



Chaire de recherche
sur les enjeux économiques
intergénérationnels

22-01

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Cahier de recherche
Working paper

Avril / April 2022





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The Future of Long-term Care in Quebec:

What are the Cost Savings from a Realistic Shift Towards more Home Care?¹

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Mai 2022

Abstract: This paper aims to estimate the future long-term care needs and expenditures in Quebec while proposing and evaluating a reform package that could deliver increased coverage as well as be more financially sustainable than current policy. This reform package consists of a shift towards more intensive use of home care while increasing public coverage of care needs. A key feature of the proposed reform is to improve the ability of users to choose their provider with the creation of a senior's care account, an account that grants 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 to increase residents' contribution in nursing homes while favoring the continued use of existing tax credits to help seniors with lower needs in terms of care. Using detailed dynamic modelling of care needs, living arrangements, and expenditures, we estimate that 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, population aging, public finances.

Mots clefs: soins de longue durée, vieillissement démographique, finances publiques.

JEL Codes: H51, H68, J14.

¹ The authors would like to thank François Dion for his invaluable assistance in helping us understand the annual financial reports of establishments of the MSSS (Quebec Ministry of Health), as well as J. Benoit Caron and Samuel Bouchard Villeneuve for very useful information on the functioning of social economy businesses that provide domestic support (*EESAD entreprises d'économie sociale en aide à domicile*). We also thank David Boisclair, Martin Boyer, Colin Busby, Jacques Légaré, Marie-Louise Leroux, Pierre Piché, and Bernard Morency for insightful discussions.

1 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 over 65 years old already exceeds 25%. Within barely a decade, this milestone will be reached in Quebec. One of the most notable consequences of population aging is the rapidly increasing fraction of the population having long-term care needs.

Our 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 CHSLDs (Centre d'hébergement et de soins de longue durée) in the 1970s. In Canada, the nursing home model remains predominant to this day with home care being kept as a relatively marginal mode of care delivery. Amongst OECD countries, Canada dedicates only 14% of LTC public financing to home care (Huber et al. 2009), far behind most European countries, with at another extreme, Denmark spending 73% of its public expenditures on home care. With rapidly increasing care needs, the nursing home model is becoming rapidly financially unsustainable as provinces have a hard time keeping up. The COVID-19 pandemic has also demonstrated the limits of the nursing home model (Wyonch, 2021). Béland and Marier (2020) suggest this acts as a "focusing event" to think about policy. This paper aims to assess the future outlook of the current system and evaluate a reform package that improves coverage, neutrality, while being more financially sustainable than current policies.

In Canada, LTC is a provincial jurisdiction which 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. While our analysis is based on the Quebec model of delivery and financing, we think that our results are of relevance for other provinces and the federal government. With scarce but informative data, we are able prospectively to 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, which taken together as a reform package, could meet several policy objectives.²

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 a different coverage level of needs by the Quebec government. The proposed coverage levels (30%, 40%, 50%) are much higher than the current level of (8%). 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 favors nursing homes since user costs are often lower (and public participation higher) than that of a comparable level of care delivered at home. Empirical evidence shows that seniors generally prefer, at an equal level of care, home

² One attempt to produce projections at the Canadian level is MacDonald, Wolfson, and Hirdes (2019).

care over institutional care. A survey realized in Quebec in 2021 unveiled that 75% of respondents want the authorities to take concrete actions for an increase in home care services (CROP, 2021). Another survey, also conducted in 2021, shows that the COVID-19 pandemic reinforced the preference for home care. 72% of the respondents reported being less inclined to enter a nursing home because of the pandemic (Achou et al. 2021). Hence, this implicit subsidy is hard to justify.

Section 2 presents the methodology used for our projections in the status quo (current policy) and the proposed reform package. In section 3, we present the results about LTC users, care hours, and costs. We then discuss the limitations of the approach in section 4 and we conclude in section 5.

2 Methodology

2.1 The status quo: current policy

As a benchmark, we use the current public LTC system of Quebec. In this scenario, the current coverage of needs is kept constant in all living arrangements, without adding any constraints on the supply side. For instance, new beds will be automatically 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 where the supply adjusts to the demand for services. Labour supply perfectly adjusts to the needs, without putting pressure on hourly wages. We assume the coverage rate 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 (CCHS) and the 2016 census. First, we estimate by age group (65-69, 70-74, 75-79, 80 and more) the proportion of people who need help with at least one instrumental activity of daily living (ADLs) with the 2017-2018 CCHS 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% for people aged 65-69, 13.1% for people aged 70-74, 16.6% for people aged 75-79, and 39.6% from 80 years old. Shares are then applied to demographic projections by age group made with SimGen³ to obtain the number of older people in need of support.

