

The changing health of Canadian grandparents

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Abstract

Fertility postponement and mortality decline are shifting the demography of the grandparent population in Canada. The ways in which the aging of the grandparent population affects families depends in large part on the health of grandparents. In this article, we document the aging of Canadian grandparents between 1985 and 2011. However, despite being older, grandparents are healthier, signaling that the compression of morbidity is outpacing the postponement of grandparenthood. This shift is partly due to the higher educational attainment of this population and partly due to secular improvements in health over time. The improved health of grandparents in Canada has important implications for intergenerational transfers and relationships.

Keywords: grandparents; grandchildren; population aging; intergenerational transfers; caregiving.

Résumé

Le décalage des naissances et l'allongement de la vie apportent des changements dans la population des grands parents au Canada. La façon dont le vieillissement de la population des grands parents affecte les familles est fonction de leur santé. Nous trouvons que le vieillissement de la population des grands parents entre 1985 et 2011 est compensé par une meilleure santé en moyenne : la compression de la morbidité est plus forte que le décalage au statut de grand parent. Ces changements sont dû en partie à la plus forte éducation des grands parents, et à leur meilleure santé. Ces améliorations de santé ont des conséquences importantes pour les transferts et relations inter-génération.

Mots-clés : grand parents, petits-enfants, vieillissement, transferts entre générations, soins.

Motivation

The health of Canadian grandparents may be changing dramatically, and these changes could have important implications for family dynamics. Delayed fertility and lower mortality may be contributing to severe population aging among the grandparent population. Fertility postponement increases the age at the transition to grandparenthood, and mortality improvement at older ages translates into more years as a grandparent. An older grandparent population may be more frail than in earlier periods if health improvement at older ages has not kept pace with the aging of this population. On the other hand, the compression of morbidity at older ages may be outpacing the aging of

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Canadian grandparents, meaning that they may have similar or even better health than before. It is unknown how the aging of the grandparent population and the compression of morbidity at older ages balance each other out.

The health of grandparents can shape the pattern of intergenerational transfers within families, which in turn affects important inputs to multiple generations. Older grandparents with limited physical or cognitive health likely have fewer, or lower-quality, inputs to provide when grandchildren finally come along, or they might be too old to provide their grandchildren with any care at all. Moreover, grandparents in poor health may even require care themselves, which could take important parental resources away from children, and place strain on the middle generation or decrease their labour force participation (Chappell and Funk 2011). On the other hand, if grandparents are in good physical and cognitive health, they may potentially provide strong resources for childcare and aid in the cognitive and personal development of grandchildren (Hagestad and Burton 1986; Hareven 1978), despite being older than grandparents in the past. Grandparents in good health may even be able to take over caregiving responsibilities and raise their grandchildren, a trend that has become increasingly more common over recent decades (Fuller-Thomson and Minkler 2001). Furthermore, interactions with younger kin may be more rewarding for grandparents when they are in good health, as they are more able to participate in activities with children and grandchildren (Lye 1996; Silverstein and Long 1998).

In this article, we examine changes in the age structure and health of the grandparent population in Canada. First, we address how the age structure of the Canadian grandparent population has changed over a quarter-century. Second, we examine how the health of Canadian grandparents has shifted over time, and whether a shift in health can be attributed to compositional changes in the sociodemographic characteristics of this group. Last, we examine whether the health of grandparent and non-grandparent populations has changed to the same degree over time.

The changing demography of grandparents

Large-scale shifts in the timing of fertility and mortality have shifted the demography of grandparenthood in developed countries like Canada (Margolis n.d.). Fertility postponement over multiple generations has delayed the transition to grandparenthood because the timing of grandparenthood is contingent on the ages at which both grandparents and their children began childbearing. In Canada, the mean age at first birth has been increasing steadily since the mid-1960s, reaching 28.5 years in 2011 (Statistics Canada 2013a). Accordingly, grandparenthood has been delayed among Canadian men and women in the last quarter-century. In 1985, almost 60 per cent of women between the ages of 50 and 54 were grandmothers, but in 2011 less than 30 per cent of women in this age group had grandchildren. Forty-four per cent of men aged 50–54 were grandfathers in 1985, but in 2011 only 22 per cent of men this age had grandchildren (Margolis n.d.).

In addition to affecting the assumption of grandparent roles at older ages, mortality decline is also a factor in shifting the age structure of the grandparent population. Mortality decline at older ages has steadily increased life expectancy at age 65, from 17.1 in 1985 to 20.5 years in 2011 for Canadian men and women combined (Human Mortality Database 2015). Therefore, once people reach the age at which grandparenthood is common, they can expect to live more years than in the past. These two demographic changes, fertility postponement and mortality decline, may be leading grandparents in Canada to be older than ever before. Previous research has not examined how the age structure of the grandparent population has changed over time, and the implications that this may have for families.

The compression or expansion of morbidity

The health of grandparents is not only affected by the age structure of their population, but also by shifts in the health of older Canadians. Trends in mortality improvement are not always matched by improvements in health. On the one hand, increases in life expectancy may be accompanied by an expansion of morbidity (Gruenberg 1977; Kramer 1980; Olshansky et al. 1991). This can occur if survival from chronic conditions improves and people spend more years with these chronic conditions. Thus, people may be living longer but with a longer period of poor health at the end of life. On the other hand, increasing life expectancy may be accompanied by improvements in health at older ages, compressing morbidity into a shorter period at the end of life (Fries 1980).

