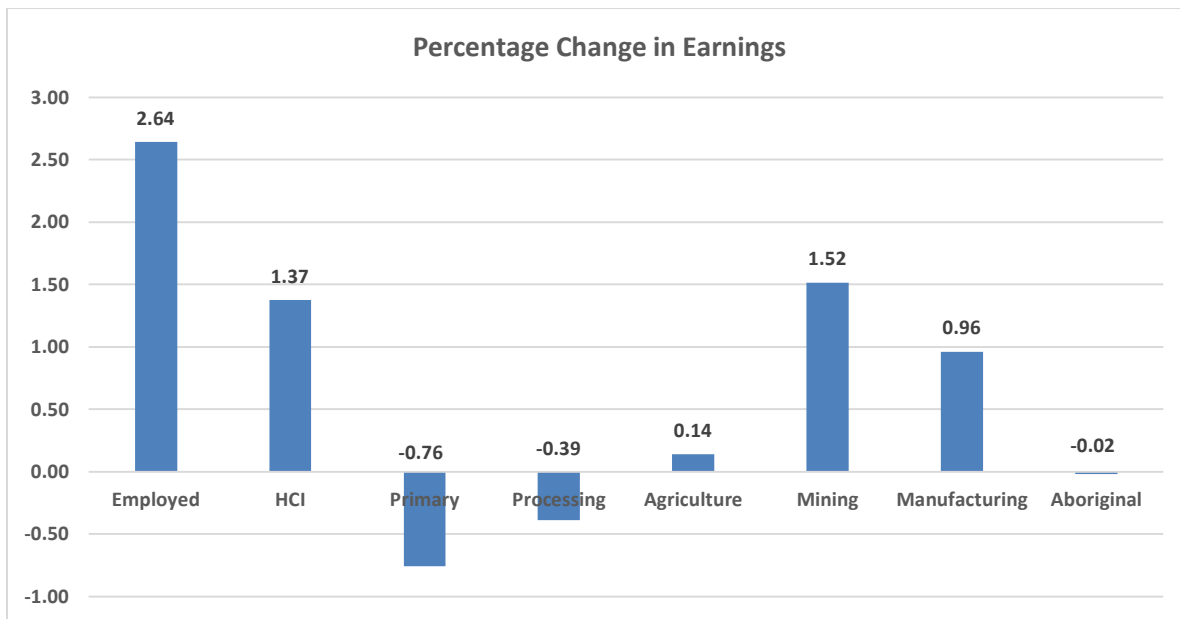


To estimate the role of human capital and agglomeration economies in explaining the urban-rural earnings gap, we estimated a model that includes both variable as well as other control variables such as the share of employed workers in primary, processing, mining, agriculture, forestry and manufacturing as well as the Aboriginal population in each CSD.³⁰ As is standard in this analysis, we use employment levels as a means to estimate the effect of agglomeration economies. The idea is based on the concept 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 2.21).

The statistical results suggest that the level of employment as well as the human capital composition index are statistically highly significant. Results suggest that the outcome of a percentage increase in a total area's employment is a 2.64 percent rise in average earnings. Also, a percentage rise in the human capital index results in a 1.37 percent increase in average earnings. Figure 2.22 also shows that areas concentrated in primary and processing activities have lower average earnings. Changes in the share of the Aboriginal people did not appear to influence average earnings. Figure 2.22 also shows that each percentage rise in employment in mining or manufacturing increases local average earnings by 1.52 and 0.96 percent respectively.

³⁰ The estimated model is of the form: $\text{Log}(\text{Earnings}) = \alpha + \beta_1 \text{Log}(\text{employment}) + \beta_2 \text{HCI} + \sum \delta_i X_i + \varepsilon_i$. Since the dependent variable is average earnings in each CSD, then the error term will be heteroskedastic by construction. We used heteroskedastic consistent variances to judge whether the estimated coefficients have a statistically significant impact on earnings or not.

Figure 2.22: Earnings, Human Capital & Agglomeration Economies



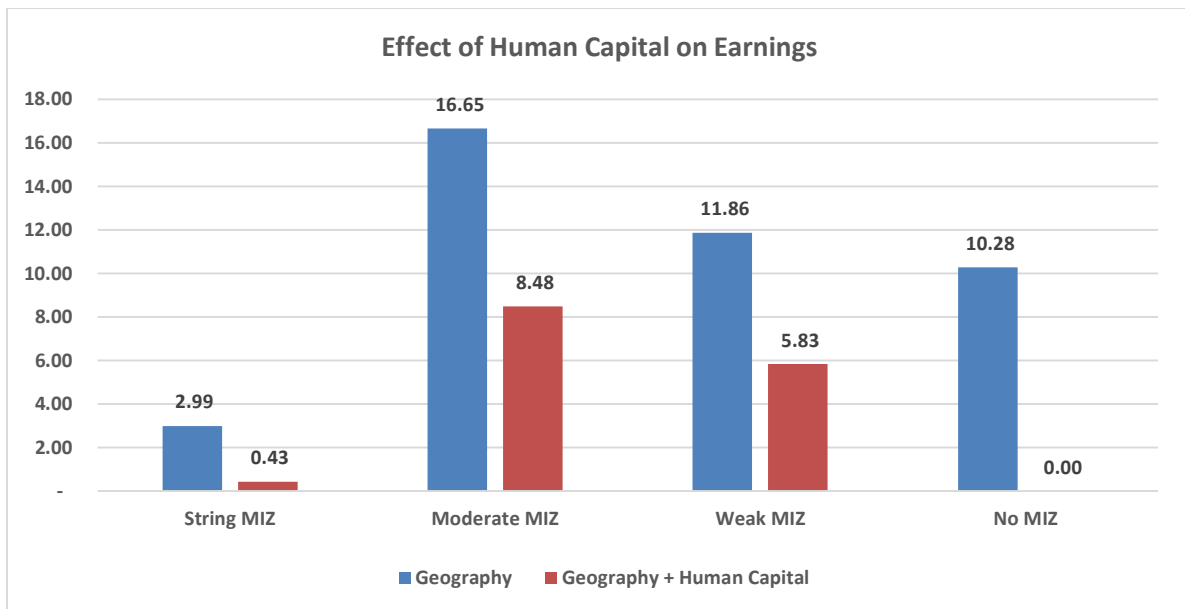
We also estimated the relationship without including the human capital composition index. The agglomeration effect increased by 195.37 percent to 7.80 percent suggesting that a one percent increase in total area employment results in a 7.8 percent rise in local average earnings. This estimate is significantly greater than the one obtained by Beckstead et. al. (2010).³¹ We saw above that the influence of employment size declines to 2.64 percent when we include the human capital index. In other words, the inclusion of control for human capital reduces the effect of agglomeration economies by 66.15 percent.

The above results suggest that the urban-rural earnings gap is influenced by agglomeration economies as well as the human capital composition and other variables shown in Figure 2.22. How much of the urban-rural earnings gap is due to differences in their human capital composition? To examine this question, we estimated two models, one with only binary variables representing rural areas with different degrees of urban influence as well as the above-mentioned control variables. Note that we excluded urban areas and thus the estimated coefficients of the binary variables measure the urban-rural earnings gap due to distance from urban centres. 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. We expect the inclusion of human capital composition to explain some of the urban-rural earnings gap and therefore resulting in a decline in the estimated coefficients of the binary variables. In other words, the difference between the estimated values of the binary variables from two models is attributed to the inclusion of the human capital index. Results are shown in Figure 2.23.³² Note that the estimated coefficients were all negative and highly significant suggesting a negative earnings gap between urban and rural areas. Figure 2.27 shows the values in positive form to simplify exposition.

³¹ Regressing average earnings on employment levels across various geographical units in Canada, they found a similar elasticity of about 5.0 percent. Combes et. al. (2008) also found the same elasticity across various geographical areas in France.

³² Inclusion of the human capital index increased the coefficient of determination from 0.23 to 0.61.

Figure 2.23: Impact of Human Capital on Rural-Urban Earnings Differentials



First, we concentrate on the estimated coefficients of the model which only includes binary geographical variables. Figure 2.23 shows that, after controlling for all other factors, the average earnings of workers in rural areas designated as having a strong MIZ is about 3.0 percent lower than average earnings in urban centres. The reduction in average earnings increases to 16.6 percent for rural areas with a moderate MIZ, to 11.9 percent for areas with a weak MIZ and to 10.3 percent for remote rural areas. How much of the above earnings gap is explained by differences in human capital composition?

