A Canadian *Parlor Room-Type* Approach to the Long-Term Care Insurance Puzzle*

M. Martin Boyer†, Philippe De Donder, Claude Fluet,

Marie-Louise Leroux, and Pierre-Carl Michaud

Abstract

We examine different hypotheses suspected to be the cause of the low market penetration of long-term care insurance in Canada. Our analysis is based on results from a survey of 2000 Canadians aged between 50 and 70, which was conducted in the autumn of 2016. A remarkable proportion of individuals in this age bracket report never having been approached to purchase such protection. Those who report having LTC insurance and those who do not do not differ in risk perception or health, although the former are more likely to report being in pension plans and, conditional on low income, have a bequest motive. We conclude that supply-side factors, including the crowding-out by government programs, are the most likely culprits in explaining the low proportion of Canadians that purchase private LTC insurance.

JEL classification: G02, G12, C14.
Keywords: Long-term care puzzle; Risk perceptions; Supply and demand of insurance; Government programs.

---

†Boyer and Michaud are professors at HEC Montréal (Université de Montréal), De Donder and Leroux are professors at ESG UQAM, and Fluet is a professor at Université Laval. All correspondance should be sent to the first author at martin.boyer@hec.ca.

"These (whodunnit) movies include the moment the crime takes place to the second the detective or intelligent protagonist reveals the real culprit in a parlor room-type scene"

(https://www.ranker.com/list/best-whodunnit-movies/ranker-film)

1 Introduction

1.1 Motivation

The Manufacturers Life Insurance Company of Canada, commonly known as Manulife, and which operates in the United States under the name John Hancock, is one of Canada's largest providers of life and health insurance. It announced in late 2017 that it would discontinue the sale of long-term care insurance in Canada by the end of the same calendar year. Reasons stated for doing so were the limited market acceptance of such a product and the new federal laws restricting insurer access to medical information. Manulife's presence on this market lasted barely 10 years. In November 2007, a Manulife official was quoted saying that "Canada's aging population, increased life expectancy and need for elder care all suggest Canadians should account for long term care costs when they're planning for retirement".[1] Although the Manulife official uttered those words in 2007, it is very likely that the same quote could be uttered by many others insurance and government officials in 2017; even the OECD (2011) recognizes that one of the biggest challenges of a modern society whose population is growing older is to devise a system that responds to the greater need of long-term care services.

Long-term care (LTC hereinafter) is defined as the care for elderly individuals over a prolonged period of time. This care is provided in the form of support with activities of daily living (such as bathing, dressing, eating, getting in and out of bed, grooming, and continence) or with instrumental activities of daily living (which include preparing meals, cleaning, doing the laundry, taking medication, getting to places beyond walking distance, shopping, managing money, and using the telephone or the Internet). LTC is related to the loss of autonomy[2] brought on by old age. LTC should be distinguished from illness, disability, and handicap, which can affect younger individuals. Put differently, LTC insurance is not the same as disability insurance: The latter is designed for the working age population, whereas the former targets the retired or soon-to-be-retired population.

LTC services are only one of many aspects of the increasingly important problems that all rich countries

---

[1] See http://www.newswire.ca/news-releases/manulife-financial-introduces-long-term-care-insurance-with-unique-design-and-benefits-for-canadians-and-their-partners-534616761.html (last visited 4 January 2018).

[2] Grignon and Bernier (2012) distinguish upstream (acute care or rehabilitation) from downstream (help with activities of daily living) services, since the former is generally the responsibility of health professionals under Canada's Health Act (and thus covered under provincial health services), whereas the latter is often provided by relatively unskilled workers and family members. For the purpose of the current study, we will limit ourselves to the downstream portion.

must face with respect to the provision of services to a growing elderly population. Great advances have been made in the provision of health services[3] and retirement income[4] to elderly; yet, the great majority of rich countries are still looking for the best way to finance the cost of providing LTC services. The financing of LTC services is therefore becoming an increasingly important problem. According to the OECD (2011), the population aged 80 and over is expected to represent 10% of the developed world's population by 2050. That age bracket, which represented only 4% of the rich world's total population in 2010, is the fastest growing age group in the developed world. The challenge for the provision and the financing of LTC services rests in the possibility that the number of years during which LTC services will be needed actually increases as the population grows older but not healthier, or that the types of services needed, sought, and/or covered by the public system or by private insurers change in the future.

1.2   Previous results

A decade ago, Brown and Finkelstein (2009) estimated that between 35% and 50% of 65-year-old Americans will be in need of a nursing home at some point. Of those, 10% to 20% will need LTC services for five years or more. Nothing suggests that these numbers have gone down, as Hurd *et al.* (2013) propose a range between 53% and 59% of 50 year old individuals who will need LTC services. LTC services will likely become more and more costly as the bulk of the baby boomer generation reaches an age when such services are needed. Canada, like other OECD countries, will not escape that trend. Having to pay for LTC represents a potentially catastrophic financial event for middle-income households, and especially for those who will need LTC for five years or more. The CLHIA (2012) projected that over the next 30 years, LTC expenses are to amount to 1.2 trillion Canadian dollars, half of which has not been budgeted yet. If, say, one-third of this is paid out-of-pocket by individuals, it would amount to 6.5 billion dollars in out-of-pocket expenses, each year, for nursing home services.

Despite LTC having many risk characteristics similar to that of catastrophes (that is, relatively low annual probability of needing LTC but high overall severity), which should be sufficient for an insurance market to thrive, LTC insurance penetration is quite low, with less than 15% of any rich country's population having some form of private LTC insurance. This low coverage phenomenon is known as the "LTC insurance puzzle".[5] Many hypotheses have been formulated to explain the lack of a market for LTC insurance. These

---

[3]For instance, medical care for the elderly is financed either from general income tax revenues, as in Canada and many Western European countries, or as a special program, such as Medicare in the United States.

[4]Such as Social Security in the United States, the Canada Pension Plan, and the Régie des rentes du Québec.

[5]We invite the interested reader to examine the Brown and Finkelstein (2004, 2011), Cremer *et al.* (2009), Grignon and Bernier (2012), and Pestieau and Ponthiere (2011) surveys on long-term care and long-term care insurance for a more detailed examination of the long-term care insurance puzzle.

hypotheses can be grouped in two categories: Demand-side considerations, including risk misperceptions, and supply-side considerations, including government crowding-out.

