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Pensions, Retirement, Longevity, and Long-term Care /
Pensions, retraite, longévité et soins de longue durée

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Guest Editors' Introduction: Pensions, Retirement, Longevity, and Long-Term Care

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Similar to other Organisation for Economic Co-operation and Development countries, Canada devotes a substantial share of its economic capacity to supporting and enhancing the well-being of elderly individuals. Much of the expenditure involves governments of all orders and at all levels, with policy interventions to support seniors that include direct government provision, tax assistance, subsidies and transfers, and the regulation of private-sector activity.

Among Canadians who view seniors as having earned the right to a dignified retirement, government support for seniors is appropriate from the point of view of compassion and fairness. Policy interventions are also justified from an economic efficiency point of view because seniors face many risks that are different in nature from those faced by younger people (see Milligan and Schirle 2013). Many risks facing seniors, such as those involving health, longevity, or the loss of a spouse, are not well covered by private insurance markets. Business cycle risks—which affect the value of retirement assets or raise the risk of unemployment—have different implications for older and younger Canadians. More generally, decision making carries risk; the average Canadian is not well equipped to fully understand the implications of complex decisions, such as portfolio choices and end-of-life planning. Interventions such as the provision of public insurance against risks may enhance economic efficiency by filling out the choice set available to seniors.

With all policy interventions, there is broad interest in improving efficiency, to allow the same spending dollars to fund a higher quantity or quality of service for Canadians. In addition to this usual concern with improving efficiency, demographic trends add more impetus. The strong tide of population aging motivates Canadians' immediate efforts to improve the effectiveness and operation of seniors' programs. The increasing number and share of seniors as the baby boom generation enters old age mean any gains in improving the operation of seniors' programs will have a larger payoff.

To provide context, we present population age shares for Canada. If one defines the baby boom generation as those born between 1946 and 1966, then baby boomers in 2023 will be aged between 57 and 77 years. The impact of this incoming tide of seniors on the Canadian population can be seen in Figure 1. We graph the realized and projected share of the population aged 65 years and older, 75 years and older, and 85 years and older from 2010 to 2050. The timing of the impact of the baby boom's arrival at different age thresholds seen in Figure 1 aligns roughly with different policy spheres.

The first policy sphere we have in mind is public and private pensions. Pension payments normally begin while people are in their 60s (and those in their 60s are not much more expensive than those in their 70s or 80s). So, the economic impact of pensions depends most strongly on the total number of seniors. As seen in Figure 1, this 65-and-older population share grows most sharply in the 2020s before starting to level off in the early 2030s.

The second policy sphere we have in mind is general health care. When people are in their 70s, the incidence of health problems begins to increase sharply. Corresponding to this, the cost of health care also climbs quickly after age 70. For example, whereas per capita health expenditures for those aged 60–64 years are just over $5,000 in 2019, and the expenditure on those aged 75–79 years is $11,600 (Figure 2). So, when considering overall health care expenditures, the share of the population aged 75 and older is of high interest. As shown in Figure 1, this

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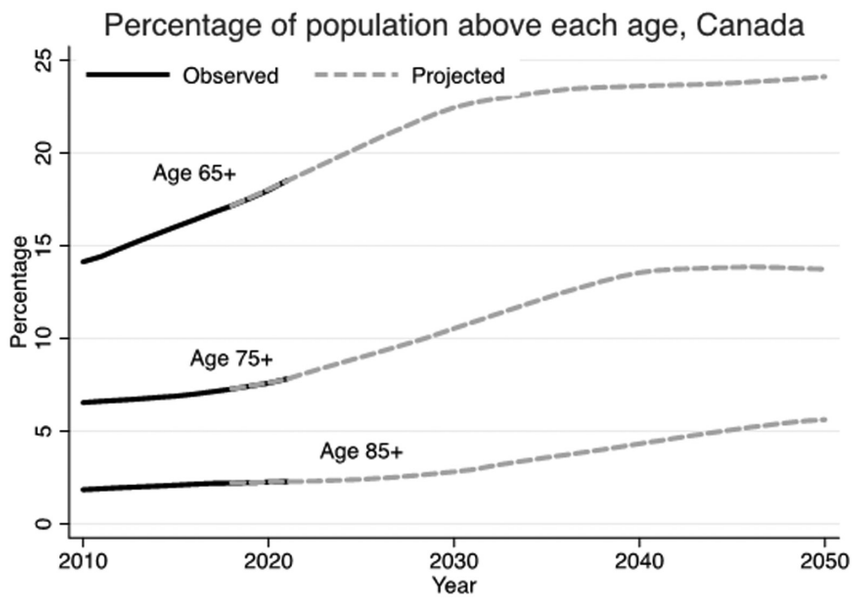

Figure 1: Percentage of the Population Above Each Age Threshold, Canada
Source: Authors' tabulations, based on Statistics Canada Tables 1700005 and 1700057.

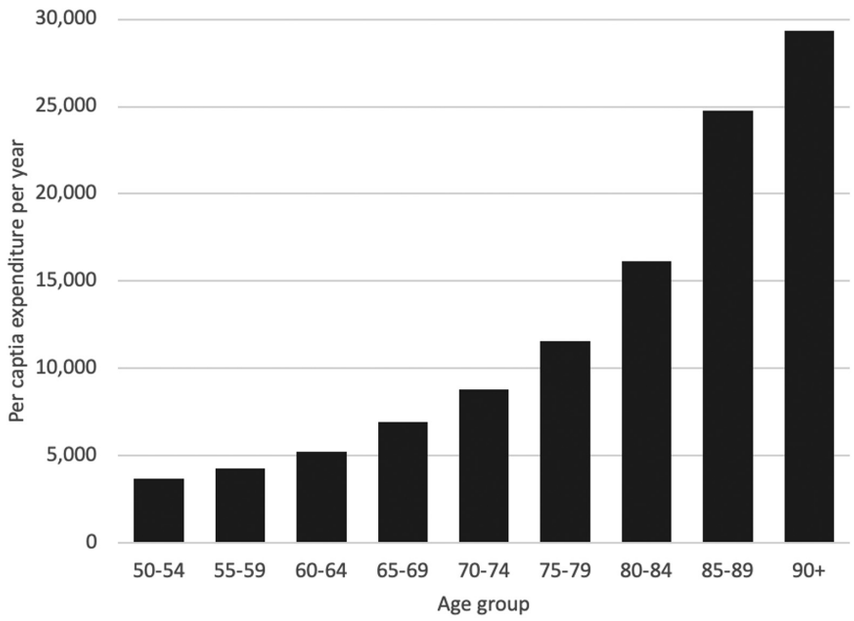

Figure 2: Total per Capita Provincial and Territorial Health Expenditures, Both Sexes, 2019
Source: Canadian Institute for Health Information, National Health Expenditures Database, Table E1.

75-and-older share rises in the 2030s and levels off in the 2040s.

Finally, those who survive to their 80s are often slowed down by impediments to activities of daily living such as basic mobility and the ability to dress and feed themselves. This leads to a sharp increase in the need for assisted living, home care, and long-term care (LTC), as well as end-of-life care, making the share of the population aged 85 years and older most relevant for this policy sphere. Figure 1 shows this 85-and-older share rising at an increasing rate through the 2040s. Of particular note is not just the rate of increase but also

the level attained by this population share. By 2050, the share of the population aged 85 and older will be 2.5 times what it was in 2020.

With the sponsorship of the Global Risk Institute, we have assembled articles by leading policy scholars on the topics of pensions, retirement, longevity, and LTC. These articles are published in this special issue of *Canadian Public Policy* and in a second special issue to be published subsequently. This issue contains six articles, which we now have the pleasure of introducing.

The first article in this special issue, by Derek Messacar (2022), concerns the retirement decision, specifically the location and hence jurisdiction of retirement. Although provincial tax revenue depends largely on the size of the working-age population, spending—especially spending on health and LTC—is more concentrated among retirees. For provinces taking on the bulk of the pressure for funding health care, a fiscal challenge occurs when workers do not spend their retirement years in the same province in which they worked. In other words, if all Canadians were working in one province but moved to another province in retirement, a large fiscal imbalance would be created for the receiving province. Investigating the extent to which Canadians move across provinces at the time of retirement is therefore policy relevant. It has implications for the design of the tax and transfer program as well as for the equalization program. In his article titled "Inter-Jurisdictional Retirement in Canada," Messacar homes in on the size of migration flows around the time of retirement. He finds that these flows double at retirement and are driven by younger and higher-income workers who moved during their working years but eventually make it back home. He concludes that relative to total net migration, these asymmetries are not very large but that a closer look should be given to broader migration movements over the life cycle across jurisdictions.

Another predominant feature of retirement is the receipt of pension income. When pension income is compared with the income received during working years, researchers can calculate a replacement rate that shows the proportion of working-age income replaced by pension income. The replacement rate is a key metric used to assess the contribution of public pension income to the well-being of retirees. Previous research has used administrative data sources drawn from tax records to calculate replacement rates. The advantage of these administrative data sources is their long reach into the income history of an individual, which facilitates the calculations. However, administrative data do not have important measures of health and education because such measures are not recorded on tax forms. The article "Replacement Rates of Public Pensions in Canada: Heterogeneity across Socio-Economic Status" by Nicholas-James Clavet, Mayssun El-Attar, and Raquel Fonseca (2022) provides a novel analysis of replacement rates and education and health, using a data source that reports both long income histories and survey questions. They find that replacement rates are higher among those with more education and better health—more than can be explained by higher lifetime income alone. The authors find suggestive evidence that assortative matching of life partners plays a role in explaining their finding.

A set of articles in this issue concern the provision and financing of care for elderly people, which is important for current policy agendas focused on home care and LTC at the federal and provincial levels. A preference for receiving care at home seems to be widespread. But how can that shift be done? And how much does it cost? What are the key uncertainties that play into the cost–benefit of shifting from institutionalization to home care? In the article "The Future of Long-Term Care in Quebec: What Are the Cost Savings from a Realistic Shift toward More Home Care?" Nicholas-James Clavet, Réjean Hébert, Pierre-Carl Michaud, and Julien Navaux (2022) build a simulation model that provides answers to some of these questions for the province of Quebec. They find that a widespread shift to home care is not cost-effective. A more cost-effective shift should be targeted to those with modest limitations while utilizing other measures in place. Done that way, there is the potential to generate cost savings while increasing the amount of care provided. They discuss various scenarios involving the creation of autonomy accounts, which would allow patients to choose which type of care they want to receive.

Even if there is a shift toward home care, more beds in LTC homes will likely be required in the future. Currently, Ontario may be in need of 70,000 LTC beds, which could cost more than $20 billion to create. Hence, important funding issues need to be addressed. In "Addressing the Capital Requirement: Perspectives on the Need for More Long-Term-Care Beds in Ontario," Blair Roblin, Raisa Deber, and Andrea Baumann (2022) tackle the issue by conducting semi-structured interviews to understand the barriers faced by current LTC home owners in undertaking new construction. They identify various barriers, including poor access to capital funding, low returns on private capital, and differences in funding by ownership model. They discuss various policy options. In particular, they emphasize the possibility of separating funding between the capital cost of the infrastructure and the operational cost as one potential solution. They also propose adapting the current funding policy to account for regional circumstances.

Several provinces rely on the non-profit sector to provide care. But how is that sector doing, and will it be able to resist the coming surge in demand and services? In the article titled "Non-Profit Long-Term Care in Ontario: How Financially Robust is the System?" Lisa Halpern, Susan D. Phillips, and Nathan J. Grasse (2022) ask an important question and document interesting trends. They compile financial data from charitable tax returns (T3010) of 112

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charitable LTC homes from 2004 to 2017. They complete these data with information on each LTC home from reports and websites. From this substantial work, they find that the revenue of non-profit LTC homes is relatively stable but hides increasing vulnerability resulting from a greater reliance on government funding and a declining role for philanthropy. Given the long-term fiscal outlook of the province, this makes non-profit LTC homes' financial situation more fragile.

Finally, one of the important questions regarding an aging population is how to organize and provide end-of-life care. Many Canadians express a preference to die at home. Compared with a death at the hospital, death at home could lead to cost savings for governments. But to what extent is this feasible? Who is able to die at home? Catherine Deri Armstrong and Rose Anne Devlin (2022), in an article titled "Dying at Home: A Privilege for Those with Time and Money," use data from the Canadian Vital Statistics Death Records from 2007 to 2019 to look into this issue. They find that those who die in neighbourhoods in the highest income quintile are more likely to die at home. The authors draw conclusions for policy and discuss in particular the possibility of using acute care savings to subsidize the cost of home care for patients dying at home.

Together, these articles highlight many of the difficulties associated with funding retirement and elderly care in an environment in which the aging of retirees will be a serious challenge for several decades. They also consider potential opportunities that could be pursued to alleviate some of the pressure in the coming decades. There is an important need for more research on these issues, and it is fair to say that the data infrastructure related to retirement and long-term care is relatively poor. This limits the ability of researchers to answer policy-relevant questions at a time when it is most needed.

Acknowledgements

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Inter-Jurisdictional Retirement in Canada

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Cette étude est la première qui porte sur la retraite interprovinciale au Canada, expression qui renvoie au fait de travailler dans un territoire de compétence donné, province ou territoire, et de s'installer à la retraite dans un autre territoire de compétence. En appliquant une méthode d'étude de l'évènement à des données administratives qui s'étendent de 1982 à 2018, je montre que la probabilité de déménager d'un territoire de compétence à un autre double à la retraite. Ce mouvement est probablement le fait de jeunes contribuables ayant un niveau de revenus supérieur, qui déménagent pendant leurs années d'activité professionnelle pour occuper des emplois à salaire élevé et ont le loisir, plus tard, de prendre une retraite précoce dans leur province ou territoire d'origine. Les provinces de l'Atlantique et la Colombie-Britannique sont des bénéficiaires nettes de retraites interprovinciales, alors que toutes les autres sont des contributrices nettes. Il existe par conséquent une asymétrie entre le lieu où les gens travaillent et paient leurs impôts, et le lieu de leur retraite.

Mots clés : retraite, revenu de pension, mobilité, étude d'évènement, Banque de données administratives longitudinales

I provide the first look at inter-jurisdictional retirement in Canada, which refers to working in one jurisdiction but moving to another at retirement. Using administrative data from 1982 to 2018, I find that the likelihood of moving jurisdictions doubles at retirement, using an event-study design. This effect is driven by younger and higher-income tax filers who likely moved during their working years for high-paying jobs and could afford to retire earlier and move home. The Atlantic provinces and British Columbia are net recipients of inter-jurisdictional retirees, whereas all others are net donors. Hence, there is asymmetry between where people work and pay taxes before retirement and where they live after retirement.

Keywords: retirement, pension income, mobility, event study, Longitudinal Administrative Databank

Introduction

Over the past few years, significant efforts have been made to better understand inter-jurisdictional employment in Canada (Laporte and Lu 2013; Bonikowska and Schellenberg 2014). Such employment may occur, for example, among rotational workers in the oil sector who work in Alberta but maintain primary residence in Atlantic Canada. The demand for information about the flow of employees and migrants across jurisdictions is great enough that Statistics Canada now produces official estimates of such behaviour.[1]

A related issue that has received considerably less attention is the extent to which inter-jurisdictional retirement occurs—that is, holding a career in one jurisdiction but moving to another at retirement. For example, Canadians who move to large urban centres when they are young may decide to move back home in another province or territory to retire near family. Figure 1 shows that roughly 10 to 20 percent of all in-migrants in selected provinces are around retirement age (aged 55–71 years), and this ratio has increased over time commensurate with population aging. This behaviour has implications for the optimal provision of provincially funded services, because regions with net out-migration of retirees collect tax revenues during their working years and also avoid the rising costs of providing health care to elderly individuals.

The goal of this study is to offer a first look at the extent to which such behaviour occurs in Canada. In contrast with inter-jurisdictional employment, there is no standard definition of inter-jurisdictional retirees; hence, this study is an exploratory analysis of whether retirement and mobility are interconnected and whether there are potential asymmetries in the flow of retirees across regions that warrant further consideration for policy.

The study is based on an analysis of Statistics Canada's Longitudinal Administrative Databank (LAD) from 1982 to 2018. The LAD is ideal because it consists of a 20 percent sample of T1 tax records and contains detailed information

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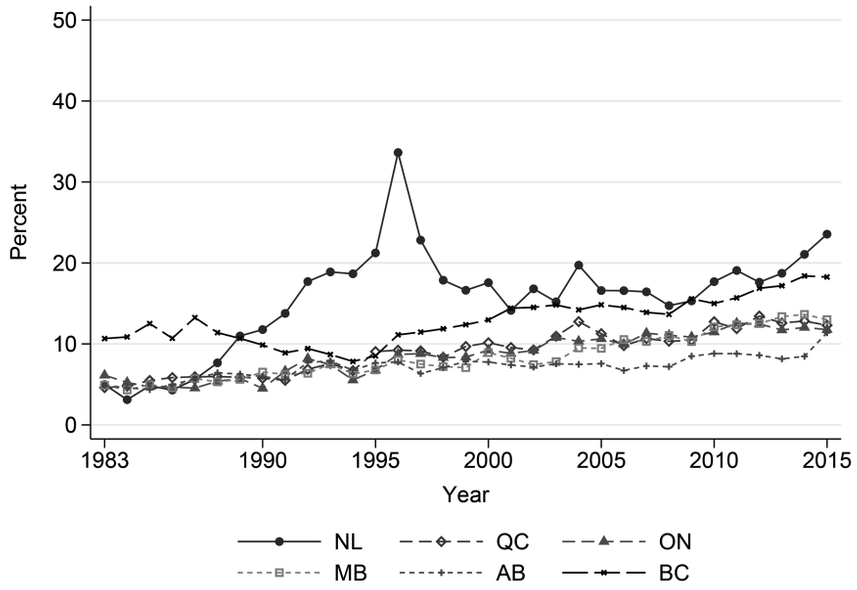


Figure 1: Percentage of Inter-Jurisdictional In-Migrants Aged 55–71 Years for Selected Provinces

Notes: This figure plots the percentage of in-migrants into selected provinces aged 55–71 years relative to the total number of in-migrants in the same province and year.

Source: Statistics Canada, Longitudinal Administrative Databank.

needed to track the location of residence of the individuals represented as well as their labour earnings and income from other sources—including pensions—for inferring retirement.

I estimate the effect of retiring on inter-jurisdictional mobility in an event-study design, which compares the probability of moving for a treatment group of retirees with that of a control group of tax filers of a similar age who either did not retire during the sample period or who retired at a later time. In this sense, my estimates are "quasi-causal" insofar as the effect of retiring on mobility can be reasonably well identified if the control group is selected properly to draw comparisons between the two groups. Retirement is an endogenous life event, so centering the analysis on retirement transitions is not truly causal, but this event-study approach nevertheless provides relevant information about how often and when inter-jurisdictional mobility occurs relative to the time of retirement.

The baseline results of this analysis indicate that retirement increases the likelihood of moving across jurisdictions by about 0.4 percentage points, which is small in absolute value but represents a doubling of migration over the base rate. This behaviour is driven primarily by tax filers who are younger and higher income. In contrast, age and marital status are not found to be significant determinants of inter-jurisdictional retirement.

Second, I explore the extent to which inter-jurisdictional retirement is affected by energy and petroleum price shocks. This is a natural question to explore because oil price shocks have been found to affect inter-jurisdictional employment and mobility (Morissette and Chan 2016), given the large worker flows into oil-producing provinces that occur. Hence, it is possible that these shocks also affect the older workers' decisions of when to retire and relocate. In contrast to the related literature, my exploratory analysis does not find evidence that price shocks for tax filers in oil-producing provinces affect such behaviour.

Last, further exploiting the dataset's longitudinal design, I consider where inter-jurisdictional retirees lived before versus after retiring and their community attachment. I find that Atlantic Canada and British Columbia tend to be net recipients of retirees, whereas all other jurisdictions tend to be net donors. Although the flow of retirees across jurisdictions each year is small, this migration likely makes up a larger share of net migration, particularly for small jurisdictions such as those in Atlantic Canada. On average, about half of all inter-jurisdictional retirees lived in only one location during the ten years leading up to retirement, suggesting that there is an asymmetry between where individuals live and pay taxes during their working years and where they retire and rely on publicly funded services such as health care. These findings have implications for the evaluation of inter-jurisdictional transfers in a dynamic context, which I discuss in more detail in the final section of the article.

This paper proceeds as follows. In the next section, I describe the data, sample selection, and empirical methodology used. I then present the main results and robustness checks for the effect of retiring on mobility.

Next, I estimate the effect of energy and petroleum price shocks on inter-jurisdictional retirement and assess the location of residence of inter-jurisdictional retirees before versus after retirement and their community attachment. Last, I conclude with a summary of the findings and a brief discussion about the magnitude of the effects relative to total versus net in-migration.

Data and Methodology

In this section, I begin by describing the dataset and sample selection restrictions used in the analysis. Then, I discuss how retirement is identified in the data and my approach to estimating its effects on income and mobility.

Data and Sample Selection

This study is based on an analysis of Statistics Canada's LAD for the years 1982 to 2018. The LAD is a panel dataset of T1 tax records derived from the Canada Revenue Agency for a 20 percent sample of tax filers, augmented annually with new tax filers to maintain national representativeness over time. The LAD contains detailed information about the tax filers represented, including their demographics, labour earnings, income from all taxable sources, and tax liabilities and transfers.

The LAD is an ideal dataset for this study for two reasons. First, it contains variables for province or territory of residence at the end of the calendar year and the amount of taxable labour earnings and pension income from public and private plans received during the year. This allows me to identify retirements as reflected by a change in composition of income over time, as well as to identify inter-jurisdictional mobility based on a change in province or territory of residence over time. Second, the wide time interval makes it possible to observe where inter-jurisdictional retirees worked and lived in the years leading up to retirement.

I restrict the analysis to individuals aged 55–71 years at the time of retirement. I chose this age range because individuals can typically begin to collect pension income from private plans when they turn 55, and individuals must begin drawing income from Registered Retirement Savings Plans by the end of the year in which they turn 71. As discussed later, the event-study analysis considers the evolution of income and mobility from five years before retirement to five years after retirement, for a total event-time of 11 years, including year zero (i.e., the year of retirement). Thus, in the event-study analysis, I restrict the sample to individuals aged 49–77 years so that they fall in the desired age range in the year they retired. In addition, I exclude individuals with zero or negative total after-tax income in the tax year because the focus of analysis is on retirements as evidenced by changes in the composition of income over time.

A limitation of the LAD is that it does not include province or territory of birth because the information derives from T1 tax records, and this information is not collected. This would be an interesting variable to exploit to assess whether people who retire tend to move back to the region where they were born. Unfortunately, this is not possible here, but future work could exploit linkages between T1 tax records and Census data to explore this issue.

Table 1 reports descriptive statistics for the full and restricted samples. More precisely, the first two columns characterize all tax filers in the LAD, and the second two columns pertain to tax filers aged 55–71 years with strictly positive after-tax incomes. On average, in the full sample, tax filers are aged about 45 years, 52 percent are female, and 57 percent are married or in common-law relationships. The table also reports the distribution of tax filers across regions, as well as the probability of having income from various sources and the average amount of income conditional on receiving a positive amount from each source. For example, in the full sample, 70 percent of tax filers have labour earnings, and the average value of labour earnings is $35,300. In the restricted sample, the distribution of tax filers across provinces remains mostly unchanged but, as a result of the age restriction being imposed, the average age is much greater. Tax filers in this sample are also more likely to be married and to receive pension income and less likely to have labour earnings than the full sample. Conditional on being employed, the average value of labour earnings is higher in the restricted sample because earnings typically increase with age. The average value of public pension income among recipients is the same across samples, although private pension income is higher in the restricted sample.

Identifying Retirement Transitions

In contrast with survey data, which contain subjective indicators of retirement status based on respondents' self-declarations, T1 personal income tax data do not provide a direct objective or subjective measure of retirement status.

In this study, I exploit the rich set of income variables and longitudinal design of the LAD to identify retirement based on a change in the composition of earnings over time. Specifically, I determine that a person has retired if one of two events (or both) occur. The first event is a sudden take-up of pension income from the Canada Pension Plan, Quebec Pension Plan, or a private plan when no income from these sources was received in any previous year. Old Age Security is not considered because this is a demogrant payment individuals start to collect when they turn age 65 and is not a strong predictor of labour market attachment. The second event is a drop in labour earnings of 50 percent or more followed by take-up of pensions in the following year.

This definition allows for the possibility that an individual may separate from their job and move jurisdictions but delay receiving pension benefits until the following year, after settling into their retirement situation and new home. This may commonly occur for workers who retire in

Table 1: Descriptive Statistics

	Mean (*SD*)					
	Full Sample		Restricted Sample		Inter-Jurisdictional Retirees	
Characteristic	(1)	(2)	(3)	(4)	(5)	(6)
Demographics						
Age, y	45.4	18.0	62.3	4.8	61.3	3.5
Female, %	51.5	50.0	49.5	50.0	46.6	49.9
Married or common-law, %	56.8	49.5	69.8	45.9	66.9	47.1
Region, %						
Atlantic Canada	7.7	26.6	7.8	26.9	18.0	38.4
Quebec	24.6	43.0	25.4	43.6	7.4	26.2
Ontario	37.7	48.5	37.6	48.4	19.8	39.9
Prairies	16.9	37.5	15.5	36.2	22.6	41.8
British Columbia	12.7	33.3	13.3	33.9	28.7	45.2
Territories	0.5	7.3	0.3	5.9	3.4	18.2
Sources of income, %						
Labour earnings	70.0	45.8	53.2	49.9	61.9	48.6
Public pension	19.3	39.5	50.2	50.0	59.3	49.1
Private pension	12.3	32.8	31.0	46.2	41.8	49.3
Conditional income, $						
Labour earnings	35,300	76,500	40,700	116,600	38,700	124,100
Public pension	5,600	3,200	5,600	3,100	4,200	3,200
Private pension	15,400	20,900	17,400	19,500	16,600	21,000

Notes: Labour earnings includes the sum of employment and self-employment income. Conditional income refers to the average value of income (rounded to the nearest $100) conditional on the amount being strictly positive. The estimates for inter-jurisdictional employees are based on data from Event-Times 0, 1, and 2. Atlantic Canada = Newfoundland and Labrador, Prince Edward Island, Nova Scotia, and New Brunswick; Prairies = Manitoba, Saskatchewan, and Alberta; Territories = Nunavut, Northwest Territories, and Yukon Territory.

Source: Statistics Canada, Longitudinal Administrative Databank.

the second half of a calendar year, especially because housing markets tend to clear gradually during the summer months. In the next section, I show how labour earnings and pension income evolve over time for retirees and find that this definition performs on average.

The last two columns of Table 1 summarize tax filers in this sample who are identified to be inter-jurisdictional retirees (which I define later in the article but consider briefly here for comparative purposes). These tax filers have similar demographic and conditional incomes as those reported for the restricted (i.e., retired) sample but are much more likely to reside in Atlantic Canada and British Columbia and to have higher labour market attachment. The strong labour market attachment is attributed to how retirement is identified in the tax data on the basis of a change in labour earnings, discussed later.

Empirical Model

The goal is to estimate the extent to which retiring is linked to the decision of tax filers to migrate across jurisdictions in Canada. To this end, denote by M_{it} as an indicator variable for whether individual i at time t lives in a different jurisdiction than at $t - 1$ and continues to live in their new jurisdiction at $t + 1$. This three-period definition of migration is similar to the approach for identifying inter-jurisdictional employees.

Individuals who retire during the sample period comprise the treatment group. All others who satisfy the age and income restrictions to be included in the study but are never observed retiring comprise the control group. Let t_i^R denote the retirement year for individual i. If an individual appears to retire more than once, such as by re-entering and then exiting the workforce, then t_i^R is taken to be the first time retiring is observed. Then, $e_{it} = t - t_i^R$ is the event-time relative to the retirement year. The statistical model is as follows:

$$M_{it} = \mu_i + \rho_t + \sum_{\tau=\tau_1}^{\tau_2} \delta_k 1\left(e_{it} = \tau\right) + X_{it}'\theta + \varepsilon_{it}. \quad (1)$$

The term $1(\cdot)$ is an indicator function. Hence, estimation of the δ coefficients informs how the likelihood of migration evolves around the time of retiring. I focus the analysis on five years before and after retirement, that is, $\tau_1 = \tau_2 = 5$. The model accounts for individual and year fixed effects,

as reflected by the parameters μ_i and ρ_t, respectively, so that identification is based on within-person variation over time. I impose that $\delta_{-2} = 0$ so the treatment effects are expressed relative to a base likelihood at event-time −2.

The variable X_{it} is a vector that controls for marital status and a cubic polynomial in after-tax income. Because the model is estimated with individual fixed effects, marital status is identified by changes that occur over time, capturing the effects of various life shocks, such as marriage dissolution or widowhood. Last, ε_{it} is the statistical residual. The model is estimated with clustered standard errors by jurisdiction and year because the variation of interest is mobility across provinces for different cohorts of retirees. The unit of analysis is the individual but clustering at this level produces smaller (less conservative) standard errors.

Although the focus of analysis is on migration decisions, Equation (1) can also estimate how labour earnings or pension income evolve around the time of retirement by replacing the dependent variable M_{it} with these other outcomes of interest.

Retiring and Mobility

In this section, I present the baseline estimates and robustness checks for the effects of retiring on inter-jurisdictional mobility. Before doing so, however, I consider the extent to which my approach to identifying retirement in the tax data is successful at generating trends in labour earnings and pension income that are consistent with a retirement transition.

Income Trends

Figure 2 begins the analysis of income trends by plotting the probability of having any labour earnings in the year and the average value of labour earnings, in Panels (a) and (b), respectively. More precisely, these event-study plots derive from estimates of Equation (1) but use the labour market outcomes as the dependent variables. The dots in the figure are the δ coefficients, and the bars around the dots are the 95 percent confidence intervals.

Figure 2 shows that employment and earnings for the treatment group are relatively constant compared with those for the control group in the years leading up to retirement, with estimates of the δ coefficients that hover around zero (expressed relative to δ_{-2}). However, in the post-treatment period, employment falls by nearly 30 percentage points, and average earnings falls by more than $20,000 within the first two years. The gradual adjustment is expected, given that the tax data report earnings for the full year. For example, a tax filer who begins collecting pension income midway through the year will be identified as both employed and retired in that year.

Reported in brackets on the *y*-axis is the mean of the dependent variable at event-time −2 for the treated group. On average, 80.2 percent of the treated group were employed and earning an annual salary of $36,383 two years before retiring. This implies that approximately half of tax filers exited the labour market completely, and mean earnings fell by 55 percent within two years of retiring. Some continued labour market attachment after retiring is consistent with previous studies on post-retirement employment and partial retirement (Bonikowska and Schellenberg 2014; Messacar and Kocourek 2019; Schellenberg, Turcotte, and Ram 2005).

Similarly, Figure 3 plots event-study estimates of the effect of retiring on pension income and the pension income ratio in Panels (a) and (b), respectively. The pension income ratio is the fraction of total after-tax income deriving from pensions. For reasons described earlier, pension income from Old Age Security is excluded. These results show smooth and flat trends in the pre-treatment period but sharp increases in the first few years thereafter. Specifically, pension income rises to about $12,000, and the pension income ratio approaches 50 percent, on average.

Taken together, although these results are largely driven mechanically by how I define retirement in the tax data, they show that employment and income behave predictably around the event time. Older tax filers who did not retire in the sample period or who retired at a later date are a reasonable control group for this analysis, as evidenced by the lack of pre-trends.

Inter-Jurisdictional Mobility

The main findings for how retirement leads to inter-jurisdictional mobility are presented in Figure 4. This corresponds to direct estimation of Equation (1) with the mobility indicator as the dependent variable and controlling for individual and year fixed effects. The analysis shows very smooth and flat pre-trends hovering at zero in the pre-treatment period, which further suggests that the treatment effect is well identified, and older tax filers who did not retire during the sample period are a reasonable control group. However, two years after retiring, the likelihood of migration is 0.4 percentage points higher for the treatment group relative to the control group (again expressed relative to δ_{-2}). This effect quickly falls back to zero, indicating that tax filers who move after retiring do so within the first few years.

This finding clearly indicates that retirement and inter-jurisdictional mobility are interconnected. Whether this effect is economically relevant is a bit less clear. A point estimate that is less than half a percentage point seems small in absolute value but much larger when compared with the base migration rate. As shown on Figure 4's *y*-axis, the likelihood of moving is only 0.417 percent among the treatment group two years before retiring, which means that retirement leads to roughly a doubling of this base rate. This leads me to conclude that inter-jurisdictional retirees comprise an economically meaningful share of

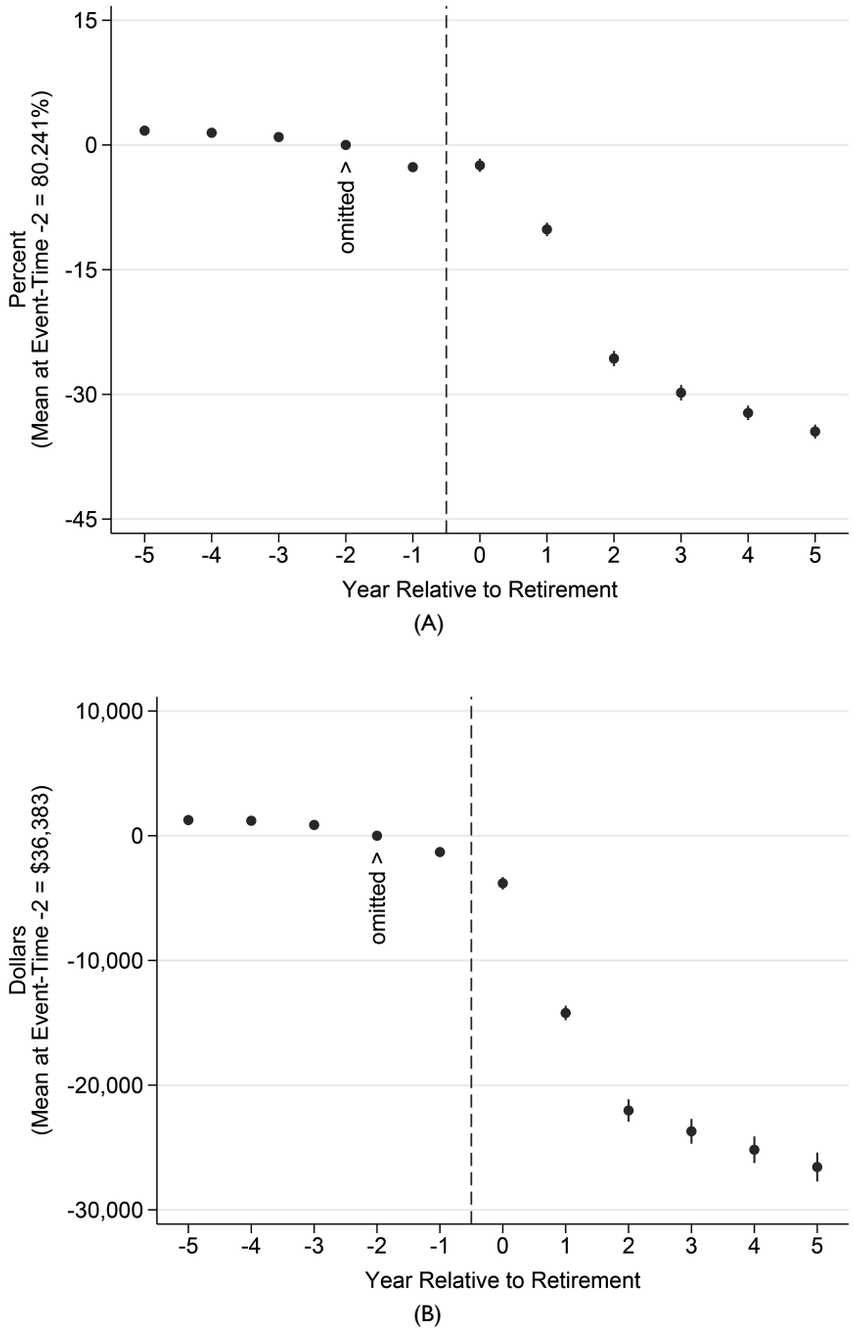
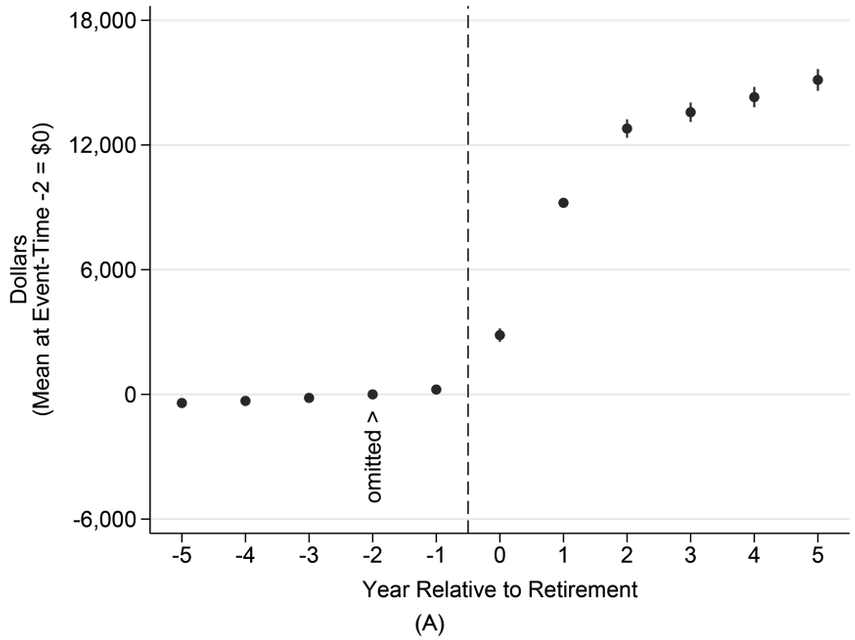


Figure 2: Event-Study of Retirement on Employment and Labour Earnings

Notes: This figure plots the γ_k coefficients from Equation (1) using an indicator for having any labour income in the year and the amount of labour earnings as the dependent variables in Panels (a) and (b), respectively. Labour earnings consists of wages and salaries, commissions, training allowances, tips and gratuities, and self-employment (net income from business, professional, farming, fishing, and commissions). The model specification includes individual, province, and year fixed effects, with controls. The bars around the dots represent the 95 percent confidence intervals, where standard errors are clustered by province and year. Event-time −2 is omitted to normalize the estimates relative to two years before the reform. Reported in brackets on the y-axis is the mean of the dependent variable at event-time −2 for the treated group.

Source: Statistics Canada, Longitudinal Administrative Databank.



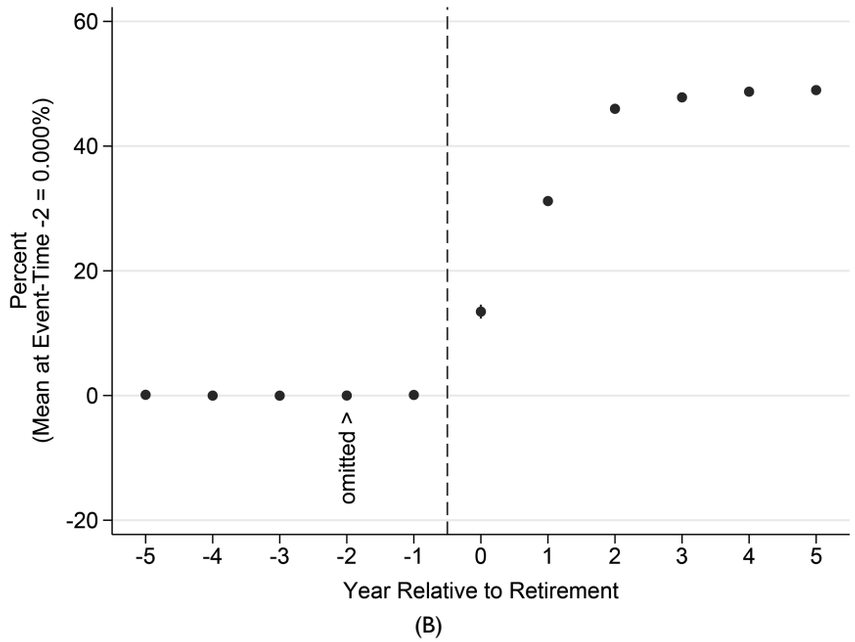


Figure 3: Event-Study of Retirement on Pension Income and the Pension Income Ratio

Notes: This figure plots the γ_k coefficients from Equation (1) using the amount of pension income and the pension income ratio as the dependent variables in Panels (a) and (b), respectively. Pension income consists of income from the Canada Pension Plan and the Quebec Pension Plan as well as private pensions. Old Age Security is excluded because this is a demogrant payment based on age and not a strong predictor of labour market attachment. The pension income ratio is the fraction of total after-tax income deriving from pensions. The model specification includes individual, province, and year fixed effects, with controls. The bars around the dots represent the 95 percent confidence intervals, where standard errors are clustered by province and year. Event-time −2 is omitted to normalize the estimates relative to two years before the reform. Reported in brackets on the *y*-axis is the mean of the dependent variable at event-time −2 for the treated group.

Source: Statistics Canada, Longitudinal Administrative Databank.

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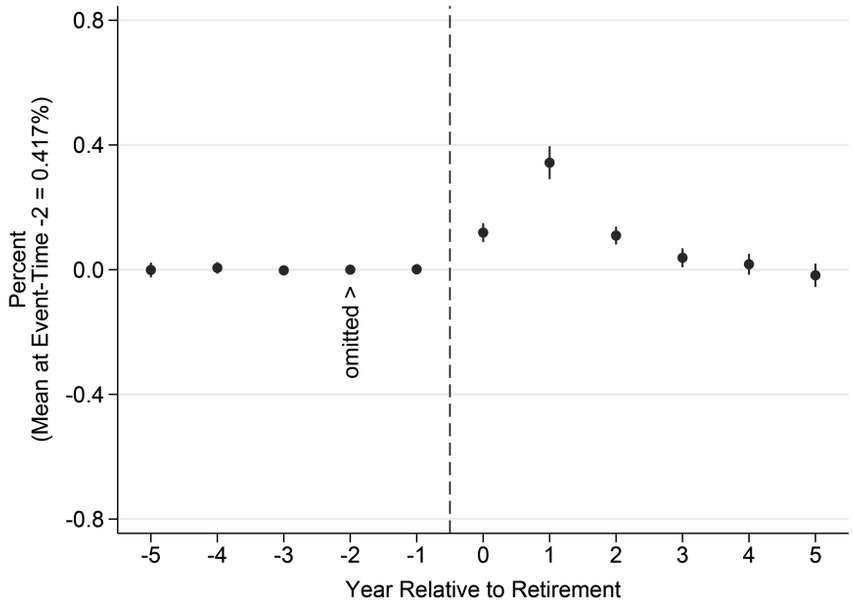


Figure 4: Event-Study of Retirement on Inter-Jurisdictional Retirement

Notes: This figure plots the γ_k coefficients from Equation (1) using an indicator for being an inter-jurisdictional retiree as the dependent variable. The bars around the dots represent the 95 percent confidence intervals, where standard errors are clustered by province and year. Event-time −2 is omitted to normalize the estimates relative to two years before the reform. Reported in brackets on the *y*-axis is the mean of the dependent variable at event-time −2 for the treated group.

Source: Statistics Canada, Longitudinal Administrative Databank.

older migrants. Further discussion about magnitude is provided later in the article.

To explore the robustness of this finding, I present results using different sets of controls in Table 2. More precisely, in Column (1), I begin by plotting the unconditional probabilities of migration per year relative to retirement among the treatment group. These estimates derive from a regression of M_{it} on the set of event-time dummies but dropping the control group from the sample, not normalizing the estimates, and omitting fixed effects and additional controls, as well as omitting the model's constant. The purpose of reporting these unconditional probabilities is to assess whether the pattern observed in Figure 4 is driven by a change in behaviour among the treatment group or arises from some change in behaviour of the control group. As shown, the unconditional probability of migration for the treatment group is roughly 0.4 percent in the years leading up to retirement and increases above 0.7 percent within two years of retiring, indicating that the baseline results are driven by migration among the treatment group.