Figure 2.23 shows that the estimated coefficient of the binary variable representing rural areas with a strong MIZ declined to 0.43 when control for human capital composition is included in the model. In other words, about 85.6 percent of the earnings gap between rural areas with a strong MIZ and urban regions are accounted for by differences in the human capital composition of their employed workforce. The rest or 14.4 percent is likely due to agglomeration economies. The coefficient of the binary variable representing rural areas with a moderate MIZ has changed from -16.65 to -8.48, a change of about 49.1 percent. In other words, about 49.1 percent of the earnings gap is attributed to the differences in the human capital composition of the employed people in moderate MIZ areas and urban regions. The rest or 50.1 percent of the gap is likely due to agglomeration economies that are represented by the binary variables. Note that the control variables for occupation and industry are included in the models. Similarly, 50.8 percent of the earnings gap between urban and rural areas with a weak MIZ is accounted for by differences in their human capital composition. Again, the rest or 49.1 percent is likely to be explained by agglomeration economies. Finally, about 100.0 percent of the earnings gap between remote areas and urban areas is explained by differences in their human capital composition. Our estimates of the share of human capital in explaining the urban-rural earnings gap are similar to those obtained by Beckstead et. al. (2010).

PART III: DEMOGRAPHIC CHANGE IN BRITISH COLUMBIA: LOOKING INTO THE FUTURE

Population Projection Model

This part of the report employs the Cohort Component method to make projections of the rural and urban populations in BC from the base year of 2011 to 2025.³³ 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 the population projections is directly proportional to the population size and its historical growth rate and inversely proportional to the length of the time projection.

The four basic components of population change are:

1. Births
2. Deaths
3. In-migration
4. Out-migration

Births and in-migration add to the population and deaths and out-migration subtract from it. One can write the demographic balancing equation as:

$$P_t - P_0 = (\text{Births} - \text{Deaths}) + (\text{In-migration} - \text{Out-migration}) \quad (1)$$

Where P_0 is the initial population and P_t is the population after time t .

If population information from two censuses are 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 province or a region at any time interval can be calculated using the demographic balancing equation as:

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

As model (2) shows, 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.

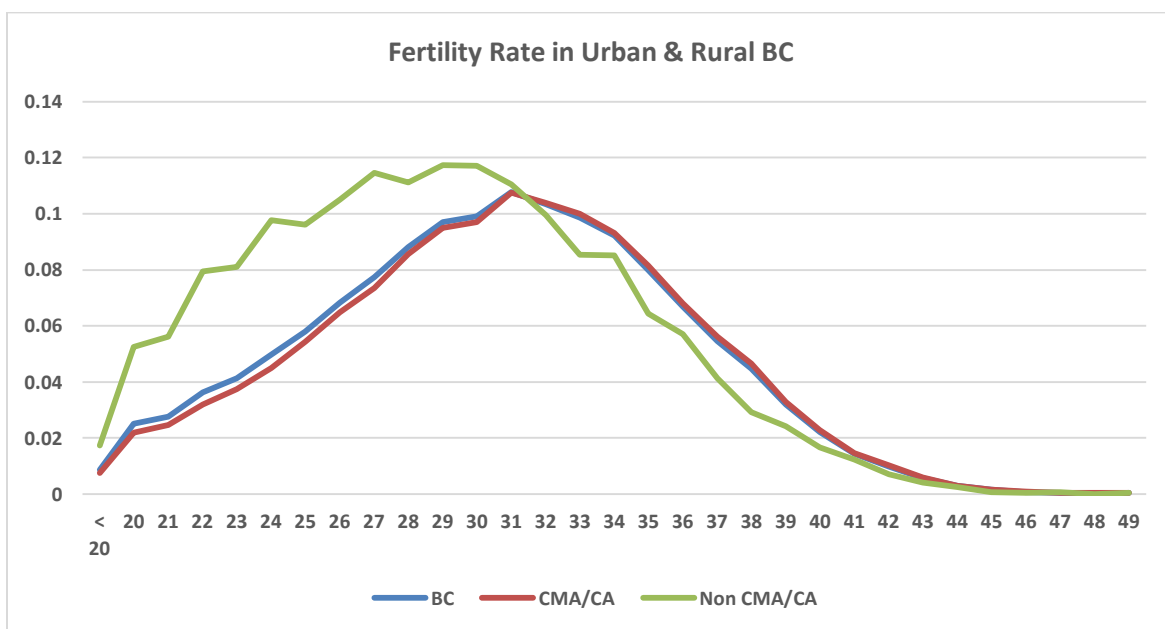
Examination of model (2) reveals that the natural population growth (B-D) evolves slowly over time. However, net migration (I-O) is a much more volatile component of population projections due to fluctuation in interprovincial migration and changes in immigration. High economic growth in recent years has resulted in greater net migration levels to BC. In fact, net interprovincial migration to British

³³ 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.

Columbia has been positive since 2007.³⁴ A changing economic environment will influence changes in interprovincial and international migration in the coming years.

To employ the cohort component method we have used detailed 2001 and 2011 Census population data obtained from Statistics Canada. We have also obtained age-specific fertility rates for rural and small towns as well as urban regions in BC in 2011. An age-specific fertility rate indicates 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 3.1 shows, the fertility rates in rural and small town BC have been much greater than those in urban regions for women aged 15 to 31 years of age. Overall, the total fertility rate for women in rural BC equals 1.76 compared to 1.42 for women in urban BC. The average provincial fertility rate equaled 1.45 in 2011.

Figure 3.1: Fertility Rates in BC in 2011



The 2009-2011 Life Table for BC is used to calculate survival rates at every single year of age. The last piece of information needed to undertake population projections is to estimate net migration. For this, an indirect method is often used. Assuming no migration flows and using one census data, P_0 , the forecaster projects population at time t , say P_t^e . 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:

$$\begin{aligned} \text{Net Migration flows} &= (\text{In-migration} - \text{Out-migration}) = (P_t - P_0) - (\text{births} - \text{deaths}) \\ &= P_t - (P_0 + \text{births} - \text{deaths}) \end{aligned} \quad (3)$$

³⁴ Net migration which includes net interprovincial plus net international migration equaled 9,384 in 2007, 9,645 in 2008, 10,145 in 2009, 9,395 in 2010, 11,675 in 2011, 15,974 in 2012 and 14,476 in 2013 (CANSIM, 053-001, 051-0017 AND 051-0037).

Model (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 BC during 2001-2011, the expected population of year 2011 in the absence of net migration ($P_0 + \text{births} - \text{deaths}$) is subtracted from the actual Census 2011 population.

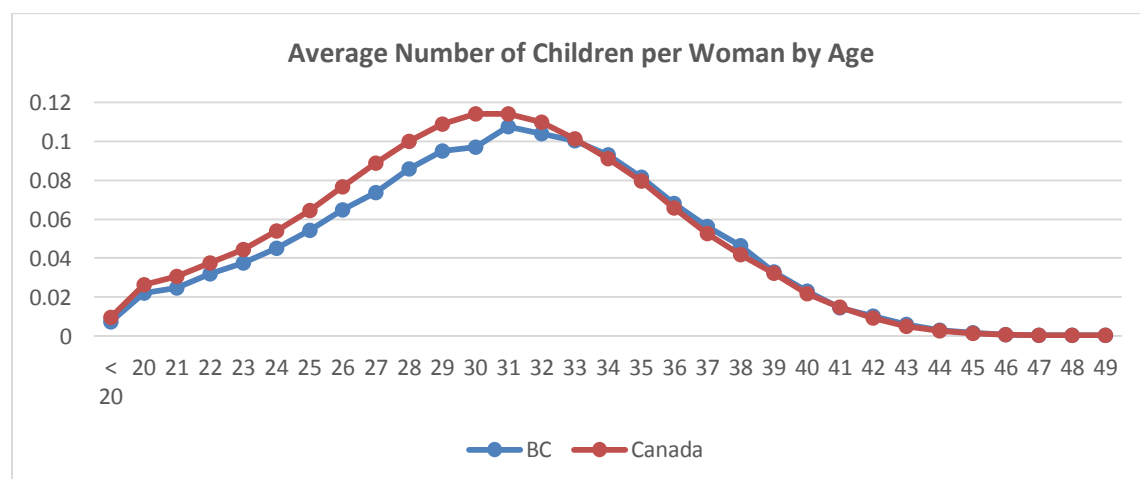
It is also assumed that the components of demographic change, i.e., mortality, fertility, and migration flows, will remain constant throughout the projection period and net migration will be equal to its 2001-2011 average. Hypothetically, one can alter the vital statistics and migration estimates to reflect his or her view of the future.