Intensity of needs

Second, we attribute an intensity of needs to older people in need of support using the Iso-SMAF profiles (see Dubuc et al. 2006), which is 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 the disabilities of a person on 29 items covering Activities of Daily Living (ADL), mobility, communication, mental functioning, and Instrumental Activities of Daily Living (IADL) (Hébert et al, 2001). The Iso-SMAF Profiles were developed by cluster analysis. SMAF ranks individuals from profile 1 (low needs in IADL) to profile 14 (heaviest needs in all categories) according to physical and mental disabilities (see Raïche et al. 2014 for more details). Quebec is the only province in

³ https://creei.ca/en/simgen-demographic-simulations/?noredirect=en_US 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.

Canada to use 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 PRISMA survey⁴ is used to estimate the proportion of Iso-SMAF profiles by age group. These proportions are then applied to the number of individuals in need of support.⁵ The PRISMA survey did not allow to differentiate Iso-SMAF profiles 11 to 14. Profiles 11 to 14 were therefore grouped in a single profile 11+. This aggregation has limited impact on projections because most individuals with profiles 11 to 14 live in nursing homes and Iso-SMAF profiles are only used for home care costs in the computations.

Living arrangements

A third step consists in assigning people with needs of support to a living arrangement or care setting. Three living arrangements are considered: 1) nursing homes, 2) residential care, and home care. Nursing homes, also called *Centres d'hébergement et de soins de longue durée* (CHSLD), are facilities where people have severe LTC needs. Residential care, corresponding to intermediate care facilities and family-type resources, are smaller facilities looking 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 need of support, as identified earlier, are taken care of in these publicly funded living arrangements. Out of 315,568 estimated people with needs in 2020, only 195 800 individuals received publicly funded LTC.

⁴ 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.

⁵ Thus, a key hypothesis is that this distribution of the Iso-SMAF profiles by age has not changed since 2006.

We then estimate the proportion of people with need of support in publicly funded living arrangements according to Iso-SMAF profiles, since public funding is higher for 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 more mostly live in nursing homes (67.2%), while those with lower profiles are more likely to receive residential care or home care. However, there is a significant number of individuals with Iso-SMAF profiles lower than 10 who reside in nursing homes.

Table 1 - Shares of living arrangements by Iso-SMAF profiles (in %) – 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

Source: Authors' calculations.

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% per year over the period of projections. This is a conservative assumption given current labor shortages and wage pressures. Most of these costs are taken from administrative data from financial reports of nursing homes of the Ministry of

Health. Costs include public funding from the government of Quebec and user costs in nursing homes and for residential care, but it is limited to public funding for home care, because it has not been possible to calculate home care 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, while per capita costs for home care vary with individuals' Iso-SMAF profile. At first sight, the assumption of a unique cost in institutions regardless of individuals' needs might seem very strong, however, most nursing homes and residential care users are concentrated in a few Iso-SMAF profiles, while the distribution of Iso-SMAF profiles in home care are 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) due to an insufficient number of existing beds. Operating cost is calculated from financial reports of the Quebec Ministry of Health and is equal to \$100,900 for 2020. The financing cost equals yearly interest paid plus capital repayment. A construction cost of \$362,500⁶ in 2020 has been estimated for beds in nursing homes, with financing over 25 years⁷ and an interest rate of 3%.

The share of nursing homes operating costs paid by users, also calculated from financial reports of the Quebec Ministry of Health, equals 18.3% (\$18,500). The remaining share of 81.7% (\$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 financial reports

⁶ This value is calculated from historical construction costs from a request for access to information made to the Quebec Health Ministry 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%. 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 1st quarter of 2017 and that of 2020 (Statistics Canada 2021). The construction cost used corresponds to a conservative hypothesis given the strong increase of housing prices in Quebec. As a comparison, a survey realized 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 that it does not significantly affect the results.

of the Quebec Ministry of Health. Moreover, the share of this cost paid by users equals 20.3% (\$13,600). The remaining share of 79.7% (\$53,500) is paid by public funds.

