Canadian Studies in Population

Special Issue

Implications of Global Peak Population for Canada's Future

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Contents

Anatole Romaniuk

Dr. Anatole Romaniuk died on March 5, 2018, at the age of 94, at home in Ottawa after a brief bout of pneumonia. He was born on February 28, 1924, in Zarojany, Khotyn district, Chernivtsi oblast, Ukraine (what was formerly Bessarabia and part of Romania). On March 11, 2018, friends and family gathered together in Ottawa to share memories of his life. Anatole was the loving husband of Maria Romaniuc, proud father of Lara (Paul Saurette) and Alex (Rachel Creane), and ecstatic grandfather to Belmont.

Anatole's childhood was not an easy one. The region where he was born, Khotyn region of Ukraine, was a multinational area with a troubled history, shunted back and forth between the Ottoman and Russian empires (today divided between Moldova and Ukraine). As a child he experienced in 1929 the sorrow of losing his father. This early loss had a lasting impact on Anatole. In 2009, after years of meticulous research he completed (in Ukrainian) a biography of his father, Ivan Onufriyovych Romaniuc, describing the short but productive life of a young family man, who served valiantly in World War I, and after the war was elected to the Romanian Parliament to proudly represent the people of his region.

During the Second World War young Anatole was forced to flee across Europe to escape from the Soviet occupation of Romania and Ukraine. While he was running away, he was caught by the (precursor to the) KGB and the Gestapo, and narrowly escaped from death twice. Although he escaped, he was sadly separated from his dear mother and sister for 16 years and had to pursue a life by himself. All these experiences had profound impact on him. He loved life and made the best of his talents to achieve great heights professionally, held in high esteem by all who knew him.

Anatole lived a long, rewarding and distinguished life of passionate scholarly and administrative engagement within the field of demography. He was a prolific scholar, active until shortly before his death. His last article was published in the 2017 fall/winter issue of *Canadian Studies in Population* (vol. 44, no. 3–4). He was a cosmopolitan man, well acquainted with the world, always keenly interested in learning more about other cultures. He was fluent in six languages (French, English, Ukrainian, Romanian, German, and Russian).

Between 1945 and 1947, he attended the University of Erlangen in Germany, to study philosophy and history. Upon graduation he went on to University of Louvain in Belgium where in 1952 he completed Master's degrees in Political Science and Pure Economics. In 1958 he moved to Paris to pursue a year of intensive training at the Institut National de la Statistique et des Etudes Economiques (INSEE). Later, in 1961, he was offered a position as a research associate at Princeton University's prestigious Office of Population Research, earning from that institution a Certificate in Demography. He eventually completed a Ph.D. in Economics at the University of Louvain, defending his dissertation in 1967.

After moving to Canada he held professorships at the University of Ottawa (1964–69) and at the University of Montreal (1969–72). In 1968, Dr. Romaniuk began working at Statistics Canada (then called the Dominion Bureau of Statistics); and over the next 25 years, with the assistance and support of colleagues he founded and directed the Demography Division at Statistics Canada, creating two specialized Sections in population estimates and projections. As Director, he expanded the Division's methodological capabilities to new heights, building on the work of his famous predecessors Nathan Keyfitz, Norman Ryder, and Karol Krotki. Dr. Romaniuk's team was also responsible for the demography component of the Canadian Census of Population.

Soon after his retirement from Statistics Canada in 1993, he was invited to serve as Adjunct Professor by the Department of Sociology at the University of Alberta, continuing to publish important works in population studies. He retired from the academic world in 2014, after more than six decades of professional activity.

Beside holding memberships in the International Union for the Scientific Study of Population, the Population Association of America, and Association des démographes du Québec, Anatole Romaniuk served as vice-president (1978–80) and president (1980–82) of the Canadian Population Society, and was president of the Federation of Canadian Demographers (1993–96).

He made significant contributions to demography in its various fields—substantive, methodological, and theoretical. In 2003, a special issue of *Canadian Studies in Population* (vol. 30, no. 1) was published in honour of his many contributions to international and Canadian demography. In 2008 he received a lifetime achievement award from the Canadian Population Society for his contributions to Canadian demography and the discipline of population studies.

One of Anatole Romaniuk's most important works that elevated him to national prominence was his monograph *Fertility in Canada: From Baby-Boom to Baby-Bust*, published in 1984 by Statistics Canada as part of a series on Current Demographic Analysis (issued in French as *La fécondité au Canada: croissance et déclin*). This book is rich in methodological and theoretical content and noteworthy for demonstrating that *sub-replacement fertility* in Canada was here to stay, having major implications with regard to population growth.[1]

Other groundbreaking contributions were published at different points in Romaniuk's career, spanning diverse areas of demography and population studies—from the demography of Africa and Eastern Europe to the social demography of indigenous populations, to methodological and theoretical aspects of demography and population projections.

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1. Throughout his career, both English (Romaniuk) and Romanian/French (Romaniuc) transliterated variants of his surname were used.

Contributions to African demography

When still at Princeton, Romaniuk collaborated with a team of scholars headed by William Brass that included Ansley Coale, Paul Demeny, Don Heisel, Frank Lorimer, and Etienne Van De Valle to produce a classic work that is foundational reading in demographic analysis: *The Demography of Tropical Africa* (Princeton University Press, 1968). The book was the culmination of many years of fieldwork in Africa by this team of eminent demographers. Anatole's chapter is titled "Demography of the Democratic Republic of the Congo," about a country he knew and understood very well, as early in his career he organized the first population census of the Congo. This challenging endeavour took seven years to complete, from the start of data collection in 1954 to the publication of results in 1961—one year after the Congo became independent from Belgium. In informal conversations with colleagues Anatole would often recount some of the spellbinding events he experienced during this period in his life. After arriving in the Congo, there were setbacks with the colonial administration. Nevertheless, he successfully mobilized a team of local Congolese to help him criss-cross the Congo from one village to the next, asking permission from tribal chiefs to count inhabitants.

Anatole also authored *La fécondité des populations congolaises* (Mouton, 1968) and *La demographie congolaise au milieu du XXe siècle* (Louvain University Press, 2006). In these works, using techniques for demographic analysis based on inadequate data, Romaniuk produced reliable measurements of the level of fertility, its regional and ethnic variations, and explored the underlying cultural and epidemiological factors. His studies, based on anthropological and medical data on sterility and infertility among certain tribes in Africa, earned him wide recognition. In particular, he placed the problem of infertility in the framework of reproductive health behaviours. More recently, in 2011 he published an article titled "Persistence of high fertility in Tropical Africa: The case of the Democratic Republic of the Congo" (*Population and Development Review* 37(1):1–28).

Contributions to Indigenous Peoples' demography

Since his move to Canada in 1964, Dr. Romaniuk was attracted by the demography of Indigenous Peoples. He felt that his experience with African demography, in terms of subject matter and methodology, could be applied to study Canada's Indigenous populations. His work in this area partly, based on his early survey of the James Bay Area of Canada, gave rise to a series of articles and conference papers which shed new light on the demographic history of Indigenous Peoples in Canada. He posed the thesis that the particularities of this demographic itinerary, with distinct waves of demographic collapse and recovery, and the tardiness of demographic transition, need to be understood in the context of the Indigenous Peoples' encounter with European civilization (see "Aboriginal Population of Canada: Growth dynamics under conditions of encounter of civilizations," *Canadian Journal of Native Studies* 20(1), 2000). This theme was further expanded in his chapter "Canada's Aboriginal Population: From encounter of civilization to revival and growth," which appeared in a book co-edited with Frank Trovato, *Aboriginal Populations: Social Demographic and Epidemiological Perspectives* (University of Alberta Press, 2014).

Contributions to population projections

In the field of *population projections*, Anatole Romaniuk's contributions were methodological, epistemological, and administrative. As of the 1971 Census, he re-established Statistics Canada as the agency of the federal government responsible for population projections. His article "Population projection as prediction, simulation, and prospective analysis" was published in the United Nations Population Division's *Population Bulletin* (1990). This, along with other subsequent articles, established his reputation in the area of population projections. In addition to introducing innovative techniques, he contributed to the reappraisal of the way forecasting and projections are perceived. In a nutshell, his emphasis in projections is on *prospective analysis* rather than *prediction*; *analytical credibility* rather than *predictability*; *impact* rather than *accuracy* as projection validation criteria; and projection as a tool of *creating* rather than *discovering* the future ("Population Forecasting: Epistemological considerations" was presented to the British Population Society in 2006).

In a review of Romaniuk's work, the Canadian demographer Thomas K. Burch encapsulated the nature of Anatole's contribution to forecasting: "Romaniuc transcends the restrictive methodological view of most demographers to highlight the multifaceted character of population projections, including its role as substantive model of population dynamics, that is, as theory" (see "The Cohort Component Projection Algorithm: Technique, model, and theory," *Canadian Studies in Population* 30(1):30, 2003).

Methodological contributions

Anatole Romaniuk's creative spirit manifested itself in three particular methodological areas.

First, he undertook innovative application of non-conventional demographic techniques, such as those based on the Coale-Demeny stable population models and Brass techniques of estimating fertility and mortality from data on children-ever-born, to estimate fertility and mortality of populations with imperfect data. He was thus able to significantly improve the estimates of basic demographic parameters for the Congo and the Indigenous Peoples in Canada.

Second, he made important contributions to the methodology of forecasting fertility. This includes two articles co-authored with S. Mitra: "Pearsonian Type I Curve and its Fertility Projection Potentials" (*Demography* 10(3), 1973) and "Three Parameter Model for Birth Projection" (*Population Studies* 27(3), 1973). The virtue of this model is that it minimizes the inputs needed while maximizing the output and also enhancing the analytical capabilities of the associated parameters.

Third, as director of the Demography Division, jointly with his colleagues, considerable methodological enhancements were made in order to improve the accuracy and timeliness of the post-censal estimates of population and households (see *Population Estimation Methods*, Statistics Canada, 1987).

Theoretical contributions

Anatole Romaniuk's significant theoretical contributions are in two particular areas—demographic transition theory and demographic history of Indigenous Peoples. In the first case, he was able to conceptualize and empirically demonstrate the upward pattern

of natural fertility in the earlier stages of modernization. The underlying idea is that modernization removes or weakens some of the traditional fertility-inhibiting factors, such as prolonged postnatal abstinence and breastfeeding, by shortening their duration, before birth control comes into practice. Two of his articles are significant in this regard: "Increase in natural fertility during earlier stages of modernization: Evidence from African Case Study, Zaire" (*Population Studies* 34(2), 1980); and "Increase in Natural Fertility during Earlier Stages of Modernization: Canadian Indians Case Study" (*Demography* 11(4), 1981).

With regard to Indigenous Peoples' demography, his *History-based Explanatory Framework* is a significant milestone in understanding their fertility over the historical span, since the first contacts with Europeans. The two fundamental pillars of the paradigm are ethnocentrism and dependency status. His chapter in *Aboriginal Populations* revisits Anatole's theoretical ideas on the long term demographic effects of culture contact on Canada's Indigenous Peoples.

Over recent years Anatole developed an interest in exploring theoretical ideas concerning the future of demographically mature societies that have long since completed the demographic transition. He felt the concept of the *stationary state* proposed by the British philosopher John Stuart Mill could be fruitfully reformulated and applied as a policy framework to address critical economic, environmental, and social demographic challenges faced by today's aging populations. This idea was presented in a number of conferences and in an electronic publication, "Stationary population as policy vision" (*Optimum Online: Journal of Public Sector Management* 42(1), March 2012). Anatole extended his work in this area in his last publication, "Stationary population, immigration, social cohesion, and national identity: What are the links and the policy implications? With special attention to Canada, a demographer's point of view" (*Canadian Studies in Population* 44(3–4), 2017).

Data collection and management

Throughout his long and productive career, Anatole Romaniuk also involved himself in large-scale statistical operations of data collection and management. The national census of population in the Democratic Republic of Congo, based on a probabilistic sample, was an outstanding achievement for a young demographer under the difficult conditions of an underdeveloped country at that time (1950s). It was a resounding success, recognized by an "Etoile de service" from the Demographic Republic of Congo. At Statistics Canada, he was involved in the 1971 to 1996 censuses, at the level of content determination and analytical studies. He also acted as a Canadian government advisor in the preparation and execution of the 2001 Census of Population in Ukraine, and earned that country's President's Award in recognition of his outstanding contribution.

Anatole as Manager at Statistics Canada, colleague and friend

As founder and director of the Demography Division and of the prior Population Estimates and Projections Division, Anatole Romaniuk was the architect and the main driving force for the Bureau's core demography program for over 20 years. Under his able leadership, initiative, and direction, the program evolved over the years into a well-integrated and well-balanced set of activities. These included population and its demographic

characteristics and components (viz. age, sex, nuptiality, fertility, mortality, and migration), current and inter-censal population estimates, population projections, and demographic analysis.

Anatole was one of those rare types of managers in a government environment who succeeded in directing a highly technical program and carrying out his own technical and substantive research in demography. Most of the aforesaid research and publications were carried out while he was at Statistics Canada, charged with heavy managerial and administrative responsibilities.

Dr. Romaniuk's managerial style was quite informal. Except for special meetings, a prior appointment was not required to see him on any matter. Often he used to go to see the staff in their offices rather than calling them to his office. His quiet managerial style, his ability to maintain a research-focused atmosphere, his hard-working nature and dedication to the profession, and his broad outlook and appreciation for good quality work, helped not only to build a highly credible demography program but also to attract and retain highly qualified professional demographers. During his time the Demography Division's staff comprised the largest single group of professional demographers in the country. He deserves special credit for building up the bilingual character and atmosphere of the Demography Division and the ethnic diversity of the staff, which had no parallel elsewhere at Statistics Canada. He also managed to attract eminent demographers like Professors Nathan Keyfitz, Norman Ryder, and Roland Pressat to work on special projects. Other well-known demographers also visited the Bureau to give public lectures and seminars.

Dr. Romaniuk was a softly spoken man, yet he had a flair for reconciling diverging and competing interests. This was particularly demonstrated by the way he was able to defuse heated discussions in his capacity as Chairman of Statistics Canada's Federal-Provincial Committee on Demography. From the Committee's inception it benefitted from his quiet diplomatic way of ironing out differences and coming to reasonable compromises.

All who knew him had great respect for Anatole. He was a wise, warm, elegant, and compassionate man, possessing a sharp intellect. He was never too busy to help and mentor those around him, offering wise counsel to friends and colleagues who sought his advice.

We as well as all his friends and colleagues will always remember and cherish our fond memories of Anatole and the many wonderful experiences we shared in our interactions and collaborations with him. He was a source of inspiration to all and a positive role model. We will miss him.

Frank Trovato
Sociology Department, University of Alberta

M.V. George
Former Senior Advisor, Demography Division, Statistics Canada
Adjunct Professor, Emory University

Rod Beaujot
Sociology Department, Western University

Dated: March 14, 2018

Editor's preface to the Special Issue

This edition of *Canadian Studies in Population* contains of works of central importance to those interested in the social demographic future of Canada. According to the United Nations' 2017 revision of the *World Population Prospects,* the medium-variant projections indicate that the world's population of 7.6 billion in 2017 would grow by slightly more than one billion people over the following 13 years, reaching 8.6 billion in 2030 and increasing further to 9.8 billion in 2050, possibly peaking at a population size of 11.2 billion by 2100 (United Nations 2017).

Canada's population in 2017 was estimated by the United Nations to have been 36.6 million, projected to increase to nearly 45 million by the middle of this century. Although growth will occur at slower rates compared to earlier times in history, the projected significant rise of population over the rest of the twenty-first century will necessarily imply major socioeconomic changes as well as resource and environmental challenges, demanding careful study today to better plan and prepare for the future.

As part of a thematic program of research on Future Challenges Areas for Canada, in 2013 the Social Sciences and Humanities Research Council of Canada (SSHRC) requested that a group of demographers prepare a report examining the implications of global peak population on Canada's future. SSHRC initially discussed the idea of this report with Professor Roderic Beaujot, Director of the Strategic Knowledge Cluster on Population Change and Lifecourse at Western University. He conferred with Alain Bélanger and Barry Edmonston, who agreed to serve as editors of the report, to be titled *Implications of Global Peak Population for Canada's Future.* Authors were then asked to write sections of the report, dealing with six key topic areas: nurturing the next generation; the well-being of families; life cycle changes; global migration and cities of the future; Arctic, rural, and remote communities; and energy, resource consumption, and climate change.

In the autumn of 2017, *Canadian Studies in Population* received permission from SSHRC to publish the six chapters and Introduction of the *Implications* report in a special issue of the journal. The editor of *CSP* then invited the authors to revise and update their respective sections and incorporate, where appropriate, any new information into their papers. Once received, the manuscripts were carefully reviewed by Professor Rod Beaujot of Western University and the *CSP* editor. *Canadian Studies in Population* is grateful to SSHRC for its approval and support of this project, and to the authors for their willingness to devote valuable time to this initiative.

While this project was being planned, Doug Saunders' book *Maximum Canada: Why 35 Million Canadians Are Not Enough* had just been released. A number of scholars alerted me to this work and to selected reviews which appeared in the national press. After consultation with colleagues, it was felt opportune and appropriate to devote a special review section of *CSP* to this insightful work that is so closely linked to many of the themes covered in the *Implications of Global Peak Population* papers.

Thus, this issue of the *CSP* journal also contains a Review Forum with five expert reviews of *Maximum Canada*, approached from the perspectives of scholars in population history, demography, sociology, environmental economics, and ecology. In corresponding with me about this idea, Doug Saunders called it an "exciting endeavour" and is "happy

to let the reviews, and the book they discuss, speak for themselves." I am grateful to the reviewers for their important contributions, and also to Sharon Klein of Penguin Random House Canada for generously providing five review copies of *Maximum Canada*.

It has been for me a pleasurable and rewarding experience in helping to bring to fruition a new volume of *Studies*. I hope that readers will also find this a memorable issue, which is dedicated to crucial questions facing the future of our country.

Best wishes for a safe and pleasant summer.

Frank Trovato
Editor
14 May 2018

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Introduction to the Special Issue

Implications of World Peak Population for Canada

Alain Bélanger
Barry Edmonston[1]

Introduction

The last century witnessed the fastest population growth in human history, but this is now ending.[2] Recent 2017 United Nations population projections assume that current fertility levels of 2.5 children per woman will decrease to 2.2 in 2050 and to a below-replacement level of 1.99 in 2100 (United Nations 2017).[3] Estimated at 7.2 billion in 2013, the world's population is expected to continue to grow, but at a much slower pace. It will eventually peak at slightly more than 11 billion in the 22nd century, and thereafter slowly decrease for the first time in several centuries. Under the United Nations' low-fertility assumption, world population would peak even sooner, at 8.7 billion in about 2050 and decrease to 7.3 billion by 2100.

Today's current population is increasing by 1.1 per cent per year, compared to almost 2 per cent as recently as 1970–75. By the end of the current century, in 2095–2100, the United Nations expects world population growth to decrease to 0.1 per cent per year; however, peak population size does not occur in this century, according to the 2017 United Nations' medium-fertility population projections. By 2095–2100, world population growth is small but still positive. If the United Nations' rates are extrapolated beyond 2100, world population growth would decrease to zero in about 2110 (by linear extrapolation) or 2115 (by exponential extrapolation). Even though world fertility is projected to fall below replacement levels by 2100, the younger age distribution in some high-fertility countries provides "momentum" for continued population growth past 2100. Nevertheless, global world population growth is expected to cease by 2075 in all regions except Africa and Oceania.

3. Replacement-level fertility is about 2.1 children born to a woman over her lifetime, taking into account the effects of low mortality and the sex ratio of 105 male births per 100 female births.

There are large variations in current fertility levels across countries and regions. Although only 8 per cent of the world's population lives in countries with high fertility (5 or more births per woman), they account for more than one-third of the world's annual population increase. Of the 22 countries with high fertility, the United Nations' population projection (2017: xxiv) expects no country to experience fertility with 5 or more births per woman by 2050. Most of the world's current population (46 per cent) lives in intermediate-fertility countries, with fertility between 2.1 and 5 births per woman over her lifetime. Only one-third of the world's population is expected to be in this category by 2050, with the remainder achieving low fertility. The other large group of the world's population (46 per cent) already lives in low-fertility countries that have less than 2.1 births per woman. These countries include all of Europe and North America, plus 19 countries in Asia, 15 in Latin America and the Caribbean, and 5 in other regions. By 2050, the United Nations expects that 69 per cent of the world's population will reside in low-fertility countries.

National population growth varies greatly. There will still be major growth for several decades in a small number of countries, such as Nigeria and India. But there are currently 75 countries with below-replacement fertility—including Canada—and all will eventually decrease without counter-balancing net immigration. More than a dozen countries in Eastern Europe and Russia will experience large population declines in coming decades, due to very low fertility levels and emigration. Global trends will affect the role of migration on population, with declines in the pool of potential immigrants from many source countries.

For several decades following World War II, Canada's demographic growth was strong. Canadians had many babies and welcomed many immigrants. But in the 1970s fertility fell to below-replacement levels. *Natural increase*, the difference between the number of births and the number of deaths, is still positive due to population momentum, but is declining and will turn negative in the future. *Net immigration* thus represents an increasing share of population change. The demographic opportunity window—which created a younger population with a higher proportion of adults in the working ages—is closing for Canada, as baby boomers retire from the labour market. Assuming continuing moderate immigration, Statistics Canada's 2013 population projections (Statistics Canada 2015) indicate that the population will increase from 35.2 million in 2013 to 51.0 million in 2063, under medium-growth assumptions. But immigration has small effects on population aging and the proportion 65 years and older could increase from 15 per cent now to between 24 and 28 per cent in 2063. Under Statistics Canada's medium-growth population projections, population growth will drop from 1.1 per cent annual growth at present to 0.7 per cent in 2063.

Interpreting peak population

The notion of the world's peak population is a special aspect of *demographic transition theory*, which was originally proposed by Princeton University demographer Frank Notestein in 1945 (demographic transition theory and later refinements are discussed in Kirk 1996). Notestein suggested that the demographic transition involved four stages. Stage I characterized pre-industrial societies with high birth rates and high, fluctuating death rates. These societies experienced negligible long-term population growth and had young age structures. Stage II occurred when death rates began to fall with improving public health and standard of living. Population growth increases and the age structure becomes slightly younger. In Stage III, birth rates began to decline, with slackening of population growth and population structure becoming older. Stage IV is reached when birth and death rates both become low. Population growth becomes negligible and there is an old age structure.

From the perspective of the *demographic transition*, the world's peak population occurs in Stage IV, when global fertility levels decrease to (or below) replacement-level, which creates birth and <u>death</u> rates that are relatively equal. At this point, population growth slackens and becomes close to zero, the world population stabilizes (or begins to decrease), and there is an older age structure. This means that the concept of *world peak population* involves three distinct outcomes: (1) population growth ceases and may, depending upon relative birth and death rates, become negative; (2) the size of the world's population peaks, and remains constant or may decrease if fertility is below replacement level; and (3) the overall age structure of the world's population becomes older. These three demographic consequences are associated with the idea of a peak population, and are discussed in more detail in the Canadian context in the papers in this special issue of *Canadian Studies in Population*.

Population growth

Fifty years ago, the global population was growing at almost 2 per cent per year (see Figure 1). Today, it is growing by 1.1 per cent per year. Although the world's population is expected to continue growing until the end of the 21st century, according to the United Nations medium-fertility assumptions, the rate at which this growth will occur is expected to continue to fall. In recent years, the population of Africa has had the fastest growth among all regions, increasing at a rate of 2.6 per cent annually in 2010–15; however, this rate is beginning to fall and is projected to reach 1.8 in 2045–50 and 0.7 in 2095–2100. Population growth will fall to zero by 2050 for Europe, Asia, and Latin America and the Caribbean. Fertility will be below-replacement for North America, but net immigration will maintain positive population growth for the remainder of the 21st century.
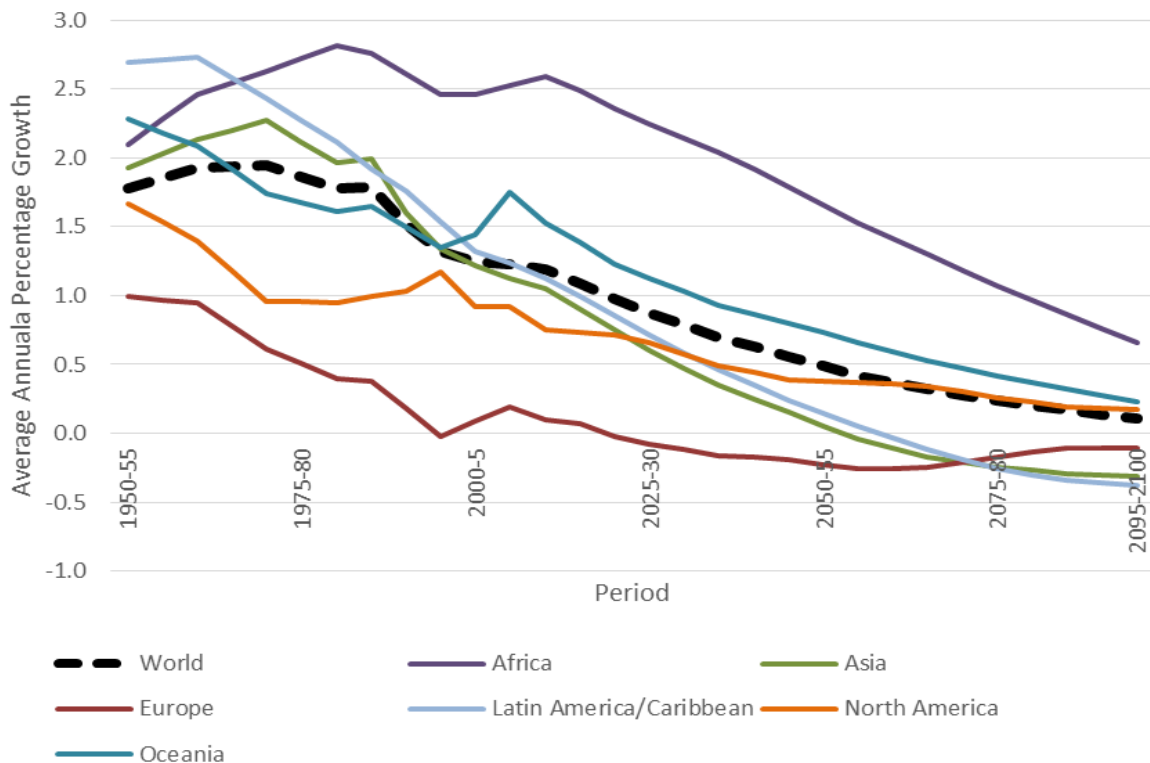
Figure 1. Average annual rate of population change by region: Estimates and medium variant population projections, 1950–2100.
Source: United Nations 2017: Table A5.

Population size

The world's population currently continues to grow, but more slowly than in the past. The world's population is projected (using United Nations medium-fertility assumptions) to increase by slightly more than one billion people over the next 13 years, reaching 8.6 billion in 2030, and to increase further to 9.8 billion in 2050 and 11.2 billion by 2100. As shown in Figure 2, more than half of the anticipated growth in global population between now and 2050 is expected to occur in Africa. Of the additional 2.2 billion people who will be added between 2017 and 2050, 1.3 billion will be in Africa. Asia is expected to be the second-largest contributor to this future growth, adding over 750 million people between 2017 and 2050. Population growth in Africa and Asia is followed by Latin America and the Caribbean, Northern America, and Oceania, where growth is projected to be more modest. In the medium-fertility population projection, Europe will be the only region with a smaller population in 2050 than in 2017. From 2050 to 2100, Africa will be the main contributor to global population growth.
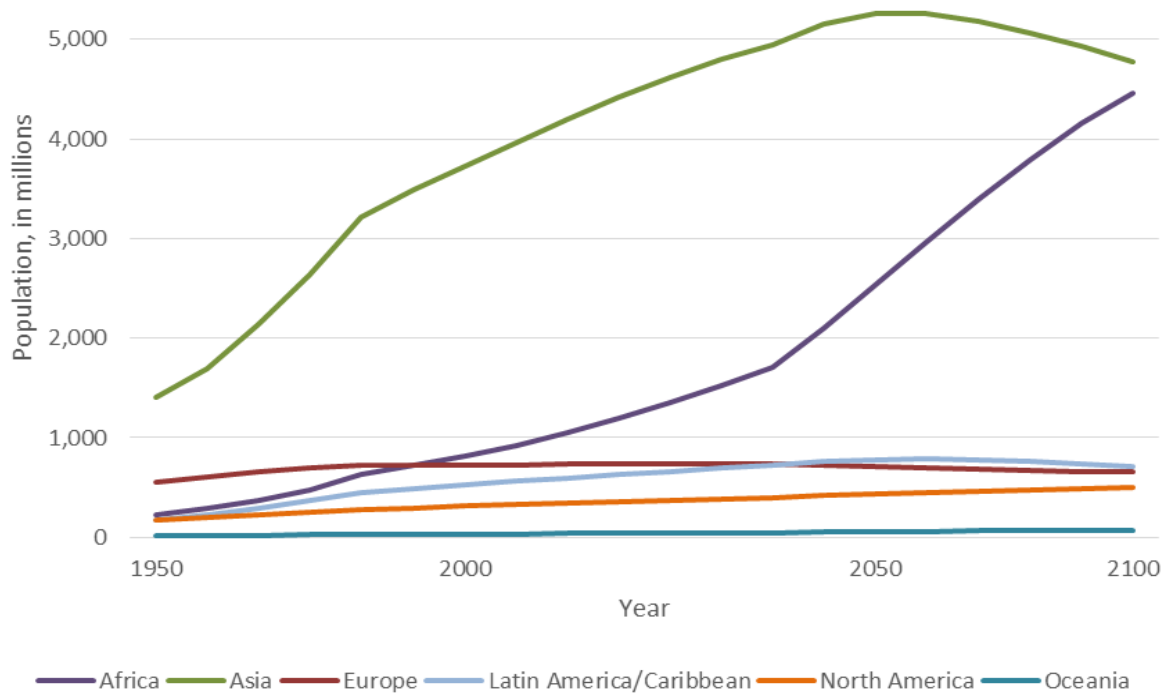
Figure 2. Population size by region: Estimates and medium variant population projections, 1950–2100.
Source: United Nations 2017: Table A1.

Age structure

As fertility declines and life expectancy rises, the proportion of the population in older ages increases relative to the population in younger ages (see Figure 3). This phenomenon, known as *population aging*, now occurs throughout the world. In 2017, there are an estimated 960 million people aged 60 or over in the world, comprising 13 per cent of the global population. The population aged 60 or above is growing at a rate of about 3 per cent per year, almost three times the overall global population growth rate. Rapid population aging will occur in all parts of the world, and by 2050 all regions of the world except Africa will have one-fourth or more of their populations aged 60 and above. The number of older persons in the world is projected to be 1.4 billion in
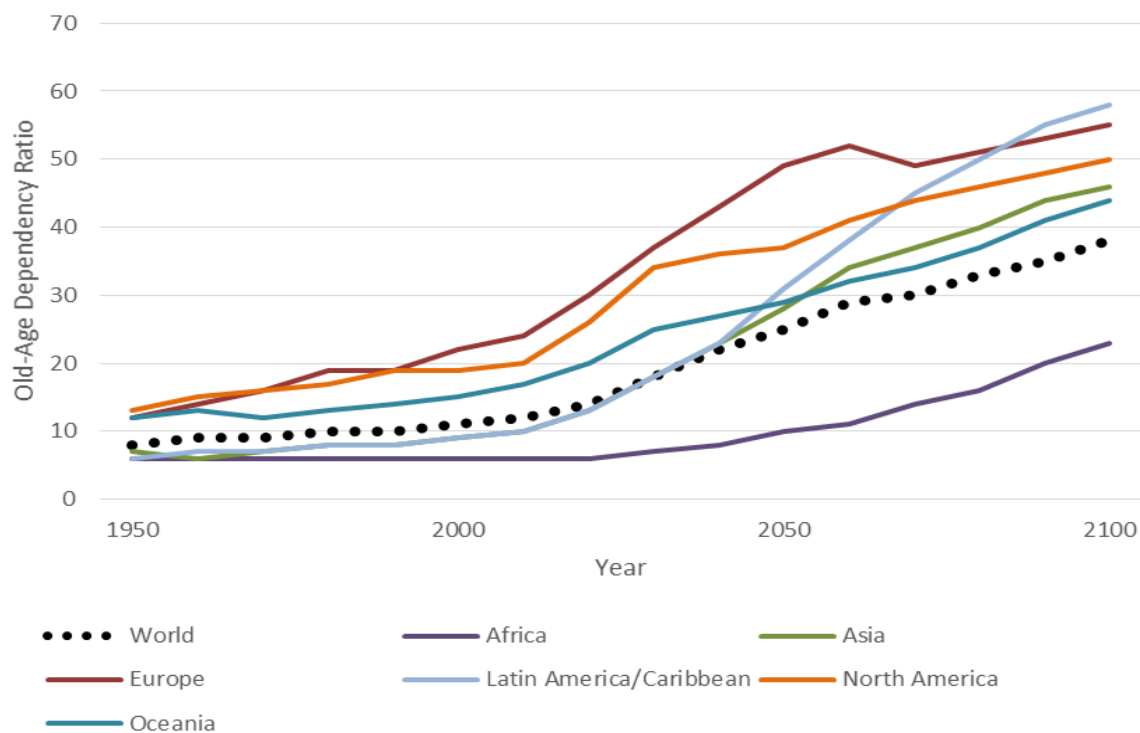
Figure 3. Old-age dependency ratios by region: Estimates and medium variant population projections, 1950–2100.

Source: United Nations 2017: Table A33.

Note: Old-age dependency ratio is defined as the number of people aged 65 years of age and older per 100 people aged 15 to 64 years.

2030, 2.1 billion in 2050, and 3.1 billion in 2100—in other words, a tripling of the older population by the end of this century.

Population aging will have a dramatic effect on the *elderly dependency ratio*, defined as the number of person aged 65 or over per 100 persons aged 15–64 years. The elderly dependency ratio is a useful indicator as a ratio of the number of persons who are potential retirees or workers by virtue of their age. Currently, the elderly dependency ratio for the world is 14, but is projected to increase to 25 in 2050 and 38 in 2100. In 2017, Africa has 6 persons aged 65 years or above for 100 persons aged 20 to 64 years. This ratio is 13 for Asia and for Latin America and the Caribbean, 20 for Oceania, 26 for Northern America, and 30 for Europe. By 2050, 7 countries in Asia, 24 in Europe, and 5 in Latin America and the Caribbean are expected to have potential support ratios around 50. By the end of this century, in 2100, the United Nations projects that elderly dependency ratios will be around 50 in all world regions except for Africa (which will be 23). These low values of 50 elderly per 100 workers—implying that there are roughly only two potential workers for every elderly person—underscore the fiscal and political pressures that many countries are likely to face in the coming decades in relation to public systems of health care, pensions, and social welfare for their growing older populations.