Columns (2)–(4) report event-study estimates of the δ coefficients with the iterative addition of control variables for jurisdiction of residence, marital status, and a cubic polynomial in after-tax income. The main estimates are not affected by the addition of controls.

I now turn to characterizing inter-jurisdictional retirees on the basis of characteristics observed in the tax data. Figure 5 carries out the event-study analysis separately for tax filers by age (< 65 vs. ³ 65), gender (male vs. female), marital status (married or common-law vs. single, separated, or divorced), and level of income (lower vs. higher) in Panels (a), (b), (c), and (d), respectively. Lower income and higher income refer to income relative to the median. Because these characteristics—notably age and income—may be endogenous with treatment, I assign tax filers into groups on the basis of their characteristics at event-time −2. It is not possible to assign an event-time to the control group who never retired during the sample period, so I hold the control group constant in all regressions and only allow the treatment group to vary, which allows for direct comparisons across groups.

The results of this heterogeneity analysis are threefold. First, gender and marital status are not relevant determinants of inter-jurisdictional retirement. Second, migration is driven by retirees aged younger than 65 years. In contrast, tax filers who retire after turning 65 are slightly less likely to migrate relative to the control group. Third, the behaviour is driven by tax filers with higher incomes, whereas the likelihood of migrating does not change after retirement for those with lower income. Taken together, a possible explanation is that tax filers move during working

Table 2: Event-Study of Retirement on Inter-Jurisdictional Retirement

		Event-Study Estimates		
Event Time	Baseline Trend of Treated Group (1)	Individual and Year Fixed Effects (2)	Individual, Province, and Year Fixed Effects (3)	Individual, Province, and Year Fixed Effects, with Controls (5)
−5	0.415***	−0.001	−0.001	−0.003
	(0.026)	(0.012)	(0.012)	(0.012)
−4	0.417***	0.006	0.006	0.004
	(0.024)	(0.009)	(0.009)	(0.009)
−3	0.410***	−0.002	−0.002	−0.004
	(0.024)	(0.008)	(0.008)	(0.008)
−2	0.415***			
	(0.024)			
−1	0.429***	0.001	0.002	0.003
	(0.025)	(0.008)	(0.008)	(0.009)
0	0.515***	0.119***	0.113***	0.115***
	(0.042)	(0.015)	(0.014)	(0.014)
1	0.743***	0.343***	0.321***	0.324***
	(0.048)	(0.027)	(0.024)	(0.024)
2	0.520***	0.109***	0.082***	0.084***
	(0.032)	(0.014)	(0.014)	(0.014)
3	0.458***	0.038**	0.006	0.008
	(0.030)	(0.015)	(0.016)	(0.016)
4	0.444***	0.017	−0.017	−0.015
	(0.029)	(0.017)	(0.019)	(0.019)
5	0.413***	−0.018	−0.055**	−0.051**
	(0.030)	(0.019)	(0.023)	(0.023)
No. of observations	30,764,044	30,546,076	30,546,075	30,316,687
R^2	0.004	0.149	0.156	0.157

Notes: Column (1) reports the unconditional probability of being an inter-jurisdictional retiree expressed relative to the retirement year, for the treatment group. Columns (2)–(4) report the γ_k coefficients from Equation (1) using an indicator for being an inter-jurisdictional retiree as the dependent variable. The dependent variable is an indicator on a scale ranging from 0 to 100. The additional controls include marital status and a cubic polynomial in after-tax income. Standard errors are clustered by province and year. Event-time −2 is omitted to normalize the estimates relative to two years before the reform.

Source: Statistics Canada, Longitudinal Administrative Databank.

years in search of higher-paying jobs and then move back to their province of birth at retirement, where earning a higher income during the working years makes retiring earlier affordable. Exploring the relationship between inter-jurisdictional retirement and earlier moves during the working years to test this conjecture is an interesting avenue for future research. The homogeneity by gender and marital status likely arises from the fact that the majority of the sample is married or in a common-law relationship (Table 1), and retirement decisions of individuals and their spouses tend to be co-determined.

The heterogeneity by age is striking and raises the question of whether restrictions for pension benefit eligibility affect this behaviour in some way. To explore this issue, I condition the sample on inter-jurisdictional retirees and plot their age distribution in Figure 6. This analysis is delineated by gender and marital status in Panels (a) and (b), respectively. The results show that inter-jurisdictional retirement occurs most prevalently among tax filers aged 60–65 years, consistent with the fact that receipt of the Canada Pension Plan and Quebec Pension Plan can begin at age 60 and the age for full benefit receipt is 65. However, a large share of inter-jurisdictional retirees still fall outside this age range, and the distributions do not vary widely by gender or marital status, suggesting that the main effect of the age restriction is on benefit receipt.

Energy and Petroleum Price Shocks

Previous studies cited in the introduction point to a strong correlation between oil price shocks and

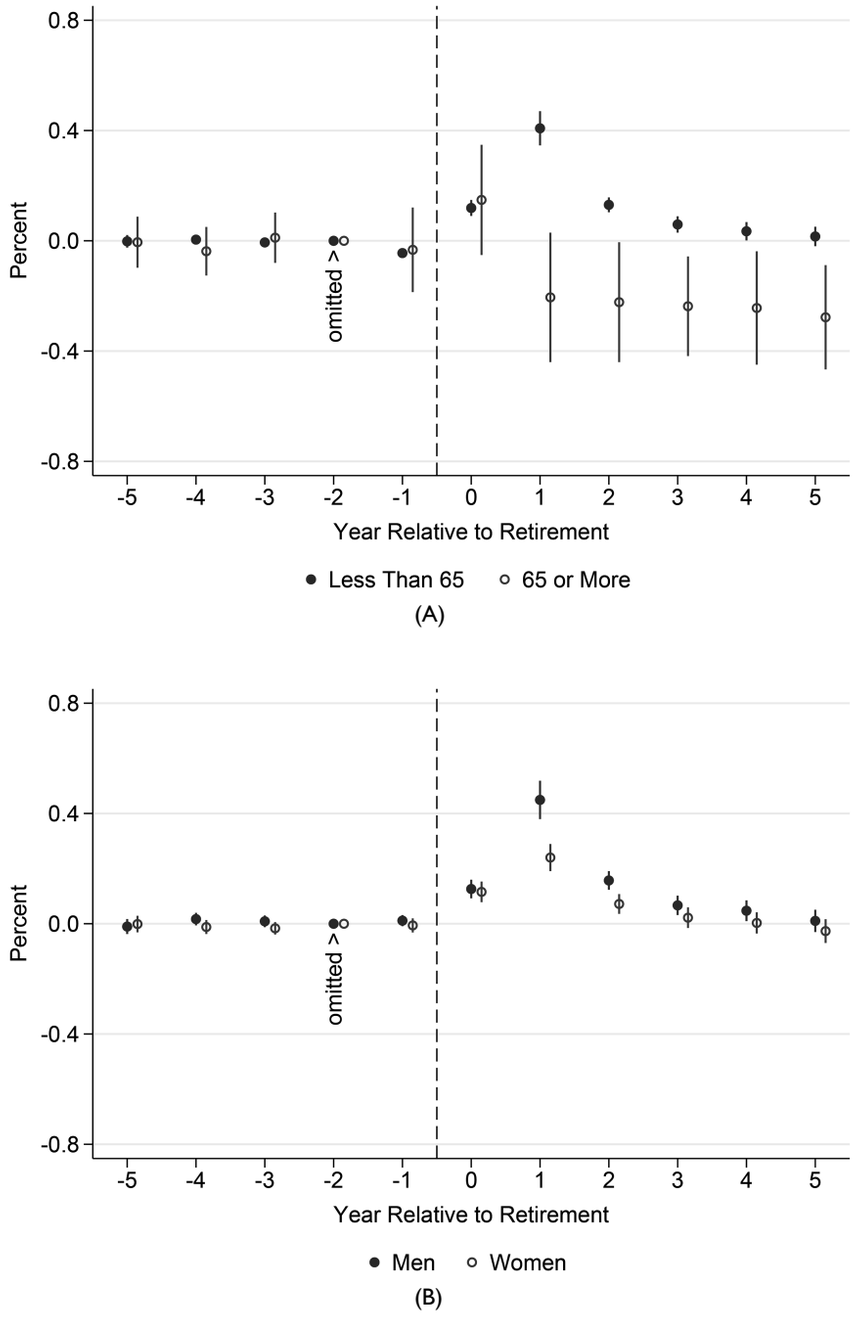
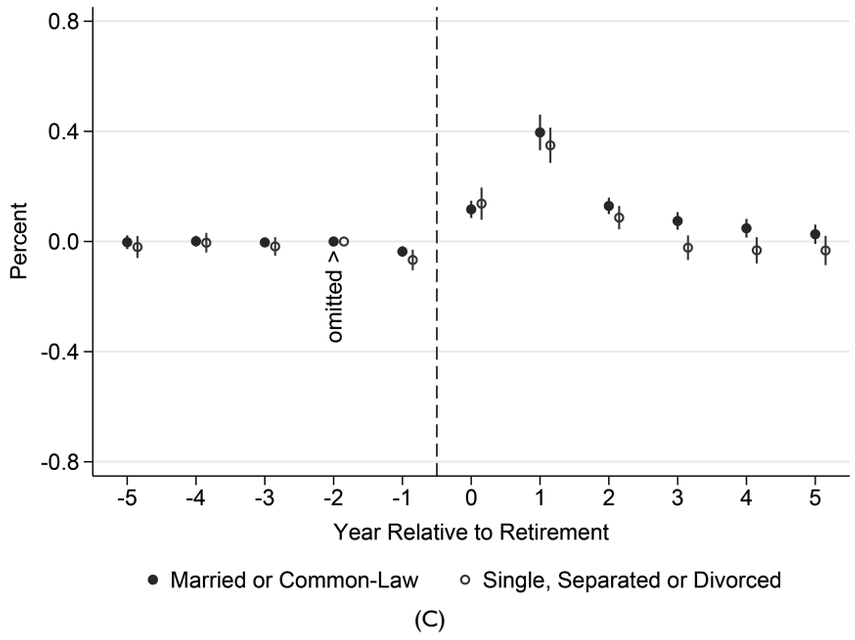


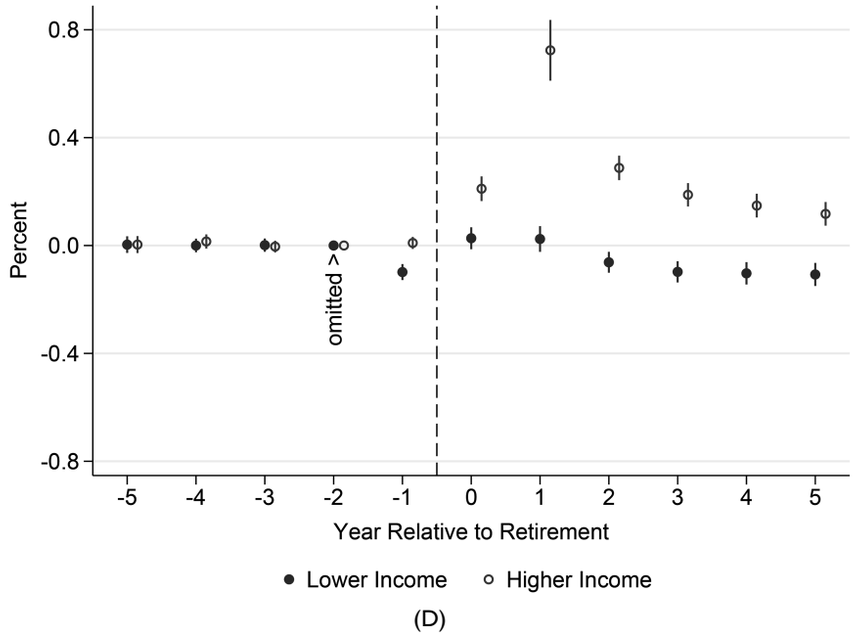
Figure 5: Event-Study of Retirement on Inter-Jurisdictional Retirement by Observed Characteristics

Notes: This figure plots the γ_k coefficients from Equation (1) using an indicator for being an inter-jurisdictional retiree as the dependent variable. The analysis is carried out separately on the basis of age, gender, marital status, and level of income in Panels (a), (b), (c), and (d), respectively. Lower and higher income categories are based on the level of after-tax income relative to the median. Individuals are assigned into groups on the basis of their observed characteristics two years before retirement. The control group is not delineated by age group, because individuals who are not observed retiring do not have an event-time that can be used to assign them into groups. Hence, the control group is the same for all treatment groups, which facilitates direct comparisons of the results across treatment groups. The bars around the dots represent the 95 percent confidence intervals, where standard errors are clustered by province and year. Event-time −2 is omitted to normalize the estimates relative to two years before the reform.

Source: Statistics Canada, Longitudinal Administrative Databank.



(C)



(D)

Figure 5: (Continued)

inter-jurisdictional mobility and employment resulting from the migration of workers into oil-producing provinces during periods of high labour demand and production. A natural question to ask is whether oil price shocks are also correlated with inter-jurisdictional retirement. For example, older workers who moved across jurisdictions to work in the oil industry at some point in their careers may choose to retire and move back home after a drop in prices and labour demand rather than face the risk of layoff.

In this section, I consider the relationship between energy and petroleum prices as a proxy for labour demand and inter-jurisdictional retirement. Specifically, I estimate the effect of the percentage change in prices on the probability of inter-jurisdictional retirement for individuals living in the oil-producing provinces of Newfoundland and Labrador, Saskatchewan, and Alberta relative to their counterparts in all other jurisdictions. I restrict this analysis to the treatment group (i.e., tax filers who retired in the sample period) and to Event-Times 0, 1, or 2

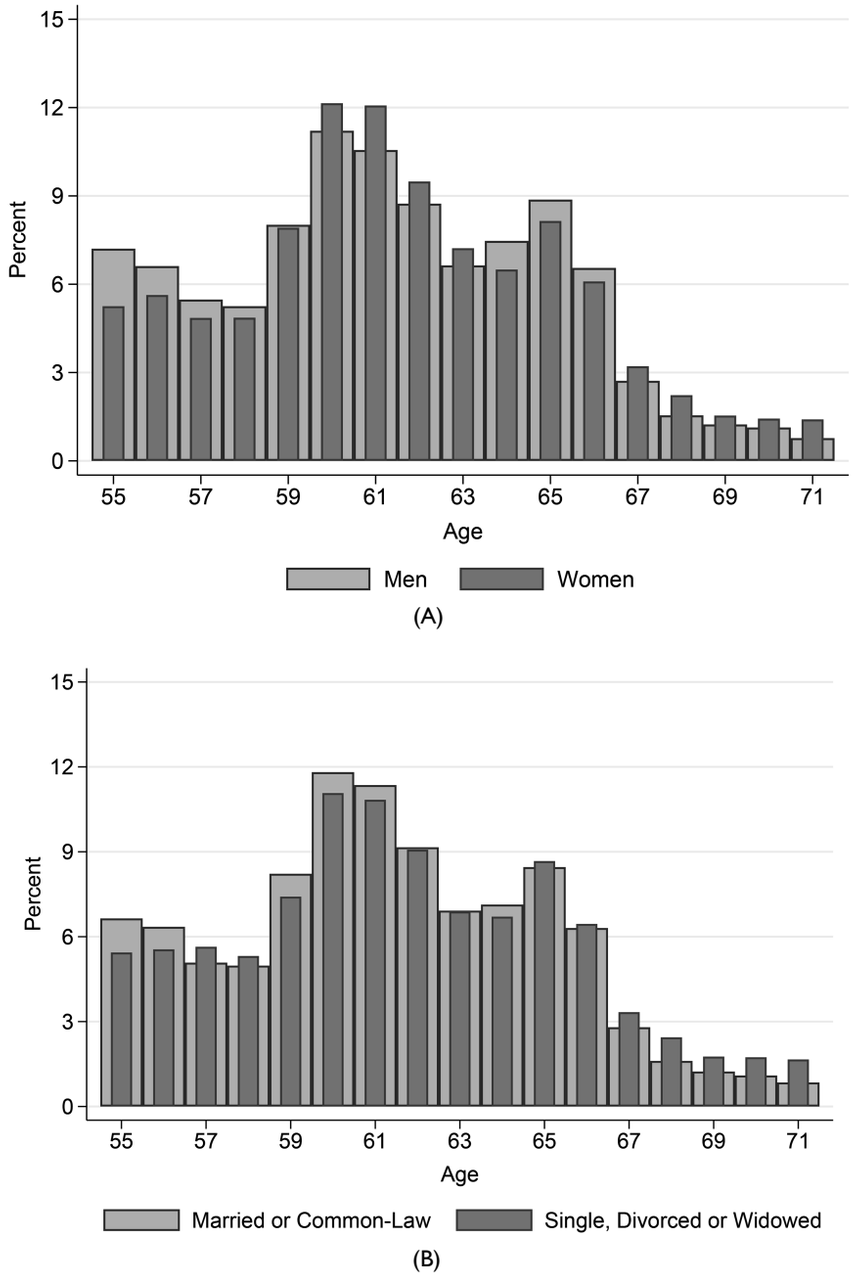


Figure 6: Distribution of Inter-Jurisdictional Retirees by Gender and Marital Status

Notes: This figure restricts the sample to inter-jurisdictional retirees at the time of their move and then plots their age distribution by gender and marital status.

Source: Statistics Canada, Longitudinal Administrative Databank.

because migration typically occurs in the first three years of retirement.

Denote by J_{it} an indicator variable for whether individual I was an inter-jurisdictional retiree in year t. Moreover, denote by P_{it}^{OIL} an indicator for whether individual i resides in an oil-producing province at time t and π_t as the percentage change in the price of energy and petroleum from year $t-1$ to year t. The statistical model is as follows:

$$J_{i,t+1} = \mu_i + \rho_t + \beta\left(P_{it}^{OIL} \times \pi_t\right) + X_{it}'\phi + \nu_{it}. \quad (2)$$

As before, μ_i and ρ_t are individual and year fixed effects, respectively; X_{it} is a vector of control variables; and ν_{it} is the residual. Because location of residence in the tax data is based on address at the end of the calendar year, I use a one-period leading variable $J_{i,t+1}$ as the dependent variable so that the price–location interaction is based on location

of residence before moving. Hence, β captures the effect of the price shock in year t on the probability of retiring and moving jurisdictions between years t and $t + 1$ benchmarked against tax filers who also retired during the same three-year window but did not move jurisdictions. This specification is consistent with Morissette and Chan (2016), who allow for a one-period delay because the effects of oil shocks on labour demand are gradual, and workers require time to adjust. Figure 7 plots the evolution of prices and percentage change in prices over time since 1982. There is indeed significant variation to exploit empirically in this analysis.

The results from Equation (2) are presented in Table 3. As before, each column controls for a different set of fixed effects and covariates as listed in the column headings. In contrast to the related literature on inter-jurisdictional employment, I do not find evidence that oil price shocks among the treatment group affect migration. The estimates for β are all nearly zero and statistically insignificant regardless of the control variables used. This suggests that either workers outside the oil industry are the most likely to move at retirement or that labour demand shocks among retirees from the oil industry are not as relevant a determinant of migration as other factors, such as age and income. Although these findings are largely exploratory and leave room for further research, the next section will shed more light on why oil price shocks may not be expected to affect mobility at retirement compared with during the working years.

Locations of Residence

Although new retirees are much more likely than other tax filers of similar ages to migrate across jurisdictions, the implications for tax and transfer policy are potentially very different depending on tax filers' attachment to their locations of residence before retiring. If a person moves for only a couple of years to a jurisdiction in search of high pay but spends most of their career working in the same jurisdiction as the one to which they return to retire, then tax implications are negligible because this person paid into the same system that they rely on in retirement. In contrast, if most inter-jurisdictional retirees pay into a system for most of their careers that differs from the one they rely on in retirement, then asymmetry exists.

To inform this issue, in Figure 8, I plot the distribution of inter-jurisdictional retirees across provinces and territories in the year before retiring versus the retirement year (after the move). The sample for this analysis is restricted to a balanced sample of inter-jurisdictional employees in these two event-times. Interestingly, the results show that the Atlantic provinces and British Columbia are the only net recipients of inter-jurisdictional retirees. In contrast, Quebec, Ontario, Manitoba, Saskatchewan, and Alberta, as well as the Territories, are all net donors of inter-jurisdictional retirees.

These results are generally consistent with the variation in sense of belonging across jurisdictions. For example, according to Statistics Canada (2019), in 2019, the Atlantic provinces and British Columbia had among the highest

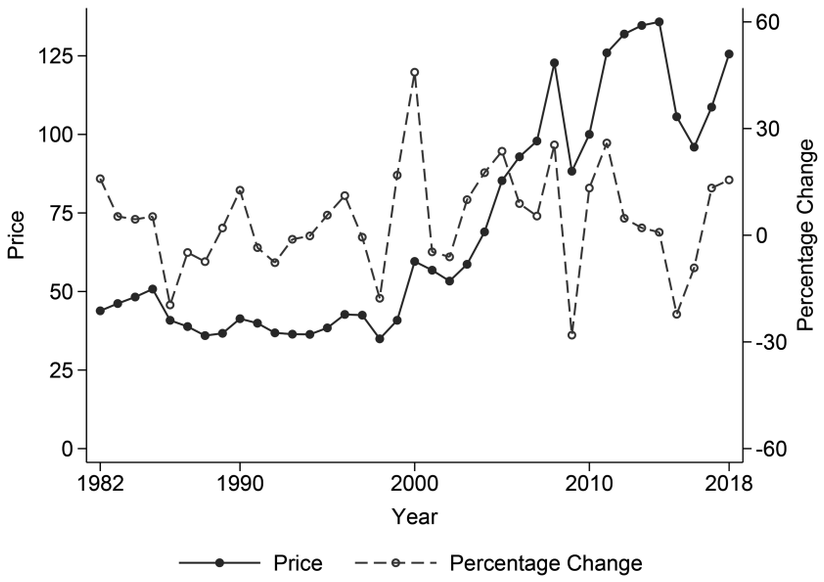


Figure 7: Energy and Petroleum Prices, by Year

Notes: Energy and petroleum prices are reported in monthly values in the raw data and converted to annual values by taking the 12-month averages. The percentage change is computed as the change in price in year t from $t - 1$ expressed as a percent relative to year $t - 1$.

Source: Statistics Canada Table 18-10-0029-01 (formerly CANSIM 329-0074).

Table 3: Effect of Energy and Petroleum Prices on Inter-Jurisdictional Retirement

Statistic	Province and Year Fixed Effects (1)	Province and Year Fixed Effects, with Demographic Controls (2)	Province and Year Fixed Effects, with Demographic and Income Controls (3)	Individual, Province and year Fixed Effects, with Demographic and Income Controls (4)
Price × province interaction	0.005	0.005	0.005	−0.002
	(0.004)	(0.004)	(0.004)	(0.007)
No. of observations	4,056,465	4,054,932	4,054,932	4,054,932
R^2	0.006	0.006	0.006	0.560

Notes: This table estimates the effect of percentage changes in energy and petroleum prices on inter-jurisdictional retirement for individuals initially living in oil-producing provinces relative to non–oil-producing provinces. The dependent variable is an indicator on a scale ranging from 0 to 100. The sample is restricted to the treatment group five years before to five years after retirement. The oil-producing provinces are Newfoundland and Labrador, Saskatchewan, and Alberta. The demographic controls include age, gender, and marital status fixed effects (age and gender are omitted when individual fixed effects are included because of collinearity). The income control is a cubic polynomial in after-tax income. Standard errors are clustered by province and year.

Source: Statistics Canada, Longitudinal Administrative Databank and Table 18-10-0029-01 (formerly CANSIM 329-0074).

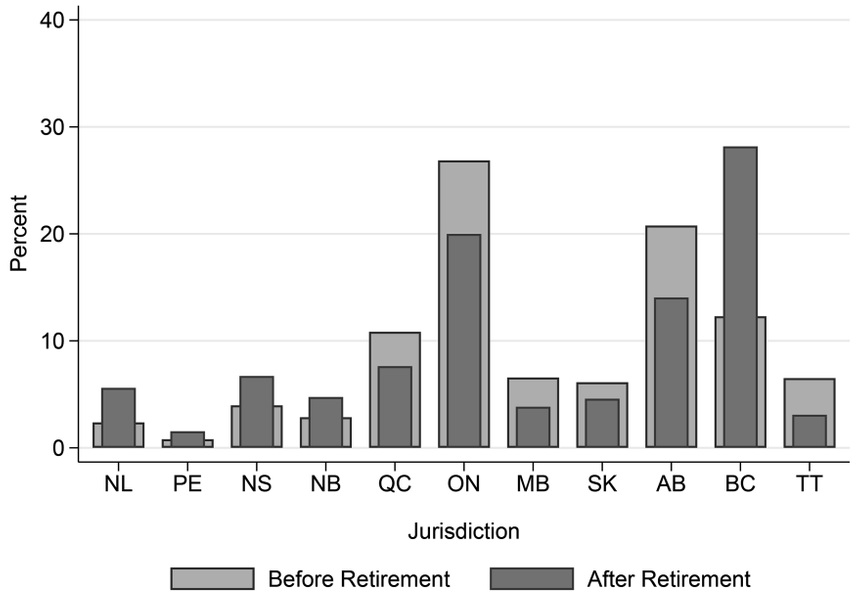


Figure 8: Provinces of Residence of Inter-Jurisdictional Retirees Before versus After Retiring

Notes: The figure restricts the sample to inter-jurisdictional retirees and then plots their distribution in their province of residence before versus after the move. The sample is balanced to individuals observed in these two event-times. TT = the territories (i.e., Nunavut, Northwest Territories, and Yukon Territory).

Source: Statistics Canada, Longitudinal Administrative Databank.

shares of the population aged 50–64 years who had a somewhat strong or very strong sense of belonging to their local community, whereas Ontario and Quebec scored the lowest (the only exception is Saskatchewan, which also scored high). In addition, the results suggest why energy and petroleum price shocks are not a strong determinant of migration, namely because net out-migration does not appear to be correlated with whether the jurisdiction is oil producing.

Although the preceding results show which jurisdictions are net donors versus recipients, they do not inform the issue of tax filers' attachment to their location of residence before retiring. To address this issue, I further exploit the longitudinal design and long time horizon of the LAD and restrict the sample to inter-jurisdictional employees who are observed for 10 or more years before they retire. Then, I compute the "mode jurisdiction" of each tax filer, that is, the jurisdiction in which the tax filer

lived the most number of years during the 10 years leading up to retirement. Last, I calculate the number of years that the tax filer lived in the mode jurisdiction: six years or less, seven years, eight years, nine years, or 10 years.

Grouping tax filers into a binned category for six years or less is desirable in cases in which a mode is not calculable. This occurs if there is more than one mode; in this case, the maximum length of time over the 10-year period that an individual could live in each mode jurisdiction is five years when there are two modes, and this length of time shortens as the number of modes increases so that it is always strictly less than six.

The distribution of tax filers by number of years living in their mode jurisdiction is reported in Table 4. Specifically, the unconditional distribution is reported in Column (1). These estimates are the same in both panels but are reported twice to facilitate comparisons with the remaining columns. In Columns (2)–(7), I report the distributions conditional on tax filers' region of residence in the year of retirement in the top panel or mode region in the bottom panel. For compactness, jurisdictions are grouped into Atlantic Canada, Quebec, Ontario, Prairies, British Columbia, and the Territories.

For example, as shown in the top estimate of the top panel, Column (2), 22.0 percent of inter-jurisdictional retirees who retired in Atlantic Canada lived for only six years or less in their mode jurisdiction during the 10 years leading up to retirement. This estimate does not inform where they resided before retirement except that it was some province (including another Atlantic province) other than the one in which they chose to retire. The top estimate in the bottom panel, Column (2) indicates that 23.0 percent of inter-jurisdictional retirees whose mode province during the 10 years leading up to retirement was Atlantic Canada lived in that province for only six years or less, although this does not inform where those tax filers eventually retired.

These two different approaches to reporting the distribution of mode province together paint a picture about community attachment of inter-jurisdictional retirees. Around 50 percent of retirees have very high attachment (all 10 years), and less than a quarter of retirees have low attachment (six years or less), which is a finding that holds irrespective of how the sample is restricted. Atlantic Canada and British Columbia tend to receive retirees who spent the most number of years working in their mode

Table 4: Attachment to Mode Jurisdiction during the 10 Years Before Retirement

		By Region					
No. of Years Before Retirement	Canada (1)	Atlantic Canada (2)	Quebec (3)	Ontario (4)	Prairies (5)	British Columbia (6)	Territories (7)
	By Region at Retirement						
≤ 6	20.7	22.0	26.3	23.7	21.0	15.1	21.8
7	8.1	8.5	9.5	9.8	8.3	5.8	7.9
8	8.3	9.4	10.1	9.0	8.6	6.3	6.6
9	10.7	10.0	12.0	10.6	11.7	9.9	12.5
10	52.3	50.0	42.0	46.9	50.5	63.0	51.3
	By Mode Region						
≤ 6	20.7	23.0	13.8	16.5	14.9	21.1	71.1
7	8.1	10.1	9.1	8.0	7.7	8.5	3.7
8	8.3	10.1	8.8	8.9	7.1	10.3	3.9
9	10.7	12.2	11.7	10.7	10.3	12.8	4.9
10	52.3	44.6	56.6	56.0	60.0	47.3	16.5

Notes: This table reports the distribution of inter-jurisdictional retirees based on the number of years they spent in their mode jurisdiction during the 10 years observed before retirement. The sample is restricted to inter-jurisdictional retirees who are observed at least 10 times before retirement. If the mode jurisdiction is not calculable, the number of years is set to be six or less. A mode is not calculable if there is more than one; in this case, the maximum length of time over the 10-year period that an individual could live in each mode jurisdiction is five years when there are two modes, and this length of time shortens as the number of modes increases. Column (1) reports the unconditional results. Columns (2)–(7) condition the analysis on the region. In the top panel, individuals are assigned into regions on the basis of the jurisdiction in which they lived after retiring. In the bottom panel, individuals are assigned into regions based on their mode jurisdiction during the 10 years before retiring, for those who had a calculable mode. Atlantic Canada = Newfoundland and Labrador, Prince Edward Island, Nova Scotia, and New Brunswick; Prairies = Manitoba, Saskatchewan, and Alberta; Territories = Nunavut, Northwest Territories, and Yukon Territory.

Source: Statistics Canada, Longitudinal Administrative Databank.

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jurisdictions before retiring, whereas Ontario and Quebec tend to have the highest shares of retirees who worked in those provinces before leaving to retire elsewhere in the country. Hence, these results are generally consistent with the findings in Figure 8 that Ontario and Quebec are net donors. The main implication is that inter-jurisdictional retirees consist primarily of people who had strong attachment to their location of residence in the years leading up to retirement.

Discussion

This study provides an exploratory analysis of the extent to which inter-jurisdictional mobility occurs around the time of retirement among Canadian tax filers. The results indicate that the likelihood of migrating increases by roughly 0.4 percentage points within two years of retiring among tax filers aged 55–71 years, expressed relative to the likelihood of migrating for tax filers in the same age range but who do not retire. Although this estimate is small in absolute magnitude, it reflects a doubling of the base rate and is estimated with a high degree of statistical precision. Such behaviour is driven primarily by younger and higher-income tax filers who perhaps relocated during the working years in search of high-paying jobs and could then afford to retire and move back home earlier in life.

Inter-jurisdictional retirement has potential implications for tax and transfer systems, because the majority of retirees leaving their location of residence had strong attachment to that location in the years leading up to retiring. On average, 50 percent of inter-jurisdictional retirees lived for 10 or more years in the same location before moving, implying an asymmetry between the jurisdiction that collects taxes during the working years and the jurisdiction incurring health care and other social costs of its retired residents.

Is this demographic phenomenon a cause for concern, or are the costs implied by this asymmetry simply too small? It is outside the scope of this exploratory analysis to answer this question definitively, but some insight can be gleaned from assessing the fraction of inter-jurisdictional retirees compared with net migration flows. As already shown in Figure 1, the ratio of in-migrants aged 55–71 years relative to all in-migrants varies across jurisdictions but does not typically exceed 20 percent in any case. In Figure 9, I replicate this analysis but express the ratio of inter-jurisdictional retirees relative to all in-migrants and find this never exceeds about 6 percent and is lower for most jurisdictions. This suggests that costs from the asymmetry are not likely very large on an annual basis.

However, as a simple example, in January 2022, the Government of Newfoundland and Labrador (2022) released a statement that the population increased by 695 persons (or 0.1%) from the previous quarter, reflecting the fourth straight quarter of growth according to Statistics Canada data. Because the Atlantic provinces tend to be net recipients of inter-jurisdictional retirees, coupled with the fact that their annual population growth is low, the extent to which this asymmetry has been compounding over

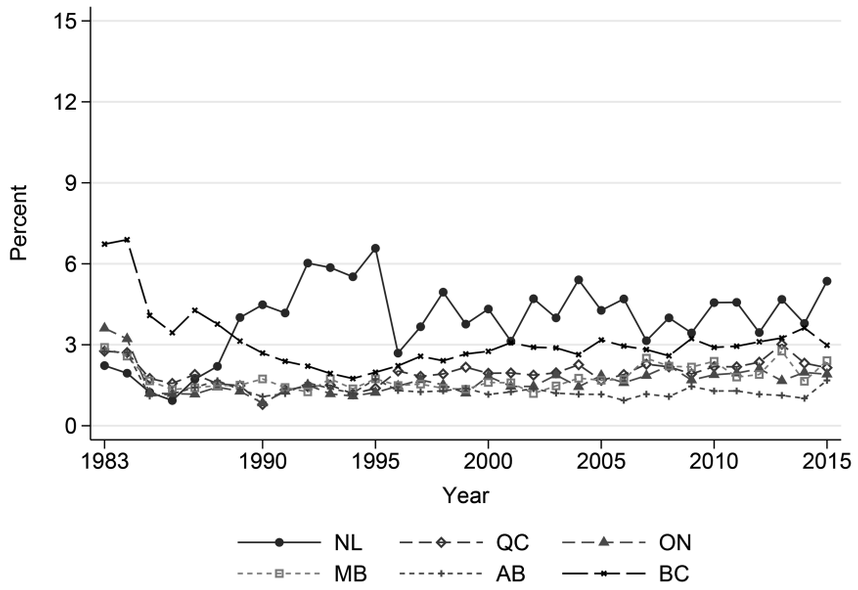

Figure 9: Ratio of Inter-Jurisdictional Retirees to Inter-Jurisdictional In-Migrants

Notes: This figure plots the number of inter-jurisdictional retirees into select provinces expressed relative to the total number of in-migrants in the same province and year.

Source: Statistics Canada, Longitudinal Administrative Databank.

time and contributes to regional differences in population aging is a different matter that warrants further investigation. This study has found that the Atlantic provinces and British Columbia are net recipients of inter-jurisdictional retirees and these are indeed the provinces whose populations are aging the most.

Moreover, inter-jurisdictional migration may be more prevalent among older Canadians who experience different shocks several years after retiring, such as adverse health shocks, divorce or widowhood, or changes in health conditions of elderly parents who require assistance. Because this study focuses exclusively on mobility within a few years of retirement, broader patterns of migration among older Canadians that have yet to be documented may contribute meaningfully to regional differences in population aging.

Note

1 Estimates of inter-jurisdictional employment are available upon request; for example, see Statistics Canada (2021). Estimates of inter-jurisdictional migrants are reported in Tables 17-10-0015-01 and 17-10-0022-01.

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Replacement Rates of Public Pensions in Canada: Heterogeneity across Socio-Economic Status

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Plusieurs sources de revenus aident les personnes retraitées à maintenir leur autonomie financière et leur niveau de consommation après qu'elles ont quitté le marché du travail. Les régimes de retraite des gouvernements sont l'une de ces sources, mais leur importance varie beaucoup selon la situation socioéconomique des individus. Dans cet article, nous analysons la variation du taux de remplacement des régimes de retraite généraux (Sécurité de la vieillesse et Supplément de revenu garanti) et des régimes de retraite à participation obligatoire (Régime de pensions du Canada et Régime de rentes du Québec) en fonction de la situation socioéconomique, en nous servant des données de l'Étude longitudinale et internationale des adultes (ÉLIA). Ces données longitudinales nous permettent de calculer et de comparer les taux moyens de remplacement en fonction de la situation socioéconomique. Afin de comprendre les variations des taux de remplacement, nous considérons expressément l'influence de l'éducation et de la santé. Nos résultats montrent que le taux de remplacement moyen des régimes de retraite généraux est de 32 pour cent chez les personnes en mauvaise santé et de 21 pour cent chez celles qui déclarent être en bonne santé. Ces pourcentages passent à 54 pour cent dans le premier cas et à 41 pour cent dans le second quand on tient compte à la fois des prestations des régimes généraux et des régimes obligatoires du Canada et du Québec. Dans une analyse par régression linéaire multiple, avec le revenu antérieur comme variable de contrôle, nous avons considéré les couples et trouvé que le revenu antérieur n'élimine pas les différences de taux de remplacement obtenus en fonction du niveau d'éducation et de l'état de santé. Nos résultats suggèrent que l'homogamie de diplômes pourrait expliquer la variation des taux de remplacement selon le degré d'instruction des individus.

Mots clés : Taux de remplacement, retraite, système de pensions publiques, ÉLIA, état de santé

Several income sources can help retirees maintain their welfare and consumption levels once they leave the workforce. One source is public pensions. Their importance as an income source varies greatly according to socio-economic status (SES). In this article, we analyze how replacement rates (RRs) of public pensions (Old Age Security and Guaranteed Income Supplement) and mandatory public pension benefits (Canada/Quebec Pension Plan [C/QPP]) vary across SES by using the Longitudinal and International Study of Adults dataset. Taking advantage of the longitudinal nature of this survey, we compute and compare average RRs by SES. We specifically consider the role of education and health to understand variations in RRs. Our results show that the average RR of public pensions for individuals in bad health is 32 percent, whereas for those who report being in good health, it is 21 percent. When public pensions and C/QPP benefits are included, these percentages become 54 percent for those in bad health and 41 percent for those in good health. When estimating a multivariate regression model and controlling for past income, we look at couples and find that

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past income does not eliminate differences in RR by education level and health status. Our results suggest that assortative matching could play a role in explaining the variation in RRs across individuals' education.

Keywords: replacement rates, retirement, Canadian public pensions, LISA, health status

Introduction

Most countries aim to protect individuals from poverty in old age, and this prevention relies heavily on public pensions. One characteristic of poverty in old age is its high persistence: exit rates from poverty are lower for older individuals, and poverty spells last longer. The reason for this high persistence is that once people stop working because of job loss or health issues, they are rarely able to again increase their income by finding a new job, not to mention a more lucrative one. Marital separations at the end of a career can also create a wealth shock that cannot be compensated for by delaying retirement. Therefore, to avoid poverty, public pensions—which in turn depend on lifetime earnings—become crucial for some individuals (see El-Attar and Fonseca 2022; Milligan 2008; Schirle 2013; Smeeding and Sullivan 1998; and Veall 2008, among others).

In this article, we study the replacement rates (RRs) of public income sources for older people, defined as the ratio of public pension income to income earned during the working life. The Organisation for Economic Co-operation and Development (OECD) ranks countries on the generosity of their retirement pension according to RRs derived from public pension rules. According to their calculations, Canada's public pensions provide a gross RR (before taxes) of 54.1 percent for people with half-average earnings, 41.0 percent for people with average earnings, and 28.5 percent for people with one-and-a-half-average earnings. With this methodology, Canada is ranked 23rd (out of 35) in the OECD for the generosity of its mandatory public pensions. The average RR in the OECD is 64.6 percent for people with half-average earnings, 52.9 percent for people with average earnings, and 48.4 percent for people with one-and-a-half-average earnings (OECD 2017).[1]

The OECD analysis accounts only for mandatory public pensions and employer-based pensions, but in Canada, private savings are an important contribution to retirement income, particularly for higher-earning Canadians. Although Baker and Milligan (2009) argue that an analysis of Canadian RRs must include all sources of income, not just the public sources, we follow the approach of the OECD, and we use two main measures of RRs: one that uses only public pension income (OAS, GIS, and the Allowance) and a second one that also uses mandatory employment-based contributions (C/QPP).[2] We argue that by focusing on only public pensions and mandatory employment-based contributions, we can better evaluate the level of income security and how much of the pre-retirement living standards is guaranteed by the public pension system.

Older Canadians' RRs have previously been measured in several articles (Baker and Milligan 2009; Larochelle-Côté, Myles, and Picot 2008; Milligan and Schirle 2014; Ostrovsky and Schellenberg 2010). Most of these authors compute aggregate RRs or use administrative data (Longitudinal Administrative Databank) to compute individual RRs. The administrative longitudinal data reported from tax filings has the advantage of containing information on the same individuals over a long period of time. It also contains detailed and accurate measures of individuals' income sources. However, this type of data lacks information on individual socio-economic characteristics. We aim to fill this gap by measuring RRs according to two major socio-economic characteristics that are typically not available in administrative data: education level and health status. These socio-economic characteristics are correlated with income, albeit not perfectly. This article will then provide a better understanding of how RRs from public income sources vary across these socio-economic characteristics and past income history. RRs are also measured across more commonly used characteristics such as sex, marital status, country of origin, and working status. A better understanding of the distribution of the RRs of public pensions across individuals' characteristics will also provide insights into the government's level of support and the system's progressivity.

Our analysis uses the Longitudinal and International Study of Adults (LISA), which includes a survey and longitudinal administrative data. The survey component of the data allows us to obtain information on individual demographic and socio-economic characteristics. From the longitudinal administrative component of the data, we also have access to retrospective earnings records that allow us to accurately measure the RRs. Other studies have also calculated RRs using longitudinal survey data. This type of data allows us to study the heterogeneity of RRs across individual characteristics, such as family structure, health, education, or labour market status. However, these datasets typically contain a short time-series dimension, which makes the study of RRs based on individuals' past earnings less precise. Several articles have used longitudinal survey data to compute RRs for Canada and for other countries (see Denton and Spencer 2011, Larochelle-Côté et al. 2008, and Ostrovsky and Schellenberg 2010, among others for Canada, Nivakoski and Barret 2019 for Ireland; Boskin and Shoven 1987, Khan, Rutledge, and Sanzenbacher 2017, Munnell and Soto 2005, and Smith 2003 for the United States; and Borella and Fornero 2009 for Europe).

Simulated synthetic data have also been used to analyze RRs. This approach combines administrative and

survey data to generate income distributions. Macdonald, Osberg, and Moore (2016) follow this approach to compute RRs, using Statistics Canada's Life Paths dynamic micro-simulation model. Although this is a useful and interesting approach, RRs calculated in this way rely highly on the specification used to match or simulate the data. Heterogeneity across individuals must then be interpreted with caution.

There is a large international literature that analyses the adequacy of retirement incomes by measuring retirees' RRs (Borella and Fornero 2009; Khan et al. 2017; Nivakoski and Barret 2019; Smith 2003). Even if cross-country comparisons are limited because of the availability of comparable data sources, some have been carried out (Disney and Johnson 2001; Disney, Mira D'Ercole, and Scherer 1998; Förster and Pellizzari 2000; Hauser 1997). From the review of the literature, it appears that different definitions of RRs have been used. Our two main definitions of RRs differ when it comes to the retirement income considered: one includes only public pension income (RR_1) and the other (RR_2) also includes C/QPP, a mandatory plan funded on the basis of employment contributions. However, RRs can also vary in terms of the working-life income considered. A review of the literature reveals that researchers have used different ways of measuring working-life income (e.g., pre-tax or after-tax earnings). Because we aim for our measures to be as comparable as possible, we summarize the main measures of working-life income used in the literature, and we show that our results are robust to these different specifications.

Our main results show that RRs differ by individuals' characteristics: RRs are higher for women, less-educated individuals, and those reporting fair or poor health. When we estimate a multivariate regression model and control for past income, we find that for individuals living in couples, past income does not eliminate differences in RRs by individual education level and health status. Our results suggest that assortative matching could play a role in explaining the variation in RRs across education level. For health status, the residual effect of this characteristic could come from the fact that individuals with poor health at ages 66–69 years are more likely to have had poor health earlier and thus lower opportunity to earn an income. We find that pensions depending on past household earnings, not just individual earnings, increase the progressivity of the system. On average, we find that 78.4 percent of respondents in our sample report that they have sufficient retirement income to comfortably cover their living expenses.