In home care, per capita cost includes a variable cost according to Iso-SMAF profiles and a fixed cost. The fixed cost of \$6,670 per user corresponds to costs that were not linked to Iso-SMAF profiles, such as readaptation services, technical help, and administration. The variable cost is related to nursing care, personal care, and support services for which Hébert et al. (1997) evaluated the number of care hours needed for each Iso-SMAF profile. Applying an intensity rate of 8.3% on average⁸ to these numbers is required to match aggregate home care expenditures since the Quebec government meets very little of the (theoretical) care needs of home care users (Tousignant et al. 2007). We also add travel time to expenditures since home care consultations usually requires that the provider travels to and from the home of the user. 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 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 category⁹. This finally allows us to obtain the variable cost according to Iso-SMAF profiles, which varies from \$470 (profile 1) to \$16,964 (profile 11+).

At last, we also modeled the home-support tax credit¹⁰, and the Financial Assistance Program for Domestic Help Services (FAPDHS)¹¹, which are two more minor support measures of

8 The ratio varies across Iso-SMAF profiles. It is of less than 10% for profiles 1 to 4, 6, and 9 but increases around 20% for profiles 5, 7, 8, 10, and 11.

9 Based on financial data of nursing homes and financial statements of the Ministry of Health, we use a wage of \$64/h for nursing care, \$36/h for personal care, and \$18/h for support services.

10 The home-support tax credit is a refundable tax credit dedicated to Quebecers aged 70 or more. 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.

11 Individuals aged 18 or over, who are covered by the Québec 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 of the hourly rate for home care services provided by social economy businesses, such as housekeeping, laundry services, meal preparation, and accompanying shopping.

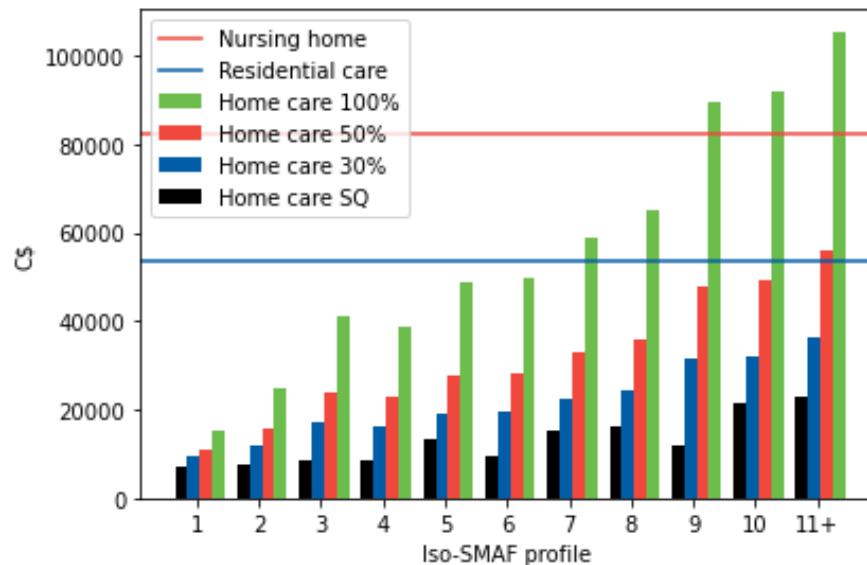
the Quebec government to support home care. These are included in total LTC expenditures every time we report those numbers. Again, more details about several aspects of the modelling can be found in Clavet et al. (2021).

2.2 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 in current policy. Three alternative care settings for home care are also introduced. A 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 homes and residential care to home care would reduce cost but would result in a reduction in the level of care provided. In fact, the coverage rate 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% for home care. The current coverage rate 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.

From Figure 1, we can see that it would be possible to significantly increase the coverage rate (30%, 50%, and 100%) in home care and generate savings if we could transfer case load from institutional living arrangements to home care. For instance, it would be possible to increase the coverage rate in home care to 50% to obtain equivalent public funding between home care for Iso-SMAF profile 11+ and residential care. The room for maneuver is greater for lower Iso-SMAF profiles, between 3 and 9. With a coverage rate of 100%, per capita public costs for Iso-SMAF profiles 1 to 6 would be lower than per capita public costs for residential care (and nursing homes).

Figure 1. Individual costs for the Quebec government by living arrangements and Iso-SMAF Profile (Status quo and alternative coverage rates for home care)



Notes: SQ = Status quo. Amounts in current dollars.

Source: Author's calculations.