It should be noted that Notestein did not highlight the role of *international migration* in his original statement of the demographic transition, because his concern was with the relationship of modernization with birth and death dynamics. In later discussion, demographers noted that migration is likely to be involved in the demographic transition. Kingsley Davis (1963) argued that high population growth in Stage II of the demographic transition produces a multiphasic response,

including outward migration when births greatly exceed deaths. Davis (1963: 352) contended that "under a prolonged drop in mortality…people found that their accustomed demographic behavior was handicapping them in their effort to take advantages being provided by the emerging economy." The multiphasic response to high population growth, according to Davis, is to postpone marriage, increase celibacy, resort to abortion, practice contraception, and emigrate overseas.

International migration cross-cuts the demographic transition for societies in two ways. During the demographic transition, there is a possibility that people emigrate from high population growth societies as part of the multiphasic response—as occurred in Western Europe in the 1800s when there were high emigration to Australia, Canada, the United States, and other destinations. And secondly, upon completion of the demographic transition—as will be the case for most countries in the coming century—international migration will subtract people from some countries, such as Eastern Europe, and lead to even larger population decreases or will add people to some below-replacement-level-fertility countries, such as Australia and Canada, and offset negative natural increase, which occurs when death rates exceed birth rates.

Six key questions

In the context of global population peaking, this Special Issue describes implications for Canada of global peak population for six key questions listed below, which are the focus for the following six papers. Each of the six papers addresses emerging issues, future challenges, and expanding our knowledge base for each key question.

Effectively *nurturing the next generation* is a critical topic for social policy. Nurturing the next generation involves establishing policies and programs for strengthening and training a new generation with the necessary knowledge and skills to be productive and contribute to changes to Canada's economy and society. This process depends greatly, however, on understanding the career aspirations and needs of youth and, at the same time, the employment demands for the future labour force.

What might *Canadian families* look like in the next 20 years, and how will they measure their well-being? The "traditional" two-parent, male-breadwinner, two-child family is already uncommon. Canadian family types have diversified in recent decades. Moreover, although some may yearn for a return to the "traditional" family, Canadian society does not appear to be worse off for evolving family trends.

Life cycle changes are challenging society, in Canada and the world. Demographic processes influence lifecourse and family cycles through their effects on longevity, parenting, and numbers and availability of spouses, children, parents, grandparents, and other relatives. Variations in lifecourse and family cycle—influenced as well by the number and composition of immigration—are key features in the frequency, direction, and timing of transitions such as entry into the labour force and retirement.

Global migration is primarily an urban phenomenon, with major effects on *cities of the future*, including Canadian cities. In 2010, about 214 million international migrants resided primarily in the large metropolises of a dozen immigrant-receiving countries. Over 63 per cent of Canada's immigrants live in Toronto, Vancouver, or Montréal, and immigrants will continue to gravitate to Canada's cities (Statistics Canada 2013). While immigration fuels Canadian cities' population and economic growth, cities have little control over national immigration policies or internal migration flows. In the future, Canadian cities will have more diverse and aging immigrants, and will be challenged to provide housing, jobs, education, and other social services, and promote the integration and inclusion of immigrants and their children.

Changing demographics and migration also affect *rural and remote communities*, particularly in the North and the Arctic. With generally higher birth rates, Arctic populations are younger and growing. These populations are often also influenced by migration that dominates short-term changes for smaller population groups. For these rural and remote communities, population changes have implications for education, housing, healthcare, employment, and increased demand for resources such as water, electricity, and energy. Climate and ecological changes also have significant implications for these communities.

There are large potential effects of global peak population on *Canada's energy, resource consumption, and climate change*. Canada's foreseeable climate change is likely to include hotter summers and milder winters. Climate change will have direct and indirect effects on the environment, energy and resource demands, and public health across Canada. Canadians will find, for example, that greenhouse gases magnify the effects of air pollution in hotter summers and, in turn, increase human health risks.

Global Peak Population: Emerging issues and future challenges

Several overarching issues and challenges are addressed in the six papers. We do not summarize each of them but highlight some broad issues that are discussed in them.

Labour force

There will be important future challenges for Canada's labour force. While the Canadian population is aging, with shortages of labour in some remote communities and in some occupations, there are likely to be increasing challenges relating to youth and long-term unemployment. The growth in service sector employment and the related decline in manufacturing employment, as well as the effect of increased education levels on the workforce, will continue to affect the Canadian labour force. The nature of work has changed significantly over the last three decades, resulting in new issues, including the "hollowing-out" of middle-income employment, and the associated "hour-glass" economy. Higher-paid jobs are increasingly dependent on good education with skills, knowledge, and experience in selected occupations.

Even in these difficult economic times, some skilled workers—ranging from pipe fitters to chemical engineers—are in short supply and the world's leading companies compete fiercely for them. Unfilled vacancies continue in recent years, despite higher unemployment. Employers report that they have trouble filling some jobs, with technicians, salespeople, skilled trades, and engineers being the hardest to find. Northern and remote communities especially report the shortage of professionals and experienced technicians. Policymakers and educators face a key challenge to anticipate future changes in the demand for labour and to design policies that help Canadian workers to respond.

Canada's higher education system has expanded greatly during the past fifty years, with the training of a large number of students who have done relatively well. New challenges are emerging, with the need for a more diverse group of workers in a period of slower labour force growth. Moreover, these challenges will require more than simply expanding higher education. Attention will be needed to better design programs for early childhood education, changes in higher education that maintain broad participation while offering closer training for new employment opportunities, and expansion and improvement in lifelong learning programs, especially for older workers and recent immigrants.

Immigration

Immigration will remain a major issue. Although difficult to predict and dependent on a number of factors, the number, characteristics, and integration of immigrants will be a key issue for policies and programs in coming decades. Besides the labour force aspects mentioned above, there are several important emerging issues related to immigration. The large numbers of immigrants who arrived in recent decades are, like other Canadians, becoming older. These immigrants will soon begin to retire and will shortly become a larger proportion of the elderly population. During the next twenty years, for example, the fastest growing elderly ethnic groups will be Chinese, South Asians, and persons from the Middle East. This will diversify our elderly population, with implications for the types of elderly services needed.

Social and economic conditions for immigrants in Canada have changed in recent years, with slower economic growth and poorer employment opportunities. We need to improve our understanding of these changing conditions for immigrants, and how immigrants have progressed in recent years. Because the success of the children of immigrants (the second immigrant generation) is so important for the future of Canadian society, it would be especially useful to know more about how immigrant and second-generation youth do after leaving school and entering the labour force.

Life cycle changes

The study of life cycle changes was originally developed by demographers to examine key transitions in individual lives, such as childhood education, becoming married or a parent, and retirement. Marshall and Mueller (2003) identified five policy domains where life cycle changes need to be considered: (1) education, the transition to employment, and lifelong learning; (2) family, and the relationship between work and family; (3) work-to-retirement transitions; (4) income security in the later years; and (5) intergenerational relations and social cohesion. In relation to the issue of peak global population, items 1, 3, and 5 are the most likely to be affected, as discussed in the specific section on life cycle changes.

Families

Several interrelated issues deserve emphasis. First, early childhood education is important for overcoming difficulties faced by disadvantaged children and in order to support parental involvement in paid employment. Yet, we lack a good understanding of the role of different types of childhood education, including the costs and features of these programs, on lifetime development for children. Nor do we fully understand the relationship of childhood education and parental employment.

It is clear that societies which promote more family flexibility—as indicated by gender roles, family types, and types of sexual unions—encourage more young people to form longer-term relationships and partnerships, and to create families. This is an area where we need a better understanding of the role of family flexibility and such other factors as housing and urban geography on family formation. For example, it seems that housing and urban geography are important for accommodating the needs of families who have children and parents who have employment.

As the costs of children have increased, there are pressures on low and middle-income families, with the potential for delayed or reduced childbearing. This is a topic that requires further study from demographers.

Immigrant families provide a challenge for our understanding of several family-related issues. Foreign-born families in Canada have lower fertility than foreign-born families in other countries,

such as the United States. While the reasons are not clear, factors such as Canada's selective immigration policy and origin countries of immigrants are likely implicated. Children of immigrants generally do well in schooling, although whether this educational success translates into commensurate occupational achievement and income remains an open question. In addition, immigrant families are aging, along with other Canadian families, yet current knowledge of aging immigrant families is quite sparse.

Labour and migration in Arctic, rural, and remote communities

Many professionals are becoming older and are likely to move after retirement. Recruitment and retention of replacement workers with technical and professional skills, especially in health care, will be a critical challenge in future years.

Population and the environment

The effect of population on the environment is perhaps the single issue most apparent to the public. Canada's success in reducing its share of greenhouse gases is more dependent than other countries on resource and energy extraction. A fundamental debate involves biologists and environmentalists who view *resource limits* as critical to dealing with environmental problems, while economists and other social scientists are more likely to stress that *innovation and new technology* offer the chance to deal with current and future environmental problems. Our understanding of population and the environment requires improved collaboration between natural and social scientists. As global population peaks and population growth slackens, the pressure of population numbers on the environment weakens. But, economic growth and new technology will continue, and will present environmental challenges in spite of slower population growth.

Global Peak Population: Expanding our knowledge base

Meeting future challenges also requires improving our knowledge base. We highlight three areas where greater efforts are needed.

First, at present we lack knowledge about a variety of important trends and processes in Canada's labour market. It is peculiar, for example, that we debate whether there are labour shortages or not; new studies are needed to understand better whether perceived labour shortages are due to a general shortage of workers, a lack of workers with specific skills and experience, or other factors. We especially need knowledge about employment over the lifetime for university graduates and recent immigrants, including a better understanding of the duration and intensity of employment, and the link between university studies and employment requirements. Such information would inform public discussion about employment by type of education, about the level of short-term unemployment, underemployment related to undesired over-qualification, and part-time employment, and the adaptation of immigrants based on their credentials and previous job experience.

Second, some important data sources, such as national data on marriages and divorces, have been lost in recent years. In addition, we need to improve or start new data sources on a number of topics, such as family dynamics and interrelationships with childbearing, employment, and early childhood education; elderly immigrants and their living arrangements, retirement income, and family support; lifetime data on taxes, health care, pensions, and social welfare benefits; and better data on northern populations.

Third, collaborative research on population and the environment is needed to better understand the interrelationships of local and national population growth and its environmental effects. In particular, social scientists need to become more involved with the study of the energetics of Canadian society.

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Emerging issues in the life cycle perspective in the context of population peaking

Alain Bélanger[1]

Abstract

This paper proposes a theoretical examination of how taking a life cycle perspective can provide a better assessment of Canadian public policies in the context of population peaking. It links the changing life cycle patterns brought about by increasing age of entry into the different phases of life and increase in life expectancy to emerging issues related to population peaking, such as recruitment and aging of immigrants or future labour demand and supply by broad skill level. Although most of the paper is theoretical in nature, a short section of it takes an empirical look and contrasts cross-sectional and life cycle estimates of economic dependency ratios for Canadian-born and foreign-born individuals. These estimates are obtained from a dynamic microsimulation model of the Canadian population (LSD-C) that takes into account, among other things, differentials in labour force participation or educational attainment between population groups. The article concludes with suggestions on the most important data gaps that need to be filled to better inform policymaking processes.

Keywords: peak population; life cycle perspective; Canada; microsimulation; immigration

Résumé

Ce papier propose un examen théorique de comment la prise en compte d'une perspective de cycle de vie peut fournir une meilleure évaluation des politiques publiques canadiennes dans le contexte d'une population atteignant un niveau maximal. Il lie les changements engendrés par l'augmentation de l'âge aux transitions entre les différentes phases du cycle de vie et par l'augmentation de l'espérance de vie aux questions émergentes liées à la population atteignant un niveau maximal. Par exemple, on y retrouve une discussion des implications en ce qui concerne le recrutement et le vieillissement des immigrants ou encore l'offre et la demande future de travail selon le niveau de compétence. Bien que la majeure partie de l'article prenne un caractère théorique, une courte section plus empirique présente une estimation des rapports de dépendance économiques pour les Canadiens de naissance et les Canadiens nés à l'étranger, contrastant les évaluations transversales et longitudinales. Ces évaluations sont obtenues à l'aide d'un modèle de microsimulation dynamique de la population canadienne (LSD-C) qui prend en compte, entre autres, les différences entre les groupes de populations au niveau de l'activité sur le marché du travail ou au niveau de la scolarité. L'article conclut avec des suggestions sur les principales lacunes de données qui devraient être comblées afin de mieux informer des politiques.

Mots clés : population maximale, perspective du cycle de vie, Canada, microsimulation, immigration

With industrialization and the expansion of the welfare state, the concept of the life cycle has been traditionally defined as having three phases: childhood, involving education; adulthood, involving work; and old age, involving work incapacity and chronic health problems. In formalizing the phases of the life cycle, it is possible to categorize them in terms of their productivity. School-

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age children are net beneficiaries of time and cash transfers, but many of these transfers occur within the family. Elderly adults are also net beneficiaries, but in their case, the largest share of the net flow is from public transfers (especially health care benefits and pensions). During adulthood, labour force participation rates peak, as well as the amount of time devoted to unpaid productive activities such as housework, childcare, and caring for older parents. While women's labour force participation rates have been approaching the higher male rates, females continue to supply most of the unpaid activities, resulting in a net transfer of unpaid production in favour of males.

With the institutionalization of retirement along with the unprecedented life expectancy increases of the 20th century, a new third phase—the golden age—has emerged (Laslet 1989). It falls between adulthood and old age and is characterized by a period of greater leisure.

During the new third age, retired individuals are generally healthy, wealthy, and have more time for non-work activities and personal development. Finally, the new fourth phase corresponds to oldest-old people, characterized by more frailty and dependency than the third age. Next, while production is highly concentrated during adulthood, consumption is much more evenly distributed among the four phases, although it tends to drastically increase in the last years of life due to health care costs and intensive caring time. In consequence, although there are some productive activities during all stages of life, the net transfers are negative during adulthood and positive at other stages.

In the past, *age at transition* between the different stages of life was clear and fairly stable. Transitions from one stage to another corresponded to normalized and institutionalized age of leaving school, entering the labour force, and retiring. Much of Canadian public policies relate to this normative view of the working life course. As an example, administrative rules of pension entitlements define the normal age for retirement. But the boundaries of these phases are evolving and are becoming increasingly blurred.

Emerging issues

Two trends are changing the life cycle patterns in Canada and other countries. First, there is a general elongation of the life cycle and of its components, in part due to the major gains in life expectancy during the last century (Vaupel 2010). Educational attainment is also increasing from one cohort to the next, increasing in turn the mean age of entry into the labour force. Then, leaving home, entering into marriage or common-law union, or having a first child are occurring at older ages, consequently delaying the age of entry into adulthood. It might be thought that late entry into the labour force would later translate into late entry into retirement, particularly at a time when life expectancy increase is more and more due to decreased old-age mortality rates. While age at retirement *decreased* from the 1970s to the mid-1990s, partly because of early retirement incentive programs used as a tool to manage downsizing, people are now delaying retirement and age at retirement has been *increasing* since 2000 (Carrière and Galarneau 2011). Labour force participation rates at 50 years and over are now clearly moving up, and this trend is expected to continue in the future, due partly to extended education and postponed labour force entry. Recent working life tables show an increase in retirement age that compensates for the increasing life expectancy at older age and thus resulting in stable length of retirement. In addition, trends in life expectancy are expected to increase, albeit at perhaps a slower rate. Changes in healthy life expectancies, however, are less clear. Although the number of healthy years is increasing, it is not clear whether it is increasing faster, at the same rate, or slower than total life expectancy. In any case, the number of years of life lived in poor health or in dependency is also increasing.

Second, globalization, economic restructuring, rapid technological changes, and downsizing firms all tend to modify the traditional single-career path. Over the life course, individuals now have more numerous jobs, often separated by spells of unemployment and underemployment.

The transition to full retirement is also often preceded by a spell of bridge jobs or part-time jobs. Adult education is not only necessary to increase the skills of workers in their career job, but also for those who are searching for new jobs after layoff.

Recruitment of future immigrants

These life cycle changes need to be linked with the emerging issue of global population peaking during this century. In this context, the first issue is the effect of global population change on recruitment of future immigrants. Several source countries of current Canadian immigration show declining fertility rates and often even faster population aging than Canada. In the coming decades, China, South Korea, the Philippines, and eventually India will see their labour force population reach a plateau. Similarly to Spain, Italy, or Greece in southern Europe, which changed from countries of emigration to immigration, current source countries for Canadian immigration may well become additional competitors in the global market for labour force and skills. Not only will immigrants become more difficult to recruit, source countries will likely shift to other regions such as northern and sub-Saharan Africa or the Middle East, where the demographic transition is lagging and population growth will continue. This will increase the ethnic diversity of immigrants and might test social cohesion as well as increase the risk of fractionalization. In addition, since the global demand for skilled immigrants will increase when there are more alternative destinations, Canada may need to reduce its selection criteria in order to maintain high immigration numbers.

The aging of immigrants

Immigrants to Canada are also aging. More than 1.6 million immigrants (about one-third of the total) admitted since 1990 are baby-boomers (born between 1946 and 1966). They expanded the already large cohort of Canadians who are progressively retiring from the labour market and receiving pension transfers and health care services. The immigrant population growth component might therefore increase rather than decrease the pressure on the pension and health care systems, and perhaps add arguments supporting Ponzi-scheme approaches to ever higher immigration as a solution to the aging challenge. While past immigration was largely European, more recent immigrants originate from Asia and other countries, and are therefore more diverse than in the past and more culturally different from the resident population. Adequate knowledge of official language and literacy (Bonikowska et al. 2008), quality of foreign education (Sweetman 2004) and training, and discrimination (Oreopoulos 2011) from potential employers, as well as oversupply of labour during economic downturns are all possible reasons explaining the increasing difficulties that recent immigrants have in fully integrating into the Canadian economy. Despite the high level of educational attainment of recent immigrants, their economic integration is more difficult, and it appears that the economic performance of immigrants admitted since 1990 will not reach the level of the Canadian-born (Picot 2008).

Future challenges

Marshall and Mueller identified five policy domains where life cycle changes need to be considered (2003): (1) education, transition to employment, and life-long learning; (2) family and the relationship between work and family; (3) work-to-retirement transitions; (4) income security in the later years; and (5) intergenerational relations and social cohesion. In relation with the issue of global population peak, items 1, 3 and 5 are the most likely to be affected, as discussed next.

Education and employment

Literacy levels of immigrants in English and French are on average lower than of the Canadian-born, despite higher educational attainment. This difference in English and French literacy explains about two-thirds of the immigrant/Canadian-born earnings gap (Ferrer et al. 2006). Immigrants also face difficulties integrating into the labour market because of language barriers, educational recognition, and discrimination. These factors are correlated with their overall earnings through the life cycle. Therefore, over their lifetime immigrants contribute less than the Canadian-born through the tax system.2 Changes in the welfare state regulations can modify the level of net transfers over the life cycle and have implications on intergenerational equity. A recent study attempts to create an index of intergenerational justice between older and younger generations for 29 OECD countries3 (Vanhuysee 2013). Canada is ranked fifth from the bottom on intergenerational justice. Given the persistence of intergenerational inequity, there may be more tolerance for inequality in intergenerational transfers when the generations who benefit are the parents or the children of those who overpay. Social cohesion can therefore be in jeopardy when a high proportion of population growth is driven by net immigration rather than natural increase.

Aging and health care

Even if they benefit from the *healthy immigrant effect*, aging immigrants will eventually need health care and social support, like older Canadian-born residents do. Continuing changes in the source countries in the context of increasing diversity will increase language barriers and cultural differences here, forcing Canadian health care providers to continuously adapt to an ever changing population. Furthermore, if immigrants live longer than the Canadian-born, can we not then expect lifetime costs for health care and pensions to be higher?

Labour demands and labour supplies

Increases in the education level of the Canadian-born and arrival of highly educated immigrants is changing the labour supply composition in terms of broad skills (Bélanger and Bastien 2013). In the context of a knowledge society, there will be greater demand for higher skills than lower skills. Nevertheless, the demand for lower-skill jobs will continue to be positive, although at a lower rate. Comparing projections of supply and demand by broad skill levels shows an increasing imbalance in the future, with a large oversupply of highly skilled workers and labour shortages among lower-skilled workers. These forecasts imply an increasing overqualification rate within the labour force, with workers that have higher level of education than job requirements. The Canadian over-qualification rate is already among the highest of all OECD countries (NCES 1997). On this point, a question worth raising for further research is: What are the advantages and disadvantages to Canada of increasing overqualification as concerned productivity or individual satisfaction? Moreover, oversupply of a highly educated labour force and shortages in lower-skilled jobs can influence relative wages by education. Recent studies show that the return from higher education is decreasing at the same time as college and university education costs are increasing (Morissette et al. 2012).

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2. In a recent study of the fiscal effects of immigration, Canadian-born households had a net positive balance of $11,000 for the 2007–09 period, compared to a net positive balance of $7,000 for immigrant households, according to the OECD's *International Migration Outlook* (2013). Both Canadian-born and immigrant households have net positive taxes minus social transfers, although the net balance is $3,000 higher for Canadian-born households. Overall, the OECD study shows that there is a negligible fiscal effect of immigrants in Canada, but this is a cross-sectional analysis.

3. The intergenerational justice index is calculated from indicators such as national debt per child, child and elder poverty, and size of ecological footprint. Canada does poorly on each of the three measures.

In this situation, will future Canadian generations reduce their investment in human capital? If immigration continues to be highly selective of university graduates, will we increasingly replace the highly skilled labour force with immigrants, while lower-skill jobs are increasingly occupied by the Canadian-born? An alternative would be to be less selective on university education for immigrants (e.g., turning temporary immigrant workers into permanent residents or increase the use of provincial nominees), but this would probably entail more difficulties of linguistic and cultural integration.

Expanding our knowledge base

Rethinking policies with the life course perspective

Despite variations in the life course, Canadian policy measures continue to be based on a stereotypical life course pattern of education–work–retirement. More thought is needed to define how social policies can better suit the evolving life course. More research is needed on healthy life expectancy in general, and to determine whether we are facing expansion or compression of morbidity. More research is also needed to understand the full consequences of the changes in life transitions and the diversification of life course patterns. Taking a life course perspective, and knowing that disadvantages tend to cumulate to create larger differences by the end of life, the disadvantages that recent immigrants have over their life course are likely to affect their economic well-being and health at older ages. It is critical to understand how aging affects health care use and costs.

Given the objective of assuring the future economic well-being of the elderly in the context of high immigration, it is also critical to take a life course approach to measure the number of active and inactive years lived in the labour market. Taking a life course approach is better than simply relying on cross-sectional measures, because of the significant differences in age structure of the native and immigrant populations. A cross-sectional perspective creates a bias in favour of the population group with the younger age structure, and it is therefore not surprising that the conventional old age dependency ratio (OADR) is more favourable to immigrants, a population group with a larger share of its population concentrated in the working ages.

This is also important because in Canada the public pension programs (OAS and C/QPP) are not very generous. The replacement rate of public pension is 45 per cent for median earners in Canada, compared to 54 per cent for OECD countries (Bélanger et al. 2016), and thus a large share of the future income of the elderly has to come from their private pension plans or other form of wealth accumulated during their working life. To get a more useful description of the situation, it is preferable to use the *economic dependency ratio* (EDR) that takes into account the difference in activity rates. The classical (cross-sectional) economic dependency ratio is defined as the ratio between the population not in the labour force (inactive) and the population in the labour force (active). But even when taking differences in participation rate into consideration, differences in age structure can continue to skew the picture. As a better measure, I propose to use the *cohort economic dependency ratio* (CEDR), which is defined as the ratio between the number of years lived inactive divided by the number of years lived active over the life course. Like other longitudinal demographic measures (cohort life expectancy), it has the inconvenient feature that it can only be observed when the last member of a cohort has died. Fortunately, we can also measure it from simulations.

The LSD-C[4] dynamic microsimulation model developed at INRS (Bélanger et al. nd; Sabourin et al. 2017) can be used to estimate the CEDR by projecting until the death of the last individual

4. LSD-C stands for Laboratoire de simulation démographique – Canada. Two other microsimulation models are being developed based on this prototype, one for the United-States (LSD-USA) and one for the European Union (CEPAM-Mic). The author acknowledges the help of his current and past graduate students in the development of the LSD-C microsimulation model: Patrick Sabourin, Guillaume Marois, Samuel Vézina, David Pelletier, Olivier Lafontaine, Kevin D'Ovidio, and Arnaud Bouchard-Santerre.

of a hypothetical cohort comprised of Canadian-born in a given year or of immigrants admitted in a given year, and calculating the number of person-years lived active and inactive. The model takes into account the increase in life expectancy as well as the increase in older worker labour force participation. It also takes into account differentials in labor force participation or educational attainment between population groups. In the context of current labour market changes (increasing immigration, increasing labor force participation of older workers, differentials in labour force participation of immigrants and by education levels), we take into consideration these characteristics and their plausible evolution. Labour force participation rates vary a lot between education groups; therefore, we compute the economic dependency ratios for the population aged 25 and over, when education is generally completed.

Figure 1 contrasts the two different perspectives of the cohort economic dependency ratios for immigrants and natives. When taking a cross-sectional view, the economic dependency ratio of the Canadian-born is 0.56, meaning that in the observed population (in 2011), the total number of person-years lived inactive represented a little more than half the total number of person-years lived active. In comparison, immigrants present an economic dependency ratio that is only marginally higher (0.59) despite their lower participation rate. Thus, using the cross-sectional approach, their lower activity rate is almost fully compensated by their more favourable age structure. Indeed, we found that when adopting the life course perspective, the dependency ratio doesn't change much for the Canadian-born, but is much less favourable to immigrants. The cohort dependency ratio of Canadian-born is 0.60, meaning that over his or her lifetime a Canadian-born person can expect to live (beyond age 25) a little bit more than half of a year inactive for each year lived active. The comparable number for a cohort of immigrants is 0.75.
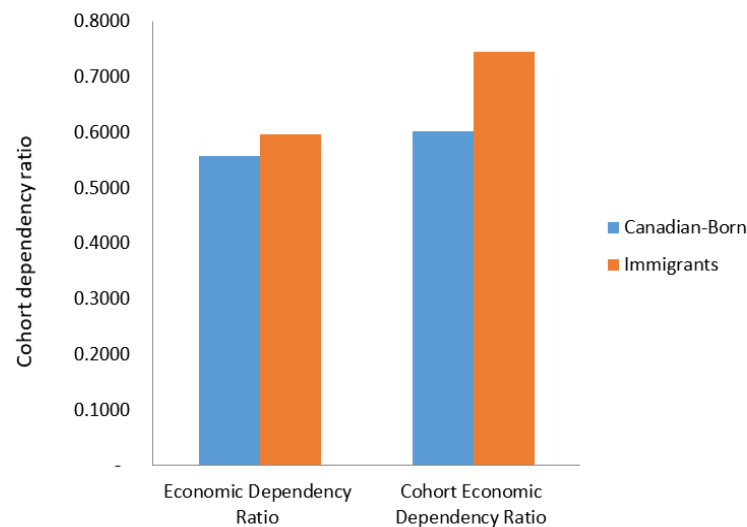
Figure 1: *Economic Dependency Ratios for Canadian-born and immigrants under two perspectives, population aged 25+.*

Relation of immigration and fertility levels

Immigration levels to this country were increased in part to assure continued labour force growth. Is there a relationship between immigration levels and fertility rates? Entry-level Canadian-born and immigrants compete in the labour market, particularly when unemployment rates are high. Increasing the labour force through immigration can create pressure on unemployment rates, particularly among the entry-level age groups. Large immigration intakes would also put pressure on the housing market. Increasing housing costs and unemployment rates may reduce

the capacity of young families to have the number of children they desire, reducing further the country's natural increase and consequently increasing its dependency on international immigration. This is a topic for further study.

Data gaps

Another longitudinal survey of immigrants in Canada could help in assessing the progress made since the early 2000s to integrate new immigrants, but longitudinal surveys are expensive. The recent tendency is more toward linkage of existing surveys to administrative data, including landing data of immigrants. In this context, an expansion of the sample size of existing cross-sectional (GSS) and longitudinal surveys (LISA), combined with modification of the sampling frame to provide better estimates through oversampling of target groups such as recent immigrants, could be a more efficient way of filling in data gaps. Facilitating research access to the administrative longitudinal data file and other linked data files in research data centers should be a priority. Surveys similar to the Gender and Generation project conducted in several OECD countries would also be useful to have in Canada. We need to increase our knowledge on the demographic and economic impact of increasing or lowering immigration levels, on the economic integration of youths and immigrants into the labour force, and on public finance in general and health care and pension costs and income taxes paid over the lifetime by immigration status in particular. We lack up-to-date information on intergenerational transfers over the life course.

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Nurturing the next Canadian generation: The case for labour market research

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Abstract

As rates of population and labour force growth slow in Canada, the country faces important challenges in promoting economic growth and sustaining prosperity. Among the most important public issues are increasing labour force participation rates among groups with low or declining rates of work and reforming education to better prepare graduates for the jobs of the new economy. At the same time, Canada needs to respond to the shifting geography of work. The concentration of employment in a limited number of major urban centres is driving young people to seek work in high-cost cities, while many smaller cities and regions face the prospect of economic and demographic decline.

Keywords: slow population growth; young generations; new economy; labour market; education reform.

Résumé

Alors que les taux de population et la croissance de la population active ralentissent au Canada, le pays devra relever d'importants défis pour promouvoir la croissance économique et maintenir la prospérité. Les plus importantes questions d'ordre public porteront, entre autres, sur le taux de participation, au sein de la population active, de groupes présentant des taux d'emploi faibles ou en déclin et la réforme de l'éducation afin de mieux préparer les diplômés aux emplois de la nouvelle économie. Le Canada doit, en même temps, aborder la géographie changeante du travail. La concentration des emplois dans quelques grands centres urbains pousse les jeunes à chercher du travail dans les villes où le coût est élevé, alors que les villes plus petites et les régions sont confrontées au déclin économique et démographique.

Mots-clés : faible accroissement de la population; jeunes générations; nouvelle économie; marché du travail; réforme de l'éducation.

As the planet moves towards its peak population, Canada's population continues to increase, but at a modest pace and largely due to immigration. In 2016–17, the nation gained just over 100,000 people through natural increase and almost 250,000 through net migration, resulting in a rate of growth of just under 1 per cent. One consequence of the trend to slower growth is a labour force that will age and grow more slowly in the years ahead. This has raised significant concern about the future health of the Canadian economy (Advisory Council on Economic Growth 2017). As a result, preparing the next generation for successful working lives, assisting immigrant workers to find their place in the Canadian labour market, and meeting the shifting needs of employers will be among the most important challenges Canadian society will face in the years ahead.

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Canada has experienced below-replacement fertility for four decades now. Evolutionary biologists argue that low-fertility species typically follow a "K strategy" of heavy investment in a small number of offspring, as opposed to an "r strategy," characteristic of high-fertility populations, where parents invest limited resources in the face of high rates of mortality (Pianka 1970). Similarly, economic demographers speak of the need for significant investment in the "quality" rather than the quantity of children (Becker and Tomes 1976). As Canada faces what is likely to be a long period of slower population growth and a declining rate of natural increase, promoting the successful development of our children will be critical to protect and improve our standard of living.

Emerging issues

Labour shortage or labour surplus

Despite the evident importance of balancing supply and demand in the labour market for both workers and employers, there is a wide gulf between the perceptions of many employers along with some labour market analysts, who perceive a growing shortage of labour, and those of most labour unions and many other analysts, who see a degree of mismatch between the skills of unemployed workers and the needs of employers but no evidence of general shortages now or in the foreseeable future (McQuillan 2013). Moreover, there is growing discussion of the impact of new technological developments that have the potential to eliminate many existing jobs and create a gulf between those employed in high-skill occupations and those with few options outside low-paying positions in the service sector.

There is no doubt that the growth rate of the labour force is slowing, and the retirement of the baby boom cohorts will lead to higher exit rates from the labour force in the near future. Some observers, including the Advisory Council on Economic Growth, established by Prime Minister Trudeau, have called for aggressive action to counter this decline, including a significant increase in immigration numbers. At the same time, Canada has seen relatively high rates of unemployment in many regions of the country, and new labour market entrants, both Canadian-born and foreign-born, face significant challenges to find work that matches their credentials. Moreover, despite continued low fertility and the imminent departure from the labour market of the baby boomers, some analysts argue that increasing labour force participation rates among older workers, women and immigrants will help to ensure continued growth of the labour force (Belanger and Bastien 2013). Men in the prime working ages constitute a fourth category to include; labour force participation rates for men with lower levels of education have fallen significantly in recent years.

Of course, adequate numbers of new entrants is only part of the issue; meeting the needs of the labour market for the skilled workers in high demand will be the greatest challenge. Rapid shifts in technology and ways of doing business can make some skills irrelevant very quickly, while educational institutions struggle to turn out workers with the new types of skills that are needed to fuel economic growth.

Expansion of higher education and shifting needs of the labour market

Canada has been remarkably successful in boosting access to education and providing quality education at all levels. Canada ranks second among OECD countries in the proportion of people aged 25–34 with some form of tertiary education (OECD Data 2016). New data from the 2016 Census of Canada (see Table 1) show the rapid growth among recent generations in the proportion with a university education, as well as a growing achievement gap between women and men (Statistics Canada 2017).

Table 1. Males and females in Canada with at least a Bachelor's degree, 2016.

Age group	Males	Females	Total
25–34	29.1	40.7	35.0
35–44	29.3	37.4	33.4
45–54	25.4	27.1	26.3
55–64	20.9	19.6	20.3

Source: 2016 Census of Canada (Statistics Canada 2017).

Yet there is growing debate about the adequacy of the preparation students are receiving for entry into the labour market. Among the concerns now being expressed are: graduates lack key skills that are needed in the world of work; there is an excess of graduates in some areas and significant shortages in others; and students lack the skills to drive innovation and new business development (Tal and Mendes 2017).

Some of these fears may be exaggerated—Canada continues to score near the top based on results of the PISA (Program for International Student Assessment) tests. Nevertheless, there has been some erosion of scores, particularly in science and mathematics (OECD 2018). Moreover, Canadians may well ask why a 22.3-per-cent increase in per-student spending over the last decade has produced no improvement in results (MacLeod and Emes 2017).

The imbalance between graduates in particular disciplines and labour market needs is a constant conundrum. There is an important time gap between the emergence of labour shortages and the production of new graduates in these areas. In addition, some critics would argue that the focus needs to be on teaching skills that can be used in many areas rather than focusing solely on producing graduates who can fill particular niches in the labour market. Nevertheless, post-secondary institutions are introducing a flood of new undergraduate and graduate programs, especially in more narrowly defined fields such as data security and business analytics. And rapid shifts in student choice show that young people are keenly attuned to their employment prospects after graduation.