Supply-side explanations for the lack of a LTC insurance market can be divided in two: The cost of underwriting, including the cost of asymmetric information and lapse risk, and the crowding out of the private market caused by government programs. Some studies (see the references in Brown and Finkelstein 2008, 2009) argue that private LTC insurance contracts are expensive because of important loading factors. Brown and Finkelstein (2007) show, however, that loads on LTC insurance are not particularly high; at least not so high as to lead rich retirees to prefer using their private savings as a form of self-insurance rather than purchasing LTC insurance. Other studies (Sloan and Norton 1997) point to the existence of important asymmetric information problems (both moral hazard and adverse selection), which induce insurers to restrict coverage. In addition to these *ex ante* information asymmetry problems, Cutler (1996) proposes that the low market penetration of LTC insurance is due to the insurers' inability to forecast properly the average cost of insured services. In addition, as individuals learn more about their health condition through time, good risks let their LTC insurance contract lapse whereas bad risks remain in the pool. In other words, insurers shy away from long-term care risk which has, in the long run, too much uncertainty regarding not only the cost of providing services, but also the composition of the risk pool.[6] As for government programs, Brown and Finkelstein (2008) show that social insurance, and in particular Medicaid in the United States, crowds out the demand for private insurance (see Veall 1986 for the impact of government programs on private savings). While acknowledging that the public provision of health services late in life can explain the lack of insurance, Boyer and Glenzer (2016) propose that retirement programs (such as Canada's Old Age Security and Guaranteed Income Supplement, the Canada Pension Plan, la Régie des rentes du Québec, or Social Security in the United States) also reduce the need for LTC insurance, while exacerbating adverse selection problems.

Demand side explanations, which are more numerous than supply side explanations — likely because more data is available from individuals than from insurers — can be categorized based on whether they originate from the agents' utility function or from the agents' probability of needing long-term care. The first, and perhaps the most significant demand side explanation for the low LTC insurance penetration observed in any country, is related to the importance of family support (and to the support of close friends, to a lesser extent). Many studies have documented the importance of family help and there is now a consensus (see

---

[6]We thank an anonymous referee for making this point. The referee adds "Long-term risk is cataclysmic for the insurance industry when the average risk follows a random walk (and there are) dynamic asymmetries of information. To counter these risks, insurers limit coverage drastically, usually to a lifetime lump-sum payment, making the product not attractive at all."

for instance Bonsang 2007 & 2009, Charles and Sevak 2005, and Van Houtven and Norton 2004) about the substitutability between informal help, which is provided by the family or close friends, and formal help. A report from the OECD (2011) highlights the fact that family care-takers are primarily women, and in particular (younger) spouses, adult daughters, and daughters-in-law. Access to family support explains part of the lack of LTC insurance because it is relatively easy to ask help from family members. In the context of family support, formal help consists in monetary transfers between children and their elderly parents, either directly to the parents or in the form of paying the elderly parents' nursing home if parents are unable to manage their finances. Informal help[7] consists in children devoting time to help their elderly parents, sharing their house or apartment with them, or moving back in with an elderly parent who is unwilling to leave his or her home (Pinquart and Sorensen 2002).

A second demand-side reason is related to the population's low level of financial literacy (see Lusardi and Mitchell 2014 and Boisclair *et al.* 2015), and to the individuals' lack of knowledge about the true costs and benefits of LTC services and LTC insurance, respectively. There is a large body of research on the lack of basic financial knowledge and on the pernicious impact of financial illiteracy in the long run (see Lusardi *et al.* 2017), especially with respect to savings decisions and retirement planning. In contrast, there is not much evidence about whether agents have any knowledge of the true costs associated with dependency.[8]

The third demand-side reason explaining the low LTC insurance take-up is the older parents' reluctance to leave their homes. Davidoff (2009) considers housing (and the sharing of it) as a substitute for LTC insurance. Elderly individuals should prefer to de-cumulate house equity[9] rather than buying insurance in anticipation of potentially needing LTC services, so that wealthier individuals should be more willing to bequeath AND buy long-term care insurance than poorer individuals. Wealth, income, and bequest motives are all related to the elderly individual's budget set. Lockwood (2018) shows that bequest motives reduce the opportunity cost of saving, thus increasing savings and decreasing the demand not only for annuities (see Brown and Poterba 2000, and Vidal-Melia and Lejarrage-Garcia 2006) but also for LTC insurance. The effect of bequest motives on the demand for LTC insurance is not trivial as it depends on the wealth elasticity

---

[7]One can surmise that individuals who expect to receive some form of informal help should choose LTC insurance policies which have a longer waiting period (and a lower premium). In reality, however, there seems to be little flexibility in that respect as the maximum waiting period is 180 days for most policies. This might still be too much coverage for those who anticipate to receive informal help for longer than 180 days. As a consequence, the least comprehensive policy on the market would still be too comprehensive and thus too expensive for these individuals. As a result, individuals expecting to receive informal help will not purchase LTCI at all.

[8]The Canadian government is promoting financial literacy by providing an online library for finding much needed information about financial products and markets (https://www.canada.ca/en/financial-consumer-agency/services/financial-literacy-database.html last visited on 12 December 2017)

[9]This is the case even though borrowing out of house equity, through a reverse mortgage, is relatively limited according to Caplin (2002). More recently, Nakajima and Trlyukova (2017) find that only 1.9% of eligible homeowners had reverse mortgage loans in 2013.

of bequests. Individuals may prefer to set aside precautionary savings as a means of self-insuring the cost of long-term care. In most cases, these substantial savings will not be needed to pay for long-term care needs and will thus significantly increase the bequest. It follows that, when risk aversion over bequests is low, LTC insurance is not attractive – especially in light of the loading on the premiums which further reduces bequests and the value of LTC insurance. There is also evidence (Auten and Joulfaian, 1996; Hurd and Smith, 2002) that retirees' risk aversion over bequests is not sufficient to make them purchase LTC insurance.

One last demand-side source to explain the thinness of the LTC insurance market is the agents' misperception of long-term care risk. This misperception occurs with respect to both the likelihood that they will need such services and the cost associated with LTC services. Brown and Finkelstein (2009) and Cremer *et al.* (2009) mention individuals' misperceptions of LTC risks as the primary reason for explaining the long-term care puzzle. As in Finkelstein and McGarry (2006), their conclusions are built on a survey that compared a respondent's subjective probability of entering a nursing home in the next 5 years to his or hers actual use 5 years later. Most respondents underestimate their true probability of needing LTC services, and they infer that such under-assessment is the main reason for not purchasing LTC insurance. Tennyson and Yang (2014) highlight the role of one's experience with LTC as a contributing factor to the awareness of the risk of LTC costs, or the lack thereof (see also Zhou-Richter *et al.* 2010). In comparison to the reliance on informal care and to an individuals's low risk aversion to bequest risk, misperception of risk along with the misperception of costs are likely stronger justifications for policy intervention.

1.3 Approach

The objective of this paper is to use a new survey conducted in the autumn of 2016 to investigate the source of the low LTC insurance take-up and solve the so-called "LTC insurance puzzle". To that end, we explore many aforementioned demand-side factors, such as the misperception of risks associated with old-age and other individual characteristics (family support, risk aversion, wealth, and bequest motives), and supply-side factors, including the crowding-out by public provision of similar services.

Our survey is closely related to that of Ameriks *et al.* (2016), which examines the characteristics of demand for LTC insurance in the United States. With the help of *Asking Canadians*, a Canadian online panel survey organization, we conducted our survey using many similar questions as in Ameriks *et al.* (2016). We asked questions about the respondent's personal characteristics and preferences related to risk, their interest in leaving a bequest, and their knowledge about long-term care and long-term care insurance to assess their demand for LTC insurance products. Ameriks *et al.* (2016) find that 60% of the panel members

should buy LTC insurance, although merely 22% of them actually have LTC insurance; interestingly, we find much smaller proportions in our panel of Canadian respondents with only 11% of respondents telling us they have LTC insurance coverage. Ameriks *et al.* (2016) explains the gap between their theoretical prediction (60%) and reality (22%) by a lack of interest on the demand side as well as poor insurance product features.