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 like horizontal equity, freedom of choice, and reduction of costs were considered in the conception of our reform package. Financial sustainability is particularly very 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 coverage rate for home care, and adjusting the public support in for residential care and in nursing homes. Our alternative scenarios differ only on coverage rate for home care. Three levels of coverage rate are analyzed: 30%, 40%, and 50%.

Optimizing the allocation across living arrangements

An increase of 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 that choice to stay at home although we do not have solid detailed evidence of preferences and sensitivity to user costs and coverage rates. This shift towards 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% of individuals who live in institutions (nursing homes and residential care) have Iso-SMAF profile from 1 to 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 home care supply is lacking. Note that a similar diagnostic has been made by the Canadian Institute for Health Information (2017). Using a large Canadian panel¹², CIHI estimated that 22% of individuals in nursing homes had also low to moderate care needs.

While 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 towards more home care is to promote its use for people with profiles from 1 to 9. Individuals with profiles from 1 to 6 would all be headed to home care. Those with profiles from 7 to 9 in nursing homes would be equally headed to residential care and home care (leaving the more severe cases an option to go towards residential care). We assume that allocation across living arrangements for profiles 10 and over would remain the same. There are inevitable implicit behavioral assumptions with any scenario. But the direction of the biases

¹² Which excludes Quebec.

introduced by our choices is unclear. On one hand, we may over-estimate 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, with perhaps 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.

*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

Source: Author's calculations.

Increasing 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. While this may be simple, one of the problems with the current home care system is that there is one provider, the Ministry of health, very often unable to meet current demand. With the surge this reform package would create, we think an alternative public funding model for long-term care is to give different options to patients 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 he or she can purchase services. The money would not flow to patients to make transactions. Instead, this could be administered by the Health Insurance Board of Quebec (RAMQ) who is familiar with processing claims and paying for services. When contracting with a provider, which could be the state, the patient would see his or her 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 an Iso-SMAF profile of 4 and over would have access to such an account while people with profiles from 1 to 3 would obtain sufficient support using home-support tax credit and FAPDHS. Indeed, even if 50% 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 (CLSC), private providers, and community organizations, which would decrease the current pressure on the 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. While 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 avoid 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 coverage rate of needs by the Quebec government in home

care. While the coverage rate is equal to 8.3% in the status quo, we propose to increase it between 30% to 50%. While a government could certainly aim for higher coverage rates, 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 in practice that personal care and support services are provided by two different workers, while 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 % to 11.7 % of individual home care cost.¹³ While 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 scenarios of home care coverage rate by the Quebec government are considered: 30%, 40%, and 50%. These three scenarios are proposed since it is possible to significantly improve the level of care provided while respecting cost constraints. Based on 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 an Iso-SMAF profile of 11+ could receive double the amount of public support that an individual with an Iso-SMAF profile of 4 could receive.

¹³ 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.

Table 3. Amount available in the senior's care account by Iso-SMAF profile and by coverage rate scenario (30%, 40%, and 50%).

Iso-SMAF profile	Coverage rate		
	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

Source: Author's calculations.

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 in nursing homes (the share of total per capita costs covered by the public system). Currently, the public support rate is 81.7% in nursing homes and 79.7% for residential care (see 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 favor institutional care over home care. To respect horizontal equity between individuals who live in different arrangements, it would therefore be possible to decrease the public support rate for residential care and in nursing homes. Notice that the proposed public support rate is an average and that it may vary depending on family income.

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 under

agreement from financial reports of the Quebec Ministry of Health.¹⁴ By adding building management, meals, laundries, and other service supports, we find that individuals should pay 30% of total costs on average in these institutions (a public support rate of 70%). This rate would be closer to what is observed in other provinces. In Canada, just under three-quarters of LTC facilities costs are paid by public sources on average (Canadian Health Coalition, 2018). The difference in average public support rate between Quebec and Canada 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 is \$36 in Quebec, while it is \$56 in Ontario. Comparing all provinces, the second-lowest daily fee is observed in Alberta with \$48 per day, which is still 34% 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% for residential care and in nursing homes and thereby decrease the public support rate to 70%. Table 4 shows that the average user contribution increases from 18,500 \$ to 30,300 \$ by year in nursing homes. On the contrary, average public support should decrease from 53,500 \$ to 47,000 \$ for residential care and from 82,400 \$ à 70,600 in nursing homes.

¹⁴ Calculations 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 that are related to nursing homes, residential care, hospitals, or community service centers (CLSC) in public nursing homes.

