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Future Changes in Age Structure and Different Migration Scenarios. The Case of North and Central America

Cambios futuros en la estructura por edad y escenarios migratorios. El caso de América del Norte y América Central

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Abstract

We analyze migration and demographic changes among the six countries of North America (NA) and the Northern Triangle of Central America (NTCA, i.e. Guatemala, Honduras and El Salvador). Together, they comprise a long-standing South-North migration stream, with the United States (US) and Canada being the main destinations for Mexico and the NTCA. Studies that analyze the demographic effects of international migration in origin and destination countries have been limited. In order to fill this gap and explain the implications of recent changes in migration trends and demographic dynamics of the six countries, we study the interrelationship between future changes in the age structure associated with different migration scenarios. We use data from the United Nations World Population Prospects 2017 to compare the main demographic indexes and age structure indicators under two prospective scenarios: with and without migration. Current and projected population dynamics suggest convergence in fertility

Keywords

International migration
Demographic change
North America
Northern Triangle of Central America

below replacement levels, higher life expectancy, and an overall aging process in the NA-NTCA region. Future migration may slow down the aging process in Canada and the US, have a small effect in Mexico, and speed it up in El Salvador. Taking both the size of the populations and the decrease in young age groups for the main sending countries we have studied, it is unlikely that international migration to the US from Mexico and the NTCA will reach the historic peak observed during the first decade of the 21st century.

Resumen

En este artículo analizamos la migración y los cambios demográficos en los seis países de América del Norte (NA) y el Triángulo Norte de América Central (NTCA, por sus siglas en inglés; es decir, Guatemala, Honduras y El Salvador). Juntos forman parte de una extensa corriente migratoria de Sur a Norte, de la que Estados Unidos (EE. UU.) y Canadá son los principales destinos, desde México y el NTCA. Los estudios sobre los efectos demográficos de la migración internacional en los países de origen y de destino son limitados. A fin de llenar ese vacío en la literatura y explicar las implicaciones de los últimos cambios en las tendencias migratorias, así como la dinámica demográfica de estos seis países, estudiamos la interrelación entre los cambios próximos en la estructura de la edad asociada con diferentes escenarios de migración. Utilizamos datos de las Perspectivas de la Población Mundial 2017 de las Naciones Unidas para comparar los principales índices demográficos y los indicadores de la estructura de la edad en dos escenarios prospectivos: con y sin migración. La dinámica actual de la población y la proyectada sugieren una convergencia en la fertilidad por debajo de los niveles de reemplazo, una mayor esperanza de vida y un proceso general de envejecimiento en la región NA-NTCA. La migración en el futuro puede retrasar el proceso de envejecimiento en Canadá y EE. UU., tener un efecto menor en México y acelerarlo en El Salvador. Al considerar el tamaño de las poblaciones, así como la disminución de los grupos de edad joven para los principales países emisores que hemos estudiado, es poco probable que la migración internacional a los EE. UU. desde México y el NTCA alcance la cúspide histórica observada durante la primera década del siglo XXI.

Palabras clave

Migración internacional

Cambio demográfico

América del Norte

Triángulo Norte de América Central

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Introduction

The rate of population aging is regulated by migration, both in sending and destination contexts. According to Gavrilov & Heuveline (2003), immigration slows down population aging because it increases the reproductive potential of receiving countries. Whereas immigration rejuvenates a population by increasing the number of young adults and children, emigration of the working-age population could accelerate population aging of sending countries, as observed in some Caribbean nations. Population aging in origin countries may be accelerated by immigration of elderly retirees from other countries, and return migration of former emigrants who are above the average population age. However, these processes might not be the same everywhere.

Demographers expect that migration will become more relevant in population aging over time, especially in low-fertility countries with stable or declining population size (Gavrilov & Heuveline, 2003).

The age structure of migration has been broadly studied in demography showing that there are age-specific gross migration flows regularities, as in fertility and mortality; in other words, migrants tend to be concentrated in certain ages: children, youth and working ages. In the pioneer work on this issue, Rogers & Castro (1981) developed a system of model migration schedules to estimate regularities in the age patterns of migration showing these age-concentrations globally, but also highlighting how age patterns are associated with cause of migration. In later work, estimations are refined in their 11-parameter mathematical model for migration rates by age, known as the multiexponential model migration schedule, considering the intensity of migration according to labor force and retirement ages (Rogers, Castro, & Lea, 2005).

The impact of international migration on demographic dynamics to address the problems caused by population aging, has been widely studied in developed countries since the 1990s, particularly in Europe and traditional immigration countries, such as Canada and the United States (Bongaarts, 2004; Canales, 2015; Coleman, 2008; Lesthaeghe, Page, & Surkyn, 1991; Passel & Cohn, 2017; Philipov & Schuster, 2010; Plane, 1993). Studies suggest that, with historical inflow levels, immigration does not offset population aging, although it sustains population growth and modifies the age structure (Beaujot, 2002, 2003; Coleman, 2002, 2008; Lutz & Scherbov, 2002; Paterno, 2011; United Nations, 2000; Zaiceva & Zimmermann, 2016).