British Columbia's Urban Population Structure

According to a custom tabulation obtained from Statistics Canada, BC's population residing in Census Metropolitan and Census Agglomeration areas increased from 3,297,135 in 2001 to 3,854,139 in 2011, a growth rate of about 16.9 percent which is greater than the provincial average of 14.0 percent during 2001-2011.

As discussed above, urban BC has experienced population growth primarily due to extensive interprovincial and international migration to the province in recent years. On average, the total fertility rate in urban BC equals 1.42 compared to 1.54 in urban Canada in 2011 (Figure 3.2). These rates are significantly below the generational replacement rate of 2.1. Therefore, migration and immigration have been the main sources of population growth in the province during 2001-2011.

Figure 3.2: Fertility Rates in Urban Canada and British Columbia



Looking into the Future: Population Projection for Urban BC during 2011-2025

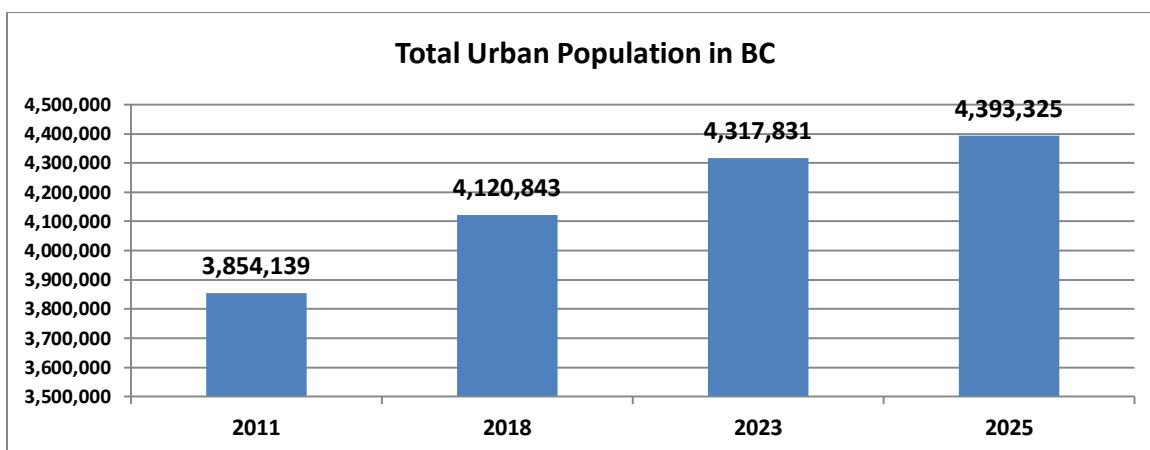
Using the demographic model discussed above and assuming that the 2001-2011 trends will continue, Table 3.1 shows population projections for urban British Columbia during 2011-2025.

Table 3.1: The Future Population of British Columbia's Urban Areas

Age Category	2011	2013	2018	2023	2025
0-4	194,935	192,089	200,605	211,117	212,860
5--9	193,500	193,990	191,598	200,082	205,288
10--14	210,874	207,397	204,258	201,858	201,368
15--19	244,163	240,546	225,691	222,278	223,924
20--24	256,271	261,429	259,827	243,797	240,678
25--29	264,898	268,559	280,241	278,463	270,325
30--34	249,322	265,894	288,435	300,910	303,018
35--39	251,900	255,589	292,785	317,642	322,541
40--44	281,630	283,183	279,358	320,203	337,462
45--49	309,810	298,338	298,621	294,738	307,716
50--54	306,848	316,094	306,291	306,683	301,452
55--59	275,551	290,268	315,979	306,053	301,195
60--64	245,669	250,853	283,743	308,884	314,471
65--69	176,873	203,748	240,619	272,315	282,238
70--74	135,418	144,746	187,308	221,084	231,651
75--79	107,835	108,163	122,596	159,056	175,672
80--84	80,247	79,792	78,460	89,327	96,988
85--89	47,070	45,132	44,073	43,634	45,134
90+	21,326	21,267	20,354	19,708	19,343
Total	3,854,139	3,927,078	4,120,843	4,317,831	4,393,325

BC's urban population is expected to grow from 3,854,139 in 2011 to 4,393,325 in 2025, a growth rate of 14.0 percent (Figure 3.3).

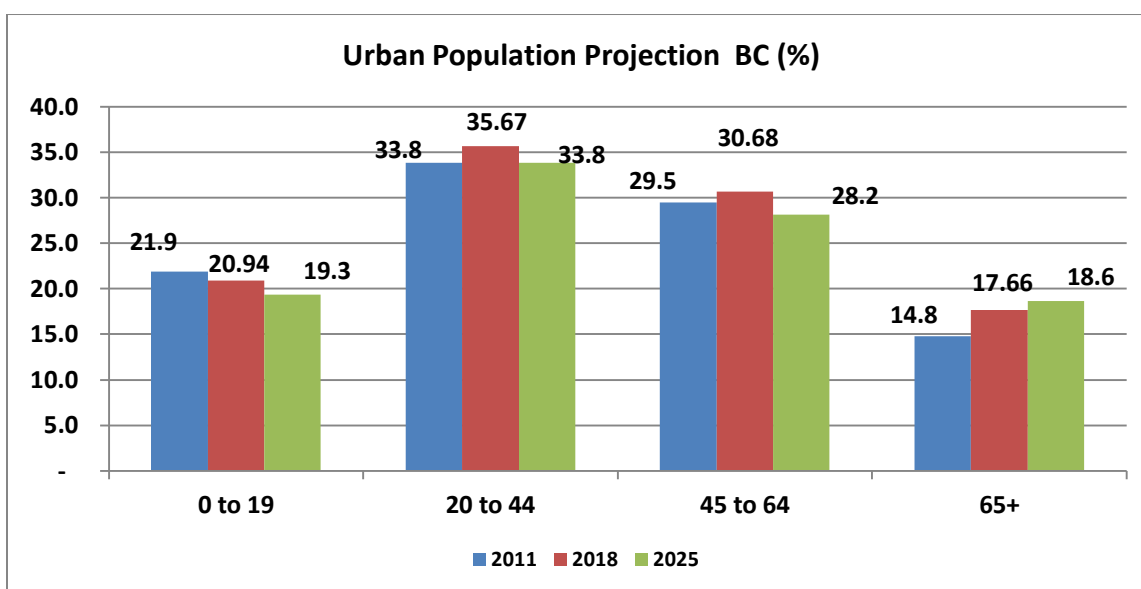
Figure 3.3: British Columbia's Future Urban Population



The share of individuals under the age of 20 is expected to decline from 21.9 percent in 2011 to 19.3 percent in 2025. The share of those in prime working age is expected to rise in the short-term but decline to its current level in 2025. This primarily reflects the in-migration of individuals in that age group during the forecast period. The share of persons aged 45 to 64 is expected to decline marginally during the projection period. The share of seniors is expected to rise from 14.8 percent in 2011 to 18.6 percent in 2025, an increase of about 3.8 percent.

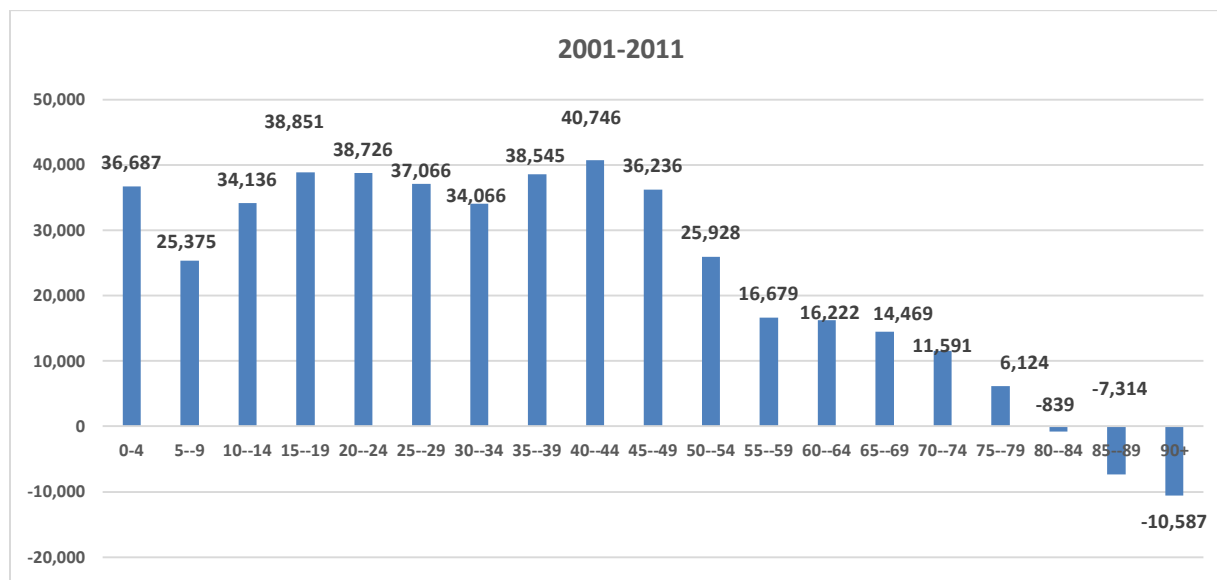
The slow aging of BC's population is partly related to the relatively low fertility rate in urban BC and partially influenced by the age structure of those who migrate to the province.