Existing research shows that through the 1990s, the health of the elderly seemed to be improving across most developed countries (Crimmins 2004), and in some populations, the compression of morbidity appears to be continuing today (Cambois et al. 2001; Doblhammer and Kytrir 2001). However, other recent research has demonstrated that improvements in the health of the elderly may be slowing down (Mandich and Margolis 2014; Robine and Michel 2004; Van de Water et al. 1996; Yong and Saito 2009). In Canada, gains in life expectancy have been more or less equally distributed between years lived healthy and disabled (Mandich and Margolis 2014; Martel and Bélanger 2006; Roberge et al. 1999; Wilkins and Adams 1992).

The delay of grandparenthood combined with either an expansion of morbidity or the slow compression of morbidity will lead to a grandparent population that is in poorer health than in the past. However, if morbidity is being compressed at the same rate or faster than the delay of grandparenthood, then the grandparent population may be in similar or even better health than before. To what extent do delayed grandparenthood and delayed poor health cancel each other out?

Compositional changes and the shifting health of the grandparent population

The characteristics of the older adult population have been changing over time, and these shifts may explain why levels of health have been changing for this group. We will investigate changes in five key compositional factors. The first is *age*. If the grandparent population is getting older over time, this may lead to lower health levels, since health generally declines as age increases. The second factor we consider is *sex*, given that a changing sex ratio among grandparents may also lead to shifts in the overall health of this population. The older population generally has many more women than men, because of higher mortality among men. However, recent mortality decline at older ages has been steeper among men, due in part to their larger declines in smoking relative to women (Preston et al. 2011). Therefore an increasing proportion of the grandparent population may be male, which would imply better health due to lower levels of morbidity among men and higher levels of morbidity among women (Case and Paxson 2005).

The third compositional factor that could shift the health of the grandparent population over time is *educational attainment*. The expansion of higher education in Canada since the mid-twentieth century has led to a much more educated population than in the past. Education is a resource attained relatively early in life that leads to improved health over the life course (Cutler and Lleras-Muney 2010; Pampel et al. 2010). It can directly lead to better health through health literacy, knowledge, interactions with the healthcare system, or patients' ability to advocate for themselves when engaging with medical practitioners (Cutler and Lleras-Muney 2010; Mirowsky and Ross 2003). Education can also lead to improved health indirectly, by increasing resources or occupational opportunities (Adler and Newman 2002). Thus, an overall more educated population in Canada may explain why the grandparent population has potentially become healthier over time.

The fourth sociodemographic characteristic that we consider, and that could play a role in shaping the health of grandparents, is *marital status*. Changing patterns of marriage, divorce, and widowhood have led to a higher proportion of older adults in unmarried states than in the past (Beaujot 2000; Le Bourdais and Lapierre-Adamcyk 2004). Marriage is associated with better levels of health and mortality, as married individuals fare better compared to people who are never married, separated/divorced, or widowed (Waite and Gallagher 2000; Williams and Umberson 2004). Whether the association is causal or due to other factors, a change in the distribution of marital status for the older population could lead to changes in the health of grandparents.

Last, the analysis also includes *immigration status*, aka *nativity*, as one of the five compositional factors that are examined. Changes over time in the proportion of the population that is foreign-born may also play a role in shifting the older population's overall level of health. In Canada, the foreign-born have lower mortality, on average, than the Canadian-born population (Chen et al. 1996; Ng 2011; Trovato and Odynak 2011; Omariba et al. 2014). However, among adults 65 and older, immigrants actually have lower levels of functional ability (Newbold and Filice 2006), require greater assistance (Turcotte and Schellenberg 2006), and have worse or similar self-rated health when compared to native-born Canadians (Gee et al. 2004; Prus et al. 2010). Increases in the proportion of the grandparent population who are immigrants may imply a less healthy grandparent population overall.

Research questions

In this paper, we address three research questions. First, how has the age structure of Canadian grandparents changed from 1985 to 2011? Second, how has the health of Canadian grandparents changed over this time period, and in which direction? We examine whether the change in health among Canadian grandparents is due to compositional changes in the sociodemographic characteristics of this group. We test for changes in age, sex, educational attainment, marital status, and nativity. Third, we examine whether the health of the grandparent and non-grandparent populations has changed to the same degree over time, and why or why not.

Data

To examine the health of Canadians by grandparent status, we use the General Social Survey (GSS), a telephone survey collected by Statistics Canada that gathers data on social trends. Established in 1985, the GSS program is a series of annual cross-sectional surveys (more information is available at Statistics Canada 2013b). These surveys are representative of all persons 15 years of age and older in Canada, excluding those residing in the Yukon and Northwest Territories (0.22 per cent of the 2011 population) and those who are full-time residents of institutions (approximately 0.02 per cent of the 2011 population) (Statistics Canada 2013c, 2014). The GSS provides data to estimate the prevalence of grandparenthood, as well as on the sociodemographic and health characteristics of respondents.

This project uses surveys conducted in the years 1985 and 2011, the first and the most recent cycle that included questions on grandparent status. Pooling the data from these two surveys produces a sample of 33,635 respondents. We exclude individuals below the age of 30, as grandparenthood is unlikely among respondents so young, leaving us with a potential analytic sample of 27,607. We also exclude respondents for whom grandchildren data were missing ($n=108$) or self-rated health was missing ($n=236$), producing the final analytical sample of 27,263 respondents. Data are weighted to

account for the two different stratified sampling designs that are used in the separate surveys, as well as missing data due to non-response.