Canada's limited success in promoting entrepreneurialism and business development is a source of much debate. Certainly, Canada has not played a leading role in the technology industries that have transformed advanced economies in recent years. With the decline in resource industries internationally, Canada will need new sources of economic growth to sustain our standard of living. Some blame our sub-standard performance on excessive regulation and high taxes; others point to a culture that has often looked to government or to established champions to be the drivers of innovation; still others complain of the hemorrhaging of talent, especially in the technology sector, to the United States. Whatever the reasons, it is clear that Canada must do better. Post-secondary institutions are increasingly aware of the issue and many are moving to build a greater emphasis on innovation and entrepreneurialism into the curriculum. Cities, too, are putting more emphasis on economic development and experimenting with policies to attract new businesses and to provide support to start-ups that will allow them to grow.

Concentration of economic growth in major cities

A major challenge for our economy, and for young people in particular, is the increasing concentration of work and opportunity in a small range of cities. This problem has received the most attention in the United States, where the contrast between centres of technological innovation like San Francisco, Boston, Austin and declining industrial centres like Detroit, Cleveland, and Cincinnati is striking (Moretti 2013; Munro 2017). But decline has been evident in many smaller cities and rural areas, too, leaving young people to choose between unemployment or under-employment in their home communities or migration to high-cost cities in search of work. Although the American case has received the most scholarly and media attention, Canada and several European nations are

experiencing a similar phenomenon. Between 2011 and 2016, 63.8 per cent of Canada's population growth was accounted for by the six largest cities; in the same period, two Census Metropolitan areas and thirty-six Census agglomerations lost population. As in the US, digitization is proceeding rapidly in some cities and industries, while others lag behind. This has been exacerbated by the downturn in many resource industries that has led to employment loss in energy, mining, and forestry. Extending economic growth to more regions and communities and responding to the housing challenges in several of our largest cities must be key policy issues for the years ahead.

Future challenges

Responding to rapid changes in the demand for labour

In his prescient 1973 book, *The Coming of Post-Industrial Society*, Daniel Bell foresaw the shift in advanced societies from an economy based around the production of goods to one anchored in the production of services. With this change came a growing need for a highly educated population that is prepared to tackle problems requiring mental rather than manual skills. Canada has experienced this shift, with significant declines in the proportion of workers in farming, manufacturing, and resource industries and huge growth in service industries. At the occupational level, the transformation has been even more intense, with rapid growth in demand for workers in jobs that did not exist even ten years ago. Anticipating shifts in the demand for labour and designing policies that help Canadian workers to respond will be a key challenge for the country.

Reforming education to prepare for a changing economy

The extraordinary expansion of higher education in Canada since the 1960s has allowed us to compete reasonably well in the new economy and has sustained our high standard of living. But rapid changes in Canada's economy, the potential for slower economic growth, and the departure of the baby boom generation will pose new challenges for our education system. Meeting the needs for workers with the right skills in an era of slower labour force growth will require changes at all levels of the school system. Three areas demand special attention:

1. Expanding and improving early childhood education. Canada currently has a patchwork system for providing education to youngsters prior to entry into elementary schools. Although there is an ongoing debate on the contribution of preschool programs to later academic success, it seems clear that in a properly designed system, earlier schooling can help build skills, especially among children from disadvantaged backgrounds, which will improve their achievement at school. Moreover, better provision of early childhood education will allow for increases in labour force participation rates, especially among young mothers, that can help offset slower labour force growth. Designing and funding the best systems for early childhood learning is a key challenge for the future.

2. Reforming the post-secondary system. When less than 10 per cent of each generation attended university, a degree was a virtual guarantee of employment. With more than one in three young people now graduating from university, and more than 60 per cent obtaining some form of post-secondary credential, that is no longer the case (Norris 2011). Canada has built a post-secondary system that has succeeded in broadening access while maintaining high standards of learning. The challenge for the future will be maintaining broad participation while developing new programs and principles of instruction that better prepare graduates for success in the labour market.

3. Improving access to lifelong learning. Slower labour force growth demands better utilization of the existing workforce. This is best accomplished by increasing participation rates among under-represented groups such as recent immigrants and older workers. But doing this will require improving training programs to allow immigrants taught under different systems to succeed in the Canadian labour market and to help older workers update their skills that will help them extend their careers.

Expanding our knowledge base

It is surprising that our knowledge of the labour market is so limited. The debate over the existence of a labour shortage is eloquent testimony to the limits of current knowledge. Why do businesses perceive such difficulty in finding the right workers while job-seekers complain of limited opportunity? Why are rates of internal migration falling when the need to move to find a good job has never been greater? Good research can answer these questions. Bringing together government and academic analysts with human resource specialists would be a good first step to improving our understanding of this critical issue for Canada's future.

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The well-being of families in Canada's future

Benoît Laplante[1]

Abstract

The author argues that the well-being of families in Canada's future is uncertain because families are losing the central position that was traditionally theirs in society. Most of the changes that occurred in and around families over the last third of the 20th century came from changes in values (from survival to personal development, from collectivity-oriented to individual-oriented), in gender relations (women's rising education, labour force participation, and economic independence), and in the legal framework that deals with family life. Such changes are still having an impact on families, which will likely not diminish. But more than anything else, Canadian society is moving toward a model in which immigration rather than reproduction is the main source of population growth, thus reducing the importance of the family in policy development. This, and the increasing political importance given to environmental issues, might further displace the family as a priority for policymaking and the allocation of public resources, and thus impair the future well-being of families in this country.

Keywords: family; policy; reproduction; immigration; environmental issues.

Résumé

L'auteur soutient que le bien-être des familles canadiennes est loin d'être assuré à long terme parce que la famille, en tant qu'institution, perd aujourd'hui la position centrale qui était traditionnellement la sienne. La plupart des changements survenus dans et autour des familles au cours du dernier tiers du XXe siècle ont été la conséquence de changements dans les valeurs (de la primauté de la survie à celle du développement personnel, de la collectivité à l'individu), dans les rapports entre les sexes (l'éducation des femmes, leur activité et leur indépendance économique) et dans l'encadrement juridique de la vie familiale. Ces transformations se poursuivent et leur impact sur les familles ne diminuera probablement pas. À ceci s'ajoute le fait que la société canadienne a adopté un modèle où l'immigration remplace la reproduction comme source principale de la croissance démographique, réduisant encore plus l'importance de la famille pour l'élaboration des politiques. Ce changement, et l'importance croissante accordée aux questions environnementales, pourrait encore réduire la place de la famille en tant que priorité pour l'élaboration des politiques et l'allocation des ressources publiques, et ainsi compromettre le bien-être futur des familles.

Mots clefs: famille; politiques; reproduction; immigration; questions environnementales.

Making predictions about the family is a risky business. Predicting twenty years ago that most young couples in Quebec would live together and have their first child without being married would not have been too chancy, because both trends were already apparent. However, predicting that courts of law and the Parliament would extend marriage to same-sex couples would have seemed farfetched. This article reviews current trends before discussing emerging issues and future challenges of the well-being of families in Canada's future, and expanding our knowledge base.

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Current trends

Unless current trends alter dramatically, several existing key trends will be influencing future Canadian families. The proportion of families that comprise two married people living with their common children will decrease. The proportion of couples living in common-law union is likely to increase, as will the proportion of children born to unmarried parents. Couples will probably spend part of their lives with interrupted marriages or in common-law unions. A large fraction of Canadian children will experience the separation or divorce of their parents. A large proportion of these children will spend a portion of their childhood in some form of shared custody, moving between homes. More children will live with step-parents and step-siblings. More children will live in families headed by a same-sex couple. Whether or not the proportion of children living with one parent will increase or remain stable is more difficult to guess. The proportion of mothers who work full-time will increase. There will be greater pressure on men to share equally in child-rearing and domestic chores. Families will demand conditions that favour a better balance between work and family life. In addition, unless there is a reversal of current trends, more people will live a large fraction of their adult lives without a spouse or partner, not only in their old age because of separation or death of a spouse, but also at younger ages that are usually considered ideal for family formation. The proportion of adults who never have children is also likely to increase.

This broad picture basically projects current trends into the future. It is simple approach, but the processes that govern these trends are too fundamental for us to expect the near future to be sharply different. This picture of the future and of the processes that produce it serves as a starting point for looking for the "weak signals" of emerging issues.

Emerging issues and future challenges

Family flexibility and family formation

About twenty years ago, cross-national comparative research showed that the association between having children and women's participation in the labour force had reversed. Fertility rates now tend to be higher in those countries where women are more likely to work. And now people are more likely to have children without being married (Héran 2013). Currently, there is also a positive effect of family flexibility on childbearing.

Why is there a positive effect? One reason is increasing out-of-wedlock births in several countries, where contraception and abortion are not readily available to poor young women. But the positive effect is mainly seen in Sweden, Norway, Denmark, France, New Zealand, and the United Kingdom, where women who have children without being married typically live in a stable relationship, similar to a common-law union, and typically have their children in their late 20s. These countries differ in their family policies, but they share two things. First, they tend to offer the same support to families whether the parents are married or not. Second, their private law does not equate marriage and common-law union to the point of imposing the sharing of assets and providing support payments to the former partner after separation. These developments have occurred by design in Sweden and from legislative inattention in France, where opposite-sex couples are often in "PACS" (in French, a *pacte civil de solidarité*, a very light form of registered partnership originally designed to accommodate same-sex couples). Increasingly, young couples seem more prone to have children in a legal context that allows them to do so while avoiding the judicial control and long-term obligations that marriage imposes. In other words, young couples seem more likely to have children in countries where their family will receive the same support regard-

less of their marital status, and where they are left to manage their own relationship, including its economic aspects, with little interference from the government.

In Canada, governments do offer the same support to families whether the parents are married or not. Moreover, the evolution of legislation and case law has rigidified the new forms of family by equating *marriage* and *common-law union*. Most provinces have enacted statute law that imposes or promotes sharing of assets and spousal support to the former partner of a common-law union, similar to a marriage. Such provisions were originally devised to relieve hardship arising from the breakdown of common-law unions and, in most provinces, have been extended to aid the ex-partner who has accumulated less wealth during the union because of greater parental duties. The intention is generous but perhaps anachronistic. Today's young people might envision their relationship as a couple from a different perspective. Young adults—knowing that their relationship as a couple is likely to end at some point, and living in conditions in which both work intensity and wage differences between partners are on average much smaller than they used to be—might prefer a contractual relationship in which they *keep control* of their own future and *avoid the risk* of having to pay for someone else after the relationship ends. They might also worry about the risk of becoming dependent on someone else after the relationship ends, while sharing chores, child rearing, and contributions to family expenses as equally as possible as long as they live together. These are important emerging trends that require new knowledge and understanding. At present, *family flexibility* is a key aspect for Canada's changing families, with consequences for living arrangements and childbearing.

The new social geography of family housing

Families with young children typically want larger accommodations. They want one bedroom for each child, some inside space for kids to play, and some outside space for family activities. In metropolitan areas, they typically choose to settle in the suburbs, where land is cheaper and homes more affordable. This solution makes sense as long as land remains available for new housing, and transportation costs between home and work remain inexpensive. Several factors may make this more unlikely in the future.

Some factors are obvious. Land availability is constrained by geography and current use. This availability decreases as population grows. Prices increase and affordable suburbs become farther from the centre. Moving away from the centre increases the cost and duration of transport, eventually to the point that moving farther is not a practical solution. For contemporary families, the difficulty of finding the right place is compounded by having to commute from home to two different places of work.

For a variety of reasons that are not limited to environmental issues, current urban planning policies favour the building of new suburbs—within which there are short walking or bicycling distances—as well as increased density of city centres and areas close to main public transit lines. People who live in the newer suburbs, however, do not use public transportation more than those who live in older suburbs, which suggests that newer suburbs have little effect on commuting (CMHCorporation 2013). More importantly, other research shows that older higher-density areas in the inner city is closely associated with gentrification (Quastel et al. 2012). Housing stock in neighborhoods that are walkable, dense, and close to transit—basically, former working-class neighbourhoods—has become more suitable to dual-earners in higher-level occupations than households in sales, service, and manual occupations.

Family housing is not only an issue of affordability. Housing is a conundrum for low- and middle-income families because moving away from the centre is no longer a simple solution. Increasingly, the cost and duration of commuting are rising because of congestion, and policies

that deter the use of private automobiles, while public transit is limited or not time-effective, and housing close to the centre has become too expensive.

For young couples, housing is a key factor in timing the birth of the first child.[2] If the prospect of finding reasonable housing for a family becomes too difficult, couples may postpone or forego family formation. One wonders if this process, as much as or maybe more than affordability per se, explains British Columbia currently having the lowest fertility of all Canadian provinces.

The increasing cost of children and the new intergenerational transmission of social status

Over recent decades, Canada's federal and provincial governments have devised policies to reduce the proportion of children living in poverty. While this is a laudable achievement, it is not likely to provide equal opportunities for children from all social backgrounds. Parents usually want their children to do well. Recent research shows that over the last decades, achieving this goal increasingly depends on family wealth and non-economic resources (Corak 2013). The most obvious consequence of this trend is to increase the reproduction of social inequality. However, another consequence may be deterrence to family formation. As people become aware that getting jobs with good wages and good conditions increasingly depends on higher education, and that higher education depends on previous parental investments that are greater than what low- and middle-income families can afford, ordinary Canadians may come to the conclusion that properly raising children is beyond their means. This potential problem should not be underestimated. The comparatively high fertility in the United States should not be interpreted as evidence that the increasing cost of children does not deter people from having them, because a significant proportion of US children are born to young women who have restricted access to contraception and abortion, or to women who belong to ethnic groups with relatively high fertility norms. In Canada, young women have access to contraception and abortion, and they use them: their fertility is significantly below that of their American counterparts. Moreover, recent research shows that in Canada, on average, immigrant women do not have more children than the Canadian-born (Adsera et al. 2012; Street and Laplante 2014).

As described below, there are serious reasons to be concerned, because policies that alleviate child poverty rather than increase the well-being of low- and middle-class families may discourage young Canadians from starting a family.

Childlessness as a norm

Over the course of the 20th century, controlled fertility has become the norm in Canada. Births have been too few to replace the population for several decades. Individuals have fewer children, either by having smaller families or no children at all. Ravanera and Beaujot (2014) show that among Canadians born between 1947 and 1951, 14.4 per cent of women and 17.3 per cent of men remained childless, and that among Canadians born between 1972 and 1976 the proportions were 30.5 and 48.3 per cent, respectively. The latter were aged 30 to 34 at the time of the survey, and many of them may have had children afterwards. Still, these proportions are very high by historical standards. Estimates for more recent cohorts are lacking, but given the trends, childlessness might reach 50 per cent among men born after 1976. A century ago, the typical Canadian had several siblings and several children. Nowadays, the typical Canadian man has few siblings, if any, and might have no children at all. Childlessness is marginal no more and could be becoming the norm. This has a series of implications for individuals: the most obvious is that half of young Canadian men

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2. Life cycle issues and concerns are discussed in greater detail in the article by Bélanger in this issue.

would be lacking financial support and care from their children in their old age in a society where the market and the family are supposed to be the main providers of resources for the individual. Childlessness as a norm also has implications for the well-being of families. As more and more people do not have children, the family is being displaced from a central institution—the *foundation of society*, as it has been thought of since antiquity—to something secondary, if not yet marginal. This was feared in the 1930s, when low fertility and industrialization shook the Western family, and then the fears proved wrong (Davis 1937). This time, however, the most worrying indicator is *childlessness* in a context where immigration is a proven and favoured way of ensuring population replacement and population growth. Before our very eyes, the family might be losing its central position in Canadian society, along with its appeal and importance for political parties and the government. In a context where young families require more public goods and services, such as daycare and paid parental leaves, because both parents work and raising a family requires the earnings of two, lessening the political weight of the family might prove harmful for the well-being of families, and might convince even more people to forego forming a family.

Children as goods rather than as citizens

Canadian society has never subordinated the individual to the group in the way, say, that Japanese society is said to do or has traditionally done. Still, since the advent of neoliberalism in the early 1980s, increased individualization and commodification have fostered the reformulation of norms and behaviour around the paradigm of freedom of choice, in both its political and economic meanings. The family has been affected, as has everything else. In antiquity, having children was the duty of the citizen, as having children was the only way of perpetuating the political body. In Christian times, having children was the duty of the subject and of the believer. In modern times, having children has variously been *imposed* by the state (by outlawing contraception), *encouraged* (by granting subsidies or privileges), or, in a more social-democratic fashion, simply *not discouraged*—by shifting most of the cost of having children from the parents to the community. From the perspective of the economic analysis of low fertility proposed in the 1930s by Gunnar and Alva Myrdal, social-democratic state intervention is mild, one that simply allows people to have the children they want (Myrdal 1940; Myrdal 1968).[3] From the neoliberal perspective, using taxes to provide services to families is another form of illegitimate intervention by the state. Individuals should be free to have children or not, and the state should not be imposing the burden of raising children on those without children, through taxation that funds education, daycare, paid parental leave, and family-oriented subsidies. Having children is a choice, not a duty, and there are other, less costly ways of ensuring the replacement of population and even its growth. This view may not be common or dominant, but it is not as marginal and extreme as it was even in the recent past, and it may contribute to a lessening of the idea of family as a central institution and a lessening of the political significance of families. This might be true even in Quebec, which is the only Canadian province that has developed an explicit set of family policies. This development occurred at a time when special circumstances — e.g., fast decline in fertility and fast diffusion of common-law union — and a wide acceptance of social-democratic views made such a development possible. Since then, society has grown accustomed to these circumstances, and a few decades of neoliberalism have lessened whatever consensus ever existed on the legitimacy of state intervention in such matters (see Dandurand 1987 and Saint-Pierre and Dandurand 2000).

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3. The original report on low fertility and the need for state intervention was published, but never translated, as: Alva Myrdal and Gunnar Myrdal, *Kris i befolkningsfrågan* (Crisis in the Population Question). Stockholm: Albert Bonniers Förlag, 1934.

Immigration as the only population policy

Since Confederation, Canada has never had an explicit policy that would foster fertility. Fostering fertility was seen as undemocratic, and the economic analysis of below-replacement fertility that led to the development of the social-democratic Nordic welfare states has never been politically fashionable, and never entered into the Canadian psyche. Immigration has been the main if not the sole component of Canadian population policy. Immigration has obvious advantages. Immigrants are selected according to whatever criteria suit the political needs of the time; they are adults, so in theory they do not need long years of publicly funded education before entering the labour market; finally, they are not admitted if they have major health problems. Immigration is the major component of population growth since 1999 and is projected to account for almost all population growth from 2041 onwards (Bohnert et al. 2015). In 2016, Finance Minister Bill Morneau seemed ready to advocate within the government a plan developed by the Conference Board of Canada to push the Canadian population to 100 million people by 2100 by steadily increasing the number of immigrants to over 600,000 per year by 2050 (Ades et al. 2016). No country currently has such an extreme immigration policy, but the mere fact that such an idea might have been discussed at this level helps take the measure of the central role of immigration in Canadian policy-making and politics. The long Canadian tradition of using immigration as the main tool of population growth, the strong ideological commitment against the redistributive policies that Nordic countries have adopted to help people have the children they desire, and the current population projections in which almost all population growth will come from immigration in less than 30 years (Bohnert et al. 2015)—all these are likely to further lessen family as a central institution and the political significance of families.

Human population as a threat to the planet

The Canadian political culture is mainly of British extraction, and through this, it inherited a strong Malthusian orientation. The British Isles are islands of limited area, and, in the times of Malthus, it seemed impossible to increase food production in any way other than to put new land to use. The fallacy of the Malthusian argument has been proven again and again—productivity can increase yield in a way that matches the exponential growth pattern of the population —, and the consequences of deriving an anti-natalist policy from this Malthusian argument had been explored as early as in the 1930s, noticeably by Enid Charles (1934).[4] The Malthusian reasoning is as simplistic and mesmerizing as the neoliberal ideology, and because of these features, it is resilient and adaptive. Its current avatar is a new version of radical or deep ecology, an ideological trend that goes beyond ecology as a science and beyond sustainability as a technological and economic paradigm, and well into the realm of utopia. One common tenet of this ideology is that there is no practical way to limit the harm that human activity does to the planet, and that human population must decrease by a large factor in order to save the living world. Discussing such an ideology in a piece on the well-being of families may seem farfetched, but it is not. This line of thought has taken root in activist groups, is pervasive in the scholarly work of some areas of the social sciences, and is permeating the thought of militants in a number of political parties at all levels of government. There is no way to estimate its current influence on the public agenda, but its ideas seem to be spreading, and they might add to the other trends that might lessen the political significance of families.

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4. See Wargon (2005) for a more detailed account of Enid Charles.

Expanding our knowledge base

Family flexibility and childbearing

Further research is needed on the relationship between family flexibility and fertility. Much of the philosophy that guided the evolution of family law in Canada over the last twenty years could be at odds with what today's young people expect, and family law could actually offset the effects of family policies. Canada may have turned the common-law union into a long-term liability that young people wish to avoid. By turning common-law union into something too similar to marriage, Canadian family law may deter young people from having children, and Canada may have inadvertently developed an *anti*-natalism policy. At present, both fertility and the proportion of children born to unmarried parents are relatively low in Canada compared to northern Europe. This is a trend that should be carefully watched and studied.

Things are a bit different in Quebec. The proportion of children born to unmarried parents has been hovering around 63 per cent since 2008, while the proportion of children whose father is not registered is about 2.6 per cent since 2006 (Institut de la statistique du Québec. 2018a). However, the total fertility rate, which had been increasing from 1.45 to 1.73 between 2000 and 2008, has been steadily decreasing since, and reached 1.59 in 2016 (Institut de la statistique du Québec. 2018b). Compared to couples living in other civil law jurisdictions, married couples in Quebec have very little freedom to decide the extent of the property they share. There are reasons to believe that many unmarried couples, who enjoy complete freedom in this matter, would not live together and would not have children if the law imposed to them the civil effects of marriage as they exist in Quebec. In this sense, Quebec's acceptance of common-law union as a framework for family formation is likely to have a real positive effect on fertility. However, this effect is not enough to reverse the declining trend. It seems limited to avoiding the fall to be even steeper. One may wonder what would happen to nuptiality and fertility if Quebec private law were modified to impose the civil effects of marriage to unmarried couples, something that came close to happen in 2013.

Improving data sources

The base for expanding knowledge on the Canadian family has shrunk during recent years. About 20 years ago, Statistics Canada and the Social Sciences and Humanities Research Council (SSHRC) reached an informal agreement. Statistics Canada would be responsible for collecting data on the Canadian society and making it available to researchers, and SSHRC would concentrate its resources on funding researchers to analyze these data. As part of this endeavour, Statistics Canada developed a large collection of longitudinal surveys, along with access to survey and census data, through the Research Data Centres. Several universities embarked on an unprecedented effort to train professors, researchers and graduate students in advanced statistical methods to make use of these data. The problem Canada does *not* face in the coming years is making the intellectual labour force more productive by increasing its skills—in fact, skill levels are better than before and training is ongoing. Rather, the problem is the dearth of data on Canada.

Adequate data sources have dwindled and new sources have not been developed. Statistics Canada has discontinued the production of some relevant aggregate data and considerably reduced the publication of basic analyses. As of 2008, Statistics Canada terminated the production of aggregate data on marriages and divorces, with no national source for the number of marriages and divorces. On other topics, although aggregate data are now more freely available than ever before through Statistics Canada's CANSIM database and other sources, researchers need to do the basic analytical work. For instance, basic comparative tables on critical demographic trends such

as marriages or divorces require the compilation of original data from individual surveys. The set of longitudinal surveys initiated in the mid-1990s provided data similar to other advanced countries, enabling researchers to monitor and compare changes at work in Canadian society. Many of these surveys have ceased, however. Converting the sample portion of the 2011 Census into a voluntary survey increased costs and raised questions about the quality and comparability of important census data. The return of the long form of the census in 2016 was a relief, but the census alone is not enough to study the Canadian society and its transformations. SSHRC is unlikely to receive funding to support data gathering initiatives lead by researchers that would compensate for these losses. Canadian foundations have a tradition of helping charities, not doing social science research, which is considered to be a government responsibility. Finding a solution to this data dearth is the first and foremost step needed to improve and expand our knowledge base on the Canadian family. Statistics Canada and other federal and provincial departments are proposing the use of administrative data on a large scale. The idea is promising, but until now, the pace at which these data have become available to researchers has been far too slow to reverse the course.

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Global migration and cities of the future

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Abstract

The number of lifetime international migrants worldwide has increased greatly in recent decades. Canada currently ranks as the fourth-largest immigrant-receiving country, with 8 million foreign-born residents in 2015. Most international migrants reside primarily in the large metropolises, with more than 60 per cent of Canada's foreign-born living in the Toronto, Vancouver, and Montreal urban conurbations. This paper examines four challenges of global migration for Canada's cities: housing and housing affordability, social services, employment, and integration and cohesion. The paper's conclusion discusses implications for expanding our knowledge base about global migration and cities of the future.

Keywords: international migration, immigration, immigration policy, immigrants and cities

Résumé

Le nombre de migrants internationaux à vie a considérablement augmenté au cours des dernières décennies. Le Canada se classe actuellement au quatrième rang des pays d'accueil des immigrants avec 8 millions de résidents nés à l'étranger en 2015. La plupart des migrants internationaux résident principalement dans de grandes métropoles, avec plus de 60 pourcent des personnes nées à Toronto, Vancouver et Montréal. agglomérations. Ce document examine quatre défis de la migration mondiale pour les villes canadiennes: l'abordabilité du logement et du logement, les services sociaux, l'emploi, l'intégration et la cohésion. La conclusion du document discute des implications pour élargir notre base de connaissance sur la migration globale et les villes du futur.

Mots-clés : migration internationale, immigration, politique d'immigration, immigrants et villes

Recent trends in global migration

The total number of lifetime international migrants worldwide grew from 175 million in 2000 to 222 million in 2010, and reached 244 million in 2015 (United Nations 2016).[2] Currently, most international migrants reside primarily in the large metropolises of a dozen immigrant-receiving countries. The largest immigrant-receiving countries in 2015 were the United States (47 million foreign-born), Germany (12 million), United Kingdom (9 million), Canada (8 million), France (8

million), and Australia (7 million). In 2015, most of the lifetime immigrants worldwide (43 per cent) originated from Asia (United Nations 2016: 15). Europe comprised the second-largest number (25 per cent), with fewer immigrants worldwide originating from Latin America (15 per cent) or Africa (14 per cent).

During the recent 2007–15 period, the United States received the largest number of permanent immigrants, averaging slightly more than one million annually (see Figure 1, which shows data for selected countries in the OECD, which is a membership group of 32 democratic developed nations). Four populous European countries—Germany, United Kingdom, Italy, and Spain—received between 300,000 to 400,000 immigrants each year. Canada received 260,000 annually, with France receiving 230,000 and Australia receiving 220,000 during the same nine-year period. Two other European countries that are not shown in Figure 1—Switzerland and the Netherlands—also received more than 100,000 immigrants each year, on average.
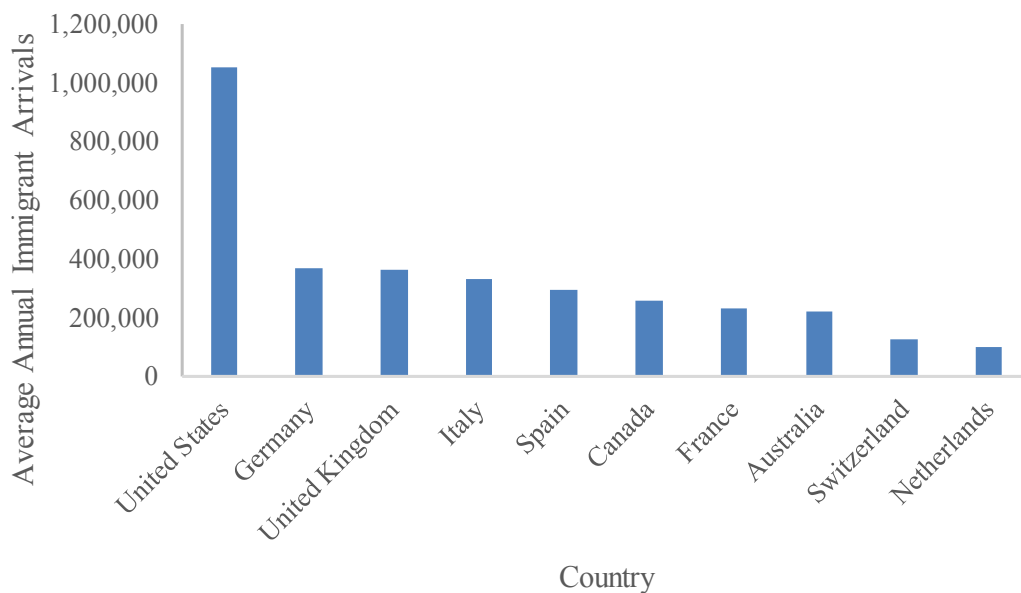
Figure 1. Average annual number of permanent immigrant arrivals for top eight immigrant-receiving OECD Countries, 2007 to 2015.
Source: Number of arrivals are from OECD 2017.

The ten countries displayed in Figure 1 vary greatly in population size. Figure 2 takes population size into account by showing the number of annual immigrant arrivals per 1 million resident population for five selected OECD countries. Australia and Canada both have had relatively high rates of immigrant arrivals per resident population, and their annual trends are fairly steady for 2007–15. Australia has been receiving about 10,000 annual immigrants per 1 million residents, while Canada has been receiving 7,500 per 1 million residents. Germany had increasing immigration rates during this period, with larger numbers of arrivals associated with recent large-scale refugee flows. Italy witnessed higher arrival rates in the early period when there were immigrant arrivals from within the European region (Spain is not shown but had trends similar to Italy). The United States had relatively lower rates of immigrant arrivals—about 3,400 annual immigrants per 1 million residents—that were fairly steady during this period (France and United Kingdom are not shown but had trends similar to the United States).
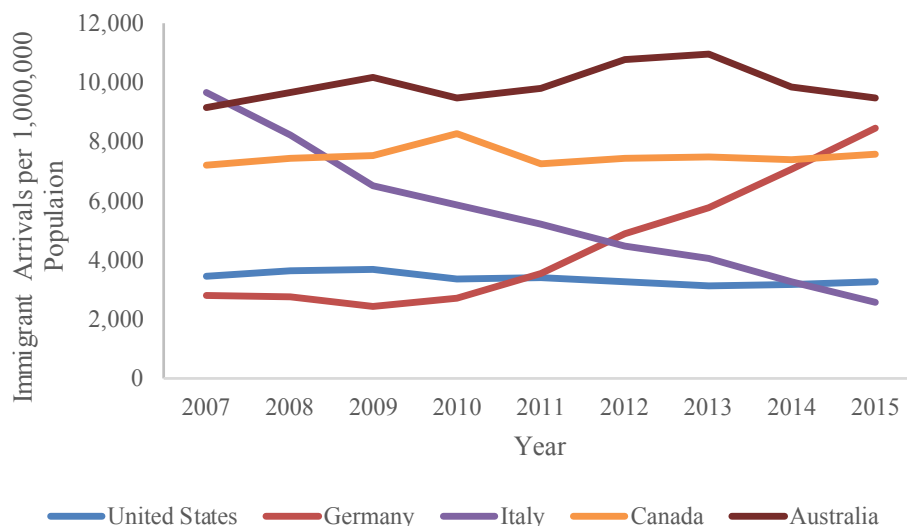
Figure 2. Annual number of permanent immigrant arrivals per 1 million resident population for five selected immigrant-receiving OECD countries, 2007 to 2015.
Source: Number of arrivals are from OECD 2017; population size figures are from Population Reference Bureau 2007 and 2015.

Both in Canada and worldwide, most immigrants originate from middle-income countries (United Nations 2016: 14). In the past fifteen years, immigrants originating from middle-income countries increased more rapidly than those from countries in either high- or low-income groups. Relatively few immigrants (less than 10 per cent worldwide) come from low-income countries.

Recent immigration policy debates

Immigration policy debates became prominent in recent decades because of high and persistent unemployment in many industrialized countries (OECD 2013). After the financial crises of 2007–08, labour markets in OECD countries recovered slowly, and large groups of the labour force experienced extended periods of unemployment. The sizable increases in immigrant flows to Europe and some other OECD countries in 2015–16 made the employment effects of immigrants a critical topic in public debate.

Recent research on the labour market outcomes of immigrants in the OECD provides two key findings (OECD 2017: 62). First, the unemployment rates of the foreign-born increased by 1.8 percentage points on average from 2015 to 2016 in all OECD countries combined, and by 4.3 percentage points in European countries. However, secondly, foreign-born residents in Canada and the United States recovered well from the financial crisis of the previous decade. Unemployment rates among the foreign-born in Canada and the United States decreased by 1.8 and 4.1 percentage points, respectively, between 2011 and 2016 (unemployment rates for Canada-born or US-born residents decreased by 0.6 and 3.4 percentage points, respectively, in Canada and the United States). Employment rates among older foreign-born residents had an especially strong recovery in Canada and the United States, growing by 5.4 and 3.6 percentage points, respectively.

More recently, immigration policy debate has centered on the refugee humanitarian crisis in Europe because of unprecedented large refugee inflows in 2015 and 2016. In 2017, however, the number of refugee arrivals in Europe dropped dramatically, to levels previously recorded in 2014 (OECD 2017). As a result, European immigration issues have shifted to concerns for helping refugees settle in their new host countries—assuming that they are likely to stay for some time—

and integrate into the destination countries' labour markets. Consequently, European immigration policy debates have moved from Europe-specific concerns with acute large refugee flows to broader concerns of immigrant integration faced by other immigrant-receiving countries outside of Europe. For further reading, the International Organization for Migration's (2017) *World Migration Report 2018* discusses current global immigration policy issues, international migration trends, factors affecting migration, and the consequences of migration for countries of origin and destination.

While Canada's employment and fiscal situation is not as dire as that of some other countries, suggesting brighter prospects for the socio-economic integration of immigrants, Canada does resemble other immigrant-receiving countries (particularly Europe) in having an ageing population and workforce. Moreover, Canadian residents share similar concerns about immigration with the Europeans, where public opinion surveys reveal that about 50 per cent of those surveyed believe that immigrants contribute less in taxes than they receive in health, welfare, and other social services (Edmonston 2016: 27–28; OECD 2013). This belief underlies the public opinion that immigrants are a large burden on the public purse, with other residents paying higher taxes in order to support immigrants.