Table 4. Average yearly cost for users and for the government by living arrangement and according to the status quo scenario and the reform package.

Living arrangement	Cost			Support rate
	User	Gov.	Total	
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: Author's calculations from AS-471 files.

3 Results

3.1 LTC users

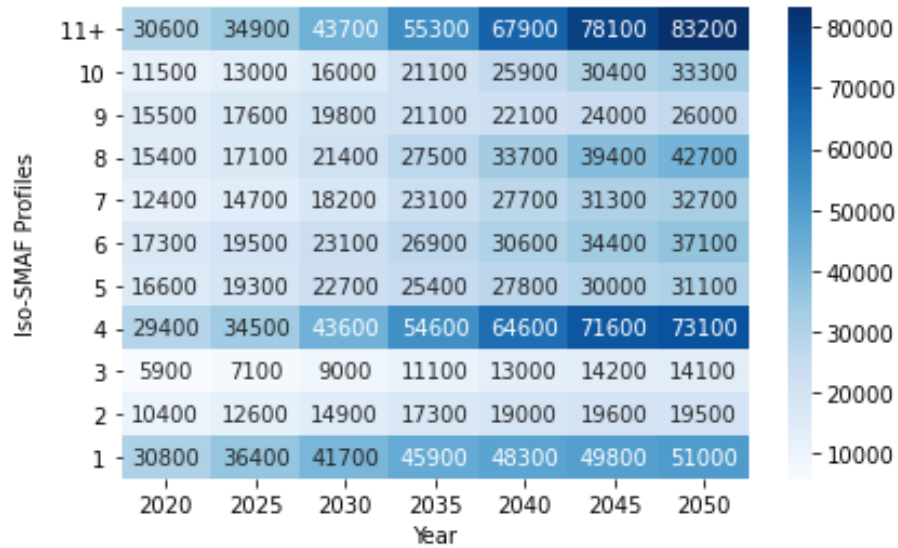
Iso-SMAF profiles

Figure 2 shows the projected number of individuals receiving publicly funded LTC¹⁵ according to their Iso-SMAF profile. LTC users are expected to increase from 195,800 in 2020 to 329,300 in 2035 (+68,2% in fifteen years) and then reach 443,800 in 2050 (+126,7% in thirty 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+ are expected to increase by 160% in 30 years. For instance, Individuals in Iso-SMAF profiles 11 and up increase from 30,600 in 2020 to 83,200 in 2050, which represents a 170% increase. The increase is lower in Iso-SMAF profiles 1 to 6, although it is still significant. For instance, Iso-SMAF profile 1 increases by 66% between 2020 and 2050. Iso-SMAF profile 4 appears to be the strongest increase among lower Iso-SMAF profiles, with an increase of

¹⁵ That we will thereafter call LTC users to simplify reading.

150% 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 85 years old in the 65+ population increases. Since more severe Iso-SMAF profiles are more predominant in the “oldest-old”, the increase is larger for those groups.

Figure 2 - Projections of the number of individuals receiving public LTC by Iso-SMAF Profile

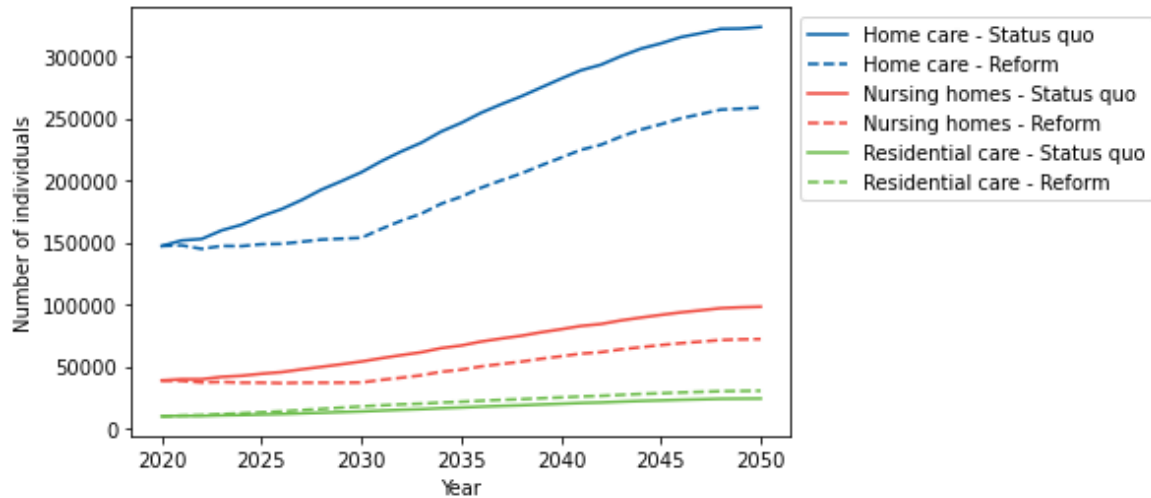


Source: Authors' calculations.