Because developed countries are usually immigrant-receiving countries, most studies usually focus on the impact of immigration in demographic dynamics and aging, rather than on the effects of outmigration. More recently, scholars have highlighted similar population aging processes in Least Developed Countries (LDCs), which have typically been immigrant-sending countries. For example, Renuga Nagarajan and colleagues (2017) find that many LDCs will experience aging before they benefit from the demographic dividend. In other words, many of these countries will age before they benefit from the boost of economic productivity that occurs when the share of working-age population is larger than the dependent population (younger than 15 and 65 and older). Because migration tends to be concentrated in working-ages, it could have an intensifier effect of population aging in LDCs. However, countries can always be origin and destination, and the extent to which, decreases in population growth and changes in age structure occur, suggest the need to consider the implications of the interaction between migration and aging for sending and receiving countries, regardless of level of development.

With the aim of adding more elements to the knowledge about the interrelation between migration and demographic dynamics, in this article, we analyze the demographic interrelation between international migration and demographic changes considering the six countries of North America (Canada, United States and Mexico) and the Northern Triangle of Central America (NTCA, i.e. Guatemala, Honduras and El Salvador). Together, they comprise a long-standing South-North migration stream, with the United States (US) and Canada being the historical main destinations for Mexican and NTCA migrants. Studies that jointly analyze the demographic effects of international migration in the North American-NTCA system have been limited. In order to fill this gap in the literature and explain the implications of recent changes in migration trends and demographic dynamics of the six countries, we study the interrelationship between future changes in the age structure associated with different migration scenarios.

Migration and demographic dynamics

Migration and fertility

The interaction between migration and demographic dynamics has been examined in depth from several disciplines, especially studying the migration-fertility and migration-mortality relationships. First, in terms of migration and fertility three main theoretical explanations have been proposed to explain the fertility behavior of migrants: Selectivity, disruption and adaptation (Jensen & Ahlburg, 2004; Kulu, 2005; Majelantle & Navaneetham, 2013). Selectivity implies different reproductive behavior where migrants tend to have lower fertility than those who did not migrate in origin countries. Disruption due to migration can cause lower fertility through the separation of couples, or because migration as a disruptive event changes fertility plans. The literature on adaptation has shown that migrants have an important adaptation mechanism that allows them to adopt prevailing lower fertility diffused norms of destination countries, as they respond to opportunity costs of childbearing as well as norms and values of destination countries that tend to be more developed. The adaptation explanation has been powerful for explaining migrant reproductive behavior upon migration (Jensen & Ahlburg, 2004).

In this context and under these frameworks, particular studies on migration from Latin America have enlightened many important aspects of migration for the countries that we analyze here. Although there is a notion that the foreign-born populations have high fertility, their fertility is usually lower than their non-migrant counterparts in origin countries, but the association will depend on fertility-specific behavior in origin/destination, migration patterns and flows, temporary or permanent migration, as well as the social, cultural and economic incorporation of migrants (Rundquist & Brown, 1989). The effects also depend on who migrates, men or women. Using retrospective data, a study of the effects of migration to the U.S. on Mexican women fertility shows how female migration lead to fewer total births, whereas male temporary migration is associated with higher marital fertility in Mexico (Lindstrom & Saucedo, 2002).

Choi (2014) shows that fertility levels among Mexican immigrants and Mexican-Americans are decreasing within and across generations, even if Mexican-American fertility has not yet converged with the fertility of U.S. native whites. In this sense, Parrado (2011) demonstrated that the apparently higher fertility of Hispanic/Mexican women in U.S. is the product of period estimates of immigrant fertility which suffer from three sources of bias: 1) problems estimating the size of immigrants; 2) the stage of the life cycle at which migration occurs, and 3) the trend of women to have a birth soon after migration. Because of those reasons, the author proposes to measure the fertility of immigrants with the completed fertility instead of period measures, like the total fertility rate. Thus, the completed fertility of immigrants in the U.S. is much lower than the level obtained from period measures. The main implication is that without a significant change in immigration levels, current fertility projections are based on assumptions of high Hispanic fertility; this exaggerates population growth of Hispanics, its impact on the ethno-racial profile of the country, and its potential to counteract population aging.

Hill & Johnson (2004) find empirical evidence of strong declines in fertility across generations of Mexican and Central American immigrants and their descendants. They also find that living with a greater share of co-ethnics is associated with lower fertility

and show that the relationship between education and fertility in the broader U.S. population is also true for Mexican and Central American women and their daughters, regardless of the neighborhood where they live.

For the Canadian case, Adserà & Ferrer (2016) examine the fertility of married immigrant women around the time of migration. They find that while immigrants have relatively fewer births during the two years preceding migration, these rise after one year in Canada, consistent with the concurrence of events when marriage and migration occur almost simultaneously. Findings also are consistent with the socialization hypothesis, since fertility levels vary across origins. Because Mexico and the NTCA countries are not usually considered countries of immigration, research on fertility patterns of those who arrive to these countries are limited, but have focused on the effects of emigration. Changes in childbearing behavior due to migration are not limited to international moves but have been also found in internal rural-urban migration, for example, in Guatemala (Lindstrom, 2003).

Migration and mortality

Results from a systematic review and meta-analysis of the academic literature on the mortality of migrants from 2001 to 2017, Aldridge and collaborators (2018) show that international migrants have a mortality advantage compared with the general population, and this advantage persisted across most of the causes of death, with the exception of infectious diseases and external causes. Infectious disease mortality was increased for viral hepatitis, tuberculosis, and HIV. Assaults and deaths of undetermined intent were increased among migrants for external causes of mortality. The mortality advantage identified by these authors is representative of international migrants in high-income countries who are studying, working, or have joined family members in these countries.