Data and Stylized Facts

We use four waves of the LISA. This longitudinal dataset contains survey data collected every two years between 2011 and 2017, and it contains information on individuals' income, health status, and demographics (such as education or marital status). The survey also contains information on subjective measures of income sufficiency during retirement. Moreover, LISA has been linked to administrative data sources (T1 and T4 files) going back to 1982. This retrospective component of the data allows us to study the evolution of earnings and income for both respondents in the family and therefore to evaluate RR at the household or the individual level. Combining the survey component with the longitudinal retrospective data component, we can then investigate whether differences in RRs can be attributed to individual characteristics.

Our sample is composed of 803 individuals aged 66–69 years in 2017. Because the relationship between RR and education or health status may vary across cohorts, and because it is difficult to capture these differences in our empirical exercise, we have selected our sample to include only a few cohorts, making the individuals as comparable as possible. We have selected the most recent cohorts eligible for the OAS or GIS to obtain the most up-to-date relationship between the RR and education or health status. To ensure that we have a sufficiently large number of observations, we include four single-year cohorts in the sample. This also ensures that almost all individuals in our sample have claimed their public pensions.[3]

Another reason to select cohorts aged 66–69 years is to measure health status at the earliest moment possible for people receiving public pensions. The moment when health status is measured is important because health degrades with age, and health during the working age is the factor with the strongest effect on future earnings. Health status between ages 66 and 69 years is then a better proxy for health during working age than health status at later ages. Moreover, the use of cohorts aged between 66 and 69 years instead of older cohorts also allows us to maximize the length of time during which we observe earnings history. With these cohorts, it is possible to trace back earnings history to when they were aged 35 years. It would not be possible with older cohorts because the earnings data history begins in 1982. Finally, we did not include the cohort of 65-year-olds because virtually all of them were eligible for the OAS or GIS during only part of the year and thus received less than a full year of benefits. Their inclusion would have underestimated the RR of these individuals compared with people who were eligible to receive OAS or GIS during a full year.

We know each individual's marital and working status, sex, place of birth (i.e., whether they were born in Canada or abroad), and level of education. Working status is an indicator that takes the value 1 if the individual reports still working. We consider four levels of education: no diploma, high school, some college, and university or more. Health is a central variable in our analysis. To measure health, we use a self-reported indicator that takes three values: excellent health, good health, and fair or poor health. Marital status is divided into four

categories: single, married, divorced, or widowed. We also relate RRs to individual past income; we consider the quintile of career average annual earnings. We also use an indicator of poverty that takes the value 1 if the individual's income in 2009 was 50 percent below the adjusted median household income for that year. We use income in 2009 because this is the year when the earnings profile generally reaches its peak. The variable immigrant takes a value of 1 if the individual is born outside Canada. All the individuals in our sample receive a positive amount of public pension. This implies that all immigrants must have been in Canada for at least 10 years.

Table 1 shows the distribution of characteristics in our dataset. For each characteristic, we also show the mean, the median, and the standard deviation of the past average earnings used to compute the RRs in the next section. It is clear that the differences in past average earnings across the individual's characteristics are important. The past earnings variable includes all paid employment income (i.e., wages, salaries, and commissions) before deductions, other employment income (consisting of any taxable receipts from employment other than wages, salaries, and commissions), net business income, net professional income, net commission income, net farming income, and net fishing income. In our measure of working earnings, we do not include any other forms of pre-retirement income, such as dividends, capital gains, or other investment income. Men's earnings are on average 40 percent higher than women's earnings (a mean of $77,400 vs. $55,300). When comparing individuals by education level, people with a university degree have average past earnings that are 123 percent higher than those of people without a diploma (mean of $94,700 vs. $42,400). We also see that the standard deviation for past earnings increases with education level ($25,600 for those without a diploma vs. $62,900 for those with a university diploma). Half of the individuals in our sample report having excellent or very good health. For those individuals, past average earnings are 43 percent higher than for those who report having fair or poor health (mean of $74,300 vs. $51,800). The standard deviation is again higher for people with excellent or very good health than for people with fair or poor health ($55,700 vs. $32,400). These patterns are in line with those typically found in the literature for working-age individuals.

Most of the individuals in our sample (74 percent) are retired and not currently working.[4] In terms of past average earnings, we do not observe much of a difference between those who work and those who do not work. In our sample, 17 percent of respondents were born outside Canada. The distribution of past earnings for this group differs from that for those born in Canada. Both groups have similar median earnings, but the individuals born outside Canada have a lower mean, indicating a thinner right tail of their earnings distribution. This statement is reinforced when looking at the standard deviation for these two groups ($75,900 for those born in Canada vs. $55,400 for those born outside Canada). Only 2.2 percent of respondents in our sample were classified as poor in 2009 (i.e., eight years before we measure RRs).[5] The median of past earnings is much lower for poor respondents than for not-poor respondents ($19,800 vs. $50,300), but the standard deviation is much higher ($75,500 vs. $57,600).

As mentioned earlier, our data also contain information about income sufficiency during retirement. In our sample, people had to answer yes or no to the following question: "Is your retirement income sufficient to comfortably cover your living expenses?"[6] Table 2 shows the proportion of people who answered yes to this question by education level and health status. Results show that almost four out of five people (78.4 percent) have sufficient retirement income. This proportion is lower for people without a diploma (73.4 percent) and for those with fair or poor health (69.8 percent), but it is higher for people with a university education (86.5 percent) and with excellent or very good health (82.6 percent).

Table 1. Distribution of Characteristics and Mean, Median, and Standard Deviation of Past Average Earnings

		Past Average Earnings		
Variables	Proportion (%)	Mean	Median	SD
Total		65,500	50,200	57,700
Gender				
Male	49.5	77,400	62,000	67,500
Female	50.6	55,300	45,000	45,500
Marital status				
Living alone	17.1	44,800	37,000	38,100
In couple	82.9	70,200	56,200	60,300
Education				
Without diploma	12.5	42,400	35,200	25,600
High school	39.5	59,100	56,100	32,300
College	24.8	57,900	62,000	29,000
University	23.0	94,700	83,200	62,900
Health				
Excellent or very good	50.1	74,300	62,400	55,700
Good	35.9	71,500	70,300	35,600
Fair or poor	14.0	51,800	49,400	32,400
Work status				
Not working	74.1	65,600	50,300	57,800
Working	25.9	65,100	50,200	58,000
Birth country				
Canada	82.9	78,400	52,200	75,900
Other	17.1	64,100	50,200	55,400
Poverty status				
Not poor	97.8	65,800	50,300	57,600
Poor	2.2	48,800	19,800	75,500

Source: Authors' compilation from Statistics Canada (2020).

Table 2. Proportion of People Answering Yes to the Question "Is Your Retirement Income Sufficient to Comfortably Cover Your Living Expenses?"

Variables	Proportion (%)
Total	78.4
Education	
Without diploma	73.4
High school	78.6
College	72.6
University	86.5
Health	
Excellent or very good	82.6
Good	75.5
Fair or poor	69.8

Source: Authors' compilation from Statistics Canada (2020).

Replacement Rates

Several methods of calculating RRs have been used in the literature. Researchers have built RRs differently depending on their research questions or their data constraints. If the objective is to shed some light on the adequacy of retirement income in the population, these differences in measurement must be considered. RRs are usually computed with retirement income as the numerator and income earned during a certain period of an individual's life as the denominator. The measurement of past income (or earnings) used to compute the RR varies across studies. Some researchers use working-life income, others compute permanent income, and still others prefer to look at earnings in different age ranges (more stable working ages or last years of working life). Income can also be measured before tax, after tax, or both. These different measures result in different RRs, and all provide important information. Larochelle-Côté et al. (2008), for example, compute RRs using the after-tax family-size-adjusted average income (ages 54–56 years) in the denominator and pension and labour market income (ages 55–77 years) in the numerator. This measure is not exactly a RR for retirees, but it gives an indication of income adequacy at older ages. Another example in the literature is Borella and Fornero (2009), who compute RRs using, in the denominator, the net income from work in the year before retirement. This method provides information about the income shock experiences of individuals who have just retired.

Using the retrospective component of the administrative data, we compute the amount of public pension that each person receives, and we obtain information on the evolution of their past income and earnings to compute the RRs. Our main measures of RRs are defined as follows:

$$RR_1 = \frac{(OAS + GIS + Allowance)}{Past\ Average\ Earnings}$$

$$RR_2 = \frac{(OAS + GIS + Allowance + C/QPP)}{Past\ Average\ Earnings}.$$

In the first definition (RR_1), public pensions are defined as the sum of the OAS pension, the GIS, and the Allowance. In the second definition (RR_2), we also include the C/QPP.[7] In the case of C/QPP, the retirement benefit is based on age and working experience. Individuals can start to collect their pensions at age 60 years for C/QPP and age 65 years for OAS.[8] Our statistical unit is the census family. The pre-retirement earnings used as a baseline capture the past pre-tax average earnings (including all kinds of employment and self-employment earnings) when individuals were at the most stable ages of their career, ages 35–54 years.[9] When the respondent reports living with a partner, we consider the public pensions received as a family and the average earnings of both individuals while they were aged 35–54 years.[10] Pension benefits and earnings are in 2011 dollars. We have also done robustness checks, using different measures of past income to construct the RRs. As our baseline, we use the income obtained during the central years of the working life (35–54 years), but we also check other measures, such as permanent income, and after-tax income, including all income sources. More detail about these different measures can be found in the Robustness section.

Figure 1 shows the distribution of RRs in our sample, using a kernel density plot. The mean of RR_1 is 25.0 percent, with a standard deviation of 18.9 percent. The distribution is right skewed, with a median of 18.8 percent. Most of the mass of the distribution lies between zero and 40 percent, with a small fraction of individuals having higher RRs. For RR_2, which also includes the C/QPP, the mean and median are higher, at 46.1 percent and 40.6 percent, respectively, and the distribution is more symmetric. There is substantial dispersion, with a standard deviation of 24 percent. These mean RRs are in line with those found in the literature (see OECD 2017).

In Table 3, we break down the RRs by individual characteristics. We report the mean, median, and standard deviation of RR_1 and RR_2 for each demographic group. In general, medians are lower than means, indicating that the distribution of RRs is skewed to the right across groups of variables. Higher RR groups tend to have a higher standard deviation, too.

Moreover, results show that RRs are lower for men. Women have 50 percent higher RRs when we use RR_1. This difference reflects the fact that women are more likely than men to receive the Allowance, which typically benefits widows, and that they have lower past earnings on average. The RR_2 is about 20 percentage points larger for both groups, indicating similar C/QPP benefits relative to earnings.

The RRs also decrease with level of education, reflecting higher earnings in higher education groups. When we

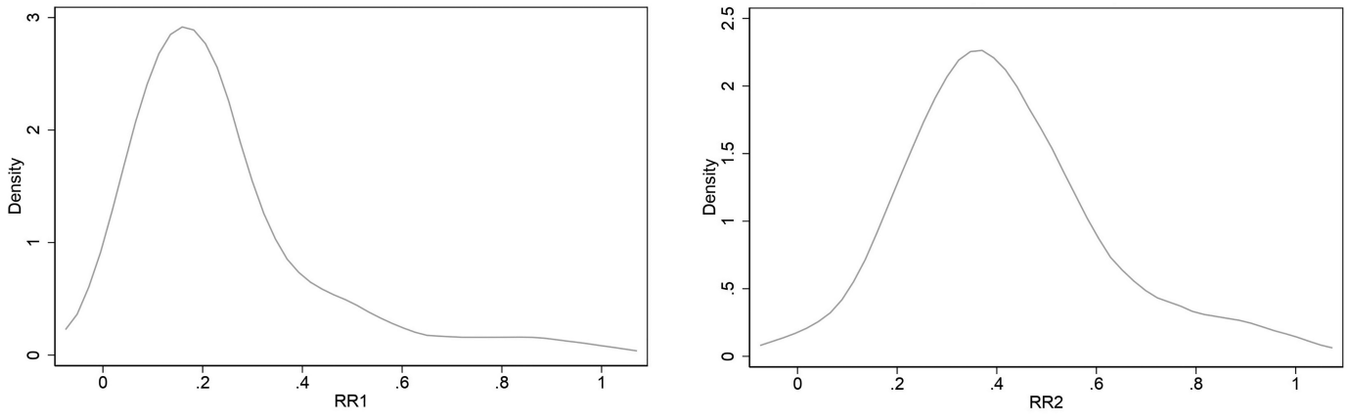

Figure 1. Distribution of Replacement Rates (RR_1 and RR_2)
Source: Authors' compilation from Statistics Canada (2020).

compare RR_1 and RR_2, we see that including the C/QPP increases the RRs by 22 percentage points in all categories of education except those with a university degree. For levels lower than a university degree, this again reflects similar C/QPP RRs. The exception occurs for university graduates, for whom C/QPP benefits add less to the RR than they do for other groups. This reflects the cap on benefits in the C/QPP system.

Table 3 also shows that the RRs are higher for individuals who report having fair or poor health in old age. When using RR_1, we see that people with fair or poor health have RRs 50 percent higher than those with good health. The difference in RRs reflects earnings differences across health groups. For those in good, fair, or poor health, RR_2 is again 22 percentage points higher than RR_1. The difference is smaller for those in excellent or very good health, due to the cap on C/QPP benefits.

A potential concern is that health may affect the age at which individuals claim their pensions, which could reduce the RRs of those individuals. In Table 3, we show that even for those whose reason for retirement was health, the difference in the RRs is maintained. Therefore, we conclude that higher RRs for individuals in poor health is explained at least partly by the fact they have lower past earnings, as seen in Table 1. Nevertheless, we can see that the median RR_1 for people who say they retired because of personal health or disability issues is nearly half of the mean (0.159 vs. 0.285). This result suggests a bimodal distribution for people who retired because of personal health or disability issues: one part with high RRs and another part with lower ones. This finding is less apparent with RR_2, but it is still noticeable.

Individuals living alone have 30 percent higher RR_1 than individuals living in couples. When we include the C/QPP, this difference is 26 percent. RRs are 21 percent higher for widows or widowers than for other individuals. It has already been noted in the literature that marital status plays an important role in explaining differences

Table 3. Mean, Median, and Standard Deviation of Replacement Rate (RR_1 and RR_2) According to Characteristics

	RR_1			RR_2		
Variables	Mean	Median	SD	Mean	Median	SD
Total	0.250	0.188	0.189	0.461	0.406	0.242
Gender						
Male	0.209	0.162	0.164	0.402	0.365	0.198
Female	0.291	0.208	0.202	0.520	0.454	0.265
Marital status						
Living alone	0.310	0.207	0.233	0.555	0.485	0.302
In couple	0.236	0.182	0.173	0.438	0.396	0.218
Widowhood						
No	0.234	0.153	0.207	0.463	0.335	0.372
Yes	0.342	0.228	0.303	0.559	0.413	0.393
Education						
No diploma	0.396	0.301	0.246	0.623	0.569	0.265
High school	0.263	0.202	0.186	0.489	0.435	0.247
College	0.237	0.179	0.162	0.452	0.403	0.218
University	0.165	0.13	0.124	0.337	0.295	0.172
Health status						
Excellent or very good	0.211	0.166	0.158	0.415	0.371	0.218
Good	0.276	0.202	0.209	0.493	0.421	0.265
Fair or poor	0.326	0.255	0.202	0.548	0.501	0.224
Retirement because of personal health or disability issues						
No	0.180	0.126	0.165	0.388	0.302	0.295
Yes	0.285	0.159	0.257	0.610	0.413	0.531
Birth country						
Canada	0.259	0.19	0.213	0.449	0.396	0.234
Other	0.244	0.184	0.179	0.455	0.404	0.235
Work status						
Not working	0.265	0.193	0.202	0.474	0.414	0.252
Working	0.207	0.17	0.135	0.424	0.396	0.205
Poverty status						
Not poor	0.237	0.182	0.173	0.449	0.399	0.235
Poor	0.471	0.391	0.281	0.641	0.562	0.275

Source: Authors' compilation from Statistics Canada (2020).

in RRs (Larochelle-Coté, Myles, and Picot 2012). Widows and widowers have access to survivor benefits from C/QPP, and divorced individuals or singles do not.

RRs are also much higher for individuals who were classified as poor in 2009 (90 percent higher on average). The difference decreases when C/QPP is included. This reveals that the design of the OAS and GIS is particularly targeted to help those individuals with lower past earnings, whereas the C/QPP benefits are proportional to past earnings.

Even if we have seen differences in past average earnings between those born in Canada and those not born in Canada, there is no statistical difference in RRs. Along the same line, there is no statistical difference in RRs between those currently working and those currently not working.

Regressions

RRs vary systematically with demographics. However, demographics are correlated, and different demographic groups also differ systematically in past earnings. For example, most widows have lower career earnings and less education than widowers. Lower career earnings are also associated with worse health outcomes. It is therefore important to determine whether these characteristics have systematic effects on the RRs on their own or whether their effects simply capture differences in past earnings across demographic groups. Therefore, we next use a multivariate regression model to estimate the correlation between the RRs and the different individual characteristics that we found relevant in the previous section.

Table 4 shows the coefficients from the regressions. In these regressions, we include different socio-demographic factors, health outcomes, and measures of past income. We also include a dummy that indicates whether the individual is currently working and a dummy that indicates whether the individual was born in Canada or abroad. Overall, the multivariate regression results are mostly in line with those of the bivariate regressions. However, there are a few exceptions, as we discuss.

We control for the effect of past earnings in two ways. In Column 1, we include a dummy for past poverty.[11] In Column 2, we include quintiles of past earnings.[12] Clearly, past income contributes to differences in RRs. Past poverty increases the RR by 10 percentage points, conditional on other demographics.[13] Past earnings are a highly statistically significant predictor of the RR; however, the relationship is not linear: RR_1 does not decrease between Quintiles 4 and 5. This reflects the fact that the OAS represents a small fraction of the retirement income for the individuals in these quantiles. GIS is also only paid to people in the first two quintiles because these benefits are income tested.

Women have higher RRs. This effect persists when we control for living arrangements, marital status, or other demographics. It also persists when controlling for past poverty. However, the coefficient on gender becomes small and statistically non-significant once we control for past earnings quintiles. This does not reflect the effect of differences in the incidence of past poverty, as shown in the first column. Instead, it reflects that, overall, the distribution of past earnings for women differs from that for men. These cumulative differences imply a higher RR.

The effect of education on RRs is interesting. We clearly saw in the descriptive statistics that education was negatively related to the RRs. Education is positively correlated

Table 4. Regression of RR_1 and RR_2 on Individual Characteristics

	RR_1		RR_2	
Variables	(1)	(2)	(3)	(4)
Gender				
Female	0.082***	0.012	0.127***	0.030**
	(0.014)	(0.010)	(0.019)	(0.013)
Health				
Good	0.026*	0.014	0.039*	0.022
	(0.015)	(0.009)	(0.021)	(0.014)
Fair or poor	0.093***	0.055***	0.147***	0.087***
	(0.027)	(0.017)	(0.035)	(0.021)
Education				
High school	−0.106***	−0.052**	−0.128***	−0.053**
	(0.034)	(0.022)	(0.042)	(0.026)
College	−0.127***	−0.058**	−0.145***	−0.048*
	(0.037)	(0.023)	(0.046)	(0.028)
University	−0.178***	−0.081***	−0.236***	−0.094***
	(0.035)	(0.022)	(0.044)	(0.026)
Work status				
Working	0.002	−0.022**	0.024	−0.009
	(0.014)	(0.009)	(0.020)	(0.014)
Birth country				
Born in Canada	0.009	−0.002	0.033	0.021
	(0.019)	(0.012)	(0.023)	(0.015)
Poverty status				
Poor	0.101**		0.107**	
	(0.041)		(0.053)	
Past earnings				
Quintile 2		−0.314***		−0.380***
		(0.034)		(0.060)
Quintile 3		−0.468***		−0.590***
		(0.033)		(0.059)
Quintile 4		−0.523***		−0.672***
		(0.033)		(0.060)
Quintile 5		−0.551***		−0.743***
		(0.032)		(0.060)
No. of observations	803			

Note: Standard deviations are in parentheses.

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Source: Authors' compilation from Statistics Canada (2020).

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with past average income. So, one would have expected that after controlling by past average income, the correlation of education with RRs would be fully explained. This is not the case. The correlation continues being negative and statistically significant. One possible explanation for this is assortative matching. The structure of the public pension benefits depends on family income. The GIS, for instance, is tested on the basis of the couple's income. This implies that if more educated individuals have partners with higher past earnings, they will have a lower RR, even conditional on their own past earnings.

Worse health is also associated with higher RRs. Again, this could partly reflect the effect of lower past earnings for those in fair or poor health. However, the regression results show that the health variables included in our models are always statistically significant, even when controlling for various measures of past earnings. A possible explanation for this finding is that individuals in fair or poor health at ages 66–69 years are more likely to have had poor health earlier and thus lower opportunity to earn. We control in the regression for past earnings, but our control may not capture the whole effect of past experiences. In particular, there could be differences in the years of contributions or the timing of earnings for which our measure cannot control.

When the C/QPP is included in our measure of RRs, we obtain stronger correlations with health and education. The coefficients on income quintiles themselves are larger in absolute value for RR_2 and flatten out less between Quintiles 4 and 5. This reflects the fact that those in past earnings Quintile 5 are affected by the cap on C/QPP benefits. Finally, for RR_2, the coefficient on gender remains positive and significant when controlling for past earnings quintiles. However, it is small, implying that most of the raw difference in RR_2 between men and women is explained by differences in earnings and other characteristics, not gender.

Results by marital status differ substantially. Tables 5 and 6 show the regression parameters of RR_1 and RR_2, respectively, on individual characteristics by marital status. The first two columns in Table 5 show that for singles, once the level of past income is considered, the RRs do not vary across gender, educational level, or health status. For couples, the variation across gender, education, and health remains, even after controlling for past income. These patterns are similar when we use RR_2.

In Column 1 of Table 6, we see that when including the C/QPP, the RRs for singles are more correlated with health status than those of couples (Column 3), but it is the reverse for educational level. When income quintiles are included in the regression (Column 2), the parameters for gender, health status, and education level approach zero and are no longer significant for singles. A similar effect is observed for couples, but the parameters for health status and education level are less affected (Columns 3 and 4) and continue to be statistically significant after controlling for income quintiles. Comparing the results in Table 5 and Table 6, we also see that RR_2 parameter dynamics seem to be the same as those for RR_1, except that for singles the parameters are greater and more significant for RR_2 when income quintiles are not included. This result comes from the fact that C/QPP benefits depend mainly on past earnings.

We have mentioned assortative matching as a possible explanation for why RRs differ across educational level even after controlling for past income. The results in Tables 5 and 6 suggest that past income is the main determinant

Table 5. Regression Parameters of RR_1 According to Marital Status (Singles and Couples) and Control Variables

	Singles		Couples	
Variables	(1)	(2)	(3)	(4)
Gender				
Female	0.086***	0.027	0.077***	0.014
	(0.031)	(0.019)	(0.016)	(0.010)
Health				
Good	0.057	0.009	0.020	0.013
	(0.040)	(0.023)	(0.017)	(0.010)
Fair or poor	0.145***	0.046	0.083***	0.040**
	(0.048)	(0.031)	(0.032)	(0.018)
Education				
High school	0.006	0.050	−0.132***	−0.072***
	(0.076)	(0.043)	(0.038)	(0.026)
College	−0.025	0.034	−0.148***	−0.083***
	(0.078)	(0.045)	(0.041)	(0.027)
University	−0.104	0.015	−0.194***	−0.101***
	(0.075)	(0.042)	(0.039)	(0.026)
Work status				
Working	0.075**	−0.047**	−0.017	−0.015*
	(0.036)	(0.020)	(0.014)	(0.009)
Birth country				
Canada	0.061	−0.012	−0.000	0.008
	(0.044)	(0.024)	(0.020)	(0.013)
Poverty status				
Poor	0.102		0.105***	
	(0.090)		(0.040)	
Past earnings				
Quintile 2		−0.293***		−0.305***
		(0.039)		(0.030)
Quintile 3		−0.571***		−0.404***
		(0.035)		(0.030)
Quintile 4		−0.701***		−0.447***
		(0.020)		(0.028)
Quintile 5		−0.762***		−0.476***
		(0.020)		(0.028)
No. of observations	144		659	

Note: Standard deviations are in parentheses.

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Source: Author's compilation from Statistics Canada (2020).

Table 6. Regression Parameters of RR_2 According to Marital Status (Singles and Couples) and Control Variables

	Singles		Couples	
Variables	(1)	(2)	(3)	(4)
Gender				
Female	0.133***	0.033	0.116***	0.033**
	(0.045)	(0.024)	(0.021)	(0.013)
Health				
Good	0.075	−0.004	0.032	0.023
	(0.058)	(0.029)	(0.023)	(0.015)
Fair or poor	0.176***	0.009	0.141***	0.080***
	(0.063)	(0.039)	(0.041)	(0.023)
Education				
High school	−0.059	0.011	−0.149***	−0.069**
	(0.087)	(0.046)	(0.047)	(0.032)
College	−0.063	0.030	−0.165***	−0.079**
	(0.095)	(0.050)	(0.052)	(0.034)
University	−0.230**	−0.045	−0.240***	−0.107***
	(0.089)	(0.048)	(0.050)	(0.032)
Work status				
Working	0.120**	−0.061**	−0.004	−0.003
	(0.053)	(0.025)	(0.020)	(0.016)
Birth country				
Canada	0.091	−0.016	0.022	0.035**
	(0.069)	(0.037)	(0.024)	(0.015)
Poverty status				
Poor	0.086		0.123**	
	(0.102)		(0.060)	
Past earnings				
Quintile 2		−0.125**		−0.362***
		(0.050)		(0.046)
Quintile 3		−0.560***		−0.507***
		(0.041)		(0.046)
Quintile 4		−0.728***		−0.565***
		(0.024)		(0.046)
Quintile 5		−0.863***		−0.633***
		(0.027)		(0.045)
No. of observations	144		659	

Note: Standard deviations are in parentheses.

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Source: Authors' compilation from Statistics Canada (2020).

of variation in RRs for singles, whereas for couples, education level is also significantly linked to RRs. The effect could arise from the positive correlation between spouses' educational levels. There is a broad consensus in the literature that there is assortative matching among couples at all levels of education (e.g., Eika, Mogstad, and Zafar 2019). Even after controlling for a spouse's past earnings, RRs remain correlated with education. Consider someone with a high level of education. Because RRs for couples are calculated at the household level (because GIS benefits depend on family income), this reduces this person's RR.

As a concluding remark for this section, we note that assortative matching implies that two individuals in the same quintile of past income but with different levels of education or health could have different RRs because of their partner's income. Assortative matching matters. In general, assortative matching increases inequality, but in this case assortative matching makes the design of the public pensions much more progressive, generating higher RRs to individuals who have characteristics associated with lower incomes, independent of their actual level of income. We have also run the regressions separately for men and women to capture the different behaviour in the labour market by gender. Table 7 shows parameter

Table 7. Regression Parameters of Replacement Rate (RR_1 and RR_2) According to Sex

	RR_1		RR_2	
Variables	Women	Men	Women	Men
Health				
Good	0.023	0.007	0.034	0.014
	(0.014)	(0.012)	(0.021)	(0.017)
Fair or poor	0.048	0.056***	0.066	0.099***
	(0.030)	(0.020)	(0.042)	(0.025)
Education				
High school	−0.070**	−0.032	−0.073*	−0.034
	(0.033)	(0.026)	(0.038)	(0.035)
College	−0.089***	−0.031	−0.072*	−0.035
	(0.033)	(0.028)	(0.043)	(0.035)
University	−0.128***	−0.040	−0.140***	−0.060*
	(0.033)	(0.025)	(0.043)	(0.033)
Work status				
Working	−0.016	−0.024**	0.004	−0.014
	(0.012)	(0.010)	(0.021)	(0.015)
Birth country				
Canada	0.013	−0.013	0.032	0.013
	(0.017)	(0.015)	(0.028)	(0.016)
Past earnings				
Quintile 2	−0.344***	−0.212**	−0.422***	−0.208
	(0.033)	(0.090)	(0.053)	(0.194)
Quintile 3	−0.483***	−0.385***	−0.621***	−0.429**
	(0.032)	(0.087)	(0.052)	(0.192)
Quintile 4	−0.525***	−0.449***	−0.696***	−0.524***
	(0.031)	(0.088)	(0.053)	(0.193)
Quintile 5	−0.558***	−0.480***	−0.763***	−0.597***
	(0.030)	(0.088)	(0.051)	(0.194)
No. of observations	388	415	388	415

Note: Standard deviations are in parentheses.

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Source: Authors' compilation from Statistics Canada (2020).

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Table 8. Regression Parameters of Replacement Rate (RR_1 and RR_2) According to Different Measures of Replacement Rates (Gross Earnings at Ages 35–54 Years, Gross Earnings for the Whole Earnings History Available, and After-Tax Income at Ages 35–54 Years)

	RR_1			RR_2		
Variables	(1)	(2)	(3)	(4)	(5)	(6)
Gender						
Female	0.012	0.017	0.007	0.030**	0.082	0.109
	(0.010)	(0.021)	(0.010)	(0.013)	(0.074)	(0.134)
Health						
Good	0.014	0.033	0.031***	0.022	0.023	0.252
	(0.009)	(0.022)	(0.010)	(0.014)	(0.071)	(0.182)
Fair or poor	0.055***	0.080**	0.049***	0.087***	0.177	0.407
	(0.017)	(0.031)	(0.014)	(0.021)	(0.362)	(0.314)
Education						
High school	−0.052**	−0.121***	−0.044**	−0.053**	−0.308	0.148
	(0.022)	(0.040)	(0.021)	(0.026)	(0.368)	(0.394)
College	−0.058**	−0.174***	−0.055**	−0.048*	−0.390	−0.096
	(0.023)	(0.040)	(0.021)	(0.028)	(0.399)	(0.239)
University	−0.081***	−0.152***	−0.082***	−0.094***	−0.437	−0.063
	(0.022)	(0.044)	(0.022)	(0.026)	(0.377)	(0.295)
Work status						
Working	−0.022**	0.025	−0.029***	−0.009	0.007	−0.119
	(0.009)	(0.027)	(0.010)	(0.014)	(0.043)	(0.090)
Birth country						
Canada	−0.002	0.032	−0.018	0.021	−0.401	0.164
	(0.012)	(0.023)	(0.013)	(0.015)	(0.268)	(0.117)
Past earnings						
Quintile 2	−0.314***	−0.193***	−0.293***	−0.380***	−1.118	−1.682**
	(0.034)	(0.053)	(0.028)	(0.060)	(0.825)	(0.720)
Quintile 3	−0.468***	−0.258***	−0.395***	−0.590***	−1.289	−1.864***
	(0.033)	(0.051)	(0.027)	(0.059)	(0.789)	(0.695)
Quintile 4	−0.523***	−0.325***	−0.432***	−0.672***	−1.337*	−1.937***
	(0.033)	(0.049)	(0.027)	(0.060)	(0.748)	(0.691)
Quintile 5	−0.551***	−0.335***	−0.460***	−0.743***	−1.376*	−1.971***
	(0.032)	(0.053)	(0.027)	(0.060)	(0.709)	(0.695)
No. of observations	803	597	843	803	597	843

Note: Standard deviations are in parentheses. In columns 1 and 4, we used pre-tax earnings from age 35 to 54 as the denominator to compute replacement rates. In columns 2 and 5, we instead used pre-tax earnings for the whole earnings history available (earnings history begins at age 31 years for people aged 66 years in our sample and age 34 years for people aged 69 years. Earnings history ends at the last year before retirement). In columns 3 and 6, we used after-tax income from ages 35 to 54.

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Source: Authors' compilation from Statistics Canada (2020).

estimates for RR_1 and RR_2 according to sex. Overall, the parameters are not statistically different between women and men, except for university education level with RR_1. In fact, education is similar to our baseline model for women and is different for men, albeit not significant. This could happen if education is more correlated with income for men than for women. The reverse happens with poor health, which is significantly positive for men but not significant, but positive for women. The overall results for quintile of past income are similar to the baseline model.

Robustness

In Table 8, we show the results obtained using different measures of RRs. The difference between the three measures used is the definition of past average income. In Columns 1 and 4, we report our baseline specification

for RR_1 and RR_2, respectively; recall that in the baseline specification, we use the average of the pre-tax average earnings when the individual was aged 35–54 years (RR_1 and RR_2, respectively). In Columns 2 and 5, we have used the average of the pre-tax average earnings for the whole earnings history available (earnings history begins at age 31 years for people aged 66 in our sample and at age 34 years for people aged 69 years. Earnings history ends at the last year before retirement).[14] In Columns 3 and 6, we used after-tax average income, which includes dividend, capital gains, and other income, when the individual is aged 35–54 years. The results are qualitatively similar for RR_1. When considering RR_1, we see that the RRs' negative association with education and positive association with health strengthens when using the whole career (Columns 2 and 5). This result shows that the end of the career (age 55 years to age at retirement) has an impact on RRs, but that it only strengthens trends observed during the core of the career. However, the use of after-tax earnings yields similar-magnitude parameters than the baseline but with a greater variance. Testing for RRs with after-tax earnings is still useful because Baker and Milligan (2009) argue that taxes during the career are higher than during retirement. Not accounting for it could then lead to underestimation of RRs.

The association with past income quintiles follows a similar pattern with the three different measures. The RRs decrease as the quintile of past income increases. This is particularly pronounced for the lowest three quintiles. Practically no difference in RRs is observed between the top two quintiles. This is because these quantiles exceed the maximum pensionable earnings for C/QPP: The fourth quintile begins at $51,800, which is the yearly maximum pensionable earnings in 2017 for the C/QPP. The difference between the first quintile and the rest of quantiles is smaller when we include the whole earnings history or when we use after-tax earnings.

Discussion and Conclusion

In this article, we find evidence that RRs differ with individuals' characteristics: RRs are higher for women, less-educated individuals, and those reporting fair or poor health. When we estimate a multivariate regression model and control for past income, we find that for singles, differences in past income fully account for differences in RRs. Hence, differences across characteristics only reflect differences in past income. For individuals in couples, in contrast, controlling for past income does not eliminate differences in RRs by individuals' characteristics. For instance, even after controlling for income, individuals with poor health have higher RRs than individuals with good health. The same is true for education, which is negatively related to RRs, even after controlling for past income. The fact that characteristics matter beyond past income, but only for couples, suggests a role for assortative matching in explaining the variation in RRs across individuals' characteristics. If more educated individuals have partners with higher past earnings, they have a lower RR, even conditional on their own past earnings. The fact that pensions depend on past household earning, not just individual earnings, increases the progressivity of the system. These findings crucially depend on the use of household-level data and a broad set of individual and household characteristics, and they go beyond those in earlier studies (e.g., OECD 2017).

Moreover, we find that OAS and GIS alone (RR_1) give a relatively low RR for people with no diploma (0.396) or with fair or poor health (0.326). The RR for these groups becomes, on average, more interesting when C/QPP is added, with a value of 0.623 for people with no diploma and of 0.548 for people with fair or poor health. RRs, however, decrease for people with higher education or better health.

Higher-educated individuals are more likely to have higher sources of private pension income, and this explains why they have better levels of self-reported sufficiency, even though public pension RRs are lower. We find that 26.6 percent of individuals with no diploma, versus 13.5 percent of those holding a university degree, declare that their income is not sufficient to comfortably cover their living expenses. Similarly, 30.2 percent of the individuals with fair or poor health report not having a sufficient level of income, whereas the percentage is 17.4 for those with excellent or very good health. A relatively good RR from public pensions and the C/QPP does not seem to be enough to satisfy more vulnerable people's needs, although it is sufficient to satisfy more than two-thirds of our sample. These results are in line with the fact that in the Canadian retirement system, even people with relatively high RRs guaranteed by public pensions must rely on individual savings or private pension plans to live comfortably during retirement.

With the enhancement of C/QPP to a targeted RR of 33 percent and the 10 percent increase in OAS at age 75 years, we estimate that the RR of these programs will reach 0.738 for people with no diploma and 0.654 for people with fair or poor health. These improvements represent a RR increase of 10 percentage points. As shown by Macdonald (2019) and Boisclair et al. (2018), recent changes in the public retirement system will undoubtedly improve the proportion of people declaring that their retirement income is sufficient among these groups, but more studies are still needed to evaluate the full extent of these improvements on income satisfaction during retirement for the most vulnerable groups of society.

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Notes

1 OECD (2017) includes Old Age Security (OAS), Guaranteed Income Supplement (GIS), and Canada/Quebec Pension Plan (C/QPP) when measuring the RR of public pensions.
2 See Government of Canada (2021) for a description of the different components of the pension system in Canada.
3 One shortcoming of our sampling strategy is that some people in our sample could be eligible for public pensions but may not yet have claimed them. Indeed, people can delay claiming their C/QPP or OAS until age 70 years. This issue does not significantly affect our results because 93.1 percent of our sample receive OAS or GIS. Similarly, 93.1 percent of individuals in our sample have claimed their C/QPP. This is in line with Staubli and Zhao (2022) and Mézil (2019). We did robustness checks, and the inclusion or not in our sample of people not receiving C/QPP or OAS and GIS does not significantly affect our results.
4 To be considered not working, an individual must earn less than $3,500 per year.
5 We use the relative measure of poverty called the Low Income Measure. It is defined by a threshold set at 50 percent of the median income.
6 Of 803 people, 650 (80.1 percent) answered this question.
7 See Milligan (2008), Veall (2008), Schirle (2013), and El-Attar and Fonseca (2022), among others, as well as official information in Canada (2021) for a full description of Canadian public pensions.
8 We do not restrict the sample to individuals who are receiving C/QPP. Of our sample, 93 percent receive C/QPP. The small fraction of people not receiving C/QPP should not significantly affect our results on RRs.
9 In the Robustness section, we also compute the RRs using two different measures of past earnings: (a) average pre-tax earnings for the whole earnings history available and (b) average after-tax income, which includes all income sources (i.e., dividend income, capital gains).
10 Even if spouses of a couple observed in 2017 were not necessarily together during the whole period, individual past earnings aggregated at the household level in 2017 still give a better picture of the standard of living during a couple's life than a short period of time when we can establish the link between the two spouses.
11 We estimated a specification without past poverty or past earning quintiles, and we obtained similar parameters as the specification with past poverty for the key variables, health and education.
12 Earnings from the first quintile range from $0 to $13,700. Those for the second range from $13,700 to $32,700; for the third, from $32,700 to $51,800; for the fourth, from $51,800 to $77,700; and for the fifth, above $77,700.
13 Previous work (El-Attar and Fonseca 2022) shows that public pensions are likely related to a decrease in the poverty rate in Canada. For example, most of those who are poor in 2009 are not considered poor in 2017, with a positive association with the redistributive nature of the public pension system.
14 We have also computed RRs with the pre-tax average earnings before retirement, and the results are closer to this method when we compute the whole career.

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The Future of Long-Term Care in Quebec: What Are the Cost Savings from a Realistic Shift toward More Home Care?

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Dans cet article, nous tâchons d'estimer les besoins et les dépenses à venir en matière de soins de longue durée au Québec, tout en proposant et en évaluant un train de réformes qui répondrait mieux aux besoins et serait plus viable financièrement que les politiques actuelles. Ce train de réformes consiste en une transition vers un usage plus intensif des soins à domicile, simultanément à l'élargissement des soins pris en charge par le gouvernement. L'un des éléments clés de la réforme consiste à donner davantage d'autonomie aux utilisateurs et utilisatrices quant au choix de leur fournisseur de soins, par la création d'un compte de soins pour personnes âgées; ce compte permettrait aux personnes qui en ont besoin de se procurer les services de différents prestataires, tant parmi les soins fournis à domicile que parmi les soins fournis en établissement. Dans le but de rendre plus neutre le soutien public à différentes formes de soin, nous proposons également d'augmenter la contribution des résidents et des résidentes des maisons de soins, tout en privilégiant le maintien des crédits d'impôt accordés aux personnes âgées dont les besoins en soins sont peu élevés. À partir d'une modélisation dynamique détaillée des besoins en soins, des modes de vie et des dépenses, nous estimons que les besoins en soins de longue durée connaîtront une hausse accélérée dans les vingt prochaines années, et que leurs coûts deviendront rapidement prohibitifs si les politiques actuelles demeurent en vigueur. Nous montrons qu'il existe un moyen de réduire ces coûts de manière substantielle.

Mots clés: soins de longue durée, soins à domicile, vieillissement démographique, finances publiques, Québec

In this article, we aim to estimate future long-term care needs and expenditures in Quebec while proposing and evaluating a reform package that could deliver increased coverage and be more financially sustainable than current policy. This reform package consists of a shift toward more intensive use of home care while increasing public coverage of care needs. A key feature of the proposed reform is to improve users' ability to choose their provider with the creation of a senior's care account, an account that allows individuals in need to purchase services from several providers, including both home and institutional care. To improve the neutrality of public support across care arrangements, we also propose an increase in the resident contribution in nursing homes while favouring the continued use of existing tax credits to help seniors with lower care needs. Using detailed dynamic modelling of care needs, living arrangements, and expenditures, we estimate that

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long-term care needs will grow rapidly in the next two decades, and the costs will quickly become prohibitive under current policy. We show that substantial cost savings may exist.

Keywords: long-term care, home care, population aging, public finance, Quebec

Introduction

Canada is aging at a pace that varies across provinces. Among those greying faster than others, Quebec and the Atlantic provinces are leading the way. In Japan, the world leader in terms of population aging, the proportion of those aged older than 65 years already exceeds 25 percent. In barely a decade, Quebec will reach this milestone. One of the most notable consequences of population aging is the rapidly increasing fraction of the population with long-term care (LTC) needs.

The health care system has been slow to adapt to population aging. Established in the second half of the twentieth century, Canada's health care system was organized around medical and hospital care, serving a younger population with acute illnesses. As early as the 1970s, provinces developed a separate support system for older individuals with care needs. For example, Quebec established the Centres d'hébergement et de soins de longue durée (CHSLDs) in the 1970s. In Canada, the nursing home model remains predominant to this day, with home care remaining a relatively marginal mode of care delivery. Among Organisation for Economic Co-operation and Development countries, Canada dedicates only 14 percent of LTC public financing to home care (Huber et al. 2009), far behind that of most European countries, with, at another extreme, Denmark spending 73 percent of its public expenditures on home care. With rapidly increasing care needs, the nursing home model is rapidly becoming financially unsustainable as provinces have a hard time keeping up. The coronavirus disease 2019 (COVID-19) pandemic has also demonstrated the limits of the nursing home model (Wyonch 2021). Béland and Marier (2020) suggest that the pandemic acts as a "focusing event" to think about policy. In this article, we aim to assess the future outlook of the current system and evaluate a reform package that improves coverage and neutrality while being more financially sustainable than current policies.

In Canada, LTC is a provincial jurisdiction that leads to a wide range of approaches in terms of delivery and financing. Attempting to model this level of heterogeneity and complexity at the Canadian level and propose a one-size-fits-all reform package would be a daunting task. Instead, we focus on the situation in the province of Quebec. Although our analysis is based on the Quebec model of delivery and financing, we think our results are of relevance to other provinces and the federal government. With scarce but informative data, we are able to prospectively calculate the population in need of care and service, evaluate the intensity of their needs, assign individuals to living arrangements, and attribute per capita costs. This rich framework enables us to craft a set of measures that, taken together as a reform package, could meet several policy objectives.[1]

To do so, we outfit a traditional demographic projection tool with a tracking system for the evolution of a total of 11 levels of care needs, using a categorization used in the current Quebec LTC system. We then build a realistic cost architecture on top of these projections to quantify the implications for current policy and the potential cost savings from a reform package. Three scenarios are simulated, with the Quebec government providing different coverage levels of needs. The proposed coverage levels (30 percent, 40 percent, 50 percent) are much higher than the current level of 8 percent. These scenarios also incorporate other changes, such as a reallocation of users across living arrangements, adjustment of fees for nursing homes and residential care, and commuting optimization for care providers. Overall, this package delivers cost savings relative to current policy while increasing the services offered.

