

The Impact of Migration on the First Nations Community Well-Being Index

Martin Cooke · Erin O’Sullivan

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Abstract Migration of First Nations people in Canada can affect social and economic conditions of First Nations communities in different ways. Overall levels of migration might cause challenges for infrastructure or service delivery, and selective in- or out-migration might have implications for community human capital. Seen through the lens of social capital, migration could be important for maintaining bridging connections to outside institutions and communities, but might also disrupt social bonds within the community. We investigated the relationships between migration and well being of Canadian First Nations communities using 5-year (2001–2006) census migration rates and the 2006 Community Well-Being Index (CWB), which measures labour market, educational attainment, income and housing conditions in First Nations communities. We found that, on average, both in-migrants to and out-migrants from First Nations had more education and higher incomes than non-migrants, but the difference was greater for out-migrants. This did not strongly affect CWB scores, however. Regressions of CWB scores on in-, out-, net, and gross migration rates, controlling for geography, found small positive effects of both in- and out-migration, as well as gross migration, on CWB scores.

Keywords Migration · First Nations · Aboriginal · Indigenous · Canada · Community well being

M. Cooke (✉)

Department of Sociology and Legal Studies & School of Public Health and Health Systems, University of Waterloo, 200 University Dr. W., Waterloo, ON N2L 3G1, Canada
e-mail: cooke@uwaterloo.ca

E. O’Sullivan

Strategic Research Directorate, Aboriginal Affairs and Northern Development Canada, Ottawa, ON K1H 0H4, Canada

1 Introduction

The social and economic well being of Aboriginal peoples in Canada is a longstanding concern. The approximately four percent of the Canadian population who identify themselves on the census as members of an Aboriginal group continue to have lower average educational attainment, income, and weaker labour force attachment than the non-Aboriginal population (Mitrou et al. 2014; Statistics Canada 2013a, b). Despite improvements in the proportions completing high school and university education in recent decades, the well being of Aboriginal peoples in Canada remains a major issue for Aboriginal and non-Aboriginal governments and therefore a challenge for research (White et al. 2007).

Of particular research and policy interest have been the conditions experienced by those living in the more than 630 First Nations communities in Canada, numbering about 314,000 people in 2011 (Statistics Canada 2013a). These First Nations communities¹ have unique and complex relationships with the Canadian federal government, defined over time by a combination of historical treaties, legislation and court decisions. First Nations vary greatly in size and geography, and represent more than a dozen major linguistic and cultural groups. Some have fewer than 100 members while others have more than 10,000. Some are very geographically isolated, with only fly-in or seasonal ice road access and others are adjacent to, or even located within, large Canadian cities. They also vary considerably with regard to their social and economic conditions, with some having employment rates comparable to other similarly sized Canadian communities, and other communities face greater challenges (O'Sullivan and McHardy 2007; White and Maxim 2007).

To facilitate research into the conditions in Aboriginal communities, researchers at Aboriginal Affairs and Northern Development Canada (AANDC) have developed a composite index of overall well being that would allow researchers to empirically examine the conditions in Aboriginal communities, including factors that appear to affect these well being scores and changes over time. The Community Well-Being Index (CWB) was created as a community-level index that would include some of the main dimensions of the United Nations' Human Development Index (HDI), and which could be calculated for Aboriginal and non-Aboriginal communities using census data (O'Sullivan and McHardy 2007). Like the HDI, the CWB includes income and education measures, but adds community labour force characteristics and housing indicators, which are available in the Canadian census. It has been calculated for census years 1981–2006 (O'Sullivan 2011), and the 2006 data are downloadable from the AANDC's website (Aboriginal Affairs and Northern Development Canada 2010).

The CWB has been used to examine the overall conditions in First Nations, Inuit, and Métis communities, and how these compare with other Canadian communities (O'Sullivan 2006, 2011, 2012; O'Sullivan and McHardy 2007; Sénécal and O'Sullivan 2006; Sénécal et al. 2008). This research has illuminated the disparity in average well being between First Nations and other Canadian communities, but also that there is a great deal of variability in conditions among First Nations communities, and that some score higher on the CWB than do many other Canadian communities (O'Sullivan and McHardy 2007).

¹ In this paper we use "First Nation" to refer to a community and also to refer to the Reserve territory occupied by that community. We use the term "Status First Nations" to refer to people who are registered under the Indian Act, a situation also known as having "Registered Indian Status."

One factor that might be important for understanding First Nations community well being is migration. Aboriginal migration, especially between First Nations and Canadian cities, has been an important issue in Canadian social research since the 1960s (Peters 2002).

Previous demographic work has focussed on estimating mobility rates, how these have changed over time, and the characteristics of First Nations migrants (e.g. Clatworthy and Norris 2007; Norris and Clatworthy 2011). There has been little empirical research relating migration to conditions in First Nations communities, however. Local economic and social conditions certainly play a role in potential migrants' decision-making, but it is also true that migration may have important effects on the conditions in First Nations communities. High rates of in- migration might strain local services and infrastructure, such as housing, for example, and in- or out-flow of highly educated people may affect the overall human capital of the community, either adding skills and expertise or acting as a "brain drain" to other communities. Even communities that do not experience large net in- or out-flows may be affected by high gross (total in and out) migration. Rapid turnover or population "churn" may make service delivery more difficult (Beavon et al. 2009; Clatworthy and Norris 2007), or may affect community "social capital" in the form of social and economic ties within the community, or between the community and other individuals or institutions (Mignone et al. 2007).

This research addresses the effects of migration on the well being of First Nations communities, as measured using the Community Well-Being Index (CWB). Using census 5-year migration data, we examined the relationships between in-, out-, net, and gross, migration rates and the CWB and its component indexes. We also examined the characteristics of in- and out-migrants on the CWB dimensions, and estimated the effects of migration to and from communities between 2001 and 2006 on the communities' measured CWB index and its component indices in 2006.