Similar findings on the association between mortality and migration have been found on research among international migrants of Hispanic origin, where there is a mortality advantage compared with natives. Empirical data that support the healthy migrant hypothesis suggest that healthier migrants might be more likely to migrate, or to be a successful migrant. The mortality advantage of migrants might also be attributed to the so-called *salmon effect*, whereby migrants return to their countries of origin prior to death or when they have health challenges, supporting the unhealthy return migration hypothesis (Markides & Eschbach, 2005; Palloni & Arias, 2004). However, evidence also suggests that these factors do not entirely explain the mortality advantage, and that other social and cultural mechanisms are likely to be driving these patterns.

Although most of this research has examined immigrants in the United States, similar findings have been shown in Canada. According to Trovato (2003) and Omariba and colleagues (2014), mortality is lower among immigrants than the Canadian-born population. The mortality differences are independent of the duration of the residence in Canada but depend on age of individual and country of origin, and results reflect selection effects. Contrary to the findings from (Omariba et al., 2014), Vang and collaborators (2015, 2017) find that the healthy immigrant effect is linked to immigrants' duration of residence in the country, it is stronger for recent immigrants who have resided in Canada less than 10 years, and vanishes among more established immigrants. These authors also find from their systematic review, that the healthy immigrant effect varies across the life-course and within each stage of the life course, being strongest during adulthood but less so during childhood/adolescence and late life.

Moreover,they also show how differences exist by immigrant entry status. For example, maternal and infant health is quite poor among refugees, although their risks of all-site cancer and mortality are significantly lower than the Canadian-born population.

Migration and age-structure

As it was put forward earlier in the introduction, migration impacts the age structure of origin and destination countries. Usually, emigration reduces the number of children and working-age population whereas immigration has the contrary effect in destination countries, increasing the number of children and young people in working-age groups. In this context, migration has a direct impact on population growth. In a groundbreaking study, Keyfitz (1971) explored how in high fertility contexts, large levels of out-migration will be required to reduce population growth, regardless of the age pattern of out-migrants.

In contexts of low fertility and low mortality, a debate exists on whether immigration can substitute fertility. On the one hand, Espenshade, Bouvier, & Arthur (1982) found that although immigrants and their early descendants may have fertility rates well above replacement levels, the outcome will still be a long-run stationary population. In other words, immigration leads to a population with a constant growth rate. Other studies show that in an unsustained regime of low fertility, immigration may produce a different type of stationary population where aging depends on the age structure of immigrants (Schmertmann, 1992). These findings have major policy implications, because although fertility increase and immigration are equally effective at halting population decline, immigration is useful as a means of rejuvenating low-fertility populations. Moreover, according to Schmertmann, an immigration-based policy could make a low-fertility population older rather than younger.

Conversely, Alho (2008) finds that the age structure of the arriving immigrant population is key and may even decelerate the aging process. Although migration can increase the growth rate in decreasing populations, it could also have the opposite effect because of the typical age pattern of new arrivals. He shows that some European countries already have a level of migration that will lead to stationarity. In countries with declining populations, migration still provides opportunities for slowing down population aging. In general, results suggest that migration affect population age structures, but not population growth (Blanchet, 1989).

Past migration impacts the current and future age structure of origin and destination countries, which also affects future migration patterns. Although the literature on population models establishes the properties and impacts of migration, it is unclear how this can predict migration effects in North and Central America, given the current migration and demographic context described in the following section.

The North America – Northern Triangle of Central America migration system

The regional migratory dynamic between North America and the Northern Triangle of Central America has been transformed in recent years, mainly due to the decline of emigration from Mexico, the increase of arrivals from the United States to Mexico, and an overall increase of emigration from Central America to the United States (Cohn, Passel & Gonzalez-Barrera, 2017; Giorguli Saucedo, Garcia-Guerrero, & Masferrer, 2016). Within the region, the US and Canada are traditional immigration countries with large shares of foreign-born population, whereas Mexico and the NTCA have been

traditional emigration states (Table 1). Mexico and El Salvador, for example, have more than 10 percent of their population living in the United States, while one out of every five residents in Canada was born abroad. The total volume of Mexican and NTCA migrants living in the United States in 2017 was 15.6 million, according to UNDESA International Migrant Stock Data. Within the last decade, unauthorized migrants from Mexico decreased from 6.95 to 5.45 million between 2007 and 2016, whereas their unauthorized counterparts from Central America increased from 1.5 to 1.85 million within this period (Passel & Cohn, 2018).

Table 1
Total and foreign-born population in North America and the Northern Triangle of Central America, 2000 and 2015

Country	Total population[1] (thousands)		Total foreign-born population[2] (thousands)		Percentage of total population		% Change
	2000	2015	2000	2015	2000	2015	(2000-2015)
Canada	30,736	35,950	5,512	7,836	17.9	21.8	42.2
US	281,983	319,929	34,814	46,627	12.3	14.6	33.9
Mexico	101,720	125,891	538	1,193	0.5	0.9	121.7
Guatemala	11,651	16,252	48	76	0.4	0.5	58.3
El Salvador	5,868	6,312	32	42	0.5	0.7	31.3
Honduras	6,524	8,961	29	28	0.4	0.3	-3.4

Source: [1]UN, World Population Prospects, 2017 revision. [2]UN, Trends in International Migrant Stock: Migrants by Destination and Origin, 2015

The role of Mexico was recently transformed, with the decline in emigration and an increase in immigration and return, following the 2008 Great Recession and stiffer immigration enforcement since the mid-2000s (Masferrer & Roberts, 2016). Today, the largest North-South flow comprises the US-born population migrating to Mexico, mainly minors joining returnees. Data for 2015 show that more than half a million minors aged 17 and younger were born in the United States but lived in Mexico throughout the country, with the majority living with two Mexican parents (Masferrer, Hamilton & Denier, *forthcoming*).