Figure 3.4: Age Structure of BC's Urban Population



The growing population in BC is primarily due to a significant in-migration that urban areas have been experiencing in the past. Net in-migration to the province during 2001-2011 is shown in Figure 3.5. It shows that urban BC experienced significant inflow of people in all age categories during 2001-2011. Overall, about 432,706 people appear to have migrated to BC during 2001-2011. Most of the newcomers are young. They come from other provinces, rural areas and other countries. The out-migration of those aged 80 and over can either be due to simply the out-migration of those in that age group from the province or it may be related to factors not explained by the average provincial mortality rates.

Figure 3.5: Net In-Migration to Urban British Columbia



Had it not been for the newcomers, BC's urban population structure would have been very different. To see the structure that would have emerged in the absence of migration, we used the province's 2011 population to forecast its future structure based on natural factors of fertility and mortality alone. The result is shown in Figure 3.6.

Figure 3.6: BC's Urban Population Structure in the Absence of Migration

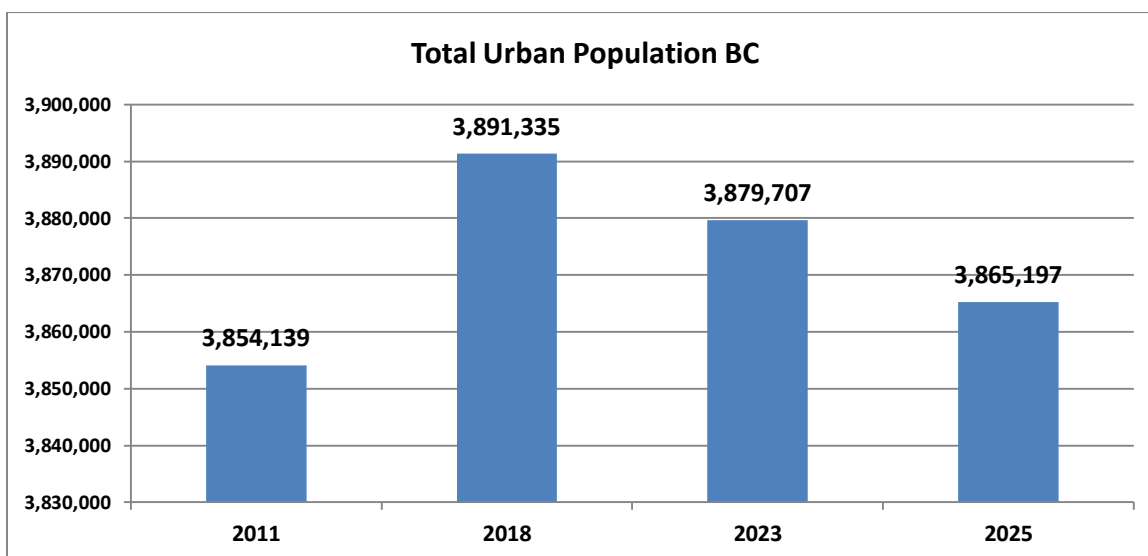
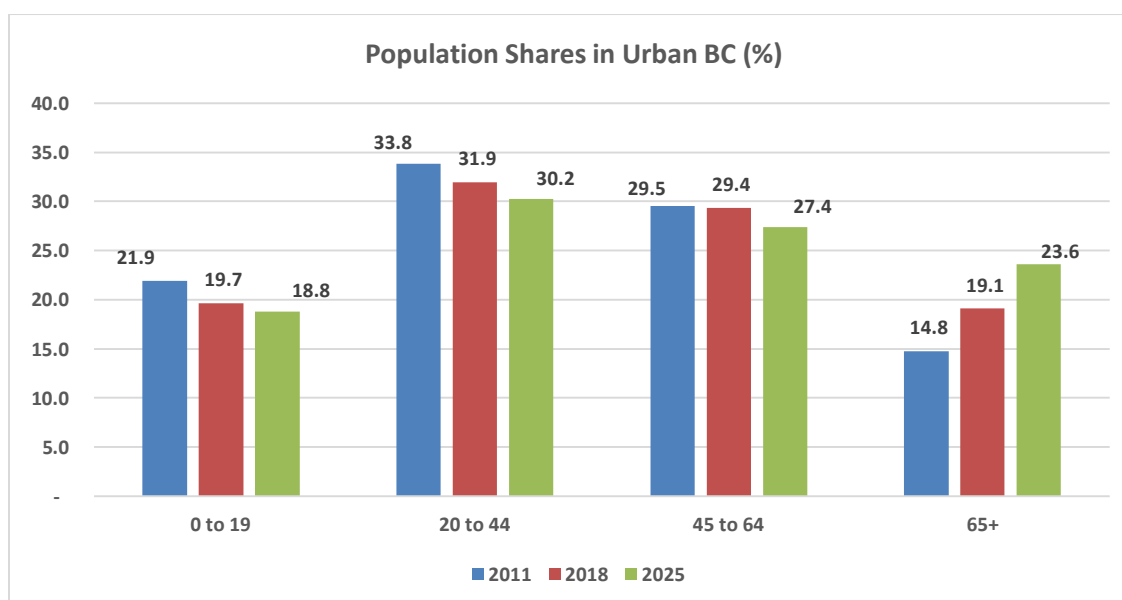


Figure 3.7 shows that under the scenario of zero net migration, the total population in urban BC would have started declining in the post-2018 era. BC's population in 2025 would be approximately equal to its 2011 level and declining thereafter. Comparing Figures 3.3 and 3.6, the total population in urban BC would be 528,128 fewer people in BC in 2025 in the absence of in-migration and immigration.

The age structure would have also changed considerably. Without migration flows, BC's urban population ages very rapidly. As shown in Figure 3.8, the share of individuals in all age categories except for seniors would have increased. The share of seniors would rise from 14.8 percent in 2011 to 23.6 percent in 2025, a rise of about 8.8 percent.

Figure 3.8: Aging of Urban Population in the Absence of Migration

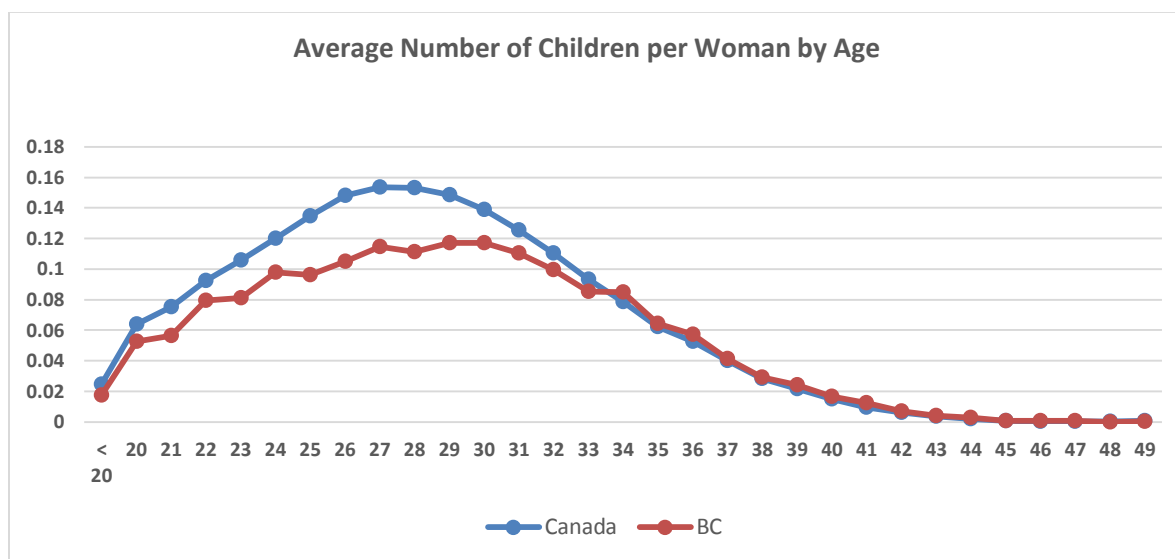


BC's Rural Population Structure

As shown in Table 2.4, BC's rural and small town population declined from 562,210 in 2001 to 545,918 in 2011, a decline of about 2.9 percent during 2001-2011 or 0.3 percent per year. This is in contrast to the total urban population that grew about 16.9 percent and the provincial population that grew about 14.0 percent during the same period.