2 Background: First Nations Migration

On average, Aboriginal peoples are somewhat more mobile than is the general Canadian population. Clatworthy and Norris report that 20.1 % of all Aboriginal people in Canada changed residence between 1996 and 2001, compared with 16.5 % of non-Aboriginal Canadians. Status First Nations people were less mobile than Métis or non-Status First Nations, with 18.8 % having moved in that period (Clatworthy and Norris 2007). These rates reflect the importance of First Nations or "reserve" communities for many First Nations people. Before changes to the *Indian Act* in 1985, "Status", or registration under the *Indian Act*, was legally connected to membership in a First Nation, and therefore to the right to live in that community. Although many First Nations communities have since set their own membership rules, "Status" is still strongly connected with community membership (Clatworthy 2005). Roughly 98 % of residents in First Nations in 2011 were Status First Nations people, and about 49 % of Status First Nations people lived on-reserve in 2011 (Statistics Canada 2013a).

Most of the existing literature has been concerned with migration flows between First Nations reserves and urban areas, although that has not been the dominant direction of movement (Peters 2002). The Status First Nations population of Canadian cities has indeed grown considerably over the past few decades, such that 39 % lived in urban areas in 2006 (Statistics Canada 2008). However, most the growth of the urban population since the 1980s has been due to natural increase and to changes to the *Indian Act* in 1985, as well to

changing response patterns in the census, rather than to migration from First Nations reserves (Guimond et al. 2004). Indeed, census data reveal that migration of Registered Indians between reserves and cities tends to favour reserves, which were net gainers of migrants from the late 1960s to 2001 (Clatworthy and Norris 2007; Norris and Clatworthy 2011). Although rates have fluctuated, the general pattern has been of movement from rural and small urban areas to both reserves and larger cities, with reserves gaining relatively small numbers of net migrants. In addition to high gross migration, there is some evidence of return migration or circulation between First Nations and urban areas (Cooke and Bélanger 2006).

Migration is generally highly selective, although the nature of this selection varies with the direction of the flow. As with most other migration streams, rates are highest among young First Nations adults aged 19–25 (Norris et al. 2004). Migration from reserves to cities has tended to be stronger among women than men, particularly in the young adult ages of 20–29 (Norris et al. 2004). Cooke (2002) found that the probability of moving from a city to a reserve between 1986 and 1991 was highest among young men and older women, as well as among those with lower incomes. Educational attainment may also be important. In general, those with higher education may tend to move to urban areas, likely in order to access stronger labour markets (Clatworthy and Cooke 2001; Cooke and Bélanger 2006).

Evidence from the 1991 Aboriginal Peoples Survey found that employment and education were the reasons First Nations migrants most often cited for moving. Other important reasons that likely continue to be important include access to health care and a lack of housing, both in reserves and reserve and in urban areas (Clatworthy and Cooke 2001). Unsurprisingly, people also report moving to First Nations in order to be close to friends and kin, as well as to access cultural activities and traditional lands (Cooke and Bélanger 2006; Darnell 2011). Norris et al. (2004) suggest that these factors may also include a perception of reserves as a home base, and a “cultural hearth,” as well as the benefits available to Status First Nations living on reserves.

These findings support the observation that different people experience different push and pull factors, and that these are related to human capital and other characteristics (Norris et al. 2004). This selectivity of migration, based on age, education, gender and family status, mean that migration may change composition of communities of origin and destination. As discussed below, these may have direct and indirect implications for community well being and its measurement.

3 Connecting Migration and Community Well Being

The relationship between migration and community well being is clearly bidirectional and complex. On one hand, community conditions certainly affect migration flows. Taking a rational choice perspective on migration, Lee (1966) classically proposed that the decision to move or not involves the weighing of various factors associated with the areas of origin and destination. The negative “push” factors associated with the origin may provide the impetus to move, while positive “pull” factors may determine the destination. As with other communities, the conditions in Aboriginal communities, including available employment, social conditions, housing, and other factors clearly affect the decision to move.

Although migration decisions are made with regard to the relative conditions in the original and potential destinations, it is also true that migration has the potential to change

these conditions. There are several mechanisms by which this might happen, including the effects of the characteristics of migrants and the effects of migration itself.

One possible effect of migration on community well being is the direct effect of migration on the composition of the population. As described above, migrants tend to be different from non-migrants on a number of dimensions, including education, gender, and age. The changes in composition as a result of migration may have implications for the human capital and skills available in the community, and for local economic development. High rates of migration into a community, especially of individuals or families with particular needs, would likely challenge the available infrastructure. A net in-migration of families with young children would place additional demands on schooling and childcare, for example, potentially drawing resources from other programs. Furthermore, if community well being is measured using aggregate measures such as educational attainment or income, changes in the composition of the population through migration will have direct effects on those measures.

There are other ways migration may affect the well being of a community, less through the characteristics of migrants and more through the dynamics of migration and its implications for community networks and institutions. Population “turbulence” or “churn” that results from high mobility may make service delivery more difficult, and result in poorer outcomes. Beavon et al. (2009) found that Aboriginal people who make multiple moves may be less likely to complete educational programmes, for example. It has been speculated that migration may make the establishment of a cohesive urban Aboriginal community more difficult, thereby hindering delivery of social support to people who migrate to the city (Cooke 2002).