Measures

Our key measures are *self-rated health*, *grandparent status*, and *survey year*. The health of respondents is coded from a question about self-rated health that was included in both waves of the survey, allowing for comparative analyses across these time periods. The response categories varied slightly, and we addressed the difference in measures by creating a harmonized dichotomous variable. The 1985 question asked how respondents would describe their state of health when compared to other persons of their age. The possible responses included “excellent,” “good,” “fair,” and “poor.” The 2011 question asked how respondents would describe their health in general; the possible responses were “excellent,” “very good,” “good,” “fair,” and “poor.” We collapsed these measures into a binary variable that distinguishes respondents who rated their health as (a) poor or fair, from those who rated it as (b) good, very good, or excellent. We use self-rated health rather than a more objective measure of health such as disability, health behaviours, or presence of medical conditions, because these other questions were not comparable over survey years.

Grandparent status is coded from questions that asked respondents whether they had any grandchildren, and the number of grandchildren at the time of the survey. Those reporting any grandchildren are coded as grandparents. The other key independent variable is survey year, for which we examine changes from 1985 to 2011.

We measure five sociodemographic characteristics of respondents that are important for understanding the shifting characteristics of the grandparent population over time. Age is coded in 5-year intervals, starting with 30–34 and ending with 80+. The highest age category is 80+ due to the top coding of age groups in the public-use GSS data. The sex of respondents is self-reported in the survey. We also examine nativity, educational attainment, and marital status. Nativity of respondents is coded as “born in Canada,” “countries other than Canada,” or “missing.” Education measures the highest level of educational attainment among respondents and is coded as (a) less than high school; (b) high school completed; (c) some post-secondary; (d) post-secondary completed; and (e) missing. Marital status indicates whether the respondent was (a) married or cohabiting; (b) single; (c) widowed; (d) divorced or separated at the time of the survey; or (e) missing.

Methods

First, we chart the age distributions of Canadian adults by grandparent status for 1985 and 2011, in Figures 1 and 2, respectively. Next, we estimate a series of logistic regression models to test how the health of grandparents has changed over time and whether the changes can be attributed to compositional differences in the grandparent population (Table 2). The first model shows the bivariate relationships between self-rated health and each of our independent variables. The second and third models examine whether the change in health of grandparents over time is due to changes in age composition or changes in other compositional variables such as sex, educational attainment, nativity, and union status. Last, we examine whether the health of the grandparent and non-grandparent populations have changed to the same degree over time (Table 4). We model this with a series of logistic regressions that include an interaction term for grandparent status and year, as well as the relevant control variables. All regressions are weighted to make estimates representative of the population.

Results

First, we examine the age structure of Canadian adults by grandparent status for the two years of analysis, 1985 and 2011. Figures 1 and 2 show population pyramids for grandparents (Figure 1) and non-grandparents (Figure 2) in each of the study years. These pyramids show the per cent in each age and sex group, for the population of either grandparents or non-grandparents aged 30 and older.

Figure 1 shows that from 1985 to 2011, the grandparent population has aged. In 2011, there are fewer grandparents in midlife compared to 1985, where a greater proportion of grandparents are in older ages. The proportion of the grandparent population that is in the oldest age group, 80+, has doubled since 1985, from 6.8 per cent to 13.5 per cent in 2011 (Table 1). Thus, the grandparent population in Canada is aging. We also see that in both years, there were far more grandmothers than