The declining of BC's rural population is partly due to low fertility rates. As mentioned above, the total fertility rate in rural BC equals 1.76 which is below the generational replacement rate of 2.1. In fact, the fertility rate in rural BC is significantly lower than that in rural Canada (Figure 3.9). The horizontal axis shows the age groups and the vertical axis shows the average number of children per woman at a given age. On average, the total fertility rate in rural BC equals 1.76 compared to 2.11 in rural Canada in 2011.

Figure 3.9: Fertility Rates in Rural BC and Canada



It is interesting to explore factors explaining the slow decline of the rural and small town population in BC. According to Statistics Canada, the total population outside areas of at least 1000 population and a density of 400 or more people per square kilometre in BC rose from 597,885 in 2001 to 609,363 in 2011, a growth of about 1.92 percent or 0.2 percent per year. The evidence suggests that the dynamics of the rural population in BC are very different from those in urban regions. It has to be mentioned that the 2001 census data for the rural population in BC is different from the population data based on the sum of the population in CSDs designated as rural. We have used the latter data (562,210) which is greater as the basis for our projections.

Looking into the Future: Rural Population Projection for 2011-2025

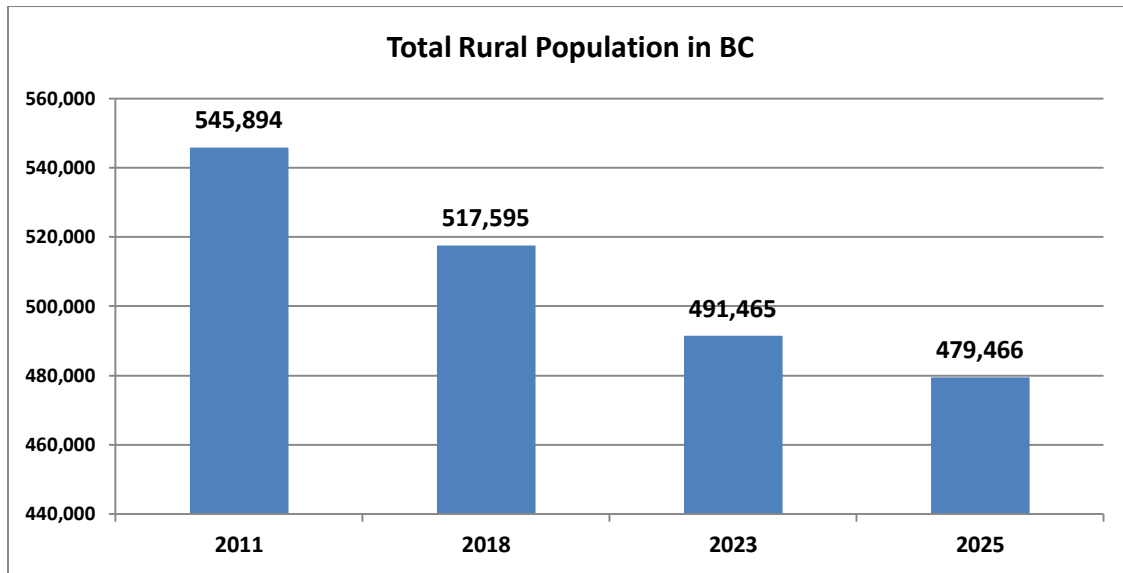
Using the demographic model discussed above, Table 3.2 presents population trends in rural British Columbia during 2011-2025.

Table 3.2: The Future Population of BC's Rural Areas

Age Category	2011	2013	2018	2023	2025
0-4	26,843	25,018	21,201	18,925	18,211
5--9	27,507	27,452	24,958	21,148	20,191
10--14	30,221	28,633	27,653	25,142	23,271
15--19	33,433	32,844	28,176	27,218	26,816
20--24	25,496	26,062	27,421	23,542	22,968
25--29	25,511	22,098	19,667	20,708	19,471
30--34	27,854	27,283	20,465	17,956	18,935
35--39	30,272	29,964	29,268	21,963	19,513
40--44	33,660	32,946	31,242	30,529	28,184
45--49	42,381	37,542	32,917	31,221	31,126
50--54	49,268	47,084	37,051	32,484	31,693
55--59	49,192	50,062	46,761	36,803	33,400
60--64	46,523	46,839	49,891	46,618	43,787
65--69	34,590	39,713	45,600	48,575	48,006
70--74	24,883	27,090	35,421	40,560	41,874
75--79	17,760	17,917	20,890	27,358	29,815
80--84	11,989	11,611	11,332	13,287	14,649
85--89	6,012	5,783	5,456	5,368	5,569
90+	2,499	2,451	2,225	2,060	1,987
Total	545,894	538,391	517,595	491,465	479,466

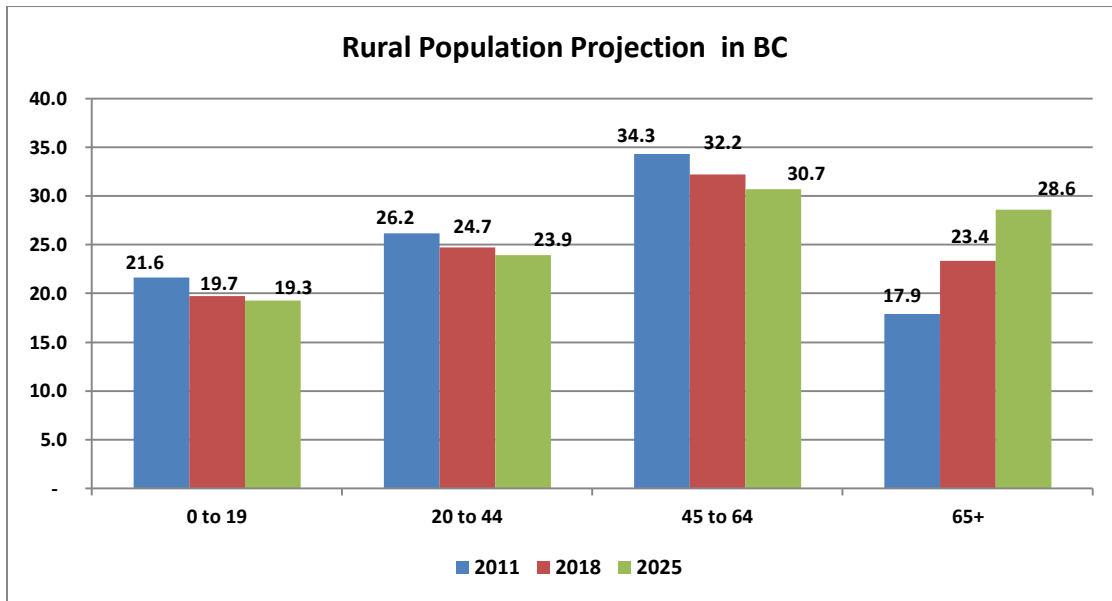
Assuming that the 2001-2011 trend will continue into the future, BC's rural population is expected to decline from 545,894 in 2011 to 479,466 in 2025, a decline of about 12.2 percent or 0.9 percent per year (Figure 3.10).