High migration, whether or not it leads to net population change, may also have implications for community social cohesion. These potential effects could be seen through the lens of social capital (Mignone et al. 2007). A well-used concept in the study of health and social development, social capital theories generally posit that the well being of individuals and communities can be enhanced by the degree to which they are connected to others through networks characterized by norms of reciprocity and trust (Veenstra et al. 2005). These networks, therefore, become social resources upon which individuals or communities can draw, in order to reach various goals (Poortinga 2006). Putnam (2000) identifies two distinct types of social capital. “Bridging” capital, is the benefit accessed through connections to networks that contain people who have resources that are unlike one’s own. “Bonding” capital characterizes networks among like individuals. Whereas bridging capital can yield benefits to people and communities by connecting them to various types of resources they may not have themselves, bonding capital may improve the ability of a community to act cohesively (Helliwell and Putnam 2004).

Migration may affect social capital and networks in a number of ways. One is the possible disruption of existing networks and weakening of the ties through which social capital flows. At the individual level, there is evidence that lower social capital might explain some of the negative relationship between migration and educational completion among children (Hagan et al. 1996). At the community level, a large population turnover or “churn” may result in communities in which members are less able to offer mutual social support, or to act cohesively in order to define and attain community goals, primarily by disrupting “bonding” social capital.

There is a more positive way of looking at the relationship between migration and community social capital. While migration may disrupt social networks, it is also a mechanism by which networks are maintained and strengthened (Brown 2002). More recent approaches to migration theory have tended to move from viewing migration

streams as the results of individual rational choices, and toward thinking of migration as part of a system. Migration systems are made up of places, people and institutions, connected through personal relationships and networks, as well as by migration itself (Boyd 1989). In the case of First Nations migration between reserves and cities, migration may be part of a system that involves reserve communities, institutions in the city, as well as individual migrants and families (Cooke and Bélanger 2006). Therefore, the connections made by migration, both between Aboriginal communities and between Aboriginal communities, cities, and other areas, may in fact improve communities' bridging social capital, and potentially increase their well being.

4 Research Questions and Hypotheses

A relationship between migration and the well being of First Nations communities may be explained in several different ways, as described above. However, it remains unclear whether an empirical relationship exists at all. The purpose of this research was to understand whether and how migration to and from First Nations communities was related to those communities' scores on the Community Well-Being Index (CWB). We had several hypotheses.

First, we expected that First Nations with higher overall with better community conditions, including higher average incomes, better housing conditions, higher average income, and higher labour force participation and employment to have higher in-migration and lower out-migration than communities with poorer conditions on these indicators. We expected that people would be "pulled" to communities with favourable conditions, and that they would be "pushed" from communities with low employment, low incomes, and poor housing. Second, we hypothesized that migration would reduce the measured CWB scores of communities, through the selectivity of migration. We expected that those who left First Nations communities would have higher educations and higher incomes than those who did not migrate, resulting in lower CWB scores. Third, we expected that high levels of population turnover, measured by high gross migration, would predict lower community well being.

Geography is also an important aspect of both migration and community socioeconomic conditions. First Nations communities are found across Canada, in rural and remote areas, in the sparsely populated regions north and close to large cities in the south. We expected that geographic proximity to urban areas would encourage migration to and from First Nations. Although high- and low-CWB First Nations are found in all regions, we also expected that remote First Nations may tend to have lower CWB scores, and that those closer to urban areas would benefit from having larger local labour markets. There are also systematic differences in First Nations CWB scores by geographic region, with First Nations in the Prairies and the Atlantic provinces having lower scores than in Ontario or British Columbia (O'Sullivan 2011). As these regions also have unique geographic and economic characteristics, it was therefore important that we control for both geographic isolation and region in the analyses.

5 Methods and Data

We used data from the Census of Canada for calculation of both the CWB index and community-specific migration rates. The census is the only reliable source of migration data for First Nations people and communities in Canada. As described below, custom

tabulations from the 2001 and 2006 Census, provided by Statistics Canada, were used to calculate the denominators for the migration rates. “Communities” were defined as Census Subdivisions (CSDs), and the Census Master File indicates whether CSDs are “Indian Reserves” or other community types.²

5.1 Calculating Migration Rates

The census migration data are based on the responses to the question, “Where did this person live 5 years ago, that is, on May 16, 2001?” which was asked on the Census 2B/D form distributed to 20 % of the general population, and to 100 % of reserve households (Statistics Canada 2010a). The Master File therefore has CSD of residence in 2006 and CSD of residence in 2001, allowing us to calculate the number of people who moved into and out of each CSD.

To calculate rates of in-, out-, net and gross migration for each CSD, we used the number of movers between 2001 and 2006 as the numerator and the average population of the CSD during the period as the denominator, in order to account for the change in population due to births and deaths, as well as migration (United Nations 1970). Using notation M_{ij} in which M is the number of migrants and the first subscript (i) indicates the origin CSD and the second subscript (j) indicates the destination CSD, the in-migration rate for CSD i is calculated as the number of migrants moving to the CSD during the period, divided by the population in 2006 plus half of the difference between the 2001 and 2006 populations³ (Eq. 1). The out-migration rate was calculated as in Eq. 2, using the number of migrants for whom CSD i was the CSD of origin in 2001 as the numerator. Net and gross migration rates were calculated using the difference between in- and out-migration and the sum of in- and out-migration, respectively.

$$IMR_i = \frac{M_i}{P_{i(2001)} + .5(P_{i(2006)} - P_{i(2001)})} \quad (1)$$

$$OMR_i = \frac{M_i}{P_{i(2001)} + .5(P_{i(2006)} - P_{i(2001)})} \quad (2)$$

5.2 Calculating the Community Well-Being Index (CWB)

As described above, the CWB includes measures on four dimensions: income, education, labour force and housing. Following the approach of the Human Development Index, indicators are scaled, based on their distance between theoretical minimum and maximum values, and each dimension is given an equal weight within an overall index.