Studies in Canada, Europe, and the United States, however, conclude that the fiscal effect of immigration on the public purse is generally negligible, and is only negative where there is a large share of older foreign-born residents receiving public pensions (Blau and Mackie 2017: Chapter 8; OECD 2013). Skilled younger immigrants, on the other hand, are *fiscal contributors* to the public purse. Overall, according to a review published by OECD (2013:145), "some general tendencies from the literature seem to hold across most OECD countries. The fiscal effect [of immigration] is generally small…the impact generally fluctuates around ±1% of GDP in most studies that look at the fiscal impact on the resident population in any given year."[3]

The most recent United Nations' *International Migration Report* (2016) provides a context for understanding Canada's future international migration trends. Comparing annual immigration rates for three of the largest immigrant destinations (Australia, Canada, and the United States), Australia had slightly higher rates from 2000 to 2015; Canada experienced an increased rate from 2000 to 2010, followed by slight decreases to 2015, and the United States had steady rates from 2000 to 2010, followed by slight decreases to 2015. During the 2010–15 period, Canada had a net immigration rate of 7.6 per 1,000, which was one-third lower than that of Australia (9.6 per 1,000) and more than twice that of the United States (3.5 per 1,000). In 2015, immigrants comprised 28 per cent of the population of Australia and 22 per cent of Canada, while the comparable figure was 14 per cent for the United States.

Based on these past trends, we expect immigration to continue to be a major driver of future population growth and change in Canada. In addition, the total number of immigrants admitted each year may increase or decrease, depending on federal immigration policies that govern regular immigration and special categories of immigrants such as refugees.

Emerging issues

There is a close relationship between international migration to Canada and ~~Canada~~this country's cities. Historically, immigrants have been drawn to cities for work and because of immigrant social networks. These trends continue today. More than one-half (61 per cent) of all foreign-born in Canada live in the large Toronto, Vancouver, and Montreal urban conurbations (Statistics Can-

3. Because the proportion of national GDP spent on government services varies by country, comparisons of the net fiscal effect of immigrants usually present estimates of net fiscal effects as a per cent of overall GDP rather than a per cent of government spending.

ada 2017). Although some immigrants subsequently disperse from the big three to other urban areas, these big three metropolises dominate Canada's immigration scene. As the potential size, origin country, and ethnocultural diversity of immigrants continue to shift in future years, how will this influence Canada's metropolises and other urban areas? What are the implications and challenges for housing, social services, and employment, and for the social and economic inclusion and integration of immigrants and their descendants?

Three key elements provide a background for emerging issues related to immigration and cities. First, as previously noted, immigrants in Canada are overwhelmingly urban residents. Statistics Canada (2010: 26–27) reports that 81 per cent of the foreign-born resided in metropolitan areas in 2006, and in 2031 83 per cent are projected to live in metropolitan areas. Although the urban nature of immigrants in Canada is similar to other immigrant-destination countries, Canada's immigrants are moreover largely concentrated in only three metropolitan areas, while in other immigrant-receiving countries such as the United States, immigrants are dispersed in over a dozen metropolitan areas. A second background element is that metropolitan areas have little control over national immigration policies or over internal migration flows, but metropolitan areas must deal with the end results of migration. Third, metropolitan areas are increasingly the engines of economic growth in Canada.

Canada's top 9 metropolitan areas take up just 1 per cent of the nation's landmass. However, these areas are home to 57 per cent of the country's population, which generates the same proportion—57 per cent—of the national GDP (Florida et al. 2009). The three major metropolitan areas of Toronto, Montreal, and Vancouver alone account for more than one-third of the national economy. Thus, the national economy is becoming increasingly a network of metropolitan economies. These metropolitan areas and cities power the country's economic engine. They can also serve as an indicator of future development for the rest of the country. New demographic trends, particularly those related to growing immigrant populations, which are also more ethno-culturally diverse, are likely to happen at a faster pace in these areas.

The abovementioned background points suggest four key emerging issues for our consideration:

1. Canada is just one of five major countries that have continuously welcomed international migrants and permanent residents for the past fifty years (Australia, Israel, New Zealand, and the United States are the other four), and collectively accept about 1.7 million immigrants annually (OECD 2017). Meanwhile, the six largest sources for emigrants (excluding those who are temporary workers in other countries), according to 2015 data (United Nations 2016:1), are India (16 million), Mexico (12 million), Russia (11 million), China (10 million), Bangladesh (7 million), Pakistan (6 million), and Ukraine (6 million). But several major sources of international migrants, such as China and India, are also undergoing rapid development, raising questions about their future as sources of emigrants. Economic development, improvements in income, employment, and standard of living (together with increased political stability and other changes), and slower population growth resulting from lower fertility have led countries—such as Italy in previous decades and, more recently, South Korea—to transition from net emigration to net immigration countries. A key question is whether large rapidly developing countries such as China and India will make a similar transition, because such a transition would have major implications for Canada's sources of immigration. If immigration from China and India to Canada should slow down, it is possible that future immigration to Canada will include larger numbers from Africa and the Middle East, which will further expand Canada's ethno-cultural diversity. Therefore, while immigration will continue to be a major source of future population growth in Canada, we expect further increases in the diversity that immigrants bring to Canadian society.

2. Although the majority of immigrants settle in Canada's largest metropolitan areas, our current understanding of migration in urban areas is inadequate. Censuses, surveys, and administrative data have not been adequately used to improve our understanding of the composition of immigrants and their adaptation and integration, and their effects on local labour markets and social services. This is an area that merits more research, which can help guide policymakers at both local and national levels.

3. Devolution has moved responsibilities and funding to local levels at the same time that globalization has increased international ties and the movement of products, services, people, and financing. In most cases, however, the shift in responsibilities to local areas has not been matched by an increase in resources from the federal government. Thus, financial challenges are likely to become more pressing in Canada's cities.

4. Immigration is increasing the ethnic diversity of Canadian cities, including diversity of ethnic origin, language, and religion. Because Canada's metropolitan areas have received most of the new immigrant arrivals, the foreign-born population is becoming concentrated in metropolitan areas and will increase the ethnic diversity of metropolitan areas in coming decades (Statistics Canada 2010; see Figure 3), with Toronto and Vancouver—and, to a lesser extent, Montreal—becoming even more diverse by 2031.
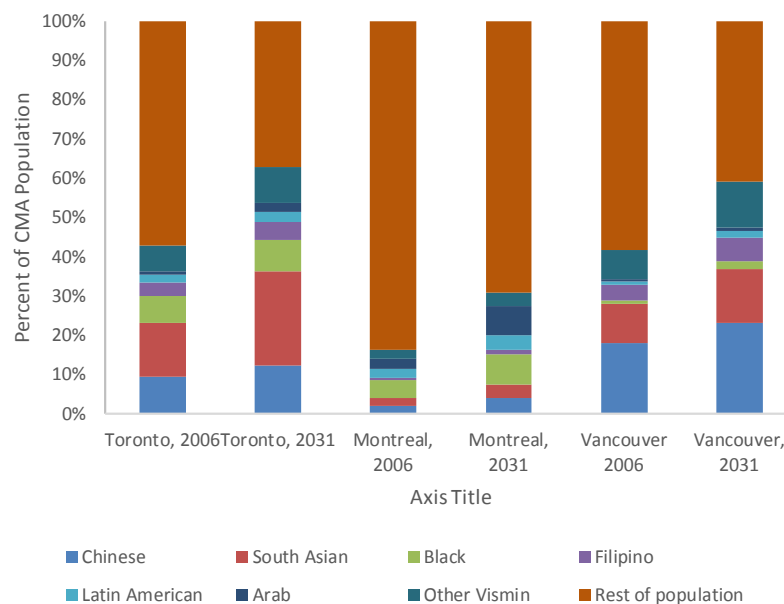
Figure 3. Distribution of Census Metropolitan Area population (CMA) by ethnic origin, Toronto, Montreal, and Vancouver, 2006 and 2031 (%).
Source Statistics Canada 2010: Table A1.

Immigration and challenges for Canadian cities

Global migration presents four challenges for Canada's cities: (1) housing and housing affordability; (2) social services; (3) employment; and (4) integration and cohesion.

Housing and housing affordability

Housing is usually the first concern for new arrivals. Even if immigrants have employment, immigrants may experience difficulties understanding and accessing local housing markets. With the possible exception of immigrants who are being transferred by a large corporation, immigrants

seldom have the background for accessing Canadian financial institutions, which makes immediate homeownership difficult. Most immigrants are likely to rent first, but landlords may look upon immigrants as unreliable tenants and may hesitate to rent to those without a previous rental record.

Immigrants in the past could more easily afford to purchase homes in central neighbourhoods of Canada's metropolitan areas, but this no longer appears possible on a large scale. Housing prices have continued to rise in Canada as well as other immigrant-receiving countries, such as Australia and New Zealand. Figure 4 shows housing price indices for Australia, Canada, and the United States for 2000 to 2016 as gauged by annual housing prices relative to household income. Housing prices may become unsustainable if they rise faster than the household income required to service mortgages and other housing costs. As indicated by Figure 4, homes are valued fairly in the United States, but in Australia and Canada, housing looks severely expensive.
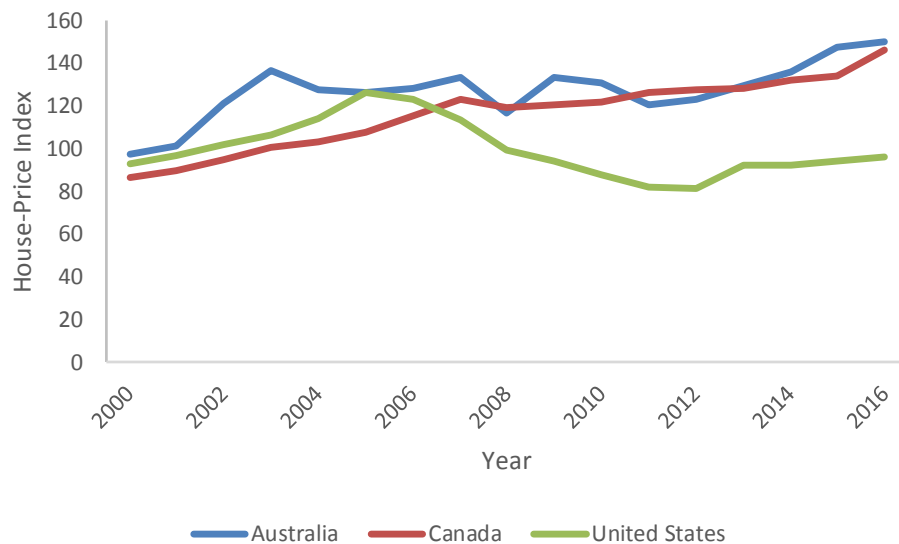
Figure 4. House price index relative to average income for Australia, Canada, and the United States, 2000 to 2016.

Source: *The Economist*, Housing-Price Index—Infographics, https://infographics.economist. com/2017/HPI/index.html, downloaded 28 November 2017.

Note: Housing price index is relative to 1980–2016 long-term average for each country: long-term average=100.

Housing prices are relatively high in Toronto and Vancouver for many Canadians, and particularly for recent immigrants. Today, most immigrants in Canada's largest metropolitan areas—with the possible exception of Montreal—seek housing in suburban areas, where homes are more affordable. But ongoing expansion of metropolitan areas presents challenges for urban planning, including rising demands for land and housing in more distant areas, and the need for more efficient metropolitan transportation services.

In other countries, local authorities have developed two main types of housing policies for immigrants (see Balbo 2005 for a discussion of immigrant housing policies in several countries, including Brazil, Canada, Germany, Italy, Mexico, and Thailand). One is directed at creating housing that is accessible to newly arrived immigrants. These policies have been used primarily in countries with large poor immigrant populations and are not generally applicable to higher-income countries. The second policy is to provide urban housing services throughout the city, to facilitate linkages between newcomers and available housing.

Social services

Knowing about and accessing social services is another important issue for immigrants. Although responsibility for social services has increasingly devolved to metropolitan governments, many have not taken a proactive role in delivering immigrant services, but rather rely on existing social service agencies to handle immigrant issues. Immigrants, in turn, have tended to rely on non-government services and the private sector, or be self-reliant to a large extent. Non-government services, however, are typically not integrated or widely accessible for newly arriving immigrants. A few governments, such as the state of Massachusetts in the United States, have established programs that offer a direct contact for immigrants, with links to non-government services.[4]

Employment

Finding employment poses several interrelated problems. It is difficult for some immigrants to find suitable full-time employment, and immigrants are often either unemployed or have to accept part-time employment in their first years after arrival. Other immigrants may find employment that does not match their skills and interest. This can happen because their credentials or experience are not recognized in Canada or there is little demand for their specific occupation.

At the same time that immigrants experience difficulties finding suitable employment, employers report there is unfilled employment in skilled occupations and trades, as well as unfilled employment in non-traditional settlement areas that are remote, rural, or have historically not received immigrants. Canada has pioneered selected immigration to non-traditional areas through its provincial nominee program. Much could be learned from this program to improve our understanding of the matching of immigrant and employment needs. Employment issues therefore include both underemployment of immigrants on the one hand, and a mismatch of immigrant human capital with labour market demands and the location of immigrants and jobs, on the other hand.

Integration and cohesion

The social integration of immigrants into Canadian society and maintaining social cohesion to include ever more diverse groups presents special challenges. Immigrants make cities more cosmopolitan and bring rich rewards to the arts, culture, sports, and cuisine. But immigration can also bring anxiety and concern to some longer-established residents.

Social inclusion has been sufficiently recognized as an important and integral part of a successful immigrant policy. Metropolitan officials usually acknowledge it in order to foster economic growth and support improvements in social services. But if a metropolitan area is to be a *polis*—that is, a place where different people come together—then policies must ensure the inclusion of new residents and tackle the barriers to social inclusion.

Social inclusion has several aspects, including (a) access to security in housing, health, educational, and social services; (b) access to public decision-making; and (c) development of new collective identities that counter the entrenchment of mutual suspicions and distrust. A cornerstone of social inclusion strategies must be the participation of migrants or their representatives in metropolitan public forums and city councils. Just as fundamental to social inclusion is public information on the origins and causes of migration, and on the costs and benefits to local communities of receiving international migrants. It is worrisome, for example, that many Canadians incorrectly believe that the public benefits immigrants receive exceed their public payments. In fact, in Canada and other countries, such as the United States, the average immigrant contributes

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4. Information about the Massachusetts Office of Refugees and Immigrants is available at http://www.mass.gov/eohhs/gov/departments/ori/.

more in public payments (mainly through taxes) over their lifetime than they receive in public benefits (primarily health care and retirement income). Setting the record straight would increase public support for efforts to promote the social inclusion of immigrants.

Expanding our knowledge base

This brief paper is the first step in a discussion of important implications for broadening our knowledge base. Further attention is needed on several critical questions concerning Canada's migration challenges.

First, finding adequate housing and social services is one of the most important problems for newly arrived immigrants, yet there is relatively little study of this topic. Second, considerable research exists on employment and social inclusion problems for immigrants, although the literature is diverse and often not easily accessible to policymakers. Concise reports with policy recommendations would help to summarize and interpret this literature to facilitate appropriate policymaking.

We conclude with a discussion of data needs for improving immigration research. Most immigration research uses current survey and census data collected by Statistics Canada. There are two broad areas for possible improvement. First, immigration research benefits greatly from surveys that include four essential questions: (1) place of birth of the respondent; (2) date of arrival in Canada; (3) citizenship status; and (4) parental nativity (place of birth of respondent's parents). Parental nativity data provide the information required to examine the social and economic characteristics of the sons and daughters of immigrants. Children of immigrants are a critical generation for study, because they reflect the relative success and rapidity of adjustment of immigrants to Canadian society. Children of immigrants are a pivotal subgroup of a national population increasingly affected by large scale immigration. The value of survey data for immigration research would be greatly improved if they include these four essential immigration related questions.

Second, some otherwise useful Canadian surveys lack adequate sample sizes for the analysis of immigrants. Small sample sizes reduce the reliability of findings, particularly when comparing across sub groups of immigrants. It would be very useful to incorporate over sampling of immigrants in designing surveys, to enhance the value of these surveys for studying immigrants.

Third, in addition to Canada's general population and survey data, several specific data sources are especially useful for immigration study. Canada's Longitudinal Survey of Immigrants to Canada provides valuable information on the first four years of residence in Canada for 4,422 immigrants who arrived between October 2000 and September 2001; however, attrition rates of the immigrants in the sample were high. In addition, longitudinal data on immigrants require repeated samples of immigrant cohorts, because the composition of immigrant cohorts changes over time, as do the social and economic conditions they experience after arrival. At present, however, the high cost of new longitudinal immigrant surveys outweighs their research value compared to other possible data.

Several other sources of immigration data are useful. Canada's Longitudinal Immigration Database (IMDB) offers data on linked administrative immigration and tax files for immigrants arriving since 1980 and their tax returns (if they filled at least one return since 1982). IMDB currently includes more than 30 years of data for 6 million immigrant records, available for studies related to employment, income, and geographic mobility of immigrants.

The French Permanent Demographic Sample (EDF) is an interesting approach for longitudinal data that could be used in other countries. EDF corresponds to a 1-per-cent sample of the French population over time. The longitudinal data set was created in 1967 by l'Institut national de la statistique et des études économiques (INSEE), based on a sample of all French residents. INSEE subsequently linked the large sample of individuals to census files from 1968 and later, adding newly

arrived immigrants in each census. The EDF has data from each census, but because they are linked over time, it offers information on changes in education, employment, income, family relationships, and other census variables. Also, because the EDF includes a large sample of French-born, foreign-born, and children of the foreign-born, it allows comparisons between these groups.

Finally, as in past censuses, Statistics Canada links census data with other administrative data in order to assess coverage and accuracy. For the 2016 census, data were linked to Immigration, Refugees, and Citizenship Canada's (IRCC) immigrant arrival data. These linked data provide improved information on date of immigrant arrival, immigrant admission category (which is not asked in the census), and other information that is available in the IRCC's administrative data. Future analysis of these linked data might study the relationship between the conditions under which immigrants were admitted and socio-economic outcomes measured in the census.

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Energy, resource consumption, and climate change

Don Kerr[1]

Abstract

Population growth, at both the national and global level, will most certainly impact Canada's climate and, more broadly, its environment. While Canada's population has been projected to continue to grow for many decades, what happens elsewhere in terms of population growth will be particularly important to Canada. Although Canada's greenhouse gas (GHG) emissions have levelled off somewhat over the last decade and a half, global emissions have continued to climb. As a direct result, with increased GHG emissions in the atmosphere, Canada's northern climate has already been impacted in a major way, with considerable warming, particularly in its most northern forests and Arctic ecosystems.

Keywords: population and environment; climate; energy use; peak population; greenhouse gas emissions

Résumé

L'accroissement de la population, autant à l'échelle nationale que mondiale, aura certainement un effet sur le climat au Canada et, plus largement, sur son environnement. Selon les projections, la population canadienne devrait continuer à augmenter pendant encore plusieurs décennies. Or, ce qui se passe ailleurs en termes d'accroissement de la population sera particulièrement important pour le Canada. Bien que les émissions de gaz à effet de serre (GES) au Canada se soient nivelées au cours de la dernière décennie et demie, les émissions globales ont cependant continué à grimper. En conséquence directe de cette augmentation de GES dans l'atmosphère, le climat dans le nord du Canada a déjà subi un impact majeur par un réchauffement important, surtout dans les forêts les plus au nord et les écosystèmes arctiques.

Mots-clés : population et environnement; climat; utilisation d'énergie; pointe de population

Introduction

There are important potential effects of global peak population on Canada's economy, as well as on forecasted levels of resource production and consumption. Yet this population growth, at both the national and global level, will also impact Canada's climate and, more broadly, its environment. While Canada's population has been projected to continue to grow for many decades, as impacted by future immigration targets, what happens elsewhere in terms of population growth and economic development will be particularly important. Although Canada's greenhouse gas (GHG) emissions have levelled off somewhat over recent years (with a very slight decline since 2005), global emissions have continued to climb rapidly—up by about 20 per cent over the 2005–16 period (Environment and Climate Change Canada 2017a). As a direct result, with increased GHG emissions in the atmosphere, Canada's northern climate has already been impacted, with considerable warming, particularly in its most northern forests and Arctic ecosystems (Thomson et al. 2017; Pizzolato et al. 2013).

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Emerging issues: World population and Canada

Canada and many industrialized countries face the prospect of slower growth and population aging, whereas other world regions continue to face major challenges associated with rapid population growth. All countries, however, face environmental effects resulting from population change. The United Nation's medium-growth projection (UN 2017) suggests that the world's population could add an additional 2.3 billion over the 2015–50 period before leveling off somewhat (this is not an inconsequential increase, because it is close to the combined current population total for China and India). While the global population growth rate is currently about 1.1 per cent, the UN medium-growth scenario suggests a growth rate of about 0.4 per cent by 2050. Even with the low variant, which assumes a major drop in fertility to levels below replacement, the population momentum inherent in the world's current age structure insures an additional 1.3 billion over the next half-century.
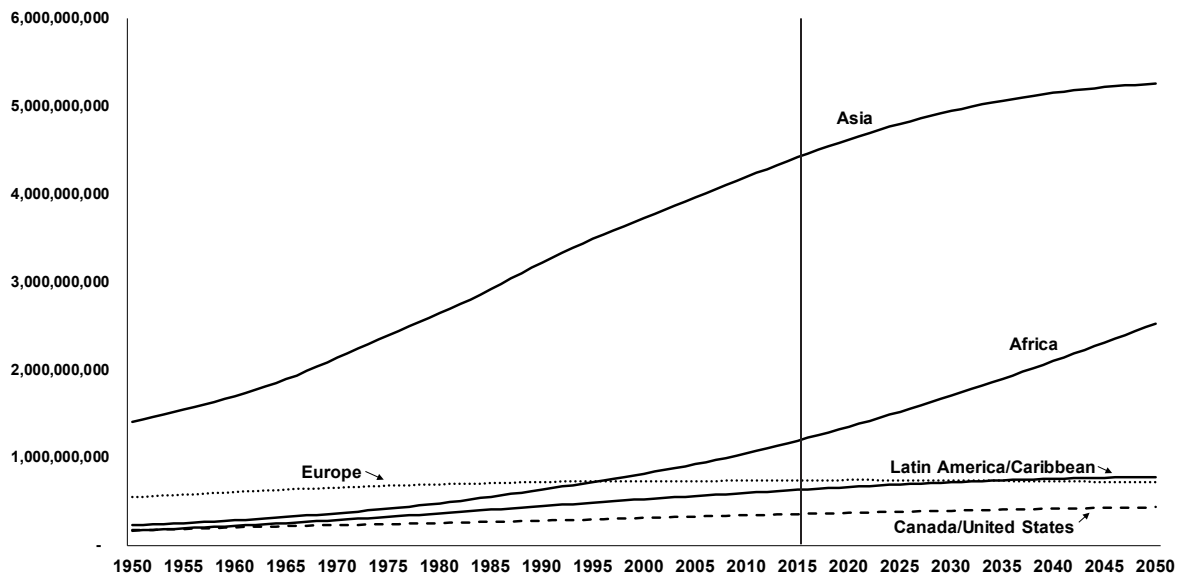
Figure 1. Global population growth, United Nations medium variant, 2017.
Source: United Nations 2017.

While UN projections suggest that North America (Canada and the United States) should maintain its share of the global population (roughly 5 per cent), some world regions are expected to increase dramatically. For example, Africa's share of the global population is set to rise from 16 per cent currently to about 26 per cent by mid-century, with a projected growth of 1.4 billion. Asia's growth is expected to involve an additional 800 million, whereas the Americas could easily see an additional 200 million by mid-century. This sort of population growth, in and of itself, is likely to increase the demand for Canadian exports and resources. This is particularly true given the importance of the resource sector to Canada's economy, as well as ongoing efforts to extend our traditional trading relationships beyond the United States and Mexico to other parts of the world, including Europe and other parts of the Americas, as well as to expanding markets situated across the Pacific Rim.

Canada's environmental record

By international standards, Canada's environmental record has been mixed. As an indication of this, the Yale Centre for Environmental Law and Policy recently published a ranking of 180 countries according to a composite index meant to measure "sustainable development." While the reference measure is somewhat vague, it essentially refers to "maintaining or improving the economic and social welfare of societies without doing irreparable damage to the environment." The composite index summarizes data across 20 public health and environmental indicators. Although Canada's record has been superior in terms of "promoting the social welfare of its population," it has been judged problematic in terms of "avoiding irreparable damage to the environment." Canada scored 25th overall, yet its relative ranking could have been much higher had it not been for its relatively poor performance on several of the indicators meant to measure "environmental damage." As an example, Canada currently ranks 107th in terms of the indicator of "CO_2 emissions per KWH" (Hsu et al. 2016).

This is consistent with what has been documented elsewhere; for example, the World Resources Institute (2016) has shown that Canada currently ranks 11th-highest internationally in terms of GHG emissions on a per capita basis. Environment and Climate Change Canada (2017b) has recently published estimates and forecasts on GHG emissions (Figure 2), which demonstrate the extent to which Canada has failed to meet past commitments on greenhouse emissions (incl. Kyoto and Copenhagen) and is likely to miss future international commitments (Paris). Based on historical data and a review of all actions taken by the government through to November 2016, Environment and Climate Change Canada has forecasted that Canada is set to miss its current international commitment at Paris of 520 megatons of CO_2 equivalent by 2030 (projected emissions range between 697 and 790 megatons under current policy/proposed regulations). While Canada has reduced its total emissions by about 2 per cent over the 2005–15 period, future emissions must be reduced by an additional 28 per cent by 2030 in order to reach its Paris commitments.
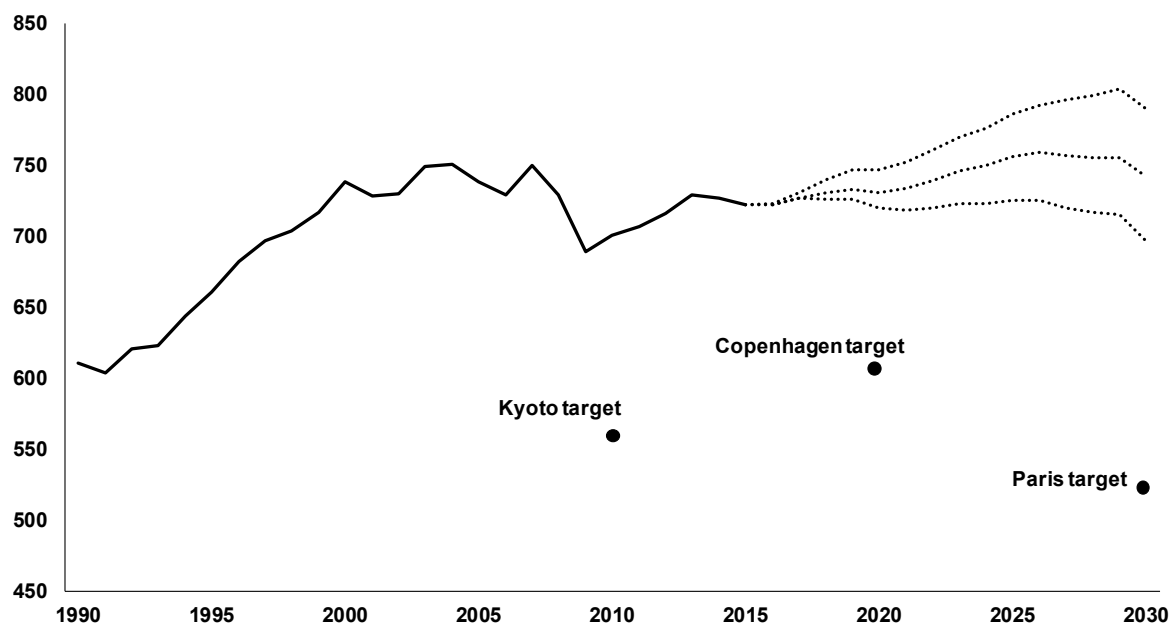

Figure 2. Historical estimates 1990–2015, and projected greenhouse gas emissions 2016–30, Canada (megatons of CO₂ equivalent).

Source: Environment and Climate Change Canada 2017b.

There is considerable uncertainty in these projections. For example, it is impossible to predict with any precision future growth in demand for Canadian commodities (including energy), just as it is impossible to predict future initiatives or regulations introduced by all levels of government. Yet in an independent set of forecasts, the International Energy Association has predicted that on a "global level", the demand for oil should continue to grow until at least 2040 (IEA 2017). This is largely due to the lack of easy alternatives to oil in the petrochemical, road freight, and aviation industries. In this context, it is reasonable to anticipate a growing demand for Canadian exports, and in particular a demand for Canada's energy resources.

The Environmental Kuznets Curve

A relevant idea in this context is the "environmental Kuznets curve," i.e., the general idea that relatively poor societies do little to protect their environment and that only with economic development can societies better afford the costs of protecting the environment, enforcing standards for a cleaner environment and actually cleaning up pollution from the past (Kuznets 1955). The general idea here is that at earlier stages of economic development, economic activity leads to major deterioration in the environment. The purported is that this situation can shift as a society becomes wealthier and its economy diversifies. The general idea is that once a society reaches a given level of development, the nature of economic activity can shift in a major way (for example, away from the primary sector and/or manufacturing to services and a post-industrial economy) and that such a society can better afford to improve its relationship with the environment.

Saunders (2017a) has recently argued that Canada is already moving through this transition, a situation that he foresees continuing even in the context of major demographic growth and climbing living standards. For example, Saunders points to a few fundamental trends, i.e., what has been happening in terms of the energy intensity (and energy efficiency) of economic activity in Canada, as well as the carbon intensity of our economy. As he points out, on these indicators we have seen gains; for example, Canada (and Ontario in particular) has reduced the amount of coal that enters into its energy mix, just as Alberta and Saskatchewan have set out to regulate GHG emissions from the oil sands. Yet regardless, as demonstrated in Figure 2, GHG emissions have essentially not declined, nor are they expected to decline anytime in the near future.

While the energy and carbon intensity of economic activity has improved, this has been offset by both demographic and economic growth. And on a global level, emissions have been climbing in a major way, specifically in those nations that have yet to move through any such transition. Large segments of the world's population continue to face significant challenges in terms of meeting even the most basic energy needs.

Reasons for both optimism and pessimism

By the criteria of the Environmental Kuznets Curve, Canada has a better record than most on several of the indicators summarized by the Yale Centre for Environmental Law and Policy (e.g., providing clean drinking water, assuring appropriate wastewater treatment, maintaining air quality, and reducing fine airborne particulate matter in its metropolitan areas). Yet on several other indicators of environmental vitality, Canada continues to rank relatively poorly (e.g., CO_2 emissions, biodiversity and habitat loss, fish stocks, change in forest cover, species protection). In many ways, Canada's environment continues to deteriorate, even with the best of intentions for environmental protection and regulation. As merely an example, consider the unintentional introduction of in-

vasive species into Canadians waterways, including the Great Lakes region, which has had a negative impact in terms of biodiversity (Environment Canada and the US Environmental Protection Agency 2014; Mandrak and Cudmore 2010). And again, while Canada's record on protecting the environment is mixed, what happens elsewhere is of fundamental importance to Canada. We return here to the basic observation that GHG emissions globally are up by 20 per cent in 2005–15, while Canadian emissions require an additional 28 per cent reduction by 2030 in order to reach its Paris commitments.

In a related matter, the Yale Center reports that Canada was among the top three countries in 2014 in terms of annual tree cover loss (behind only Russia and Brazil), despite some of the best efforts introduced over recent years on the part of the forestry industry to introduce more sustainable practice (Hsu 2016). In particular, this sector can be credited for the application of science-based approaches to the management of forest resources, and considerable effort invested in reforestation. Yet despite such efforts, the health and biodiversity of Canadian forests have declined. While forestry, timber, and other commercial activities have been implicated in tree cover loss, far more important has been the impact of climate change: fires and insect infestations have worsened in extent and intensity as the climate in northern latitudes has warmed, with drier conditions (Aitken 2015). British Columbia in particular has witnessed a major infestation of the mountain pine beetle at latitudes previously unheard of, which is linked to milder winters and earlier arrival of spring. In a subtle and more gradual manner, both the flora and fauna composition of Canada's forests and tundra regions have been impacted, as degraded ecosystems impact biodiversity. The health of Canadian forests has in turn impacted Canada's ranking on other indicators; for example, Canada could potentially do much better on minimizing biodiversity loss and habitat protection.

Canada's warming climate

Over the last 69 years of careful record-keeping across Canada, Environment and Climate Change Canada (2017c) has captured a linear trend for the country as a whole that indicates a warming of about 1.5 degrees Celsius during the summer months and fully 3.3 degrees Celsius during the winter months (Figure 3). In working with annual averages rather than the aforementioned seasonal changes, Canada has warmed at a rate that is about twice the global average (Environment Canada 2015). While Canada produces more than its share of GHG emissions, so too has it witnessed greater warming of its climate—an inference which is true across several high-latitude regions, including Alaska, Greenland, Siberia, and other regions of northern Europe and Asia. This has led to many profound changes in the north, including the melting of glaciers and sea ice, softening of much of the northern tundra, and a real impact upon the health of the boreal forest.

In contrast, the most southern and densely populated regions of the country have witnessed much less warming, particularly during the summer months, regardless of public perceptions. Over the next several decades, the International Panel on Climate Change (IPCC) forecasts that this warming will be felt increasingly in the more southern regions of Canada, with uncertain environmental and social effects (Romero-Lankao et al. 2014). Whereas Environment and Climate Change Canada has recently documented that 2016 was its fourth-warmest year on record (2010 was the warmest), temperatures were not far from average throughout much of southern Canada. While in 2016 the national average was 2.1 degrees Celsius above Environment Canada's baseline average, temperatures were of the range of 3 to 4 degrees above this same baseline

throughout much of Nunavut and the eastern Arctic. In terms of winter temperatures, Yukon had its warmest winter on record (fully 6.8 degrees above average), with comparable anomalies in the Northwest Territories and the northernmost forests of Alberta, Saskatchewan, and Manitoba (5.1 degrees).