Living arrangement

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

Figure 3. Number of LTC users by living arrangement and by scenario (status quo and reform package)



Note: RC = residential care; NH = nursing homes; HC = home care.
Source: Author's calculations.

The number of LTC users in residential care increases more rapidly with the proposed re-allocation than in the status quo scenario. In 2050, the proposed re-allocation leads to a need for 6,288 additional beds (+26%) 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 following the re-allocation. In 2050, the number of users is lower by 26,100 in nursing homes (-26.5%) and by 65,000 in home care (-20%) compared to the status quo. In home care this decrease is explained by the choice of excluding Iso-SMAF profiles lower than 4 from the senior's care account. However, these people are still eligible for the Tax Credit for Home-Support Services

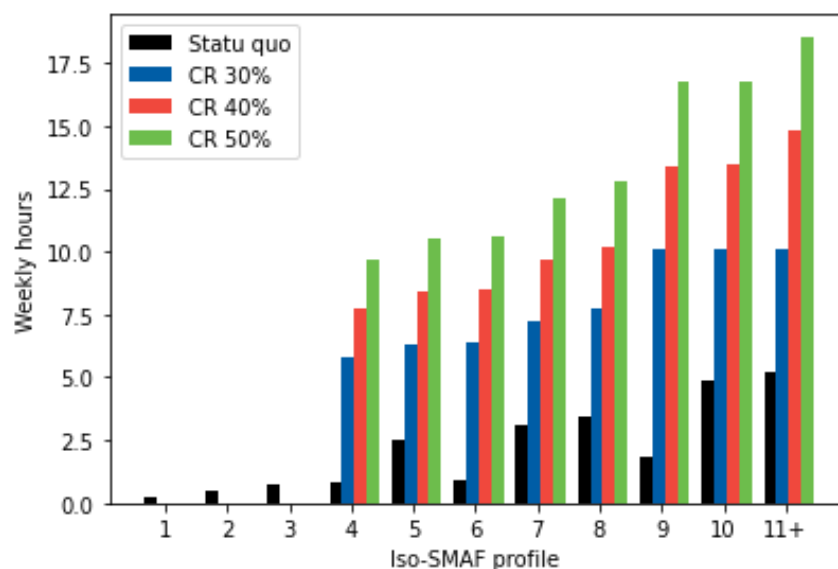
for Seniors and to the Financial Assistance Program for Domestic Help Services, but they do not appear in Figure 3.

The decrease in need for additional beds in nursing homes has a sizeable impact on construction costs. In fact, there is no need for additional nursing home beds in the next 10 years following re-allocation, while 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%), while only 33,000 additional beds are necessary with the proposed re-allocation (+86%).

Hours of home care

The three alternative scenarios for the reform package differ according to the coverage rate of home care provided by the Quebec government, i.e., 30%, 40%, or 50% of LTC needs. Figure 4 reports the impacts of such coverage rates (CR) on the number of hours by Iso-SMAF profile publicly funded by the senior's care account. 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 13M in 2020 to 31M in 2050. It increases up to 100M with a CR of 30%, 134M with a CR of 40%, and 167M with a CR of 50%. Over 30 years, the average annual growth rate (AAGR) equals 2,9 % for the status quo scenario, 7 % with a CR of 30%, 8,1 % with a CR of 40%, and 8,9 % with a CR of 50%. The results suggest that the AAGR of the total number of hours increases by around 1 percentage point when the coverage rate increases by 10 percentage points.

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: CR = coverage rate. Amounts in current dollars.

Source: Author's calculations.

Table 5. Total number of hours of home care per year paid by the Quebec government

Years	Status quo		Reform package								
			Coverage rate =								
	Hrs. (M)	AAGR (%)	30%			40%			50%		
			Hrs. (M)	AAGR (%)	Diff. (M)	Hrs. (M)	AAGR (%)	Diff. (M\$)	Hrs. (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: Hrs.: hours; Diff.: difference; AAGR = Average Annual Growth Rate.