One of the policy objectives we pursue is to improve the neutrality of public participation across living arrangements. The current model implicitly favours nursing homes because user costs are often lower (and public participation is often higher) than those for a comparable level of care delivered at home. However, empirical evidence shows that seniors mostly prefer home care over institutional care. A 2020 survey established that 91 percent of Canadians and almost all individuals aged 65 years and older plan on supporting themselves at home for as long as possible (NIA and TELUS Health 2020). Moreover, individuals expect public authorities to act more toward home care. A 2021 survey in Quebec shows that 75 percent of respondents want the authorities to take concrete actions to increase home care services (Centre de Recherche sur l'Opinion Publique 2021). Another survey, also conducted in 2021, shows that the COVID-19 pandemic reinforced the preference for home care. Of the respondents, 72 percent reported being less inclined to enter a nursing home because of the pandemic (Achou et al. 2021). Hence, this implicit subsidy of institutional care over home care is hard to justify.

In the next section, we present the methodology used for our projections in the status quo (current policy) and the proposed reform package. We then present the results regarding LTC users, care hours, and costs. We then discuss the limitations of the approach. The final section concludes.

Methodology

The Status Quo: Current Policy

As a benchmark, we use Quebec's current public LTC system. In this scenario, the current needs coverage is kept constant in all living arrangements, without adding any constraints on the supply side. For instance, new beds will automatically be provided if the need for beds in nursing homes is greater than the current capacity. We incorporate costs associated with building new infrastructure. The same goes for other living arrangements in which the supply adjusts to the demand for services. Labour supply perfectly adjusts to the needs without putting pressure on hourly wages. We assume that the coverage rate (CR) for home care needs, which corresponds to the share of individuals' needs covered by public services, remains constant in the future.

Next, we detail some of the key components of the simulation model (Clavet et al. 2021 can be consulted for more technical details).

Older People in Need of Support

The number of older people in need of support is modeled using data from the 2017–2018 Canadian Community Health Survey (Statistics Canada 2017–2018) and the 2016 Census (Statistics Canada 2016). First, we estimate the proportion of people who need help with at least one instrumental activity of daily living (IADL), by age group (65–69, 70–74, 75–79, 80 years and over), with the 2017–2018 Canadian Community Health Survey and the proportion of people in institutions, for the same age groups, with the 2016 Census. We then combine both proportions to obtain the share of frail older people (living at home or in institutions) in need of support. These shares are 9.8 percent for people aged 65–69 years, 13.1 percent for people aged 70–74 years, 16.6 percent for people aged 70–74 years, and 39.6 percent for people aged 80 years and older. Shares are then applied to demographic projections by age group with SimGen to obtain the number of older people in need of support.[2]

Intensity of Needs

Second, we attribute an intensity of needs to older people in need of support by using Iso-SMAF profiles (see Dubuc et al. 2006), the case-mix classification used in the Quebec health system to quantify care needs. This classification is used to assign individuals to particular care settings. The Iso-SMAF profiles are based on the SMAF (Système de mesure de l'autonomie fonctionnelle [Functional Autonomy Measuring System]) rating scale, which assesses a person's disabilities with 29 items covering activities of daily living (ADLs), mobility, communication, mental functioning, and IADLs (Hébert et al. 2001). The Iso-SMAF profiles were developed by cluster analysis. SMAF ranks individuals from Profile 1 (low IADL needs) to Profile 14 (high needs in all categories) according to physical and mental disabilities (see Raîche et al. 2014 for more details). Quebec is the only province in Canada that uses this instrument. Other provinces use indicators derived from the Resident Assessment Instrument (Hirdes, Poss, and Curtin-Telegdi 2008).

To attribute Iso-SMAF profiles to people in need of support, the Program of Research to Integrate Services for the Maintenance of Autonomy (PRISMA) survey is used to estimate the proportion of Iso-SMAF profiles by age group.[3] These proportions are then applied to the number of individuals in need of support.[4] The PRISMA survey did not allow differentiation of Iso-SMAF Profiles 11–14. Profiles 11–14 were therefore grouped into a single profile, 11+. This aggregation has a limited impact on the projections because most individuals with Profiles 11–14 live in nursing homes, and the computations use Iso-SMAF profiles only for home care costs.

Living Arrangements

A third step consists of assigning people with support needs to a living arrangement or care setting. Three living arrangements are considered: (a) nursing homes, (b) residential care, and (c) home care. Nursing homes, also called CHSLDs, are facilities in which people have severe LTC needs. Residential care facilities, corresponding to intermediate-care facilities and family-type resources, are smaller facilities that look more like homes for people with moderate to severe LTC needs. Finally, home care is when individuals receive LTC while living in a private residence or a retirement home. All older people in these three living arrangements receive publicly regulated and funded LTC. Nevertheless, only a fraction of people with support needs, as identified earlier, are taken care of in these publicly funded living arrangements. Of an estimated 315,568 people with needs in 2020, only 195,800 individuals received publicly funded LTC.

We then estimate the proportion of people with support needs in publicly funded living arrangements according to Iso-SMAF profiles, because public funding is higher for

Table 1: Percentage of Older People in Each Living Arrangement by Iso-SMAF Profiles: Status Quo

Profiles	Nursing Homes	Residential Care	Home Care
1	0.1	0.1	99.8
2	0.2	0.2	99.6
3	1.2	2.2	96.5
4	0.6	1.1	98.2
5	3.1	5.6	91.3
6	4.2	7.6	88.2
7	13.4	17.2	69.5
8	13.3	15.4	71.3
9	41.2	7.2	51.5
10	48.6	6.0	45.4
11+	67.2	1.5	31.4

Note: SMAF = Système de mesure de l'autonomie fonctionnelle.

Source: Authors' calculations.

people with higher profiles. In 2020, which is the reference year for our projections, 38,800 individuals were in nursing homes, 9,900 received residential care, and 147,100 received home care. Table 1 shows the share of older people in each living arrangement among people receiving publicly funded LTC (data from Ministry of Health). We see that individuals with an Iso-SMAF profile of 11 or higher mostly live in nursing homes (67.2 percent), whereas those with lower profiles are more likely to receive residential care or home care. However, a significant number of individuals with Iso-SMAF profiles lower than 10 reside in nursing homes.

Per Capita Costs

As a fourth step, per capita costs are calculated separately for nursing homes, residential care, and home care and are indexed at a rate of 1.6 percent per year over the period of projections.[5] Most of these costs are taken from administrative data found in Ministry of Health financial reports from nursing homes. Costs include public funding from the Government of Quebec and user costs for nursing homes and for residential care, but they are limited to public funding for home care, because it is not possible to calculate home care costs paid by users. Moreover, per capita costs are identical for all individuals in nursing homes and in residential care, regardless of their Iso-SMAF profile, whereas per capita costs for home care vary with individuals' Iso-SMAF profile. At first, the assumption of a unique cost in institutions regardless of individuals' needs might seem strong; however, most nursing home and residential care users are concentrated in a few Iso-SMAF profiles, whereas the distribution of Iso-SMAF profiles in home care is more widely spread.

In nursing homes, per capita costs include yearly operating costs and financing costs if the bed had to be built during projected years (since 2020) as a result of an insufficient number of existing beds. Operating cost is calculated from financial reports of the Quebec Ministry of Health and equals $100,900 for 2020. The financing cost equals yearly interest paid plus capital repayment. A construction cost of $362,500 in 2020 has been estimated for beds in nursing homes,[6] with financing over 25 years and an interest rate of 3 percent. [7]

The share of nursing home operating costs paid by users, also calculated from Quebec Ministry of Health financial reports, equals 18.3 percent ($18,500). The remaining share of 81.7 percent ($82,400) is financed by the Quebec Ministry of Health. In residential care, an operating cost of $67,100 per year is considered for each user. This cost was again calculated from Quebec Ministry of Health financial reports. Moreover, the share of this cost paid by users equals 20.3 percent ($13,600). The remaining share of 79.7 percent ($53,500) is paid by public funds.

In home care, per capita cost is calculated as the sum of a variable cost and a fixed cost. The fixed cost is $6,670 per user, and it corresponds to costs that are not related to Iso-SMAF profiles, such as readaptation services, technical help, and administration. The variable cost is a function of Iso-SMAF profiles, and it varies between Iso-SMAF profiles according to the supply of nursing care, personal care, and support services. For these types of care, the number of care hours necessary to fill a user's needs has been evaluated by Hébert et al. (1997). A number of hours for nursing care, personal care, and support care is then attributed to each user according to their Iso-SMAF profile. Nevertheless, we had to apply an intensity rate of 8.3 percent on average to these numbers to match aggregate home care expenditures because the Quebec government meets very little of the (theoretical) care needs of home care users (Tousignant et al. 2007).[8] To these gross hours of care, we also add travel time to expenditures because home care consultations usually require that the provider travel to and from the user's home. These costs can add up. We impute travel time proportionally to the number of care hours to include the commuting time between two home care users. Finally, we obtain the total number of hours worked by means of Iso-SMAF profiles for nursing care, personal care, and support services. We then apply to these total hours worked a wage rate for each care category.[9] This finally allows us to obtain the variable cost according to Iso-SMAF profile, which varies from $470 for Profile 1 to $16,964 for Profile 11+.

Last, we also modeled the home-support tax credit and the Financial Assistance Program for Domestic Help Services (FAPDHS),[10] two more minor measures of the Quebec government to support home care. These measures are included in total LTC expenditures every time we report those numbers. Again, more details about several aspects of the modelling can be found in Clavet et al. (2021).

Reform Package

The starting point for the reform package we want to produce is shown in Figure 1. The figure shows the average public funding per patient and Iso-SMAF profile under current policy. Three alternative care settings for home care are also introduced. The first observation we can make about current policy is that funding per patient in home care is much lower for any Iso-SMAF profile. Hence, there is a large public funding gap between institutional living arrangements (nursing homes and residential care) and home care. Simply shifting patients from nursing home and residential care to home care would reduce costs but would result in a reduction in the level of care provided. In fact, the CR of care needs, which is defined as the share of care needs (nursing, personal, and support care) that are financed by the Quebec government, is currently estimated to be 8.3 percent for home care. The current CR of needs in nursing homes and residential care is likely to be much higher even though we do not have a precise measurement of these figures.

Figure 1 shows that it would be possible to significantly increase the CR (to 30 percent, 50 percent, and 100 percent) in home care and generate savings if case load could be transferred from institutional living arrangements to

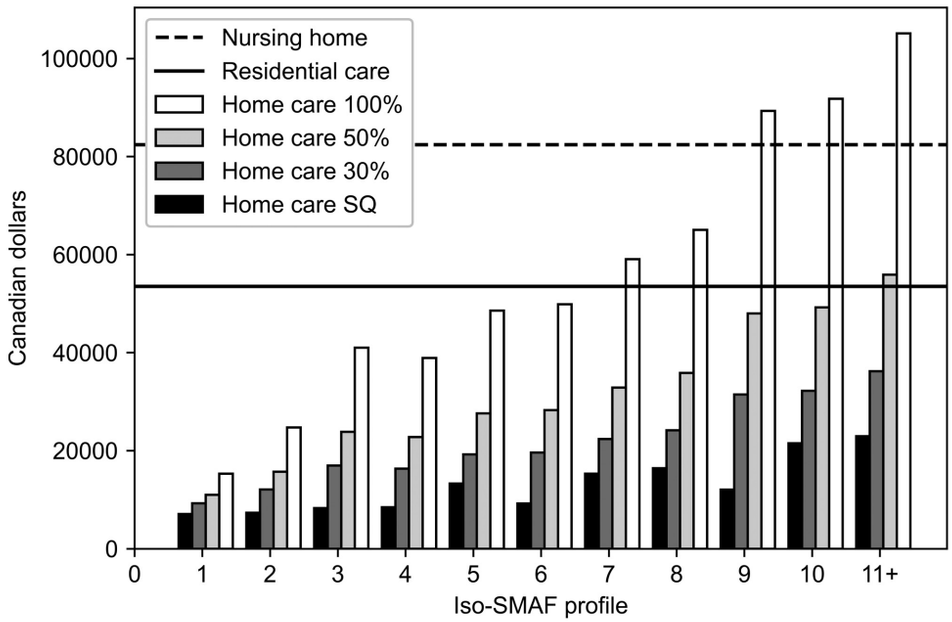

Figure 1: Individual Costs for the Quebec Government by Living Arrangements and Iso-SMAF Profile (SQ and Alternative Coverage Rates for Home Care)

Notes: Amounts in current dollars. SMAF = Système de mesure de l'autonomie fonctionnelle; SQ = status quo.

Source: Authors' calculations.

home care. For instance, it would be possible to increase the CR in home care to 50 percent to obtain equivalent public funding between home care for Iso-SMAF Profile 11+ and residential care. The room for maneuvering is greater for lower Iso-SMAF profiles, between 3 and 9. With a CR of 100 percent, per capita public costs for Iso-SMAF Profiles 1–6 would be lower than per capita public costs for residential care (and nursing homes).

Given these observations, it is clear that the actual system supports much more institutional care (nursing homes and residential care) than home care. Our departure point from current policy is therefore to seek better neutrality in terms of public support across living arrangements. Other issues, such as horizontal equity, freedom of choice, and reduction in costs, were considered in the conceptualization of our reform package. Financial sustainability is particularly important given mounting pressures on provincial public finances. Hence, we start by re-optimizing the distribution of people needing care across living arrangements, increasing the CR for home care, and adjusting the public support for residential care and nursing homes. Our alternative scenarios differ only on CR for home care. Three levels of CR are analyzed: 30 percent, 40 percent, and 50 percent.

Optimizing the Allocation Across Living Arrangements

An increase in public funding would enable more extensive use of home care among frail older adults while allowing them to obtain a higher amount of care. It does not mean that all individuals would live at home, but it means that they would be able to choose more freely where to live. We suspect that many would make the choice to stay at home, although we do not have solid, detailed evidence of preferences and sensitivity to user costs and CRs. This shift toward home care would mainly concern individuals with light to moderate care needs that can easily be provided at home provided enough services are covered and available. For instance, around 11 percent of individuals who live in institutions (nursing homes and residential care) have Iso-SMAF Profile 1–6 (low to medium care needs). It would be feasible to incentivize these individuals toward home care if sufficient care was provided to them. These individuals often end up in nursing homes because the home care supply is lacking. Note that a similar diagnostic has been made by the Canadian Institute for Health Information (CIHI; 2017). Using a large Canadian panel,[11] CIHI estimated that 22 percent of individuals in nursing homes also had low to moderate care needs.

Whereas Table 1 showed shares of living arrangements by Iso-SMAF profiles in the status quo scenario, Table 2 makes explicit the kind of re-allocation that could be desirable to induce. The main feature of a shift toward more home care is to promote its use for people with Iso-SMAF Profiles 1–9. Individuals with Profiles 1–6 would all be headed to home care. Those with Profiles 7–9 in nursing homes would be equally headed to residential

Table 2: Shares of Living Arrangements (in %) by Iso-SMAF Profiles: Reform Package

Profiles	Nursing Homes	Residential Care	Home Care
1	0.0	0.0	100.0
2	0.0	0.0	100.0
3	0.0	0.0	100.0
4	0.0	0.0	100.0
5	0.0	0.0	100.0
6	0.0	0.0	100.0
7	0.0	23.8	76.2
8	0.0	22.1	77.9
9	0.0	27.8	72.2
10	48.6	6.0	45.4
11+	67.2	1.5	31.4

Notes: SMAF = Système de mesure de l'autonomie fonctionnelle.
Source: Authors' calculations.

care and home care (leaving the more severe cases with an option to go to residential care). We assume that allocation across living arrangements for Profiles 10 and over would remain the same. There are inevitable implicit behavioural assumptions with any scenario, but the direction of the biases introduced by our choices is unclear. On the one hand, we may overestimate the number of people who would move to home care among those with Profiles 1–9. On the other hand, we may underestimate the number of individuals with severe needs who may prefer home care, properly funded, perhaps with help from the family.

We assume that the transition between the status quo (Table 1) and the reform package (Table 2) would be made progressively over 10 years. We assume the new distribution of living arrangements from Table 2 is achieved in 2030 and remains constant thereafter.

Increasing the Coverage Rate with a Senior's Care Account

One could of course force individuals to use home care when it is desirable to do so. Although this may be simple, one of the problems with the current home care system is that there is one provider, the Ministry of Health, that is very often unable to meet current demand. With the surge this reform package would create, we think an alternative public funding model for LTC is to give patients different options from which to choose, including community and private care and eventually residential care. This could be done with the creation of a notional senior's care account, which would be credited with an allowance function of the Iso-SMAF profile. For example, an individual with Iso-SMAF Profile 6 could be given an allocation from which they can purchase services. The money would not flow to patients to make transactions. Instead, it could be administered by the Health Insurance Board of Quebec (RAMQ), which is familiar with processing claims and paying for services. When contracting with a provider, which could be the state, the patient would see their account debited for the cost of the services purchased. Fees for these services could be set by the government or an external independent review board. This type of account would not need to be implemented for all Iso-SMAF profiles. In what follows, we assume that individuals with Iso-SMAF Profile 4 or higher would have access to such an account, whereas people with Profiles 1–3 would obtain sufficient support using a home-support tax credit and FAPDHS. Indeed, even with 50 percent coverage under a senior's account, the amount of the tax credit would be superior for these groups.

Individuals eligible for the account would be able to choose between different home care providers, including public community service centers (CLSCs), private providers, and community organizations, which would decrease the current pressure on public providers. Entities would need to be accredited to be able to bill the Quebec Health Insurance Board, and certification could be revoked if irregularities were uncovered. The account would reset every year with an annual amount depending on the current Iso-SMAF profile established by a health professional, and the Quebec government would finance the effective hours of care provided. Although the creation of this type of account does not have a material effect on our projections, we think it is an important element to consider, fostering freedom of choice and avoiding supply constraints with a unique central provider.

In terms of public financial support, the main difference between the status quo and the reform package we propose is the Quebec government's CR of needs in home care. Although the CR is equal to 8.3 percent in the status quo scenario, we propose to increase it to between 30 percent and 50 percent. A government could certainly aim for a higher CR, but the objective of keeping the reform financially sustainable constrains the coverage that can be provided. In addition to this increased coverage in the reform package, there is also room to optimize how care is delivered. In fact, it is common practice for personal care and support services to be provided by two different workers, although these two kinds of care could easily be provided by one person. The use of the same person to provide personal care and support services could reduce commuting time and staffing needs. Savings from this change increase with Iso-SMAF profile, and they range from 3.4 percent to 11.7 percent of individual home care cost.[12] Although our results do not depend crucially on this element, we think it is important to highlight these sources of efficiency gains in our projections.

Three home care CR scenarios by the Quebec government are considered: 30 percent, 40 percent, and 50 percent. These three scenarios are proposed because it is possible to significantly improve the level of care provided while respecting cost constraints. On the basis of

Table 3: Amount Available in the Senior's Care Account by Iso-SMAF Profile and by Coverage Rate Scenario

	Coverage Rate, $		
Iso-SMAF Profile	**30%**	**40%**	**50%**
4	13,400	17,900	22,400
5	16,200	21,600	27,000
6	16,600	22,100	27,600
7	18,700	24,900	31,100
8	20,200	26,900	33,600
9	25,900	34,600	43,200
10	26,700	35,600	44,500
11+	30,600	40,800	51,000

Notes: SMAF = Système de mesure de l'autonomie fonctionnelle.

Source: Authors' calculations.

our assumptions, Table 3 shows the annual amount that would be made available in the senior's care account as a function of the Iso-SMAF profile. Funding would increase significantly as a result and effectively multiply Quebec government funds by a maximum of 3.5 in comparison with current policy. Moreover, the amount of the senior's care account increases with respect to Iso-SMAF profiles. For instance, an individual with Iso-SMAF Profile 11+ could receive double the amount of public support received by an individual with Iso-SMAF Profile 4.

Adjusting Public Support for Residential Care and in Nursing Homes

The last main feature of the reform package is to adjust the public support rate for residential care and nursing homes (the share of total per capita costs covered by the public system). Currently, the public support rate is 81.7 percent for nursing homes and 79.7 percent for residential care (Table 4). When looking at the components of this support, one can observe that accommodation and meal costs are largely covered by the Quebec government. However, these expenses are supported by individuals when they use home care. Therefore, the current formula tends to favour institutional care over home care. To strive for more neutrality between individuals who live in different arrangements, it would therefore be possible to decrease the public support rate for residential care and nursing homes. Note that the proposed public support rate is an average, and it may vary depending on family income. The new system will therefore keep striving for more redistribution because the current system already reduces inequalities by means of subsidies.

It is possible to calculate the share of the total cost that should be paid by users if they were responsible for all accommodation and meal costs in private nursing homes that have an agreement with the Quebec Ministry of Health. Figures come from financial reports of the Quebec Ministry of Health.[13] By adding building management, meals, laundry, and other support services, we find that individuals should pay 30 percent of total costs on average in these institutions (a public support rate of 70 percent). This rate would be closer to what is observed in other provinces. In Canada, just less than three-quarters of LTC facility costs are paid by public sources, on average (Canadian Health Coalition 2018). The difference between Quebec and Canada in the average public support rate is around 5 percentage points. The Canadian average, however, is strongly pulled down by the province of Quebec. As reported by MacDonald (2015), the daily standard fee for a basic shared room in a nursing home (before subsidization for low-income patients) is $36 in Quebec, whereas it is $56 in Ontario. Comparing all provinces, the second-lowest daily fee is observed in Alberta, at $48 per day, which is still 34 percent higher than in Quebec. Nova Scotia is at the other end of the spectrum, with a daily fee equal to $104 per day, which is almost three times the daily fee observed in Quebec.

Considering these observations, we propose to increase the user contribution rate to 30 percent for residential care and nursing homes and thereby decrease the public support rate to 70 percent. Table 4 shows that the average user contribution increases from $18,500 to $30,300 per year in nursing homes. In contrast, average public support should decrease from $53,500 to $47,000 for residential care and from $82,400 to $70,600 for nursing homes.

Results

Long-Term Care Users

Iso-SMAF Profiles

Figure 2 shows the projected number of individuals receiving publicly funded LTC,[14] according to their Iso-SMAF profile. The number of LTC users is expected to increase from 195,800 in 2020 to 329,300 in 2035 (68.2 percent increase in 15 years) and to then reach 443,800

Table 4: Average Yearly Cost for Users and for the Government by Living Arrangement and by Status Quo Scenario and the Reform Package

	Cost, $			
Living Arrangement	User	Government	Total	Support Rate, %
Status quo				
Residential care	13,600	53,500	67,100	79.7
Nursing homes	18,500	82,400	100,900	81.7
Reform package				
Residential care	20,100	47,000	67,100	70.0
Nursing homes	30,300	70,600	100,900	70.0

Source: Authors' calculations from AS-471 files.

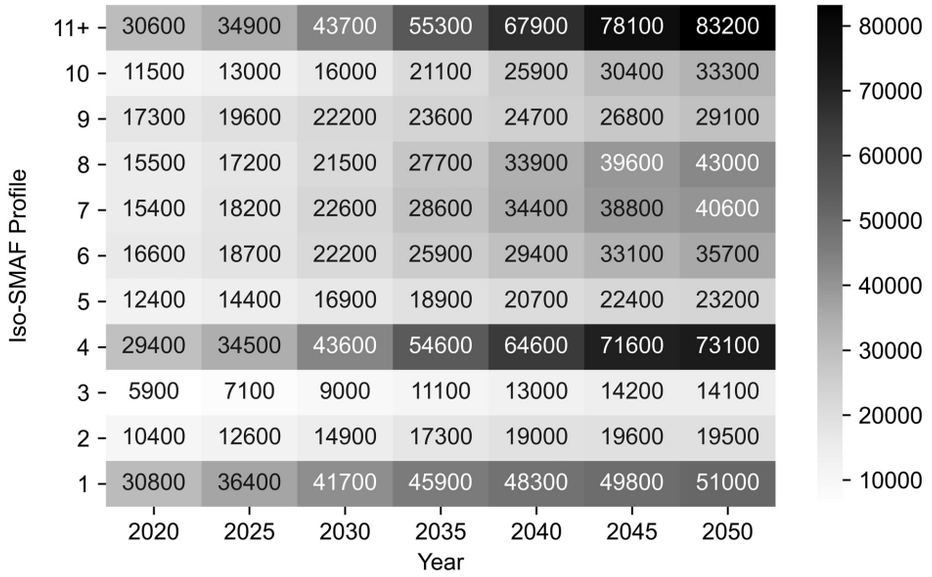

Figure 2: Projections of the Number of Individuals Receiving Public LTC by Iso-SMAF Profile

Notes: LTC = long-term care; SMAF = Système de mesure de l'autonomie fonctionnelle.

Source: Authors' calculations.

in 2050 (126.7 percent increase in 30 years). Figure 2 also reveals a stronger increase for higher Iso-SMAF profiles. The number of individuals in Iso-SMAF Profiles 7, 8, 10, and 11+ is expected to increase by 160 percent in 30 years. For instance, the number of individuals in Iso-SMAF Profiles 11+ increases from 30,600 in 2020 to 83,200 in 2050, which represents a 170 percent increase. The increase is lower in Iso-SMAF Profiles 1–6, although it is still significant. For instance, the number of persons in Iso-SMAF Profile 1 increases by 66 percent between 2020 and 2050. Iso-SMAF Profile 4 appears to have the strongest increase among lower Iso-SMAF profiles, with an increase of 150 percent in 30 years. The main reason for the faster increase in higher Iso-SMAF profiles is that there is population aging within the aging group. The share of those aged 85 years in the population aged 65 years and older increases. Because more severe Iso-SMAF profiles are more predominant among the oldest-old, the increase is larger for those groups.

Living Arrangement

Figure 3 presents the projected number of LTC users by living arrangement under the current policy and then under the alternative reform package.

The number of LTC users in residential care increases more rapidly with the proposed reallocation than in the status quo scenario. In 2050, the proposed reallocation leads to a need for 6,288 additional beds (26 percent increase) in comparison with the status quo scenario (an increase from 24,200 beds to 30,500 beds). Conversely, the projected number of LTC users in nursing homes and home care is lower after the reallocation. In 2050, the number of users is lower by 26,100 in nursing homes (26.5 percent decrease) and by 65,000 in home care (20 percent decrease) compared with the status quo. In home care, this decrease is explained by the choice of excluding Iso-SMAF profiles lower than Profile 4 from the senior's care account, which account for 84,000 people in 2050. Without people from Iso-SMAF Profiles 1–3, the number of home care users during this year would have been 239,000 rather than 323,000. These people are still eligible for the Tax Credit for Home-Support Services for Seniors and for the Financial Assistance Program for Domestic Help Services, but they are not included in Figure 3.

The decrease in need for additional beds in nursing homes has a sizable impact on construction costs. In fact, there is no need for additional nursing home beds in the next 10 years after reallocation, whereas the status quo scenario requires 15,300 new beds by 2030. By 2050, 59,400 beds should be built according to the status quo scenario (153 percent increase), but only 33,000 additional beds are necessary with the proposed reallocation (86 percent increase).

Hours of Home Care

The three alternative scenarios for the reform package differ according to the CR of home care provided by the Quebec government (i.e., 30 percent, 40 percent, or 50 percent of LTC needs). Figure 4 reports the impacts

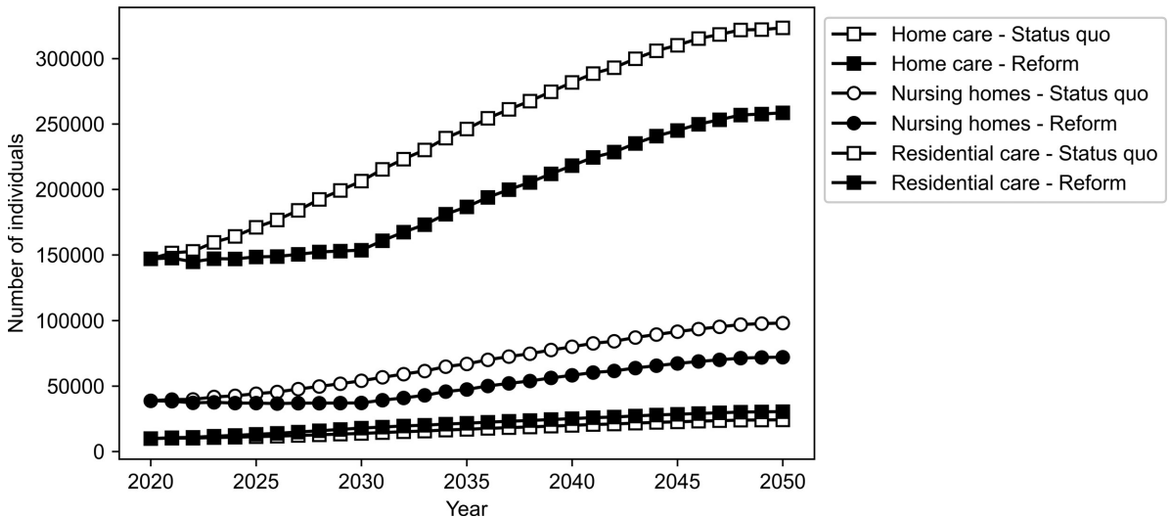

Figure 3: Number of LTC Users by Living Arrangement and by Scenario (Status Quo and Reform Package)

Notes: LTC = long-term care; RC = residential care; NH = nursing homes; HC = home care.

Source: Authors' calculations.

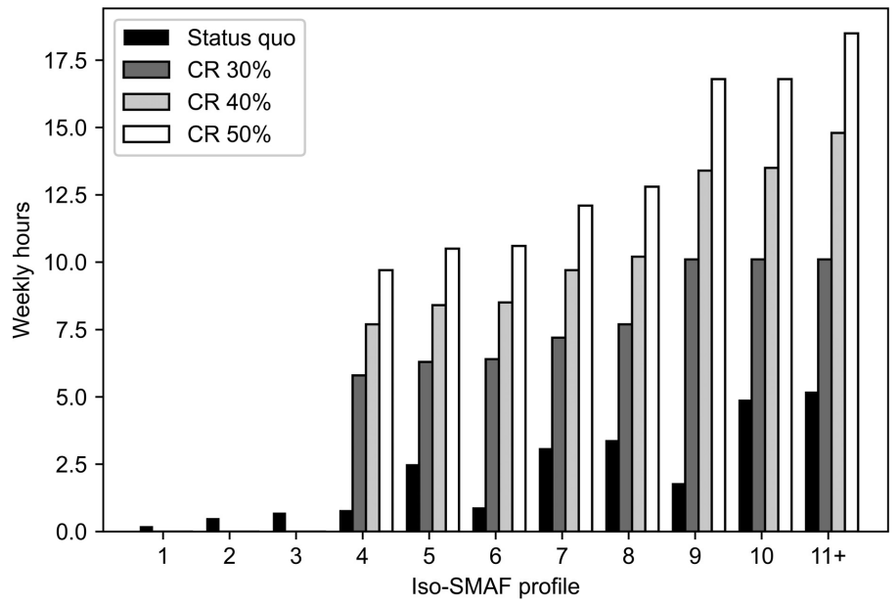

Figure 4: Maximum Number of Hours of Support Financed per Week by the Senior's Care Account by Iso-SMAF Profile: Status Quo and Alternative Scenarios

Notes: Amounts in current dollars. SMAF = Système de mesure de l'autonomie fonctionnelle; CR = coverage rate.

Source: Authors' calculations.

of such CRs on the number of hours publicly funded by the senior's care account by Iso-SMAF profile. Table 5 shows the impacts of these scenarios on the total number of hours of home care paid by the Quebec government between 2020 and 2050. In the status quo scenario, the total number of hours increases from 13 million in 2020 to 31 million in 2050. It increases to 100 million with a CR of 30 percent, 134 million with a CR of 40 percent, and 167 million with a CR of 50 percent. Over 30 years, the average annual growth rate (AAGR) equals 2.9

Table 5: Total Number of Hours of Home Care per Year Paid by the Quebec Government

			Reform Package Coverage Rate, %								
	Status Quo		30			40			50		
Years	Hr, M	AAGR, %	Hr, M	AAGR, %	Diff., M	Hr, M	AAGR, %	Diff., M$	Hr, M	AAGR, %	Diff., M
2020	13		13		0	13		0	13		0
2025	14	1.5	30	18.2	16	38	23.9	24	46	28.8	32
2030	18	5.2	59	14.5	41	79	15.8	61	99	16.6	81
2035	22	4.1	72	4.1	50	96	4.0	74	120	3.9	98
2040	26	3.4	84	3.1	58	112	3.1	86	140	3.1	114
2045	29	2.2	95	2.5	66	126	2.4	97	158	2.4	129
2050	31	1.3	100	1.0	69	134	1.2	103	167	1.1	136

Notes: AAGR = average annual growth rate; Diff. = difference.

Source: Authors' calculations.

percent for the status quo scenario, 7 percent with a CR of 30 percent, 8.1 percent with a CR of 40 percent, and 8.9 percent with a CR of 50 percent. The results suggest that the AAGR of the total number of hours increases by around 1 percentage point when the CR increases by 10 percentage points.

Costs

Current Policy Leads to Faster Growth of Institutionalization

Table 6 shows that the status quo scenario results in a strong increase in total costs for all living arrangements. However, the increase is stronger in institutions than in home care. Although the cost for the Government of Quebec increases by 340 percent in 30 years for nursing homes and by 290 percent for residential care, it increases by 270 percent for home care. Hence, we project an increase in the share of nursing homes and residential care in total long-term care expenditures, from 61.3 percent in 2020 to 64.8 percent in 2050. The status quo combined with population aging would therefore reinforce institutionalization in Quebec.

A Reform Package with a Shift in Home Care that Leads to Cost Savings

Before simulating the reform package from a dynamic perspective, it is possible to assess its impact in a static way. The complete implementation of the reform package in 2021 would decrease LTC costs for the Quebec government by 21.6 percent with a CR of 30 percent, by 11.4 percent with a CR of 40 percent, and by 1.1 percent with a CR of 50 percent. This static approach is useful to assess the magnitude of the reform package's impact in comparison with the status quo. However, it does not provide information about the cost savings over time for the Quebec government, which highly depends on the population dynamics associated with the reform package. Moreover, it does not consider a realistic reform timeline, which is spread over 10 years in our reform package. The results shown in Figure 5 and Table 7 include all these variables and introduce total expenditures for the status quo scenario (current policy) and the three alternative scenarios under the reform package.

Table 6: Cost of LTC for the Quebec Government in the Status Quo Scenario by Living Arrangement

	Living Arrangement					
	Nursing Homes		Residential Care		Home Care	
Years	M$	AAGR, %	M$	AAGR, %	M$	AAGR, %
2020	3,194		529		2,352	
2025	4,018	4.7	657	4.4	3,108	5.7
2030	5,483	6.4	866	5.7	4,082	5.6
2035	7,518	6.5	1,152	5.9	5,308	5.4
2040	9,826	5.5	1,469	5.0	6,557	4.3
2045	12,204	4.4	1,805	4.2	7,757	3.4
2050	14,070	2.9	2,083	2.9	8,756	2.5

Notes: LTC = long-term care; AAGR = average annual growth rate.

Source: Authors' calculations.

With the status quo, the total cost for the Quebec government increases by 310 percent between 2020 ($6.1 billion) and 2060 ($24.9 billion),[15] which represents an AAGR of 4.8 percent over the period. The annual growth of public expenditures is stronger between 2025 and 2035 (6.0 percent), which is driven by the strong increase in the number of individuals needing care during this period. In Figure 3, we show that the number of individuals receiving public LTC will grow by 45.2 percent between 2025 and 2035 and that it will grow by 28.4 percent in the following decade.

All the alternative scenarios under the reform package lead to lower expenditures and therefore cost savings. Total public costs include both the direct public cost of home care, residential care, and home care and the tax spending associated with tax credits and similar programs. The cost savings are positive for every year after 2020. For instance, in 2025 a CR of 30 percent reduces expenditures by $1.2 billion in comparison with the status quo scenario, which represents a decrease of 15.1 percent. A CR of 50 percent would also imply substantial savings. It would decrease the costs for the Quebec government by 6.0 percent ($464 million) in 2025 in comparison with the status quo scenario. There is still a little leeway over 50 percent because the CR that would equal the public cost of the status quo scenario and the public cost of the reform package is 52.5 percent for the year 2050.

Savings for the Quebec government quickly materialize during the first 10 years after the reform and are maximized in 2030 when the new allocation of living arrangements is achieved, as shown by the evolution of

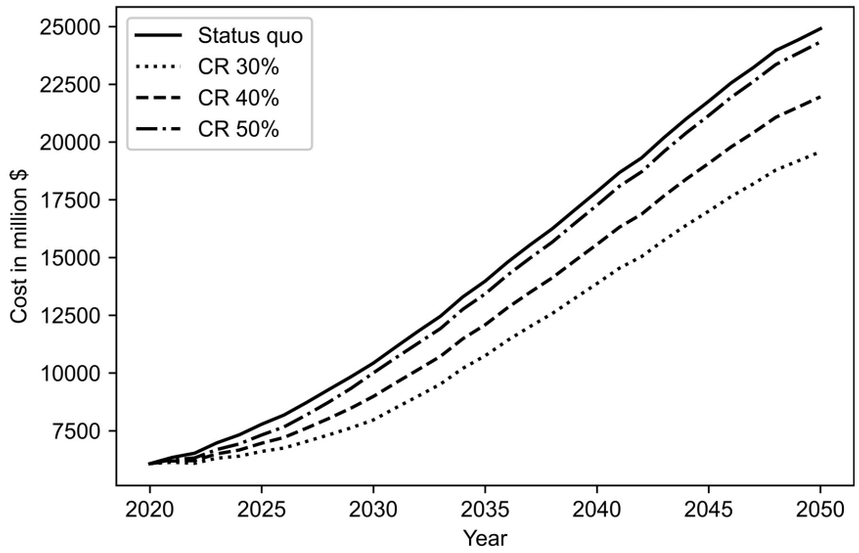

Figure 5: Total Cost of LTC for the Quebec Government for the Status Quo Scenario and the Reform Package (CRs of 30%, 40%, and 50% for Home Care)

Notes: Amounts in current dollars. LTC = long-term care; CR = coverage rate.

Source: Authors' calculations.

Table 7: Total Cost of LTC for the Quebec Government for the Status Quo Scenario and the Three Alternative Scenarios for Home Care

			Reform Package Coverage Rate, %								
	Status Quo		30			40			50		
Years	Amount, M$	AAGR, %	Amount, M$	AAGR, %	Diff., M$	Amount, M$	AAGR, %	Diff., M$	Amount, M$	AAGR, %	Diff., M$
2020	6,075	—	6,075	—	0	6,075	—	0	6,075	—	0
2025	7,782	5.1	6,606	1.7	−1,176	6,962	2.8	−820	7,318	3.8	−464
2030	10,430	6.0	7,969	3.8	−2,461	8,987	5.2	−1,443	10,006	6.5	−424
2035	13,977	6.0	10,749	6.2	−3,228	12,088	6.1	−1,889	13,427	6.1	−550
2040	17,853	5.0	13,872	5.2	−3,981	15,568	5.2	−2,285	17,263	5.2	−590
2045	21,766	4.0	17,009	4.2	−4,757	19,078	4.2	−2,688	21,148	4.1	−618
2050	24,909	2.7	19,581	2.9	−5,328	21,958	2.9	−2,951	24,335	2.8	−574

Notes: Amounts in current dollars. Dashes indicate that the AAGR cannot be calculated because there are no available data for 2015. LTC = long-term care; AAGR = average annual growth rate.

Source: Authors' calculations.

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the AAGR of total costs shown in Table 7. AAGRs for the alternative scenarios between 2020 and 2025 for CRs of 30 percent, 40 percent, and 50 percent are, respectively, 3.4 percentage points, 2.3 percentage points, and 1.3 percentage points lower than those for the status quo scenario. Between 2025 and 2030, AAGRs for the alternative scenarios are lower than those for the status quo scenario for a CR of 30 percent (−2.2 percentage points) and 40 percent (−0.8 percentage point) but slightly higher for a CR of 50 percent (+0.5 percentage point). Comparing AAGR between 2020–2025 and 2025–2030 shows that the gains are larger during the first five years of the reform than during the last five years. This can be explained by the progressive transition for living arrangements and CRs over 10 years combined with the population aging process that is not linear over this period. From 2035 on, AAGRs are very similar for all scenarios. However, savings are still generated after 2030. For instance, in 2050, the reform package with a CR of 50 percent is $574 million less costly for the Quebec government than the status quo scenario.

With the reform package considered, cumulated savings (in constant dollars) for the Quebec government from 2020 to 2050 are expected to be quite large. Thirty years after the reform, a CR of 30 percent generates $69.4 billion of cumulated savings. It represents 1.3 years of the Quebec budget for health expenditures, which equalled $53.0 billion in 2020–2021. These cumulated savings equal $40.5 billion with a CR of 40 percent (equivalent to 9 months of the Quebec budget for health expenditures) and $11.9 billion with a CR of 50 percent (equivalent to 2.5 months of the Quebec budget for health expenditures).[16]

Limitations

First, the results from our simulations depend to a great extent on underlying assumptions. In particular, the annual per capita costs growth rate of 1.6 percent is a conservative assumption given the current labour shortages and because health care costs usually outpace general inflation. It is thus useful to measure the sensitivity of the results according to this parameter. To this end, we estimated the impact of doubling the per capita costs growth rate (i.e., increasing it to 3.2 percent). Such a growth rate would change the total cost of LTC in value for all scenarios. For instance, for the status quo scenario, the cost of LTC is $39.5 billion in 2050 with a 3.2 percent growth rate instead of $24.9 billion with a 1.6 percent growth rate. With the reform package and a CR of 50 percent, the cost of LTC is $38.8 billion in 2050 with a 3.2 percent growth rate instead of $24.3 billion with a 1.6 percent growth rate. However, even if the total cost of LTC in value is highly influenced by this assumption, the impact of the reform package in comparison with the status quo scenario is comparable. Instead of decreasing the cost of LTC by 21.4 percent in 2050 with a CR of 30 percent, it decreases it by 21.1 percent. For the same year, a CR of 40 percent results in a decrease of 11.8 percent with a 1.6 percent growth rate and a decrease of 11.5 percent with a 3.2 percent growth rate. A CR of 50 percent decreases the cost by 1.9 percent with a 3.2 percent growth rate instead of 2.3 percent with a 1.6 percent growth rate. The relative impact of the reform package in comparison with the status quo scenario is therefore very similar regardless of the per capita growth rate.

Moreover, it is assumed that per capita needs for support will remain constant by age. The implication is that health status according to age will get neither better nor worse, whereas negative effects such as the growing prevalence of obesity and positive effects such as the improvement in health care for chronic conditions could modify needs for support by age. It is not clear whether negative effects will overcome positive effects. Nevertheless, recent research tends to tip the balance to an increase in healthy life expectancy (Cao et al. 2020). To evaluate the sensitivity of the results to a health status improvement, we measure the effects of decreasing the share of people with care needs by age. Following the results of Jehn and Zaracova (2019), we simulate a yearly decrease in the incidence rate of individuals with needs by 1.5 percent, up to maximum of 20 percent. As already noted for the per capita growth rate, a health status improvement modifies the total cost of LTC, but the impact of the reform package in comparison with the status quo scenario remains similar. In 2050, the total cost of LTC equals $20.4 billion instead of $24.9 billion without health improvement, which represents a gain of 18 percent. In 2050, the impact of the reform package with a CR of 30 percent equals a decrease of 20.9 percent instead of one of 21.4 percent without health improvement. A CR of 40 percent results in a decrease in LTC by 11.6 percent instead of 11.8 percent and a CR of 50 percent results in a decrease in LTC by 2.3 percent whether health status improves or not.

Second, this article focused on public costs for the Government of Quebec. User costs have been estimated for nursing homes and residential care, but it was not possible to estimate the share of individuals' needs that were covered by private insurance plans, out-of-pocket spending, or caregivers. Moreover, estimations do not include care from informal caregivers, who cover a high share of needs in Quebec and in Canada. For the entire country, MacDonald, Wolfson, and Hirdes (2019) estimate that the value of informal care was between $5.4 billion and $9 billion in 2019, depending on the monetization method (direct hourly wage costs or replacement costs). Moreover, these authors evidence that the number of hours per caregiver will strongly increase in the next 30 years. The reform proposed in our article is expected to reduce the need for informal home care by increasing the public CR from 8.3 percent to 30 percent, 40 percent, or 50 percent, depending on the alternative scenario.