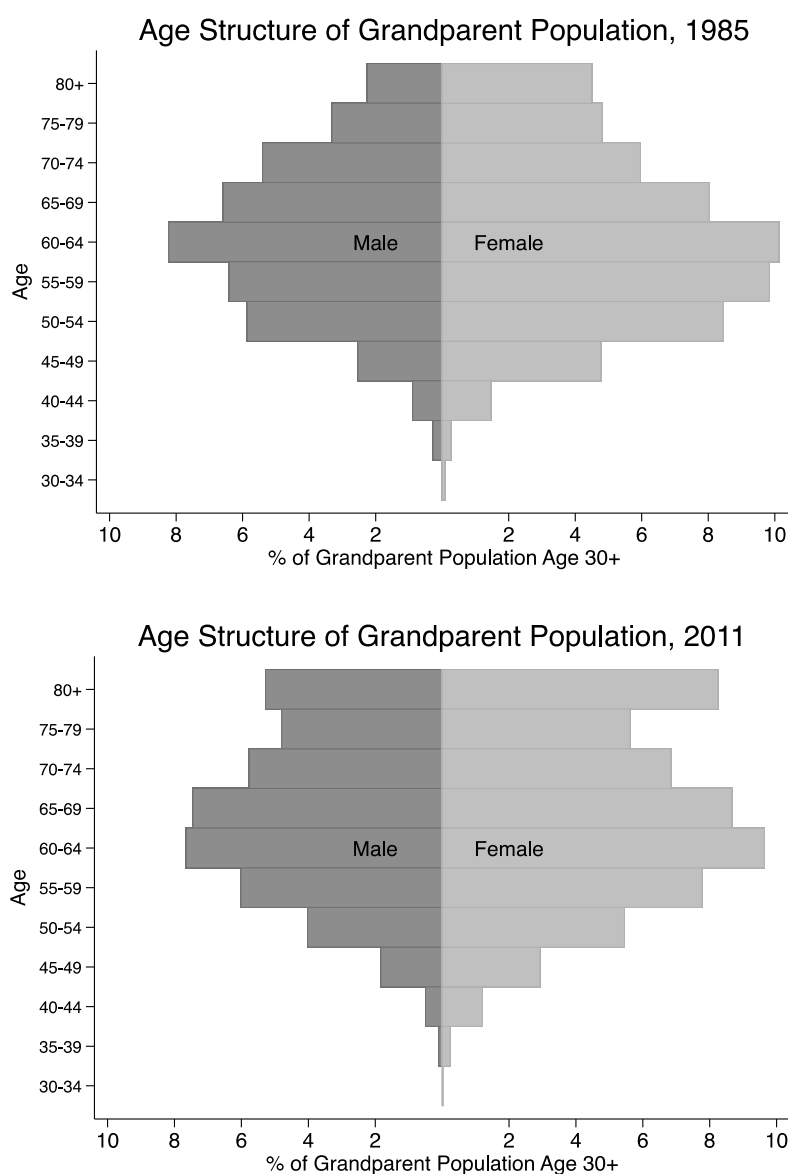


Figure 1: Age structure of the grandparent population, aged 30 and older (Canada GSS 1985, 2011).

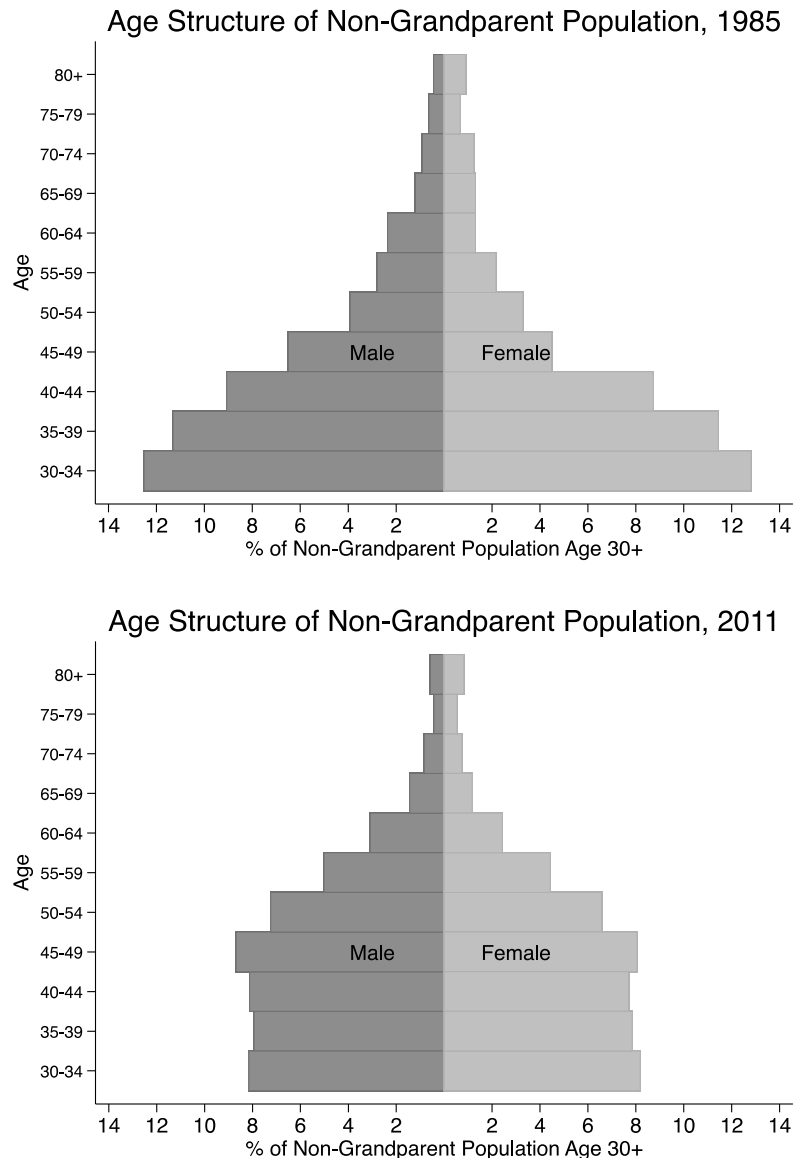


Figure 2. Age structure of the non-grandparent population, aged 30 and older (Canada GSS 1985, 1990, 2006, 2011).

grandfathers. This is likely due to overall lower mortality rates among women than men, and the fact that women tend to marry at younger ages than men, thus becoming grandparents at younger ages than their spouses. However, a mortality decline among older men has led to more grandfathers at the oldest ages and a sex ratio that is higher in 2011 than in 1985 for very old grandparents.

Figure 2 presents the age structure of the non-grandparent population in 1985 and 2011. Over the period of analysis, the non-grandparent population has also gotten significantly older, due to smaller cohorts in the younger age range 30–45. The *percentage* of non-grandparents in the oldest ages has not grown considerably, but given the population growth in Canada over this period, the number of non-grandparents has certainly increased. Thus, both the grandparent and non-grandparent populations are aging in Canada. The former is aging due to higher proportions in the oldest ages and fewer people in middle ages. The latter is aging due to much smaller cohorts in the young adult ages.