Source: Author's calculations.

3.2 Costs

Current policy leads to faster growth of institutionalization

Table 6 shows that the status quo scenario results in a strong increase of total costs in all living arrangements. However, the growth is stronger in institutions than in home care. While the cost for the government of Quebec increases by 340% in 30 years in nursing homes and by 290% for residential care, it increases by 270% 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% in 2020 to 64.8% in 2050. The status quo combined with population aging would therefore reinforce institutionalization in Quebec.

Table 6 – Cost of LTC for the Quebec government in the status quo scenario by living arrangement

Years	Living arrangement					
	Nursing homes		Residential care		Home care	
	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: AAGR = Average Annual Growth Rate.

Source: Authors' calculations.

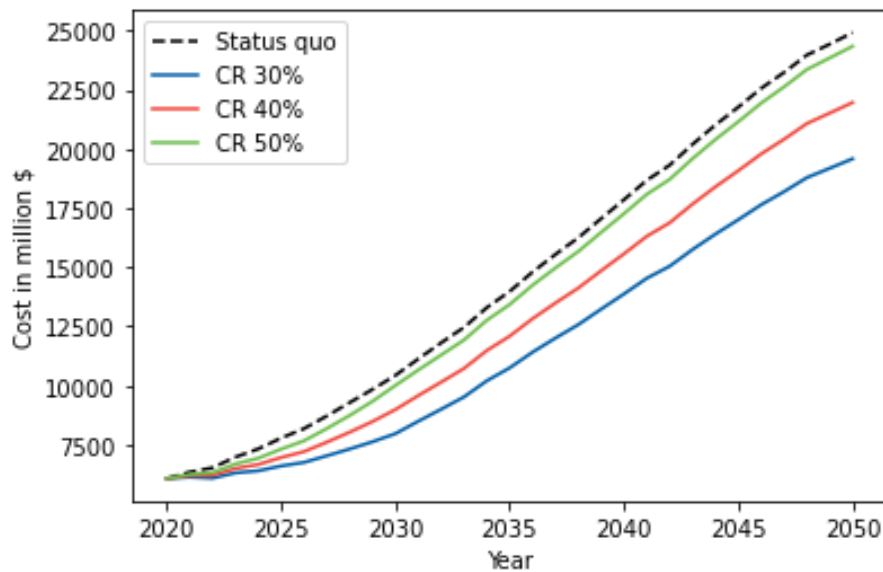
A reform package with a shift in home care that leads to cost savings

Figure 5 and Table 7 show total expenditures for the status quo scenario (current policy) and the three alternative scenarios under the reform package. With the status quo, the total cost for the Quebec government increases by 310% between 2020 (\$6.1B) and 2060 (\$24.9B)¹⁶, which represents an AAGR of 4,8% over the period. The annual growth of public expenditures is stronger between 2025 and 2035 (6.0%), 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% between 2025 and 2035 and that it will grow by 28.4% during 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 as well as 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 coverage rate of 30% reduces expenditures by \$1.2 billion in comparison with the status quo scenario, which represents a decrease of 15.1%. A coverage rate of 50% would also imply substantial savings. It would decrease the costs for the Quebec government by 6.0% (\$464M) in 2025 in comparison with the status quo scenario.

¹⁶ Of note, the magnitude of increase calculated with our analyses matches the country-level estimations produced by the National Institute on Ageing. Also based on a population microsimulation model, the institute found that publicly funded LTC should increase more than four times within the next 30 years (MacDonald 2022).

Figure 5. Total cost of LTC for the Quebec government for the status quo scenario and the reform package (coverage rate of 30%, 40%, and 50% in home care).



Notes: CR = coverage rate. Amounts in current dollars.
Source: Author's calculations.

Table 7. Total cost of LTC for the Quebec government for the status quo scenario and the three alternative scenarios (coverage rate of 30%, 40%, and 50% in home care).

Years	Status quo		Reform package Coverage rate =								
			30%			40%			50%		
	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

Note: AAGR = Average Annual Growth Rate. Amounts in current dollars.
Source: Author's calculations.