To provide a broader context, NASA (2017) has reported that the global average was 0.99 degrees Celsius warmer than the 20th-century mean, making 2016 the third year in a row to set a new record for average surface temperatures. The impact of this warming, particularly in the far north, is of growing concern to climate scientists in light of the potential for *climate change feedback loops*. The softening of the northern tundra is already having an impact on many northern settlements, whereas the melting of sea ice is freeing large expanses of the Arctic Ocean to open water. This is leading scientists to worry about the potential release of methane into the atmosphere due to the thawing of the tundra and the absorption of additional heat into the ocean and land surface due to receding ice cover. The concern is that these feedback loops hold the potential for an *acceleration* in the pace of global warming, as implied in the climate models of some of the IPCC's most pessimistic forecasts (Cubasch et al. 2013).
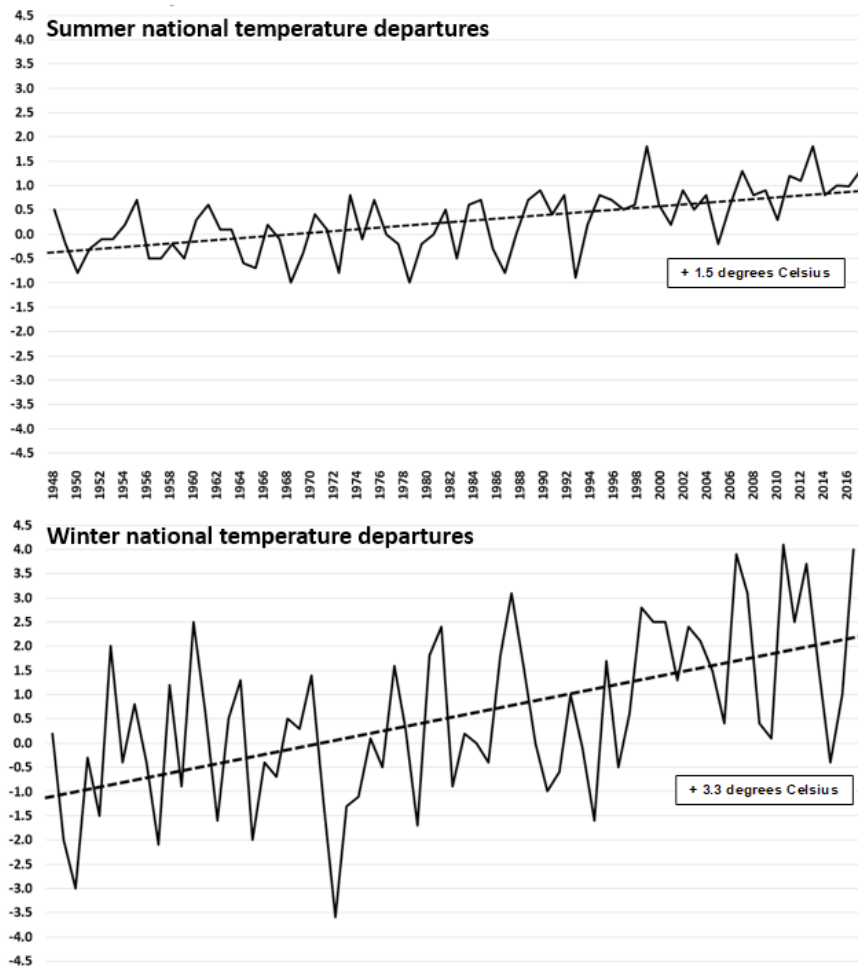

Figure 3. National temperature departures (degrees Celsius) and long-term trend, Canada, 1948–2016.

Source: Environment and Climate Change Canada 2017c.

Future challenges

In the early 1970s, Ehrlich and Holdren (1971) formulated the "IPAT equation" with the intention of refuting the argument that *population size*, in and of itself, was a minor factor explaining environmental change. The IPAT equation was proposed as a starting point for investigating the impact of human populations on the environment. These interrelationships were: I (Impact) = Population (P) × Affluence (A) × Technology (T), where Impact (I) refers to the amount of a particular kind of environmental degradation (for example, GHG emissions), the size of the population (P), affluence (A) is typically measured in terms of income per capita, and technology (T) is meant to capture the environmentally damaging properties of a particular production technique.

While the model has been criticized as being an oversimplification, its primary utility is to highlight the centrality of demography for discussing environmental problems. For example, the IPCC (2000) has used a slightly revised version (called the *Kaya identity*) in an attempt to disentangle the importance of demography to increased CO_2 emissions at the global level. This model, in various forms, has suggested repeatedly that across nations, regardless of their level of affluence, increased population *matters* and typically implies a proportional increase in environmental impact.

The impact of affluence (A) , on the other hand, is not quite as straightforward because empirical evidence suggests that its effect is neither always proportional nor linear (consider for example, the aforementioned discussion of the Kuznet's environmental curve). While greater affluence is typically associated with a greater carbon footprint, several post-industrial societies have witnessed some decline in GHG emissions due to a shift away from their most energy intensive industries associated with the manufacturing sectors. The role of technology (T) is complex, as both gains in energy efficiency *and* transition to renewable sources of energy can be important in reducing environmental impact. The success of Canada in using technology (T) to reduce environmental impact should not be overstated, as several European countries have not only increased the energy efficiency of their economies (as is true of Canada), but are also much further along in terms of an energy transition away from fossil fuels toward less CO_2-intensive alternatives, including hydroelectricity, nuclear, and, to a lesser extent, geothermal, wind, and solar (Hamilton and Turton 2002; Kerr and Mellon 2012).

Canada's energy transition

In this context, the insights of Canadian geographer Vaclav Smil are useful. Smil writes that "a world without fossil fuel combustion is highly desirable, and, to be optimistic, our collective determination, commitment and persistence could accelerate its arrival. But getting there will be expensive and will require considerable patience. Coming energy transitions will unfold, as past ones have done, across decades, and not years" (2010: 149).

With this in mind, consider the enormous political, economic and technological challenges involved, as both domestic and international demand for fossil fuels remains high, and a substantial proportion of all Canadian economic activity is tied into investment and further extraction in Canada's resource sector. The future challenge in this context is to move through the energy transition and *away* from fossil fuels, a necessity that will become more pressing as the impact of global warming becomes more obvious to the Canadian public.

Much of the current economic and political leadership in Canada is highly committed to further expansion of the Canadian energy sector, and Canada has known fossil fuel reserves that are estimated to be third only to Venezuela and Saudi Arabia. For example, since being elected in 2015, the current Liberal government in Ottawa has committed to the expansion of energy exports as

its modus operandi. This includes support for completion of the Keystone XL pipeline, intended to move bitumen from the oil sands of Alberta to refineries off the Gulf Coast, as well as for Enbridge's Line 3, which will move large quantities of oil through northern Minnesota to Lake Superior, and Kinder-Morgan's Trans-mountain pipeline, meant to meet an expected demand for energy across the Pacific Rim (Carr 2017; McCarthy 2017).

Expanding our knowledge base

Collaborative research

In the study of environmental impact, there is a tendency among natural scientists to emphasize the consequences of continuing growth in a finite world (the fixed limits to growth). On the other hand, among social scientists, and economists in particular, there has been a tendency to emphasize the ability of modern economies to create technologies and socioeconomic innovations that have the capacity to modify, control, and sometimes transcend natural environmental limits. Among Canadian demographers, the most commonly acknowledged demographic problem is the issue of population aging, as linked to below-replacement fertility, as well as related challenges that accompany a reliance on immigration to maintain population and labour force growth. Nonetheless, the idea of limiting population growth is seldom debated.

Heavily influenced by the economics literature, there is a tendency to ignore the idea of fixed limits and, if anything, to believe that Canada is perhaps "under-populated" by world standards. This argument has forcefully been made recently in the editorial pages of the *Globe and Mail*, arguing that "Canada's small population" serves as an obstacle to the country's well-being in the longer term (Saunders 2017a). Yet such argument is not new, and completely consistent with Julian Simon's (1981) widely cited cornucopian views as to the lasting economic benefits associated with continuous population growth. Many social scientists appear to distance themselves from the natural sciences, or from the basic reality that all *human societies are ultimately embedded in nature* and the inference that there are obvious *natural environmental limits to population growth*.

Arguably, there is perhaps an opposite tendency on the part of the natural sciences to ignore or downplay the potential for political, technological, and sociocultural innovation, and to assume that the limits are unyielding and we have little say in the matter (Sabin 2013). This lack of dialogue between the natural and social scientists is a fundamental barrier to promoting a more informed research agenda into how Canada can achieve a sustainable economy, and to incorporate a more comprehensive assessment of the large-scale environmental risks that we currently face.

The energetics of Canadian society

A useful example of the lack of interdisciplinary dialogue is that relatively few social scientists have been concerned with the social and environmental consequences of energy production—the *energetics of human societies*. Yet in light of the very real challenges that we currently face, both globally and nationally, in terms of reducing our reliance on fossil fuels, there is an obvious need for further collaborative research to understand the energy trajectories of different societies. Comparative research with other more developed nations may assist us to better understand the many political, economic, and technological barriers to transitioning to a fossil-free economy. Social scientists can certainly contribute—through research on personal, household, and regional differences in energy consumption, not to mention how international trade and globalization have influenced both the supply and demand for fossil fuels, among other, less CO_2-intensive alternatives.

High-risk choices

The IPCC has established with near-certainty the association between increased GHG emissions and global warming. On this front, Canada is an important player internationally, particularly given our large fossil fuel reserves. As human environment interactions are complex and include many nonlinear relationships and feedback mechanisms, it is extremely difficult to forecast the pace of global warming, as well as our reaction to it. Yet in light of the extremely high risks associated with a warming planet, the social sciences (and demography) may be very well placed in terms of thinking of high-risk choices in a continuing context of great uncertainty.

Briefly, Figure 4 provides a summary of the IPCC's (2014) most recent set of forecasts (Fifth Assessment Report) on the extent to which average global surface temperatures can expect to rise over the next century. All the forecasts imply a warming climate, yet the range of future outcomes is extremely wide. Four different scenarios are provided (representative concentration pathways, or RCPs), developed by the IPCC to portray four possible climate futures. RCP2.6 assumes that global GHG emissions will peak in the current decade (2010–20), with levels declining substantially thereafter. Emissions in RCP4.5 peak around 2040, then decline, whereas emissions in RCP6.5 peak in 2080, then decline. RCP8.5 is the most pessimistic of all the scenarios in assuming a sustained growth of emissions throughout the 20th century.

Underlying each pathway is a different scenario on future population growth, which in turn is considered fundamental in forecasting emissions. For example, the most pessimistic forecast (RCP8.5) assumes sustained population growth throughout the current century, whereas the most encouraging (RCP2.5) assumes slow growth that stabilizes by mid-century (van Vuuren et al. 2011). In the IPCC's most optimistic forecast (RCP2.6), the underlying assumption on population is not far from the UN's low variant, with global population reaching about 9 billion by mid-century. In the IPCC's most pessimistic forecast (RCP8.5), projected growth is closest to the UN's high variant, with lobal population reaching 10.4 billion by mid-century (van Vuuren et.al. 2011).
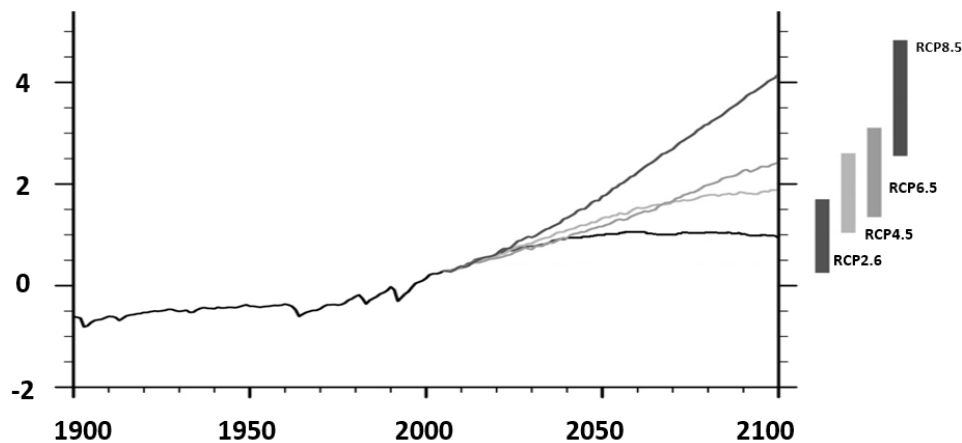
Figure 4. Forecasted average surface temperature change (relative to 1986–2005), degrees Celsius.
Source: IPCC Fifth Assessment Report 2014.

With this wide range on future *concentration pathways* (and future demographic growth), the only scenario that falls without the target set out in Paris is RCP2.6, with a warming of less than 2 degrees over the longer term historical average. This latter scenario is not realistic, as it implies a very stringent mitigation scenario in terms of reducing GHG emissions (i.e., that the world meet is its Paris commitments) and a rather dramatic slowing in the rate of global population growth

(with the global fertility rate falling below replacement within a few decades). In addition, with each RCP the IPCC has applied a broad range of climate models which leads to a wide range of forecasts associated with each (this is captured through uncertainty associated with each RCP, as represented by the bars to the left of Figure 4). This uncertainty relates to the complexities of modelling climate beyond the uncertainties in forecasting future population and GHG emission levels. And recall that the pace of warming will be far greater in the northern latitudes; the forecasts implied in Figure 4 will be amplified into far greater warming for Canada's north. The uncertainty in these forecasts remains high, just as do the potential risks associated with some of the worst-case scenarios.

From a standpoint of moving through the energy transition away from fossil fuels, the IPCC forecasts are impacted by projected population growth, with slower growth or even population stability being desirable. The IPCC considers population growth as fundamental to its forecasts on GHG emissions, with greater growth implying higher emissions. This scientific research begins with what is easily verifiable: population size can be considered a fundamental multiplier in estimating environmental impact (this inference is true, regardless of arguments that have been widely circulated as of late on how it is possible to green an economy through demographic growth. The consensus coming out of the IPCC is that major population growth at the global level will be a major obstacle to reducing GHG emissions and obtaining a sustainable future.

Toward population stability

While forecasting the future is extremely difficult, the social sciences may provide some prudent basis for proposed action and policy on energy use and our continued reliance on fossil fuels. In addition, in light of the enormous difficulties involved in moving away from our dependency on fossil fuels, it would seem well advised that social scientists work more closely with climate scientists in carefully identifying and monitoring the pace of warming in Canada, as to how this impacts specific regions of the country and how we are affected and/or adjust to what is increasingly looking to be inevitable.

In terms of the population component, as global population moves toward stabilization toward the middle of the current century, what will be Canada's future? Given the high level of consumption or affluence (A) that characterizes North America, Canada can arguably play a larger role in climate change through achieving a *stable* population rather than a *growing* one. Increasingly, the consensus is that at the global level a smaller population would be better, and the sooner we arrive at population stability the better. This is especially true given rising consumption, which amplifies the impact of demographic growth. A worthwhile debate in this context is the *extent to which Canada shares a concern to move toward population stability*.

From a standpoint of achieving environmental sustainability, the IPCC has argued that slower population growth or even population stability makes such an achievement more realistic and obtainable. Yet with the globalization of trade, there will inevitably be growth in demand for Canadian resources (and energy resources) regardless of the pace of population growth internal to Canada. Even if Canada were to achieve population stability, there will continue to be major challenges in our efforts to reduce GHG emissions and promote environmental sustainability. While Canada's population could potentially double over the current century (its current growth rate implies a doubling in about 70 years), the far more challenging future remains tied to the basic insight from the UN that we can easily anticipate an additional 2 billion prior to peak population on a global scale.

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Implications of Global Peak Population for Canada's future: Northern, rural, and remote communities

Martin Cooke[1]

Abstract

The broad demographic changes that are affecting the Canadian population, including population aging and changes to immigration, will not have the same impact or implications in all places across the country. For communities in the North and rural and remote communities in the South, the patterns of demographic change might be quite different from those faced by cities. There is also considerable diversity among these non-urban areas. Non-urban hinterlands that are within commuting distance of cities (high Metropolitan Influence) have been growing, with some being reclassified as parts of urban agglomerations. Population change in rural areas that are outside of urban influence is more closely related to employment dynamics in particular sectors, especially agriculture and resource extraction. Populations of many of those communities have been declining and aging, due to out-migration of young adults and a lack of immigration. In the North, where populations are younger, resource development has meant rapid change to Northern communities and cultures. Current challenges for Northern, rural, and remote communities include potential labour force skills shortages and adapting infrastructure to a changing population, in the context of difficult geography. Future issues related to population change have implications for social cohesion. In the North, there is a risk of widening socio-economic inequality, particularly between Indigenous and non-Indigenous populations. In the South, disparities in lifestyles and labour force experiences between rural and urban populations might also grow. Recommendations for knowledge development include more research on the effective recruitment and retention of professionals, including immigrants, in these areas, as well as better sources of data on Northern populations.

Keywords: 1, 2, 3, 4, 5.

Résumé

The broad demographic changes that are affecting the Canadian population, including population aging and changes to immigration, will not have the same impact or implications in all places across the country. For communities in the North and rural and remote communities in the South, the patterns of demographic change might be quite different from those faced by cities. There is also considerable diversity among these non-urban areas. Non-urban hinterlands that are within commuting distance of cities (high Metropolitan Influence) have been growing, with some being reclassified as parts of urban agglomerations. Population change in rural areas that are outside of urban influence is more closely related to employment dynamics in particular sectors, especially agriculture and resource extraction. Populations of many of those communities have been declining and aging due to out-migration of young adults and a lack of immigration. In the North, where populations are younger, resource development has meant rapid change to Northern communities and cultures. Current challenges for Northern, rural and remote communities include potential labour force skills shortages and adapting infrastructure to a changing population, in the context of difficult geography. Future issues

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related to population change have implications for social cohesion. In the North, there is a risk of widening socioeconomic inequality, particularly between Indigenous and non-Indigenous populations. In the South, disparities in lifestyles and labour force experiences between rural and urban populations might also grow. Recommendations for knowledge development include more research on the effective recruitment and retention of professionals, including immigrants, in these areas, as well as better sources of data on Northern populations.

Mots-clés : 1, 2, 3, 4, 5.

Popular imagery often emphasizes Canada's non-urban landscapes, including agrarian scenes, picturesque maritime towns and northern wilderness. As we know, however, the majority of Canadians are city dwellers, with 83 per cent living in cities of 10,000 or more in 2016, and two-thirds of the population clustered near the southern border (Statistics Canada 2017a). Although definitions of "urban" vary internationally, this makes Canada among the most urbanized in the world, certainly among highly developed countries (Statistics Canada 2012).

The dynamics of population change and the implications of that change are somewhat different for rural areas and small towns, and communities in the North, compared to urban centres in the South. Although the proportion of Canadians living in rural settings has been declining for a long time, the size of the rural population has nonetheless been recently increasing. In the 2016 census, the total rural and small town population including the Territories was 5,918,771 people, an increase of 1.4 per cent since 2011 (Bollman 2017). This overall growth in the rural population masks a great deal of regional diversity, but there are some commonalities among these communities, particularly in the challenges that are presented by the broader demographic processes of population aging, slowing population growth, and changing migration patterns.

In this report, we briefly describe the main aspects of recent demographic change in rural and remote communities in southern Canada and in the North, and the emerging issues and future challenges that we can expect. Space does not permit a thorough consideration of the full diversity of community types and regional differences across the country. In particular, First Nations reserve communities vary greatly in terms of size, proximity to urban areas, and demography (Cooke and O'Sullivan 2015), and so are not specifically addressed here.

Demographic changes in rural areas in the South

Regional differences in the ways that southern rural populations are changing in Canada are related to the relationships between rural areas and urban systems. Overall, the population in Canadian *rural areas and small towns*, defined as areas that are neither Census Metropolitan Areas (CMAs) nor Census Agglomerations (CAs),[2] has been fairly stable over the past several census periods, experiencing either small amounts of growth or decline (Bollman 2017). However, assessing the overall pattern of demographic change is complicated by the reclassification of formally non-urban areas as "urban," as well as by the regional diversity of rural areas. Ontario, for example, saw growth in its rural area and small town population of 2.6 per cent between 2011 and 2016, while the rural area and small town population of Nova Scotia fell by 2.1 per cent in this period (Bollman 2017).

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2. Census Metropolitan Areas (CMAs) are one or more municipalities with a total population of at least 100,000, with 50,000 or more in a single urban core. Census Agglomerations (CAs) have an urban core population of at least 10,000 (Statistics Canada 2017b).

These regional differences are no doubt related to different economic activities in the regions, but they also reflect different aspects of rural-urban systems. It is important to distinguish between areas that are "rural" as defined by their own population density but which are within commuting distance of larger urban areas, and rural areas that are *not* within the "shadows" of urban areas. Those that are closer to CMAs or CAs (strong and moderate Metropolitan Influence Zones[3]) have grown rather consistently in census periods from 1986–91 to 2011–16, with a 3.4 per cent increase in the most recent period (Bollman 2017). This has resulted in the redefinition of boundaries, and redefinition of some of these former hinterland areas as now being within urban agglomerations (Bollman 2017)—as in the Windsor–Toronto–Montreal corridor, for example. For these *near-urban rural areas* (with high Metropolitan Influence), the factors underlying population change might be more similar to those of their larger urban neighbours. They tend to have more diverse employment and higher average educational attainment than other rural areas, owing to the possibility of commuting, as well as being sites for employment outside of the resource industries (Bollman and Alasia 2012; Lauzon et al. 2015). Some of these areas have been affected by changes to those sectors, such as the recent reductions in manufacturing employment in Ontario (Lauzon et al. 2015).

On the other hand, rural areas that are outside of the influence of large metropolitan areas—such as those in the Prairie Provinces or Atlantic region—have experienced more consistent population decline (Bollman 2017). These areas are more likely to have economies that are tied tightly to resource sectors, and recent demographic changes can be related to sectoral economic changes. One example is the increase in the size of farming operations over the past several decades, resulting in fewer entrants to that industry and an older average age of farm operators (Alasia 2010; Beaulieu 2014).

Despite the diversity among rural areas in the South, there are some generalizations that can be made regarding recent demographic changes. Overall, these areas are either growing slowly or experiencing population decline, and have an older average age, owing to both out-migration of young people (Bollman and Clemenson 2008; Moazzami 2013) and a lack of immigrant settlement, as the large majority of immigrants to Canada continue to land in the CMAs (Beshri and He 2009; Statistics Canada 2017b). Moreover, those immigrants that have recently settled in rural areas have tended to be from western and northern Europe and the United States, rather than from Asia or Africa (Beshri and He 2009). Rural areas vary in the degree to which their economies are based on agriculture or resource extraction, but in general they have lower average educational attainment, lower average employment income, and higher unemployment rates than do urban areas (Lauzon et al. 2015; Moazzami 2013).

Demographic change in Northern communities

Communities in the North are experiencing different demographic dynamics than are rural areas in the South. Natural increase, due to higher fertility than the Canadian average—particularly in Nunavut (Statistics Canada 2017d)—means that the population of the North is younger than the overall Canadian population, and it is growing (Milan 2011). However, despite the energy and resource development that has occurred in the North in recent decades (Standing Committee on Natural Resources 2012), there has been net out-migration from the Territories every year since the 1980s. This net loss of migrants conceals a fair amount of in-migration to the North (Sergerie

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3. Metropolitan Influence Zones (MIZ) are a classification of non-urban places on the basis of the percentage of the employed population that commutes to work in the core of a CA or CMA (Statistics Canada 2017b).

2016). It also does not consider the "rotational" workforce of "fly-in/fly-out" workers who live in other provinces or territories but work in the North (Conference Board of Canada 2016).

As in the South, there are regional differences between the northern territories. Both Yukon and Nunavut have been growing more quickly than the total Canadian population over the past decade; Nunavut had the highest growth rate of the provinces and territories between 2011 and 2016 (12.7 per cent), and Yukon had the highest growth rate between 2006 and 2011 (11.6 per cent) but grew more slowly between 2011 and 2016 (5.8 per cent). The population of the Northwest Territories, however, grew at only 0.8 per cent between 2011 and 2016 (Statistics Canada 2017a).

Emerging issues in Southern rural areas and Northern communities

Despite the differences between rural areas in the South and northern communities, and the regional differences within these community types, the above-described demographic processes do present some common emerging challenges in the short and medium terms.

Continuing skills shortages in particular industries

There is academic disagreement about the degree to which population aging might lead to widespread skills shortages, or whether the labour markets will adjust in various ways (Creedy and Guest 2013). Nonetheless, rural and remote communities in both the South and Northern regions will likely face shortages of skills in particular occupations and industries. Overall, this can be due to an older age structure of some occupations and industries, coupled with high barriers to younger entrants. One example is farming, where the proportion of enterprises in which the oldest operator was at least 55 years old in 2011 was 55 per cent, and where the costs of entry and potential risk of price instability in some farm products are significant barriers for new farmers (Beaulieu 2014). This occupation is also likely to include longer educational requirements, as well as large numbers of retirements expected in the short term (McMullin et al. 2008). Potential skills shortages could be compounded by the difficulties already experienced in recruiting and retaining professionals in industries such as health care (Hanlon and Halseth 2005), and difficulties in attracting and retaining immigrants with skills to these areas (Simard 2009).

Infrastructure needs in response to changing population, in a difficult geography

The growth and age composition of the population in northern and remote communities will lead to continuing challenges for infrastructure such as roads, housing, and social and health service provision. This will likely be different in the North and in rural communities in the South. For many non-Aboriginal rural and remote communities in the South that do not have labour in-migration, infrastructure associated with population aging is an emerging issue. In these communities, in which out-migration by younger people has led to an older remaining rural population, needs associated with maintaining seniors' health and providing support as they age in place might pose a significant burden on communities. Other communities, particularly in the North, will experience challenges associated with a young and growing population. In both types of community, some needs, such as that for transportation or mobility assistance, might be especially exacerbated by remoteness and difficult geography.

Future challenges

In the longer term, three interrelated future challenges are important for both Northern and Southern rural communities in Canada.

Rapid social and cultural change in the North

The North has seen dramatic changes over the past several decades. These have involved rapid modernization and development, and have meant the importation of new lifestyles and cultures (Southcott 2013). This has been especially devastating for Inuit and other Indigenous communities, which have seen cultural and geographic displacement affect their social and physical well-being (Richmond and Ross 2009). As resource-based economic activity continues to increase, there will likely be more in-migration of non-Indigenous people to the North, at least on a temporary basis. This might also include higher international migration, leading to challenges related to immigrant integration (Simard 2009; Yoshida and Ramos 2013).

Increasing income and social inequality

Rising income inequality has been identified as a major social policy problem. The changes that we have described have the potential to exacerbate inequalities in at least two ways.

First, it seems likely that *socio-economic inequality* will increase within the North. Already in 2011, the census divisions with the highest median incomes and those with the lowest median incomes were both found in the North (Sisco and Stonebridge 2010). This reflects the disparity between communities that have access to resources development opportunities and those that do not. This between-community inequality seems likely to increase, as might the inequality between those with the human capital to find employment in these resource sectors and those that do not. In particular, it seems that integrating the young and growing Indigenous population into the economy will be a major challenge, with the potential for disparities between Indigenous and non-Indigenous northerners to widen.

Second, in the case of southern rural communities, the *disparity between rural areas and urban ones* within the same regions is at risk of widening. As described above, rural communities in the South tend to have lower average educational attainment and higher unemployment. As farming, manufacturing, and other resource industries continue to require less labour, due in part to automated processes, the disparity between these areas and urban ones might widen, in terms of their residents' employment and income trajectories (Lauzon et al. 2015).

Lower social cohesion

These two dynamics, increasing inequality and rapid cultural change, might have implications for *social cohesion* in Canada. High migration, especially short-term labour migration, might itself lead to reduced social cohesion or social capital in Northern communities (Cooke and O'Sullivan 2015). This might exacerbate other dimensions of social cohesion, including Aboriginal-non-Aboriginal relations. In the South, an increasing differentiation of experiences between rural and urban residents might continue to lead to *political differences*, with implications for federal and regional electoral politics (Speers and Jivani 2017).

Expanding our knowledge base

Some areas require further research or knowledge translation efforts, and better data. This is particularly the case for the North. We offer some examples below.

Research on effective recruitment and retention of professionals

The problem of recruiting and retaining professionals to work in remote areas is not a new one, although there are unique challenges in both Northern and rural communities. There has not been a systematic assessment of best practices for recruitment and retention, however, especially one specific to a Northern context.

Better data on the Northern populations

Although there are more data about the North regularly available than before, not all Statistics Canada surveys collect data, or sufficient data, in the North. For example, the new Longitudinal and International Survey on Adults, which will allow the examination of long-term employment and work trajectories, includes neither the Territories nor the northern areas of provinces (Statistics Canada 2015).

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REVIEW • FORUM
Doug Saunders' *Maximum Canada*[1]

Bigger, bolder, better: Historical images and Canadian population history

Review by Gordon Darroch, York University

Doug Saunders, known as Canada's leading international-affairs columnist, has become one of Canada's leading public intellectuals. In *Maximum Canada*, he writes for a wide public, aiming to influence public policy and asking that we think carefully about our collective past and about what we are presently doing, and failing to do, to shape our collective futures.

Saunders' 2011 book, *Arrival City*, was received as carefully researched and humane, written for a wide audience.[2] *Maximum Canada* is a very different book, focused on Canada in a rare attempt to make this county's population history a matter of urgent public debate. His starting point is "an often overlooked fact about Canada: it is a country that has long had trouble keeping people" (p. 8). The history of emigration seems an unlikely topic for an intervention into Canadian public-policy, much less for aspiring best-sellers. It is welcomed.

Saunders constructs a tale about how from the seventeenth century onward Canada has been marked by a singular contestation—a "moral war"—between two overarching worldviews, a "minimizing impulse" and a "maximizing impulse." These conflicting typifications are Saunders' central narrative device in his story about Canada's history of "underpopulation" (p. 5).

The book is organized in three parts. First is Saunders' version of the origins and character of his "minimizing impulse," stretching from the early nineteenth century to the beginning of the twentieth. Emanating from powerful governing ideas (p. 9), the formation had six main features: restrictive immigration, which sustained narrow British ethnic homogeneity, primacy of staples exports, a racialized view of indigenous peoples, fearful relations with the US, and unduly limited population growth. The consequence was "insufficient population density, market size, and tax-payer base to service the country's geographic, human, and economic needs" (p. 11).

The second part is the story of the "maximizing impulse." It first surfaced during Canada's greatest immigration experiment in the Laurier-Sifton years, 1896 to 1911, but only bloomed in the late 1960s.[3] The transformations arose from sea changes in the everyday experience and world views of ordinary Canadians—marked visibly, for example, by Expo '67; political elites had to catch up. The new formation began with more diverse sources of immigration, accompanied by a shift from the primacy of resource extraction toward an urban-industrial and service economy,

1. *Maximum Canada: Why 35 Million Canadians Are Not Enough* (Toronto: Knopf Canada, 2017). ISBN 978-0-7352-7309-2. Softcover C$29.95, 247 pp.
2. See, for example, the reviews posted at https://www.theguardian.com/books/2010/sep/18/arrival-city-migration-doug-saunders and http://www.nytimes.com/2011/03/18/books/arrival-city-by-doug-saunders-review.html.
3. Between 1896 and 1911, some two million immigrants joined a population of just over five million.

with late-blooming interest in continental trade. Quebec's neo-nationalism emerged in this era, as did a slow conversion toward acknowledging indigenous peoples as sovereign nations that require rights-recognition and negotiation. Concentrated urban populations emerged as the main source of cultural and economic creativity (ch. 5).

A sub-plot in these accounts is a comparison between the negative effects of continuing emigration from Canada and the positive effects of US immigration. For Saunders, if Canada's limited population growth largely resulted from massive emigration to the south, this emigration also drained off the most capable and energetic people. I find this to be his most contentious claim.

In the third part, Saunders assesses the risks of continuing "underpopulation" and makes policy recommendations. The challenge is to boost the population to 100 million by 2100, requiring "a set of family policies to bring fertility rates to 1.7 and a modest increase in immigration, to a rate of 1.3 percent annually," to approximately 400,000 or so immigrants yearly (p. 157).[4] Saunders' focus is not on population growth but on enhancing human "capacity" (p. 152)—that is, intensified urban concentrations of markets, taxpayers, labour forces, cultural audiences, and clusters of expertise. The argument echoes his main theses in *Arrival City*, which documents the dynamism of concentrated migrant communities worldwide, including the Thorncliff community in Toronto.

He makes five key points about the costs of failing to increase population capacities. The first is a familiar argument about an ageing population, which increases dependency ratios and restricts the fiscal basis for public services. He provides a brief, conversant account of the problem, suggesting that although it is the most widely publicized, it is also the most readily resolvable.

Of greater concern are Canada's limited size and concentration of markets, which inhibit the productivity of a generally well-educated and resourceful labour force, making innovators and investors unduly dependent on foreign capital and markets. Saunders is persuasive about how the expansion of innovative urban centres and increased density of urban populations underwrite economic productivity and employment. His third point concerns the environmental costs of a scattered national population, and here Saunders writes against the grain. Population growth is not a problem, he says, if it provides a critical mass of strategically distributed fiscal and human resources, increasing the reliance on green energy, lowering transportation costs and carbon-dioxide emissions, and enhancing coastal and urban infrastructures to face the consequences of climate change.

His fourth issue is national security and stability. He notes that contrary to much public sentiment, immigrant populations tend to reduce crime rates and particularly violent crime (although he skirts the causal question). He argues that larger and more concentrated populations make more efficient use of resources for defense and security needs, while boosting the capacity for multilateral influence. The fifth and last issue is cultural. Multiple dispersed and regionally variable audiences challenge Canadians' ability to cultivate and sustain many cultural institutions, from magazines, news channels, and museums to statistical agencies. He points to Quebec's more concentrated and successful funding in supporting cultural institutions as an example.

Chapter 7, "The case against 100 million," is particularly laudable. Saunders thoughtfully reviews the obstacles and risks faced in attempting to achieve his policy goals. First, he provides a measured account of why political interventions are required; the rare historical conditions engendering immigrant successes in the post-WWII years cannot be duplicated. Then he faults

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4. Saunders acknowledges the objective is not an original idea, serving as a symbol for a larger set of proposals (p. 157). See the Century Initiative (http://www.centuryinitiative.ca), Advisor Council on Economic Growth, October 20, 2016 (https://www.budget.gc.ca/aceg-ccce/pdf/immigration-eng.pdf).

the regionally decentralized and exclusionary accreditation processes that create obstacles for current immigrants in upgrading their technical and professional training. Finally, he addresses the possibilities of a rising anti-immigrant backlash in the absence of sufficient institutional preparation, but is optimistic about the ways that racism and exclusion can be moderated. He candidly admits that in the absence of sufficient institutional preparation and investment, even immigrants' historic inventiveness and ambition might not make the risks of increased immigration worthwhile.

The concluding chapter asks how Canada can establish a supportive context for significant population growth. Saunders makes a persuasive case for expanded, subsidized child-care, supplemented by more flexible family leave and work programs. Other proposals include increasing investments in immigrant settlement and employment opportunities through appropriate Federal and Provincial ministries. Following *Arrival City*, he argues that the key is fostering urban home-ownership, small business, and employment opportunities for immigrants in a variety of urban growth poles, as well as in Canada's three major reception cities. Increasing population concentrations provides opportunities for newcomers, enhances environmental stewardship, and has widespread, long-term benefits.

Maximum Canada deserves to be widely read and debated. It is readable, convincing, and (with important exceptions) draws on a considerable, selected research literature. It is notable in making population history central to public policy debates. In my view, it could serve as a starting text in senior undergraduate and graduate courses in social demography, population history, social change, or political sociology. But it needs to be complemented by alternative research studies and critical assessments. The book's ambition and concision invite criticism of its historical accounts and leave a number of nagging questions.

Saunders' representation of the Canadian national experience in terms of two conflicting "impulses" lends the book a dramatic and engaging story-line. Like most historical typifications, however, they greatly simplify complex historical processes, including a tendency to exaggerate the organic, self-adjusting character of the formations described. The nineteenth- and early twentieth-century "minimizing impulse" is simplistically presented as a set of governing ideologies, imposed from above on seemingly passive ordinary folk, almost without resistance (p. 25–27, 39).[5]

By contrast, the "maximizing impulse" erupts in the 1960s "from below," catching political elites by surprise (p. 115–16, 127). Absent is a convincing account of this historic turnabout. The absence partly arises from a questionable stereotype about Canada's rural past as peopled by self-sufficient, isolated, non-commercial "traditional" folk (in Saunders' unfortunate terms, "a self-selected group who didn't want much from life" [p. 49][6]).