Table 1. Weighted sample characteristics by grandparent status, General Social Survey 1985, 2011.

Variables	Non-grandparent population aged 30+ (N=15,847)			Grandparent population aged 30+ (N=11,416)			Total population aged 30+ (N=27,263)		
	1985	2011	1985 vs. 2011	1985	2011	1985 vs. 2011	1985	2011	1985 vs. 2011
Age structure			***			***			***
% 30–34	25.3	16.3		0.1	0.0		16.5	10.9	
% 35–39	22.8	15.8		0.5	0.3		15.0	10.7	
% 40–44	17.8	15.8		2.3	1.7		12.4	11.1	
% 45–49	11.0	16.8		7.3	4.7		9.7	12.8	
% 50–54	7.2	13.7		14.3	9.3		9.7	12.3	
% 55–59	5.0	9.4		16.1	13.9		8.9	10.9	
% 60–64	3.6	5.5		18.4	17.3		8.8	9.4	
% 65–69	2.5	2.6		14.5	16.2		6.7	7.1	
% 70–74	2.1	1.6		11.4	12.6		5.4	5.2	
% 75–79	1.3	1.0		8.1	10.3		3.7	4.1	
% 80+	1.3	1.4		6.8	13.5		3.2	5.4	
Self-rated health			***			***			***
% Fair/poor	16.3	12.0		30.5	23.3		21.3	15.8	
% Good/v. good/excellent	83.7	88.0		69.5	76.6		78.7	84.2	
Sex						***			***
% Female	48.4	48.4		58.2	56.6		51.8	51.1	
% Male	51.6	51.6		41.8	43.4		48.1	48.9	
Educational attainment			***			***			***
% Less than high school	33.3	9.2		65.6	29.3		44.6	15.9	
% High school complete	19.8	12.4		11.3	18.3		16.8	14.4	
% Some post-secondary	13.7	12.8		9.4	11.9		12.2	12.5	
% Post-secondary complete	32.4	65.2		12.8	40.0		25.5	56.8	
% Missing	0.7	0.4		0.8	0.5		0.8	0.5	
Nativity			***			***			***
% Canadian-born	78.0	73.6		77.2	79.2		77.7	75.5	
% Foreign-born	22.0	26.2		22.5	20.7		22.2	24.4	
% Missing	0.1	0.2		0.3	0.1		0.1	0.1	
Marital status			***			***			***
% Married/cohabiting	78.0	77.0		75.4	73.0		77.1	75.7	
% Single	11.7	13.6		0.8	1.9		7.8	9.7	
% Widowed	3.2	1.8		18.7	15.4		8.6	6.3	
% Separated/divorced	6.7	7.5		4.9	9.7		6.1	8.3	
% Missing	0.5	0.0		0.2	0.0		0.4	0.0	

*** $p < 0.01$

1985 vs. 2011 reports results of Chi² test.

Table 1 presents weighted sample characteristics by grandparent status and for the whole sample for the years 1985 and 2011. In addition to changes in the age structure discussed above, there have also been other compositional changes in the Canadian adult population over this time period. In 2011, a larger proportion of both grandparents and non-grandparents are in good health relative to 1985, despite the fact that these populations have older age distributions. Another important change is that both grandparents and non-grandparents are much more highly educated in 2011 compared to 1985. For example, almost 40 per cent of grandparents have completed post-secondary education in 2011, whereas only 13 per cent have in 1985. In addition, among all Canadians aged 30 and older, a larger proportion is foreign-born in 2011 compared to 1985. However, among grandparents specifically, the percentage of foreign-born has actually decreased, from 22.5 per cent in 1985 to 20.6 per cent in 2011. Last, there have been changes in the composition of adult marital status over time.

That is, there are fewer individuals who are married/cohabiting or widowed in 2011 than 1985, and more adults who are single or separated/divorced adults.

Table 2 examines whether the odds of being in good health among grandparents have changed over time in Canada. The results from the bivariate model show that the odds of grandparents being in good health are 44 per cent higher in 2011 compared to 1985. In Model 2, the improved health of grandparents in 2011 *increases* when taking into account the changes in the age distribution of this group. When controlling for age, the odds of being in good health relative to poor health increase to 55 per cent. This shows evidence of *morbidity compression*, as there is a health improvement even with the aging of the population. In the third model, when we take into account changes in the compositions of sex, education, nativity, and union status, we see that these factors explain a large part of the improved health of grandparents, but not all. In additional analyses (not shown), we tested to see which of these factors was the most important in explaining the changes in health over time. We found that changes in the educational composition of the grandparent population was the most important factor explaining the improvement in health over time. The other three factors (sex, marital status, and nativity) did not contribute to explaining these differences. Thus, the improved health of grandparents over time is in large part due to the higher levels

Table 2. Odds ratios from weighted logistic regression models predicting good health among grandparents (General Social Survey 1985, 2011).