Figure 3.10: BC's Future Rural & Small Town Population



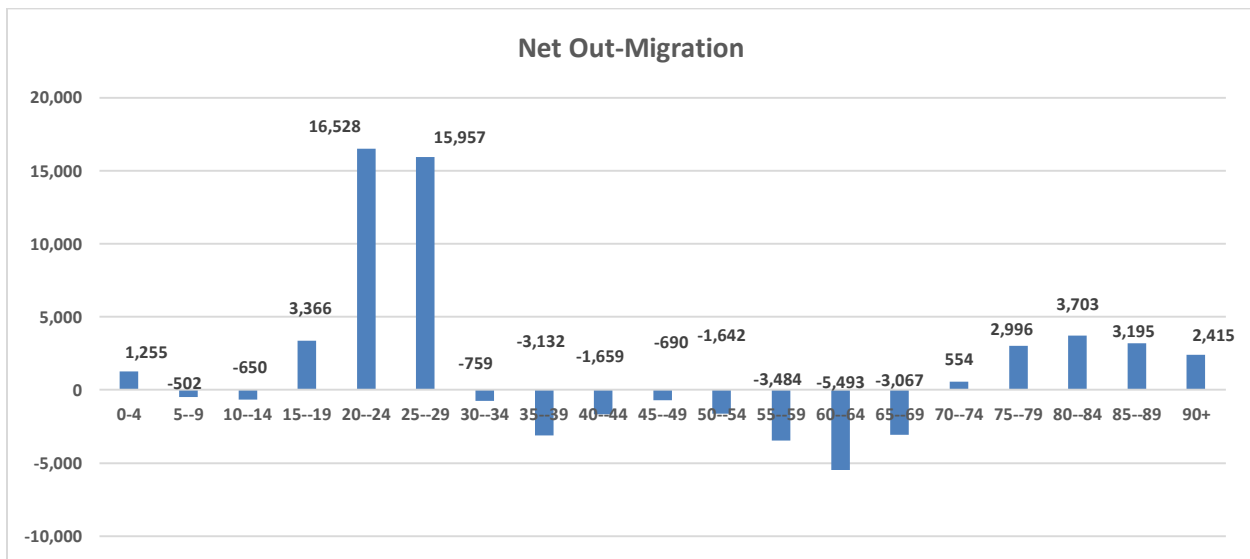
All age categories except for seniors will experience decline during the forecast period. The share of the population under 19 years of age declines from 21.6 percent in 2011 to 19.3 percent in 2025. Similarly, the share of those in prime working age of 20 to 44 and between 45 and 64 years of age declines from 26.2 and 34.3 percent in 2011 to 23.9 and 30.7 percent respectively in 2025. The share of seniors is expected to rise from 17.9 percent in 2011 to 28.6 percent in 2025, a rise of 10.7 percent.

Figure 3.11: Age Structure of BC's Rural Population



To examine the potential factor explaining the declining rural population in BC, we used the 2001 population to forecast its 2011 level assuming zero net migration flows. Comparing the actual 2011 population with the expected 2011 population in the absence of migration provides us with information regarding the level of migration by age during 2001-2011. Results shown in Figure 3.12 reveals that rural BC experienced both in-migration as well as out-migration during 2001-2011.

Figure 3.12: Net Out-Migration from Rural BC

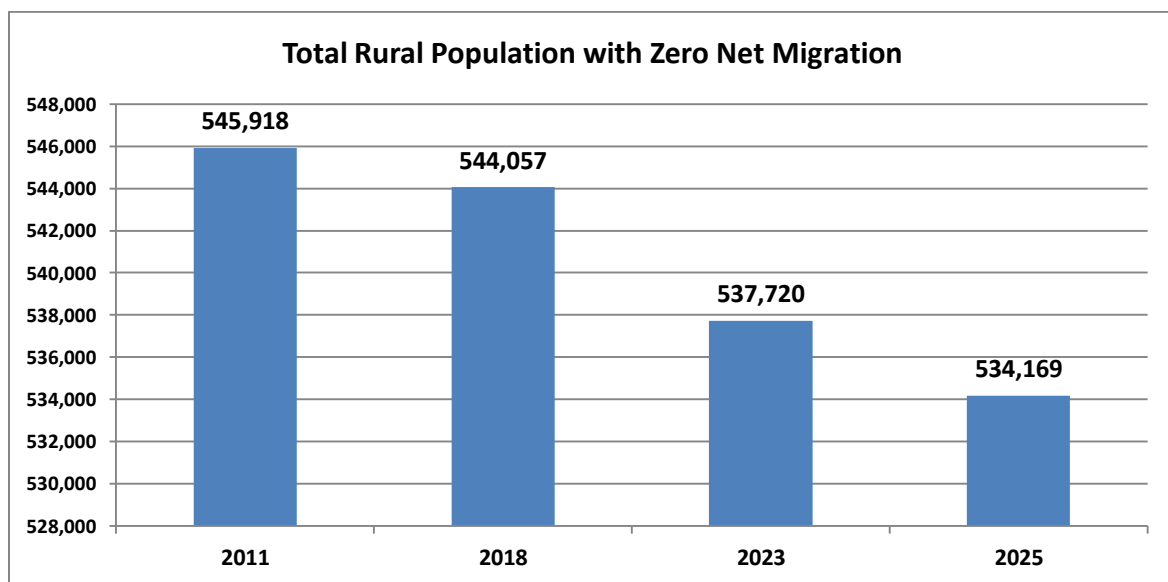


The largest group of movers are those between the ages of 20 and 30 years old. It is expected that the youth out-migrate in search of better employment opportunities in urban areas. However, this process leaves rural areas without the necessary human capital that is required if rural areas are to remain productive. In addition to the youth, the data shows some out-migration of seniors seeking better medical services in urban regions or following their young children to other regions.

The data suggests that BC's rural areas have also experienced net in-migration of individuals aged 30 to 69 years of age. Overall, the data suggests that about 28,891 people out-migrated from rural areas during 2001-2011. Some moved to urban regions within the province and some moved out of the province.

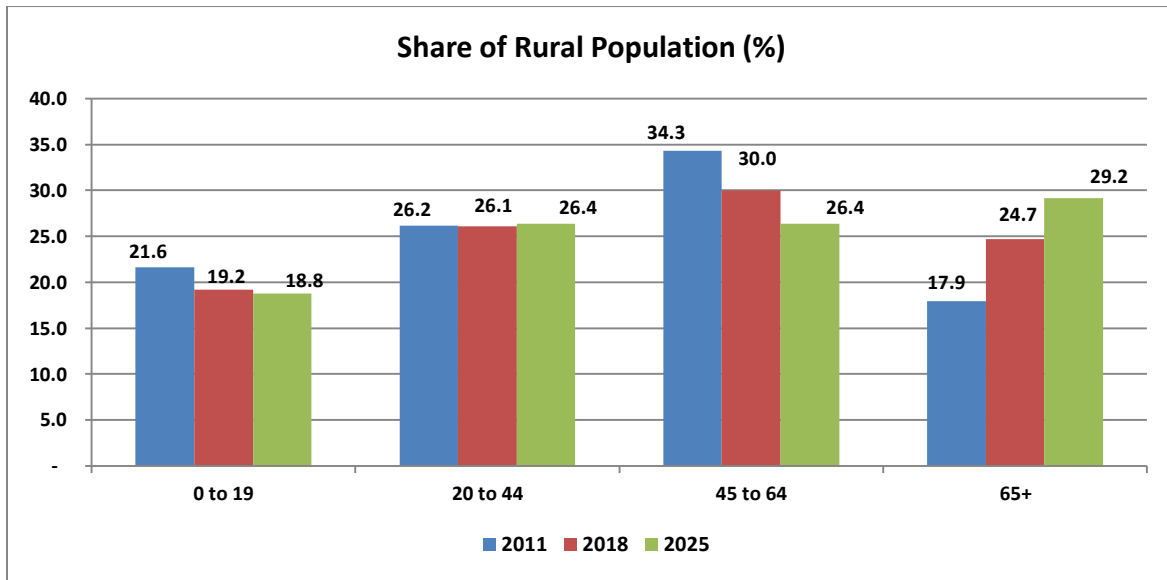
To investigate the structure that would have emerged in the absence of migration, we used rural BC's 2011 population to forecast its future structure based on natural factors of fertility and mortality alone. The results shown in Figure 3.13 suggest that had it not been for out-migration, BC's rural population would have declined slowly from its current level of 545,918 to 534,169 in 2025, a decline of 2.15 percent.

Figure 3.13: BC's Rural Population in the Absence of Migration



Without migration flows, BC's rural population would have declined and aged slowly. Figure 3.14 shows that the share of the population under 19 years of age would decline from 21.6 percent in 2011 to 18.8 percent in 2025. The share of individuals in their prime working age of 20 to 44 would have stayed relatively constant at 26.0 percent during the projection period. The share of the population aged 45 to 64 would have declined from 34.3 percent in 2011 to 26.4 percent in 2025. The share of seniors aged 65 years and over would have increased from 17.9 percent in 2011 to 29.2 percent in 2025, a rise of about 11.3 percent.

Figure 3.14: Aging of the Population in Rural BC in the Absence of Migration



PART IV: CONCLUDING REMARKS

The present report analyzes past, present and future demographic changes in rural and urban British Columbia. It examines various socio-economic characteristics of the rural and urban population and makes projections of their future demographic trends. The relationship between earnings and human capital composition of rural and urban regions are investigated and attempts are made to explain the existing earnings differences between rural and urban areas. The report focusses on four population groups, namely total provincial population, Francophone, Aboriginal and immigrant population and pays special attention to the degree of rurality.