A related, deep flaw is Saunders' repeated notion that continuing emigration to the US throughout most of the nineteenth and early twentieth centuries was a powerful filter, selecting out the most knowledgeable, ambitious, inventive, entrepreneurial, and talented (p. 38, 46, 49, and elsewhere). Saunders cites a useful body of migration research, but none warrants this speculation and many other studies complicate it (McInnis 1994; Ramirez 2001; Widdis 1998).[7] Migration

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5. The resistances were readily defeated, as in the rebellions of 1830s.

6. For revisionist interpretations, see Craig (2009) or McCalla (2015) regarding the routine involvement of early Canadian rural households in local markets and their "deep engagement in the international world of goods" (McCalla 2015: 153).

7. McInnis (1994) gives some evidence that significant numbers of nineteenth-century emigrants from Canada to the US were simply sojourners, those who found it easier or cheaper to travel through Canada before moving on, as they originally intended. Saunders cites the many studies of the historical French-

flows are always selective, with selectivity varying widely. The differences in the character of migrants and non-migrants are complex and difficult to address with historical evidence. The closest Saunders comes to systematic evidence is citing Lew and Cater (2012), who indicate that Canadian migrants to the US in the first decades of twentieth century tended to be more literate than those who remained. Research documents a variety of historical conditions under which migrants tend to be more literate or educated than non-migrants (see Long 1973; Ozden and Schiff 2006). But Saunders takes literacy itself to stand in for knowledge, ambition, inventiveness, and talent. Of course, some talented people left. The original authors are more nuanced, however, interpreting literacy differentials in the context of chain and career migration, differing employment opportunities, and the likely effects of US literacy tests after 1917.

I find curious, too, Saunders' notion about the determinative role of the "minimizing impulse" in the history of racialization and brutality toward Canada's indigenous peoples. He fails to note how this relationship has been paralleled in the US and the antipodal settler societies, despite many historical differences. The author also ignores some less sanguine research about the limited effect of immigration on wages and employment even in the longer term—or, for that matter, on solving the ageing population problem (see Riddell et al. 2016; this review was probably not available in time for Saunders' publication, but the research cited was).

Two nagging questions about Quebec arise. Saunders usefully cites the province's experience of support for cultural institutions and the relative success of its childcare policies. But Quebec is not Canada. One wonders about the capacity of our very different regional cultures to pursue similar political initiatives, especially among the low-tax political cultures. And unaddressed is the larger question about how to manage ramped-up national immigration without it being perceived as culturally threatening in Quebec or as upsetting the historical balance of population, political influence and economic well-being between the province and the rest of Canada.

Maximum Canada is an unusual attempt at public education and intervention in public policy. Saunders constructs a compelling and intentionally provocative combination of a simplified but engaging historical narrative and a set of policy proposals. The book's central virtue lies in its potential to invite public consideration of the many social and political implications of our population history and future.

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Canadian emigration to New England as if they confirmed his idea that this bled the province of its best and brightest. No evidence supports this claim. Even the work he mainly cites, Bélanger and Bélanger (2000), reiterates the importance to emigration decisions of prior migrants, family networks, channels of information, chain migration, and the opportunities for employment in not-too-distant mills, including employment of family members, especially of women. The emigrants were self- and family-selected, but not by some sieve that strained talent, risk-taking, or initiative and left the dregs behind.

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REVIEW • FORUM
Doug Saunders' *Maximum Canada*[1]

Maximum Canada: What do Canadians wish to maximize?

Review by Roderic Beaujot, Western University, and
Lise Patterson, Economist, formerly with Canada's Privy Council Office

While including a history of population questions going back to the war of 1812, *Maximum Canada* is fundamentally a book-length argument for higher immigration, aimed at boosting Canada's population to 100 million by the year 2100. Throughout the book, the author contrasts what he calls a "minimizing impulse" and a "maximizing impulse," with a clear preference for maximizing. Doug Saunders claims, for example, that as far back as the early nineteenth century: "Canada was making a concerted effort to be small in size and limited in function. This would be a recurring trend through the next two centuries—but it would constantly be in conflict with another, larger idea" (p. 8).

Originally, the minimizing impulse sought to keep Canada as a colony of Britain and a source of staple products. Later, this approach envisaged a mono-ethnic population of British or Anglican identity, favouring an economic elite with strong links to the mother country and preventing Canada from becoming anything like the United States. In contrast, the maximizing ideas placed Canada in a North American context, benefiting from strong trade relations with the United States.

Saunders' maximizing vision extends beyond broad-source immigration and population growth to include continental integration and open trade within North America; a diversified and value-added economy; pluralism and ethnic heterogeneity; indigenous nations as sovereign partners; and a view of society as a collection of individuals (p. 123–25). Besides linking population growth to economic growth and to cultural inclusiveness, Saunders sees ecological benefits to larger cities with a dense pattern of habitation. For Toronto, Montreal and Vancouver, he proposes that "all three metropolitan areas could easily double or triple their populations without extending their current boundaries (p. 222–23).

While we support the arguments for cultural inclusiveness, we find that Saunders pays too much attention to overall economic growth and too little heed to individual standards of living and quality of life considerations. Above all, we find it hard to swallow his suggestions that large-scale population growth will bring net ecological benefits.

For instance, Saunders proposes that a more populous Canada could better afford costly climate change mitigation and adaptation measures (p. 177–78). He fails to mention, however, that such population growth would require Canada to act more aggressively to meet its target commitments under the Paris Climate Accord. These targets are expressed in terms of total impact on the

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environment, not in terms of per capita emissions or efficiency of resource use. We would observe that while Canada is 37th in population size, it is already 10th among the countries of the world in terms of total CO_2 emissions (Kerr and Beaujot 2016: 307).

In the concluding chapter, Saunders calls for "a large-scale inquiry into the investments needed at national, provincial/territorial, and municipal levels to prepare Canada for its next (population) tripling" (p. 212). As proposed, this inquiry would not consider other alternatives such as low or medium immigration, only how to accommodate higher levels.

Here, we would observe that his population proposals are out of synch with broadly endorsed goals for further slowing the pace of global population growth (see, for example, United Nations 1994: 5). Such goals will prove elusive if each country seeks to maximize its own population.

Canada benefits from immigration, especially from the diversity that brings us into contact with a pluralistic and globalizing world. By including refugees in immigration planning, Canada comes to the aid of the world's most marginalized individuals and families. Instead of seeking to triple the population of Canada by the end of the century, we would argue for achieving population stability through our current levels of fertility, and immigration levels that are closer to the postwar historical average (Beaujot 2017). While Saunders would "focus exclusively on high-skill and post-secondary student immigration" and predicts a "sharp decrease in refugee numbers, which tend to spike only during crises every few decades" (p. 221), we would argue for a diversity of immigrants across the economic, family, and refugee classes, along with diversity of skill levels and places of origin.

Dominance of a minimizing impulse

Before returning to the current context, we will reflect on some interpretations that Doug Saunders gives to population growth over Canada's history. He argues that while a maximizing orientation was present during the years 1897–1913, and slowly took hold in the period after 1967, a minimizing impulse was otherwise dominant: "The starting point of this book [is that Canada] is a country that has long had trouble keeping people. During most decades of the nineteenth century, and for many decades in the twentieth, Canada sent more people to other countries than it received as immigrants" (p. 8).

Saunders asserts that the period 1867–1967 represented a "century-long crisis of underpopulation that had kept the country closed, dependent, and in denial" (p. 122). In particular, he observes that during the 90 years between 1851 and 1941, Canada attracted 6.7 million immigrants but lost almost 6.3 million to emigration, for a net gain of only 400,000 (p. 99). All accounts of Canadian immigration history point to four decades of net emigration at the time surrounding Confederation (1861–1901) and another such decade in the 1930s, but various analytical works point to net immigration in all other decades. For instance, Kerr and Beaujot (2016: 113) and Edmonston (2016: 116) both show a net immigration of 960,000 for the period 1851–1941 (6,191,000 immigrants and 5,230,000 emigrants). McInnis (2000: 387) calculates a net positive immigration for each decade from 1821 to 1861, for a total net gain of 487,000 in these four decades of the 19th century.

Saunders is correct in saying that the United States attracted a number of the immigrants who originally landed in Canada, and also that large numbers of Canadian-born emigrated to places south of the border. But despite low levels of net immigration, the Canadian population did in fact grow—from 2.5 million in 1851 to 14.0 million in 1951, or by a factor of 5.6. This is lower than the 6.5-fold growth of the US population, from 23.2 million in 1850 to 150.7 million in 1950, but it is higher than the 2.0-fold growth of the world population over this century (1.241 billion in 1850 to 2.529 billion in 1950; see Livi-Bacci 2012: 25).

Our main point of disagreement regarding the pre-1960s period is that Saunders attributes Canada's disadvantage to a "minimizing approach" that worked against attracting and retaining more immigrants. In our view, he downplays various factors that drove population growth in the New England colonies and the subsequent United States of America. Already by 1760, at the end of New France, the white population of the United States was over a million (1,268,000), compared to just 70,000 in Canada. The USA began building a more industrial economy with its larger population, especially over the last three decades of the 19th century, and by 1900 its population reached 76 million, as against 5.3 million in Canada. This more dynamic economy south of the border was partly based on an independent and enterprising capitalist spirit, but it was also based on the exploitation of Black and Indigenous populations. Clearly, the industrializing US economy of the 19th century was an attractive alternative to the surplus agricultural economy along the Saint Lawrence Valley.

Saunders also downplays the role of climatic and geographic disadvantages north of the border. When comparing Quebec and New England, the Canadian prairies and the Dakotas, and Toronto, Montreal, and Hamilton to Chicago, New York City, and Boston, he says, "And no, it was not the weather," that these represent "similar climates" (p. 35). The *Farmer's Almanac* (2018) shows considerable differences in average annual frost-free days: Montreal at 181 compared to New York City at 230, Regina at 106 compared to Minot (ND) at 141, and Toronto at 173 frost-free days compared to 204 for Chicago. There are other important geographic differences. In the 19th century, there was year-round marine access to New York, while Montreal was not accessible in winter. The United States also benefits from a more contiguous agricultural area, while the narrow strip north of the border is interrupted by the extensive Canadian Shield. Thus, it is not only due to differences in political will that the US westward push, and the associated displacement and near elimination of the Indigenous population, occurred two decades earlier south of the border.

With the benefit of hindsight, we can agree that Canadian Prime Minster John A. Macdonald's "National Policy" was misguided, especially in not integrating the Indigenous and Metis peoples into an advancing agrarian economy (see Carter 1990). Nonetheless, this policy did establish an east-west economy north of the border that managed to avoid being absorbed by US expansionism. It is true that the arrangement gave much land to the railways, and to the Hudson's Bay Company that originally owned Rupert's Land, but here again Saunders is exaggerating. He says that "homesteads could not be established within twenty miles of a train track because the railways had been granted that prime land by Parliament for future development" (p. 57). In effect, 20 miles would have been an almost impossible distance for bringing grain to the railway by horse and wagon or horse and sleigh. In fact, the land given to the railways was on "odd numbered sections" representing an average of 16 of the 36 sections of a given township (Waiser 2007: 156–57). Homesteads *were* available next to the rail lines, not just at a 32-km distance (Tyman 1972). Looking at the homestead map for the Rural Municipality of Silverwood (No. 123), which adjoins the Canadian Pacific Line that opened to Whitewood Saskatchewan in 1882, about one-third of the 324 sections (each a mile square) are labeled as "C.P.R.," but these are spread out over the 18×18 square-mile area of the municipality.

Saunders proposes that "the entire program of settling the Prairies was a failure," in part because of the lack of urban infrastructure and associated markets (p. 58). However, we would observe that by 1921, Saskatchewan was the third-largest province by population, after Ontario and Quebec. It was the dust-bowl conditions in this fragile geographic area and the coinciding 1930s economic depression that undermined the population of the prairies, not the lack of urban infrastructure. Saunders proposes that by 1941, "Canada's population had become more rural" (p. 99). In fact, the rural percentage declined from 58.3% in 1911 to 48.9% in 1941 (Beaujot and McQuillan, 1982: 158).

A maximizing orientation: The 15-year Canadian century and building a maximizing consensus since the 1960s

While it is true that the Wilfrid Laurier years represented a strong advance in building Canada's population, the groundwork had been done during the time of John A. Macdonald. The period 1897–1913 corresponded to a time of globalization, when Canada benefited from conditions much beyond the political reach of Canadian policy. This was just as much "La Belle Époque" as it was the "The Fifteen-Year Canadian Century," to quote the title of Chapter 3.

Saunders proposes that the 1960s and 1970s were a time of confrontation and debate that ultimately produced considerable consensus toward an open economy and pluralistic inclusiveness. In effect, there was the Royal Commission on Bilingualism and Biculturalism (1963–70) that resulted in the Official Languages Act (1969) and the Multiculturalism Act (1971, 1988). In 1982 there was the incorporation of the Charter of Rights and Freedoms in the Constitution. The Royal Commission on the Economic Union and Development Prospects for Canada (aka Macdonald Commission,1982–85) became the basis of the 1988 Free Trade Agreement with the United States and the 1994 North American Free Trade Agreement. The Commission made a case for free trade on the basis that in contrast to other developed economies, Canada did not have access to a market of 100 million people. In 1991–96, the Royal Commission on Aboriginal Peoples produced a new push toward better recognition of the First Nations and repairs of historical injustices.

Saunders sees the associated discussions as resulting in "core maximizing ideas": ethnic, racial, and religious pluralism, as well as population growth, immigration, North American free trade, individual rights, and Indigenous self-government (p. 126). As reviewers, we share in this consensus with regard to openness and pluralism, but we ask why it should be linked to increasing to a population of 100 million by the end of this century. If Canada is already characterized by this "maximizing consensus," why do we need such a large population? While Saunders says that "35 million is not enough," he also observes that Canadians are among the most educated people in the world, with Canada ranking in the top four countries on the Global Entrepreneurship Index and as a world leader in science and technology innovations (p. 160). We would add to these Canada's high life expectancy, which is among the best of the world and three years above US life expectancy (United Nations 2017: Table S6). Apropos, if we need a significantly larger population to be successful, how did Norway, with a population of 5.3 million, achieve such success in the 2018 Winter Olympic Games? By moving instead toward a stable population, can we not build on these core values of openness and pluralism while also playing our role as responsible ecological stewards?

Saunders also claims that the political parties in Quebec have moved away from concern about the relative size of Quebec in Canada to concern about the small absolute size of Quebec:

> By the time the neo-nationalists had evolved into the Parti Québécois in 1968, both separatists and Liberals shared the view that Quebec's absolute population needed to grow, and fast, even if that meant that Canada itself grew faster (p. 138). […] There's a great understanding that Quebec is underpopulated […] francophone Quebecois are a generation ahead of English Canadians in recognizing the shortfalls of absolute population and the need to have a more robust population (Doug Saunders as quoted in Runnalls 2018: 59).

We asked a Quebec demographer who follows these questions to comment. Jacques Légaré (2018) responded that he had never heard anyone make propositions of this kind. He observed that Quebec had been focused on avoiding population decline, but small changes to family policies and immigration have pushed this concern off into the 2060s (see Légaré 2017). There remains a preoccupation to not have the Francophone proportion decline because of international immigration.

Saunders observes that Canada's population tripled in the period 1946–2015, from 12 to 35 million, and thus it is not such a stretch to triple once again, to 100 million, as a Conference Board of Canada study has proposed (Ades et al. 2016). We would argue that there are serious limits to comparing such growth in the 1946–2015 period to a similar increase for 2015–2100. The postwar period was a time of rebuilding. Prime Minister Mackenzie-King had wanted to ensure that the returning soldiers would not be as poorly integrated into the society as had been the case after the Great War. In effect, Canada's welfare state was first designed for the returning soldiers, including health benefits, support for higher education, loans for persons going into business or farming, and investments in housing. As the welfare state expanded, including family allowance, it provided security to young families and set the basis for the baby boom.

It is noteworthy that both groups of immigrants of the 1897–1913 and 1946–60 periods followed a hiatus in immigration, and both groups achieved fairly successful economic integration (Richmond and Kalbach 1980; Beaujot et al. 1988). The lesser economic success of arrival cohorts since the 1990s (Picot and Sweetman 2005) brings into question the continued high levels of immigration.

In contrast to the period 1946–2015, the proposed tripling of population for 2015–2100 would occur under rather different circumstances. In particular, this tripling in Canada would stand in marked contrast to the projected 1.4-fold growth in the US and 1.5-fold increase for the world as a whole (United Nations 2017: medium projection for US and world population).

Saunders is not clear about the immigration level that would be needed to reach this 100 million mark. At one point he says that even at "current immigration levels and fertility rate, (Canada's population) would still be approaching 90 million people by 2100" (p. 217); elsewhere he says that "a robust set of family policies to bring fertility rates to 1.7" and an immigration rate of 1.3 per cent annually would reach a population of 100 million by 2100 (p. 157).

It is worth citing official projections relating to Canada's long-term population growth. United Nations (2017) projections show low, medium, and high populations of 36.4, 51.6, and 72.0 million, respectively, for 2100. Since the Canadian immigration level has averaged 7.5 per 1,000 population over the period 1991–2015 (Kerr and Beaujot 2016: 112), Statistics Canada uses the low, medium, and high assumptions of 5.0, 7.5, and 9.0 immigrants per 1,000 population (Bohnert et al. 2015); these are paired with Total Fertility Rate assumptions of 1.53, 1.67, and 1.88 births per woman, respectively. Because of the underlying uncertainty of projections, Statistics Canada only publishes results for 25 years at the provincial level and 50 years at the national level. It is, however, possible to extend these projections up to 2100 based on a continuation of the same assumptions. These produce populations of 40.8, 65.9, and 100.8 million for 2100 under low, medium, and high assumptions, respectively.[2] Thus, even an immigration of 5.0 annual arrivals per thousand population, with fertility rates of 1.5, shows a larger population in 2100 than in 2015.

The case for 100 million

Saunders' case for the near-tripling of Canada's population hangs substantially on the promise of large economic and fiscal gains. He argues that the resulting changes to Canada's age structures, GDP growth, and government revenues would offer a "significant" cushion against pressures associated with population aging and free up much fiscal capacity (p.157–59). Among other things, such gains would help Canada sustain social programs (p.157–58), expand public institutions (p.181–83, 188), upgrade foreign policy, security, and defence capabilities (p. 180–81), undertake

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2. These results were provided to the authors by Statistics Canada on special request.

costly climate change–related investments (p. 177–78), and make long-needed upgrades to transit systems, affordable housing, and other urban infrastructure (p. 211, 221–28). Canada's private sector would also benefit from the rising population size and density, which would unleash significant gains in innovation, productivity and economies of scale (p. 159–72). Ultimately, Saunders holds out the promise of a more prosperous, sustainable, and safer society that enjoys not only higher standards of living but also a better quality of life.

Saunders tempers these bold assertions with notes of caution, as he admits to certain social and political risks associated with his population strategy (p. 192–213). He also acknowledges that his proposed surge in immigrant numbers would require costly up-front investments in programs, institutions, and infrastructure (p. 212, 222–25). In the end, he maintains that the potential benefits of the strategy would far outweigh all such costs (p. 212). We remain unconvinced, however, as we believe that he has overstated likely economic gains while ignoring or downplaying significant risks to the environment and to human well-being. Below we raise some specific concerns with his arguments and flag other points that may warrant consideration.

Impacts on age structures and dependency ratios

Saunders cites the burden of rising dependency ratios as a key reason for boosting Canada's population growth. He acknowledges that his proposed population expansion would not prevent overall population aging (p. 154–59), but suggests it would produce a "considerably younger" population (p. 221) and a "markedly lower" peak share of Canadians over the age of 65 (p. 157). By contrast, other sources and studies suggest that similarly large increases in immigration levels would yield only modest long-term changes in age structures, median ages, old age dependency ratios, and workers-per-retiree ratios (Kerr and Beaujot 2016: 198–200; Riddell et al. 2016; Statistics Canada 2015: 14; El-Assal and Fields 2017: 20–22).

Fiscal impacts

Saunders quotes fiscal projections from a 2016 Conference Board of Canada study to demonstrate that certain strategies yielding a population of 100 million by 2100 would free up substantial fiscal capacity by the end of the century (p. 157). We would discount this portrayal for two reasons: (1) there is dubious value in fiscal projections out to 2100; and (2) the study focuses on outcomes with respect to health care and Old Age Security costs, but does not consider spending increases associated with much higher levels of immigration (Ades et al. 2016). A subsequent Conference Board study, which looks at "status quo" versus higher immigration scenarios out to 2040, gives a somewhat more balanced take on fiscal impacts; it projects that a high-immigration policy would reduce health care costs by an amount equal to roughly two per cent of provincial government budgets by 2040, while adding an unspecified amount to social expenditure costs. The study also warns of possible negative fiscal and economic consequences if Canada fails to address the long-standing obstacles to labour market integration faced by immigrants (El-Assal and Fields 2017: 20–22). This suggests that much higher levels of immigration would likely offer some long-term fiscal relief, though this is not guaranteed. In any event, a large windfall of added fiscal capacity seems unlikely in the years to 2040.

Impacts on GDP versus GDP per capita

Saunders points to large GDP gains under his suggested high immigration scenario, but he says nothing about the consequences for GDP per capita. The above-mentioned 2017 Conference

Board study projects that Canada's total GDP in 2040 would be nearly 5 per cent higher under the high immigration versus the "status quo" scenario. Conversely, the projected GDP per capita in 2040 would be roughly 2.0 per cent *lower* for the high-growth versus "status quo" scenario (El Assal and Fields 2017: 20). High-level immigration would no doubt increase Canada's national income over time, but it might do little for average individual incomes.

Impacts on productivity and competitiveness

Saunders contends that his population strategy would deliver large economic gains in the form of enhanced innovation, productivity, market size, and economies of scale. We see a need for further study of these effects within the Canadian context and on a microeconomic scale, as outcomes could vary substantially by industry. Researchers should also assess the broader economic costs and benefits of such growth on those cities and metropolitan areas most affected. Some urban planners suggest that optimum density levels vary by city, and they warn of possible negative economic and social consequences if these levels are exceeded (Florida 2012; Lehmann 2016). Might a tripling of Canada's population mean a four-fold increase within the Vancouver census metropolitan area? If so, this area would harbour 22,000 people per square kilometre, twice the current population density of New York City. A quadrupling of people within Toronto's census metropolitan area would yield a population of 25 million and a density of over 17,300 people per square kilometre. (NYC nd; Statistics Canada 2017; Statistics Canada 2016). Would these numbers fall within "optimal" ranges?

Saunders is correct to flag the serious productivity concerns facing Canada, and the extent to which these may undermine future standards of living. We would note, however, that studies have pointed to multiple potential causes and remedies for this problem, many of which do not relate to population or labour market size (Antunes and Ozyildirim 2015; Capeluck 2016; Drummond 2011; Hodgson 2017; Van Ark et al. 2015).

In making the case for a larger domestic market, Saunders points to a global rise in protectionist tendencies since 2009. We should not assume this trend will last, as the world has seen numerous swings to and away from protectionism in the past two centuries (Reuveny and Thompson 2004: 112–15). One might further argue that current high levels of globalization and tightly integrated transnational supply chains will serve to limit the depth and duration of protectionist swings going forward (Sandbu 2017). In any event, a Canada of 100 million would no doubt remain substantially reliant on external markets; our market size and related economies of scale would still be dwarfed by those of the USA, the EU, China, and the increasingly integrated markets of East Asia. We should recognize this and maintain a strong focus on securing access to diverse external markets.

Impacts on labour markets

Maximum Canada has little to say about the effects of proposed population increases on employment rates, real wage levels, and labour market composition. Past research suggests that immigration flows to Canada have had relatively little impact on wages and employment rates, although less is known about potential distributional effects (Riddell et al. 2016). Looking ahead, however, it may be wise to consider the impacts of population growth on labour market conditions and income distributions, given the unknown and potentially disruptive effects of forthcoming labour-saving technologies and anticipated high levels of job automation throughout the developed world (WTO 2017: p. 90–100).

Impacts on the environment

We find that Saunders' arguments are weakest in the environmental realm. He notes that increased levels of urban density serve to improve ecological outcomes (p. 174–79), and this is certainly true when population levels are held constant and redistributed to achieve greater density. It is a dubious assertion, however, when such density is achieved by enlarging populations. Saunders explains that one city of 8 million people requires 15 per cent less material infrastructure than two cities of 4 million people each (p. 175). While this may be true, it is also almost certainly true that 8 million people will have more total environmental impact than 4 million.

Saunders allows at one point that his proposed high immigration strategy might add to overall problems of pollution and environmental degradation in Canada (p. 176). This can be justified, he suggests, because increased immigration to Canada would benefit the global environment; it would help to depress global population growth because immigrants to Canada from high-fertility source countries tend to have substantially lower birth rates within a generation of arriving (p. 177). We see several problems with this justification: (1) the fertility rates of most major source countries have dropped or are in decline; (2) per capita consumption levels tend to balloon for immigrants who move from developing to developed countries; and (3) Canada is responsible for protecting its own environment, for the sake of its current citizens and future generations.

Saunders cites underpopulation as the cause of urban sprawl, traffic gridlock, and other environmental problems in Canada's largest cities. He claims that current population levels "force" us to use inefficient or high-carbon technologies, as our cities lack the financial resources and tax base required to install adequate public transit systems and green infrastructure (p. 173–74, 222). Some might argue instead that these cities have failed to keep pace with the needs and impacts of their surging populations because residents and governments have been slow to embrace needed changes in behaviours, policies, and investment priorities (Resnik 2010). To the extent these latter factors play a key role, adding large numbers of people will not solve our urban problems and may well make them worse.

There is good international evidence to suggest that cities need not be highly populous to be sustainable. For example, a sustainable cities index compiled by two multinational consulting firms ranks cities around the world according to their environmental performance; six of the top 10 cities on the latest list have populations smaller than those of Canada's three largest cities (Arcadis 2016: 20–21). Certain US cities with populations under one million were among the best performers on a 2010 index of urban sprawl compiled by University of Utah researchers; only two cities larger than a million made their top 10 list for urban "compactness" (Jaffe 2014). Some of the best-performing US metropolitan transit systems also have populations of less than a million, according to a 2011 study by the Brookings Institution (Tomer et al 2011: 824–25).

Saunders contends that a tripling of Canada's population would not jeopardize valuable farmland or green areas, as substantial population growth would only take place in the largest cities; indeed, such growth would leave "natural spaces untouched and probably better protected" (p. 171). This assertion does not align with Canada's past experience, however, as large-scale urban population growth has invariably spilled over into nearby regions, disrupting local ecosystems. Even if governments managed to prevent all such peripheral growth, a tripling of Canada's population would result in significantly more travel to or through Canadian wilderness areas. Such a trend would place added pressures on Canada's natural ecosystems at a most disadvantageous time; the World Wildlife Fund has warned that as many as half of Canada's wildlife species may be dying off at alarming rates due to habitat loss, climate change, pollution, and overfishing (WWF 2017: 5).

Impacts on well-being

While pursuit of urban density is a desirable and increasingly necessary response to population growth, it does not automatically follow that people are happiest living in high-density environments; indeed, a variety of foreign-based studies point to negative effects on health and happiness for those living in high-density environments (Cramer et al. 2004; Florida 2016; Lederborgen et al. 2011; Okulicz-Kozaryn and Mazelis 2016; Peen et al. 2010; Sundquist et al. 2004) There is no doubt that efficient transit systems and good urban design, including features such as green architecture and urban forests, can do much to reduce ill effects from urban density. Yet there is risk in assuming that such optimal conditions will prevail, and that they will solve all problems associated with high-density living. There is also danger that while some population groups may benefit from increasing density, others with fewer resources will disproportionately suffer the costs.

Finally, we submit that Saunders puts the cart before the horse when he calls for a national inquiry into the feasibility of major immigration increases. Instead, Canada should first embark on broad-based discussions and debates over a desired population trajectory. These discussions should not be left to select committees alone; they should incorporate views from interested citizens, officials from all levels of government, NGOs, and specialists from a wide array of disciplines, ranging from the social and health sciences to environmentalists and urban planners. Such population debates could prove contentious, and there is no reason to expect that compromises would emerge. But this airing of views could allow for well-informed policy decisions that better reflect a balance of Canadian interests.

Canada suffers from a dearth of research into the impacts of population growth on diverse aspects of Canadian life. These analytical gaps make it difficult to assess and properly challenge many assertions in *Maximum Canada*, and they impede any national debates on this topic. More important still, governments at all levels currently lack analytical support for many population-related decisions. Canada's academic and research community needs to step up with a more comprehensive and refined array of analytical studies into the impacts of changing population size on the prosperity and well-being of Canadians and the health of domestic ecosystems. If *Maximum Canada* inspires such needed studies and debates, it will have served Canadians well.

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REVIEW • FORUM
Doug Saunders' *Maximum Canada*[1]

Does size really matter?

Review by Guillaume Marois, World Population Program, IIASA (Austria)

The book by the *Globe and Mail*'s columnist Doug Saunders, *Maximum Canada*, proposes to encourage a substantial increase in the population of Canada. Indeed, according to the author, the current population of Canada, about 35 million inhabitants, is not enough, and immigration and fertility policies should seek to strongly increase the size to 100 million by 2100, in order to improve the overall living conditions of the people and to have more opportunities to deal with the consequences of population aging. In other words, according to the author, the size of the population matters. Reading this book leaves me with mixed impressions, as it includes several very interesting parts but also has many deficiencies that, when summed up, do not manage to convince this reviewer as to how an increase in population size would really change the daily life of the average Canadian citizen.

The first two parts of the book are the most interesting. Through a rigorous and concise overview of the history of Canada since the British conquest of 1760, the author presents a summary of the debate around two geopolitical views of Canada. For most of its history and until the end of the 19th century, a *minimalist* view influenced most government policies. Canada then had the role of a colony, with the economy oriented toward providing resources for England, and immigration was restrained to assure that Canada's population profile remained white, British, loyalist, and rural. And thus, entrepreneurial thinking and education were not promoted, trade with other nations was constrained by taxes and fees, and emigration toward the USA was high. Consequently, the overall population growth was small.

Starting in the early 20th century, mentalities gradually changed and a *maximalist* view took over the minimalist one. Canada switched from British dependency to North American integration, seeing the emerging US as its main trade partner, which culminated in the free trade deal in the 1980s. Among other important changes at the time, ethnic diversity became recognized and accepted by every class. Indeed, as the author aptly notes, today even the harshest critics of immigration to Canada would be considered by most other countries as favouring immigration.

Although this reviewer is not an expert in political history, these parts of Saunders' book appear accurate, even the statements related to the Quebec situation. Indeed, Saunders accurately states that the unloved Bill 101, far from being an excessively oppressive regulation, does not differ that much from the Canadian vision of immigrant integration. While Canada's *multiculturalism* policy encourages allophones to adopt English or French (but de facto English) at work and in public institutions, Quebec's *interculturalism* opts for French only. In both cases, it is not possible for allophone immigrants to work, go to school, or receive public services in their maternal language.

1. *Maximum Canada: Why 35 Million Canadians Are Not Enough* (Toronto: Knopf Canada, 2017). ISBN 978-0-7352-7309-2. Softcover C$29.95, 247 pp.

Although I appreciated the first two parts of *Maximum Canada*, it's unclear how they are related to the main thesis of the book. Most of Saunders' arguments in favour of a strong increase of the Canadian population are in the third part. Unfortunately, this last section is much less convincing than the preceding ones. Compared to the first two parts, where the statements are supported by rigorous research and relevant references, the final section is a bit disappointing. Summing up, one can divide Saunders' arguments in this section into three broad categories.

In the first category of argument I place those which rely on little empirical evidence or are trivial. For instance, according to Saunders, the small size of the Canadian population is a day-to-day costly experience for most Canadians. To support this statement, he writes that "[m]any international products cost considerably more in Canada than they do a few kilometres to the south, because of the higher cost of distributing them across a thinly populated geography" (p. 160). Maybe it is true for some products, but overall, purchasing parity indexes show that the cost of living in Canada is comparable to the USA, and generally more advantageous than many more populated Western nations, such as the United Kingdom (OECD 2018). In addition, without providing any evidence, Saunders says that some products are not available in Canada because the population would be too small to develop a market. I do not have the expertise to invalidate this statement, but it is doubtful that this hypothetical lack of products is a major concern for many Canadians. In addition, the author also argues that discounts are less exciting in Canada because of the lack of competition. Is this really an issue on which public policies should focus? If so, then a better policy than increasing population might be to assure that seeming competitors such as Provigo and Loblaws are not the same company with two different names.

Many statements in the book are based on preconceptions and anecdotes, or are simply slogans, without any empirical evidence to support them. For instance, Saunders writes that "anyone in business will tell you that there are real limits to what can be accomplished in Canada's low-density population" (p.160) or that "[f]or [the] individual Canadian, the most familiar experience of underpopulation is the discovery, at some point in your career, that you need to leave the country" (p. 150). In fact, when looking at emigration rates, fewer people leave Canada than most other developed nations (Abel 2016).

In my second category are arguments based on a confusion of concepts, as well as those based on doubtful reasoning. Indeed, all over this part of the book, Saunders mixes different demographic dynamics that are not necessarily related, such as population aging, population growth, population density, and population size. For instance, he uses an erroneous statement related to population growth to pose an argument, saying that "[a]s a result (of low fertility), Canada's population growth currently depends entirely on immigration" (p.156),[2] and then briefly summarizes the economic consequences of population aging. However, a fast-growing population does not always imply a much younger age structure, and similarly, an aging population does not necessarily lead to a population decline. Furthermore, at the same time as the author says that the low population of Canada is a major issue that is responsible for a lack of opportunities, and is at the root of the country's presumed vulnerability and unpreparedness for a more challenging economic future (why?), he also says that it is density that matters rather than absolute size. Actually, it is not quite clear whether the author is arguing for a more populated country, a younger country, or for better redistribution of the population over the national territory.