Before getting into the possible reasons why so little LTC insurance is purchased, we first present in the next section the situation and the challenges that befall Canada with respect to the growing elderly population and its need for LTC services. In Section 3, we present the survey we conducted on LTC insurance. Demand side explanations, such as risk aversion, risk perception, and wealth, are first examined to explain the low take-up rate. We then examine supply side explanations, including the crowding-out by government programs. Finally we conclude in Section 4 with public policy implications of our results.

2   The state of LTC in Canada

Despite the demographic trend towards having an older population and the pressure it puts on health care cost at older ages, OECD countries have still been able to keep LTC expenditures (either public or private) relatively low. Overall, spending on LTC services in OECD countries averaged 1.5% of GDP, of which only 20% can be considered as private expenditures. Figure 1 illustrates the importance of total expenditures on LTC services (health and social) in 30 OECD countries as a percentage of their GDP. Canada is close to the OECD average.

Because the Canada Health Act does not include LTC services in dedicated establishments, provinces are not required to provide such services on a universal basis. In addition, there are no federally-mandated standards[10] for LTC services so that they can vary across provinces. LTC services can also vary within a province based on an individual's ability to pay or the type of services needed or available. Insurance payments are not necessarily conditional on using formal LTC facilities (such as nursing homes, *inter alia*), as participants can be allowed to use insurance payments to compensate family members for the informal help they provide. To illustrate the extent of disparities across provinces in the provision of LTC services, Table 1A provides the out-of-pocket costs to individuals needing residential care and Table 1B provides statistics[11] on the availability of beds in residential care facilities and on the importance of the for-profit sector in the provision of LTC services.

Across Canada the maximum daily copayment for a stay in a residential care facility in 2005 varied

---

[10]See McGregor and Ronald (2011) for more on this topic.

[11]See Greb *et al.* (1994) for individuals 65 and over, and to a 2009 CUPE study cited in McGregor and Ronald (2011) for individuals 75 and over.
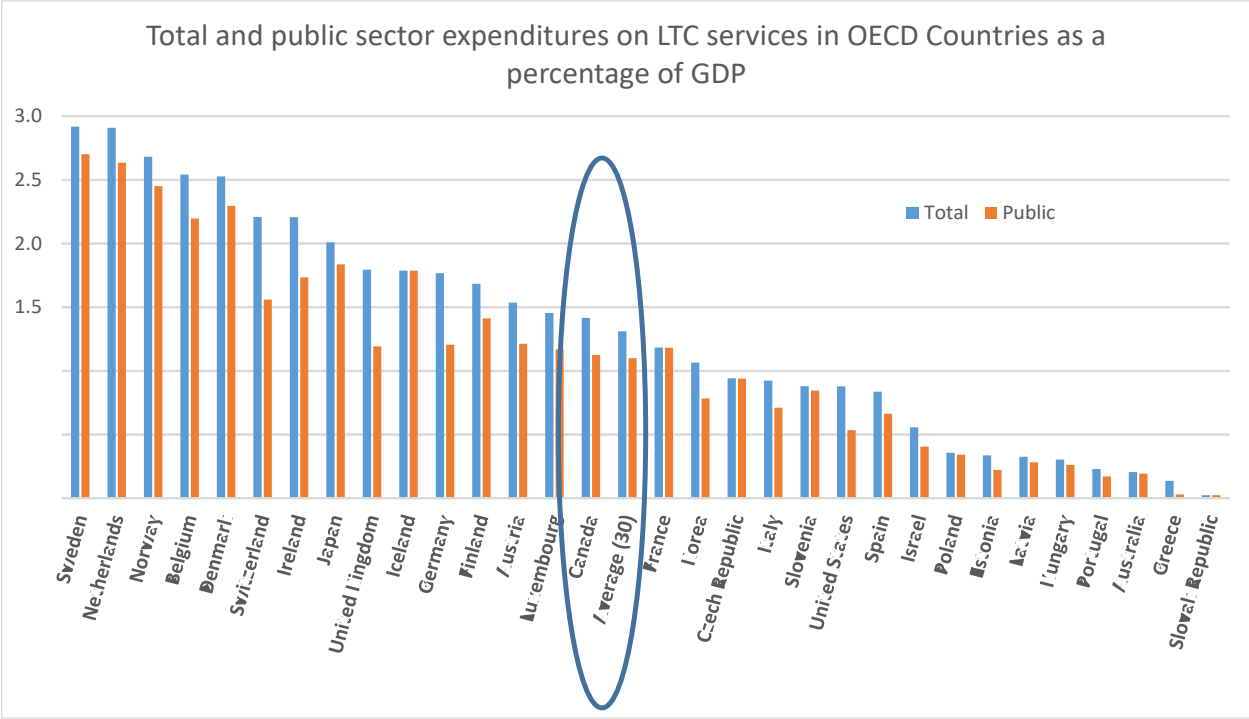
Figure 1: Total and public sector spending on long-term care services as a percentage of the country's GDP for the year 2014. Source: OECD Health Statistics (2017)

from almost $200 in Nova Scotia to $40 in Alberta. Some provinces (Alberta, Ontario, and Newfoundland & Labrador) asked all residents to pay the same price for a stay in a residential-care facility, at least in terms of the basic service. Other provinces used some form of means-testing approach, or had different prices for different individuals based on their age or the type of services that is required or demanded (such as a private room). In 2017, as in 2005, there are substantial differences across provinces in the amounts charged.[12] In Quebec, a bed in a long-term care unit (the French acronym is CHSLD) can be secured for a maximum of between $1,163 and $1,868 per month.[13] The higher bound seems relatively low compared to

---

[12] Per province (last visited on 8 February 2018):
AB: http://www.health.alberta.ca/services/continuing-care-accommodation-charges.html
BC: https://www2.gov.bc.ca/gov/content/health/accessing-health-care/home-community-care/care-options-and-cost/long-term-residential-car
MB: http://www.gov.mb.ca/health/pcs/index.html
NB: http://www2.gnb.ca/content/gnb/en/services/services_renderer.9615.html
NL: http://www.health.gov.nl.ca/health/faq/nhltfaq.html
NS: https://novascotia.ca/dhw/ccs/FactSheets/Paying-for-Long-Term-Care.pdf
ON: https://www.ontario.ca/page/get-help-paying-long-term-care
PEI: http://www.gov.pe.ca/photos/original/hlth_ltc_fs1.pdf (2012)
QC: www4.prod.ramq.gouv.qc.ca.
SA: https://www.saskatchewan.ca/residents/health/accessing-health-care-services/care-at-home-and-outside-the-hospital/special-care-homes
[13] This cost varies depending on whether this is a private or shared room, and according to income. See https://www4.prod.ramq.gouv.qc.ca/Cah/BY/BYG_GereAdheb/BYG6_CalcContb_iut/BYG6_Accueil.aspx (last visited on

the monthly earnings[14] of richer retirees. In Ontario, the basic service monthly cost for any elderly individual in a residential care facility is \$1820. The maximum cost in Atlantic Canada varies between twice and four times the minimum price.