The CWB income measure is the logarithm of average total individual income. Unlike most published income figures, total income is averaged for the total population in the CSD, including those with and without income. Following the HDI’s approach, log-income

² The data for these analyses were provided by Statistics Canada through the Research Data Centres program. The analyses and the conclusions are the authors’ alone and do not reflect the views of Statistics Canada or Aboriginal Affairs and Northern Development Canada.

³ The 2001 and 2006 populations were calculated from the Census 2A form, distributed to all Canadian households, and provided in custom tabulations by Statistics Canada. For a small number of CSDs, 2001 populations were not available. These were approximated by subtracting the number of children aged 0–4 in 2006, and the number of in-migrants between 2001 and 2006, from the 2006 CSD population and adding out-migrants.

is used to account for the decreasing marginal utility of income. The minimum and maximum values are \$2,000 and \$4,000, respectively (Eq. 3).

$$\text{Income Index} = \frac{\log(\text{per capita income}) = \log(\$2,000)}{\log(\$40,000) - \log(\$2,000)} \times 100 \quad (3)$$

The 2006 version of the CWB includes two education indicators. The first, “high school plus”, is the percentage of the population 20 and older that has at least a high school education ($\%HS_{20}$ in Eq. 4). This measure is given a weight of 2/3 in the Education Index and is included in order to reflect the importance of secondary education in the contemporary Canadian labour market. The second education indicator is the percentage of the population 25 and older with a university degree ($\%UNI_{25}$). Both are scaled between 0 and 100 %.

$$\text{Education Index} = \left[\left(\frac{\%HS_{20} - 0}{100 - 0} \right) \times \frac{2}{3} \right] + \left[\left(\frac{\%UNI_{25} - 0}{100 - 0} \right) \times \frac{1}{3} \right] \times 100 \quad (4)$$

The Labour Force Index includes two equally weighted indicators (Eq. 5). Labour force participation is measured as the percentage of the population 20–65 that reported working or looking for work ($\%LFP_{20-65}$) and employment rate is the number in that age range who were currently working, as a percentage of the total population ($\%EMP_{20-65}$).

$$\text{Labour Force Index} = \left[\left(\frac{\%LFP_{20-65} - 0}{100 - 0} \right) + \left(\frac{\%EMP_{20-65} - 0}{100 - 0} \right) \right] \times 100 \quad (5)$$

The fourth dimension, housing, also includes two measures and they are combined in the same way as the labour force index. The measures are of housing *quantity* (the percentage of the population living in dwellings that contain no more than one person per room) and housing *quality* (percentage of the population living in dwellings that are not in need of major repairs).

The average of these four dimensions is the overall index score, which also ranges from 0 to 100. For reasons related to confidentiality and the stability of estimates, the CWB is only calculated for CSDs with a population of at least 65 in the census, including Reserve and Inuit communities, and “other” Canadian communities (O’Sullivan 2011). For the present analysis, 533 First Nations communities were included.

As described above, First Nations scored significantly lower than other Canadian communities, in terms of the average CWB score, but there was a lot of variability. First Nations CWB scores ranged from 39 to 77, with an average score of 57 and standard deviation of 10.3. Non-Aboriginal communities ranged from 64 to 87, with an average score of 77.0 and standard deviation of 5.9.

5.3 Geographic Isolation

To include a measure of geographic isolation, we used O’Sullivan’s approach of taking the population of all CSDs within a 25 km radius of the CSD as a measure of the “proximate population” (O’Sullivan 2012). This measure provides a reasonable proxy for the nearness of labour markets and various amenities, and is an alternative to the use of Statistics Canada’s “Metropolitan Influence Zones”, which may not be appropriate for Aboriginal communities. Proximate population data were derived using geographic and population data provided by Statistics Canada and were merged with CSD-level migration and CWB

data by CSD code. This was done for the 533 First Nations reserves CSD and 3849 “Non-Aboriginal” communities, defined as CSDs that were neither First Nations reserves nor Inuit communities.

5.4 Analyses

The analysis was conducted in four stages. First, descriptive analyses of data were conducted including, (a) examination of migration rates for high, medium, and low-scoring communities on the CWB indices, and (b) scatterplots and other visual analyses of relationships between CWB indicator scores and net and gross migration rates.

Second, we examined the various characteristics of in- and out-migrants to and from communities, and compared them to the characteristics of non-migrants in the same CSDs. This included examination of migrants’ and non-migrants’ educational attainment, total income and employment income to assess whether, on average, those moving into or out of communities between 2001 and 2006 were different on these dimensions from those who remained in those communities over the whole period.

The third step addressed the question of whether the characteristics of migrants had an effect on the measured well being of communities. CWB scores for 2006 were adjusted for migration by “removing” those who had moved into communities between 2001 and 2006. Similarly, those who had left communities during the period were “replaced” in the communities they had left. This approach allowed us to measure the degree that CWB scores were affected by the characteristics of migrants.

Fourth, ordinary least squares (OLS) regression models were used to test whether in-, out-, net or gross migration had statistically significant effects on the CWB and its components. These models included controlled for the effects of geographic isolation and were estimated at the national level and for separate geographic regions.

6 Results

6.1 Five-Year Migration Rates by CWB Index Category

For the first analyses, communities were divided into those with “low”, “medium”, and “high” CWB and component index rates. These cut-offs were identified empirically; the communities with index scores within one standard deviation of the mean score were defined as having “medium” scores, and those with index scores greater than one standard deviation above or below the mean were defined as having “high” and “low” index scores, respectively.