Still in my second category, Saunders surprisingly links a large population with alleviation of the ecological footprint. According to his reasoning, a low population is an ecological cost

2. In 2016–17, the number of births in Canada surpassed the number of deaths by about 110,000. According to Statistics Canada's most recent projection (medium scenario), natural growth will not be negative before 2060.

because it implies highly polluted forms of transportation, heating, and energy. And so, according to the author, "by settling in urban areas, the next wave of Canadians will be the country's most important ecological asset" (p.173). He also says that the poor quality of public transit in cities is caused by the low population of Canada. This reasoning is misleading, as it forgets that the inefficiency of local public transit in Canada does not rely on the population size of cities but rather on the urban development policies that placed the car in the centre of commuting practice (Newman and Kenworthy 1999; Kenworthy and Laube 1999). Many North American metropolises are stuck with even worse public transit systems than Montreal or Toronto, and yet they have higher populations (Los Angeles, Houston, Atlanta, etc.) (Arcadis 2017). Nevertheless, Saunders quickly solves this issue by saying that future population growth in Canadian metropolitan areas will automatically generate higher density. However, there is no empirical evidence showing that this will be the case. Urban sprawl and its consequences have long been acknowledged to be a problem by North American urban planners and governments, yet there have not been any efficient large-scale solutions (Neuman 2005). Indeed, without a drastic change in urban planning—including the destruction of many low-density districts—that is unlikely to happen. Any further population growth would probably just accelerate the urban sprawl on fertile lands, which would raise several issues around food dependency, traffic jams, pollution, and reduction of biodiversity (Nechyba and Walsh 2004; Huard et al. 2010; Roberts 2001). In addition, even if changes in urban planning policies could help turn population growth into an economic incentive for a more efficient public transit system, it is hard to conclude that this would be an asset for the environment. Maybe the ecological footprint per capita would be slightly reduced in Canada, but since population growth would rely either on additional people on Earth (in the case of new births) or on the move of people from low-consumption countries to higher consumption ones (as in the case of most Canadian immigrants), the global ecological footprint would necessarily be negatively affected.

One more thing: Saunders admits, rightly, that most growth in population, especially through immigration, would take place in metropolises rather than in small cities or in the rural areas of Canada. Then, it is hard to understand how an increase in population could resolve issues related to areas that are sparsely populated or experiencing population decline; in fact, none of the major immigration hubs in Canada are facing issues related to population decline. Saunders argues that medium-sized cities would eventually benefit from increased immigration, as the housing cost would be favorable to new settlers when compared to Toronto, Montreal, and Vancouver. However, again, empirical evidence goes against this wishful thinking. For instance, the average housing price in Saguenay is already about half that in Montreal (CMHC 2018), and still the city receives only a few dozen immigrants a year (or about 0.1 per cent of the number that settle every year in Montreal.

In my last category I place those arguments that benefit only a small part of the population, such as businesses or international artists. Indeed, Saunders presents many numbers to show the positive consequences of population increase on economic growth. Obviously, a larger population would lead to a larger economy that would offer more opportunities for companies to grow and develop new markets. However, when considering "per capita" indicators that are more relevant for the prosperity and living conditions of the average Canadian (such as GDP/capita, Human Development Index, etc.), increasing population size has virtually no effect on them (House of Lords 2008; Prettner 2014). In fact, when looking around the world, the fastest growing countries, or those with large populations, are generally not those with the highest living conditions.

Saunders also states that "[m]any of our largest national companies, once they grow big enough to compete with world markets, are suddenly too big to be owned by Canadians." Consequently, we have to endure some Canadian companies being bought by foreigners. It is not clear, however, how these issues are caused by the low and sparse population of Canada rather than by the broad consequences of globalization. The examples he provides are not convincing: he cites the purchase of Alcan by a company from Australia, a country that is very similar to Canada in terms of geo-demographic dynamics. Sure, some Canadian companies are bought by foreign ones, but many Canadian companies also buy foreign businesses, such as Jean-Coutu and Couche-Tard. Summing up, the author does not provide evidences that the overall balance for Canada is negative on this topic, or that increasing population size or density would change it positively.

Finally, I would like to add my personal view on some expected consequences of a Canada reaching 100 million inhabitants, mainly through immigration, as proposed by Saunders. First, it would probably imply a strong marginalization of rural areas and of small and medium cities, because most of the future growth would benefit only the metropolitan areas and their surrounding regions. Second, the urbanization required to accommodate such population growth would negatively affect the agricultural lands surrounding most metropolitan areas, and consequently would reduce Canada's agricultural potential on the whole. We could expect a merger of the urbanized territory within the Great Lakes Region, forming a megacity of something like 40 million inhabitants. A large part of the farms around Montreal would also disappear, and extensive urban sprawl would occur in the metropolitan areas of the Prairies, particularly in Alberta. Third, such strong population growth would exert massive pressure on the real estate market in metropolitan areas. It is hard to see how a city with limited space, such as Vancouver, could manage any additional pressure, knowing that it is already a challenge for middle-class families to find an affordable dwelling there. Fourth, Canada would become increasingly fragmented ethnically, which could raise issues of social cohesion and even economic growth (Patsiurko, Campbell, and Hall 2012). Also, because most newcomers are much more likely to choose English as their language of integration (Quebec is already struggling, with only limited success in integrating their 50,000 annual newcomers to the French environment (Bélanger and Sabourin 2013), the maximum Canada proposed by Saunders would amplify the marginalization of French-speaking Canadians, from a quarter of the Canadian population actually to something like 10 per cent or even less. This is likely to awake linguistic conflicts. Finally, and not least, in the long run it is not demographically possible to maintain an immigration rate of 1.3 per cent of the total population, as suggested by Saunders. With such immigration levels, the population would grow exponentially and would eventually reach an implausible level; meanwhile, sooner or later all countries in the world will have to achieve stationarity of their populations (if not population reduction). Summing up, are all these plausible undesirable consequences of the Canadian population reaching 100 million inhabitants by 2100 really worth it for the average Canadian to receive "more exciting discounts"?–

To conclude, although I am not convinced by Saunders' thesis on maximum Canada, I appreciate the contribution of the author. His book opens up the debate on population policies, which are too often forgotten or ignored in the public space and by policy makers. Thus, while I still believe that population size does not matter, I am more convinced than ever that demography does matter.

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REVIEW • FORUM
Doug Saunders' *Maximum Canada*[1]

Minimum ecology in *Maximum Canada*: A review from an ecological economics perspective

Review by Eric Miller, Consulting Economist, Hamilton, Ontario

Doug Saunders, an international affairs columnist for the *Globe and Mail* newspaper, is convinced that an extra 65 Million people living in Canada's cities by 2100 would be "the best ecological asset Canada could have" (p. 179). In his book *Maximum Canada: Why 35 Million Canadians are not Enough*, the author boldly asserts that "underpopulation harms Canada's climate and ecological prospects." He writes that underpopulation "forces us" to use energy-inefficient and polluting transportation systems and heating technologies. And it "denies us" the people and tax revenue needed to replace inefficient systems and technologies with green energy that would "protect us against the effects of climate change" (p. 173). The sprawled auto-dependent mode of past planning is the result of too few people, such that Toronto and Vancouver "need a lot more population in order to overcome the practical and ecological problems of population" (p. 174).

Saunders anticipates that some might question whether "a higher population means more pollution and degradation" (p. 176). In a global context, Saunders claims that "Canada serves as a population-growth reducer for the world, accelerating the decline in the number of carbon-emitting people" (p. 177) by offering them a new home, a lower-fertility jurisdiction. He asserts a positive correlation between "places with large, dense populations" and "robust conservation programs": "Canadian history has shown that conservation and respect for natural resources rise when populations increase and become more diverse." This idea is extended abroad, noting that ecological catastrophes, including the Exxon Valdez oil spill, "occurred in sparsely populated places where few eyes are watching and there aren't sufficiently dense communities to press for ecological protection" (p. 178).

This environment-focused content occupies about 10 per cent of the pages that imagine Canada's capacity in the future. About two-thirds of the book is devoted to a historic exploration of "the minimizing impulse" (p. 9) from pre-confederation to the present era, which he calls "the maximizing consensus" (p. 121). Readers interested in the environmental aspects of Canadian population are likely to be underwhelmed by the amount of content that should have been included to support many of the bold "ecological" assertions in the book. In the opinion of this reviewer, it would have been more instructive to raise questions, rather than provide assertions, about the ecological ramifications of a "maximum" Canada. In this review, I offer a few of my own questions on the ecological aspects that arose upon reading *Maximum Canada*.

Does population density determine the means of transportation, or vice versa?

Saunders rightfully criticises the inefficiency of transportation based upon the internal combustion engine. But I question the assertion that "we don't have the masses of people needed" (p. 173) for transit and rail. I live in Hamilton. As in many Canadian cities, hydroelectric-powered transportation once dominated Hamilton, with its streetcars and electric inter-city rail. These were developed by, and for, a *smaller* population—and were all removed with a *growing* population. No explanation is offered as to why the automobile came to dominate, and no exploration of how its dominance might be incentivized to subside in bigger cities, or be deliberately downsized. And no hint is given as to how the existing landscape of suburban mazes could be retrofitted, considering the lock-in of not just the internal combustion engine but also current property rights and pro-automobile social norms.

Will efficiency necessarily grow enough to offset growth in total consumption?

Saunders suggests that population growth would enable more energy and emissions efficiency, without considering its practical implications. By my calculation, to accommodate the energetic demands of 100 million Canadians by 2100 through greater efficiency alone would require 1.35 per cent reductions in total energy consumed *every year for the next 80 years*, while the number of energy consumers grows at the same rate. That would be an extraordinary accomplishment. For example, applying that to Saunders' concern about "single-family dwellings that lack heating efficiency" (p. 173), space heating in 2100 would need to be generated from just 34 per cent of the energy used today. To accomplish this by changing habitation alone would require almost tripling the average household size without any increase in the total volume of heated habitation within Canada.

How much of this challenge could be mitigated by new furnaces, or different furnaces, and higher insulation (net of its up-front energetic costs)? I'm not aware of any research that has explored this empirically; for now, one may be skeptical not only of its technical potential but also its economic feasibility and practical likelihood. Moreover, even without any growth in the number of consumers, increased efficiency can generate what are known as rebound effects, with some of the savings from increased efficiency being used to further consumption of the same thing, or other things, thus mitigating the net benefit. Add to this challenge another one that is not addressed in *Maximum Canada*: Canada has made commitments to significantly reduce *total* emissions over the coming decades. A 2011 report by the National Round Table on the Environment and the Economy (NRTEE) is cited about the costs of adapting to climate change, and is used to assert that the costs would be easier to manage with more people in Canada—without, however, acknowledging that more people would mean more infrastructure to adapt.

Do cities necessarily provide ecological economies as they grow in size?

In Saunders' book it is asserted that "larger, denser cities are vastly less ecologically damaging than smaller, looser ones" (p. 174). The academic literature is rich with investigations into whether pollution and other ecological outcomes decline with a growing scale of human activity. Some of this is captured by studies on "decoupling" and some by the theory of an Environmental Kuznets Curve (which Saunders considers). A more neutral and nuanced read of the literature casts doubt on some of the categorical correlations and causations. Comparing cities of different sizes—even when considered within just one country—can obscure important differences that could prevent smaller ones from replicating the characteristics of larger ones through growth.

Different cities can rely upon different energy mixes for electricity and heat, resulting in different emissions even with the same consumption of energy. Furthermore, different cities can exist in different climates, and can take different forms, from monocentric to polycentric patterns,

each offering different possibilities and constraints for densification. And different cities can have people with different levels of average material affluence and disposable income. All of these details should temper one's enthusiasm for categorical assumptions about ecological economies of scale. Even without any empirics, in the realm of theory one should wonder whether the theory of economies of scale is indefinite, or whether there can be points beyond which there are dis-economies of growth. On the other hand, there are certainly enough examples in the world of megacities with lower ecological consumption per resident, but at the cost of vastly lowered quality of life.

How can we account for the total ecological demand of cities?

Saunders is rightfully concerned about land use efficiency. But on this matter it is important to point out that the physical footprint of a city is only part of its *total ecological demand*. All economic production involves the transformation of materials and energy from nature, requiring ecological inputs and generating outputs into ecosystems. Cities concentrate people, and can indeed economize on infrastructure (as Saunders correctly noted), but their areas are still supported by the use of ecosystems outside their boundaries. Without counting total ecological demand, one cannot be sure that a city with a higher human density is necessarily more ecologically efficient. Similarly, one may question the assumption that the hinterland will be better conserved with more people living in cities, since more hinterland will need to be used to supply the additional materials and energy (especially *green* energy) and ecosystem services used by additional urbanites.

The Ecological Footprint is a useful and relevant measure. It measures the amount of biologically productive land and sea area needed to supply a given population with settlements and infrastructure, cropland, grazing lands, fishing grounds, forested lands that provide timber and fibre, and other areas that sequester greenhouse gas emissions (Borucke et al. 2013). The broad scope of this indicator makes it a comprehensive measure of the ecological demands of humans.

A 2015 assessment of Ontario's Ecological Footprint found that its size was close to the sum of all biologically productive areas within Ontario's borders (Zokai et al. 2015). Assessments at a municipal scale have found a lack of correlation between the size of cities and the Ecological Footprint of their residents. For example, residents in Winnipeg and Quebec have a smaller average per-capita Ecological Footprint than those who live in Toronto, while residents in Calgary and Edmonton and Halifax have some of the highest (Wilson and Anielski 2005; Isman et al. 2018). The physical footprint of settlements and infrastructure is a relatively small part of the Ecological Footprint of urban dwellers. Global assessments similarly shed light on wide discrepancies in per-capita footprints and the effect of trade flows, such that some jurisdictions have effectively offshored their Ecological Footprint (Borucke et al. 2013).

What are the costs and dependencies of growth and demographic changes?

Saunders seems to imply that a growing population provides a sort of free lunch, with more people providing more bodies and more tax revenues to support public services. This optimism isn't balanced by a consideration of how demand would change from a larger and growing population; nor is consideration given to any change in age structure that would result from combinations of growth from fertility and net immigration.

Demand for public services, and the capacity to supply them, are a function of the total population, its age structure, and any differences between cohorts. However, the convention of using age-based measures of dependency can be questioned. After all, not all *working-age* people work, not all *seniors* depend upon *working-age* people for care, and higher fertility generates additional *young* dependents. These details are important, but are not considered by Saunders.

Saunders suggests that a public inquiry should be held to estimate "the investments needed" (p. 212) to accommodate growth. In the public interest, such an inquiry should consider competing population and economic policies—not just the scenario of a 100-million Canada. It should also consider the *returns on investment*, to inform a more balanced consideration of costs and benefits. And it should assess *who* would and could do the investing and *who* would benefit. As with all properly done economic assessments, such an inquiry should consider externalized costs, including unpriced environmental benefits and damages such as wastes and pollution.

Humans depend upon ecosystem goods and ecosystem services. Their scarcities also need to be considered as part of the logic of demographic dependencies. In response to Saunders' view that immigration to Canada reduces population growth elsewhere, which results in "accelerating the decline in the number of carbon-emitting people" (p. 177), consider a couple immigrating to Canada from India. The couple would raise 1.6 children in Canada rather than 2.4 children in India, according to average national total lifetime fertility rates (World Bank 2015). Yet their smaller family in Canada would account for 54.4T of emissions, versus 7.5T if they raised a larger family in India (based on average per-capita emissions of 15.1T in Canada versus 1.7T in India; World Bank 2014).

Does demography affect behaviours and attitudes and environmental outcomes?

Environmental outcomes are a function not only of the number of people, but also their age structure and cultural norms, which can be cohort-based. Research in this area is admittedly weak, in part because there have been few recurring environment-oriented surveys by Statistics Canada. Saunders hopes that more people will generate more pro-environmental political attitudes, and thereafter more higher-density settlements. This reviewer is not convinced. In my observation, younger cohorts remain as paradoxical as older ones. Car-sharing is hip, as is interest in global travel; I see more vegetarianism together with a normalization of dining out and deliveries; I see young people wanting to live in denser neighbourhoods while still wanting a house with a yard for the family dog. The young households in my neighbourhood don't appear to fill their recycling boxes with the *Globe and Mail*, but they certainly put out a lot of take-away containers and parcel boxes from Amazon.

Will market forces (on their own) generate environmental outcomes?

In this book, market liberalization is attributed as a maximizing orientation. But it's not clear how the minimizing impulse on emissions and energy use would be achieved within a laissez-faire context. To achieve the environmental commitments that Canada has already made will require governments of all levels to deliberately make pollution and depletion and land more scarce by making it more costly. Saunders' claim that a more populous Toronto or Vancouver would provide the "voter clout to make such developments happen" (p. 174) is not convincing. Indeed, it seems to me that the supply of elected representatives has not matched growth in the supply of the electorate, with an outcome that political power is increasingly concentrated.

All considered, the above questions are just a few that come to mind to this reviewer when reading *Maximum Canada*. The chapter on sources is prefaced by Saunders' assertion that "a comprehensive history of Canadian population has yet to be written." I would add that a comprehensive demographic-environmental assessment of Canada's future is also needed. I would encourage Canadian demographers to take an interest in environmental issues—and for environmental scholars to take an interest in demography. Both lend themselves to useful empirical modelling in order to test conjectures and explore the implications of oft-held beliefs.

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REVIEW • FORUM
Doug Saunders' *Maximum Canada*[1]

The end (of growth) is nigh

Review by William E. Rees, University of British Columbia

Doug Saunders' *Maximum Canada* is an excellent, well-researched book about an idea whose time has gone.

Saunders argues that Canada's national development has been stunted, like an undernourished orphan, by a variety of circumstances and purposeful politics. Much of Canada's colonial and even post-confederation history has seen the nation seemingly "making a concerted effort to be small in size and limited in function" (p. 8). One consequence is that even as late as the 19th century—while Europe was disgorging an unprecedented 40 million immigrants into the New World, and the world as a whole was "enjoying" an unprecedented population boom—Canada bled more people to other countries, particularly the United States, than it welcomed as immigrants.

Indeed, the fact that Canada "has long had trouble keeping people" (p. 8) provides the starting point for Saunders' analysis. The nation will remain underweight as long as it remains underpopulated; and to create a diverse self-reliant economy and maintain a credible role on the world stage, it must attract more people and learn to retain its most gifted citizens.

For early Canada-to-be, the main organizing question was whether to serve mainly as a subservient provider of unprocessed resources for its overseas masters or strive for a more diverse economy and greater independence. Saunders weaves a necessarily convoluted tale, in which the emerging nation lurches between these divergent poles—buffeted by external events, colonial mandates, and the personal beliefs of those in power. Regardless of which vision was in ascendance, however, the relevant authorities recognized underpopulation as being problematic for achieving their specific goals.

Perhaps the first hint of trouble ahead followed from the Royal Proclamation of 1763, which encouraged the northward migration of settlers from the Thirteen Colonies of British America. The resultant trickle of ambitious American immigrants soon chafed under the restrictive economic and political conditions imposed by Britain over the Province of Quebec (formerly New France's colony of Canada) and Nova Scotia (Acadia), newly acquired from France. Meanwhile, the British became apprehensive over the potential long-term threat to their hegemony posed by the dynamism and entrepreneurial sensibilities of the new arrivals.

The subsequent flood of American migrants during and after the war of independence exacerbated this fundamental tension. Britain's suspicion of Americans' zest for commerce; her fear that the rebellious spirit of the new settlers would feed the desire for greater autonomy in the Canadas; and the growing economic clout of the United States itself precipitated furious debate

in the Parliament of Great Britain. Overwhelming nascent liberal leanings, Britain followed its Tory instincts and resolved to "lock down" the Americans by restricting their trade and marine commerce, and to reward Canada's loyalists by consolidating their role as exclusive providers of lumber, grain, fish, and other resources to Britain.

These actions helped to precipitate the war of 1812 and, soon after, to consolidate a set of ideas on the British side into what Saunders refers to as Canada's "minimizing impulse." Fearful of their own people, the colonial rulers were now determined "to prevent Canada from becoming anything like the United States" and "erect a set of barriers between their subjects and the fast-expanding North American culture and economy" (p. 27–28).

The minimizing impulse had several core elements: *restrictive immigration* favouring mainly white Western Europeans (Saunders' account is of an alarmingly racist Canada); *an official desire for ethnic homogeneity,* preferably British Anglican; *a simple resource-based economy* in the service of imperial Britain; *restricted relations with the United States*; a perception of *indigenous-people-as-problem* subject to paternalistic control; and *chronic underpopulation*, mostly as a result of the previous elements.

The minimizing impulse became Canada's dominant governing framework throughout the 19th and much of the 20th centuries, driving out many of her most gifted citizens and retarding national development. Not until the fractious years following the nation's 1967 Centennial did it show signs of collapsing under the cumulative weight of bigger ideas. Significantly, these ideas "weren't coming from parliament or the courts; they were becoming imbedded in public thought as the collective results of twenty million lived experiences" (p. 123). Canada's colonial mentality was finally dissipating, enabling the full emergence of a new "maximizing impulse."

The maximizing impulse inverted the minimizing variety: *Pluralism and ethnic heterogeneity* recognizes that Canada's *de facto* core values and institutions are independent of ethnic, religious, or racial identities; *broadly based expansionist immigration* fosters economic diversity and population growth; *a diversified value-added economy* recognizes that the manufacturing, high-end service, and knowledge-based sectors are essential to the nation's self-reliance and independence; *free trade and greater economic integration within North America* acknowledge the natural north–south flow of goods and services and the waning of ties to Britain; seeing *First Nations as sovereign partners* recognizes their constitutional and additional legal rights as defined in the treaties; and, most importantly, *a growing population* facilitates further development.

Indeed, Saunders' central thesis is that a greater population is necessary to create adequate concentrations of people and sufficient economies of scale to ensure the cultural, entrepreneurial, economic, and fiscal vitality of any more-or-less self-reliant country. The final sections of *Maximum Canada* therefore provide a balanced rationale for policies geared toward enabling Canada to nearly treble its 2018 population, to 100 million by the end of the century. Chapter 6 details the continuing public, private, ecological, strategic, and cultural costs of underpopulation and, by implication, the benefits of overcoming them. Saunders' obvious expansionist bias does not prevent chapter 7 from outlining possible barriers to success. Do we have the developmental skills and opportunities to accommodate triple our present number of workers? Can our urban infrastructure adapt to the high densities required for an ecologically sound tripling of the population? Will we invest adequately in human capital to enable new citizens to realize their full potential? Most importantly, will Canada be able to avoid a backlash among old Canadians as we attempt to integrate expanding numbers of new Canadians? These are indeed important questions, and Saunders freely admits that "the 100-million plan is probably best rejected if Canada is not willing to make investments and take precautions in advance to ensure that the system continues to function well" (p. 211).

This brings us to what may be the biggest deficiency in Saunders' expansionist thesis. *Maximum Canada* virtually ignores contemporary biophysical reality and assumes that the *global* long term will unfold more or less as a smooth extension of the recent past. These are potentially fatal flaws.

Consider that it took all of human evolutionary history (about 200,000 years) for the world's population to reach 1 billion in the early 1800s, but only 200 years—1/1000th as much time—to expand to today's 7.6 billion! Meanwhile, material demand on the planet ballooned even more—real global GDP has increased 100-fold since 1800, and average per-capita incomes by a factor of 13 (rising 25-fold in the richest countries).[2] Consequently, consumption has exploded hyper-exponentially: half of the fossil fuels and many other resources ever used by humans have been consumed in just the past 40 years! The result? Techno-industrial society is in overshoot, using even renewable resources and natural sinks beyond the regenerative and assimilative capacity of ecosystems (WWF 2016; Steffen et al. 2007; Rockström et al. 2009).

Three observations should be drawn here. First, the recent spurt of population and economic growth that we take to be the norm is actually the most *anomalous* period in human evolutionary history. Second, this explosion of enterprise and population got underway precisely when Saunders' "minimizing impulse" was securing its grip on Canada. Third, the phenomenon is unrepeatable—*the ship of unconstrained growth has sailed, arguably having left Canada stranded on the dock*.

The problem is that if prevailing growth trends continue, they will likely lead *in this century* to runaway climate change, the collapse of major biophysical systems, food shortages, global strife, and generally diminished prospects for global civilization (Barnosky et al. 2012). As early as 1992, the world's top scientists issued a *Warning to Humanity*[3] that "a great change in our stewardship of the Earth and the life on it is required, if vast human misery is to be avoided"; a second notice, issued on 13 November 2017, stated that most of the negative trends identified 25 years earlier "are getting far worse."[4] By ignoring such warnings the world invites an era of geopolitical chaos and forced de-growth. This is hardly a propitious time to advocate a 65-million increase in the population of a nation whose citizens consume four or five times more energy and resources than the world average and have among the world's largest per capita ecological footprints (Rees 2013).

Despite this weakness, Doug Saunders' *Maximum Canada* is a fascinating, well-written, and readily accessible tale that leaves us asking what the nation might have become had its maximizing impulse prevailed from the outset. (Keep in mind that we have actually done rather well in the past half-century, while United States society is arguably in steep decline.) But *Maximum Canada* also leaves us wondering what to do now. Science tells us, "The future ain't what it used to be." How might Saunders' vision change were he to account for current ecological realities and likely future prospects? What if, for example, the main driver of national population growth in coming decades is an irresistible flood of desperate, mostly impoverished refugees, fleeing from flooding coastlines, spreading deserts, encroaching famine, and geopolitical strife?

How then to "maximize" Canada?

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3. http://www.ucsusa.org/about/1992-world-scientists.html#.WguS5miPIdU
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Information Geometry and Population Genetics: The Mathematical Structure of the Wright-Fisher Model

by Julian Hofrichter, Jurgen Jost and Tat Dat Tran
Dordrecht: Springer, 2017
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Reviewed by Ranjita Pandey
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Population genetics is the study of evolutionary behaviour of alleles caused by genetic drift, mutations, natural selection, or recombination. *Information Geometry and Population Genetics* masterfully explores the stochastic dynamics of the progressive distribution of alleles over generations through a geometric perspective on the traditional Wright-Fisher model. *Information geometry* is the study of the geometry of probability distributions under parametric set up. The authors of this book provide a unified source of information on the mathematics of the Wright-Fisher model. The book exhaustively covers mathematical concepts related to analysis based on the Wright-Fisher model, while exploring its potential to connect to other mathematically amenable disciplines. The novel contribution of the present book is in providing a new analytic approach for computing co-existence probabilities of different alleles, a geometric perspective to assess and analyze resultant impact of recombination, free energy constructions for asymptotic inferences, and in hierarchical modelling of allele loss.

The book comprises of three broad sections, arranged in ten chapters, with the objective of translating biological processes into mathematical form. The first two chapters are devoted to an introduction of the elementary Wright-Fisher model and its adaptations. The next five chapters develop the geometry behind the model through Kolmogorov equations and computational tools of moments and free-energy functionals. The last three chapters focus on hierarchical approaches to solutions.

Chapter 2 begins with an explanation of background assumptions for the basic Wright-Fisher model. Extensions of the model to accommodate mutation and selection effects are given. Probability distributions, utilized in the development of a modelling approach through Kolmogorov equations, are described, addressing the evolution of allele distribution for the future as well as in the ancestral states. Probabilistic preliminaries and visualization of their extension to notion of cubes and their boundary instances are covered in a simplistic manner.

Chapter 3 deals with Riemannian metrics for the probability simplex which is utilised in the future chapters to analyse relative allele frequencies. Related mathematical concepts of basic Calculus operators, connection map, curvature tensor, torsion tensor, Fisher metric, geometry of probability simplex, affine and Beltrami Laplacian, and Brownian motion on the sphere are presented in a simple and understandable manner.

Chapter 4 begins with the justification of Markovian diffusion limits, which is derived for the Wright-Fisher model. The corresponding moment evolution equations of the rudimentary two-allele model without selection or mutation, to the more general combinatorial forms are described. The idea of *moment duality* is presented with Kingman coalescent model which chalks out the ancestral trajectory of a population generation resulting from Wright-Fisher models.

Chapter 5 explores dynamics of allele frequency probabilities through the tenets of gamete recombination, linkage and stochastic combinations of gametes and zygotes. Mathematics for the hierarchy in the single locus case, compositionality in the two locus case and geometry of the state space of recombination and linkage equilibria are elaborately covered for various loci-allelic permutations.

In chapter 6 construction of moment generating function and free energy functionals for Kolmogorov forward equations of Wright Fisher model are explained in context of two alleles case with mutation and selection, which are then generalised to N individuals with $n+1$ alleles. Authors deftly handle mathematics of the evolution of free energy functional along the flow of specified densities and curvature dimension conditions based on the assumption of positive uniform mutation rates.

Under chapter 7, Large Deviation Principle (LDP) for a sequence of probability measures are discussed with illustrative examples. This is followed by systematic reconstruction of minimizers for action functionals for various adaptations of Wright Fisher model. Two alleles case, without and with mutations (one way and two way) and selection, is covered with graphical explanation.

Chapter 8 is an in-depth exposition on the diffusion approximation of the $(n+1)$ allelic one locus Wright-Fisher model, without mutation and selection based on Kolmogorov forward equation. Construction of local solution, determination of moments and weak formulation of the Kolmogorov forward equation is followed by hierarchical solution and their extensions leading to deeper comprehension of boundary transitions.

Asymmetry between forward and backward equations implies that some special treatment is required for configuration on boundary of the probability simplex for the latter. Chapter 9 undertakes assessment of influence of boundary composition on the interior and its subsequent extension to the entire stratified boundary of the domain. Probabilistic interpretation and iterated extensions are followed by exhaustive stochastic treatment of a suitably iterated application of the basic blow-up transformation with intention to translate the extended Kolmogorov backward equation into a corresponding differential equation. Stationary solutions to the Kolmogorov backward equation are developed with the objective of determining expected times for exit of one or several alleles.

Chapter 10 sums up the contributions of the text by focussing on computation of biological metrics for two alleles and k alleles population. Hierarchical solutions to determine rate of loss of one allele in a three allele population are provided.

The authors have given exhaustive mathematical derivation for each of the stochastic tools proposed, with reference to the application, analysis, and interpretation of Wright-Fisher model. Related literature reviews are presented adequately in the context of specific topics as the book unfolds. Building stochastic solutions for the complex loci structure and linkage equilibria are handled remarkably well in the book, with a foresight to identify the expected distribution of alleles in future generations. Overall, the book provides exhaustive coverage of the Wright-Fisher model and its application to expected genetic transformations in future generations. The present book is a useful piece of literature for applied biologists with a fair understanding of calculus, who are looking toward the exploration of new dimensions in research on genetic evolution.

Biological Timekeeping: Clocks, Rhythms and Behaviour

edited by Vinod Kumar
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The cyclicity of physical, chemical, biological, and social processes has been the object of intensive study for centuries. The proton-proton cycle was studied as the main mechanism of energy release on stars. At the molecular level, chain chemical processes have a cyclic character. The cell cycle—a sequence of events associated with the multiplication of cells—is essential for the growth, development, and very existence of living organisms. Social processes are not characterized by strict periodicity, although many of them have a cyclic dynamic. Usually, cycling objects interact as parts of a system.

The reviewed book represents the results of studies on the effect of periodicity of physical processes on the features and behaviour of organisms, from bacteria to human. The authors mainly studied the influence of temperature oscillations, the rotation of the Earth around its axis (circadian), and the rotation of the Earth around the Sun (circannual). Some authors analyzed the effect of shorter-period processes (ultradian, tidal).

The book is effectively structured. Each of the thirty-one independent articles constitutes a chapter, and the chapters are grouped into seven parts. Some chapters review the existing literature on circadian, circannual, and other shorter-period rhythms of biological processes; other chapters present new findings.

Part I, "History, Concepts, Evolution, and Basic Features of Biological Clock," contains chapters 1–5 and reviews studies on biological clocks and the main concepts of the developed theories in this field. I would like to make note of chapter 1, written by Drs. William J. Schwartz and Serge Daan, where the authors provide a particularly compelling historical exploration of the ancestry of circadian biology.

In part II, "Animal Clocks: Complexity and Diversity" (chapters 6–12), the authors discuss the cellular and molecular mechanisms regulating circadian rhythms through a large range of organisms: amphibians, insects, fish, reptiles, birds, and mammals. In chapter 11 (Vincent M. Cassone, Jiffin K. Paulose, Clifford E. Harpole, Ye Li, and Melissa Whitfield-Rucker), the authors demonstrate that, unlike mammals, there are three different master clocks in birds that regulate timing in such a way that they produce synchronized events in the daily lives of all birds.

Part III (chapters 13–15), "Human Circadian Rhythms: Entrainment and Sleep Regulation," discusses the mechanisms underlying daily patterns in human physiology and behaviour. The authors describe the importance of circadian entrainment and how the circadian system is organized to

fulfill this purpose. The mechanisms of delayed sleep phase disorder in humans are also discussed, and its treatment. Assessment of circadian phases are analyzed as an important diagnostic tool.

In part IV (chapters 16–19), "Clock Interactions Within and Between Individual and the Natural World," the authors review studies on the interaction between oscillations with different periods. They analyze the effect of non-photic cues such as temperature, food, anxiety, and induced activities.

In part V (chapters 20–23), "Circadian Clocks, Metabolism, and Immune Functions," circadian deregulation—a mismatch between the external time and the internal circadian time—is analyzed as one of the causes of metabolic disruptions, chronic diseases, and cancer. In chapter 23 (Silke Kiessling and Nicolas Cermakian), the importance of circadian timing for the development of effective cancer therapies is emphasized for humans, rats, and mice.

In part VI (chapters 24–25), "Pineal, Melatonin, and Biological Timekeeping," the authors specify how melatonin (indoleamine hormone) is involved in circadian organization, behavioural and physiological functions, and photoperiodic measurement in birds and other vertebrates. It is also noted that melatonin plays a significant role in daily and seasonal functions, like the immune response.

Part VII (chapters 26–31), "Circannual Rhythms, Photoperiodism, and Seasonal Behaviour," discusses circannual rhythms that anticipate the Earth's annual periodicity. It is shown that the biology of annual cycles in migration, hibernation, and reproduction in birds, mammals, and fishes is associated with the annual rotation of the Earth around the Sun.

The reviewed book makes a significant contribution to the understanding of the role of periodical physical processes on the physiology and behaviour of organisms. The book would potentially benefit from an article or two on the seasonal oscillations of human births. This interesting phenomenon was first recognized approximately 175 years ago (Quetelet 1842), and periodical environmental factors (such as temperature, photoperiod) are considered as possible determinants of the periodicity of human births (He and Earn 2007; Seaver 1985; Trovato and Odynak 1993).

I have no doubt that this book will be incredibly helpful for a wide range of researchers and graduate students: biologists, medical scientists. The chapters relating to human behaviour could be interesting for psychologists and social scientists as well. Some chapters (for instance chapters 1, 6, 11, 13, 16, 20, 24, and 26) could potentially be relevant for undergraduate students.

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Population and Society: An Introduction to Demography

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Reviewed by Sulaiman Bah
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This review (one of several reviews of the book) was undertaken at an opportune time, when I needed to assign a demography textbook to public health students for an introductory course in demography. Before undertaking the review, I had already prescribed this book (based on a cursory look at it and brief descriptions of it). With a few months still remaining before the start of the course, one of my driving aims for reviewing the book was to verify my earlier position regarding the book. At the end of the review, I planned to give my decision on the matter.