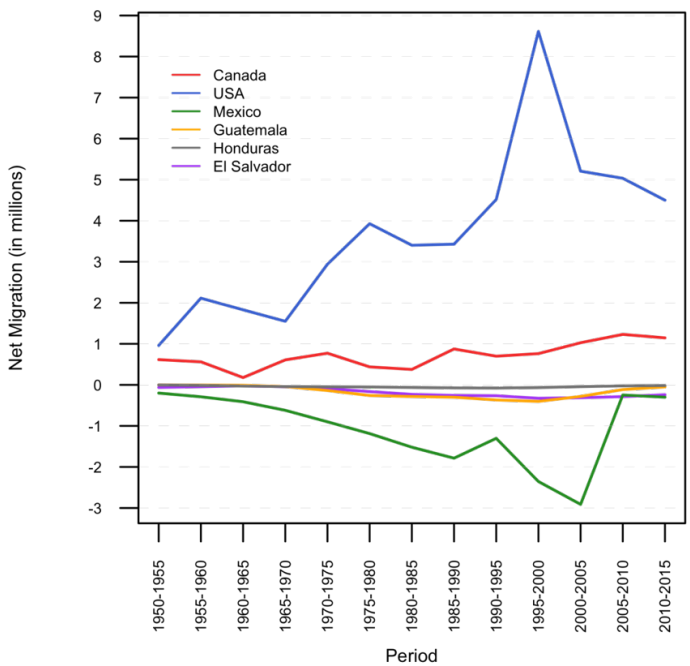
Central American migration to the US and Canada dates back to the 1980s –a time of political turmoil, dictatorships, violence, and insecurity – but has also been associated with environmental factors as well as a recent increase in violence and associated economic hardship (Pederzini, Riosmena, Masferrer, & Molina, 2015). Although it has been characterized by transit through Mexico, there has been an increase of settlement in the country. Mexican census data estimated stocks of around 50 and 68 thousand NTCA migrants residing in Mexico in 2010 and 2015, highly concentrated in working-ages, especially 24 to 44 years (Masferrer & Pederzini, 2017). Central American migration to the US came into sharp focus in 2014, when more Central Americans, many of whom were unaccompanied minors, than Mexicans were apprehended at the Mexico-US border (Goździak, 2015; Rosenblum & Ball, 2016; Stinchcomb & Hershberg, 2014). However, the estimated number of NTCA migrants in irregular transit through Mexico had reached a similar high point in 2005, declined dramatically and then increased again post-2010 (Rodríguez, 2016). This flow has gained increasing attention from various actors and has generated increasing tension with recent arrivals of migrant caravans since the last months of 2018, even if the discussion on the role of immigration policy and how to manage these flows is not new (Castillo, 2000; García, 2006).

Since the 1980s, Canada admits an annual number of new immigrants as permanent residents equivalent to 1% of the population under economic, family and humanitarian considerations. With a population of 35 million in 2016, and one in every five residents born out of the country, Canada had one of the highest migration rates in the world. In terms of the stocks, the top immigrant origin-countries as of 2016, were China, India, the Philippines, United Kingdom and the United States. The number of Mexicans and NTCA migrants is fairly small compared to the top origin-countries: 80, 48, 17, and 7 thousand from Mexico, El Salvador, Guatemala, and Honduras, respectively, although migrants from the NA-NTCA migration system have increased since the 1990s and arrived in an orderly fashion, both as temporary and permanent migrants (Giorguli Saucedo et al., 2016).

Projecting migration is hard due to its higher uncertainty compared to fertility or mortality, but projected estimations suggest a deceleration of emigration from Mexico and Central America, contrary to what is observed in other areas of the world (Hanson & McIntosh, 2016). Figure 1 shows past net migration, the balance between emigration and immigration to/from a country, for five-year periods from 1950 to 2015 for North America and the NTCA. The period between 1995 to 2005 was the decade with highest emigration from Mexico and the NTCA, and it was also the period of highest net migration for the United States, although net migration changed dramatically after 2005 in Mexico and the NTCA. For Canada, the period of highest net migration was 2005-2010. Net migration for Mexico between 2000 and 2005 represented a loss of almost 3 million people, whereas the greatest losses of population for the NTCA happened in the 1990s: in 1990-1995 in Honduras, and 1995-2000 in Guatemala and El Salvador. Mexican net migration reduced almost ten times from almost -3 million in 2000-2005 to -300 thousand in 2010-2015.

Figure 1

Past net migration (in millions) for five-year periods, 1950-2015



Source: World Population Prospects, The 2017 Revision.