Table 1 presents the average in-, out-, net and gross migration rates for the 533 First Nations communities with sufficient data to calculate a CWB score for 2006, categorized by their scores on the overall CWB and also its sub-indices; the Income Index, the Education Index, the Housing Index and the Labour Force Index. For comparison, average migration rates are also shown for the 3,849 non-Aboriginal CSDs. At the community level, there was somewhat higher in-migration to, and out-migration from, First Nations compared with non-Aboriginal communities. Averaged over the 533 communities, the average five-year in-migration rate to First Nations was 23.3 people per 100 residents, between 2001 and 2006, compared with 21.8 for non-Aboriginal communities. However, there was a considerably lower out-migration rate from First Nations; 6.8 compared with 16.8 for non-Aboriginal communities. The result was that, on average, First Nations were

Table 1 Average 2001–2006 migration rates for First Nations by CWB index score category

	Mean migration rate (SD)			Net migration
	In-migration	Out-migration	Gross migration	
Community well-being index				
Low (0–47.1, N = 95)	21.48 (6.75)	5.93 (6.94)	27.41 (9.67)	15.56 (9.68)
Medium (47.1–67.6, N = 348)	23.34 (10.64)	6.53 (10.39)	29.86 (14.54)	16.82 (15.19)
High (67.7–100, N = 90)	25.33 (7.80)	8.56 (10.04)	33.88 (13.60)	16.77 (11.77)
Income index				
Low (0–42.1, N = 80)	26.06 (14.33)	6.12 (6.75)	32.18 (15.96)	19.93 (15.72)
Medium (42.1–68.1, N = 370)	22.34 (8.47)	5.92 (9.96)	28.26 (12.85)	16.42 (13.29)
High (68.1–100, N = 83)	25.21 (8.36)	11.14 (10.63)	36.35 (13.41)	14.07 (13.63)
Education index				
Low (0–21.0, N = 97)	20.61 (7.33)	5.01 (6.10)	25.62 (9.36)	15.59 (9.71)
Medium (21.1–46.1, N = 335)	23.65 (10.51)	7.16 (10.78)	30.81 (14.72)	16.49 (15.38)
High (46.1–100, N = 101)	24.96 (8.11)	7.13 (9.27)	32.09 (13.16)	17.84 (11.43)
Housing index				
Low (0–54.6, N = 91)	22.00 (6.51)	4.98 (6.49)	26.98 (8.87)	17.03 (9.51)
Medium (54.6–84.9, N = 354)	23.28 (10.50)	6.98 (9.58)	30.26 (14.17)	16.29 (14.25)
High (84.9–100, N = s88)	25.00 (8.66)	7.71 (13.03)	32.72 (15.58)	17.29 (15.71)
Labour force index				
Low (0–62.2, N = 89)	21.76 (12.76)	5.86 (8.86)	27.62 (14.67)	15.89 (16.36)
Medium (62.2–79.9, N = 352)	23.01 (8.98)	6.27 (8.77)	29.28 (12.75)	16.73 (12.36)
High (80.0–100, N = 92)	26.16 (8.13)	9.50 (13.49)	35.66 (15.20)	16.67 (16.28)
All First Nations (N = 533)	23.34 (9.66)	6.76 (9.82)	30.10 (13.75)	16.58 (13.80)
Non-aboriginal communities (N = 3849)	21.82 (10.63)	16.83 (12.48)	38.66 (17.77)	4.98 (14.88)

Categories appear to overlap because CWB high, medium and low range cutpoints are rounded

net gainers of 16.6 migrants per 100 residents over the period, while non-Aboriginal communities gained about 5 per 100, on average. Non-Aboriginal communities had higher gross migration, with 38.9 migrants per 100 residents, compared with 30.1 for First Nations communities.

Categorizing First Nations by their CWB and sub-index scores, we see that the general pattern was one of higher-scoring communities having higher rates of in- and out-migration, and therefore higher gross migration. The exception to this was the Income Index, for which communities in both the low and high index score categories had higher in- and out-migration than those in the medium category (Table 1). However, note that the high variability of community migration rates meant that the differences in average migration rates across index score categories were generally not significant.

6.2 Characteristics of In-and Out-Migrants

The census data allowed us to examine the income and education characteristics of those who had moved *to* First Nation communities between 2001 and 2006 and those who had moved *from* First Nations communities in that period. One major limitation of this is that the 2006 census recorded income for 2005 and educational attainment at the time of the census, and we therefore do not know how these characteristics may have changed as a result of moving. Nonetheless, knowing the 2006 characteristics of in- and out-migrants does provide us some insight into whether migration is contributing to an in- or out-flow of human capital from First Nations.

Figure 1 shows a comparison of migrants' and non-migrants' scores on the two CWB education indicators; having high school or higher education for those 20 and older, or having a university degree for those aged 25 and older. In order to answer the question of how migration might affect the composition of communities, we calculated the difference between migrant and non-migrant scores for each CSD, and averaged them for the two community types.

Figure 1 therefore shows the average difference in education between migrants and non-migrants for First Nations communities, and for other Canadian communities. We found both in- migrants and out-migrants to First Nations had higher education attainment than non-migrants. On average the difference between the percentage of in-migrants to a First Nation who had high school or higher education and the percentage non-migrants with the same educational attainment was 12.5 % points. Similarly, the difference in the percentage with university degrees was 7.7 % points, favouring in-migrants. Although in-migrants tended to have higher education than non-migrants, the difference was even greater among out-migrants. Among First Nations, the average difference in the percentage of out-migrants and non-migrants with high school or higher was 20.1 % points. The average difference in the percentage with university degrees was 8.7 % points. Comparing this to non-Aboriginal communities, we find similar, but less dramatic effects.