	Model 1 (Bivariate)		Model 2 (Multivariate)		Model 3 (Multivariate)	
2011 (1985)	1.44	***	1.55	***	1.16	**
Age (30–34)						
35–39	0.35		0.32		0.33	
40–44	0.50		0.45		0.41	
45–49	0.40		0.37		0.33	
50–54	0.36		0.33		0.28	
55–59	0.36		0.32		0.27	
60–64	0.32		0.28		0.26	
65–69	0.30		0.26		0.24	
70–74	0.27		0.23		0.23	
75–79	0.18		0.16		0.16	
80+	0.22		0.18		0.20	
Female (Male)	0.96				1.04	
Education (Less than HS)						
High school complete	2.38	***			2.16	***
Some post-secondary	2.08	***			1.91	***
Post-secondary complete	2.61	***			2.40	***
Missing	1.67				1.62	
Nativity (Canadian-born)						
Foreign-born	0.93				0.94	
Missing	5.21	***			4.49	
Union status (Married/cohab)						
Single	0.58	**			0.50	***
Widowed	0.61	***			0.78	***
Separated/divorced	0.69	***			0.62	***
Missing	0.80				1.07	
N	11,416		11,416		11,416	

*** p<0.01; ** p<0.05

Note: Bivariate model shows predictor estimates based on separate bivariate equations including a predictor and the dependent variable. In this and subsequent table, values in parentheses indicate reference category of given predictor.

Table 3. Odds ratios from weighted logistic regression models predicting good health (General Social Survey 1985, 2011).

	Model 1		Model 2		Model 3	
Grandparent (Non-grandparent)	0.44	***	0.79	**	0.86	*
2011 (1985)	1.42	***	1.59	***	1.17	**
Grandparent × 2011 interaction	1.02		0.99		0.97	
Age (30–34)						
35–39			0.96		0.96	
40–44			0.87		0.90	
45–49			0.60	***	0.66	***
50–54			0.53	***	0.58	***
55–59			0.47	***	0.52	***
60–64			0.39	***	0.47	***
65–69			0.38	***	0.48	***
70–74			0.34	***	0.45	***
75–79			0.23	***	0.33	***
80+			0.25	***	0.38	***
Female (Male)					1.01	
Education (Less than HS)						
High school complete					2.24	***
Some post-secondary					1.78	***
Post-secondary complete					2.85	***
Missing					1.20	
Nativity (Canadian-born)						
Foreign-born					0.94	
Missing					6.24	**
Union status (Married/cohab)						
Single					0.62	***
Widowed					0.76	***
Separated/divorced					0.53	***
Missing					0.77	
N	27,263		27,263		27,263	

*** p<0.01; ** p<0.05; * p<0.10

of education for this group. However, even when taking into account the compositional differences over time, grandparents in 2011 have 16 per cent higher odds of being in good health than grandparents did in 1985. We also estimated models to examine whether these relationships differed for grandparents by gender, and the results did not differ from those presented here (results not shown). Thus, both grandfathers and grandmothers are healthier in 2011 than in 1985, despite compositional changes.

Table 3 examines our last research question, about whether the health of grandparents and non-grandparents is changing at different rates, and if so, why. Model 1 presents an interactive effect of grandparent status and survey year on self-rated health. The main effects of grandparents and year show that grandparents are on average, less healthy than non-grandparents, and that health is improving over time. The interaction term is not statistically significant, noting that the health of adults by grandparent status is improving in a similar manner over time. We see the same result in Model 2, which adds a control for the age distribution, as well as Model 3, which includes controls for sociodemographic factors. When testing to see whether these relationships held true for both men and women, we once again found that the relationships did not differ significantly by sex. Thus, the answer to our third question, about whether the health of grandparents and non-grandparents is changing at different rates, is “no.”

Discussion

Major long-term demographic shifts in fertility postponement and mortality decline are shifting the demography of the grandparent population in Canada. We show that the population of Canadian grandparents is significantly older in 2011 than a quarter-century before. The ways in which the aging of the grandparent population affects families depends in large part on the health of grandparents. Older grandparents may be in poorer health than in the past, if health improvement at older ages is occurring more slowly than the aging of this population. On the other hand, improvements in health at older ages may be keeping pace or even outpacing the aging of this group.

Our first important finding is that grandparents in Canada are healthier than in 1985, as measured by self-rated health. The fact that grandparents are healthier in 2011 than in 1985, despite shifts in the age distribution, shows evidence of the compression of morbidity over time. This shift has important implications for family dynamics. Since grandparents are in improved health, they are potentially more able to provide important resources to younger generations, including the provision of grandchild care and aid in the personal and cognitive development of the younger generation. This care may be key for allowing the middle generation to keep labour force participation high, which can improve household income, gender equality, and overall well-being for families (Hank and Buber 2009; Igel and Szydlik 2011; Aassve et al. 2012). Healthy grandparents may also have more rewarding interactions with younger kin, as they are better able to participate in activities with the family (Lye 1996; Silverstein and Long 1998).

We found that the most important factor explaining the improvement in health over time is the higher educational composition of adults in more recent cohorts. Although we cannot disentangle the mechanisms in this analysis, we expect that education has led to health-promoting behaviours throughout the life course, which in turn has led to the improvement of health at older ages (Cutler and Lleras-Muney 2010; Pampel et al. 2010). The more educated population may be in better health due to higher levels of health literacy, health knowledge, or improved interactions with the healthcare system (Mirowsky and Ross 2003; Cutler and Lleras-Muney 2010). It may also be that a more educated population has more resources at their disposal to improve health, or education has led to occupations that are less harmful to health (Adler and Newman 2002). Future work could attempt to disentangle some of these mechanisms that lead a more educated, healthier population of Canadian grandparents.