Another limitation is that we do not consider the issue of labour shortages and how they affect cost savings. However, the effect would be ambiguous. Labour shortages are likely to put upward pressures on the trajectory of total expenditures with the current policy. It is unclear how shifting the allocation toward more home care would affect labour demand and ultimately labour costs. With senior's care accounts, one could even assume that this could spur entry on the supply side of the market, which could ease labour pressures in the public sector.

Conclusion

In this article, we projected the future needs and costs of LTC in Quebec. As a result of population aging and the rapid growth in the number of the oldest old (those aged 85 years and older), the current policy would lead to exploding costs and effectively increase the share of public expenditures devoted to institutionalization instead of home care. That path is not only financially unsustainable but also appears, in light of the various surveys documenting a clear preference for more home care, undesirable as a policy. At the current pace, it will be difficult for the public sector to build enough homes and beds to meet the upcoming surge. With provincial governments operating under tight budget constraints, a shift toward more home care has been advocated.

We show that a broad shift toward home care, while guaranteeing a reasonable level of care, does not lead to cost savings across the board. The shift needs to be targeted toward individuals with moderate care needs. In fact, caring for more severe cases tends to be more costly in home care than it is in institutions, and existing tax measures are sufficient to cover the needs of those with fewer needs. Once targeted to this group, it is possible to generate substantial cost savings while increasing the intensity of care given to those who receive home care. The public CR increase from 8.3 percent to 30 percent, 40 percent, or 50 percent represents a multiplication of public support to home care by 3.6, 4.8, or 6.0, respectively.

In the reform package we propose, we argue for the creation of senior's care accounts. Administered by RAMQ, an Iso-SMAF–indexed credit would be made available for seniors to purchase care. Seniors would not be responsible for handling claims; providers would directly bill the health insurance board for these services, as do physicians and drug stores for medication. The RAMQ would debit the value of care received from the account of each senior requiring care. Fees would be regulated and set by either the government or an independent review board. This type of account would ensure that seniors have the freedom to pick the type of care they prefer. The introduction of senior's care accounts could very easily be adjusted to the user's income and assets, which could also improve vertical equity (Blomqvist and Busby 2012).

The final element of the proposed package would be to improve neutrality in the current funding model by increasing the user contribution in nursing homes to a level that would make the public share of total costs more comparable to what it is for home care. As we document, Quebec strongly favours institutionalization by covering meals and other home support services in nursing homes but not in home care settings.

With this combined reform package, we show that a shift toward home care accompanied by an increase in covered needs in home care could reduce total LTC costs for the government. The alternative scenarios reinforcing home care and the creation of a senior's care account are in line with public long-term insurances developed in continental Europe, Japan, and South Korea. The amount funded by the government would be in the range of what is funded, for example, in Germany and the Netherlands (Flood et al. 2021). Grignon and Pollex (2020) reach a similar conclusion.

The current LTC financing model is pay-as-you-go, with general revenue funding public expenditures. Indeed, the LTC public insurance schemes in other countries are not capitalized (Hébert 2012). We are not proposing to change the financing model. First, moving to a capitalization model that would pre-fund future expenditures is not useful at this stage of the aging transition. Building up sufficient funding will take a long time and likely miss the bulk of the pressures ahead in the next decades. Second, we are not encouraging a move toward a larger presence of private LTC insurance. Insurance providers have moved away in recent years from this market for a number of reasons, and the trend is unlikely to be reversed anytime soon, especially in a low interest rate environment (Grignon and Bernier 2012; Boyer et al. 2020).

However, there is a role for a complementary insurance market to cover user costs in both home care and nursing home care. Under the possibility that user costs increase with income, retirees could find it worthwhile to subscribe to additional insurance to cover these costs. More education on the costs of LTC could certainly go a long way toward helping Canadians plan for this period of their lives and improve the dialogue with decision makers. Canadians have a number of misperceptions about the risks they face (Boyer et al. 2019). The reform package we present is constrained by the objective to generate a program that would be financially sustainable for provinces. We have not analyzed the potential participation of the federal government in such a model of care delivery. Clearly, there is the potential to deliver a higher CR in home care with the participation of the federal government.

There are a number of unknowns worth thinking about when planning for a LTC reform similar to the reform package we put forward. First, although we know (relatively) a lot about the supply of care, we still know

very little about demand for care and the economic value attached to different care arrangements in Canada. This hampers our ability to build scenarios that account for behavioural responses when we change user costs, and it also makes finding the optimal user costs more difficult. In the end, thinking about an optimal LTC system requires knowledge of both cost and economic value to improve the allocation of scarce resources.

Second, one of the major challenges of the LTC infrastructure as well as the health care system as a whole will be to recruit and retain sufficient workers to deliver services as well as increase productivity through the use of technology. Unless there is close coordination of training needs between stakeholders and faster diffusion of technological advances, the best reform packages will land in the immensely packed graveyard of failed reforms of the past.

Reinforcing home care funding would not only respond to older people's desire to stay longer at home in their physical and social environments, but it would also be less costly for the government and contribute to slowing down public spending associated with population aging. The Quebec government should seriously consider this option and make a major shift to home care.

Note Regarding Editorial Process

As Pierre-Carl Michaud, one of the Guest Editors of this supplemental issue, is one of the co-authors of this paper, he was recused from its editorial review.

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Notes

1 One attempt to produce projections at the Canadian level is MacDonald et al. (2019).
2 Research Chair in Intergeneral Economics (2022) contains an overview of the microsimulation model SimGen and a link to more detailed documentation. Aggregate projections by age, sex, and year are calibrated in Statistics Canada projections.
3 The PRISMA survey, conducted by Hébert et al. (2010) in Quebec from 2001 to 2006, measures the Iso-SMAF profile for a representative sample of 1,501 individuals in need of help.
4 Thus, a key hypothesis is that this distribution of the Iso-SMAF profiles by age has not changed since 2006.
5 We discuss the sensitivity of the results to the growth rate of per capita costs in the Limitations section.
6 Construction cost is calculated from historical construction costs from a request for access to information made to the Quebec Ministry of Health in 2017. The estimated cost was $325,000 in 2017 (Tremblay 2018), but the value has been updated to 2020 with a yearly rate of 3.7 percent. This rate corresponds to the annual average growth of the building construction price indexes for institutional buildings in the Montreal census metropolitan area between the first quarter of 2017 and the first quarter of 2020 (Statistics Canada 2021). The construction cost used corresponds to a conservative hypothesis, given the strong increase in housing prices in Quebec. As a comparison, a survey on announcements of LTC builds coming from various provinces estimated this cost at $536,000 (Gibbard 2017).
7 Notice that several amortizing durations have been tested and do not significantly affect the results.
8 The ratio varies across Iso-SMAF profiles. It is less than 10 percent for Profiles 1–4, 6, and 9 but increases to around 15 percent for Profiles 5, 7, 8, 10, and 11+.
9 On the basis of nursing homes' financial data and Ministry of Health financial statements, we use a wage of $64 per hour for nursing care, $36 per hour for personal care, and $18 per hour for support services.
10 The home-support tax credit is a refundable tax credit dedicated to Quebecers aged 70 years or older. It can be claimed for home services that are included in the rent, which targets especially private seniors' residences, and for occasional services that are not included in the rent such as laundry services, housekeeping, or dressing services. Individuals aged 18 years or older, who are covered by the Quebec Health Insurance Plan and who use the services of a domestic help business recognized by the Quebec Ministry of Health, are eligible for the FAPDHS. It allows a reduction in the hourly rate for home care services provided by social economy businesses, such as housekeeping, laundry services, meal preparation, and accompanying shopping.
11 This panel excludes Quebec.
12 Notice that nursing care has not been considered for this measure, because it requires specific degrees and knowledge that are different from personal care and support services.
13 That is, these costs are calculated from AS-471 financial statement files of nursing homes. The calculation is limited to private nursing homes under agreement because it was not possible to identify the costs related to nursing homes, residential care, hospitals, or CLSCs in public nursing homes.
14 Hereinafter, we call these individuals LTC users to simplify reading.
15 Of note, the magnitude of increase calculated with our analyses matches the country-level estimations produced by the National Institute on Ageing. Also, on the basis of a population microsimulation model, the institute found that the cost of publicly funded LTC will be multiplied by more than four within the next 30 years (MacDonald 2022).

16 These cost savings rely heavily on labour costs assumptions. Nevertheless, note that 55.4 percent of costs in nursing homes are related to nursing, personal care, and support care wages. In home care, these labour costs will depend on the CR of needs. With a wage increase of 10 percent in these care types, there will be a cumulated savings decrease of 66 percent with a CR of 50 percent, of 12.2 percent with a CR of 40 percent, and of 3.0 percent with a CR of 30 percent. In sum, our qualitative findings are robust to labour cost hypotheses for scenarios with a CR of 30 percent or 40 percent. The scenario with a coverage rate of 50 percent is less robust, but a wage increase of more than 15 percent would be needed to cancel cumulated savings.

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Addressing the Capital Requirement: Perspectives on the Need for More Long-Term-Care Beds in Ontario

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Il manque à l'Ontario, à l'heure actuelle, 70 000 places en soins de longue durée (SLD), soit 38 000 pour vider les listes d'attentes et 32 000 de plus pour compenser les installations qui doivent être remplacées, pour un cout total de plus de 20 milliards de dollars. Cette étude porte sur les sources et les exigences du financement des maisons de soins de longue durée en Ontario, ainsi que sur les structures de propriété dans ce secteur. Des entrevues semi-structurées permettent de comprendre les moyens dont disposent les propriétaires de maisons de SLD, leurs difficultés et leur volonté d'entreprendre les projets de construction nécessaires. Les propriétaires qui ont répondu au sondage ont nommé les difficultés suivantes : le manque d'accès au capital de financement, le rendement insuffisant du capital privé, les différences dans le financement selon le modèle de propriété, les différences de couts selon la région, ainsi qu'une règlementation contraignante. Des options concernant les politiques sont proposées pour surmonter ces obstacles et stimuler la construction et la relance des maisons de SLD.

Mots clés : maison de soins de longue durée, fonds pour les dépenses en capital, rendement du capital, construction, relance, structure de propriété

Ontario has an immediate need for 70,000 long-term-care (LTC) beds—38,000 to address current waitlists and a further 32,000 in need of replacement, which together will cost more than $20 billion. This study examines funding sources and requirements and ownership structures in the LTC homes sector in Ontario. Semi-structured interviews were used to understand the ability, challenges, and willingness of LTC home owners to undertake the needed construction. Respondents identified poor access to capital funding, inadequate returns on private capital, differences in funding by ownership model, differing costs by region, and regulatory obstacles. Policy options are identified to overcome constraints and spur construction and redevelopment of LTC homes.

Keywords: long-term-care homes, capital funding, return on capital, construction, redevelopment, ownership structure

Introduction

There is an urgent need to replace and supplement the stock of long-term-care (LTC) beds in Ontario. Against a current stock of 78,000 beds, the province requires approximately 32,000 beds to be redeveloped in the short term to meet current design standards and 38,000 beds to address the current waitlist. The associated construction cost of these 70,000 beds has been estimated at more than $20 billion (Marrocco, Coke, and Kitts 2021). These requirements are in addition to ongoing growth in demand spurred by the province's aging population.

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Despite the lengthening waitlist for beds, only 611 beds were built across the province between 2011 and 2018 (Government of Ontario Newsroom 2020b). However, 45 percent of all licensed beds (32,000) require redevelopment by 30 June 2025 or their licenses will expire. Substantial growth is also anticipated in the number of seniors in Ontario, who constitute the majority of LTC home residents. Ontarians aged 75 years and older are projected to increase in number from 1.1 million to almost 2.7 million between 2019 and 2046, and the number of seniors aged older than 90 years will more than triple, from 130,000 to 443,000 (Ontario Ministry of Finance 2020). However, the Government of Ontario, which is already constrained by high health care costs, has an unprecedented projected total debt of approximately $500 billion by 2024 (Powers 2021).

In July 2020, there were 627 licensed LTC homes in Ontario, of which 57 percent were for-profits (FPs), 27 percent were not-for-profits (NFPs), and 16 percent were municipally owned. At the national level, the Canadian Institutes for Health Information (CIHI; 2021) categorize homes as being (a) publicly owned by some level of government, representing 46 percent of LTC homes, or (b) privately owned, either FP or NFP, representing 54 percent of homes. The proportion of privately and publicly owned homes varies by jurisdiction, with the homes in the three territories being 100 percent publicly owned and the homes in New Brunswick being 100 percent privately owned (i.e., 30 percent FP and 70 percent NFP). Ontario, British Columbia, Alberta, Nova Scotia, and Prince Edward Island have significant FP ownership, with Ontario having the highest. Essentially, all jurisdictions in the country need to build additional capacity to meet demand for LTC beds and are examining funding and incentive structures to spur construction. The Conference Board of Canada has estimated that Canada will require 454,000 LTC beds by 2035, implying a need to build 199,000 beds to supplement a stock of 255,000 beds in 2016, with a projected cost of $64 billion in 2017 dollars (Gibbard 2017). This gap is represented by forecast growth in demand for beds as the Canadian population ages as well as catch-up for a deficit in beds compared with current demand, tempered by increased diversion of demand for LTC beds toward home and community care (Gibbard 2017). This estimate is in addition to the cost of replacing any existing beds before 2035, including those beds in Ontario that are not compliant with current standards.

This article is based on a study undertaken between June 2020 and March 2021 that focused on issues of financial viability in the LTC homes sector in Ontario and formed part of a broader research project titled "Long-Term Care in Crisis: The Reality of COVID-19," which was funded through the Canadian Institutes of Health Research.

The study focused on owners of LTC homes. Owners of homes, as distinct from operators, are the entities or their representatives responsible for making the economic decision to invest or remain invested in LTC home assets. In Ontario, ownership models include a mix of FP, municipally owned, and other NFP entities. They include small, closely held firms; large private and public corporations; registered charities and foundations; municipalities; community groups; and large national chains. Critical issues include whether owners possess the capital resources and interest in redeveloping existing homes that do not meet current design standards and in building new beds to address long waitlists and satisfy growing demand.

The LTC homes sector is highly capital intensive, requiring investment in land, buildings, furniture, and equipment. Owners access capital from a mix of governments, commercial and government-sponsored lenders, private investors, and donors. Access to capital is difficult to measure quantitatively because most FP owners do not disclose their financial information publicly and because access to funding varies by ownership model.

Research Methodology

The research on which this article is based used a mixed-methods sequential explanatory design (Creswell and Plano Clark 2011) consisting of two distinct phases. Phase 1 involved the collection of quantitative and descriptive data from numerous publicly available sources regarding the sectoral characteristics, regulatory environment, funding and financing regime, and prevalence of ownership structures used. These data informed Phase 2 key informant interviews. The mixed-methods sequential explanatory design was considered the best means to explore owners' subjective (qualitative) decision making, with interviews informed first by financial, regulatory, and ownership (quantitative) data regarding the sector, which might be expected to affect those decisions.

Fifteen participants were recruited using purposeful sampling. These included 13 owners (seven FPs, four NFPs, and two municipalities) and two LTC associations. An effort was made to obtain representation of ownership groups in the sample in approximately the same proportions as the ownership of homes in the province. In addition, representation was sought from rural and urban locations, small operators, and national chains (Table 1). All respondents were owners or senior executives of their organizations or in roles that involved financial responsibility.

The full study examined the financial viability of LTC homes. Interview topics pertaining specifically to this article included the adequacy of capital funding, the effect of ownership model on these decisions, the impact of the coronavirus disease 2019 (COVID-19) pandemic, the willingness of owners to undertake redevelopment or new construction of homes, and policy responses relevant

Table 1: Characteristics of Interview Respondents

Characteristics	No. of Participants
LTC home owners or senior employees	
For profit	7
Not for profit	4
Municipal home	2
Total	13
LTC associations	2
Total no. of respondents	15

Note: LTC = long term care.

Source: Authors.

to these matters. Interviews were semi-structured, and respondents were given discretion to pursue in greater detail the issues they considered most salient.

Phase 2 interviews were analyzed using content analysis (Saldaña 2015). All interviews were coded by the researcher (BR), and five interviews were independently coded, audited, or verified by two other coders to ensure consistency and completeness. Ethics approval was obtained from McMaster University. All interviews were conducted by telephone on a semi-structured basis by the researcher.

Long-Term-Care Sector and Funding Structure

Description of the Sector

LTC refers to a variety of services necessary for people who cannot care for themselves. These services can be provided in a variety of settings, including in one's home, in outpatient community settings, and in residences, including LTC homes and retirement homes. To be eligible to reside in a LTC home in Ontario, residents must require (a) nursing care on site 24 hours a day or (b) throughout the day and assistance, supervision, or monitoring to ensure their safety or well-being (Ontario 2007). Retirement homes typically serve residents with a broader spectrum of care needs, ranging from those who live independently to those who have care needs similar to those of residents in LTC homes. In Ontario, retirement homes are not eligible for the government care funding received by LTC homes.

In Canada, health care is under provincial jurisdiction, but to receive full federal funding under the terms of the *Canada Health Act* (Canada 1985), provincial and territorial insurance plans are required to fully cover all insured services (defined as "medically necessary" services provided by physicians and hospitals) to all insured persons (defined as legal residents of that province or territory). However, LTC services are categorized as "extended health services" and are not required to be covered. In Ontario, the Ministry of Long-Term Care (MLTC) has funded some LTC costs but leaves the cost of accommodation primarily to the resident.

Currently, LTC homes must be licensed under the *Long-Term Care Homes Act, 2007* (LTCHA; Ontario 2007a) and *Ontario Regulation 79/10* (Ontario 2007b) to operate as such and to receive government funding. LTC bed licenses are classified on the basis of their structural compliance with MLTC design standards. Class A beds substantially meet standards issued by the MLTC in 1998, and Class B and C beds generally meet 1972 standards but do not meet the 1998 standards. The standards include numerous construction features, but the most relevant ones for this inquiry pertain to resident room configurations, including the prevalence of ward-type rooms with the B and C licenses, where three or four residents may share living quarters and bathrooms. In July 2020, more than 40 percent of Ontario LTC beds were classified as B and C. Class A homes have typically been licensed for 25- or 30-year terms, whereas B and C bed licenses are currently scheduled to expire on 30 June 2025 unless renovated and upgraded to comply with current standards.

Ontario provides a public interest test in determining the geographic location of LTC homes across the province (Ontario 2007a), which considers, among other issues, existing resources in the area. Although this should promote the availability of LTC capacity in accordance with population density, there is evidence of fewer beds being available, relative to population, in more urban and suburban areas of the province (Roblin et al. 2019). Part VIII of the LTCHA also mandates municipalities to establish and maintain municipally owned LTC homes.

Owners of LTC homes range from sole proprietors to national chains. Despite some consolidation in recent years, the industry remains highly fragmented. As of 1 July 2020, 16 percent of LTC homes in Ontario were owned by the three largest chains. However, more than half of all LTC homes were owned by parties with either one or two licensed homes (Chartwell Retirement Residences 2016). In addition to direct ownership, some of the larger owners, such as Extendicare Inc. (Extendicare 2019), also perform management services for smaller owners, thereby increasing their presence in the sector.

Larger owners are able to achieve economies of scale in areas of supply chain management and bulk purchasing. They may also have more specialized management skills that include liaising with government, regulators, and labour. In addition, larger entities may have a greater ability to obtain debt and equity from financial markets (Chartwell Retirement Residences 2016).

Ownership Models

Ontario's LTC homes are owned by a mix of FPs, NFPs, and municipalities. The principal legal distinction between FP and NFP entities relates to the use of profits or

surpluses generated from operations. Ontario's (2010) ***Not-for-Profit Corporations Act, 2010*** provides that a NFP corporation may engage in commercial activities as long as they support the corporation's NFP purposes. Moreover, the corporation may generate a profit provided it is used exclusively for its NFP purposes and not paid out to its members. Therefore, the legal distinction between FPs and NFPs pertains not to the generation of profits but to how they are used by the corporation. The focus on profit may also have the unintended consequence of treating external capital differently depending on whether it is debt or equity. Externally sourced debt, in the form of mortgages or other loans, incurs an interest expense that reduces a firm's profit for accounting purposes and therefore brings the firm closer to break-even, or non-profit, status. However, where equity financing results in a return to capital providers, the return occurs after debt expenses and is part of profit for accounting purposes.

Funding of Operations

In Ontario, the MLTC provides both operational and capital funding to LTC homes. Operating funding flows through different level-of-care (LOC) funding envelopes, which are principally (a) nursing and personal care (NPC), (b) programming and support services (PSS), (c) raw food (RF), and (d) other accommodation (OA), including other wages, equipment, and supplies for dietary, housekeeping, furnishing, maintenance, operating, administration, and financing costs (Ontario Ministry of Health and Long-Term Care 2017).

LOC funding is provided to homes on a per-person, per-diem basis, totalling $185 per day at the time the study was conducted (MLTC n.d.). This funding level is consistent across the province, even though the costs may not be. The NPC, PSS, and RF envelopes are provided on a pass-through basis, requiring any amounts not spent by the home on these care-related services to be returned. The effect is that homes cannot earn a profit from MLTC funding of these non-care services. In addition, homes are not permitted to charge residents for any goods or services in these categories (Ontario 2007b). However, operators may retain as income any portion of OA funding (i.e., non-care portion) that is unspent. Homes may also charge residents directly for accommodation by means of a resident co-payment, according to amounts prescribed by the MLTC, although such amounts received by the home generally reduce, dollar-for-dollar, the LOC funding received from the MLTC (2019). In addition, certain premium amounts paid by residents, such as for a private room, may be retained by the home.

The LOC funding provides for various adjustments to these funding streams based on occupancy and size of home. There are additional streams for specialized programs, which increase both funding and complexity of the system. To supplement LOC funding, the Ontario government introduced several COVID-19 emergency measures during 2020 for the hiring and training of staff, prevention and control measures, and stabilization of operations (AdvantAge Ontario 2020; Government of Ontario Newsroom 2020c).

In addition to Ontario government sources, some homes are able to access external resources to fund operations. Some examples follow:

- Municipal governments contribute to municipally owned homes, over and above the provincial funding. In 2016, these amounts totalled $350 million, not including capital expenditures (Association of Municipalities Ontario 2019). This equates to more than $21,000 per resident per year, or about one-third of the amount provided by the province through the LOC funding.
- NFPs obtain funding from donations and bequests (Lasby 2020).
- Municipal homes and NFPs derive significant staff assistance from unpaid volunteers (AdvantAge Ontario 2018).

Generally, the resident is not responsible for paying any care costs in the home, although they may supplement with private care providers. However, the resident is responsible for a monthly accommodation fee, similar to rent. This amount is paid to the LTC home but reduces dollar-for-dollar the LOC amounts paid to the home by the MLTC (2019).

Funding for Construction

The MLTC contributes to the cost of home construction through the LTC Home Capital Development Funding Policy (Ontario Ministry of Long-Term Care 2020). In July 2020, the government announced the commitment of $1.75 billion over the next five years to accelerate construction of LTC projects, including new and redeveloped beds (Government of Ontario Newsroom 2020a). In addition, the 2021 Ontario budget included the investment of a further $933 million toward the program (Powers 2021).

Construction funding flows from the Ontario government to owners in two main forms. The Construction Funding Subsidy (CFS) provides a per-diem, per-bed stream for 25 years, whereas the Development Grant (DG) provides an up-front grant after certain approvals are obtained. The DG is available to cover between 10 percent and 17 percent of total eligible project costs, depending on regional categories (large urban, urban, mid-size, and rural) and targeted home sizes. Reflected as grant amounts available under the policy, DGs are stated to be between $24,923 and $51,376 per bed. Correspondingly, the total implied eligible project costs are between $243,717 and $302,212, depending on the DG percentages and the regional categories (Table 2).

Table 2: Implied Maximum Eligible Project Costs per Bed

Funding Parameters	Large Urban	Urban	Mid-Size	Rural
Maximum development grant per bed, $	51,376	47,926	24,923	29,246
Development grant percentage	17	17	10	12
Implied total eligible project costs, $	302,212	251,915	249,230	243,717

Source: Ontario Ministry of Long-Term Care 2020.

Responsibility for Construction Funding and Cost of Capital

Although the MLTC contributes to construction funding for LTC homes, a significant portion of the funding must come from other sources. This is distinct from care funding, for which many homes rely only on the MLTC's LOC funding for day-to-day operations. Where capital is contributed in the form of mortgage lending or other debt financing, the cost takes the form of interest payments. In the case of FPs, which raise equity capital, this cost of capital is paid for in the form of returns to investors by dividends or accumulation of retained earnings that accrue to shareholders.

In capital markets, the required rate of return to providers of capital is a function of the risk associated with the venture that generates that return. For businesses in which real estate makes up the largest component, the concept of capitalization rate is used to measure the required net operating income of an investment asset as a percentage of its current market value or the cost to (re)build it, reflecting the expected returns as a function of the risk associated with achieving them. Higher risk assets therefore require higher returns to justify an investment.

Before the pandemic, capitalization rates applicable to LTC homes in Canada were at historic lows, with more attractive properties in the sector carrying capitalization rates of approximately 7 percent (Roblin, Treitel, and McCrorie 2018). These rates increased somewhat during the pandemic, to approximately 7.5 percent by late 2020, despite a reduction in the Government of Canada 10-year bond, thus reflecting an increased risk premium associated with LTC assets (McCrorie, Payne, and Lennard 2021). This capitalization rate captures the return requirements of financial stakeholders as compensation for committing their money. It represents the average cost of capital, before considering how that return is allocated between debt and equity stakeholders.

Capital has a cost, regardless of whether a public or private entity is sourcing the funds. In the case of municipally owned homes that operate on a non-profit basis, the equity provided by the municipality is funded by the local taxpayer, who forgoes both the capital and its return, representing an opportunity cost to the local taxpayer. Similarly, the donor who provides the equity capital to the NFP also forgoes the return on capital that could otherwise be earned by the donor on that equity contribution were it not donated. The donor essentially makes an economic decision that the intrinsic value derived from making the donation is greater than the expected return that could have been earned in a similar-risk investment in the donor's hands.

When the government enlists the private sector to provide the capital required, it avoids having to use its taxpayer-funded financial resources. The trade-off is that it also has to allow the private sector to earn a return on the equity capital it contributes, because the government is not using public funds sourced from taxpayers.

Table 3 shows the government contributions to the total construction costs of one LTC bed, made up of the CFS per diem funding and the upfront DG funding. For illustrative purposes, an urban development is assumed with a total construction cost of $300,000 per bed, an amount consistent with estimates provided by study respondents and respondents interviewed by Ontario's Long-Term Care COVID-19 Commission (Marrocco et al. 2021). This amount fully utilizes the DG subsidy of $47,926 from Table 2. Together with the average CFS, the MLTC funding covers approximately 46 percent of construction costs ($138,067 of the $300,000 total), with the balance (approximately $161,933) required to be raised by owners, independent of MLTC programs.

In the example in Table 3, the cost of external funding would equate to $12,145 per annum, representing the 7.5% capital cost of the $161,933 funded by owners. This cost applies to owners of LTC homes of all ownership models,

Table 3: Ministry Funding Available per LTC HCDP

Funding Parameters	Amounts
Rural (lowest CFS per diem), $	20.53
Large urban (highest CFS per diem), $	23.78
Average per diem,[a] $	22.16
Average annualized, $	8,087
Payment term, y	25
Discount rate, %	7.5
Net present value of per diem CFS, $	90,141
Development grant (urban), $	47,926
Total HCDP per bed, $	138,067
Total construction cost per bed (assumed), $	300,000
Proportion funded by HCDP, $ (%)	138,067 (46)
Proportion funded externally, $ (%)	161,933 (54)

Notes: CFS = Construction Funding Subsidy; LTC = long term care; HCDP = Home Capital Development Policy; NFP = not-for-profit.

[a] Excludes planning grant available to NPF homes and per diem adjustments based on home size.

Source: Ontario Ministry of Long-Term Care 2020.

whether as an actual return to lenders or shareholders or as an opportunity cost to local governments, taxpayers, or donors that could have deployed those funds for other purposes.

Paying for this capital cost is problematic within the MLTC funding regime. Financing costs are limited by the flow-through nature of the LOC funding envelopes, which do not permit surpluses to be earned on care services and which regulate amounts obtained from the OA envelope. Essentially, any net surplus available to a home from MLTC funding must come from an excess of OA funding over its operating costs. This is a simplification, because a home's revenues are subject to the external funding sources listed earlier, certain preferred revenues that homes can earn from private room accommodation, and numerous and complex supplementary streams from specialized programs available from the MLTC. Obtaining representative and reliable data on operating surpluses of LTC homes is problematic for the reasons listed earlier. The Ontario Long-Term Care Association (OLTCA; 2015), before its 2016 Pre-Budget Submission to the Ontario government, undertook to portray the percentage breakdown of OA-related expenses as a percentage of OA funding, based on its analysis of the annual audited financial statements of 50 percent of LTC homes. Table 4 shows the breakdown.

As of April 2020, OA funding totalled $56.52 per diem, per bed (Ontario Ministry of Health and Long-Term Care 2019), or $20,644 annualized ($56.52 × 365.25 days). The financial data referenced by the OLTCA (2015) suggest that 16 percent of OA funding is available to defray the costs of capital expenditures and return on debt and equity capital, equal to approximately $3,300 per annum of funding. As indicated, this is only an approximation, because it does not account for other external or internal revenue (MLTC-funded) streams available to homes or additional expenses such as income taxes. Nevertheless, this leaves a large deficit against financing costs of $12,145, as estimated earlier, to be funded by the owner.

Table 4. OA Expenses as a Percentage of OA Funding

Expense	%
Salaries, benefits, and purchased services	53
Utilities	9
Management and allocated fees	6
Maintenance and building services	4
Supplies and equipment	7
Property taxes	2
Insurance and communication	1
Other items	2
Debt service, mortgage interest, capital expenditures, and return on investment	16
Total	100

Notes: OA = other accommodation.

Source: Adapted from Ontario Long-Term Care Association (2015).

Owners' Responses Regarding Redevelopment and Construction

Propensity of Owners to Redevelop or Undertake New Construction Generally

In this section, we refer to respondents as R1 through R15, corresponding to the chronological order in which they were interviewed. The majority of respondents expressed doubt that the sector would meet the requirement to redevelop the B and C beds before their licenses were set to expire in 2025. Several respondents commented positively on the recent government construction funding initiatives announced in August 2020. However, most thought that these new funding initiatives would fall well short of meeting the need for new and redeveloped beds.

Many respondents pointed to the high cost of undertaking home construction or redevelopment in expensive urban areas. Much of this cost was related to the escalating cost of land, but even for rebuilds where the land was already owned, respondents noted that competing uses for the land presented more attractive financial opportunities than use as an LTC home. In addition, for existing LTC homes with a constrained lot size, redevelopment meant either the purchase of a second parcel of land at great expense or the displacement of all residents to other locations while a new building was constructed on the existing property. This meant that, for most redevelopments, the cost was the same as for new construction.

> The cost of having to decant [relocate] residents while you renovate or rebuild are huge, both to the system and to the operator. You lose the revenue, [incur] costs of laying off employees, and also the cost of redeploying when the building is ready to go. *(R6)*

Other respondents noted the business risk of having to purchase land for construction before learning whether their application had been approved and was eligible for government funding. Several respondents cited administrative red tape involved in approvals, licensing, and development as a major obstacle. Some complained that applications were turned down without adequate explanation.

> We have made three proposals for redevelopment in the past. . . . We spent a million dollars on planners and architects, and our proposals were not even given consideration. *(R3)*
>
> No idea why people are being turned down . . . but one of the biggest problems is all the red tape. When the Ministry originally starting giving beds, they had a whole task force that helped put it through. Now the red tape you have to go through to build is insane. *(R9)*

> The developer has to take the risk. So, if I want to do multiple projects, I need to know that I'm going to get approvals for the replacement beds before I go out and commit to buying land. *(R11)*
>
> Part of the challenge with government is that they have approved [beds], but they can't get the development agreements started. They get mired in the muck. . . . They spend undue time looking at the architectural design and frankly it's an impediment to the process. They should have the architectural sign off that it is in compliance with the standard and move on. *(R14)*

Limiting Factors Dependent on Ownership Model

Factors that dissuaded owners from redeveloping or expanding in the sector differed by ownership model. For municipalities, there was a recognition of their obligation to rebuild homes to updated standards, but the majority of respondents who commented on the matter believed that most municipalities would not increase their role beyond their legal obligation to do so. Those respondents who commented on the perspective of local governments indicated that the financial burden of owning and operating LTC homes diverted monies from other purposes that the municipality was responsible to fund.

> And municipalities are losing enough on the one home, so they aren't going to build more. *(R12)*
>
> If council could get out of the business tomorrow, they would in a heartbeat. *(R1)*

NFPs were considered by most respondents to be the most disadvantaged in accessing capital for construction. Operating at or near breakeven made it difficult to meet debt service requirements posed by financial institutions, and aside from fundraising, there were no prospects of raising equity.

For FPs, the question was whether further investment in the LTC homes sector was the best means to use their capital in terms of risk and return, given other alternatives, opportunities, or obligations they may have.

> And we've seen organizations like [Company] saying strategically we're going to focus on retirement homes because the margins are higher, the regulation is a lot less, the reputational risk, public reporting, and COVID-19 is much less. So, it's manifesting itself in different ways depending on the organization, but I think that it [LTC homes] is a low-return endeavour for a huge amount of organizational effort with a ton of reputational risk. *(R10)*

Perceived Differences in Access to Funding

The MLTC's LOC funding model applies to all homes, regardless of ownership or profit status. However, respondents commented extensively on factors that put each of the ownership classifications (FPs, NFPs, and municipal homes) on a different footing from the others.

There was generally a recognition among respondents that municipal homes gained a significant advantage in receiving supplemental revenues from the local municipality. Most respondents regarded this as an unfair funding advantage and as evidence that the MLTC LOC funding alone was inadequate to cover expenses.

Regarding NFPs, respondents identified their ability to raise money through fundraising campaigns or charitable donations as an advantage that FPs or municipal homes were not able to enjoy to the same extent, and in some cases, this provided a significant supplement to MLTC funding. Some NFPs were affiliated with local hospitals and were able to derive supplemental funding from that relationship. However, NFPs were considered disadvantaged in their access to traditional lending sources, such as commercial banks. Because they operate at or near breakeven from a budgetary perspective, it is more difficult to service and repay debt.

For FPs, perceived disadvantages included the lack of recognition in the funding model for the cost of capital and less access to various community resources, municipal tax bases, charitable donations, and other programs that were available for other ownership models. Concerns were also voiced about the application of harmonized sales tax (HST), income taxes, and development fees that treated municipal homes and NFPs differently from FPs. However, FPs were seen as being able to make up for these factors with greater economies of scale and better access to capital markets than their NFP and municipal counterparts.

Need for Private Capital

Respondents mostly agreed that the financing required to redevelop and build homes to address the current bed deficit would need to come substantially from private capital, given government budgetary constraints and the reluctance or inability of municipalities or NFPs to access significant external capital. Two NFP respondents commented as follows:

> In terms of investment in this sector, it's going to need an innovative approach to have the private sector invest in the capital portion. The public sector cannot afford it on its own. So, some of that has to be funded by the private sector because the private sector does it much better than the public sector. *(R13)*
>
> So, the rebuilding will be done by the private sector, and they will only do it if the numbers make sense. No amount of browbeating them will help. They have shareholders to satisfy. The government has signalled they want these rebuilt, and it hasn't happened. Private sector is the only one [option]. *(R12)*

The FPs were regarded by most respondents as being best able to access financing through the capital markets by way of both debt and equity. However, the ability to attract equity capital was understood to be dependent

on owners being able to provide an adequate return on capital to investors, which depended on the particular investment.

> With the operating realities being what they are, the projects aren't driving enough return on equity to encourage investment. *(R5)*

Several FPs provided a perspective on the required returns in the LTC homes sector, noting that returns tended to be lower but more consistent than in the retirement homes sector. They also noted that the care delivery aspect of LTC was more prone to risks associated with human resources and vulnerable clientele, whereas the real estate infrastructure aspect was steadier but more capital intensive.

Several FP respondents drew attention to the fact that much of their capital funding came from private investors, which required a return on investment not factored into the government funding model and that this was poorly understood by the media and the public.

> People don't understand that the people who receive the dividends have given [Company] money to use in addition to the government funding. There has to be a better way to explain that. *(R5)*
>
> Private investors require an appropriate return. You can't justify a project unless there is some return on the capital that's invested. In terms of return, its pretty tight. *(R6)*
>
> The FPs require a return on capital because it's private capital. Not just that, but the dividends that are coming out of [public companies] are funded by the retirement homes, not LTC. The profits are made in retirement homes, and the public isn't told that. *(R15)*

Analysis and Discussion

In this study, we examined the ability, challenges, and willingness of LTC owners, including municipalities, NFPs, and FPs, to build or redevelop beds to meet current design standards and address current waitlists. There is an immediate need for capital to undertake construction of 70,000 LTC beds, which, at a cost of approximately $300,000 per bed, totals $21 billion. Respondents cited both regulatory and financial barriers to addressing the need, although the latter was the greater concern.

With respect to regulatory obstacles, respondents referred to the red tape around licensing, design and construction approvals, development agreements, and the need to obtain reapproval for designs that had already been approved once. There were also concerns about the transparency of the approval process and the need to spend money on land and other expenses before learning whether a project would be approved.

To enhance the financial incentive for owners to pursue construction projects, the Ontario government introduced new measures during the pandemic and in the 2021 budget. At the time of the 2021 budget announcement, the government reported that it was moving forward with the approval of 9,478 new beds and the upgrade of an additional 5,212 existing beds to meet current construction standards (Powers 2021). The new funding was applauded by many respondents as a substantial enhancement to the previous funding available, although most expected that redevelopment and new builds would not come close to the number needed. Of particular concern were the special challenges of densely populated urban areas, where the need for beds is greatest but costliest, and the limited take-up expected from municipal homes and NFPs that either lack the necessary internal funding or have other priorities.

Recognizing Differences in Access to Funding

Access to funding from sources other than the MLTC was considered a significant issue for all three ownership models in owners' willingness to undertake LTC home construction. Most respondents noted the position of municipally owned homes, which receive significant supplemental funding from the local tax base. As a form of government intervention, many of the respondents saw this as patently unfair to the other owners and residents, indicating a clear acknowledgement that the MLTC funding was inadequate on its own. Although some of this supplemental funding was explained in terms of higher wage rates paid to staff in municipal homes, the perceived effect expressed by owners was that it made it harder for other homes to compete for staff in a sector that was already constrained for resources.

NFPs were noted to have access to certain preferential MLTC funding for staff costs and a $250,000 grant under the Home Capital Development Policy. NFPs were also said to be subject to lower HST than FPs and to be exempt from development charges in certain regions. In certain cases, NFPs had close affiliations or common ownership with hospitals, which absorbed some costs while providing operating synergies. NFPs were seen as having greater ability to fundraise from private sources, particularly as charities or foundations, with the ability to issue tax receipts. In addition, NFPs were perceived to have a preferred position in attracting volunteers, thereby increasing care hours without affecting employee costs.

The principal financial advantage cited for FPs was their greater access to capital markets to fund construction. However, the offset, as noted by respondents, was that there exists no provision in the government funding model to address the cost of capital from private sources.

Private Capital Imperative

Regarding capital for development and construction of LTC beds, almost all respondents commented on the greater availability of and need for private capital or,

conversely, on the inability or unwillingness of governments and donors to provide the necessary capital. Together, these comments support a role for private capital in funding LTC development.

Although municipalities are expected to redevelop their B and C homes by 2025, they appear to be less interested in increasing their stock of beds to meet additional demand, especially given that they already provide top-up funding that averages $21,000 per year to each home they already own. Indeed, the Association of Municipalities Ontario (AMO) has called on the province to amend the LTCHA to give municipalities the choice of whether to operate a LTC home at all, allowing them to "invest their property tax dollars in the provision of services most appropriate to their local residents' needs" (AdvantAge Ontario 2018, 10). In the view of the AMO, "Given the evolution of long-term care into a primary care service, it is questionable whether the property tax base is the best source to top up provincial funding" (AdvantAge Ontario 2018, 9).

For NFP owners, the primary obstacle to large-scale construction was access to the necessary capital, both debt and equity. For many NFPs, debt service was problematic, and access to equity depends on securing hard-earned donations, because there is no ability to offer a return on capital to investors.

The Ontario government has, to date, not assumed a significant role in owning LTC homes, aside from a few instances that have involved partnerships with hospitals. The province continues to underwrite the bulk of funding for the care in homes and, as described, has already significantly increased its contribution to capital for home construction during the pandemic. Understandably, Ontario has become burdened with a substantially higher level of debt, in part as a result of the pandemic. Between 1990–1991 and 2020–2021, Ontario's net debt grew from $38.4 billion to $373.6 billion, and it is expected to reach $503.3 billion by 2023–2024 (Di Matteo 2022; Powers 2021).

Determining the Role of For-Profits in Long-Term Care's Future

The role for FPs in meeting the need for new LTC beds has to be considered in the context of their current role in the sector. At present, FP ownership accounts for a majority of LTC beds in Ontario. However, appealing to private capital to expand the sector could raise objections from those who oppose FPs' participation in providing care to seniors. At the time of writing, the Official Opposition in the Ontario legislature was proposing a plan to remove FP ownership of LTC homes, making all homes either publicly owned by government or owned by NFPs (Ontario New Democratic Party n.d.). The plan would bring an immediate stop to new licenses for FPs, an orderly transfer of all services to public and community health organizations and NFPs, and the redirection of public dollars to publicly owned and NFP homes, including funding for refurbishment and new construction. The economic trade-offs associated with such a policy could be significant. From a financial perspective, the removal of the private sector would require purchasing approximately 45,000 beds from private interests in addition to the costs to construct the 70,000 beds needed for replacement and waitlists, all at government expense. Using the assumed cost of $300,000 per bed referenced previously, a purchase of 45,000 beds would cost the government $13.5 billion for the operating assets (land, buildings, etc.) before considering the economic costs associated with expropriation of any licenses before their expiry.

Alternatively, if the role of FPs in the future expansion of the LTC home sector is to be preserved, this study suggests that it should be done with a better understanding of (a) the adequacy of current regulatory safeguards to prevent any diversion of profits from government-funded care envelopes and (b) the extent to which any differences in funding streams or other resources available to municipal homes, NFPs, or FPs might be contributing to corresponding differences in the magnitude of care expenditures at the home level.

This study highlights the fact that capital provided by NFPs and FPs to construct and own LTC homes is less expensive from the government's viewpoint, because it avoids approximately half of the costs of home construction (and the cost of capital associated with it) that would otherwise need to be funded through tax dollars. In addition, non-public ownership does not entail the significant government supplemental funding received by municipal homes. There are also revenues collected by government from FP homes in the form of HST, income tax, and development fees that are not received to the same extent from homes owned and run by the government.

However, as further suggested here, the gap in LTC home construction is unlikely to be met without some increase in incentives to owners to underwrite the capital costs involved. The government's challenge here has intensified in recent years as prices in the Ontario housing market have continued to escalate. Indeed, in the 12 months after completion of this research, the average sales price of residential homes in Ontario (all types) increased 25.8% (Canadian Real Estate Association 2022). This directly affects the opportunity cost to owners who must decide whether to build new LTC beds (or rebuild B and C beds before 2025) or to redeploy their capital and real estate assets for other use in the housing market.

Understanding Accountability and the Cost of Capital

All owners have to balance the needs of their stakeholders, which include residents, employees, and the MLTC. For FPs, an additional stakeholder is the private investor, who provides capital for the asset-intensive infrastructure

needed to operate. Health care services in Canada commonly operate on a contract model in which public payers contract with private health care providers (Deber 2014). In this model, the policy instruments used by government to maintain accountability can include financial incentives, supported by regulations that govern how participants must operate. For LTC homes in Ontario, that balance of interests is currently based on permitting FPs to earn returns while eliminating profits from care-related categories with flow-through funding, regulating the accommodation costs to residents, and enforcing universal care standards for all homes, regardless of ownership model.

As discussed, all ownership models in the LTC homes sector must deal with the cost of capital, although in different ways. For municipalities and NFPs, it is represented by the opportunity cost to local taxpayers or charitable donors, who forgo the use of or return on their capital to fund the portion of LTC home construction that is not covered by the province. They must account to those interests for the way their monies are spent. Under the FP ownership model, owners must answer to private investors, in terms of both the application of their investment funding and providing returns on the capital invested. Although the contribution of capital from private sources demands a return, that reality is often forgotten or misunderstood when examined in a health care framework.