Figure 2 shows a similar analysis, examining differences in income between migrants and non-migrants. Although the CWB includes only total income, we also examined employment income, which reflects migrants' labour force connection. On average, both in- and out-migrants to First Nations had higher 2005 incomes than non-migrants. This was more the case for out-migrants, who had total income that was on average about 136 % of non-migrants' in those First Nations, than for in-migrants, whose total income was 108 % of non-migrants'. The somewhat higher differences for employment income likely reflect migrants moving both to and from First Nations in pursuit of employment opportunities. By comparison, total income and employment income of in-migrants to non-Aboriginal

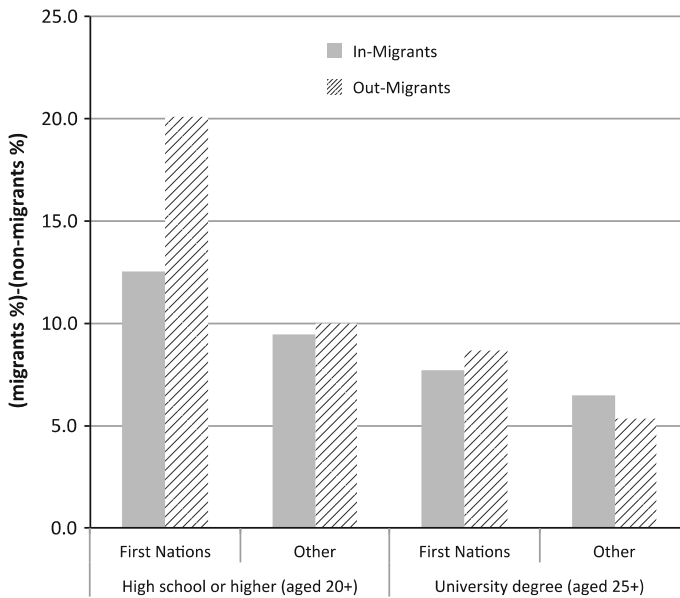


Fig. 1 Average difference between migrants' and non-migrants' educational attainment scores, First Nations and other Canadian communities. Calculated by first calculating the differences for each CSD, and then averaging the differences across CSD types

communities was slightly lower than non-migrants in those communities, and the income difference between out-migrants from communities and those who remained was not as high as in First Nations.

6.3 Effects of Migration on CWB Scores

Although it is useful to examine the characteristics of in- and out-migrants to a community, the effects of these characteristics on community well being will of course depend on the amount of migration that takes place as well. Being able to identify people who had moved into or out of a CSD allows us to “adjust” a community's CSD scores for both in- and out-migration. Figure 3 shows the average change that took place in the overall CWB scores of communities by this adjustment. In this case, positive differences mean that the index scores were *increased* by in-migration and negative differences mean that communities' scores were *reduced* by in-migrants.

For both First Nations and non-Aboriginal communities, in-migrants reduced community's CWB scores, by an average of .67 for First Nations and .21 for non-Aboriginal communities (Fig. 3). Examining the sub index scores, it is clear that the income index is responsible for much of this. As we saw in Fig. 2, those who moved into communities tended to have higher incomes than did non-migrants who lived in those communities for the full period. Once the amount of migration into those communities was considered by re-calculating the CWB scores with in-migrants removed, we see that the average effect of in-migration for communities was to reduce the observed 2006 Income Index by 3.31 points (Fig. 3). On the other hand, in-migration improved the observed 2006 educational attainment index by an average of 1.15 for First Nations and 1.43 for non-Aboriginal communities.

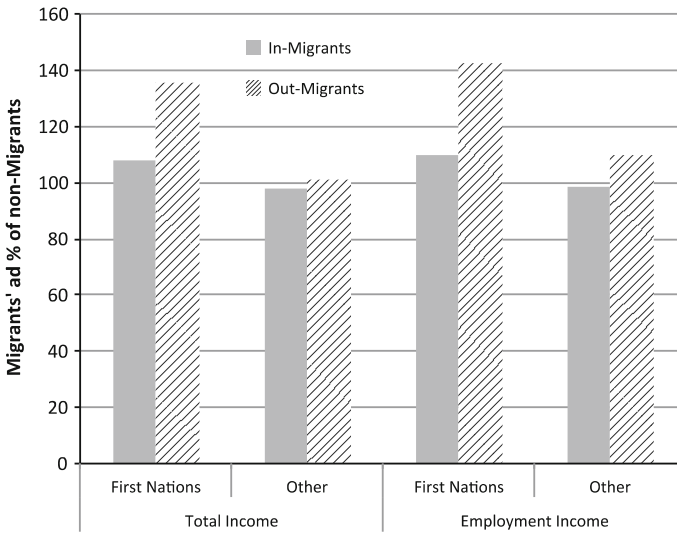


Fig. 2 Average migrants' income as % of non-migrants' income, First Nations and other Canadian Communities. Calculated by first calculating the differences for each CSD, and then averaging the differences across CSD

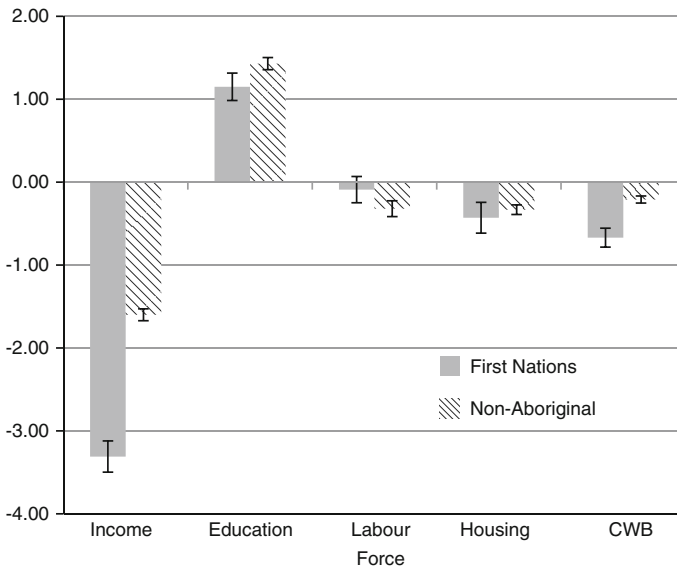


Fig. 3 Average change in CWB Scores after removing 2001–2006 in-migrants. Error bars show 95 % confidence interval. Positive differences indicate CWB is increased by in-migration