Future research should examine whether the trends that we report for self-rated health are similar for disability and cognitive health. Due to data availability, we use a subjective measure of health, *self-rated health*, which is common in analyses such as these (Humphries and Van Doorslaer 2000; Acevedo-Garcia et al. 2010; Karlsson et al. 2010; Prus 2011) but also has limitations. An analysis of disability was not possible due to the fact that questions on disability were included in the 1985 cycle but excluded from the questionnaire in 2011. We also did not have multigenerational data, to examine to what extent better health in grandparenthood is leading to the changes in family dynamics that we expect may happen, such as increased support from grandparents to younger generations. A lack of multigenerational data also prevented us from examining whether the improved health of grandparents is changing the generational structure of families in Canada. Lastly, we could not address whether the trends that we examine hold for the great-grandparent population or biological versus step-grandparent populations. Future research with other data sources should examine these questions.

Despite limitations, this article makes important contributions to understanding how the health of Canadian grandparents has been shifting over time. The improvement in health for this population, despite it being older, can mean less strain on the middle generation and potentially more mean-

ingful interactions between grandparents and grandchildren. This analysis may also give us a clue about potential changes to anticipate for the future. Grandparents in the future may be more robust and healthy than in 1985.

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References

- Aassve, A., E. Meroni, and C. Pronzato. 2012. Grandparenting and childbearing in the extended family. *European Journal of Population* 28:499–518.
- Acevedo-Garcia, D., L.M. Bates, T.L. Osypuk, and N. McArdle. 2010. The effect of immigrant generation and duration on self-rated health among US adults 2003–2007. *Social Science & Medicine* 71(6):1161–72.
- Adler, N.E., and K. Newman. 2002. Socioeconomic disparities in health: Pathways and policies. *Health Affairs* 21(2):60–76.
- Beaujot, R.P. 2000. *Earning and Caring in Canadian Families*. Calgary: Broadview Press.
- Cambois, E., J.M. Robine, and M.D. Hayward. 2001. Social inequalities in disability-free life expectancy in the French male population, 1980–1991. *Demography* 38(4):513–24.
- Case, A., and C. Paxson. 2005. Sex differences in morbidity and mortality. *Demography* 42(2):189–214.
- Chappell, N.L., and L.M. Funk. 2011. Social support, caregiving, and aging. *Canadian Journal on Aging* 30(3):355–70.
- Chen, J., R. Wilkins, and E. Ng. 1996. Health expectancy by immigrant status, 1986 and 1991. *Health Reports* 8(3):29–38.
- Crimmins, E.M. 2004. Trends in the health of the elderly. *Annual Review of Public Health* 25L:79–137.
- Cutler, D.M., and A. Lleras-Muney. 2010. Understanding differences in health behaviors by education. *Journal of Health Economics* 29(1):1–28.
- Doblhammer, G., and J. Kytir. 2001. Compression or expansion of morbidity? Trends in healthy-life expectancy in the elderly Austrian population between 1978 and 1998. *Social Science & Medicine* 52:385–91.
- Fries, J.F. 1980. Aging, natural death and the compression of morbidity. *New England Journal of Medicine* 303:130–35.
- Fuller-Thomson, E., and M. Minkler. 2001. American grandparents providing extensive child care to their grandchildren prevalence and profile. *The Gerontologist* 41(2):201–09.
- Gee, E.M., K.M. Kobayashi, and S.G. Prus. 2004. Examining the healthy immigrant effect in mid-to later life: findings from the Canadian Community Health Survey. *Canadian Journal on Aging* 23(S1):S61–69.
- Gruenberg, E. 1977. The failures of success. *Milbank Memorial Foundation Quarterly/Health and Society* 55:3–24.