Exacerbating the problem of cost of capital is the fact that the government's funding model lacks transparency around return on capital, the level of return required, and even the mechanism by which it is derived. In particular, the OA funding envelope does little to recognize the different financial requirements among ownership models. Although all homes receive the same basic funding through the OA envelope, those funds are expected to enable municipalities and NFPs to effectively break even after meeting accommodation-related expenses, whereas FPs are expected to generate sufficient returns to satisfy shareholders who have provided investment capital to the organization.

This structure is in contrast to those of other regulated, capital-intensive industries in which participants' revenues are set according to the required returns dictated by capital market considerations. In many such industries, a firm's revenues are set by an outside agency that determines a fair return to capital providers. Thus, where governments limit competition by means of special licenses or other barriers to entry, or contribute to or sanction funding, regulation ensures that firms do not exploit the opportunity for excessive profits (Callen, Mathewson, and Mohring 1976; Moore, Durant, and Mabee 2013; Taggart 1981). The Ontario Energy Board (OEB; n.d.), for example, establishes the rates charged consumers on the basis of, among other things, a set required rate of return on assets deployed by electrical utilities. In rate applications, the OEB (n.d.) attempts to balance reliability and quality of service with the financial viability of the utility, where "regulation ensures that the public good is served." Regulating the returns of LTC homes could similarly be done on the basis of the public good, because competition is confined to those with licenses, the sector is capital intensive, services are funded by government, and profits are permitted.

The absence of any provision for returns to investors in the LTC homes funding model leads to two problems. First, it results in FPs needing to "find" profit within an OA envelope that funds NFPs and FPs the same way. Second, it means there is no standard, or even guideline, to indicate what reasonable returns ought to be. There are numerous ways to address these problems that can bring transparency to FP returns while at the same time aligning returns more closely with the risk inherent in infrastructure assets of the LTC sector. The LOC funding envelopes already distinguish care expenditures (NPC, PSS, and RF) from accommodation or infrastructure expenditures (OA), with the latter addressing occupancy costs and requiring the bulk of the capital requirements for LTC homes. This presents an opportunity for government policy to establish return criteria and quantum within the accommodation envelope.

This in turn can lead to a recognition that ownership and maintenance of real estate infrastructure assets represent a separate business within residential care, as distinct from the staff-intensive services activities involving hands-on care of frail residents. Introducing greater delineation between the infrastructure business and the care operations would help address concerns about profit in seniors' care, which has received considerable attention in research (Pue, Westlake, and Jansen 2021) and in the media (Warnica 2021). At the same time, it would enable the segregation of two distinct investment classes: (a) real estate infrastructure assets, which provide relatively conservative returns and steady cash flows with a risk profile dependent on interest rates, financing availability, construction costs, maintenance, and zoning and (b) care operations, which are characterized by risks associated with reputation, contagious disease, vulnerability of seniors, regulation, staffing, and employee relations.

Capital formation also tends to be different for infrastructure assets, with pension funds, life insurance entities, and other institutional investors able to match the long-term return profiles to the term structure of their liabilities. Many of Canada's larger pension funds already have a significant presence in seniors' housing, including the Ontario Teachers' Pension Fund, which owns BayBridge Seniors Housing, and the federal government's Public Sector Pension Investment Board, which owns Revera Inc. Within the sector, there is also evidence that some investment funds prefer to specialize in the infrastructure side of the business as opposed to the operations side. As a

case in point, Axium Infrastructure Inc. is an independent portfolio management firm focused on long-term returns on core infrastructure assets, with more than $7 billion in assets under management. In October 2017, Axium entered into a joint venture partnership with Revera Inc. to share ownership of 32 of Revera's LTC homes in Ontario, Alberta, Manitoba, and British Columbia (Axium Infrastructure Inc. 2017). The transaction contemplated Axium owning a 75 percent equity interest in the joint venture, with Revera retaining the remainder and also continuing to assume responsibility for operating the homes. In March 2022, Axium further announced the acquisition of 16 LTC homes (2,418 beds) from Chartwell Retirement Residences, in partnership with AgeCare Health Services Inc. (CPE News 2022)

Establishing a stronger footing for private capital in the sector can also open the door to a greater role for Infrastructure Ontario (IO). IO reports to the Minister of Infrastructure and defines its mandate as facilitating partnerships between public and private sectors to modernize and create value for taxpayers (IO n.d.).

Consideration of Alternative or Supplementary Funding Models

Despite the recent changes in construction funding for urban regions, land prices around metropolitan areas were still viewed by respondents as making costs prohibitive, particularly for landlocked properties. The current construction funding model uses a tariff-based model that prescribes funding on the basis of location and building parameters. Incenting owners to build in expensive regions may require policies directed toward specific projects in critical locations. The government has already shown a willingness to consider projects outside of what it terms "traditional long-term-care development" by partnering with three hospitals to expedite procurement and construction of LTC homes at specific sites on hospital-owned land (Government of Ontario Newsroom 2022). Strategies exist to target projects by various means, including an auction process by which interested groups could bid on the construction of needed homes at sites where the government's current rate schedule leaves gaps in certain communities.

Limitations

This study's focus was owners of LTC homes; therefore, there may be bias with respect to views on the inadequacy of government funding and the strictness of sector regulation. Although the factual accuracy of comments could not be confirmed in many cases, the views are those of selected decision makers likely to influence the construction of LTC bed capacity. Further research could be undertaken to verify concerns and claims expressed by respondents.

The study involved a relatively small group of respondents. In addition, the greatest representation was from FPs, similar to their representation in LTC ownership in the province. This limitation was mitigated by considerable consistency in responses among all ownership groups represented, but further research could explore possible solutions for each group more fully.

The funding challenges explored here are shared across Canada and internationally, and further research could examine policy solutions from other jurisdictions and their applicability in Ontario.

Conclusions and Policy Implications

Respondents from all ownership groups confirm the need for additional capital in building out needed bed capacity in the province. However, Ontario's policy framework makes no provision for the cost of capital and no reference to what level of return is appropriate, and it provides no means to measure it or sanction it and no visibility around what returns are actually being earned. The LOC funding envelopes are already structured in a way that segregates care-related services for which no surplus is permitted, making way for a separate funding regime for the capital-intensive infrastructure required in residential care. Numerous examples exist of regulated industries that provide public services where returns on capital assets are funded, monitored, and enforced. A policy that recognizes and funds the capital cost of the infrastructure (as distinct from the care operation) can facilitate compensation for that capital, minimize concerns about firms profiting from care, and better accommodate an investor community that views these two asset classes differently in terms of risk and return profile.

In addition, the MLTC's current construction funding policy is based on a schedule of rates or tariffs that does not adequately account for regional circumstances that differ by population, real estate costs, tax base, affluence, or seniors' demographics. Alternatives exist to supplement the current tariff model, and they include regulatory and request-for-proposal or auction structures and the use of rate-based and other mechanisms to attract and deploy non-government capital sources, addressing the needs of particular communities and the risk profile of specific infrastructure assets.

Ontario's LTC sector faces an enormous challenge in redeveloping B and C beds, undertaking the construction of new homes to absorb a lengthy waitlist, and building additional capacity for the growing population of seniors. From a broad policy perspective, the government could opt for a reduced role for LTC homes in the care and housing of vulnerable Ontarians, relying more on home and community care options and privately funded retirement homes. Alternatively, funding constraints may lead policy toward greater funding required from residents themselves, perhaps from those individuals best able to pay. However, as policy currently stands, the senior care sector relies heavily on the provision

of LTC beds, and despite recent changes in the level of capital funding by the Ontario government, a current gap of 70,000 beds persists for those requiring a high level of care. The limited ability or willingness of existing owners in the sector to fund this gap necessitates policy to address the need for construction capital and the accompanying cost of capital.

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Non-Profit Long-Term Care in Ontario: How Financially Robust Is the System?

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Les conséquences catastrophiques de la maladie à coronavirus de 2019 ont mis en lumière la nécessité de réformer complètement les politiques, la règlementation et le système de financement des soins de longue durée au Canada, y compris par le renforcement du volet philanthropique du système de soins. Cet article évalue les conséquences, pour les fournisseurs sans but lucratif, de l'évolution des politiques ontariennes relatives aux soins de longue durée. On y analyse les tendances des revenus et de la santé financière des établissements caritatifs de soins de longue durée entre 2004 et 2017. Bien que les revenus de ces établissements tendent à la stabilité, leur solidité financière s'est rigidifiée au fil du temps, soumise à leur dépendance croissante au financement gouvernemental et à l'amenuisement de la contribution philanthropique.

Mots clés : financement de charité, soins de longue durée**,** aide financière de soins de longue durée, organismes à but non lucratif, soins de longue durée à but non lucratif, philanthropie

The disastrous effects of the 2019 pandemic have demonstrated the need for comprehensive reform of the policy, regulatory, and financing regimes of long-term care in Canada, including strengthening the non-profit component of the care system. In this article, we assess the implications of the evolution of Ontario's long-term-care policy on non-profit providers. We analyze the revenue trends and financial health of charitable long-term-care homes (LTCHs) from 2004 to 2017. Although the general pattern is one of revenue stability for non-profit LTCHs, their financial robustness has become more constrained over time as a result of greater reliance on government funding and declining philanthropy.

Keywords: charity financing, long-term care, long-term care financial help, non-profit organizations, non-profit long-term care, philanthropy

Across many countries, long-term-care homes (LTCHs) had a disproportionately high number of infections and deaths due to coronavirus disease 2019 (COVID-19). Among high-income countries, Canada has the worst record of COVID-19 deaths in LTCHs (Canadian Institute for Health Information [CIHI] 2021b). In the first and second waves of the pandemic, outbreaks occurred in 63 percent of homes; more than 101,170 residents and 56,770 staff were infected, resulting in approximately 17,000 deaths (National Institute on Ageing 2022), of which 31 percent (4,425) occurred in Ontario's LTCHs (Public Health Ontario 2022, 3). This tragedy has led to widespread calls to reform the long-term-care (LTC) system, including eliminating four-bed rooms, improved inspection and enforcement of standards, better integration of LTC into provincial health care systems, the introduction of national standards, and funding for new construction, among others (Office of the Auditor General of Ontario 2021; Tuohy 2021). The more dramatic policy shift that has long been advocated (Armstrong et al. 2020, 2021) is to transfer ownership of and management responsibilities for the large component of LTCHs operated by for-profit firms to the non-profit sector. Although the Government of Ontario has initiated greater support for select LTCH providers with its announcement in December 2021 of loan guarantees to encourage investment in expanded

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bed capacity (Government of Ontario Newsroom 2021), whether non-profits will be in a financial position to significantly extend their presence in LTC remains unclear.

The case, both conceptually and empirically, is that without a profit motive, non-profits will invest in more staff, better pay, and updated facilities; deliver a higher standard of care for residents; and foster greater public trust in the system (Armstrong et al. 2020; Comondore et al., 2009; McGregor et al. 2006; Weisbrod 1975). As charities that can issue tax receipts for donations, this sub-sector should be able to supplement the mainstay of government funding with philanthropy, thereby improving its financial footing. The purposeful expansion of the non-profit component of Canada's mixed delivery system of LTC presumes that this sub-sector is financially robust or could readily become so with some additional investment—an assumption that has not been adequately tested. We address this research gap by analyzing the financial health of LTCHs operated by charities in Ontario over the past 20 years to better understand the potential for expansion and innovation of the charitable component of LTC. *Financial health* refers to an organization's financial capacity, involving the resources available to attain the mission, adapt and innovate, and withstand unexpected crises and its financial sustainability as reflected in the fluctuation of this capacity over time (Bowman 2011; Hung and Hager 2018).

We first provide an overview of the LTC system in Ontario and describe policy changes since 1940, with a particular focus on those that have had significant implications for the configuration and financing of the system. We then analyze trends in the composite revenues of charitable LTCHs, including government funding, philanthropy, and revenues from earned income through the sale of goods and services. The non-profit LTC sector is not uniform, however, so we take a deeper dive into its sub-components, assessing differences by facility size and age, urban versus rural, accreditation status, and faith and ethnocultural affiliation.

Overview of the Long-Term-Care System in Ontario

Like other provinces, Ontario has a mixed LTC delivery system, although it has the most heavily for-profit system in Canada (Marrocco, Coke, and Kitts 2021; Pue, Westlake, and Jansen 2021). Approximately 58 percent (n = 377) of the 653 LTCHs in Ontario are owned by for-profits, 26 percent (n = 172) by non-profits (including charities and community-based non-profits), and 16 percent (n = 104) by municipal governments (Marrocco et al. 2021; Ministry of Health and Long-Term Care [MOHLTC] 2022; Office of the Auditor General of Ontario 2021). The non-profit LTCHs tend to be relatively smaller facilities (46 percent have fewer than 100 beds); 39 percent are medium-sized (100–200 beds), and only 15 percent have more than 200 beds (MOHLTC 2020, 2022). More than 90 percent of the non-profit LTCHs are registered charities that, in addition to being exempt from income and municipal property taxes, can issue tax receipts for donations, and 51 percent of these have faith or ethnocultural affiliations (Office of the Auditor General of Ontario 2021). Although non-profit in concept and ownership, increasingly complicated management structures make it difficult to neatly differentiate the fully non-profit LTCH from its for-profit counterparts (Stevenson, Bramson, and Grabowski 2013, 30). As shown in Table 1, 13 percent of the non-profit or charitable LTCHs contract out their day-to-day operations to for-profit firms. Our analysis focuses on the population of 112 LTCHs that are owned by registered charities, regardless of whether they contract out their operational management.

Table 1: Ontario Non-Profit LTCH Operators That Contract Out Day-to-Day Operations (N = 172)

Homes and Beds	Contract with for-Profit Firm	Contract With Charity	Do not Contract Out
Homes, *n* (%)	22 (12.8)	2 (1.2)	148 (86)
Beds, *n*	3,132	171	17,397

Notes: LTC = long-term-care home.

Source: Ontario Ministry of Health and Long-Term Care (2020, 2022).

Despite significant policy changes over the years, the configuration of the LTC system is designed to be very stable without consumer competition based on price. Licenses for new LTCHs may be granted for up to 30 years, and when existing licenses expire the preference appears to be for renewal (Pue et al. 2021). There are high barriers to entry for LTCH provision, in part because of the heavily regulated environment and capital costs (Daly 2015). The current system falls far short of meeting demand, however, because an estimated 37,000 people are on waitlists for LTC, requiring up to five years in some parts of the province to secure a place (Office of the Auditor General of Ontario 2021). The waitlists suggest a preference for non-profit and municipal homes because more than two-thirds of people are waiting for spaces in these homes (Marrocco et al. 2021, 39).

The provincial government provides the vast bulk of funding for LTCHs on the basis of a per bed, per day, and care-specific formula, no matter whether the home is for-profit, non-profit, or municipal. Of the total $6 billion in revenue of Ontario's LTCHs in 2019–2020, $4.4 billion (73 percent) was provided by the MOHLTC (CIHI 2021a; Office of the Auditor General of Ontario 2021). The government funding envelope is differentiated into health care, non–health care, and capital. Health care funding is a flow-through cost and cannot be transferred to non–health care budgets to ensure that no profit is made from health provision and that residents obtain a consistent level of health care support across homes (Morrison Park

Advisors 2021, 7). The non–health care portion of funding is further divided into three subparts: a global per diem, other accommodations, and development. LTCHs may offer three types of accommodations at differing rates: basic ($62.18/resident day, which is remitted to government), semi-private ($62.18 + a $13.02 premium that is retained by the home), and private ($62.18 + a $27.15 premium that is retained; Morrison Park Advisors 2021, 17). Each LTCH is required to offer 40 percent of its rooms at a basic accommodation price, regardless of the actual overall room configuration (Morrison Park Advisors 2021, 17). Although all homes must be licensed by the province, the MOHLTC provides an incentive of an additional $0.36 per bed per day for homes accredited through a sector self-regulatory system. About 84 percent of all Ontario LTCHs are accredited through this system (Marrocco et al. 2021, 73).

The second component of financing comes from non-governmental sources, notably through earned income involving the sale of top-up services paid by residents and ancillary retirement home rentals and through philanthropy. The resident-paid services include accommodation premiums, short-term-care respite beds, hotel-like accommodation for visitors, and other optional services such as Internet, cable, telephone, parking, and beauty services and products, among others (Morrison Park Advisors 2021, 17). In addition to premiums on semi-private and private LTC rooms, charitable homes may provide other types of seniors' rental accommodation (without nursing care) that are outside the provincial LTC formulas and regulations.

The charitable LTCHs should be able to attract additional discretionary funding through donations. Given that non-profits operate under a constraint of the non-distribution of profits, they are assumed to be trustworthy and come with a presumption of effective performance; donors receive "warm glow" benefits from this trust relationship that enhance the propensity to donate (Hansmann 1980; Weisbrod 1975). Because people tend to give, either through donations or bequests, to causes and organizations that touch them personally (Bekkers and Wiepking 2011; Breeze 2010)—such as having a loved one in care or being the recipient of care—LTCHs should be a prime candidate for philanthropy. An indicator of the importance of fundraising for charitable LTCHs is that 20 percent of them have established affiliated charitable foundations for this purpose (our calculation). Whether philanthropy and earned income are, in fact, significant sources of revenue for LTC charities, however, has not been examined in the Canadian context.

The configuration and financial viability of segments of Ontario's LTC system, as Baum (1999) notes, have been shaped by provincial policies. Although the LTC system is publicly funded with private (non-profit and for-profit) delivery and policy officially gives preference to non-profit provision, the system has evolved over time to favour the growth of the private sector. As Armstrong et al. (2021, 5) argue, it has also been characterized by "decades of underfunding and neglect" that contributed to catastrophic consequences during the pandemic. In the next section, we briefly address the implications of the major changes in the policy and financing regimes since the development of the modern welfare state.

Evolution of Ontario's Long-Term-Care Policy and Financing Regime

The modern era of LTC in Ontario is marked by the passage of the *Homes for the Aged Act* in 1947, with new legislation of the same name in 1949 that introduced regulation and increased provincial funding (Ontario Nursing Home Association 1999; Struthers 1997). For many years, however, the historical and legislative distinction between homes for the aged that served poor elderly individuals and nursing homes that were governed by health authorities produced a fragmented approach to financing and regulation (Berta, Laporte, and Valdmanis 2005; Daly 2015). Initially, for-profit homes of both types were mainly small, family-run facilities; most non-profits had a religious affiliation, and hospitals dominated care for those with more complex medical needs (Armstrong et al. 2020). Beginning in the mid-1960s, the regulatory regime was consolidated and strengthened. Amid wide variations in care and reports of abuse, in 1966 nursing homes were required to be licensed by the Department of Health, and some basic standards of care were mandated (Baum 1999; Daly 2015). Municipalities received provincial funding for re-allocation to facilities and were responsible for regulation and inspection, although oversight remained minimal. Smaller nursing homes that could not afford compliance with the new regulations closed, and during the late 1960s large new private nursing homes were built and the number of private-sector beds more than doubled, from 8,500 to 18,200 (Struthers 1997, 173).

A medicalized model was solidified in 1972 (Daly 2015) with the passage of the Extended Care Units program that provided public funding (through provincial health insurance) to residents with medical care needs (*The Nursing Homes Act* 1972, c 11.13.[1]), and transferred responsibility for regulatory enforcement from municipalities to the provincial Ministry of Health. Public funding, combined with low per diems, propelled the expansion of the for-profit industry and its consolidation into chains to capitalize on economies of scale, and it hurt the financial viability of smaller independent homes (Baum 1999). Over the next decade, the for-profit industry nevertheless lobbied for increased funding for its nursing homes on the basis that they were disadvantaged compared with municipal and charitable homes that were not subject to comparable taxation, could offer tax receipts for donations,

and were governed under separate legislation that provided more flexible funding arrangements (Daly 2015).

A decade-long period of "ad hoc-ism" followed as eldercare fell off policy agendas (Picard 2021). The lack of attention to eldercare is evident in the creation of the *Canada Health Act* in 1984 (Canada 1985), which aims to ensure consistency of access to medical services across the country but, among other services, excludes long-term residential and home care (Armstrong et al. 2020, 87). A New Democratic Party government initiated a new round of reform with *The Long-Term Care Statute Law Amendment Act* (Ontario 1993), which brought homes for older adults under the umbrella of the Ministry of Health and, with its 1994 companion legislation, mandated some basic standards of care, introduced a new envelope system of financing, and tied funding to a classification system based on the complexity of residents' needs (Daly 2015; Ontario Health Coalition 2002). By replacing the global funding model for non-profit and public LTCHs with a more constrained envelope model, the operational flexibility of non-profit LTCHs became more limited. At the same time, competition from the private sector increased when LTC was included in the 1994 North American Free Trade Agreement provisions (Canada 1993), which opened the Canadian LTC sector to ownership by international corporations and weakened the position of non-profit providers (Daly 2015).

When the Harris Conservative government swept to power in 1995 on the promise of tax cuts and privatization, it set about restructuring hospitals while committing to no reduction in the global budget of the Ministry of Health (Sinclair, Rochon, and Leatt 2006). During its term, the Conservative government closed 39 hospitals—one of every three acute care beds in the province—while promising a more integrated system of acute, long-term, and home care (Williams et al. 2016). In 1998, the Harris government announced capital funding of $1.2 billion for home care and LTC facilities, which was to be used to create 20,000 new LTC beds by 2006 and upgrade an additional 16,000 LTC beds in 102 structurally non-compliant facilities, although the demand for this level of expansion at that time was questionable (Williams et al. 2016). A new competitive bidding process was initiated that required bidders to have access to sufficient capital to build or retrofit existing buildings to meet new structural building classifications (Armstrong et al. 2020, 90). Consequently, two-thirds of the bids for new beds were awarded to for-profit chains, mainly for much larger facilities that then needed to be filled, thus further weakening the position of independent, non-profit operators (Armstrong et al. 2020, 90; Daly 2015, 46). The Harris government claimed that its introduction of a single point of access for home care and LTC through the creation of 43 regionally based Community Care Access Centres (CCACs) would produce greater coordination of services and cost efficiencies. Instead, the contracting model for care services, which was based on managed (winner-take-all) competition, resulted in the displacement of smaller non-profit home care service providers by large, primarily for-profit contractors and deepened inequities in access to services across locales (Cloutier-Fischer and Joseph 2000; Jenson and Phillips 2000; Skinner and Rosenberg 2006; Yakerson 2019).[1]

From 2003 to 2018, the successor Liberal government maintained parity of financial support requirements for all licensed LTC beds regardless of ownership, injected additional capital funding, and increased support for personal support workers. With the growth in the number of beds, however, staffing (and staff salaries) remained inadequate, and homes struggled to fill staff vacancies (Ontario Association of Non-Profit Homes and Services for Seniors [OANHSS] 2004, 2007; Sharkey 2008). As OANHSS (2000) observed, non-profit service providers faced ongoing pressure "to fundraise in order to bridge the funding gap and meet ever-increasing demands" (9).

Regulatory parity among for-profit, non-profit, and public providers eventually occurred in 2010 with passage of Ontario's (2007) *Long-Term Care Homes Act.* It amalgamated the three separate legislative authorities, in effect setting the same rules for all types of LTCHs, and aimed to strengthen enforcement of standards (Meadus 2010). Its preamble reinforced a commitment by the people of Ontario and their government to "the promotion of the delivery of LTCH services by not-for-profit organizations" (Ontario 2007).

At the same time, the province introduced an elaborate, standardized tool imported from the United States for the assessment of resident care needs, the Resident Assessment Instrument–Minimum Data Set (RAI–MDS), that was intended to produce more "evidence-based decision making" (Hirdes et al. 2003, 48) and that tied funding to measurement. The medically focused system required investment in sophisticated data systems and technical staff, was time consuming for care staff to administer, and linked funding to residents with more complex needs (Armstrong, Daly, and Choiniere 2016; Morrison Park Advisors 2021). As Daly notes (as quoted in Wells 2020), "It becomes a numbers game. The bigger the organization, the better they are at maximizing their numbers—to capture the highest level of complexity and acuity, and to ensure the highest level of funding." As a result, many smaller homes that had difficulty in effectively implementing the RAI–MDS system or could not play the numbers game well experienced a decrease in funding.

The decade leading up to the emergence of the pandemic was mainly one of policy drift or, in a more critical view, one of policy neglect (Armstrong et al. 2021) involving no serious policy, regulatory, or financing reform. Incremental upward adjustments were made to the government per diems, although they remain low. Workforce standards and data for making policy and managing the

sector were lacking, and integration across residential, community, and acute care was not improved (Estabrooks et al. 2020). Rather, the Conservative Ford government rolled back comprehensive quality inspections and ignored systemic concerns, leaving LTCHs unprepared to deal with the pandemic (Office of the Auditor General of Ontario 2021; Pedersen, Mancini, and Common 2020).

The policy and financial frameworks for non-profit LTCHs are still evolving. The provincial government has made new funding commitments and loan guarantees for the expansion of beds, and in April 2022 the *Fixing Long Term Care Act, 2021* (Ontario 1993) was proclaimed, replacing the *Long-Term Care Homes Act* with key goals of increasing hours of care and the accountability of LTC licensees and enhancing emergency planning. It also introduces greater transparency for retirement homes, which are regulated (to a lesser degree) separately under the *Retirement Homes Act, 2010*.[2]

In a system that has experienced a rapid expansion of large chain-owned for-profits, how have charitable LTCHs remained financially viable, and how robust is their current financial health? As resource dependency theory indicates, organizations will secure resources from their environments as needed and do so in a manner that enhances their position relative to others—which depends on the environment in which they operate (Froelich 1999; Malatesta and Smith 2014). The for-profit component of LTC has maintained financial profitability mainly through consolidation into large chains to capture economies of scale. Given that non-profit homes are more rooted in community, whether that is a place or a faith or ethnocultural community, consolidation to create economies of scale is not a favoured option as it has been for the private sector (Cooper and Maktoufi 2018; Singer and Yankey 1991). Rather, a distinct advantage of charitable LTCHs is their ability to supplement the relatively static provincial revenues with donations, in addition to income earned through the sale of user-pay services. Thus, philanthropy could be a sizable and consistent portion of the total revenues of LTCH charities. Given that earned income has been the fastest-growing source of revenue for the charitable sector over the past decade (Lasby and Barr 2021), we would expect LTCH charities to follow this pattern. In the rest of this article, we examine the patterns and factors in the financial health of Ontario's charitable LTCHs.

Methodology

Our contribution is to analyze how the financial position of Ontario's charitable LTC sector has changed over the past two decades, which we do in three ways. First, we examine the revenues of Ontario's charitable LTCHs since 2004, considering each of the components of government, philanthropy, and earned income. Second, we focus on measures of financial robustness and analyze financial indicators of LTCHs' financial positions. The third component recognizes that the charitable sector is not homogeneous simply because it is not-for-profit. Rather, differences in financial health, particularly the ability to earn discretionary income and raise philanthropic funds, may be influenced by several factors, including facility size and age, urban versus rural location, accreditation status, and faith or ethnocultural affiliation. Consideration of these factors is woven throughout the analysis.

The analysis relies on a panel of the charitable tax return (T3010) data that represents the population of 112 of Ontario's charitable LTCHs from 2004 to 2017.[3] The T3010 includes information on total revenues, as well as revenue from the sale of goods and services, tax-receipted donations, and transfers from other charities (e.g., the fundraising foundations of LTCHs), as well as expenditure and number of employees, which are not part of this analysis. The tax data have been supplemented by information on LTCHs' faith or ethnocultural affiliations, accreditation status, and number of beds gathered from LTCH websites and organizational annual reports, as presented in Table 2.

Revenue Trends

Here we examine the trends of each of the three main sources of revenue: provincial revenues, philanthropy, and earned income, considering differences by type of home where relevant.

Provincial Revenues

As expected, given the dominance of public funding, provincial revenue as a percentage of total revenue is largely stable between 2003 and 2017 for the majority of charitable LTCHs. For most, there has been a slight decline since 2013 that may reflect how they are applying the standardized RAI–MDS assessment that ties funding to the complexity of resident medical needs. However, in the 10th percentile of homes, we observe major variation. From 2004 to 2011, approximately 30 percent of these homes' funding came

Table 2: Ontario Charitable LTCHs by Faith or Ethnocultural Affiliation, Accreditation, and Bed Count, 2017 (*N* = 112)

LTCH Characteristic	*n* (%)
Religious or ethnocultural affiliation	60 (53.6)
Accredited	71 (63.4)
Bed count	
Small (0–99 beds/home)	44 (39.3)
Medium (100–200 beds/home)	45 (40.2)
Large (> 200 beds/home)	14 (12.5)
Mixed (multiple homes with different bed count)	9 (8.0)

Notes: LTCH = long-term care home.

Source: Ontario Ministry of Health and Long-Term Care (2020, 2022), LTCH websites.

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from provincial revenue, whereas from 2014 to 2017 the percentage was nearly zero (Figure 1). The reason for the low proportion of provincial funding for this set of homes pertains to the large amount of income earned from rental units that operate outside the LTC funding regime, as discussed in the Earned Income section. The combination of user-pay rental accommodation and LTC beds increases total revenues for the charity but limits the proportion that is provincial funding.

Philanthropy

The ability to offer tax receipts for donations and to receive gifts from foundations is a distinctive advantage for charitable LTCHs, and as the OANHSS (2000) has indicated, they have been actively pursuing donations through fundraising campaigns for many years. However, the data indicate that philanthropy as a revenue source for non-profit LTC is insignificant, both in amounts and as a percentage of total revenues, and has been in steady decline, as shown in Figure 2. Nearly a quarter of the homes (23.3 percent) issued no tax receipts for charitable gifts from 2009 to 2017. For those that had receipted donations, the vast majority have experienced a consistent decline in the share of revenue they receive from these donations—indeed, in many cases a quite dramatic drop—from the 2003 level. Since 2014, donations have constituted less than 2 percent of total revenues. Support from philanthropy could also come from transfers from other charities, mainly the affiliated fundraising foundations, rather than through donations directly to the homes. However, these transfers are also a small percentage of the revenue portfolio of LTCHs, less than 1 percent of the total revenue for three-quarters of charities, with the 90th percentile receiving between 1 percent and 2.5 percent of revenues from transfers over the study period.

Although a small percentage of the overall revenues, the philanthropy literature suggests that some types of LTCH charities would be more effective at fundraising. In Canada, as elsewhere, charitable giving is highest among those with a faith affiliation and practice and those with a strong community identity (Turcotte 2015). Given that religion remains the dominant destination of charitable giving in Canada, accounting for 31 percent of donations (CanadaHelps 2021), faith- and ethnoculturally affiliated homes may have a pool of committed donors and larger identity-based constituencies from which to fundraise. It is thus anticipated that homes with a religious or specific ethnocultural affiliation will raise higher amounts through donations.[4] Accreditation status is a second factor because accreditation can serve as a signal of or proxy for quality (Prakash and Gugerty 2010), and as Lu (2016) suggests, donations to LTC are sensitive to service quality.

LTC charities with faith or ethnocultural affiliations are more likely to receive donations than their secular counterparts (of those reporting no donations, only 37 percent are faith based), but donations do not constitute

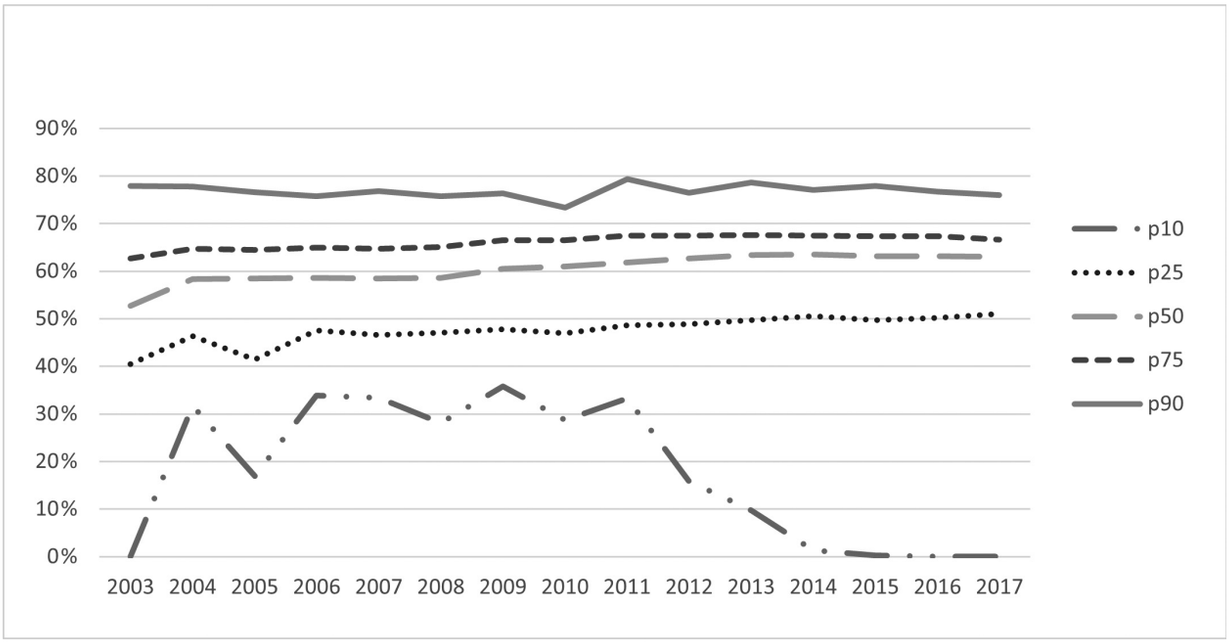

Figure 1: Percentage of Total Revenue of Ontario Charitable LTCHs Provided by Provincial Revenue (2003–2017)

Note: LTCHs = long-term-care homes; p = percentile.

Source: Public data from annual charitable tax returns (T3010) from 2000 to 2017.

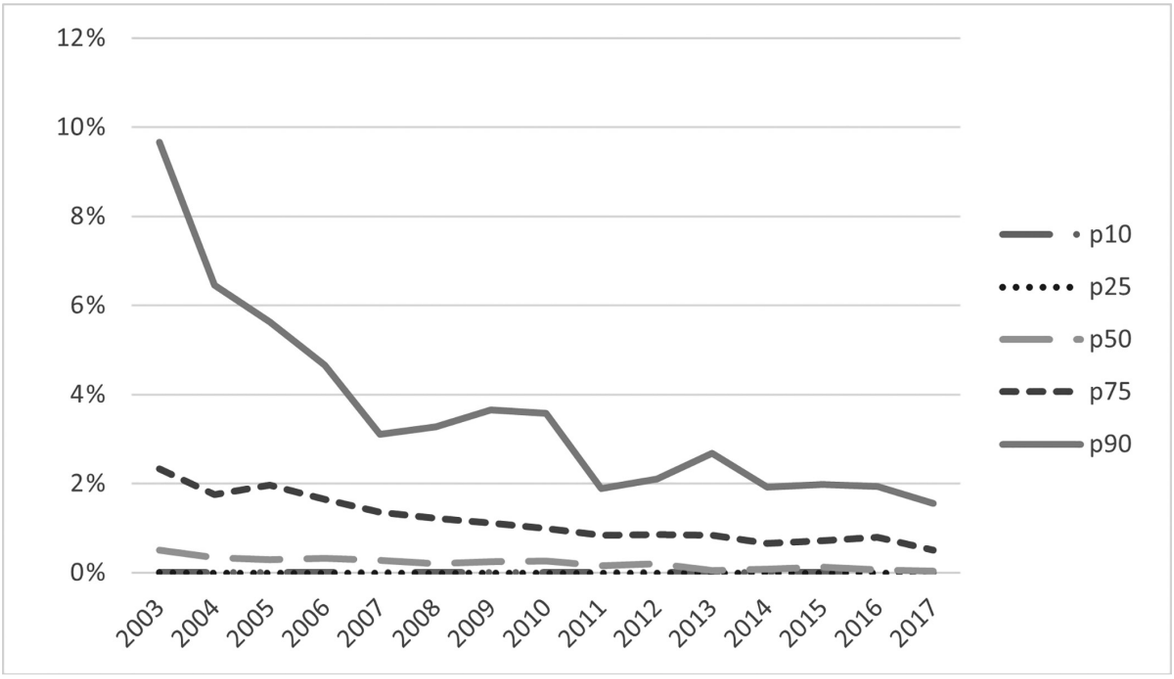

Figure 2: Percentage of Total Revenue of Ontario Charitable LTCHs Provided by Receipted Donations (2003–2017)

Note: The 10th and 25th percentiles are zero, reflecting no revenue from receipted donations for these organizations. LTCHs = long-term-care homes; p = percentile.

Source: Public data from annual charitable tax returns, T3010, from 2000 to 2017.

a larger percentage of their revenues. Accreditation does not appear to be a proxy for quality or trustworthiness in a way that enhances donations: of those homes without donations, 83 percent are accredited.

Earned Income

In contrast to philanthropy, the sale of goods and services, at least for a substantial portion of LTCH charities, has been a growing source of revenue but is highly uneven across homes. As shown in Figure 3, for the 50th percentile, revenues from earned income are less than 5 percent but rising steadily. For this group, the main sources of sales are likely room premiums and optional services paid by residents. Non-profit LTCHs have a higher proportion of single- (50 percent) and double-occupancy (41 percent) rooms than do for-profits (Morrison Park Advisors 2021, 12; Stall et al. 2021), up to 60 percent of which could be offered at premium rates. For example, for a 150-bed home with 75 private rooms, the total annual premium could be more than $740,000.

The opportunity for earned income through the sale of premium rooms should benefit newer homes (because they could be built with a larger portion of such rooms) and larger facilities that can offer a greater number of single rooms.[5] The analysis does not support these propositions, however. A greater percentage of older LTCHs have experienced a rise in earned income over this period (52 percent, vs. 36 percent for new homes), and there is no difference in increase by facility size (the average increase is 35 percent for small, medium, and large homes). A slightly greater proportion of secular and accredited homes have had an increase in earned income since 2009, although the difference between them and their faith-based and unaccredited counterparts is less than 10 percent.

The surprising finding is that in the 90th and 75th percentiles, homes receive about a third of their revenues from earned income, which cannot be accounted for solely by room premiums, hair salons, and related services. We thus dug deeper into this subset of charities with a review of their operations as presented on their websites. Of charitable LTCHs, 46 percent also operate retirement homes, seniors' rental apartments, or both under the same business number and same board of directors as their LTC facility (Table 3); this high earned income subgroup reflects this form of hybrid operation. These ancillary accommodations are often advertised as a continuum of care that enables residents to move from independent living through progressively higher levels of care in the same place. As discussed later, the distinct revenue portfolio of these hybrid LTC–retirement–rental home charities may have different implications for their responsiveness

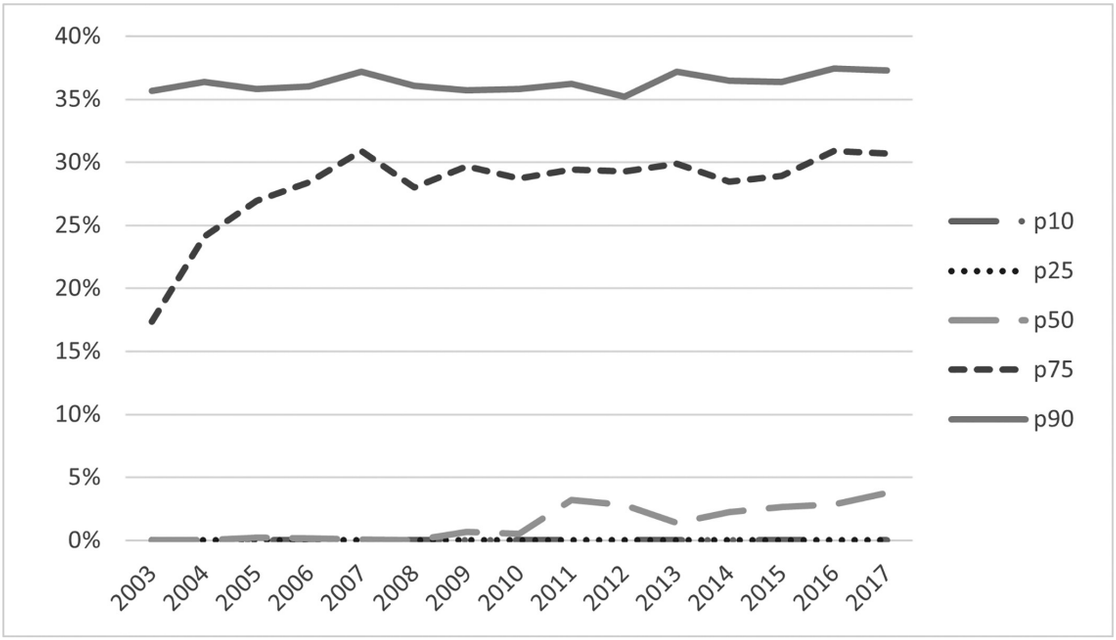

Figure 3: Percentage of Total Revenue of Ontario Charitable LTCHs Provided by Sales of Goods and Services (2003–2017)

Note: The 10th and 25th percentiles are zero, reflecting no revenue from earned income for these organizations. LTCHs = long-term-care homes; p = percentile.

Source: Public data from annual charitable tax returns (T3010) from 2000 to 2017.

Table 3: Ontario Charitable LTCHs that Operate Retirement Homes, Senior Rental Apartments, or Both (*N* = 112)

Homes and Beds	Operate LTCHs and Retirement Homes or Senior Rental Apartments	Stand-Alone LTCH
No. (%)	51 (45.5)	61 (54.5)
No. of LTC beds	7,832	8,794

Note: LTCH = long-term-care home.

Source: Ontario Ministry of Health and Long-Term Care (2020, 2022) and LTCHs' websites.

to expansion of LTC beds than the charities that operate only LTCHs.

Measures of Financial Health

The measurement of financial health represents several dimensions of an organization's operation. This includes its ability to generate support sufficient to maintain operations, sustain shocks, manage debt, maintain a revenue structure, and structure its expenses with a reasonable degree of predictability. For example, in two influential articles, Chang and Tuckman (1991) and Tuckman and Chang (1991) selected four ratios to determine whether a non-profit is financially vulnerable, defined as an organization that is "likely to cut back its service offerings immediately when it experiences a financial shock" (Tuckman and Chang 1991, 445): equity, total surplus divided by total revenue, administrative expenses divided by total expenses, and a Herfindahl index of revenue concentration. Organizations were considered at risk when they were in the bottom quintile for one ratio and severely at risk when they were in the bottom quintile for all four ratios.

We rely on five similar measures to examine the financial condition of Ontario's charitable LTCHs from 2004 to 2017: the savings indicator, which compares revenue and expenses; the defensive interval, which measures liquidity relative to expenses; the equity ratio, which assesses solvency; the administrative expense ratio, which measures percentages of expenses dedicated to management and administration; and the Herfindahl–Hirschman Index (HHI), which measures the diversification of organizations' revenue portfolios.[6] Collectively, these indicators, as presented in Table 4, give a sense of the net income generated by operations, the organization's capacity to sustain these operations in the event of disruptions, the debt reliance of LTCHs, their administrative spending, and their revenue structures.

Although charities would not be expected to attempt to maximize their savings, they are likely to try to break even. A positive value of the savings indicator reflects revenues

Table 4: Ontario Charitable LTCHs' Descriptive Statistics for 2017 Tax Year

			Percentile				
Variable	No.	Mean (SD)	10th	25th	50th	75th	90th
No. of beds	111	142.93 (127.55)	41.00	67.00	120.00	167.00	243.00
Provincial revenue, proportion	105	0.56 (0.22)	0.28	0.53	0.63	0.67	0.76
Receipted donations revenue, proportion	105	0.01 (0.04)	0.00	0.00	0.00	0.00	0.02
Sales of goods and services revenue, proportion	105	0.14 (0.17)	0.00	0.00	0.04	0.31	0.35
Savings indicator	108	0.06 (0.24)	−0.02	0.00	0.02	0.05	0.08
Defensive interval	106	2.82 (3.00)	0.55	1.10	1.96	3.77	5.47
Equity ratio	111	0.23 (0.00)	0.23	0.23	0.23	0.23	0.23
Administrative expense, proportion	109	0.07 (0.08)	0.00	0.03	0.06	0.09	0.15
Herfindahl–Hirschman Index	105	0.52 (0.13)	0.36	0.49	0.52	0.58	0.66

Note: LTCHs = long-term-care homes.