Table 1A. Cost of long-term care facilities in 2005 and 2017 in the ten Canadian provinces				
Province	Monthly charge[b] for residential care in 2005. McGregor and Ronald (2011)		Maximum monthly charge for residential care in 2017. Multiple sources	
	Min	Max	Basic service	Private room
Alberta	\$1,200	\$1,200 [a]	\$1,636	\$1,992
British Columbia	\$810	\$1,950	\$3,279	
Manitoba	\$780	\$1,860	\$2,550	
New Brunswick	\$3,540	\$5,220	\$3,437	
Newfoundland	\$2,790	\$2,790 [a]	\$2,990	
Nova Scotia	\$3,300	\$5,970	\$3,350	
Ontario	\$1,470	\$1,470 [a]	\$1,820	\$2,599
PEI	\$1,350	\$4,590	\$2,328	
Québec	\$900	\$1,470	\$1,163	\$1,868
Saskatchewan	\$870	\$1,620	\$2,722	
Source	CIHI (2005)[c]			
[a] Same cost to all residents (for more details, see McGregor and Ronald 2011).				
[b] The reported values were in days, we multiplied all by 30 to arrive at the above numbers.				
[c] From McGregor and Ronald (2011) citing CIHI (2005).				

We see in Table 1B that the supply of long-term care facilities varies a lot across provinces, both in terms of the number of beds available as a proportion of the population aged 65 and over in 1994 and aged 75 and over in 2009, and in terms of the importance of for-profit care facilities in the provinces (especially with respect to the Greb *et al.* 1994 findings). With respect to the number of beds in the 2009 CUPE study, it is in New Brunswick where the supply of beds is the smallest with 78.5 beds per 1000 individuals aged 75 and over, compared to 116.1 in Manitoba. The private sector's presence is also quite different across provinces as it represents less than 10% of the total supply of beds in Saskatchewan, New Brunswick and Newfoundland & Labrador, compared to 30% in British Columbia, Alberta, and Nova Scotia, and to 53% in Ontario. The important differences in the market share of for-profit facilities between the Greb *et al.* (1994) study and the CUPE (2009) study cited in McGregor and Ronald (2011) epitomize the difficulty in comparing LTC markets in different jurisdictions within Canada.

---

29 august 2018).

[14] According to the 2015 survey, senior families, where the highest income earner was 65 years of age or older, had a median after-tax income of \$57,500, whereas unattached individuals 65 years of age or older had a median after-tax income of \$26,300. http://www.statcan.gc.ca/daily-quotidien/170526/dq170526a-eng.htm (last visited on 29 January 2018).

Table 1B. Bed availability for elderly individuals in long-term care facilities and importance of for-profit facilities in the ten Canadian provinces			
Province	Beds per 1000 individuals	For profit facilities as a % of total	
	aged 65 + in 1994	aged 75 + in 2009	1994	2009
Alberta	75.8	83.9	20%	30%
British Columbia	68.3	81.3	56%	31%
Manitoba	77.9	116.1	33%	26%
New Brunswick	97.7	78.5	87%	5%
Newfoundland	80.8	84.2	75%	0
Nova Scotia	89.6	89.4	57%	30%
Ontario	72.7	91.5	57%	53%
PEI	107.5	100.1	74%	41%
Québec	72.6	88.3	13%	23%
Saskatchewan	90.1	112.8	48%	8%
Source	Greb (1994)	CUPE (2009)^c	Greb (1994)	CUPE (2009)^c
^{c} From McGregor and Ronald (2011).			

Based on OECD (2009, 2011) publications on long-term care services, Boyer (2018) shows that Canada is not unique in its treatment of LTC at the regional level since Slovakia and Estonia also have regional mandates for LTC services. In Spain, Ireland, the United Kingdom, Switzerland, Italy, and New Zealand, the responsibility of providing LTC services is shared between the central government and their more-or-less autonomous regions. In the United States, Medicare and Medicaid programs provide means-tested long-term care services that are managed at the federal and state levels. What is unique about Canada is that it is the only OECD country whereby the LTC responsibility falls entirely upon the different regions (that is, the provinces), while at the same time allowing a private LTC insurance market to operate.

We acknowledge that the LTC insurance puzzle is probably less intense in Canada than say, in the United States, because of public policy differences. In particular, Canadian provinces offer subsidized nursing home services, in contrast to U.S. states. Also, while the U.S. Medicaid will pay for LTC only for people with low income and low assets, means-testing in Canada often considers only income, except in Quebec and Newfoundland & Labrador, where assets are somewhat included according to Blomqvist and Busby (2014). The combination of Old Age Security and Guaranteed Income Supplement available to most Canadian seniors is sufficient to cover basic public-supported LTC services at the means-tested rate. It remains surprising that so few individuals insure themselves against the possibility that they will want more than basic services, or that they will need expensive private nursing home care while waiting for a subsidized space.

3 Why so little insurance?

3.1 The Survey

We contacted a Canadian online panel survey organization, *Asking Canadians*,[15] to conduct a survey on long-term care insurance in late autumn 2016. Two thousand panel members aged 50 to 70 residing either in Ontario or in Quebec were randomly selected. The 50 to 70 year-old range was chosen because individuals in that age group are those for whom the risk of needing long-term care is most salient and foreseeable, but yet idiosyncratic enough for insurers to see the risk as diversifiable, at least over time (similar to life insurance). Because some socio-demographic groups are under-represented in the survey (in particular the group of low-educated individuals), we re-weighed the data using the Labor Force Survey of 2014 by stratifying groups based on age (20 categories), sex (2 categories), province of residence (2 categories), and level of education (3 categories).

Available in French and English, the survey questionnaire had four parts. The first three parts asked respondents about their socioeconomic characteristics, reasons for having purchased (or not) long-term care insurance, risk perceptions, and their preferences regarding the type of long-term care they would prefer to receive. Questions for which we expected a significant fraction of missing information, such as measures of savings and income, were asked using unfolding brackets. We then imputed missing values with information from the bracketing based on socio-demographic covariates. The fourth and last part of the survey, which we do not use in the current paper, consisted of a stated-preference experiment using the framework developed by Einav *et al.* (2010). In this experiment respondents were presented randomized LTC insurance contracts and were asked the likelihood with which they would purchase this product. The experiment is described in more details in Boyer *et al.* (2017).

Table 2 reports the weighted summary statistics of some results from the survey (all survey values reported in the paper are in 2016 Canadian dollars). With respect to unweighted results (not in the table), 50% of our respondents are residents of the province of Quebec, are women, or are aged 60 and over. Approximately the same proportion of respondents use French as their main language at home, or are retired. With respect to their health, 44% of our respondents reported having or having had at least one of the following seven medical conditions: Heart disease, Stroke, Diabetes, Lung disease, Hypertension, Mental problems (including depression), and/or Cancer. 72% of those with an illness reported having only that one, 20% of survey respondents with at least one illness reported having two medical conditions, and 8% having three or

---

[15]*Asking Canadians* rewards participants for their effort with loyalty rewards from major retailers,

more[16] illnesses.