- Hagestad, G.O., and L.M. Burton. 1986. Grandparenthood, life context, and family development. *American Behavioral Scientist* 29:471.
- Hank, K., and I. Buber. Grandparents caring for their grandchildren: Findings from the 2004 Survey of Health Ageing and Retirement in Europe. *Journal of Family Issues* 30(1):53.
- Hareven, T.K. 1978. The dynamics of kin in an industrial community. *American Journal of Sociology* 84(Suppl.):S151–82.
- Human Mortality Database (University of California, Berkeley, and Max Planck Institute for Demographic Research). 2015. *Human Mortality Database*. Available at www.mortality.org or www.humanmortality.de (data downloaded 2014).
- Humphries, K.H., and E. Van Doorslaer. 2000. Income-related health inequality in Canada. *Social Science & Medicine* 50(5):663–71.
- Igel, C., and M. Szydlik. 2011. Grandchild care and welfare state arrangements in Europe. *Journal of European Social Policy* 21:210.
- Karlsson, M., T. Nilsson, C.H. Lyttkens, and G. Leeson. 2010. Income inequality and health: Importance of a cross-country perspective. *Social Science & Medicine* 70(6):875–85.
- Kramer, M. 1980. The rising epidemic of mental disorders and associated chronic diseases and disabilities. *Acta Psychiatrica Scandinavica* 62:282–97.
- Le Bourdais, C., and E. Lapierre-Adamcyk. 2004. Changes in conjugal life in Canada: Is cohabitation progressively replacing marriage? *Journal of Marriage and Family* 66(4):929–42.
- Lye, D.N. 1996. Adult child–parent relationships. *Annual Review of Sociology* 22:79–102.
- Mandich, S., and R. Margolis. 2014. Changes in disability-free life expectancy in Canada between 1994 and 2007. *Canadian Studies in Population* 41(1–2):192–208.
- Margolis, R. n.d. The changing demography of grandparenthood. *Journal of Marriage and Family*. Forthcoming.
- Martel, L., and A. Bélanger. 2006. An analysis of the change in dependence-free life expectancy in Canada between 1986 and 1996. *Report on the Demographic Situation in Canada, 1998–1999*. Catalogue no. 91-209-XPE. Ottawa: Statistics Canada.
- Mirowsky, J., and C.E. Ross. 2003. *Education, Social Status, and Health*. Piscataway NJ: Transaction Publishers.
- Newbold, K.B., and J.K. Filice. 2006. Health status of older immigrants to Canada. *Journal on Aging* 25:305–19.
- Ng, E. 2011. The healthy immigrant effect and mortality rates. *Health Reports* 22:25–29.
- Olshansky, S.J., M.A. Rudberg, B.A. Carnes, B.A. Cassel, and J.A. Brady. 1991. Trading off longer life for worsening health: The expansion of morbidity hypothesis. *Journal of Aging and Health* 3:194–216.
- Omariba, D.W., E. Ng, and B. Vissandjee. 2014. Differences between immigrants at various durations of residence and host population in all-cause mortality, Canada 1991–2006. *Population Studies* 68(3):339–57.
- Pampel, F.C., P.M. Krueger, and J.T. Denney. 2010. Socioeconomic disparities in health behaviors. *Annual Review of Sociology* 36:349–70.

- Preston, S.H., D.A. Gleij, and J.R. Wilmoth. 2011. Contribution of smoking to international differences in life expectancy, in *International Differences in Mortality at Older Ages: Dimensions and Sources*, edited by E.M. Crimmins, S.H. Preston, and B. Cohen. Washington: The National Academies Press, p. 105–31.
- Prus, S.G. 2011. Comparing social determinants of self-rated health across the United States and Canada. *Social Science & Medicine* 73(1):50–59.
- Prus, S.G., R. Tfaïly, and Z. Lin. 2010. Comparing racial and immigrant health status and health care access in later life in Canada and the United States. *Journal on Aging* 29:383–95.
- Roberge, R., J.-M. Berthelot, and K. Cranswick. 1999. Adjusting life expectancy to account for disability in a population: A comparison of three techniques. *Social Indicators Research* 48:217–43.
- Robine, J.M., and J.P. Michel. 2004. Looking forward to a general theory on population. *Journal of Gerontology: Medical Sciences* 59(A):590–97.
- Silverstein, M., and J.D. Long. 1998. Trajectories of grandparents' perceived solidarity with adult grandchildren: A growth curve analysis over 23 years. *Journal of Marriage and Family* 60(4):912–23.
- Statistics Canada. 2013a. Report on the Demographic Situation in Canada, Fertility: Overview, 2009–11. Available at: <http://www5.statcan.gc.ca/olc-cel/olc.action?objId=91-209-X&objType=2&lang=en&limit=0>
- . 2013b. *The General Social Survey: An Overview*. Publication 89F0115X. Available at: <http://www.statcan.gc.ca/pub/89f0115x/89f0115x2013001-eng.htm>
- . 2013c. 2011 *Census of Canada: Topic-based tabulations. Selected Collective Dwelling and Population Characteristics and Type of Collective Dwelling for the Population in Collective Dwellings of Canada, Provinces and Territories, 2011 Census*. Cat. no. 98-313-XCB2011024. Ottawa: Statistics Canada.
- . 2014. *Population and Dwelling Counts for Canada, Provinces and Territories, 2011 and 2006 Censuses*. <https://www12.statcan.gc.ca/census-recensement/2011/dp-pd/hlt-fst/pd-pl/Table-Tableau.cfm?LANG=Eng&T=101&S=50&O=A>.
- Trovato, F., and D. Odynak. 2011. Sex differences in life expectancy in Canada: Immigrant and native born populations. *Journal of Biosocial Science* 43(3):353–67.
- Turcotte, M., and G. Schellenberg. 2006. *A Portrait of Seniors in Canada*. Catalogue no. 89-519-XIE. Ottawa: Statistics Canada.
- Waite, L., and M. Gallagher. 2000. *The Case for Marriage: Why Married People are Healthier, Happier, and Better-off Financially*. New York: Doubleday.
- Wilkins, R., and O. Adams. 1992. Les tendances de l'espérance de vie en santé au Canada, 1951–1986, in *Espérances de santé*, edited by J.-M. Robine, M. Blanchet, and J.E. Dowd. Collection Analyse et Prospective. Paris: Éditions INSERM.
- Williams, K., and D. Umberson. 2004. Marital status, marital transitions, and health: A gendered life course perspective. *Journal of Health and Social Behavior* 45(1):81–98.
- Van de Water, H., H. Boshuizen, R. Perenboom, C. Mathers, and J.M. Robine. 1996. Health expectancy: An indicator for change? *Journal of Epidemiology and Community Health* 49:330–32.
- Yong, V., and Y. Saito. 2009. Trends in healthy life expectancy in Japan: 1986–2004. *Demographic Research* 20(19):467–94.