As we mentioned above, the census captures characteristics after migration, and so it is impossible to know whether these in-migrants' incomes or educations changed as a result of their moving into First Nations communities. This is likely a bigger problem for the income measure than for education. The labour force and housing indicators have similar

problems, as an individual's housing conditions or labour force participation may change as a result of a move in either direction. Moreover, we might expect people to choose not to move to communities in which employment is scarce or housing quality or quantity is low. Nonetheless, the results shown in Fig. 3 provide some indication that for most First Nations, movers to the community tended to be people living in adequate housing, and were more likely to be employed or in the labour force than those who were already there. As Fig. 3 shows, the effect of in-migrants was to increase the First Nations housing Index by 0.43 and the Labour Force Index by 0.09. The effect of in-migration for non-Aboriginal communities was to increase the Housing Index by 0.33 and the Labour Force Index by 0.32.

Figure 4 presents a similar analysis for out-migration. In this case, positive differences mean that the CWB and component index scores were *reduced* by out-migration. For each of the sub-index scores and the overall CWB, the average effect of out-migration on communities was to reduce measured well being. In this case, the higher average incomes of out-migrants from First Nations communities resulted in a reduction of the Income Index by 0.82, more than twice that of more than the effect in non-Aboriginal communities (0.40). The Labour Force and Education Index effects were similar for both types of communities, but the effect of out-migration on the housing indicator was once again much higher for First Nations (0.78), compared with non-Aboriginal Communities (0.09). The average effect of out-migration was to reduce the CWB scores of First Nations communities by 0.68 and of non-Aboriginal communities by 0.45.

The analyses shown in Figs. 3 and 4 would suggest that the average effect of both in- and out migration on First Nations' CWB scores tended to be negative. Although in-migration improved First Nations' educational attainment index scores on average, out-migration also tended to reduce it, although to a lesser amount. Note that the CWB's index scales range from 0 to 100, and the average CWB score for a First Nation community in 2006 was 57. The effects observed were all therefore very small. If we consider a change in CWB score of 5 or more to be substantial, only three of the First Nations CSDs had their overall CWB scores increased or decreased by this amount. Moreover, considering the scale, these small effects of migration were essentially the same for both First Nations and non-Aboriginal communities.

6.4 Regressions of CWB Scores on Migration Rates

As a final analysis, we regressed CWB and component index scores on migration rates in order to estimate the average effect and to include some limited control for geography.

We present two sets of models. Table 2 shows basic parameters and model fit for regressions of CWB scores on in-, out-, net-, and gross migration rates, controlling for the log of the Isolation Index, which is the sum of the populations of the CSDs within 25 km of a community. In-migration, out-migration and gross migration rates each had significant positive relationship with CWB Index scores for First Nations. The log-isolation parameters were also positive, indicating that First Nations near to larger populations tended to have higher CWB scores, independent of migration. The effects of migration, controlling for isolation, were not at all strong. An increase in the in-migration rate of 1 person per every 100 living in the community would be associated with a 0.09 increase in CWB score. Increasing in-migration by one standard deviation (9.66) would therefore increase the predicted CWB score by only 0.87. The predicted effect of out-migration is also positive, but slight (0.16). Net migration (in-out) had no significant effect. Gross migration also had a small positive effect (0.12). Migration and isolation did a poor job of accounting for the variance in CWB scores of First Nations.

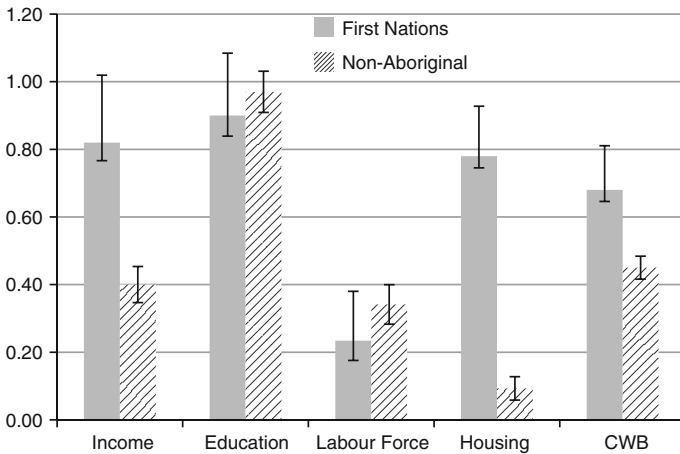


Fig. 4 Average change in CWB scores after adding 2001–2006 out-migrants. Error bars show 95 % confidence interval. Positive differences indicate CWB is decreased by out-migration

Table 2 OLS regressions of First Nations CWB scores on In-, Out-, Net and gross migration rates, controlling for geographic isolation

	In-migration		Out-migration		Net migration		Gross migration	
	B (SE)	Sig.	B (SE)	Sig.	B (SE)	Sig.	B (SE)	Sig.
Constant	39.42 (2.57)	0.000	39.51 (2.46)	0.000	41.31 (2.47)	0.000	37.62 (2.56)	0.000
Migration rate	0.09 (0.04)	0.046	0.16 (0.04)	0.000	-0.04 (0.03)	0.240	0.12 (0.03)	0.000
Log (isolation)	2.84 (0.59)	0.000	4.06 (0.58)	0.000	4.03 (0.59)	0.000	3.88 (0.58)	0.000
R ²	0.086		0.102		0.082		0.107	
N	533		533		533		533	

In the second set of models, separate regressions were estimated for each of eight provinces or regions. These models are summarized in Table 3. Here we see that the only sizable effect of in-migration was seen for First Nations in the Atlantic region, for which the in-migration parameter was 0.34. For each of the other regions this effect was either very small or statistically insignificant. Significant out-migration effects were slightly larger, ranging from 0.31 to 0.45. Net migration did not have a significant association with SCB score in any region. Gross migration rates were significant in five of the eight regions, with positive effects ranging from 0.12 in British Columbia to 0.38 in the Territories (Table 3).