The first result to appear in Table 2 is the fact that LTC insurance is not very popular as 10.8% of survey participants report having some sort of LTC insurance coverage. This compares to 70% of the respondents who declare having life insurance.

Table 2. Weighted summary statistics for a subset of variables.								
	Num	Mean	Std.Dev.	10%	25%	Median	75%	90%
Has LTC insurance	1819	0.108	0.311					
Total income ($'000)	2000	105.8	438.9	20	40	74	110.2	171.0
House value ($'000)	1216	724.5	5777	143	225	350	550	850
Total wealth house owners ($'000)	1216	1006	6072	180	295	501	900	1290
Total wealth renters ($'000)	408	96.8	449	0	0	15	70	200
Has life insurance	1969	0.700	0.458					
Lives in Quebec	2000	0.380	0.486					
Speak French at home	2000	0.379	0.485					
Aged 60 and over	2000	0.442	0.497					
Retired	2000	0.453	0.498					
Women	2000	0.505	0.500					
At least one sickness	2000	0.433	0.496					
Number of sicknesses	2000	0.608	0.878	0	0	0	1	2
Has a pension plan	2000	0.547	0.498					
Monthly premium (>$1)	209	122	112	21	49	85	164	250
Potential monthly benefits (>1$)	211	2377	1995	400	889	1974	3124	5000
Premium-to-benefit ratio	207	20.4%	70.7%	0.99%	2.25%	4.78%	10.4%	30.0%

The columns give the number of usable answers per question (the number of respondents is 2000), mean, standard deviation, and some quantile values (including median) for 10 variables in the survey. *Has LTC insurance* is equal to 1 if the respondent has LTC insurance and 0 otherwise. *Number of sicknesses* is equal to the number of health issues (heart disease, stroke, diabetes, lung disease, hypertension, mental problem, cancer) a respondent has. Monthly premiums and potential benefits are imputed conditional on being greater than $1. By design, half the respondents live in Quebec, are women / speak French / are aged 60 and over.

The 10.8% LTC insurance take-up rate is not as small as one could think, however. Boyer *et al.* (2017) state that, in Quebec, "the association representing insurers (CLHIA) reported a take-up rate for long-term care insurance policies around 1.7% in 2015" (page 2). For Canada as a whole, CLHIA (2014) writes that "as of 2010, there were only about 385,000 Canadians with long-term care coverage" (page 8), which, given a total of 4.8 million Canadians[17] aged 65 and over, gives a penetration rate of 8%.[18] Baker (2009) also finds a take-up rate of less than 1% (at least as reported in Grignon and Bernier 2012). Our survey results

---

[16] Two respondents reported having all 7 conditions.

[17] https://www150.statcan.gc.ca/n1/pub/11-402-x/2011000/chap/seniors-aines/seniors-aines-eng.htm last visited on 20 november 2018.

[18] To conclude that the penetration rate of long-term care insurance is 1.7% in Canada given the 385,000 covered individuals, the ratio has to be taken with respect to the population aged 30 and older (or the population aged between 25 and 75 years). Source: https://www150.statcan.gc.ca/t1/tbl1/en/cv.action?pid=1710000501, last visited on 21 november 2018.

are much closer to the 13.8% take-up rate in the United States that was reported in Brown and Finkelstein (2011) and Grignon and Bernier (2012), but not as high as the 22% take-up rate reported in Ameriks *et al.* (2016).

The median annual household income stands at $74,000. It is slightly below the median income of Canadian households, which stands at $79,000, but equal to the median income of Quebec households. 54.7% of our respondents report having an employer-sponsored pension plan. Conditional on reporting a coverage and a premium greater than $1 (some respondents said they had insurance but refused to give the premium and/or coverage), the average monthly premium is $122, for an average monthly benefit of $2377. Both values are in line with what is observed in the actual LTC insurance market.

Since we seek to find the reason why LTC insurance products − which protect Canadians and their families against the hardship associated with the catastrophic cost of LTC services − are not more prevalent in our modern society, we consider in the rest of the paper the following four suspects − two come from the demand-side, and two come from the supply-side. Even though there are potentially other reasons (such as a lack of confidence in the insurance industry) why LTC insurance markets find little traction in Canada and in other OECD regions or countries, these are the most likely usual suspects.

1. LTC insurance is too expensive given the individual's perception of the risk associated with this type of adverse event.

2. Individuals' characteristics (such as risk aversion and wealth) are such that they have a low demand or need for LTC insurance.

3. The supply of long-term care insurance is lacking because either insurers do not see much profitability to be made in this market, or compared to other personal insurance lines, insurance agents do not perceive there is enough commission upside to warrant investing much energy to understand the drivers of the LTC insurance market and to sell LTC insurance products.

4. Public services are crowding out the private insurance market either directly by offering LTC services, or indirectly by causing disruptions which prevent insurers from having access to a big enough market to diversify risk and recoup the fixed costs associated with introducing and maintaining LTC insurance products.

3.2 Price and risk perceptions

We asked survey respondents for the basic pricing characteristics of their LTC insurance contracts. The median monthly premium respondents pay is $85, which is lower than the mean of $122 (see Table 2). These premium payments allow respondents to obtain monthly benefits equal to $2377 on average if some kind of help with activities of daily living is needed or the respondent has lost his autonomy. Similarly to the case of the premiums, the mean benefit is greater than the median benefit, which stands at $1974. Assuming a five-year average need of LTC services (see Boisclair *et al.* 2016), the average potential benefit is close to $145,000. This is similar to the $150,000 that was reported in Grignon and Bernier (2012) for each member of a married couple. The monthly premium of $122 (or close to $1500 per year) is quite similar to the cost of automobile insurance. It is therefore difficult to argue that the reason why most people do not have long-term care insurance is that it is prohibitively expensive.

Still, individuals may have a low demand for insurance if they under-estimate their probability of needing care so that the perceived price of insurance is too high given such a low subjective probability. To investigate this possibility, we asked respondents for their perceived probability of eventually needing long-term care in a nursing home, and of living more than 1, 2, or 4 years with one or more physical or mental (or ADL) limitations. Table 3 compiles the results of the respondents' answers to these questions.

Table 3. Perception of the risk of needing long-term care in the future						
Question: What is your probability...	Without LTC Insurance		With LTC Insurance		Objective Probability	Tests Mean/Median
...of needing a nursing home (%)	36.9 (30.0)	1087	28.0 (26.7)	152	26%	1% / 1%
...of living more than 1 year with an ADL (%)	46.9 (32.7)	1055	39.6 (33.6)	142	56%[19]	1% / 1%
...of living more than 2 years with an ADL (%)	42.9 (31.2)	763	37.6 (33.5)	91	N/A	10% / n.s.
...of living more than 4 years with an ADL (%)	35.8 (30.5)	597	33.8 (33.9)	77	N/A	n.s. / n.s.
...of living with a family member if in need of a nursing home (%)	39.0 (36.7)	1258	38.6 (36.3)	166	N/A	n.s. / n.s.