Projections (not shown here) assuming that migration patterns will continue as in the last period (medium variant), suggest that Canada and the United States will remain as destination countries with positive net migration, and stable through the period. For Mexico, net migration is expected to remain stable in the future, around -300 thousand (considering returnees and immigrants). However, the NTCA show expected changes in the size of the flows for the next period (2015-2020), but long-term projections suggest stability and a trend towards a decline in outmigration flows. El Salvador is the NTCA country with the highest projected negative net migration, expected to change from -202 thousand in 2015-2020 to -116 by 2045-2050. In the same periods, Guatemala and Honduras are expected to have a similar trend, changing from -46 to -34 and -14 and -2 thousand, respectively (Garcia-Guerrero, Giorguli Saucedo, & Masferrer, 2018).

Data and methods

We use data from the UN World Population Prospects (UN-WPP) 2017 Revision (United Nations, 2017). This data allows cross-country comparisons of demographic dynamics. In order to analyze the effect of migration on age structure, we examine two prospective scenarios by comparing the medium- and zero-migration variants available by quinquennial periods. Both projections assume medium fertility and normal mortality, in other words, that all countries undergo the three phases of the fertility transition and that life expectancy rises over the projection period. Contrary to the assumption of zero migration beginning in the period 2015-2020, the medium-variant projection assumes future levels of net migration will be constant until the period 2045-2050. The baseline considers country-specific policies regarding future international migration and takes into account recent fluctuations in migration stocks, as well as refugee and temporary labor flows (United Nations, 2015).

In this paper, we also study the evolution of life expectancy at birth (LE), total fertility rate, ageing index (AI), total dependency ratios (DR) and potential support ratios (PSR), as well as estimated and projected population age groups. We examine the 0-15 and 15-30 age groups, which allows us to anticipate changes in the working-age population and the age group where most first migrations are concentrated. We calculate the change in age-group size due to migration as the difference between the migration variants for age groups 0-15 and 15-30. We use the potential support ratio to better assess changes in the working age population, especially due to migration (Coleman, 2008; Renuga Nagarajan et al., 2017). Changes in PSR are defined by subtracting zero-migration from the middle variant projection.

Results

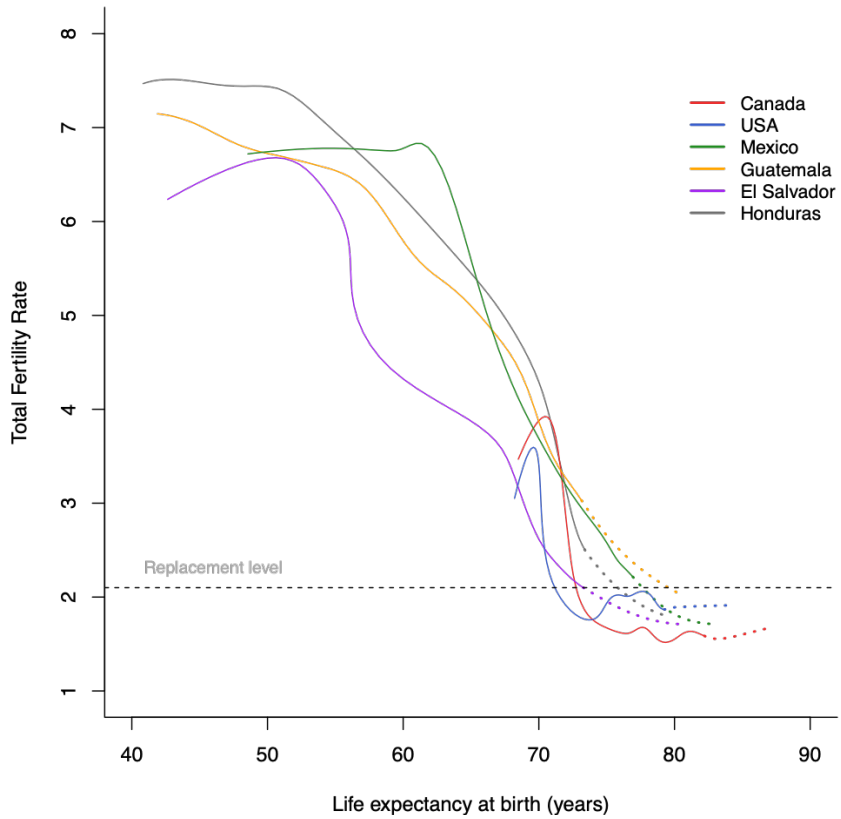
Overall, results show a generalized aging process in the NA–NTCA region, albeit at different speeds. Convergence to higher levels of LE is expected by 2050, despite different starting points in 1950 (see Figure 2), although unexpected epidemiological events could delay this process (Canudas-Romo, García-Guerrero, & Echarri-Cánovas, 2015; Xu, Murphy, Kochanek, & Arias, 2016). Canada and the US crossed the fertility replacement level threshold in 1972, El Salvador did so in 2016, and Mexico, Honduras, and Guatemala are expected to follow suit in 2018, 2029, and 2045, respectively.

In order to analyze the changes in age structure resulting from the demographic transition of the six countries, we explore how migration impacts age groups 0-15 and 15-30. Figure 3 shows the size and trend of these two broad age groups estimated for 1990-2015 and projected for 2016-2050. Projections show that these two age groups in

Mexico and the NTCA will decrease marginally due to migration, although the effect will be more visible for El Salvador. In contrast, migration in Canada and US will sharply increase in these age groups, with a larger increase for the US than Canada. Migration is expected to increase the number of young labor market entrants (aged 15-30) in the US by 2.2 million in 2016-2020 and over 11 million by 2050 (16% of the total population aged 15-30).