7 Discussion and Conclusions

The purpose of this paper was to examine whether migration appears to be related to the Community Well-Being Index (CWB) scores of First Nations. Previous research had used the CWB to examine the overall well being in First Nations communities, and other literature had suggested that migration might be an important factor for understanding communities’ housing and labour market conditions. We hoped to identify whether there

Table 3 Regional regressions of migration rates on First Nations 2006 CWB index scores

	In-migration				Out-migration			
	Constant	B	SE(B)	R ²	Constant	B	SE(B)	R ²
Atlantic (N = 31)	61.6	0.34	0.14	0.03	62.6	0.45	0.16	0.21
Quebec (N = 32)	55.5	0.24	0.30	0.02	59.7	0.04	0.38	0.00
Ontario (N = 99)	29.3	0.10	0.11	0.00	61.2	-0.17	0.14	0.01
Manitoba (N = 64)	40.6	0.01	0.17	0.08	46.3	0.31	0.14	0.07
Saskatchewan (N = 78)	46.7	0.02	0.06	0.03	47.0	0.31	0.11	0.10
Alberta (N = 50)	53.8	0.05	0.15	0.02	20.0	0.11	0.11	0.02
British Columbia (N = 144)	56.7	0.03	0.07	0.06	61.3	0.07	0.05	0.01
Territories (N = 35)	59.1	0.30	0.17	0.09	60.8	0.34	0.12	0.21

	Net migration				Gross migration			
	Constant	B	SE(B)	R ²	Constant	B	SE(B)	R ²
Atlantic (N = 31)	65.9	-0.08	0.11	0.02	57.9	0.25	0.10	0.17
Quebec (N = 32)	57.9	0.16	0.26	0.01	56.6	0.13	0.21	0.01
Ontario (N = 99)	58.5	0.10	0.09	0.01	61.2	-0.03	0.08	0.00
Manitoba (N = 64)	48.8	-0.02	0.12	0.00	40.6	0.29	0.10	0.13
Saskatchewan (N = 78)	49.2	0.00	0.06	0.00	44.5	0.13	0.05	0.08
Alberta (N = 50)	52.5	-0.11	0.08	0.04	50.1	0.02	0.10	0.00
British Columbia (N = 144)	61.2	0.03	0.04	0.00	58.0	0.12	0.04	0.05
Territories (N = 35)	67.0	-0.10	0.10	0.03	51.3	0.38	0.09	0.35

Ordinary least squares regressions. Bold indicates migration parameter is significant at $P \leq 0.05$

were observable effects of migration on the measured well being of First Nations communities.

On the whole, we found that there was little observable relationship between migration and measured well being. Communities with high, medium, or low CWB scores did not differ systematically in terms of their in-, out-, net- or gross- migration rates. Migrants moving both into and out of First Nations tended to have higher incomes and educations than those who remained, although the difference was greater for out-migrants. When we adjusted CWB scores for in- and out-migrants, we found that both adjustments reduced the average CWB scores, but that these effects were small. The regressions of CWB scores on migration found some weak positive effects of in-, out-, and gross migration, but no effects of net migration. This suggests that the overall effects of migration and also of population “churn” or turnover might be positive.

This is a somewhat surprising finding. We had generally expected that migration would have a more pronounced negative effect on First Nations community well being, through the effects of either a “brain drain” of more highly educated members, or a return of members with lower education or skills, and possibly higher needs. We also expected that population growth through net migration, or gross migration or turnover might reduce well being. None of these were strongly supported.

These results should be interpreted as exploratory and a first step to understanding the relationships between migration and community well being. One reason is that there are limitations to the data we have used here. Because the census provides migrants’ characteristics

at only the time of the census, and not the time of migration, it is impossible to attribute causality. As well, our census data identify only place of residence at the beginning and end of the 5-year period—intervening moves are lost. Both the CWB and the migration rates are potentially affected by the non-participation of some First Nations communities in the census and possibly lower response among off-reserve Aboriginal people (Statistics Canada 2010b).

It is also important to recognize that the CWB is a limited measure that captures only particular aspects of “well being”, and ignores other community conditions that might be important to First Nations themselves. As Taylor (2008) has argued, a focus on market employment and income as key indicators might actually undermine other aspirations of Indigenous peoples, such as maintaining traditional ways of life and language, and connections to traditional territories. Nonetheless, the CWB is useful as a general measure of community conditions. Those dimensions that are included; housing, education, income and labour force attachment, are important and the exclusion of other dimensions of culture and community life does not lessen their relevance. Indeed, improving education and income have long been stated priorities for Canadian First Nations (e.g. Assembly of First Nations 2013). It is also not necessarily the case that improving educational attainment or labour force attachment is antithetical to the goal of preserving culture or tradition. In Australia, Dockery (2010) has found that preservation of culture and language are positively correlated with economic development, casting doubt on the opposition between these two sets of outcomes.

It is a useful finding that migration may be generally positive for First Nations communities. Further research should examine the complex relationships among the factors that affect both migration and community CWB scores. Although we have controlled for geography here, there are other community-level characteristics that could be included in analyses, including community size, aspects of demographic composition such as dependency ratios, and occupation or industrial concentration of the workforce, among others. The effects of these factors on both community well being and migration could be unpacked using path-analytic or structural equation approaches that consider the interrelationships among these community characteristics and the CWB index components.

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