The study shows that BC's population has increased from 3,859,345 in 2001 to 4,400,057 in 2011, a growth rate of about 14.0 percent. The urban population has increased from 3,297,135 in 2001 to 3,854,139 in 2011, a rise of about 16.9 percent. On the other hand, the rural and small town population declined from 562,210 in 2001 to 545,918 in 2011, a decline of about 2.9 percent. More importantly, the share of the rural population in the province has declined significantly in recent years.

Assuming that the 2001-2011 trends will continue into the future, BC's total population is forecasted to grow by 10.7 percent to 4,872,791 in 2025. The urban population is also expected to increase by about 14.0 percent during the projection period. The rural population, on the other hand, is expected to decline by 12.2 percent to 479,466 in 2025.

The study shows that the provincial population is aging. The share of individuals below the age of 20 has declined from 36.9 percent in 1971 to 20.9 percent in 2011 while the share of seniors rose from 9.3 percent in 1971 to 16.4 percent in 2011. Aging of the population is also reflected in rising median age in British Columbia from 27.8 in 1971 to 41.1 years in 2011. During the same period, the median age in Canada rose from 26.2 to 40.6 years. The median age is the age that divides a population into two numerically equal groups whereby half the people are younger than the median age and half are older.

The aging rural and urban population has significant budgetary implications for the province. An aging population affects the tax bases from which the provincial government draws revenue. It also impacts demand for government program expenditures such as health care. What healthcare related services will be essential to meet the requirements of a rapidly aging provincial population? How many doctors, nurses and other types of healthcare providers do we need to train to replace the aging healthcare providers while satisfying the growing demand for healthcare services? How much of specific types of services and facilities do we require? These are important questions that policy makers need to address in the coming years.

The study shows that the unemployment rate equals 6.6 percent in urban centres and rises as one moves away from population centres and towards rural areas. It reaches an average of about 19.2 percent in remote rural regions. The high rural unemployment rate is caused by a mismatch between the existing skills and those in high demand. Similarly, the labour force participation rate declines as the degree of rurality rises.

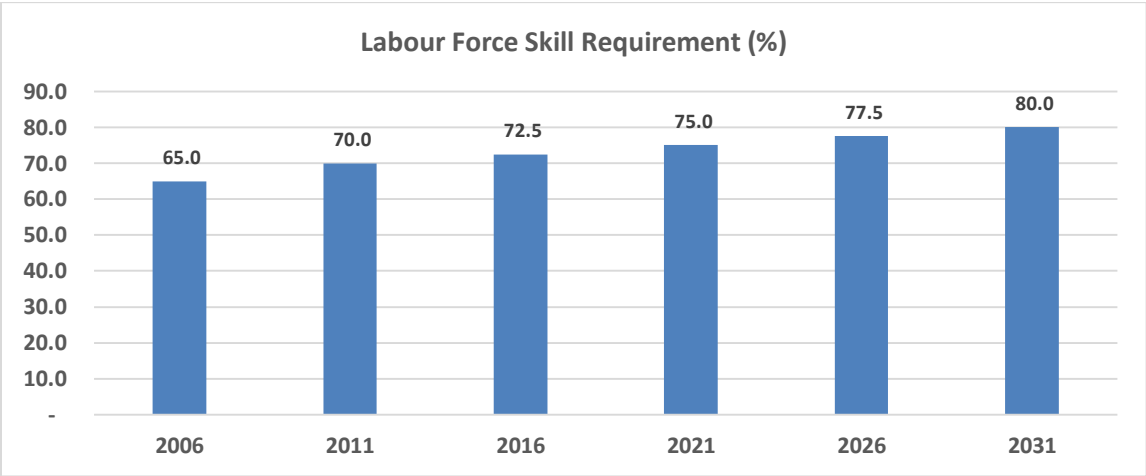
The study shows that the unemployment rate in rural areas is much higher than that in urban centres. Also, the dependency on government transfer payments is much higher in rural areas than in urban areas. There is a significant gap between the earnings of workers in rural and urban areas. Moreover, the average earnings is different among various population groups. The Aboriginal population appears to have the lowest average earnings in the province followed by immigrants and Francophones.

The study attempts to explain the existing earnings gap between rural and urban regions. For this, the report develops a human capital index for various population groups as well as for different rural and urban regions. The human capital index developed in this study reflects productivity levels associated with different levels of educational attainment. It is found that a significant share of the earnings gap is explained by differences in the human capital composition of the workers in different areas.

It is also found that the on-reserve and off-reserve Aboriginal people have the lowest human capital composition index indicating relatively low levels of educational achievement among various population groups. Also the human capital composition of the working age population declines significantly as the degree of rurality rises.

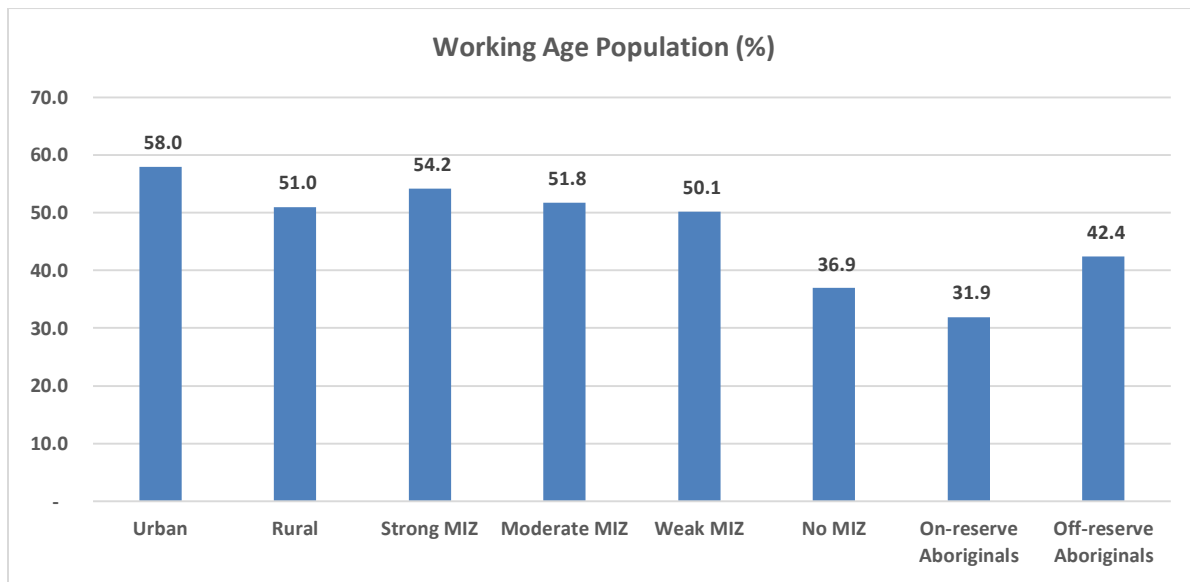
Based on various studies by the Ontario Ministry of Education, Human Resources and Skills Development Canada and other government agencies, Miner Management Consultants provides estimates of the percentage of new jobs requiring post-secondary education in the coming years (Figure 4.1).

Figure 4.1: Percentage of Jobs Requiring Post-Secondary Education



What is the actual skill availability of the working age population in urban and rural BC at the present time? How does it compare with the skill requirements shown in Figure 4.1? Using the 2011 National Household Survey and focusing on the working-age population aged 15 to 64, Figure 4.2 shows the percentage of the working age population who have postsecondary credentials. The skill levels in urban BC are very similar to that in Canada (57%).

Figure 4.2: Percentage with Post-Secondary Credentials in 2011



Comparing Figures 4.1 and 4.2 shows that the skill levels in rural areas of BC are significantly below the skill requirement in 2011. Continuation of this skill mismatch will result in what is referred to as people without jobs and jobs without people in rural BC in the coming years. This situation is especially critical when it comes to the Aboriginal people and those living in rural areas.