Figure 2

Evolution of life expectancy at birth vs. total fertility rate for periods 1950-2015 (estimates in solid lines) and 2016-2050 (projections in dotted lines)



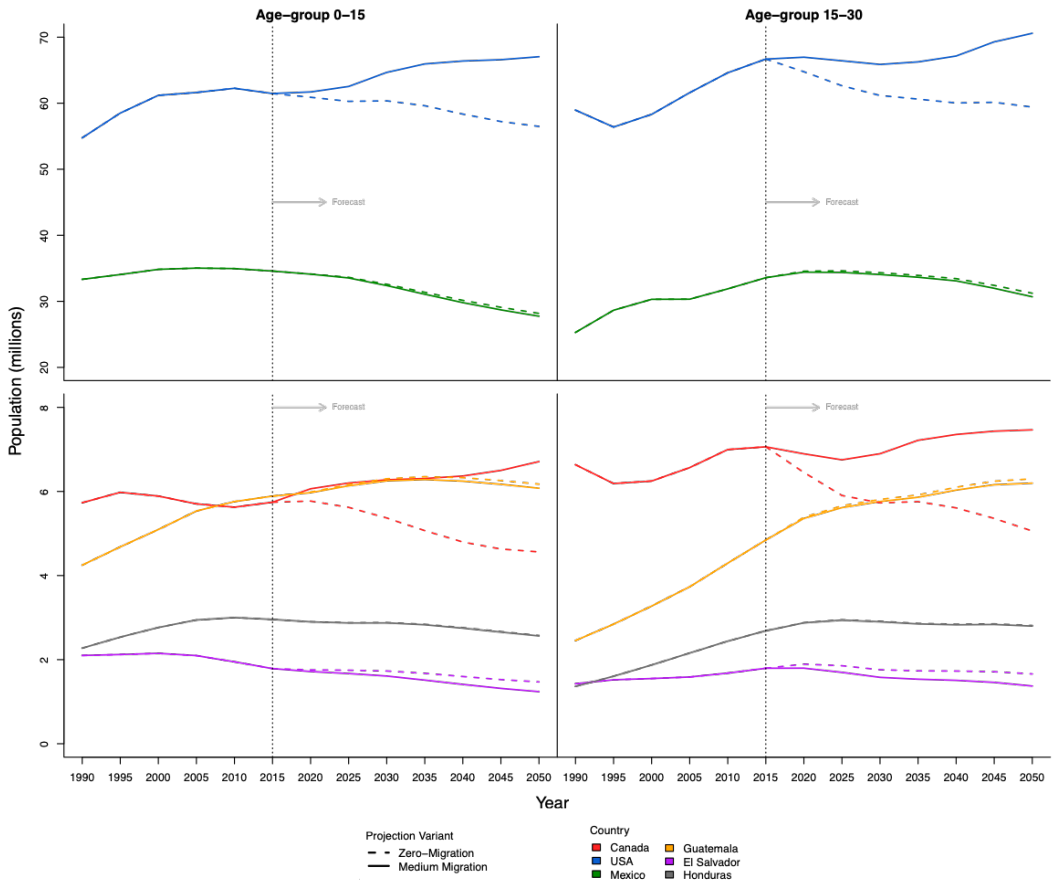
Source: World Population Prospects, The 2017 Revision. Retrieved from Giorguli et al. (2016).

Changes in age structure impact the relation between different age groups. To analyze this interrelation, we show estimated and projected total dependency ratios and ageing indexes (Figure 4). Projected fertility trends, as observed in Figure 1, suggest that the rise in total DRs for Canada and the US, as well as Mexico post-2035, is not driven by increases in the young population. In Canada and the US, traditional immigrant receiving countries, migration is projected to slow down the increase in total DRs at the stage of old-age driven dependency, whereas Mexico and the NTCA, traditional emigration countries, will have total DRs dominated by a young population. Among the six countries, Canada is undergoing the aging process at the fastest rate without migration, followed by the US. Aging indexes for Mexico and US are expected to converge with migration in the US, yet independently of migration for Mexico. All NTCA

countries are aging at different rates, with migration having an earlier, more visible effect in El Salvador. Although the total DRs for Mexico and US in 2015 are the same, they reflect different stages of the demographic transition. The total US DR is driven by an older population, whereas in Mexico, it is driven by a younger population. Regardless of migration, the evolution of the total DR for Guatemala shows that dependency is driven by youth.