This table presents the mean, (standard error), and *number of answers* to the five questions related to the respondents' subjective probability of needing long-term care. The column labelled "Objective Probability" gives the actual statistic according to Boisclair *et al. (*2016). The last column gives the level of significance of the test for the difference in the mean and in the median answers of those who believe they have LTC insurance coverage and those who have no insurance, at the 1%, 5%, and 10% levels, or a difference that is not significant (n.s.). The test for the difference between the means (resp. medians) is a t–test (resp. Wilcoxon rank-sum test). In all cases, we can reject the hypothesis that insured individuals are more pessimistic than uninsured individuals.

[19] Although the 35% to 40% is the "standard value range" obtained from The Retirement Project (2007), Robinson (1996),

Examining first the respondents' perceptions of risks with the actual probability of the event occurring, we see that uninsured respondents overestimate their probability of needing a nursing home, whereas insured respondents provide estimates that are quite close to their objective probability. The fact that uninsured individuals perceive their risk of needing LTC as being greater than insured individuals is contrary to what we know about the demand for insurance products. Uninsured respondents should assign a lower subjective probability of needing long-term care services in a nursing home and a lower subjective probability of living 1, 2, and 4 years with an ADL limitation. The differences in the respondent's perception of facing hardship later in life do not match their differences in LTC insurance purchasing decisions.

The difference in the distribution of the perceived probability of needing a nursing home amongst purchasers and non-purchasers of LTC insurance is more evident in Figure 2A where we merged probabilities in 20% bins. Insured respondents (on the right) more commonly assign a low chance of needing a nursing home than uninsured respondents. Looking at the evidence from our survey, we conclude that insured respondents are not those who are the most pessimistic about the risk of needing LTC services; it is rather the opposite. More precisely, the two populations (with and without LTC insurance) either have a similar estimation of the risk (probability of living to age 85, of living more than 4 years with an ADL or of living with a family member in need of a nursing home), or the insured population has a lower subjective probability of needing a nursing home, or of living more than 1 or 2 years with an ADL. Boyer *et al* (2019) show that uninsured individuals are more pessimistic than insured individuals even after controlling for possible covariates and characteristics associated with risk aversion (such as sex, income) and financial literacy.

Figure 2B shows that the perceived probability of ever needing a nursing home does not vary by sex. This perceived probability does, however, depend on the respondent's province of residence (see Figure 2C); residents of Quebec perceive the risk of finding themselves in a nursing home to be significantly lower than Ontario residents. The only demographic variable that is significantly correlated with one's subjective probability of needing LTC services is whether high school was completed (see Figure 2D, with those without a high school degree on the left). The histogram tells us that individuals who finished high school perceive their probability of living in a nursing home to be significantly higher than those individuals who did not finish high school. The link between education and LTC risk perception is not linear, however, as we find no significant relationship between the respondents' LTC risk perception and different post-high school

and Dick *et al.* (1994), we will use the recent estimate reported in Boyer *et al.* (2017) of 56%. The estimates in Hurd *et al.* (2013) and Friedberg et al. (2014) are closer to 50%. Kemper and Murtaugh (1991) propose 43%, whereas Wiener *et al.* (1994, 2000) report 49%. According to a senior executive of the Canadian Life and Health Insurance Association (CLHIA) quoted in The Globe and Mail, 3 Feb. 2016, the probability that any Canadian will need long-term care at least once in his/her lifetime is 17% (https://www.theglobeandmail.com/globe-investor/retirement/retire-health/should-you-buy-long-term-care-insurance/article28512380/).

education levels. Irrespective of one's optimistic or pessimistic views on life, less educated individuals could actually have a higher risk of dying before needing LTC services.
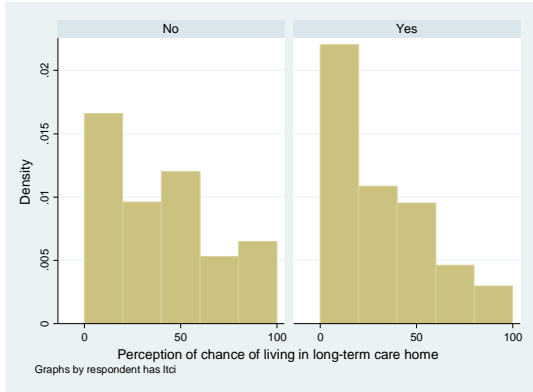

Figure 2A. Perception of living in a long-term care home at some point in one's life as a function of whether the survey respondent is insured (right) or not (left).
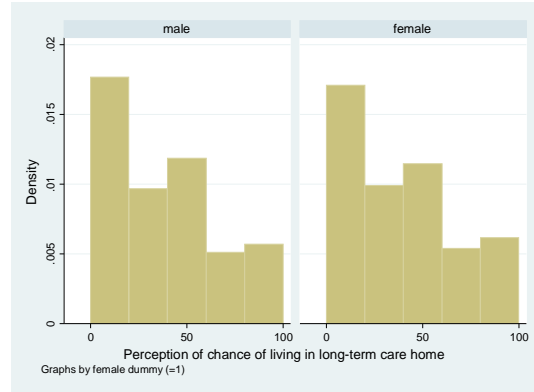
Figure 2B. Perception of living in a long-term care home at some point in one's life as a function of whether the survey respondent is female (right) or male (left).
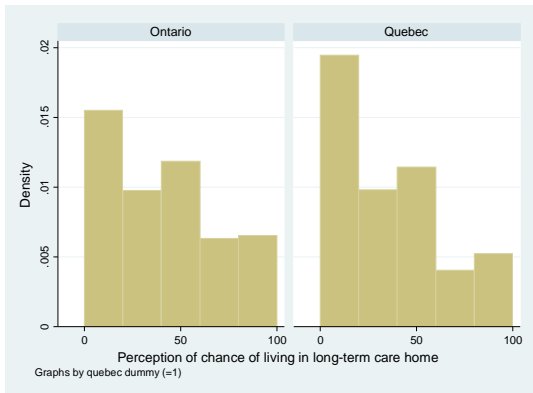
Figure 2C. Perception of living in a long-term care home at some point in one's life as a function of whether the survey respondent resides in Quebec (right) or Ontario (left).
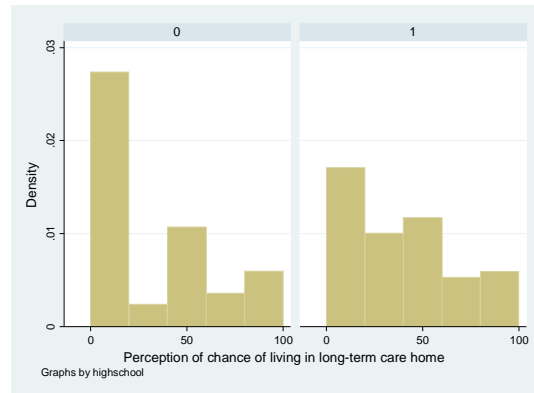
Figure 2D. Perception of living in a long-term care home at some point in one's life as a function of whether the survey respondent finished high school (right) or not (left).