The second edition is largely a single-authored rewrite of the previous double-authored version (first edition) and bears the personal style of Professor Dudley Poston, a septuagenarian with decades of demographic teaching experience, active research (as recent as 2015), and scores of students supervised. He uses the active instead of the passive voice, and makes it user-friendly by interlacing the book with his "personal demography." The reader gets to know innumerable details about the professor, his date of birth, his hometown, his sister's name, his wife's name, when they got married and their ages when they got married, the years of death of his parents, the shows he watched when he was a child, etc. He gives many examples (US and international), drawing upon his published works and those of his former students. On topics that are debatable, the author tries to give the arguments for and against the position, and gives his own position, directly or indirectly.

The book has sixteen chapters, including standard demographic topics like fertility, mortality, and migration and non-standard topics like contraception and birth control and "The Earth in the Twenty-first and Twenty-second Centuries." It includes useful glossary, name index, and subject index, in addition to an exhaustive 44-page list of references. The book is very well edited, almost free of grammatical flaws. The only editorial slip I could detect was the mention that ICD-10 was adapted in 1992 (instead of adopted).

The merits of the book are many. Primarily, it makes a good balance between substantive demography and technical demography. It covers the theories very well, while providing only the minimum technical details needed to understand a topic, using consistent mathematical formulas and symbols. For fertility, it includes interesting discussions on childlessness, proximate determinants, how the family has changed in the US, etc. The mortality section is also well done. It includes interesting discussions on race differential in mortality, racial mortality crossover, famines and epidemics, etc. The book sheds light on some paradoxes (the Hispanic epidemiological paradox, the Taeuber paradox), describing them and summarizing the debates around them. The migra-

tion section is also well written, giving a good, clear introduction to the concepts found in both internal and international migration. It gives a clear description of the immigration dynamics in the Arabian Gulf countries and the uniqueness of the Vatican City State vis-à-vis migration. Regarding the controversies around international migration, the author comes out with a very clear message that research findings refute the notion that immigrants are criminals. The book gives a balanced summary of views pro and against immigration. Overall, the book takes a pro-migration stance, based on the balance of evidence. Similarly, the book summarizes the debates on population growth and, based on the author's prior research, argues against the proponents of negative population growth. The chapter on "Theoretical and Substantive Issues of Age and Sex" is very well written, making a good balance between the substantive and technical. The chapter gives a very interesting non-mathematical explanation of *ergodicity* (without even mentioning the term).

The book discusses race and ethnicity at depth. Using US examples, the book clarifies the complexities around race and ethnicity, addressing questions on the identity of the Hispanics and how the US is struggling with it own cultural adaptation, the progress it is making, and the different positions being taken. Overall, the book takes a middle position between cultural assimilation and cultural separatism. The book goes further to propose some ideals about the desired American society of the future. On population policy, the book makes an interesting statement that "doing nothing" is itself a policy. It also discusses the politics of world population conferences and the behind-the-scenes role of the US in lowering population growth in the developing countries. The book also gives a good analysis of China's change from a one-child to a two-child policy.

As with other books, this one also has some demerits. The beginning of demography is discussed in a foggy manner. The data sources are brushed through, with no discussion of their advantages and disadvantages. After a quick introduction, the discussion digresses into a detailed evaluation of same-sex marriage data obtained from censuses. No mention is made of the different ways of conducting censuses, nor of register-based census. While some demographic theories are described, there is no critique of them. Discussing fertility before mortality means that life table–related measures that appear in fertility (e.g., net reproduction rate) are discussed when the reader is not yet introduced to life tables. Similarly, the fundamental topic of age and sex composition is only discussed in chapter 10, after some 250 pages of text. While age heaping is discussed, nothing is mentioned about the different ways of smoothing age distribution and redistributing population in the different ages. These are basic tools that should be covered in an introductory demography textbook. In general, some of the chapter sequence is confusing (e.g., from age composition to ethnicity, to world population change). As a topic, cause of death is only introduced on p. 186.

Migration theories are glossed over, and there is hardly much discussion on how mortality, fertility, and migration interact. At different places in the book, ethical issues are mentioned but are left hanging. The reader is not alerted to the fact that there are substantial ethical debates surrounding the topic. In the chapter on contraception and birth control, the book uses graphic descriptions (not found in other demography textbooks); at some point, readers may well wonder if they are still within the topic of demography.

Another serious shortcoming from the point of view of an introductory text is that no introduction is given on rates and their problems. As such, problems are discussed in an ad hoc manner, as they come along. As an example, only direct standardization is discussed, and there is no mention of indirect standardization. Students in introductory courses are often introduced to standard demographic software such as the US Census Bureau's PAS (Population Analysis System) and the United Nations' Mortpak (Mortality Package). This book deviates from that route and instead shows preference for the statistical package Stata for handing standardization.

The discussion on international migration could have been strengthened by some historical and contemporary examples. Topics such as the migrant crisis in Europe are overlooked, as is migration in Southern Africa, which has affected several nations for decades. Instead, the basic perspective is that of America contrasted with some Asian countries, primarily China. Even in the discussion on ethnicity and pluralism, a lot could be learned from Canada but is missing.

There is an abundance of trivia in the book, scattered here and there. For example, the case of Annie Moore (a migrant from Ireland to the US), the length of the sex organ of the male child at birth, etc. Similarly, the author's beliefs (unrelated to demography) are also given here and there. For example, the author denies the conviction held by Muslims, Christians, and Jews that humans descended from Adam and Eve, although a book on demography is not a forum for discussing such differences in belief. Another example is that wiping out Native Americans in the United States is termed as "adaptation"—a perspective that not everyone will agree with. Moreover, on some demographic debates the book does not take a balanced stand. For example, as the author is inclined toward pro-Malthusian views, contrasting viewpoints such as those of Boserup and of Simon are not given a forum and are only mentioned toward the end.

The Poston book is interesting and very well written, making a good balance between substantive and technical demography. However, it is not technical enough for the level I wanted for an introductory course on demography. For this reason, I decided to change the reference in my course outline, and selected multiple textbooks for the course instead of a single textbook.

Marriage Vows and Racial Choices

by Jessica Vasquez-Tokos
New York: Russell Sage Foundation, 2017
ISBN 978-0087154-868-9
Softcover, $35, 388 pp.

Reviewed by Gillian Stevens
University of Alberta

People's choices of marriage partners sometimes seem inexplicable to their friends and families, and often seem over-determined by demographic or social constraints to sociologists. In *Marriage Vows and Racial Choices*, Jessica Vasquez-Tokos delves into why Latino respondents marry either within or outside of their racial/ethnic group, and the ramifications of their marital choices for their cultural practices and racial consciousness. Her analyses are based on semi-structured interviews with 109 respondents from 49 families in California and Kansas. In these interviews, she inquired about the respondents' racial backgrounds, identity claims, natal and marital families, child-rearing strategies, and cultural practices.

The respondents' narratives vividly show that marital choices are influenced by a complex array of individual, family, and contextual factors. Some of Vasquez-Tokos' respondents implicitly (and sometimes explicitly) referred to out-marriage to a white partner as a means of increasing their own class-race status. Other respondents preferred non-white partners who shared the experience of being members of marginalized racial groups. Still others actively sought partners outside of their own ethnic racial group in an effort to avoid oppressive gender roles. In a particularly compelling outcome, some of the author's Latina respondents with domineering fathers veered away from choosing Latino husbands in an effort to avoid reproducing their natal family dynamics.

Unlike most other studies of racial in-marriage and out-marriage, Vasquez-Tokos pays attention to important issues and perspectives that are often ignored. For example, she considers the modification or maintenance of cultural practices and racial identities from the vantage point of both partners in the marriage rather than just one. The inclusion of adult children among her respondents also means that she is able to show disparities in how children of interracial marriages construct their own racial identities. Finally, the study pays attention to how the demographic context influences people's tolerance, and expectations, of interracial marriage.

Overall, scholars interested in intermarriage or racial identities will find this book well worth reading. Vasquez-Tokos' research is well designed, she uses a strong theoretical stance, and her observations and conclusions are insightful and compelling.

Gender and Migration

by Caroline B. Brettel
Cambridge, MA: Polity Press, 2016
Immigration & Society Series
ISBN 978-0-7456-8789-6
Softcover $27.95, 240 pp.

Reviewed by Kathya Aathavan
Western University, London Ontario

Gender has been absent as a subject of analysis within migration literature in the past, and research on how gender shapes pre- and post-migration conditions has been missing. However, in the last few decades, gender and its relationship to migration has gained momentum in scholarly research. In the book *Gender and Migration,* Caroline B. Brettel synthesizes the complex and segmented research, both quantitative and qualitative, on the effects of gender in the processes and consequences of migration, primarily in the post-war American context. According to Brettel, women became *visible* in the migration literature about three decades ago, and in this time, research went from the "just add women" approach that examined female migrants descriptively into a more theoretical approach of gender in general. Along these lines, the author contests early research that examined the effects of gender as a dichotomous and stagnant variable on migration. Instead, she is interested in the dynamic nature of gender as it affects the migration experience, and as it is redefined and renegotiated in the process of migration through gendered institutions such as the state, the family, and the labour market.

Brettel brings gender to the center stage in this book by considering it a constitutive element of migration. The book examines the gendered nature of the structures and institutions that dictate the process of migration and the ways in which gendered relations are maintained, challenged, and redefined in and through this process. It also explores the intersections of gender with race and class. True to feminist literature, Brettel allows space for agency to enact change within the constraints placed by macro-level structures at the global, national, and community level. A welcome addition to this complex and dynamic relationship would be a more nuanced examination of gender and sexuality beyond the conventional norms of binary identity and heteronormativity. The author writes that this is an area that needs further investigation with migration literature.

In chapter one, Brettel dives into the historical patterns of the gendered demography of migration. She is interested in the gendered compositions of migration routes and the transitions of these compositions through time. For a nuanced understanding, she turns to Gabaccia and Zanoni's typology of gendered migrations, which quantifies streams into heavily male dominant, male predominant, gender balanced, female predominant and heavily female dominant (2012). She looks at United States immigration history from the mid-nineteenth century to the present, to identify transitions in the gendered streams and the reasons behind them. For example, of the 3.5 million immigrants in the US from the West Indies in 2009, over half were women, making

this a predominantly female-oriented stream. This can be explained by the local gender ideologies particularly of Trinidad and Tobago, the Dominican Republic, and Jamaica, where female-headed households made it common for women to be breadwinners; as well, the demand in the US for domestic labour and nurses made it easier for women to obtain labour certificates for migration in comparison to their male counterparts. Brettel is critical of the claim in earlier migration literature that global migration routes have feminized since the 1960s. And by synthesizing available research, she examines whether this feminization can be noted in the migration streams coming into the US. In this process, the book produces a gendered US migration history spanning from the spur of emigration of young single Irish women escaping the Potato Famine in the 1800s to the Indian men of the Imperial Valley of California who married Mexican women, and the refugee streams coming out of Asia and Africa.

In the next chapter, the book highlights how this composition explored previously is affected by the gendered biases and expectations within the seemingly gender-neutral immigration laws and policies. This section also examines the ways in which legal structures affect the experience in the host country differentially along the gender lines. This follows the discussion from the earlier chapter, as migration laws and policy are a primary factor in the gendered nature of migration streams and their transitions. In the case of Chinese migrantsthis includes labour demands which called for large proportions of young male labourers to migrate to the US. However, in the guise of anti-prostitution laws that "save" Chinese women from being victimized and "protect" White men from contracting diseases that spread through prostitution, family reunification was not allowed, and Chinese women were restricted from entering the country. In this way, a "bachelor society" was created (p. 39). As illustrated through this example, this chapter examines the laws determining the construction of migration streams and its implications for immigrant groups. But more importantly, Brettel explores the larger politics around the changes in the laws and the how they are reasoned and justified. Moreover, the book also explores the differences in political participation between the genders. She finds that immigrant women are more likely to be involved in the community, which signals integration, and encourages future research on the ways that women participate in politics.

In chapter three, the book explores the role played by the economic environment of both the host country and the sending country on the gendered nature of migration. The shifting global labour demands, as well as the labour market characteristics of the countries involved, play a vital role in the gendered nature of mobility. Often, it is the primary reason of migration, and a primary indicator of integration in the host country; however, Brettel concentrates on the ways in which gender shapes and is shaped in this process. The labour markets in both sending and receiving countries are segmented by gender as well as race and class. Responding to global shortages in certain fields like information technology, workers from India and China or health care workers from Philippines, India, and the Caribbean participate in the skilled labour market and are able to navigate the migration experience better than those whose skills are not in demand and thus get channeled into immigrant occupational niches as well as temporary or precarious work. In this chapter, Brettel also explores global care work, sex trafficking, and immigrant self-employment.

In the final chapter, the author examines gender and the immigrant family, and how gender roles and relations are redefined and renegotiated within the context of migration. She challenges the notion that migration is innately empowering for the women in immigrant families. In some cases, increased economic independence in the host country does lead to increased autonomy and freedom for women. However, in other cases instability, poverty, and hardship experienced in the post-migration context make women wishful for the life they had back at home. Moreover, past research has found that for some women, the process of migration is disempowering. Literature on

Somalian migrant women in New York, for example, states that gender relations become strained because of the structural barriers that lead to persistent unemployment of the men, and the preference of welfare assistance programs for women. Men feel emasculated by the system and the host community, and this negatively affects the autonomy and freedom of women in both the private and public sphere. In this chapter, Brettel also illustrates the ways in which gender norms and relations are renegotiated by individuals, immigrant groups, and their home communities. In the example of a female breadwinner, the meaning of motherhood is redefined to include providing for the family economically rather than just through emotional labour within the home. This affects the gender relations within the home, as well as the gender norms and expectations within the community.

With the use of demographic research on general migration patterns, and the synthesis of hundreds of localized examples of men and women migrating to the US from all over the globe at different points in time, this book is able to depict how "gender shapes the reality of migration" (p. 172). Going forward, the author calls for more research on gendered differences in political participation, immigrant health, intersections of gender, sexuality and migration, and second-generation immigrations. Migration is at the forefront of discussion now in politics and policy, the media, and academia, with increasing proportions of the world's population being displaced as well as highly mobile. *Gender and Migration* can provide an accessible and well-executed overview of the topic in its complexities for undergraduate students, academics, and anyone interested in an introduction migration studies.

Reference

Gabaccia, D., and E. Zanoni. 2012. Transitions in gender ratios among international migrants, 1820–1930. *Social Science History* 36(2):197–221.

Population Change in the United Kingdom

edited by Tony Champion and Jane Falkingham
London and New York: Rowman and Littlefield, 2016
ISBN 978-1-78348-592-5
Softcover, US$44.95, 275 pp.

Reviewed by Barry Edmonston
University of Victoria

Books studying the demography of national populations have some interesting features. Most books of this type are published on the occasion of a recent population census. In Canada and the United States, for example, "census volumes" were published after censuses from the 1930s to the 1990s. These volumes provided useful discussions of population changes because official census statistics were lengthy, detailed, and often complicated tabulations. Earlier census tabulations were printed in large collections that were generally available only in larger libraries. In order to interpret population changes for the general public, census volumes were usually authored by leading population scholars familiar with specialized topics, such as population change or internal migration.

In recent years, census data and reports have become widely available on the internet, and have largely replaced the need for census volumes. Nevertheless, occasional books are published that survey a nation's population situation, such as the recent *Population Change in the United Kingdom*. While this book was not undertaken as a traditional census volume, it has some similarities: its chapters mainly rely on analysis of the 2011 UK census and discuss the key demographic characteristics and processes affecting the UK population.

During the 1980s, population issues were not a prominent part of British thinking about social and economic policy. In the mid-1980s, the British Society for Population Studies (BSPS) collaborated with the Centre for Economic Policy Research in the United Kingdom on a series of lectures addressing the major challenges facing society as a result of the changing demography of Britain. Professor Heather Joshi, then president of the BSPS, compiled the lectures together in a book, entitled *The Changing Population of Britain*, published by Blackwell Publishing in 1989. In the mid-2010s, the BSPS brought together population scholars and policymakers to update the essays in the 1989 volume, resulting in the book under review here. The purpose of the updated work was twofold: first, to highlight demographic changes during the past twenty-five years since the earlier volume and, second, to improve understanding of the determinants and consequences of current demographic change in Britain. This volume documents the analysis, conclusions, and implications for future research by leading British population scholars.

Population Change in the United Kingdom discusses most of the topics that would be expected in a traditional census volume, although there are several noticeable omissions. Population processes are covered, with chapters examining general population change, population composition, population distribution, fertility, mortality and health, international migration, and internal migration.

The book includes the subjects of families, households, and ethnicity, but several other topics are missing. The UK census does not ask respondents about income or sources of income. Hence, there is a noteworthy absence of census results on income and poverty. British demographers have developed several census-based small-area measures as a partial replacement for low-income statistics, which are examined in Chapter 11 of *Population Change in the United Kingdom*. Finally, the book does not discuss educational attainment and labour force status, which seems peculiar given the importance of these two topics for current United Kingdom social and economic debate.

This edited volume includes a brief foreword and preface, and eleven chapters. Chapter 1, written by the two co-editors of the book, provides a general introduction to the volume. It also discusses population change during the past quarter-century, and Britain's expected future population changes over the next twenty-five years. As in Canada, an increasing proportion of UK population growth stems from international migration. And, similar to Canada, the population is aging and becoming more ethnically diverse. The editors point out that the 2021 UK census will primarily use online data collection, and that later censuses are likely to rely increasingly on administrative records. There will be significant future challenges for data providers and users in order to maintain data quality and continuity of census data series.

The next two chapters examine population aging and its implications for elderly health and social care. Chapter 2 proposes that population aging is predictable, because the forces of low fertility guarantee an increasingly older population. The proportion aged 65 years and older in the United Kingdom almost doubled, from 10 per cent in 1941 to 18 per cent in 2014, and is projected to grow to 24 per cent in 2041. But it is not only the number and proportion of elderly that has implications for health and social care. Increases in the number of elderly living alone and in the proportion of elderly who are childless will reduce the potential for social care from partners and children, and place more need on public services. Chapter 3 examines the challenge of ensuring the well-being of all British elderly, not only a privileged few. Social and spatial inequalities in the health and life expectancy of older people have been stable, and may have even widened in recent years. This chapter provides a helpful summary of available evidence about inequalities in elderly health and mortality, and about future research questions that require answers.

The next two chapters, 4 and 5, concern immigration trends and immigrant fertility. Chapter 4 correctly argues that increased immigration is not a solution for population aging. But there is great uncertainty concerning anticipated future immigration levels—especially now, due to possible Brexit arrangements and changes to UK immigration rules—and about the future numbers of immigrant admissions and selection of types of immigrants. Future changes in the UK's role within Europe's custom and economic unions create additional uncertainty about how attractive the UK will be for potential immigrants. Chapter 5 provides evidence from survey data that immigrant fertility decreases with duration of UK residence, and that fertility of the descendants of immigrants is converging to national levels. Overall, decreasing fertility among the foreign-stock population points to lower future UK fertility levels.

Two chapters examine aspects of UK families and households. Chapter 6 takes a children's perspective on the dynamics of family structure. The most important trend is that family size has been decreasing in recent years. Smaller family size improves the availability of parental resources but shrinks the overall family network. Overall, as children mature into adulthood, they may rely more on friendship than family networks, even though friends are less likely than family to care for frail or older adults. Chapter 7 examines the effects of the lower level of new housing units that have been built in recent years. Fewer new units, coupled with removal of older, dilapidated housing, has created supply restrictions on the growth of available housing. This chapter offers useful reading for applied demographers, with its interesting use of methods for projecting housing units.

The next two chapters deal with internal migration and ethnic diversity. Chapter 8 identifies three main trends in UK internal migration during the past quarter-century: (a) a reduction of geographic mobility, except for university students; (b) a fading of southward migration, which was substantial until the 1980s; and (c) a slowdown of the urban exodus, with a trend toward urban recovery. Decreases in residential mobility may be partially due to lower rates of adding new housing units, a topic examined in chapter 7. Chapter 9 discusses the overlap of international and internal migration, pointing out that the foreign-born are dispersing from their places of original settlement. The resettlement of the foreign-born alters the composition of their original ethnic communities and increases the ethnic diversity of their new destinations.

Chapter 10 deals with sexual and reproductive health (SRH), including the study of trends in sexual partnerships, contraceptive use, induced abortion, and sexually transmitted diseases. The chapter argues convincingly for the importance of monitoring and studying SRH in order to constantly adapt and improve policy, service, and data systems.

Chapter 11 concerns challenges in monitoring deprivation and social exclusion, largely because the UK census does not collect data on income or income sources. As a result, the study of the low-income population has been measured by proxy indicators, including unemployment, non–car ownership, non–house ownership, and housing overcrowding (defined as more than one person per room). However, these deprivation measures have limitations: secular trends in the indicators affect changes in overall deprivation; outcome measures are for small-areas and not available for individuals or households; and trends over time require data to have comparable geographies. Although the advantages and limitations of deprivation measures appear to be well-known to UK researchers, improvements in the study of factors affecting the low-income population will require study of longitudinal data for individuals and families.

This edited volume is an important book for the study of population changes in the United Kingdom. The eleven chapters cover a range of demographic topics that will also be of interest to Canadian and other researchers.

Spatial Mobility, Migration, and Living Arrangements

Edited by Can M. Aybek, Johannes Huinink, and Raya Muttarak
Dordrecht: Springer, 2015
ISBN 978-3-319-10021-0
Hardcover C$109.99, 254 pp.

Reviewed by Barry Edmonston
University of Victoria

Most research publications are concerned with determinants or factors affecting an outcome, such as divorce or family stability. Other works focus on the consequences or implications of a factor or related processes, such as the effects of immigration on a population's ethnic composition. Less common is research that concerns the overlap of two distinct topics, which is the motivation of this book. It focuses on the intersection of the dynamics of spatial mobility and living arrangements. In a general way, the emphasis of this book is a subset of the interconnection of migration and life course events, a topic considered in the Spring/Summer 2013 special issue of *Canadian Studies in Population* (vol. 40, no. 1–2).

The overlap of spatial mobility and living arrangements is a useful area for systematic study. Causality in this relationship runs in both directions, to give two examples: (a) long-distance commuting affects family life, while (b) changes in family structure can influence spatial mobility. There are both positive and negative effects of spatial mobility. Positively, spatial mobility can reunite families and improve living conditions through higher income or access to better schools. On the other hand, negatively, some mobility strategies can worsen family life by separating family members or worsening conditions for some members when, for instance, a spouse moves for economic reasons but is away for long periods. Family dynamics influence spatial mobility in different ways as well. Families with young children may move to improve schooling opportunities. Divorced couples inevitably separate into two households. Aging parents often trigger mobility decisions for either the parents or their children, to improve proximity. Life cycle changes, in general, are associated with spatial mobility.

This volume's three editors are European: Aybek and Huinink are associated with Bremen University in Germany, and Muttarak is affiliated with the Vienna Institute of Demography in Austria. The ten empirical papers sometimes deal with more than one country. Overall, there are seven papers dealing with Germany, and one paper that includes data on Switzerland, Italy, United States, Spain, and Europe in general. Six papers examine new survey data, often collected by the authors. One research paper analyzes census microdata. And three papers discuss the results of ethnographic case studies.

This edited volume includes a useful 19-page introduction (chapter 1) and ten empirical papers that are organized in three sections. The first section includes three papers (chapters 2 to 4) related to the relationship of partner choice and family formation with international migration. Chapter 2 examines the partner selection and migration from Turkey by Turkish immigrants living in Ger-

many. It discusses the motivations and risks for both partners, and how key problems for trans-national marriages are negotiated and resolved. Chapter 3 deals with partner choices for second generation Turkish women in Switzerland. The Swiss research primarily summarizes twenty-six interviews with men and women, with an emphasis on how families influence their children's decisions. Chapter 4 discusses results from a mail questionnaire in Berlin concerning fertility levels for German husbands with a foreign-born wife (limited in the survey to wives from Poland, Thailand, Russia, or Brazil). The fertility level of these transnational unions is lower than German-German unions, because immigrant women in transnational marriages are older at the time of their German marriage and sometimes have children from prior marriages.

The second section includes three papers (chapters 5–7) dealing with job-related migration and family arrangements. Recurring spatial mobility includes migration as well as daily commuting. But, as Chapter 5 points out, a new form of mobility is frequent long-distance daily and weekly commuting associated with high-speed transportation. The higher speed of recent train transportation systems in Europe and other places means that more people can work and live at longer distances and commute rather than relocate. Long-distance commuting, however, has social consequences for commuters, and their families and communities. Viry and Vincent-Geslin analyze 2007 survey data on 6,128 households in six European countries, noting three types of recurring long distance commuting: (1) long-distance daily commuting of two or more hours; (2) long-distance family relationships where one partner lives more one hour driving from their partner; and (3) overnighters who spend 60 or more nights a year away from their partner, in a second home, on business trips, or in seasonal work. It may be surprising that about one-in-five European households with one working partner reports that they are engaged in recurring long-distance commuting, with 36 per cent in type (1), 5 per cent in type (2), 25 per cent in type (3), 17 per cent in two or more types, and the remaining unable to be classified in one of the three types above. This suggests that recurring long-distance commuting should be an important topic of study. Research in chapter 5 argues that mobility commuting may be adaptive but does not provide evidence about mobility preferences over the life course. Do younger families involved in mobile living continue this lifestyle over time? Do both partners and their children report similar experiences, perceptions, and preferences about mobile living? Chapter 5 should serve as a stimulus for further research on the social effects of long-distance commuting.

Chapter 6 concerns the relationship of commuting to partnerships, comparing couples living apart together with those living together apart. Overall, partnership satisfaction for German couples is higher for those living together, while those living apart together appear more satisfied than those living together apart. Chapter 7 examines the effect of job-related mobility on union dissolution, based on a German longitudinal survey. Interestingly, long-distance commuting *does not increase* the risk of separation, and female employment *does not increase* the risk of separation, but lengthy commuting of working women *does decrease* partnership stability. The author proposes that female fulltime employment requiring long-distance commuting becomes a risk in Germany when it puts too great a burden on women, perhaps because such commuting conflicts with childcare and other family duties.

The third section includes four papers (chapters 8–11) describing spatial mobility and family life course events. Chapter 8 compares living arrangements for immigrant and native-born young adults in Spain and the United States. The authors find that living arrangements differ by nativity, and that living arrangements for young immigrants vary by age at arrival, country of origin, and also by country of destination. Chapter 9 reports on an ethnographic study based on interviews with university students in Italy and Germany, asking about their motivation and reasons for moving from their parents' home. Italian students are less likely to seek residential independence, while

German students suggest that employment conditions are an important reason to move away from their parents. Scheir's work in chapter 10 concerns the spatial mobility of families following divorce, a topic that has received relatively little research. Her analysis of survey data, along with an ethnographic case study of German families, offers insights about the spatial processes and suggests needed further work. The final chapter in the book, chapter 11, deals with spatial mobility during pre- and post-retirement for German adults aged 50 years and older. They analyze longitudinal data from the German Socio-Economic Panel, which has interviewed a large number of adults since 1984 in West Germany and since 1990 in East Germany. Their piecewise-constant hazard model analysis finds that employment changes, housing conditions, and family-related transitions are key to understanding the decision about when and where to move. Their results will interest other researchers, because German survey data includes several variables—such as health conditions, disability changes, and loneliness—that are often not available in other data.

In sum, this edited volume is an important book for those studying migration and family structure. The ten empirical studies cover a range of important topics that will surely stimulate interest in research on spatial mobility and living arrangements.

Global Shift: Mapping the Changing Contours of the World Economy

by Peter Dicken

7th edn, New York and London: Guilford Press, 2015
ISBN 978-1-4625-1955-2
Softcover $55, 645 pages

Reviewed by Susan McDaniel
University of Lethbridge

Global Shift is a big book with a big history (this is the seventh edition), on a big, ever-shifting topic with a big history itself. The first edition was published in 1985 as a self-described (by the author in the Preface) one-off attempt to make sense of changing geographies of the world economy. Clearly, that attempt appealed to readers, since here we are in the seventh edition. And it is easy to see why, as this review will elucidate.

Peter Dicken is a highly acclaimed Emeritus Professor of Economic Geography, School of Environment and Development, University of Manchester. The four principles that guide this volume are revealed in every chapter: (1) to be solidly empirical but not descriptive; (2) to theoretically and broadly engage with globalization ideas; (3) to connect current events with longer term processes; and (4) to acknowledge the complexities of globalization. This reviewer would add that this book, unlike much writing on globalization, is unequivocally interdisciplinary, giving it strength and depth of insight. And it has companion websites for both students and instructors that include more than the usual sets of discussion or test questions, also a wide array of additional readings and resources.

Structured into four sections (seventeen chapters), the book unfolds not only as highly engaging but as a true page-turner. Part One follows a lead chapter enticingly entitled "What in the World is Going On?" and focuses on a perpetually shifting global economic map, with changing centres of gravity. Part Two (chapters 3–6) explores the many complex ways in which actors, institutions, and processes that comprise the global economy interact to produce global production networks. This section examines how "gales of creative destruction"—set in motion by technological changes, increasingly complex networks, and changing relations of states with transnational corporations and other states—work to construct and reconstruct globalization. Part Three (chapters 7–11)—looks at winning and losing in the global economy, and impacts on people and places. Here, attention is given to the uneasy relations of transnationals to states, of environment to economies, of the local or national in seeing value in global networks, and how all might find ways to benefit. Part Four (chapters 12–17) brings previous discussions down to earth, with six case studies revealing how globalization processes operate differently in different contexts. The studies range from primary industries such as food production and mineral extraction to manufacturing as diverse as clothing and automobiles, to so-called advanced business, financial, logistical, and distribution services. Precisely how these very different economic sectors are configured

and reconfigured with respect to state-private enterprise relations, labour/consumer relations, and technological pressures are further explained.

In the stage-setting chapter 1, a series of crises over the past half-century is laid out, as well as two competing meanings of globalization: as structural changes in the global economy, and as an ideology of neo-liberalism and free marketism. These two contrasting meanings play out throughout the book like a Greek chorus. Pointed out clearly and sharply in this chapter is that the global economy is, in fact, not so much more open than it had been, but it is more connected, qualitatively transforming economic relations across geographies. Importantly this introductory chapter challenges what Dicken calls the "more egregious globalization myths," i.e., that the world is now flat or borderless, that global corporations rule the world, and that globalization is always bad or always good.

Perhaps the most compelling chapters in the book—since not every chapter in this giant tome can be given its due in this short review—are the last six, chapters 12–17. They bring global shifts to earth in examining changing economic relations in extractive industries, in agro-food, in clothing, automobiles, business services, and logistics/distribution. It is here that we see the heterogeneity of globalization, where the myths mentioned in chapter 1 are confirmed as false. For example, contrasting the global processes involved in extractive industries, in food production, in clothing industries, and in the automotive sector, it is apparent and the globe is far from flat and borderless, and that the globalization of economic relations in these sectors is both good and bad. It must be emphasized that Dicken does not contrast these sectors but treats each one in a separate chapter. Very briefly, change characterizes each of these sectors, but in different ways. Extractive industries (chapter 12) are both landed and material, and face extreme volatility in demand, and socio-political constraints on supply as well. Issues involved in global processes tend to be viewed through a techno-economic lens, but Dicken points out that states are very much involved across the world, particularly with oil resources, that he suggests are not so much "natural" as socio-cultural and political. Certainly that is the case, as he suggests, with the Alberta Oil Sands. In agro-food global processes (chapter 13), transnational producers and large retailers play a significant role, while states are generally relegated to a regulatory role. Unlike in extractive industries, in food production the global chains are often difficult to trace. Evidence for this is the horsemeat scandal in France not long ago. Clothing and fashion production (chapter 14) exemplify intractable issues in the global economy, as clothing production is highly global and very fragmented. Consumer demand is uncertain and risky. As well, social movements such as anti-sweatshop groups make escalating demands on production networks.

As a further example, the auto industry (chapter 15) is nothing if not changing. In recent NAFTA negotiations, one might be forgiven for thinking that vehicles are mainly assembled in the three NAFTA countries in order to supply the global market. Not so, given that China, a one-party state with business controlled largely by said party, is by far the world's largest producer of cars. And their cars are increasingly being exported, although this reviewer can attest from a recent trip to China that many, many Chinese-made cars, often big SUVs, are on the roads in that country. The role of the state clearly is widely different in these different auto production regimes. Interestingly, if auto production is ranked, Japan comes after China, with the US and South Korea tied for third place, at only 6.6 per cent of global auto production.

With the financial and business services (chapter 16), the situation is described by Dicken as a "global casino" (a term coined by Susan Strange), where large sums of money are played on the other side of the world while we might be sleeping, and affect our well-being and security even if we never play the game. These services provide the "wiring" for the global economy, and finance is one of the most controversial of all economic activities. With the 2008 financial crisis, tensions

between states and markets became acute. International financial flows have reached an unprecedented level, and many escape any state awareness, let alone regulation. If all the innovative financial "products" are added into the mix, risks are intensified and spread more widely, as happened with the US below-prime mortgage paper bubble that sparked the global financial crisis. In this sector, the globe is more borderless than in other sectors, but still not flat. Corporate strategies are international and profit-oriented, driving up salaries in this sector to very high levels indeed. And connectivity permits concentration of services in large cities, most notably in London's 'The City' and New York's Wall Street. Meanwhile, lower-order financial services are off-shored to less costly labour markets.

Lastly, in chapter 17 Dicken considers logistics and distribution services, a sector less often the focus of global studies. It is thought perhaps that with global markets and greater connectivity, products will somehow be moved as if by magic. This is, however, a huge sector of the global economy. In microcosm, we see the challenges with online ordering of goods and their delivery where some companies manage far better than others. The central barrier to smooth operation of logistics is political, ie the complications of tariffs, customs and administration. There is further pressure for rapid delivery. Dicken shows, with his penchant for descriptive graphics, the immense complexity of distribution processes that complicate and at times compromise the prospect of off-shoring production. It is a remarkable exposé.

This is a very contemporary book, accessible, readable and enlightening. The spectacular explanatory graphics are worth a look all on their own. They are illuminating, deftly conceptualized to illustrate complex issues and their interconnections, and beautifully presented in colour. The book as well has a long list of up-to-date references (41 pages) with a small number of footnotes in each chapter. It also has a helpful de-coding list upfront for all the usual acronyms used in globalization discussions which can feel like alphabet soup. But Dicken generally notes as well the full names throughout the text prior to relying the acronym.

This new edition is truly a sprightly path through the thicket that is globalization or the world economy. It is a book highly accessible to all levels of readers, from undergraduates to scholars of globalization. In particular, it would be appropriate for courses and scholars in business/ management, economics, development studies, geography, political science, and sociology. For demography or population studies courses, the book provides a vital backdrop for understanding demographic change, although there is little here directly on population *per se*. Topics of population ageing, migration, and population growth are considered but not in much depth.

Global Shift: Mapping the Changing Contours of the World Economy, 7th edition, is more than a readable book. It is a page-turner, opening up complex questions page after page and turning them over for the reader in clear, expository language to reveal an exciting adventure that leaves the reader hungry for more. This is no small task for a doorstopper of a book on the challenging and wide-ranging topic of global change. It is a masterful work.