A recent survey of 150 chief executives of leading businesses in all sectors and regions in Canada reported that companies were unable to fill approximately 11,000 jobs during 2011-2013. BC ranked fifth in difficulty finding qualified workers after Alberta, Quebec, Ontario and Saskatchewan. Many of the respondents stated that they expect shortages to increase over the next five to 10 years as the population ages and the economy expands.³⁵

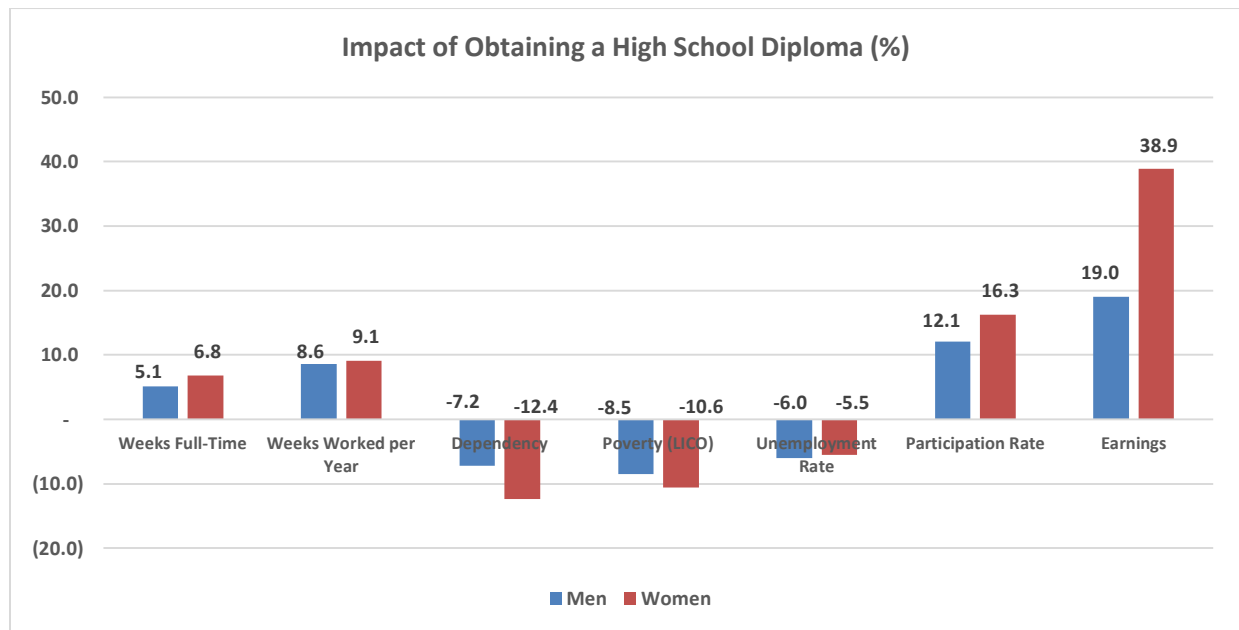
Given that the stock of human capital affects productivity and earnings capacity of the rural as well as urban population, one approach to maintaining or even increasing earnings and production capacity is to enhance productivity by increasing investment in education in rural areas. In fact, apart from increasing productivity and earnings, investment in education has significant positive social and economic consequences as well. The goal should be to reduce the gap between the human capital level in rural and urban BC and the skills requirements of the future jobs as shown in Figure 4.1.

A companion study to the present report shows that a higher level of educational achievement in BC increases the likelihood of working full-time weeks as well as increasing the number of weeks worked per year; lowers the probability of dependency on government transfers and 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. Higher level of schooling is also associated with higher productivity and earnings.

Figure 4.3 summarizes the impact of obtaining a high school diploma relative to those without a secondary certificate, on various socio-economic indicators for men and women in BC. Achieving post-secondary education also produced similar impacts.

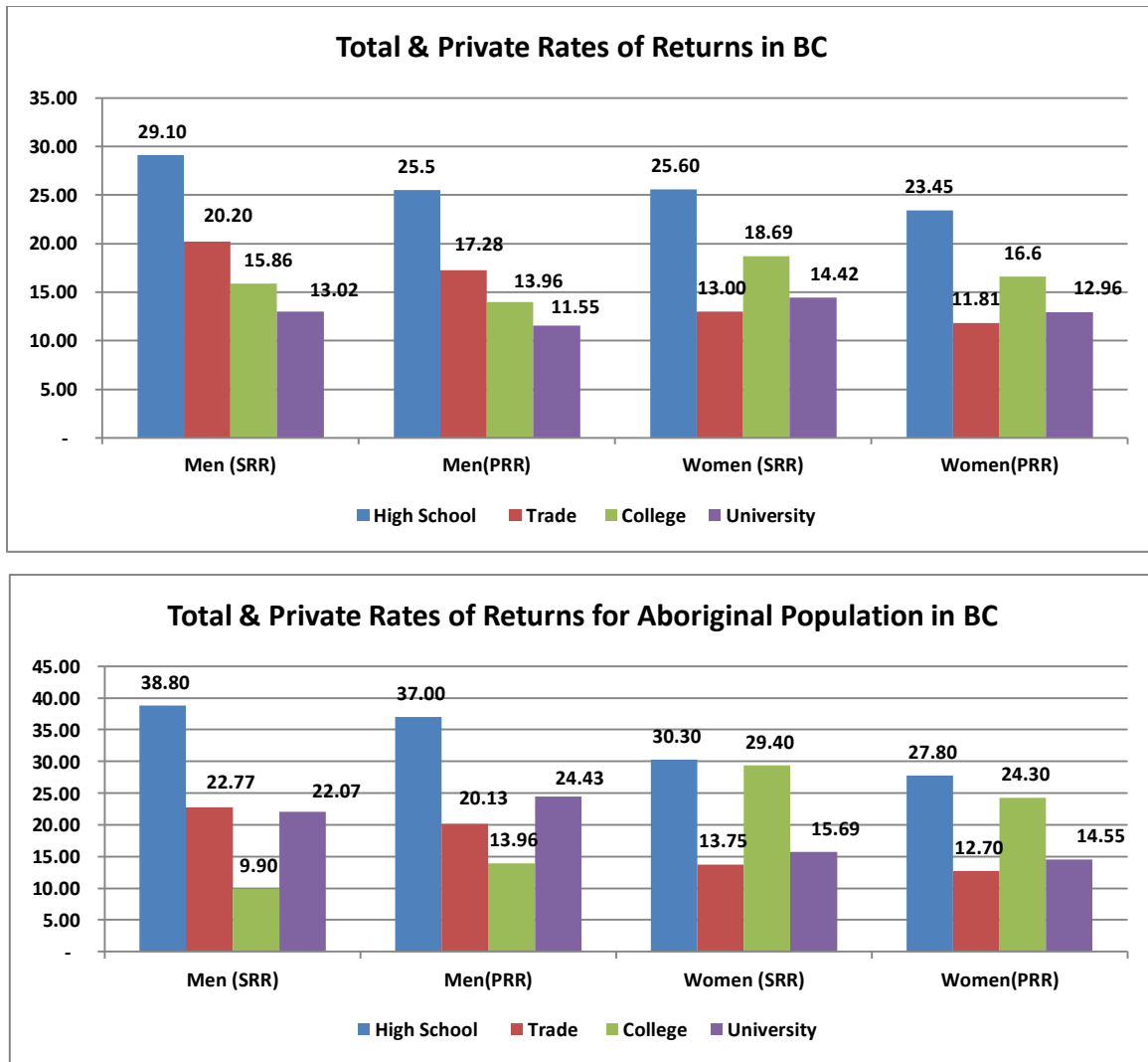
³⁵ The Canadian Council of Chief Executives, *Second Survey Report: Skills Shortages in Canada*, March 2014.

Figure 4.3: Percentage Change in Indicators (%)



Having found human capital as the main determinant of productivity, earnings and other socio-economic determinants of well-being, a companion study to the present report investigates returns to investment in education for men and women in BC. It is found that the rates of returns to investment in education are well above the returns for other forms of investment. This suggests that investment in secondary and post-secondary education yields relatively high ex-post rates of returns over and above the earnings foregone and length of time invested. The report finds that the rates of returns to investment in a high school diploma, trade and college certificate are higher for men. On the other hand, the returns to investment in a university education are greater for women. Figure 4.4 summarizes returns to investment in education for all men and women as well as for Aboriginal people in BC.

Figure 4.4: Internal Rates of Returns to Investment in Education



Although monetary returns may not be the only factor influencing the decision to pursue higher education, the above rates of returns are a useful indicator for prospective students as well as those involved in the education system. The above results have important policy implications emphasizing the importance of measures aimed at increasing secondary completion rates, especially in rural areas.

Finally, the present study shows that acquiring a secondary or post-secondary education offers substantial labour market advantage over those without a secondary certificate. Better labour market outcome includes higher earnings, lower likelihood of unemployment or underemployment and improved job quality. Technological change has resulted in a shift in demand for labour towards higher skilled workers relative to lower skilled ones. This has resulted in growing employment opportunities for better educated workers and declining demand for less skilled ones.