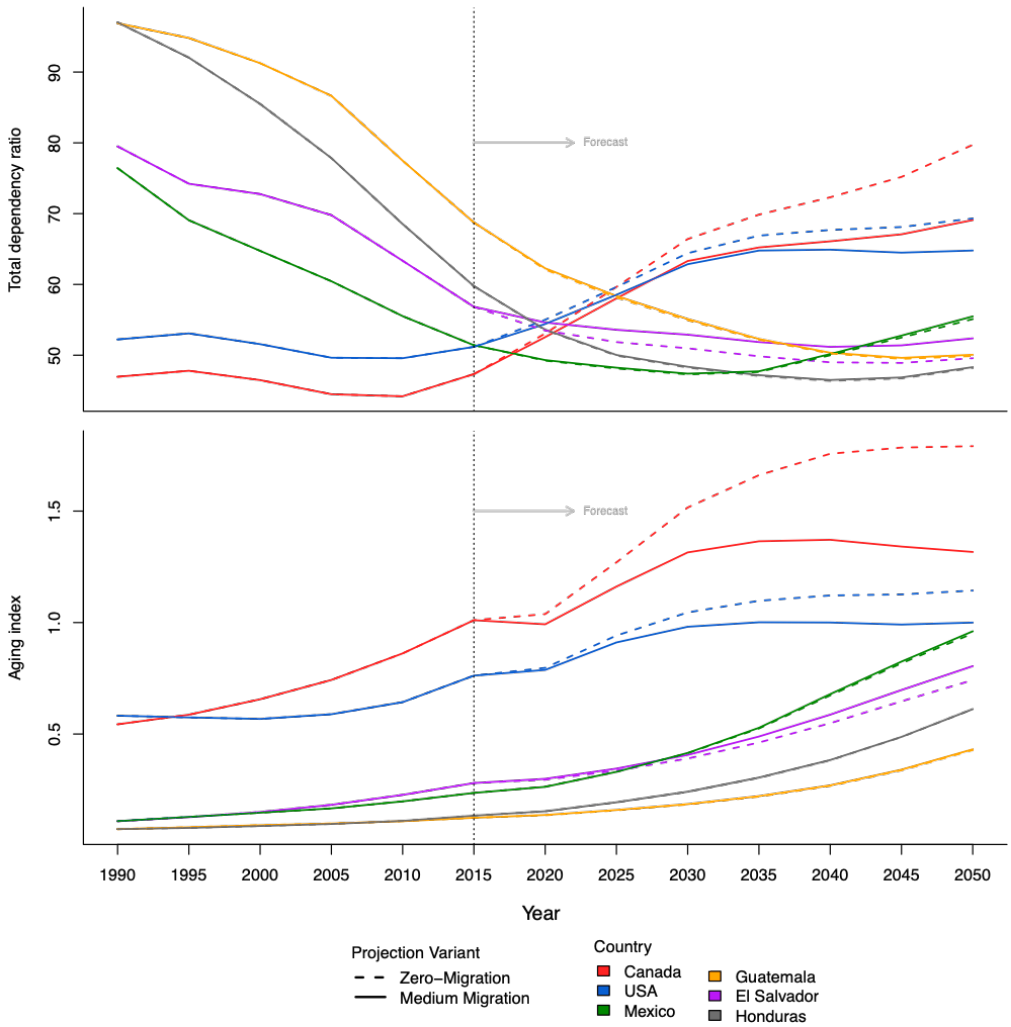
Figure 3

Estimated and projected population age-groups, 0-15 and 15-30 accordingly to two migration scenarios. North America and Northern Triangle of Central America, 1990-2050 by quinquennial periods



Source: Own calculations based on UN World Population Prospects, The 2017 Revision.

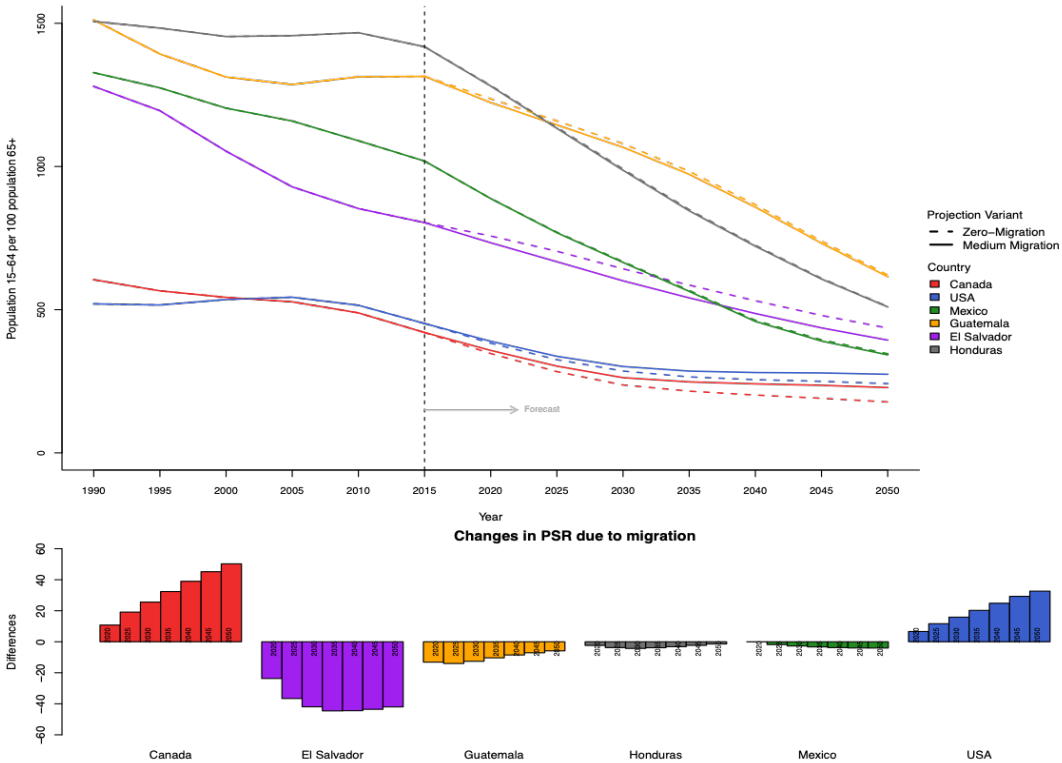
Figure 4
Estimated and projected total dependency ratios and aging indexes. North America and Northern Triangle of Central America, 1950-2050 by quinquennial periods



Source: Own calculations based on UN World Population Prospects, The 2017 Revision.