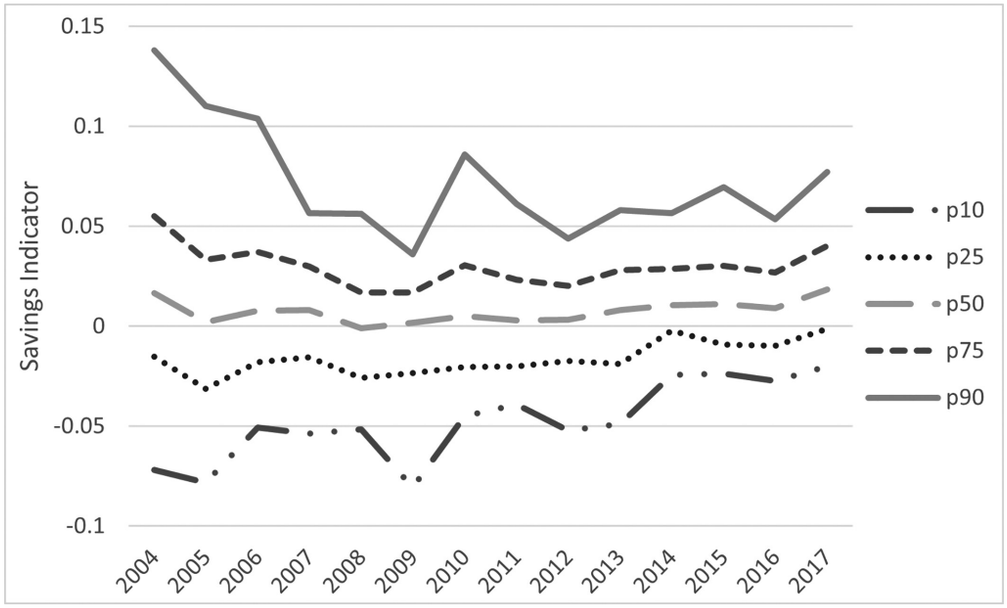

Figure 4: Savings Indicator of Ontario Charitable LTCHs (2004–2017)

Note: LTCHs = long-term-care homes; p = percentile.

Source: Public data from annual charitable tax returns (T3010) from 2000 to 2017.

that exceed expenses; negative values indicate that an organization is spending down its fund balance. Examining Ontario's charitable LTCHs, we see relative stability in the levels of organizations' savings, with median values just above zero, but less variance over time. This includes an improvement in the position of LTCHs with the least savings, as evidenced by the trend in the 10th percentile, although more than one-quarter of LTCHs drew down on their fund balances each year.

The defensive interval compares liquid reserves with organizational expenses, measuring these in the number of months the organization could meet its average expenses if resource flows were interrupted. Although charitable LTCHs would also not be expected to manage to maximize these reserves (Mitchell and Calabrese 2022), they would be expected to attempt to maintain reserves sufficient to sustain the organization for multiple months. Examining the defensive interval from 2004 to 2017, we observe that the median organization held 0.7 months fewer liquid reserves in 2017.

The solvency of LTCHs in this period is relatively stable, except for the most debt-burdened LTCHs. Figure

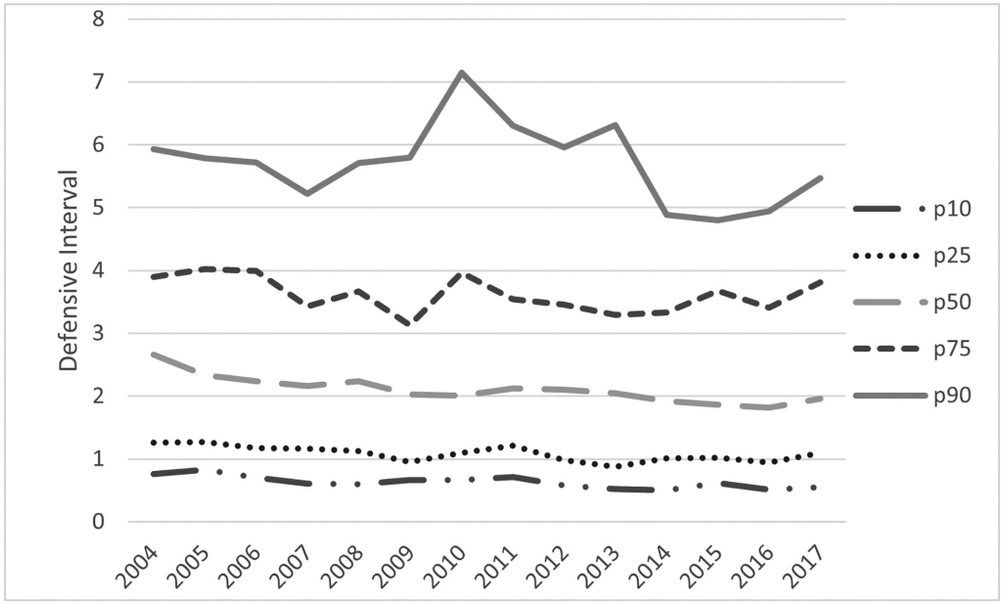

Figure 5: Defensive Interval of Ontario Charitable LTCHs (2004–2017)

Note: LTCHs = long-term-care homes; p = percentile.

Source: Public data from annual charitable tax returns (T3010) from 2000 to 2017.

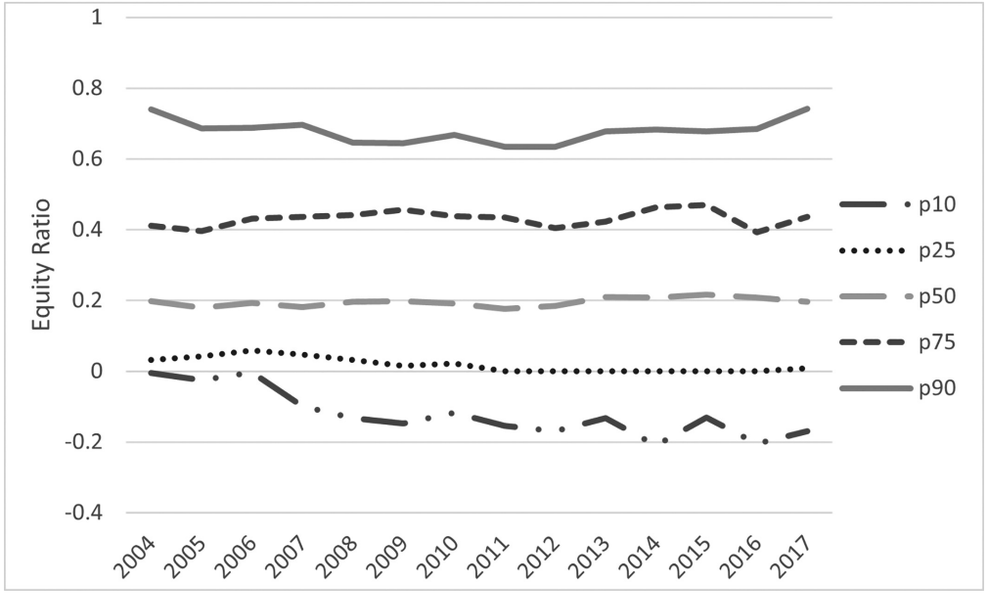

Figure 6: Equity Ratio of Ontario Charitable LTCHs (2004–2017)

Note: LTCHs = long-term-care homes; p = percentile.

Source: Public data from annual charitable tax returns (T3010) from 2000 to 2017.

6 demonstrates the changing position of the LTCHs with the most liabilities, seen in the decreasing 10th percentile. The position of these organizations shifted dramatically after 2006, with the value of their liabilities increasing more than their assets in this period.

The administrative expense ratio for Ontario LTCHs indicates that they report spending little on the management and administration of their organizations, with median values well below 10 percent (see Figure 7). These medians are also well below those reported for the health

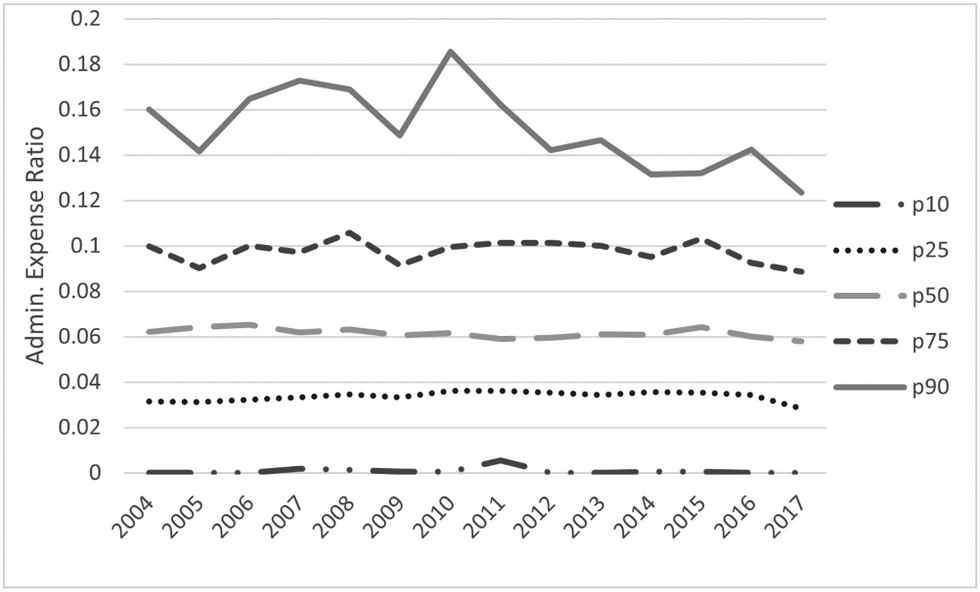

Figure 7: Administrative Expense Ratio of Ontario Charitable LTCHs (2004–2017)

Note: LTCHs = long-term-care homes; p = percentile.

Source: Public data from annual charitable tax returns (T3010) from 2000 to 2017.

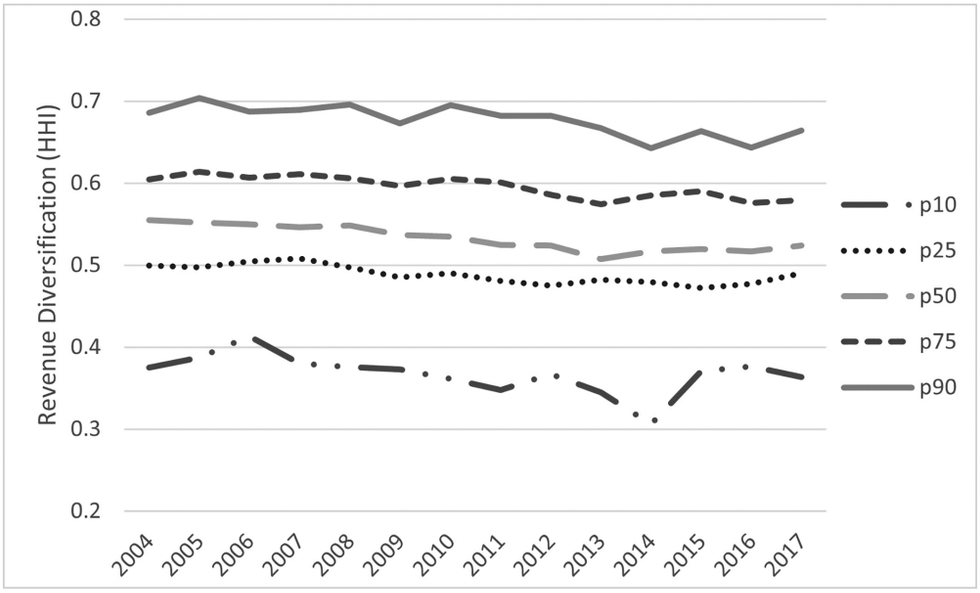

Figure 8: Revenue Diversification of Ontario Charitable LTCHs (2004–2017)

Note: LTCHs = long-term-care homes; p = percentile.

Source: Public data from annual charitable tax returns (T3010) from 2000 to 2017.

sub-sector in other contexts (Greenlee and Bukovinsky 1998; Lecy and Searing 2015).

As shown in Figure 8, the revenue structures of Ontario LTCHs have become more concentrated over time, as demonstrated by the slight decline in HHI values (measuring diversification of revenues) from 2004 to 2017. This effect is concentrated in subgroups of rural LTCHS and among unaccredited organizations.

Discussion

Ontario's regulatory and financing regime for LTC has reinforced path dependency—in which options and outcomes become increasingly channeled and locked in by the system and by an organization's history, making innovation or growth difficult. The growing reliance on provincial funding has concentrated revenue structures, which may increase fragility (Lu, Lin, and Wang 2019). Although relatively stable over the past 15 years, the financial health of charitable LTCHs could not be described as robust. A quarter have drawn down their fund balances year after year, and the differences in savings across homes have diminished over time, suggesting that all are under increased pressure for operational spending. The median charitable LTCH holds less than two months of liquid reserves, which help stabilize finances (Calabrese 2018), whereas a minimum of three months is considered a standard for non-profits (Kim and Mason 2020). Since 2006, the liabilities of a significant portion (the 10th percentile) of LTCHs have increased dramatically relative to their assets. This indicates that it may be very difficult for these homes to borrow further to facilitate expansion or renovations because of limited debt capacity.

We do not observe differences across size categories, as measured in the number of beds. Rural LTCHs may be in a more precarious financial position than their urban counterparts. For a subset of rural homes, the increased revenue concentration has become particularly pronounced, which may be attributed to a variety of factors. Rural LTCHs tend to be small (OLTCA 2018; they have lower annual government per diems per bed (Morrison Park Advisors 2021); there are fewer options for home care and other infrastructure to support aging in place, thus making LTC the only viable option for people with diverse needs; staffing difficulties are significant; and the volunteer base, an essential component of care, is older and shrinking (Skinner and McCrillis 2019).

Limited Philanthropy

An important finding is that, despite ongoing efforts at fundraising, philanthropy is a very small and diminishing component of LTCH revenues. For three-quarters of charitable LTCHs, direct donations now account for less than 2 percent of revenues, and transfers from their fundraising foundations or other charitable organizations account for less than 1 percent. This compares starkly with health care (e.g., hospitals, cancer and heart disease research), which is the destination for 26 percent of charitable giving in Canada, surpassed only by religion and, since the pandemic, by social services (CanadaHelps 2021).

Although it would be difficult to identify and determine non-givers' reasons for not giving, the low and declining rates of philanthropy probably reflect several factors. First, the general donation rate has been declining in Canada for the past 30 years (Lasby and Barr 2018): whereas in 2007, 24 percent of tax filers claimed a charitable credit, in 2017 only 19 percent did so (CanadaHelps 2021). Second, donations are more likely to be made by families or community members than by residents. Only 5 percent of giving in Canada is made through bequests (Canadian Association of Gift Planners 2022), and people entering LTC are now quite frail, with high incidence rates of cognitive impairment, and the length of stay is about two years (Marrocco et al. 2021). An important determinant of giving by family members has been shown to be perceptions of quality and the associated "warm glow" created by trust in a home, whether by direct observation or by a proxy measure, such as accreditation (Lu 2016; Mitchell and Calabrese 2022). However, these positive associations seem to be compromised in the case of LTC. As reported by Ben-Ner, Hamann, and Ren (2018), people are generally unaware of ownership status, or the relationship of non-profit management to quality, and thus may not connect a home with their charitable giving. In addition, the outcomes for residents are not positive—as they often are for hospital treatment—with the result being a sense of loss by families rather than a warm glow that prompts donating.

Finally, the current sector self-regulatory accreditation system is a weak signal of quality. Accreditation, not to be confused with mandatory government licensing, is a voluntary process by which LTCHs apply through Accreditation Canada or the Commission on Accreditation of Rehabilitation Facilities. By any standard of self-regulation, this system is weak, as is the government's financial incentive for attaining certification. Accreditation Canada covers 35 countries with more than 15,000 organizations using its programs, and it offers accreditation to hospitals, prisons, lab and diagnostic facilities, community and social service agencies, and other sub-sectors. Transparency is very limited; any issues identified through the accreditation process are not disclosed other than to the home operator. Couple this with reduced government comprehensive inspection for compliance with quality standards, and the public has little ability to assess quality care, which inhibits philanthropy and which allowed many of the long-standing issues in LTCHs to go undetected until COVID-19 revealed their effects in a dramatic way (Marrocco et al. 2021).

The limited contribution of philanthropy to the financial health of Ontario's LTCHs suggests that it may be difficult for homes to achieve successful capital fundraising campaigns for future development—ancillary support the provincial government appears to be counting on for system expansion.

Implications for Expanding Long-Term Care

In 2025, more than 40 percent of the licenses of Ontario's LTCHs will expire (Office of the Auditor General of Ontario 2021), and the Ontario government has committed

to assisting the development of an additional 10,000 net new beds and more than 12,000 upgraded beds with loan guarantees and subsidies for eligible homes, which after completion of construction can cover up to 60 percent of construction costs (Government of Ontario Newsroom 2022; Howlett 2022). However, Ontario's funding model is premised on attracting equity investors (Armstrong et al. 2021): typically, an organization must raise 30 percent of construction costs and borrow the rest (Howlett 2022). If seeking support from the Canada Mortgage and Housing Corporation, an applicant still needs cash reserves of 15 percent of the mortgage (Armstrong et al. 2021). In contrast to large for-profits, non-profits face major hurdles in securing the upfront capital. As our analysis shows, they have limited reserves to finance such costs, they cannot attract equity investors expecting a return on profits, and they are regularly turned away for mortgages by commercial banks (Advantage Ontario 2022; Armstrong et al. 2021; Morrison Park Advisors 2021). Non-profits also often lack the expertise required to assess community needs, lead new development, or facilitate the use of social investment finance instruments (Advantage Ontario 2022; Jog 2020). The rising cost of land and construction and the effects of higher inflation on the operating side have exacerbated these underlying challenges, and the government subsidy has not kept pace with rising costs (Howlett 2022).

Our analysis indicates that there are two quite different revenue and operational profiles of LTC charities: those that provide only LTC and the hybrids that operate a mix of LTC, retirement homes, and other rental housing for seniors. For most LTC charities, earned income (from room premiums and other resident-pay services) is only about 5 percent of their revenue portfolios and, although rising, does not appear to inject significant financial slack (Cyert and March 1963). The situation is quite different for almost half of Ontario charities that have mixed LTC and other rental accommodation because their financial health is highly dependent on these other rental sources of income. Thus, the incentives to expand the LTC component of their facilities may be different and even more constrained than their specialized LTC counterparts. The regulatory environment in which these hybrids operate is complicated because of the split oversight of the Ministry of Health, Ministry of Municipal Affairs and Housing, and the Retirement Homes Regulatory Authority. Financing needs to be coordinated across different sets of funders, and expanding the ancillary rental accommodation—which represents such a large portion of their income—does not qualify for loan guarantees. As the non-profit long-term-care industry association, Advantage Ontario (2022), argues, there is a "missing middle" of funding to support accommodation that enables people to age in place because lenders assume increased levels of care are available in an LTCH. Yet, these charities value and widely advertise the benefits of an integrated continuum of care: without financial support for the missing (and financially important) middle, the case for extending the LTC end of this continuum may not be strong. In addition, the cost of complying with the new regulations under the *Fixing Long-Term Care Act* is estimated to be between $590,000 to $650,000 per home annually (Advantage Ontario 2022), which acts as a further disincentive to expanding the LTC side of their operations.

The conclusion reached by the Office of the Auditor General of Ontario (2021, 37) is that it is uncertain whether LTCH operators will be able to raise the necessary funds to expand or renovate their facilities. The contribution of our analysis has been to assess the financial health of charitable LTCHs, demonstrating that Ontario's policy regime has made this component of LTC highly dependent on provincial revenues. As a result of the increased concentration of revenues, any change in government funding formulas will have a significant impact on charitable LTCHs. The long-standing implicit assumption that donations provide a financial cushion for charitable LTCHs that facilitate enhanced operations or expansion is no longer valid. With the commitment to fix the LTC system post-pandemic, policy change needs to proceed with caution, recognizing the substantial differences between the non-profit, municipal, and for-profit parts of the system as well as the differences within the charitable component. The challenges of financing expansion for non-profits points to the need to break out of the traditional categories of non-profit and for-profit homes, for instance by following the recommendation of the Long-Term Care Commission (Marrocco et al. 2021) to separate the building and maintenance of homes—which could be undertaken by profit-focused entities—from care delivery, as already occurs with hospitals.

Limitations

Although our analysis is the first to provide a close examination of the financial health of non-profit LTCHs, it has several limitations. First, we focus on revenues without a nuanced assessment of expenditures. Given the reliance on the charitable tax return data, the study is limited to LTCHs operating as registered charities and does not take into account non-profits that are not charities or differentiate among multiple homes operating under a single business number. The analysis is confined to Canada's largest province and, given differences in provincial care systems, the financial health of non-profit LTCHs in other provinces may differ from that of those in Ontario. Moreover, the data (which are the latest set of tax data available at the time) are pre-pandemic and do not capture the enormous disruptions in operations caused by COVID-19. Finally, the analysis does not attempt to address the differences in finances or quality of care between non-profit

and for-profit LTC providers or the broader question of whether for-profit provision should be curtailed—a question that is taken up by a substantial literature (Armstrong et al. 2021; Pue et al. 2021).

Conclusion

The evolution of the policy, regulatory, and financing regime for LTC has created a path-dependent system. Over time, financial and regulatory parity between non-profit and for-profit LTC providers and fixed-formula provincial funding has produced a pattern of general stability in the financing of non-profit LTCHs. Our analysis indicates, however, that the financial robustness of charitable homes has become more constrained over time with greater revenue dependency on government and declining philanthropy. Rural homes may be in a particularly precarious financial situation, although their situation needs more investigation.

The COVID-19 pandemic created a critical juncture in LTC that revealed the flaws in existing policies (Béland and Marier 2020) and has opened a "window of opportunity to make once-in-a-generation changes" (Tuohy 2021) to the policy and financing frameworks. The path forward on which the Ontario government is launched includes an extensive expansion of the number of beds and the renovation of older homes to meet modern care standards. If such development is to be taken up by non-profit LTCHs, rather than merely further extending the dominance of chain-owned for-profits, the ability and willingness of non-profits to take up loan guarantees and access capital financing needs to be better understood. Just increasing the number of beds will not address the inadequacy of LTC, however. The once-in-a-generation fix also involves addressing the workforce crisis, stronger and more integrated infrastructure for aging in place, improved financing, and stronger accreditation and regulation (Ontario 2022). Our case is that to truly reform the system, the financial health of the non-profit component of LTC requires better data, more sophisticated analyses, and evidence-based policy action.

Acknowledgements

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Notes

1 The market-based managed competition model for home care was abandoned, and the CCACs were absorbed into the 14 existing Local Health Integration Networks (LHINs) in 2017, although the delivery system had already been recast as a more concentrated, largely for-profit–dominant configuration. In 2021, health system planning and funding responsibilities were transferred from the LHINs to Ontario Health.

2 Retirement homes provide rental accommodation, with some services but without regular nursing care, for seniors who can live independently with minimal support and who self-fund the accommodation.

3 The T3010 data set provided by the Charities Directorate, Canada Revenue Agency, was first cleaned to correct its numerous errors and arranged as panel data that can be assessed by individual charity under Social Sciences and Humanities Research Council Grant No. 435-2018-1214. The data include only registered charities and omit the LTC homes run by non-profits that are not charities. The entities are represented by the business number (BN) of the registered charity; some operate more than one home under the same BN, but these are counted as one organization because they operate under the same governance structure. Note that the T3010 data do not separate revenues for construction from overall revenues.

4 We determine the faith or ethnocultural affiliation of non-profit LTCHs on the basis of a review of the individual homes' websites. We include specified populations, for example, Deaf Canadians or veterans, in the category of faith- or ethnoculturally affiliated homes.

5 Facility size is categorized as large (more than 200 beds), medium (100–200 beds), or small (fewer than 100 beds); age is divided into old building design when built to the 1972 structural classifications standard, containing "C" beds, which include homes that may have four-person shared wards, or "D" beds, which do not meet the 1972 standard (fewer than 1,300 LTCHs for all ownership types have D beds), and newer building design when meeting or exceeding the 1972 structural classifications and having only new, "A" or "B" beds.

6 Savings indicator = (total revenue – total expenses)/total expenses (Greenlee and Bukovinsky 1998); defensive interval = (cash + marketable securities + receivables)/average monthly expenses (Greenlee and Bukovinsky 1998); equity ratio = assets – liabilities/assets (Bowman 2011); administrative expense ratio = management and administrative expenses/total expenses; and HHI = $(1 - \left(\sum_{i=1}^{n} Ri^2\right))/((n - 1)/n)$. HHI includes receipted gifts, amounts from other registered charities, unreceipted gifts, federal revenue, provincial revenue, municipal or regional government revenue, revenue from interest or investments, gross income from the rental of land or buildings, unreceipted revenues from dues or association fees, unreceipted revenue from fundraising, revenue from the sales of goods or services, and other revenues.

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Dying at Home: A Privilege for Those with Time and Money

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C'est un fait bien documenté que les gens préfèrent mourir à la maison, plutôt qu'à l'hôpital ou dans un autre établissement. Les économies dont profitent les gouvernements provinciaux dans ce cas sont elles aussi solidement documentées. Or, malgré ces objectifs concordants, de nombreuses personnes qui pourraient et préfèreraient mourir à la maison s'éteignent à l'hôpital. Dans cet article, nous examinons le lien qui existe entre le cout en temps et en argent et les résultats des décès à la maison, en nous servant des décès rapportés de 2007 à 2019 dans la Base canadienne de données sur l'état civil. Nous nous concentrons sur les décès liés au cancer, pour lesquels les gens, le plus souvent, ont le temps de choisir le lieu où il se produira.

Mots clés : lieu du décès, soins de fin de vie, conjoncture macroéconomique, actes de décès, décès par cancer

The preference for dying at home, as opposed to in a hospital or other facility, is well established. So too are the cost savings for provincial governments from home deaths. Despite these aligned objectives, many individuals who could and would prefer to die at home find themselves dying in a hospital. In this article, we examine how time and money costs are associated with the home death outcome using Canadian Vital Statistics death records from 2007 to 2019. The focus is on cancer-related deaths, for which patients often have the time to think about and plan the location of death.

Keywords: location of death, end-of-life care, macroeconomic conditions, death records, cancer deaths

Introduction

End-of-life (EOL) care is expensive for families and for governments. In Ontario, some $4.7 billion per year, or 10 percent of the province's health care expenditures, are devoted to EOL care; in the last year of life, the average public health care cost per decedent amounts to $53,661, with inpatient hospital services making up 43 percent of these costs (Tanuseputro et al. 2015).

Many articles point to the cost savings associated with moving EOL care out of acute care hospitals. For example, Isenberg et al. (2020) use linked administrative databases to examine older individuals who died between 2011 and 2015, comparing individuals who received EOL home care with those who did not. A careful propensity score matching process constructed a comparison group. Home care costs were higher for the EOL home care group, as were hospital emergency room costs; however, acute care hospital costs were lower for the group receiving EOL home care. Overall, EOL home care was cheaper largely because it facilitated dying at home rather than in a hospital.

Moving care out of hospitals is not only optimal for governments but would align with the well-established preferences of most people for dying at home. Gomes et al. (2013), in a systematic review of 210 studies, conclude that most people prefer a home death; the systematic review in Costa et al. (2016) and other more recent articles corroborate this conclusion (e.g., Isenberg et al. 2020; Schou-Andersen et al. 2015). Of course, home is not always the preferred location, especially when pain management is a concern (e.g., Johnston 2015), and it may in fact not be an inherently a good outcome if the needs of either the decedent or the caregivers are not sufficiently met.

Despite these aligned objectives, many individuals who could and would prefer to die at home find themselves dying in a hospital. To die at home, help is almost always needed. Provincially funded home care is limited and varies considerably with location, with families providing most of the unpaid care, often while engaged in paid work. In addition to the time costs of providing a loved one home care, there can be significant

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out-of-pocket costs, including those associated with private assisted living arrangements, private home support services, and drugs and devices not covered by government programs.[1]

The report of the Commission on the Future of Health Care in Canada (2002), known as the Romanow Report, called for more support of caregivers and for alternative arrangements for Canadians near the EOL. In response, the federal government entered into agreements with the provinces to provide enhanced EOL home care. In 2004, it also created the Compassionate Care Benefit (CCB) policy to help support family members caring for a gravely ill family member by partially compensating them for their time off work. Ten years after the Romanow Report, the Canadian Hospice Palliative Care Association (CHPCA; 2012) reiterated the shortage of EOL care, with particular attention to geographic disparities in this regard. Now, 20 years later, the lack of EOL care arrangements is still being talked about (e.g., Quinn, Isenberg, and Downar 2021), and most Canadians continue to pass away in hospitals.

This article contributes to the limited literature that empirically examines the determinants of location of death in Canada. It is the first to examine the role played by time and money costs in influencing the home death outcome. We focus on the most common cause of death in Canada, cancer, which usually allows patients the time to think about and plan the location of death. Canadian Vital Statistics death records from 2007 to 2019 not only provide the needed demographic information on the population of all decedents in Canada but also report the date, cause, and, more important, the location of death.

We find compelling evidence that time and money costs matter. Consistent with young and married decedents being more likely to have available caregivers and thus lower time costs, these groups are more likely to die at home. We proxy for money costs using decedents' neighbourhood income quintiles. We find a very clear income gradient: decedents from the highest quintile neighbourhoods are significantly more likely to pass away at home than those in the lowest quintile neighbourhoods. We explore the relationship between home death and economic conditions. When economic conditions worsen, the opportunity cost of time falls: time becomes relatively cheaper, and money becomes relatively expensive. We find a robustly negative relationship between the unemployment rate and home death. Our estimates suggest that in a recession the probability of home death would fall by 6 percent. From this, we draw two conclusions: first, that time and money inputs are not easily substitutable—the same quantity of home deaths is not achievable by substituting the relatively cheaper input (here, time) when relative prices change—and second, that money inputs are crucial in the production of home deaths and present a real barrier for some families.

We contribute to the paucity of work on the impact of economic factors on the decision of where to die. The aging population along with the attendant reduction in available (family) caregivers exacerbate the home death challenge and render this topic of particular importance. On the face of it, the solution seems almost trivial: take the savings from reduced acute care use, and apply it to the costs of home care for dying patients. We discuss the challenges associated with implementing this solution.

Location of Death: Literature on Determinants and Correlates

There is a very large literature on palliative and EOL care, mostly by health care professionals and health researchers (indeed, the list of academic journals devoted to this subject is long and includes the *Journal of Palliative Medicine, Journal of Palliative Care, Journal of Hospice and Palliative Nursing*, and *BMJ Supportive and Palliative Care*). A much smaller but still significant number of articles discuss the location of death, usually comparing acute care hospitals with other arrangements (e.g., the reviews in Gomes et al. 2013; Gomes and Higginson 2006). Overall, economists have not featured much in either area. The discussion on location of death centres almost exclusively on the availability of options—the dearth of hospice, non–acute care institutional environments—and how that exacerbates the use of acute care hospitals. Aside from the almost universal acknowledgement that the supply of alternative options is an issue, few researchers mention the economic factors influencing the location-of-death decision.

A much smaller body of work uses data and statistical techniques to discern the factors influencing where to die. Wilson et al. (2001) is one of the first Canadian studies to use vital statistics to focus on hospital versus non-hospital deaths. They use a painstakingly curated data set that includes age, sex, marital status, whether the decedent was born in Canada, and cause of death. Simple statistical comparisons of the characteristics of those who died in a hospital versus a non-hospital highlight some trends. By and large, dying in a hospital was increasingly the norm from 1950 to 1994, with some drop-off over the last three years of study (1995–1997). Wilson et al. (2009) continue this work for the 1994–2004 period and find that, although still the norm, the percentage of hospital deaths declined from 77.7 percent in 1994 to 60.6 percent in 2004.

Several international studies focus on place of death; none include economic variables, although education level did feature in a few of them. Cohen et al. (2006) incorporated education level into their analysis of location of deaths in Flanders, Belgium, and found that the probability of a home death depended on the region of residence and whether it was urban or rural, the availability of hospital beds, and level of education, with the likelihood of a home death falling for those with lower education. A cross-country study of the location of cancer deaths in six

European countries by Cohen et al. (2010) found differences in the impact of cultural, social, and health care factors influencing this decision. In the three countries with information on educational attainment (Belgium, Italy, and Norway), higher education was associated with an increased likelihood of a home death. Houttekier et al. (2011) also use the Belgium data set and highlight education as a factor shifting deaths from hospitals to care homes.

Kalseth and Theisen (2017) study place of deaths in Norway from 1987 to 2011, linking age, sex, and cause of death to the likelihood of dying at home, in a hospital or nursing home, or other care arrangement. They found an increased likelihood of dying in a nursing home rather than in a hospital or home setting. Changes in the cause of death, from circulatory diseases to cancers and mental health (dementia), coupled with an aging population, contribute to this shift. Cross and Warraich (2019) provide a statistical analysis of place of death in the United States. As in the Norwegian study, they too found that the proportion of deaths in hospitals has fallen (from 2003 to 2017), but unlike that study, Americans were also less likely to die in a nursing home over time, with the increase in place of death occurring for homes (from 23.8 percent to 30.7 percent) and hospices (from 0.2 percent to 8.3 percent). Older patients, male patients, and White patients were more likely to die at home (compared with younger, female, and racialized patients). Health conditions also affected place of death.

Canadian studies reinforce the importance of demographics and geography when it comes to place of death. Jayaraman and Joseph (2013) use data on deaths in British Columbia between 2004 and 2008 to examine the association between sex, marital status, rural or urban, and country of birth (China vs. Canada) and location of death. Another study focuses on the determinants of place of death for patients receiving palliative home care in Toronto from 2005 to 2015 (Sun et al. 2020). The likelihood of dying at home among this group was higher over the period 2006–2015 relative to 2005. The predictors of a home death were caregiver age, sex, spousal relationship, retirement status, number of support hours, and nursing hours. As in Jayaraman and Joseph (2013), those with a partner were more likely to die at home relative to single people, and women were more likely to die at home than men. Sun et al. (2020) note that earlier referrals for home care were not associated with more home deaths. Burge et al. (2015) analyze the importance of chronic diseases and environmental factors in home deaths in Nova Scotia, highlighting the crucial role played by home visits by health care professionals. The pivotal role played by physician home visits in influencing home deaths is further addressed by Tanuseputro et al. (2018).

Aside from education level, we found no empirical studies that incorporate economic factors directly into the location-of-death decision. Burge et al. (2005) focus on the determinants of physician home care visits for EOL cancer patients in Nova Scotia from 1992 to 1997 and include the median household income by enumeration area (neighbourhood) in their analysis, as well as sex, age, region of residency, and type of cancer. Neighbourhood income quintile predicted physician home visits when the patient lived outside of the most populous Halifax region, suggesting that household (neighbourhood) economic factors affected the quality (availability) of home care (and, presumably then, the likelihood of a home death, as found, for instance, in McEwen et al. 2018).

Data

The main source of data for this article is the Canadian Vital Statistics Death Database (CVSD), which contains administrative death records. The data capture all deaths occurring in Canada going back to 1974.[2] Each record contains basic demographic information about each decedent (e.g., sex, age, marital status, residential postal code, neighbourhood income quintile) as well as the date, location, and cause of death. The second data source used in our analysis is the province–year unemployment rates obtained from Statistics Canada (Table 12-10-0327-01).

Because death records are first captured by the provinces and territories before being sent to Statistics Canada, the information collected is not always comparable across regions or over time. Location of death, the main outcome variable in this study, is categorized in the CVSD as having occurred in (a) a hospital, (b) a private home, (c) another health care facility, (d) another specified locality, or (e) an unknown locality.[3] Unfortunately, the categorization for hospital and home death is not consistent across provinces and years. In Quebec, deaths occurring in residential and long-term-care centers are categorized together with hospital deaths; home deaths in that province were inconsistently reported before 2013. In 2006, Manitoba began coding deaths in other health care facilities as deaths in hospitals. Then in August 2018, it began categorizing deaths occurring in personal care homes as having occurred in other health care facilities instead of in hospitals. The category of hospital deaths in Quebec and Manitoba captures different things over time and is not comparable with hospital deaths recorded in other provinces. As of 2014, Saskatchewan stopped recording deaths in private homes. Our analysis excludes deaths from Quebec, Manitoba, and Saskatchewan.

Other changes in the definition of location of death occurred within provinces over time. British Columbia had problems with the location-of-death variable for 2005 and 2006 (all deaths are listed as having occurred in an unknown locality), and Ontario adopted a new coding system for location of death in 2004. In the transition year, as compared with other years, a disproportionate number of deaths were coded as having occurred in an unknown locality. We thus use the period 2007–2019, the most recent years of consistently comparable data.

We apply several sample restrictions. We exclude decedents with unspecified age or sex, as well as records missing a valid postal code. Decedents whose usual place of residence is not Canada are automatically excluded because they have no Canadian postal code in the CVSD. We exclude decedents from the three territories, because unemployment rate data are unavailable for these regions. Finally, because deaths of Canadians occurring outside of Canada are as of 2010 no longer reported in the CVSD, for comparability we exclude Canadian decedents who died outside of Canada before 2010.

Table 1 summarizes the data for three samples, the full sample of decedents (N = 2,252,875), the sample of decedents whose official cause of death is reported as cancer (n = 659,130), and those who died of all causes other than cancer (n = 1,593,745). Most deaths in Canada occur in hospital, representing 56 percent of all deaths and 61 percent of cancer deaths. Home deaths are significantly less common, only 17 percent to 18 percent of deaths in

Table 1: Summary Statistics

Variable	Full Sample	Cancer	Non-Cancer
Home death	0.175	0.180	0.172
	(0.380)	(0.384)	(0.378)
Hospital death	0.556	0.609	0.533
	(0.497)	(0.488)	(0.499)
Cancer	0.293		
	(0.455)		
Cardiovascular disease	0.279		0.394
	(0.448)		(0.489)
Respiratory	0.088		0.124
	(0.283)		(0.330)
Other cause of death	0.341		0.482
	(0.474)		(0.500)
Female	0.490	0.472	0.497
	(0.500)	(0.499)	(0.500)
Marital status			
Single	0.120	0.087	0.134
	(0.325)	(0.281)	(0.341)
Married	0.404	0.528	0.353
	(0.491)	(0.499)	(0.478)
Widowed	0.357	0.255	0.400
	(0.479)	(0.436)	(0.490)
Divorced	0.086	0.092	0.084
	(0.280)	(0.289)	(0.277)
Separated	0.006	0.006	0.006
	(0.075)	(0.075)	(0.075)
Unknown marital status	0.027	0.033	0.024
	(0.161)	(0.178)	(0.153)
Income quintile			
1	0.242	0.220	0.251
	(0.428)	(0.414)	(0.434)
2	0.211	0.211	0.211
	(0.408)	(0.408)	(0.408)
3	0.192	0.195	0.190
	(0.394)	(0.396)	(0.392)
4	0.179	0.187	0.176
	(0.384)	(0.390)	(0.381)
5	0.165	0.176	0.160
	(0.371)	(0.381)	(0.367)
Missing income quintile	0.012	0.011	0.012
	(0.108)	(0.103)	(0.110)
Age, y			
0–64	0.213	0.257	0.195
	(0.409)	(0.437)	(0.396)
65–74	0.170	0.256	0.134
	(0.376)	(0.437)	(0.341)
≥ 75	0.617	0.486	0.671
	(0.486)	(0.500)	(0.470)
Urbanicity			
Rural	0.175	0.183	0.171
	(0.380)	(0.387)	(0.377)
Urban	0.825	0.817	0.829
	(0.380)	(0.387)	(0.377)
Province			
Newfoundland	0.028	0.028	0.028
	(0.164)	(0.166)	(0.164)
Prince Edward Island	0.007	0.007	0.007
	(0.085)	(0.084)	(0.085)
Nova Scotia	0.051	0.053	0.050
	(0.220)	(0.223)	(0.219)
New Brunswick	0.039	0.039	0.040
	(0.195)	(0.194)	(0.195)
Ontario	0.546	0.555	0.542
	(0.498)	(0.497)	(0.498)
Alberta	0.131	0.123	0.134
	(0.337)	(0.328)	(0.341)
British Columbia	0.197	0.195	0.199
	(0.398)	(0.396)	(0.399)
No. of observations	2,252,875	659,130	1,593,745

Notes: The data are unweighted and rounded to the nearest 5. Standard deviations are in parentheses.

Source: Authors' tabulations based on the Canadian Vital Statistics death records.

all samples. Cancer is the leading cause of death (29 percent), just ahead of cardiovascular disease (28 percent). Decedents from cancer are more likely to be married (53 percent vs. 35 percent) and younger (26 percent of cancer decedents are aged younger than 64 years, compared with 20 percent of non-cancer decedents; 49 percent of cancer decedents are aged older than 75 years, compared with 67 percent of all decedents). The income distribution of cancer decedents is slightly skewed toward higher income: 22 percent of cancer decedents lived in the lowest income quintile neighborhoods versus 25 percent of non-cancer decedents, and 18 percent of cancer decedents lived in the highest income quintile neighborhoods versus 16 percent of all decedents.

A series of figures helps to illustrate some key trends in the data. Figures 1a and 1b present the trends in home and

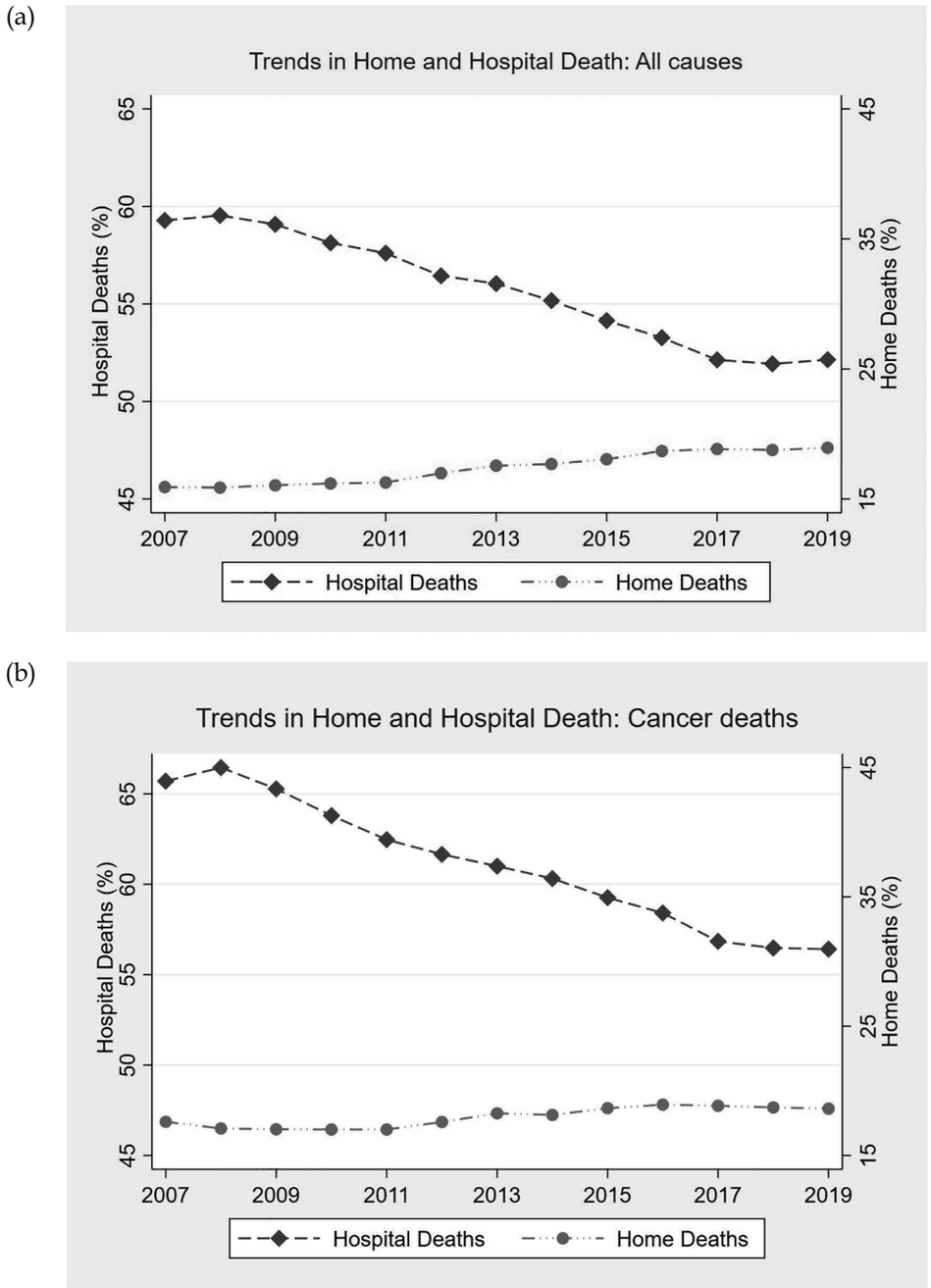

Figure 1: Trends in Home and Hospital Death: (a) All Causes and (b) Cancer
Source: Authors' tabulations using Canadian Vital Statistics death records.