Lastly, Table 4 presents the reported values for the monthly mean individual cost of (or, equivalently, the net fee they have to pay for) a private LTC home and of a subsidized one. Uninsured Quebec respondents believe the monthly cost of an unsubsidized private nursing home to be higher than those who have LTC coverage. The uninsureds' perception of the cost of an unsubsidized nursing home is more than three times the insured respondents' perception. At the same time, the same respondents believe the fee of the subsidized nursing homes to be lower.

Table 4. Perceived individual cost of LTC services depending on the respondents' perceived insured status and their province of residence				
In 2016, what is the average monthly cost of staying in a private, subsidized (or unsubsidized) long-term care home if you are uninsured? This would include the cost of room and board as well as that of all personal and nursing care				
	Unsubsidized		Subsidized	
	Without LTC Insurance	With LTC Insurance	Without LTC Insurance	With LTC Insurance
In Quebec	$9354	$2615	$2187	$2373
In Ontario	Not Asked[20]		Without LTC Insurance	With LTC Insurance
			$3797	$2970
This table presents the perceived monthly cost of a subsidized nursing home in Quebec and in Ontario, and that of an unsubsidized one in Quebec, as a function of the respondent's perceived LTC insured status.				

Ontario residents perceive the monthly individual cost of a subsidized nursing home to be greater than Quebec residents. Uninsured Ontario respondents are more pessimistic in terms of the monthly cost of a nursing home than insured respondents by about $830, or almost 30% of the perceived cost of insured Ontario residents. In Quebec, the difference between an uninsured's perception of the fee of a subsidized nursing home is only 10% lower than an insured's perception. The perceived median waiting time for a room in a LTC facility is between 13 and 14 months by insured and uninsured respondents alike, and in both provinces. The perception is a tad pessimistic compared to reality as the actual median waiting time is approximately 3.5 months in Ontario and 10 months in Quebec.[21]

We conclude from this section that the reason for the low take-up of LTC insurance does not seem to be that non-covered individuals under-estimate their probability of needing LTC or its price, nor that LTC insurance is especially expensive compared to other types of insurance purchased by many individuals of the same age groups. The rationale for the low take-up must then lie elsewhere on the demand side, and/or be a supply-side issue.

3.3 Demand characteristics unrelated to risk perceptions

In addition to price and perceptions, we explore four other aspects of the demand for LTC insurance in Canada:

1. The respondents' risk aversion under the hypothesis that higher risk aversion should induce larger demand for LTC insurance;

---

[20]Long-term care accommodation costs are set by the Ministry of Health and Long-Term Care and are standard in all long-term care homes across Ontario. See https://www.ontario.ca/page/get-help-paying-long-term-care

[21]For Ontario and Quebec, see http://www.waittimealliance.ca/wp-content/uploads/2015/12/EN-FINAL-2015-WTA-Report-Card_REV.pdf and http://www.csbe.gouv.qc.ca/fileadmin/www/2017/InfoPerformance/CSBE_Info_Performance_no16.pdf respectively.

2. Whether agents feel they do not need to actively purchase LTC insurance because they believe they obtained it from their employer (or some other collective insurance contract);

3. Whether the individual's health condition influences his or her willingness to buy insurance; and

4. The role of bequest motives.

3.3.1 Risk Aversion

If LTC insurance is similar to other types of insurance products, then, all else equal, we should expect more risk averse agents to be more likely to have insurance. In our survey, we asked one direct question[22] unrelated to the demand for long-term care insurance to tease out each agent's attitude towards risk. More precisely, we asked about an agent's willingness to take substantial, above average, average, or under average financial risks in order to obtain substantial, above average, average or under average financial returns. Our presumption is that more risk averse agents in capital market investing should also be more risk averse in seeking insurance protection.[23] In other words, agents who seek investment with a higher risk should be less likely to purchase insurance. The first result of Table 5 shows that insured respondents are significantly more willing to take above-average financial risks (23.7% against 19.2%), which means that (financial) risk aversion does not positively correlate with the demand for LTC insurance.

In addition to this direct question, we report in Table 5 some individual characteristics (age, sex, education, marital status, number of children) associated with risk aversion (see Halek and Eisenhauer 2001), which we cross-tabulate with having LTC insurance coverage (on the right) or not (on the left). Older individuals[24] and women are thus deemed more risk averse. Married individuals can also be seen as being able to support more risk since it will be borne by two individuals and not a single one, although individuals could get married because they are risk averse (see Halek and Eisenhauer 2001 for that argument).

The last two entries in Table 5 are associated with the willingness to leave a bequest or, when appropriate, the feeling that children can also bear part of the respondent's long-term care risk. We can consider the

---

[22]Because the question on investment risk attitudes is the only direct question we asked with respect to risk aversion, all other measures we will use with respect to risk aversion will be somewhat indirect.

[23]One very comprehensive study based on German data shows that even a more general survey question about respondents' risk attitude ("How willing are you to take risks, in general?") was a meaningful predictor of actual behavior in a real-stakes lottery (see Dohmen et al. 2011). Nevertheless, psychological research suggests that risk aversion in different domains (financial, recreational, etc) can differ (e.g. Slovic 1972). Directly asking for respondents' risk tolerance in a financial context should thus be a robust predictor of actual behavior. Kapteyn and Teppa (2011) show that ad-hoc answers to questions about risk aversion have the most explanatory power for actual portfolio decisions.

[24]Although it is true that Halek and Eisenhauer (2001) find that risk aversion diminishes with age, this is true only for individuals that are younger than 65 years. Individuals aged 65 and over are approximately twice as risk averse as individuals who are younger than 65 years of age.

hypothesis that having children is a way to share the burden of the cost associated with long-term care, so that having children implies a higher tolerance for risk, at least when it relates to long-term care risk.

Table 5. Personal characteristics as a function of whether respondents believe that they have LTC insurance or not							
Characteristics of respondents	Without LTC Insurance		With LTC Insurance		T-test RankSum		
% looking for risk above average in investing	20.3 (40.2)	1604	23.1 (42.2)	215	10% n.s.	False
Age	59.5 (5.79)	1604	57.4 (5.27)	215	1% 1%	False
% Women	52.0 (50.0)	1604	35.7 (48.0)	215	1% 1%	False
% Finished high school	83.7 (36.9)	1604	94.0 (23.8)	215	n.s. n.s.	False
% Married / with significant other	71.2 (45.3)	1604	81.0 (39.3)	215	1% 5%	False
% Has at least one child	75.4 (43.1)	1604	69.2 (46.3)	215	n.s. n.s.	False
... if so, how many children	2.12 (0.99)	1166	2.50 (2.72)	152	1% n.s.	False
This table presents the weighted mean, standard deviation, and number of answers to six personal characteristics potentially linked to risk aversion. The last column gives the level of significance of the test that the difference in means (t-test) and medians (Rank-sum test) between who have and those who do not have LTC insurance is zero, at the 1%, 5%, and 10% levels, or a difference that is not significant (n.s.). *False* refers to the conclusion that the difference in means and/or medians does not agree with the risk aversion hypothesis.							