The increase in DRs in the region due to the increase in the old population entails an increase in the burden on the working-age population. To measure the size of this burden, we use the PSR –defined as the number of people aged 15–64 per one hundred people over 65— to study its changes attributable to migration over time (Figure 5). As expected, the ratio between the working age population and the elderly is projected to change due to migration. Differences in PSR show how migration slows down the aging process in Canada and US, yet they accelerate it in the other countries. Canada increases its potential support more than US due to migration. The largest loss in PSR due to migration occurs in El Salvador. Guatemala's loss of PSR is smaller than that of El Salvador. Finally, projected changes in PSR due to migration in Mexico and Honduras are below four post-2015.

Figure 5
Estimated and forecasted potential support ratios according to two migration scenarios. North America and Northern Triangle of Central America, 1950-2050 by quinquennial periods



Source: Own calculations based on UN World Population Prospects, The 2017 Revision.

Discussion

Current and projected population dynamics suggest convergence in fertility below replacement levels, higher life expectancy, and an overall aging process in the NA-NTCA region. Future migration may slow down the aging process in Canada and US, have a small effect in Mexico, and speed it up in El Salvador. Taking both the size of the populations and the decrease in young age groups for the main sending countries we have studied, it is unlikely that international migration to the US from Mexico and the NTCA will reach the historic peak observed during the first decade of the 21st century. The impact of these changes on the labor force in origin and destination countries opens up venues for future research not only in terms of its sociodemographic impacts, but economic, political and cultural. For example, it is unclear if technological change will be stronger in El Salvador than in Mexico, where population aging will occur earlier, or if the increase of deportations of working-age unauthorized migrants from Mexico and Central America in the United States, will impact local labor markets.

Although predicting long-term migration flows is a risky venture due to economic shocks, political conflicts, and natural disasters, it seems that the era of rapid increases in immigration levels is coming to an end in the US, contrary to what is expected in

Europe (Hanson & McIntosh, 2016). We do not use population projections allowing for different migration scenarios such as those linked to the Shared Socioeconomic Pathways, but our use of the UN-WPP provide a benchmark for the impact of migration on regional age structures. Recent research has suggested that zero and medium variant assumptions may be problematic post-2050, a time frame beyond the scope of our analysis (Abel, 2018).

The NA-NTCA migration system is not closed and other origins and destinations are also important. The US and Canada receive immigrants from various origins, with Asian migration surpassing Mexican migration. However, the US remains the main destination for Mexico and NTCA, with immigrants from these countries overwhelmingly engaged in low skilled occupations (Brick, Challinor, & Rosenblum, 2011). Canada, the second destination for Mexico, Guatemala and El Salvador, has a labor force that is far less dependent on these countries than the US.

Medium-variant migration assumes projected levels of net migration will remain constant to recent levels. In the Mexican case, close-to-zero net migration rate in 2010-2015 may be driving the small projected differences due to migration. Zero net migration rate is not zero international migration (Bouvier, Poston, & Zhai, 1997). Therefore, even if migration levels are projected to remain constant, future profiles could change. UN-WWP projections do not take into account changes in the age composition of migrants associated with modifications in age at first migration, educational attainment or return migration. This limitation of the UN-WWP projections might be misleading if unexpected changes in migration patterns occur in the future, increasing migration driven by external factors, like climate change, or violence, different than it has been observed previously. Nor do they take into account heterogeneity within countries, i.e. geographical variations of smaller units that may be undergoing different stages of the migration process. Our findings highlight the differences between Central American countries, which are often considered a homogenous group.

Immigration policy can shape net migration rates and flow sizes, as well as the composition of these flows. Although Canada has explicitly attempted to admit 1% of the population annually as permanent residents, in recent years, the number of migrants with temporary work and study permits has exceeded the number of new permanent residents. This share is larger than the number of new arrivals to the US. Data from the American Community Survey show that the number of new annual recent arrivals from all over the world to the US was equivalent to 0.5% of the total population during 2000-2015. The share of newcomers from Canada, Mexico, and the NTCA decreased from 35% in 2000 to 18% in 2015. This decline was driven by the sharp decrease in Mexican arrivals from 413,000 in 2000 to 143,000 in 2015. Although Canada and US are considered destination countries, temporary and permanent flows between them are important (Giorguli Saucedo *et al., 2016*). The literature on the effects of migration on population aging does not distinguish between the temporality of migration flows. This is of particular importance in a context where return migration from the US to Mexico and Central America has increased and been transformed post-2009. These changes have not only occurred in the volume, but also the age composition of migrants moving North and South. Accordingly, the importance of age and sex patterns of return migration should be taken into account in population projections.

As the aging process advances in Canada and US, the demand for migrant labor will continue and possibly even rise for particular occupations and sectors of the labor market. An aging population may regard immigration as a way of slowing down the decrease in PSRs and of meeting the growing demand for certain types of jobs,

such as care work. The decrease in population growth and the concomitant drop in demographic pressure in the main sending countries may represent an opportunity to manage migration flows while recognizing regional dynamics and linkages.

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