Savings for the Quebec government quickly materialize during the first 10 years following the reform and are maximized in 2030 when the new allocation of living arrangements is achieved, as shown by the evolution of the AAGR of total costs shown in Table 7. AAGRs of alternative scenarios between 2020 and 2025 are respectively 3.4 percentage points, 2.3 percentage points, and 1.3 percentage points lower than the status quo scenario for coverage rates of 30%, 40%, and 50%. Between 2025 and 2030, AAGRs of alternative scenarios are lower than the status quo scenario for a coverage rate of 30% (-2.2 percentage points) and 40% (-0.8 percentage point), but it is slightly higher for a coverage rate of 50% (+0.5%). 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 five last years. This can be explained by the progressive transition for living arrangements and coverage rates over 10 years combined with the population aging process that is not linear over this period. From 2035, AAGRs are very similar for all scenarios. However, savings are still generated after 2030. For instance, in 2050, the reform package with a coverage rate of 50% is \$574M less costly for the Quebec government than the status quo scenario.

Cumulated savings (in constant dollars) for the Quebec government from 2020 to 2050 are expected to be quite large with the reform package considered. Thirty years after the reform a coverage rate of 30% generates \$69.4 billion of cumulated savings. It represents 1.3 years of the Quebec budget for health expenditure which equals \$53,0 billion in 2020-2021. These cumulated savings equal \$40.5 billion with a coverage rate of 40% (equivalent to 9 months of the Quebec budget for health expenditures) and \$11.9 billion with a coverage rate of 50% (equivalent to 2.5 months of the Quebec budget for health expenditures)¹⁷.

¹⁷ These cost savings rely heavily on labor costs assumptions. Nevertheless, it is to be noted that 55.4% of costs in NH are related to nursing, personal care, and support care wages. In home care, these labor costs will depend on the coverage rate of needs. With a wage increase of 10% in these care types, cumulated savings decrease of 66% with a coverage rate of 50%, of 12.2% with a coverage rate of 40%, and of 3.0% with a coverage rate of 30%. In sum, our qualitative findings are robust to labor cost hypotheses for scenarios with a coverage rate of 30% or 40%. The scenario

4 Limitations

This article focused on public costs for the government of Quebec. User costs have been estimated for nursing homes and residential care, but it has not been possible to estimate the share of individuals' needs that were covered either by private insurance plans or by out-of-pocket spending. Moreover, estimations do not include care from informal caregivers that 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 estimated between 5.4 billion dollars to 9 billion dollars in 2019, depending on the monetization method (direct hourly wage costs or replacement costs). Moreover, the authors evidence that the number of hours per caregiver will strongly increase in the next 30 years. The reform proposed in our paper is expected to reduce the need for informal home care by increasing the public coverage rate from 8.3% to 30%, 40%, or 50%, depending on the alternative scenario. A second limitation is that we do not consider the issue of labor shortages and how it impacts cost savings. However, the effect would be ambiguous. Labor shortages are likely to put upward pressures on the trajectory of total expenditures with the current policy. In shifting the allocation towards more home care, it is unclear how this would affect labor demand and ultimately labor 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 labor pressures in the public sector.

with a coverage rate of 50% is less robust but it would necessitate a wage increase of more than 15% to cancel cumulated savings.

5 Conclusion

In this article, we projected the future needs and costs of LTC in Quebec. Due to population aging and the rapid growth of the “oldest old” (the 85+), 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 a tight budget constraint, a shift towards more home care has been advocated.

We show that a broad shift towards home care, while guaranteeing a reasonable level of care, does not lead to cost savings across the board. The shift needs to be targeted towards individuals with moderate care needs. In fact, caring for more severe cases tends to be more costly for home care than it is in institutions and existing tax measures are sufficient to cover the needs of those with lower 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.

In the reform package we propose, we argue for the creation of senior’s care accounts. Administered by the Health insurance board of Quebec (RAMQ), an Iso-SMAF indexed credit would be made available for seniors to purchase care. Seniors would not be responsible for handling claims, but 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 either by 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 account could

be very easily adjusted to 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 favors institutionalization by covering meals and other home support services in its coverage for nursing homes but not in home care settings.

With this combined reform package, we show that a shift towards home care accompanied by an increase of 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 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, all 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 which 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 to move towards a larger presence of private long-term care 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 both in 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 long-term care could certainly go a long way towards 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 of delivering a higher coverage rate 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 which accounts for behavioural responses when we change user costs but also it makes finding the optimal user costs more difficult. In the end, thinking about an optimal long-term care 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 well increase productivity by 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 environment, 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.

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