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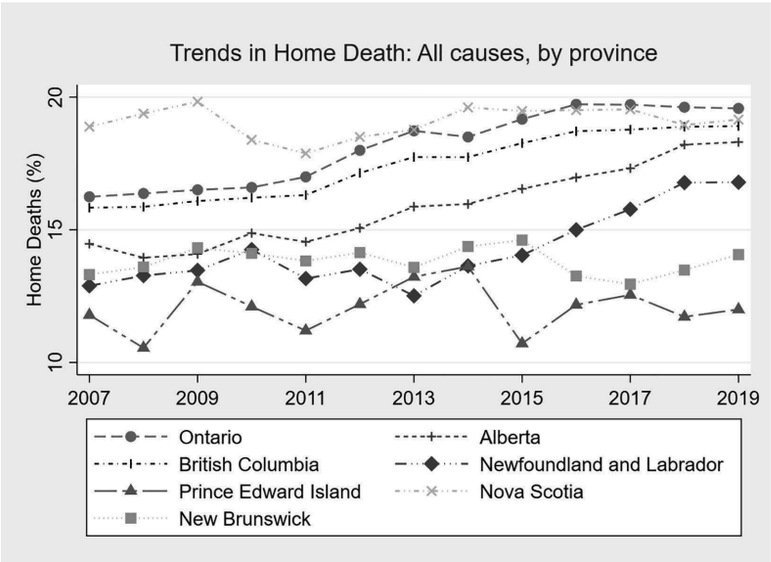
hospital death for the full sample of deaths and the cancer sub-sample. A clear decreasing trend in hospital deaths appears over most of the sample period, continuing the trend documented in Wilson et al. (2009). In 2007, almost 60 percent of deaths occurred in a hospital. Through 2017, hospital deaths continued to decrease, but the last three years of our sample displays a levelling off of this trend, in contrast to the pattern documented in earlier studies. The decrease in hospital deaths occurred alongside an increase in home deaths, which similarly levelled off in 2017. Although not the focus of this article, this end to a decades-long decrease in the proportion of deaths in hospital is a curious observation that warrants further study.

Very similar patterns are present for the cancer sub-sample, as shown in Figure 1b, with a clear downward trend in hospital deaths that levels off in the last few years. The decrease in hospital deaths is not driven to the same extent by an increase in home deaths in the cancer sample. Home deaths increased ever so slightly, from 18 percent in 2007 to a fairly consistent 19 percent over the last five years of our sample.

These trends mask significant variation across provinces. In Figure 2, we plot trends over the sample period in home death for (a) all decedents and (b) cancer decedents, by province. Home deaths generally increase in most provinces over time for all decedents but are quite stable over time when only cancer decedents are considered.

(a)



(b)

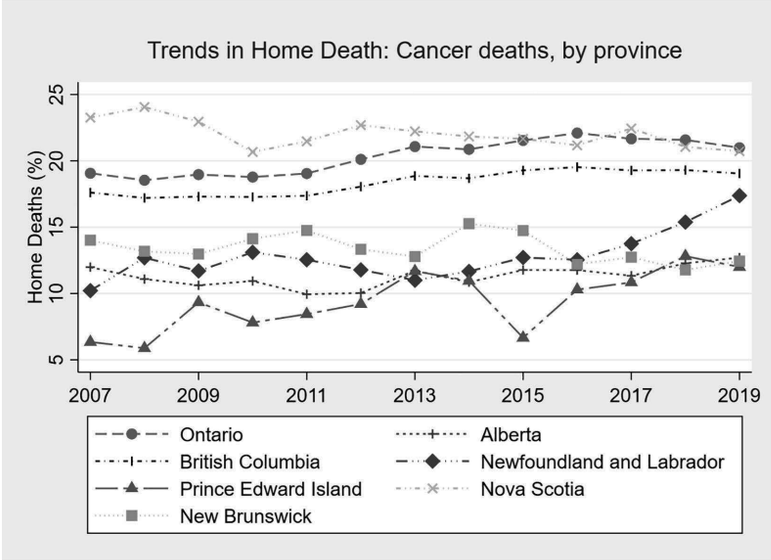


Figure 2: Trends in Home Death by Province: (a) All Deaths and (b) Cancer Deaths
Source: Authors' tabulations using Canadian Vital Statistics death records.

Significant differences across provinces are found—home deaths are more likely in Nova Scotia, Ontario, and British Columbia and are least likely in the smaller East Coast provinces of Prince Edward Island, Newfoundland and Labrador, and New Brunswick. There is an approximately 7 percentage point difference in the proportion of home deaths in the provinces with the most (Nova Scotia) and least (Prince Edward Island) home deaths for the full sample of decedents, and a 9 percentage point difference in these provinces for cancer decedents in 2019, the most recent year of our sample, representing differences of 39 percent and 50 percent, respectively. These differences are statistically significant at the 1 percent level, both on average and for each year in our sample.

Home deaths by cause of death are plotted in Figure 3. The increasing trend in home deaths described earlier is clearly driven by increases in home deaths for non-cancer reasons. In all years, home deaths are highest for deaths due to cardiovascular causes and lowest for deaths due to respiratory causes. Although partly due to the sudden nature of many cardiovascular events, this group still displays a significant increase over the period, from 18 percent in 2007 to 23 percent in 2019. Respiratory death is least likely to occur at home, likely because of the need for breathing equipment that is more readily available at a hospital. This group also shows a marked increase in home deaths, from 9 percent in 2007 to 15 percent in 2019.

In the remainder of this article, we focus on home deaths and the cancer sub-sample. Given disease trajectories, decedents from cancer are likely to have had more time for EOL planning than decedents from non-malignant disease.

Methods

We use a two-pronged approach to investigate how time and money affect home deaths, starting with a graphical depiction of the data parsed in revealing ways and followed by a regression-based analysis. The CVSD provides three variables that we use to proxy for the time input: sex, age, and marital status. Because caregivers are disproportionately female (Schrank et al. 2016), male decedents are more likely to have a caregiver. The ability to care for others decreases in old age, so younger decedents are more likely to have able caregivers. Finally, the presence of a spouse of any age or sex increases the likelihood of a caregiver. An ideal measure of the time input would not just pick up the availability of a caregiver but also proxy for the opportunity cost of their time: the earnings, human capital accumulation, investments in health, or other activities that are forgone to care for their dying family member. Although the proxies used here arguably capture the availability of caregivers, we maintain that they also pick up some components of the opportunity cost of their time. For example, being married lowers the time cost of helping because travel costs are zero if the caregiver and care recipient share the same address. To the extent that women are less attached to the labour force, and on average earn less, their opportunity cost of time is lower. Money costs are proxied using the income quintile of the decedent's neighbourhood. We then plot and compare

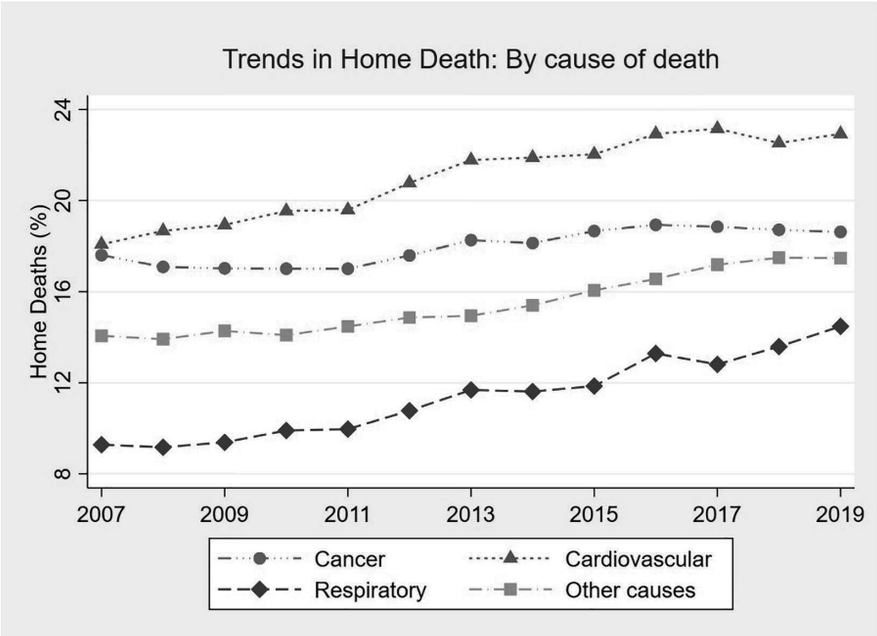


Figure 3: Trends in Home Death by Cause of Death

Source: Authors' tabulations using the Canadian Vital Statistics death records.

home deaths over time for decedents selected on these characteristics.

After the graphical analysis, regressions are used to further examine the relationship between economic conditions and home death. Fluctuations in economic conditions affect the relative costs of time and money inputs, the key factors explored in this article. We are motivated by the literature on how health behaviours change over the business cycle. A number of articles examine whether changes in the opportunity cost of time affect lifestyles choices, in particular activities that are time intensive but health enhancing. Recessionary periods have been found to be associated with decreased heavy alcohol consumption (Ruhm 1995), smoking, and physical inactivity (Ruhm 2005) and increased sleep (Brochu, Deri Armstrong, and Morin 2012).[4] We postulate that home death is "produced" using inputs of time and money and seek to better understand the relative importance, and substitutability, of these inputs.

Consider a worsening of economic conditions. As the unemployment rate rises, the opportunity cost of time decreases: time inputs become relatively cheaper and money inputs relatively more expensive. Three possible scenarios ensue: home deaths decrease, remain unchanged, or increase. If we observe a decrease in home deaths, this means that when economic conditions worsen (time is relatively cheap, and money inputs are relatively more expensive), individuals are less able to provide the resources required for a home death. This result would suggest that money inputs are significant in the production of home deaths and that time and money inputs not are easily substitutable. If we observe no change in home deaths, we would conclude that variations in the relative cost of these inputs do not measurably affect the ability of families to produce a home death for a loved one. This would be the case if either (a) neither input is a significant determinant of a home death or (b) the inputs are easily substitutable, that is, home death could be produced using a different combination of time and money inputs. Finally, an increase in home deaths would mean that the additional home deaths found in periods of higher unemployment are produced using more of the cheaper inputs, time. This would highlight the importance of time inputs for caregivers (friends and family) helping to support a home death. It would further point to the need for policy to provide the right conditions (time) for caregivers.

There is another pathway through which economic conditions could affect home death. Stevens et al. (2015) find that staffing in health care occupations in general, and nursing homes in particular, move counter-cyclically in the United States. When the economy thrives, staffing shortages in health care occupations become more severe. To the extent that this relationship also holds in Canada, we would expect fewer home deaths in times with relatively higher unemployment rates because more patients could be accommodated in health care facilities. We use sub-sample analysis to assess the importance of this particular channel.

We exploit exogenous variations in provincial unemployment rates over time to assess their importance in predicting home deaths using the following reduced form relationship:[5]

$$Home\ Death_{ipt} = \beta_0 + \beta_1 UR_{pt} + \beta_2 X_{ipt} + \pi_t + \gamma_p + \varepsilon_{ipt}, \qquad (1)$$

where the dependent variable is a dichotomous indicator of death occurring at home. Subscripts i, p, and t refer to the individual, province, and year, respectively. UR is the unemployment rate, and X is a vector of individual characteristics, including sex, marital status, income quintile, age group, and an indicator for rural locality to help pick up the impact of location-of-death options. π is a set of year dummies, and γ is the set of province dummies. The analysis is carried out for the full sample of cancer decedents, and then, to assess the robustness of the effect, the analysis is repeated for a variety of sub-samples. β_1 is our parameter of interest. Its estimates will allow us to speak to the importance and substitutability of time and money inputs in the production of home death.

Results

Figures 4–6 illustrate how home death (from cancer) is related to the three proxies for time inputs: sex, marital status, and age. Recall the prediction that all else equal, we expect male, married, and younger decedents to have a higher likelihood of a home death because these decedents are more likely to have able and available caregivers. Figure 4 displays a higher percentage of home deaths for male decedents relative to female decedents over our sample: men are approximately 1 percentage point (5.6 percent) more likely to die at home than women. This difference is quite small compared with the difference found in Figure 5, which compares home deaths of married and non-married (single, divorced, and separated) decedents. Married decedents are approximately 6 percentage points (33 percent) and 4 percentage points (22 percent) more likely to die at home in the early and later years of our sample, respectively. In Figure 6, the sample is separated by age group: decedents aged younger than 64 years, aged 65–75 years, and aged older than 75 years. A clear gradient is evident, whereby the youngest decedents are the most likely to die at home. Whereas the proportion of home deaths is fairly steady at around 20 percent over the sample for the youngest group, there is a clear increasing trend in home death for the oldest decedents. For them, home deaths increase by 3 percentage points (from 15 percent to 18 percent) over the sample period. The differences between groups (men vs. women, married vs. not married, and aged younger than vs. older than 64 years) are statistically significant at the 1 percent level both on average and for each year in the sample.

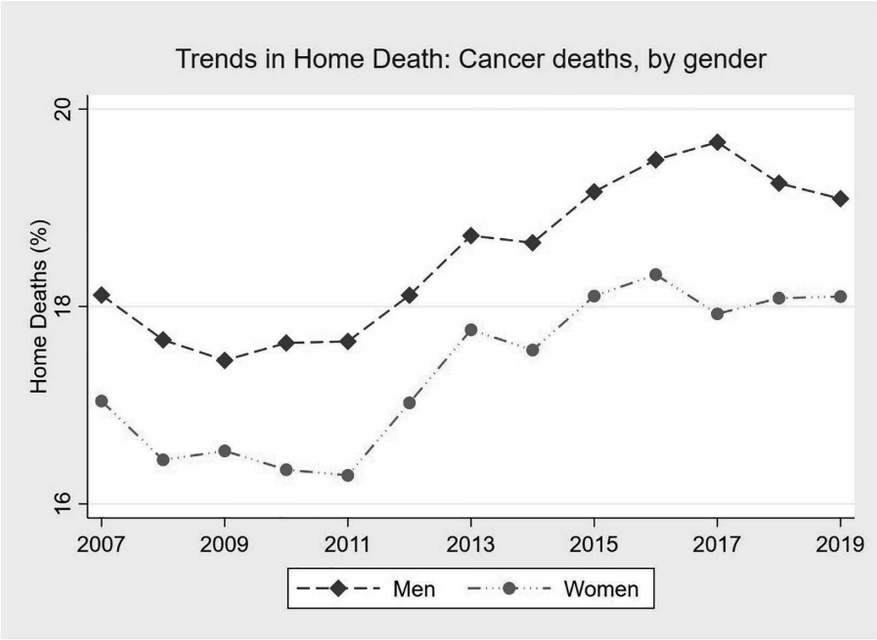


Figure 4: Trends in Home Death: Cancer Deaths by Sex
Source: Authors' tabulations using Canadian Vital Statistics death records.

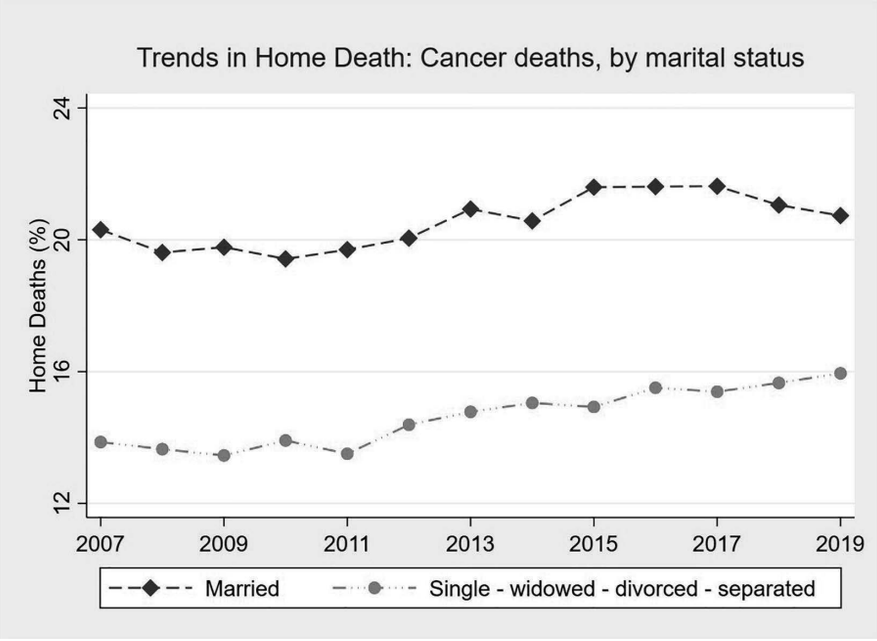


Figure 5: Trends in Home Death: Cancer Deaths by Marital Status
Source: Authors' tabulations using Canadian Vital Statistics death records.

The trends in home death by income quintile, our proxy for money input, are plotted in Figure 7. Again, a very clear gradient emerges. Decedents who lived in the lowest income neighbourhoods are the least likely to die at home; decedents who lived in the highest income neighborhoods are the most likely, with a fairly robust 6 percentage point difference between these groups over time. There appears to be little change in home deaths over time in these extreme groups, but in the middle three groups, some movement is observed.

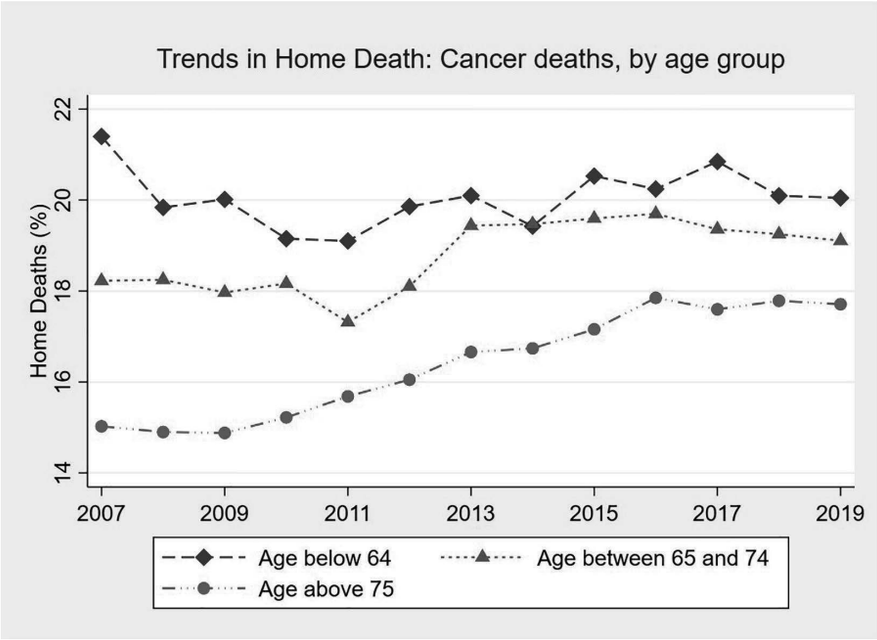


Figure 6: Trends in Home Death: Cancer Deaths by Age Group
Source: Authors' tabulations using Canadian Vital Statistics death records.

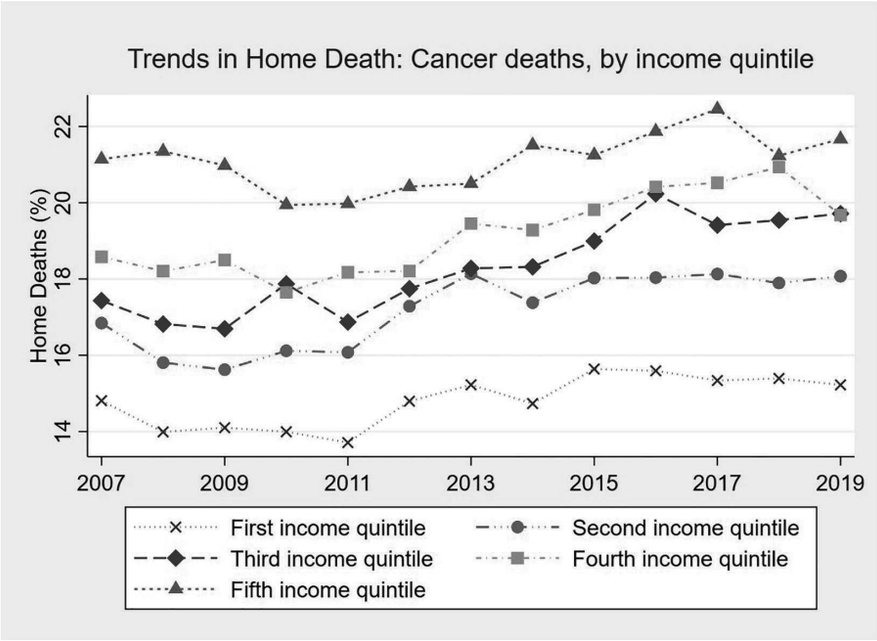


Figure 7: Trends in Home Death: Cancer Deaths by Income Quintile
Source: Authors' tabulations using Canadian Vital Statistics death records.

The preceding three graphs reveal that both time and money inputs seem meaningfully related to home deaths. Regression analyses allow us to control for several factors at once to see whether these relationships continue to hold. Tables 2–4 report the regression results for the relationship between economic conditions and home death. The first column of data in Table 2 presents the estimated coefficients from an ordinary least squares (OLS) regression using the full (cancer death) sample; this is followed by the estimated marginal probabilities from a Probit model

Table 2: Economic Conditions and Home Death: Main Results

			Income Quintile				
Regressor	OLS	Probit	1	2	3	4	5
Unemployment rate	−0.002***	−0.002**	0.001	−0.005***	−0.005***	−0.004***	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Female	0.000	0.000	−0.004**	0.000	0.002	−0.001	0.004*
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Marital status							
Single, widowed, divorced, separated	−0.050***	−0.051***	−0.047***	−0.048***	−0.049***	−0.050***	−0.056***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)
Unknown	−0.005*	−0.006**	−0.010*	−0.004	0.004	0.006	−0.019**
	(0.003)	(0.003)	(0.005)	(0.006)	(0.007)	(0.007)	(0.008)
Income quintile							
1	−0.028***	−0.029***					
	(0.001)	(0.002)					
2	−0.009***	−0.009***					
	(0.001)	(0.002)					
4	0.007***	0.007***					
	(0.002)	(0.002)					
5	0.025***	0.025***					
	(0.002)	(0.002)					
Unknown	0.010**	0.010*					
	(0.005)	(0.006)					
Age, y							
65–74	−0.014***	−0.014***	−0.012***	−0.015***	−0.010***	−0.015***	−0.022***
	(0.001)	(0.001)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
≥ 75	−0.029***	−0.029***	−0.029***	−0.029***	−0.029***	−0.032***	−0.028***
	(0.001)	(0.001)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)
Urbanicity							
Rural	0.021***	0.020***	0.038***	0.022***	0.021***	0.017***	0.001
	(0.001)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Constant	0.249***		0.191***	0.259***	0.279***	0.270***	0.262***
	(0.006)		(0.011)	(0.011)	(0.012)	(0.013)	(0.014)
No. of observations	659,130	659,130	145,030	138,810	128,635	123,340	116,245

Notes: The dependent variable in all regressions is the dichotomous outcome, home death. Regressions are all OLS unless otherwise reported. Probit regression reports marginal probabilities. All regressions are unweighted. Standard errors are in parentheses. Province and year dummies are included but not reported. The number of observations is rounded to the nearest 5. OLS = ordinary least squares.

* $p = 0.1$; ** $p = 0.05$; *** $p = 0.01$.

Source: Authors' tabulations based on the Canadian Vital Statistics death records.

Table 3: Economic Conditions and Home Death: Age and Sex Sub-Samples

		Age, y			Sex	
Regressor	OLS	< 64	65–74	≥ 75	Female	Male
Unemployment rate	−0.002***	−0.001	−0.001	−0.003***	−0.002*	−0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Female	0.000	−0.017***	−0.004*	0.011***		
	(0.001)	(0.002)	(0.002)	(0.001)		
Marital status						

(*Continued*)

Table 3: (Continued)

		Age, y			Sex	
Regressor	OLS	< 64	65–74	≥ 75	Female	Male
Single, widowed, divorced, separated	−0.050***	−0.062***	−0.056***	−0.046***	−0.041***	−0.063***
	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)
Unknown	−0.005*	−0.014***	−0.004	0.001	−0.010**	−0.004
	(0.003)	(0.004)	(0.005)	(0.006)	(0.005)	(0.004)
Income quintile						
1	−0.028***	−0.026***	−0.028***	−0.029***	−0.033***	−0.024***
	(0.001)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)
2	−0.009***	−0.007**	−0.012***	−0.009***	−0.011***	−0.008***
	(0.001)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)
4	0.007***	0.009***	0.004	0.007***	0.006**	0.008***
	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)
5	0.025***	0.027***	0.015***	0.028***	0.026***	0.024***
	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)
Unknown	0.010**	0.012	0.000	0.013**	0.018***	0.003
	(0.005)	(0.009)	(0.009)	(0.007)	(0.007)	(0.006)
Age, y						
65–74	−0.014***				−0.009***	−0.022***
	(0.001)				(0.002)	(0.002)
≥ 75	−0.029***				−0.017***	−0.044***
	(0.001)				(0.002)	(0.002)
Rural	0.021***	0.030***	0.021***	0.016***	0.016***	0.026***
	(0.001)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)
Constant	0.249***	0.253***	0.238***	0.216***	0.233***	0.265***
	(0.006)	(0.011)	(0.011)	(0.008)	(0.008)	(0.008)
No. of observations	659,130	169,555	168,965	320,610	310,805	348,325

Notes: The dependent variable in all regressions is the dichotomous outcome, home death. Regressions are all OLS unless otherwise reported. Standard errors are in parentheses. Province and year dummies are included but not reported. The number of observations is rounded to the nearest 5. OLS = ordinary least squares.

* $p = 0.1$; ** $p = 0.05$; *** $p = 0.01$.

Source: Authors' tabulations based on the Canadian Vital Statistics death records.

Table 4: Economic Conditions and Home Death: Marital Status and Urbanicity Sub-Samples

		Marital Status		Urbanicity	
Regressors	OLS	Married	Not Married	Rural	Urban
Unemployment rate	−0.002***	−0.002***	−0.002**	−0.003***	−0.002***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Female	0.000	−0.012***	0.014***	−0.007***	0.002**
	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)
Marital status					
Single, widowed, divorced, separated	−0.050***			−0.056***	−0.049***
	(0.001)			(0.002)	(0.001)
Unknown	−0.005*			−0.016**	−0.003
	(0.003)			(0.006)	(0.003)

(*Continued*)

Table 4: (Continued)

		Marital Status		Urbanicity	
Regressors	OLS	Married	Not Married	Rural	Urban
Income quintile					
1	−0.028***	−0.027***	−0.028***	−0.012***	−0.032***
	(0.001)	(0.002)	(0.002)	(0.004)	(0.002)
2	−0.009***	−0.009***	−0.009***	−0.007**	−0.010***
	(0.001)	(0.002)	(0.002)	(0.003)	(0.002)
4	0.007***	0.008***	0.006**	0.003	0.008***
	(0.002)	(0.002)	(0.002)	(0.004)	(0.002)
5	0.025***	0.028***	0.021***	0.003	0.029***
	(0.002)	(0.002)	(0.002)	(0.004)	(0.002)
Unknown	0.010**	0.021***	−0.001	0.019*	0.006
	(0.005)	(0.007)	(0.006)	(0.011)	(0.005)
Age, y					
65–74	−0.014***	−0.019***	−0.011***	−0.024***	−0.012***
	(0.001)	(0.002)	(0.002)	(0.003)	(0.002)
≥ 75	−0.029***	−0.042***	−0.019***	−0.041***	−0.026***
	(0.001)	(0.002)	(0.002)	(0.003)	(0.001)
Rural	0.021***	0.026***	0.014***		
	(0.001)	(0.002)	(0.002)		
Constant	0.249***	0.261***	0.182***	0.301***	0.241***
	(0.006)	(0.008)	(0.008)	(0.012)	(0.006)
No. of observations	659,130	348,085	289,510	120,800	512,485

Notes: The dependent variable in all regressions is the dichotomous outcome, home death. Regressions are all OLS unless otherwise reported. Standard errors are in parentheses. Province and year dummies are included but not reported. The number of observations is rounded to the nearest 5. OLS = ordinary least squares.

* $p = 0.1$; ** $p = 0.05$; *** $p = 0.01$.

Source: Authors' tabulations based on the Canadian Vital Statistics death records.

on the same sample. The remaining columns present OLS estimates from the sample parsed by income quintile. Tables 3 and 4 present estimates parsed by age group and sex and by marital status and urbanicity, respectively.

We begin with a discussion of some key covariates. The link between income quintile and likelihood of home death is remarkably monotonic and consistent across the various cuts of the data: as income increases, so too does the likelihood of home death. This once again reinforces the importance of money inputs in the production of home death. Using estimates from the full sample of decedents, those in the lowest income quintiles are 2.8 percentage points (16 percent) less likely to die at home relative to those in the omitted third income quintile; decedents in the highest income quintile are 2.5 percentage points (14 percent) more likely to die at home. The one case in which this result does not hold is for the sub-sample of rural decedents (Table 4, Column 4). In this case, although being in the lowest income quintile is associated with a 1.2 percentage point lower likelihood of a home death than those in the third income quintile, decedents in the highest (fourth and fifth) income quintiles are not more likely to have a home death, although the point estimates are positive.

The results for being non-married are also consistently negative and significant across all specifications. The estimated coefficient for single, widowed, divorced, and separated of −0.050 implies that, relative to married decedents, a non-married decedent is 5 percentage points (28 percent) less likely to have a home death. This is similar to the difference in home deaths by marital status that we noted in Figure 5. Similarly, the age effects are consistent across specifications: relative to the youngest decedents, those in the middle- and high-income groups are 1.4 percentage points and 2.9 percentage points, respectively, less likely to die at home. The availability of able caregivers is, therefore, a very strong predictor of location of death.

We included an indicator for rurality to capture variation in location-of-death options, noting that access to full hospital care is more complicated for individuals in rural locations. In a study looking at rural–urban differences in EOL care, Wilson et al. (2012) highlight the difficulties

for rural residents associated with travelling to various medical care settings for both patients and their caregivers and the relatively limited availability of local services in rural locations. In all but one specification, we find that rural decedents are more likely to pass away at home—by approximately 2 percentage points (11 percent) in most specifications. Although a lack of options and services suggests that rural decedents would be less likely to have a home death, the robustly positive estimate might reflect the cultural closeness of residents of rural communities, who are known to be extremely supportive and helpful in times of need. Thus, the positive estimated effect of rurality might be capturing the greater availability of informal care in rural areas. Looking at the specification parsed by married or not married in Table 4, it is notable that rural married individuals have a much larger likelihood of dying at home than do rural not-married individuals (2.6 percentage points vs. 1.4 percentage points, respectively). There is an interesting income gradient displayed in Table 2, in which rural decedents in the lowest to highest income quintile groups are, respectively, 3.8, 2.2, 2.1, 1.7, and 0 percentage points more likely to have a home death. Whereas in the full sample, higher income is associated with an increased likelihood of home death, the situation is different for rural decedents. For them, income may provide more location-of-death choices, with low-income rural residents dying at home not by choice but by necessity.

The estimated effect of being female is not consistent across specifications, but it reveals some interesting patterns. We expected that because caregivers are disproportionately female (Schrank et al. 2016), male decedents would be more likely to have a caregiver. This result holds up in Figure 4, although the difference is small, only 1 percentage point. In the full sample regression, no difference is found in the likelihood of home death for men and women, controlling for all other factors (the estimate is exactly 0 percentage points). However, differences are found in the subgroups. Looking at the estimated effects by income quintile, we find that being female is associated with a 0.4 percentage point lower likelihood of a home death for the lowest income quintile group and a 0.4 percentage point higher likelihood of home death for the highest income group. Married women are 1.2 percentage points less likely to die at home; non-married women are 1.4 percentage points more likely to die at home. Women in the youngest age group are 1.7 percentage points less likely to die at home; women in the oldest age group are 1.1 percentage points more likely to die at home. As discussed by Gott, Morgan, and Williams 2020, in the context of palliative care and sex, intersectionality and context clearly matter for understanding differences in the likelihood of home death between the sexes. Looking further into why these differences arise would be an interesting avenue for future work.

We next turn to the estimated effect of the unemployment rate, our variable of interest. The unemployment rate has a statistically significant and negative association with home deaths for the full sample of cancer deaths (OLS and Probit) and for 10 of the 14 sub-samples across Tables 2–4. As mentioned, a negative relationship between the unemployment rate and home death is consistent with two key results. First, time and money inputs are not easily substitutable; the same quantity of home death is not achievable by substituting the relatively cheaper input (here, time) when relative prices change. Second, following from the first result, money inputs are crucial in the production of home death and represent a real barrier.

To interpret the magnitude, we follow Oreopoulos et al. (2012) and assume that the unemployment rate increases by 5 percentage points in a recession. This means that a point estimate of −0.002 (e.g., Columns 1 and 2 in Table 2) is associated with the probability of a home death falling by 1 percentage point in a recession ($5 \times -0.002 = 0.01$). Given that the average proportion of home deaths in our sample is 18 percent, this represents a 6 percent decrease in home deaths.

The importance of money inputs is reinforced in the results in the income quintile columns of Table 2. No effect of economic conditions for either the lowest or highest income quintiles is consistent with money constraints not being binding for either group. The lowest income group is unlikely to be able to afford the needed out-of-pocket inputs for a home death and hence is unresponsive to the economic cycle; the highest income group can afford those inputs and hence is similarly unresponsive. The estimated effect of economic conditions is highest for the middle-income groups, where we expect financial constraints to be binding and changes in the relative cost of time and money to matter. For the second and third income quintiles, our estimates suggest that in a recession, home deaths would fall by 2.5 percentage points, or 14 percent.

This U-shaped response also allows us to speak to another channel through which home deaths could be affected by economic conditions—the counter-cyclical staffing in health facilities, documented in the United States by Stevens et al. (2015). If capacity in such facilities increases in economic downturns, we would see home death falling for all groups. That we do not see any relationship specifically for groups in which the money constraints are not binding suggests that this alternative channel is unlikely to be driving our results.

The estimated unemployment rate coefficients in the sub-samples parsed by sex, age, marital status, and urbanicity generally indicate that home deaths are procyclical, with estimated magnitudes similar to when the full sample is used. The only exception is found for the younger age groups (those aged < 64 years and 65–74 years). Although the point estimates are negative, they are not precise.

Discussion and Conclusions

This article is the first to examine the role played by time and money costs in influencing the home death outcome using Canadian Vital Statistics death records from 2007 to 2019. We find compelling evidence that both time and money inputs are important determinants of home death. Young and married decedents, those more likely to have available caregivers and thus lower time costs, are found to be more likely to die at home. We find a very clear income gradient: decedents from the highest income quintile neighbourhoods are significantly more likely to pass away at home than those in the lowest income quintile neighbourhoods. We exploit variation in economic conditions to examine how home deaths vary with changes in the relative costs of the inputs. We find a robust negative relationship between unemployment rate and home death. Our estimates suggest that in a recession the probability of home death would fall by 6 percent. From this we draw two conclusions: first, that time and money inputs are not easily substitutable—the same quantity of home deaths is not achievable by substituting the relatively cheaper input (here, time) when relative prices change—and second, that money inputs are crucial in the production of home deaths and present a real barrier for some families.

Although this analysis has several important strengths, it has limitations. First, we measure the location of death, not where people spent the bulk of their last days. It could be that an individual spent most of their last days at home but went to the hospital at the very end or vice versa. Relatedly, we have no information on hospice or other care decedents may have used near or at the EOL. Hospice use, for example, has been associated with location of death, although notably even among those receiving home hospice care, we find that home death is less likely among low-income decedents (Barclay et al. 2013). Second, the neighbourhood income quintile is a high-level proxy for socio-economic status (SES). Finally, the incomparability of the definitions of location of death meant that we excluded three provinces from our analysis. Economists have been slow to contribute to EOL and location-of-death discussions despite their clear public finance implications in Canada. The aging (aged) population and attendant reduction in the number of available caregivers exacerbate the home death challenge and render this topic of particular importance.

Some piecemeal policies address the costs of home care. The CCB policy was first introduced by the federal government in 2004 to help support those caring for a gravely ill family member by partially compensating family members who take time off work. The benefit was extended in 2016 from six weeks of benefits to up to six months, and it provides 55 percent of average insurable earnings to a yearly maximum amount that differs each tax year (Canada 2022). In 2021, the maximum insurable earnings for Employment Insurance were $56,300. According to the most recent available data, 7,581 claims were made for the CCB in the 2019/20 fiscal year (down from 8,385 in the previous year), and more than 70 percent of the claimants were women. The cost of the program was $39.6 million that year (Canada Employment Insurance Commission 2021, Table 48, 149).

To put the number of claimants of the CCB in context, 296,920 individuals died in the 2019/20 fiscal year (Statista 2022), meaning that about 2.6 percent of them had caregivers who received benefits from the CCB program. The average duration of benefits was 11 weeks (this figure is the lowest in the three most recent years of data). So, although the CCB undoubtedly provides much-needed assistance to a group of caregivers, it does not have a large take-up rate.

To date, no analysis has evaluated the impact of the CCB on home deaths. Indeed, the rather scant literature on the CCB tends to focus on small-sample qualitative methods designed to examine questions around, for instance, awareness of the CCB (e.g., Dykeman and Williams 2013) or caregiver experiences with the program (e.g., Giesbrecht et al. 2012). We see this as a topic worthy of future quantitative study.

Another policy that could affect home deaths is medical assistance in dying (MAID), which came into effect in 2016 and was revised in 2021 (Health Canada 2021). Data are available from its inception to 2020, where we see an upward trend in the number of assisted deaths from 1,018 to 7,595. Although still a small portion of total deaths, almost 70 percent of these deaths were among individuals with cancer. Private residences were the most common location of MAID, with 48 percent of deaths, followed by hospitals at 28 percent (Health Canada 2021). A population-based case-control study of Ontario decedents found that lower-SES decedents had 39 percent lower odds of receiving MAID under universal health coverage (Redelmeier et al. 2021). Thus, although the MAID policy has the potential to boost home deaths over time, it may in fact exacerbate the differences in home death between SES groups.

A recent C.D. Howe Institute commentary on the cost of EOL care (Quinn et al. 2021) provides a useful analysis of the big picture in the Canadian health care scene, including the problem of supply. It points to four structural problems in the current environment that help explain the situation: the lack of EOL beds and options, the way in which health care is financed (silos), the inability to transition to palliative care early enough, and barriers to home and community resources. On this latter point, Quinn et al. (2021) speak to the lack of alternative care arrangements to which patients no longer needing acute care services can be discharged. These alternative-level-of-care (ALC) patients, as they are known in Ontario, include those who are nearing the EOL. Just before the coronavirus disease 2019 pandemic began, the Ontario Hospital Association (as reported in Quinn et al. 2021, 7)

estimated that about 17 percent of all patients admitted to acute care beds were ALC. The alternatives available to ALC patients range from hospital-like settings, such as rehabilitation centres (hospitals) that help people recover from a variety of conditions (brain surgery, stroke, hip replacement) with the view toward helping them live more independent lives back home, to hospices designed to provide palliative and other EOL care, senior residences and long-term-care facilities, and homes with in-service arrangements (home care).

One main economic argument for having alternative care arrangements is that they typically cost less than acute care. The CHPCA (2012) has been vocal in this regard, issuing a report synthesizing the literature. The economic case for alternative care arrangements, while relying on a large number of narrowly focused studies typically using US data, is compelling. There are dissenters, of course, who underscore the need for sophisticated (often heroic) interventions at the EOL (e.g., Isenberg et al. 2020). By and large, however, there is agreement that the current practice of using acute care hospital beds at the EOL serves neither patients nor the health care system.

On the face of it, the solution is simple: take the savings associated with fewer EOL patients in the acute care system and use them to help support alternative arrangements. As pointed out many times, however, and most recently by Quinn et al. (2021), the siloed nature of health care financing means that the savings in one sector (say, hospitals) rarely make it to other sectors (say, home care). Of course, the solution is not simple. Indeed, it would necessitate a re-evaluation of entrenched health care boundaries, a broadening of the definition of health care to include home care supports and alternative configurations, and a re-thinking of health care financing and responsibilities, political quagmires at the best of times.

Stabile, Laporte, and Coyte (2006) show that public spending on home care may lead to an increased level of formal care with an almost entirely offsetting decline in informal care at home. Publicly funded home care policies might not affect overall levels of care but change who is doing the caregiving. Palliative care was not specifically considered in the Stabile et al. article. Like the CCB, though, more generous home care programs may make it easier to accommodate the needs of the dying at home by lowering the cost to informal caregivers. Determining the nature of these differences and potentially creating policies to incentivize provinces to move toward a particular location-of-death outcome, when possible, is a fruitful avenue for future work.

A careful examination of determinants and correlates of location of death—in particular the identification of any barriers to the cheaper and preferred location—is vital for informed policy discussions surrounding EOL and the allocation of scarce EOL resources. We contribute to the paucity of work on the impact of economic factors on the decision of where to die by looking at the impact of time and money inputs into EOL home care and by examining how general economic conditions affect EOL decisions.

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Notes

1 In Ontario, for example, HomeInstead is a facility that provides private care. It charges about $65 per hour for a minimum of three hours for a registered nurse and $35 per hour for a minimum of three hours for a personal support worker. These costs can add up very quickly if daily help is needed.

2 Before 2010, the CVSD included deaths of Canadians occurring in the United States. Since 2010, the CVSD no longer records deaths of Canadians outside Canada. The data do, however, include deaths of non-Canadians occurring in Canada.

3 The category "other health care facility" captures deaths occurring in nursing homes, other long-term-care facilities, nursing stations, other short-term-care facilities, and other health care facilities not licensed to operate as hospitals by provincial, territorial, or federal governments, such as free-standing birthing centers.

4 The starting point for this literature is a series of articles (e.g., Ruhm 2000, 2003, 2007; Gerdtham and Ruhm 2006) that show that health is pro-cyclical, that is, that health improves during economic downturns, despite the well-established positive relationship between income and health. These results have been reproduced many times in various contexts and using different measures of health and economic conditions, including Ariizumi and Schirle (2012), who document the cyclicality of health for middle-aged individuals using Canadian data.

5 There is considerable variation in the unemployment rate both between and across provinces over time. For example, the gap between provinces in a given year ranges from 7 percentage points (the unemployment rate was 6.1 percent in Alberta and 13.1 percent in Newfoundland in 2015) to 9.9 percentage points (the unemployment rate was 3.6 percent in Alberta and 13.5 percent in Newfoundland in 2007). Although in each year the highest rates were in Newfoundland, the lowest rates were in Alberta from 2007 to 2015 and in British Columbia from 2016 to 2019. Within-province variation is also considerable. The unemployment rate in Nova

Scotia had the least variation over the sample (from a low of 7.4 percent in 2019 to a high of 9.6 percent in 2010), and Alberta had the most variation (from 3.6 percent in both 2007 and 2008 to a high of 8.2 percent in 2016).

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