Entries in the table give the mean, the standard error (in parentheses) and the number of respondents (on the right) who provided a usable answer to the relevant questions. We see that uninsured respondents are on average 1.5 years older than insured respondents. At the same time, women are more likely to be uninsured than men as they represent over half of the uninsured respondents, but only one-third of the respondents who reported being covered by some sort of LTC insurance. Individuals who reported having some type of LTC insurance coverage are not statistically more likely to have completed high school. With respect to marital status, we observe that individuals who are living with a partner are proportionally more likely to have LTC insurance Finally, having at least one child[25] is not significantly associated with insurance coverage. None of these results[26] offers any support to the hypothesis that risk aversion is a determining factor for having LTC insurance.

---

[25] The number of kids is not significant either once we remove the ONE respondent who reported having 23 kids (the mean number of kids then becomes 2.18 for the insured population compared to 2.12 for the uninsured population).

[26] A multi-variate probit analysis tells the same story: Only age, being a woman and being married are significant in explaining having any LTC insurance coverage.

3.3.2 Collective insurance

I this section, we investigate whether there is a relationship between respondents' reports of LTC coverage and their report of other insurance products. For instance, respondents may believe that such coverage is part of their employer's (or their former employer's) pension plan system, or that it is a component of their spouses' collective insurance agreement.[27] To examine this hypothesis, we asked respondents what type of pension plan their employer offered. Table 6 gives a breakdown of the respondents' answers to some of our survey's relevant questions with an emphasis on whether they have (or believe they have) LTC insurance, and if not, why so. Moreover, we asked them about their level of knowledge of LTC insurance.

Table 6. Distribution of answers to whether respondent believe they have LTC insurance or not, the reason why (initial sample of 2000), and some other characteristics of participants.							
All Respondents N=1819							
Panel A: Respondents who **do not have** long-term care insurance (1604 respondents)							
Untapped Demand 50.7%			Lapsed/Denied 1.2%		Refused LTCI 39.0%		
Pension					Knowledge		
DB	DC/other	None			None	Some	Good
44.3%	13.1%	42.6%			27.9%	67.9%	10.2%
Panel B: Respondents who **believe they have** long-term care insurance (215 respondents)							
Outside 40.2%			Searched for 10.4%		Offered 49.3%		
Pension					Knowledge		
DB	DC/other	None			None	Some	Good
52.8%	16.8%	30.4%			3.7%	62.4%	33.9%
The table decomposes the respondents' answers to our survey as a function of whether they believe they have some sort of LTC insurance and what motivated them to be in that situation. Out of the initial 2000 respondents, 1819 gave us a straight answer to whether they have LTC insurance coverage (215 "yes" and 1604 "no"). Percentages do not add up to unity because of omitted or missing answers.							

In case respondents declare having no LTC insurance coverage, we define as the *Untapped demand* the one associated with respondents who, when asked why they have no coverage, answered either that they did not know what that was or that they were never offered this type of insurance coverage by any insurance company representative and /or financial planner. Half of the respondents who declare having no LTC insurance can be classified as part of the untapped demand group of individuals.

---

[27]Our understanding of the LTC insurance market in Canada is that it is never a part of the collective insurance package that is offered to employees and retirees, or their family. In our survey, however, some respondents responded that they did not buy LTC insurance because, when asked in an open ended question, such protection was part of their employer's collective insurance package, or their spouse's.

Respondents who *Refused LTCI*, responded to the question of why they did not have LTC insurance. Possible answers were that they thought it was too expensive, that they did not need it (say because they are sufficiently wealthy to self-insure), or that the coverage offered did not meet their needs. Finally, we also looked at the proportion of respondents whose coverage has lapsed or whose application was denied (they are those who wished they could have insurance or were covered until recently). The omitted answer categories are from respondents who were still waiting for an answer from the insurance company or who had not yet decided on whether they needed such insurance coverage.

Conditional on being part of the untapped demand for LTC insurance, or conditional on being part of the group of respondents who believe they have LTC insurance but did not choose to buy it (i.e., it came with the job, or the spouse's coverage, or is part of a group benefit), we divided the respondents based on whether they had access to an employer-provided defined benefit pension plan, an employer-provided defined contribution pension plan, or no employer-provided pension plan at all. Asking about the respondents' access to a pension plan and its type is done to test the hypothesis that individuals gain access to LTC insurance coverage through the bundling of insurance products with their current or former employer, or their spouse's. We are hypothesizing that LTC insurance is more likely to be offered as part of a portfolio of insurance protection which includes having an employer-sponsored pension plan.

Amongst individuals who believe they are covered by some sort of LTC insurance, close to 70% of them answered that they had access to some sort of employer-provided pension plan. This contrasts with those individuals whose demand for LTC insurance remains untapped where only 57% of them have access to some employer-provided pension plan. Examining the likelihood of having access to a DB plan conditional on any pension plan being offered by the employer, we find no statistical difference between individuals who believe they are covered without actually having bought insurance and those whose demand is untapped. It therefore seems that merely having access to an employer-provided pension plan is sufficient for increasing the likelihood that an individual will have LTC insurance coverage. This suggests that transaction and search costs matter. We finally tested (results not shown) for whether the correlation between LTC insurance and access to a pension was due to income by comparing individuals who reported having LTC insurance and a pension plan, and those who reported having neither. There is no statistical difference in the mean total income, in the mean total savings, in the mean house value, in the mean total income conditional on being retired (or not), or the mean education level. The difference between the two samples is correlated with being a woman (more likely to have neither) and to live in Quebec (more likely to have both).

21

3.3.3 Health

Going back to the health condition of our respondents, we recall from Table 2 that 44% of our respondents reported having or having had at least one of the seven following medical conditions: Heart disease, Stroke, Diabetes, Lung disease, Hypertension, Mental problems, and Cancer. To control for the medical conditions' impact on the purchase of LTC insurance, respondents were separated based on whether they have life insurance in addition to having LTC insurance. This gives us four buckets in which survey participants could be classified depending on whether they have LTC insurance only, life insurance only, both, or neither. Table 7 presents how the incidence of these chronic conditions differs across respondents depending on their insured conditions and test whether the proportion of respondents afflicted with at least one of the seven chronic conditions is significantly different across the different buckets.

Table 7. Incidence of seven illnesses common in elderly individuals as a function of whether they have LTC insurance and/or life insurance or not			
	LTC insured & Life insured	LTC insured & Life uninsured	LTC uninsured & Life insured	LTC uninsured & Life uninsured
Heart	8.77%	8.89%	5.62%	7.42%
Stroke	1.17%	0	1.27%	2.06%
Lung	2.34%	6.67%	3.36%	1.86%
Diabetes	14.04%	4.44%	12.34%	12.78%
Hypertension	23.39%	13.33%	23.32%	18.97%
Mental	5.85%	4.44%	7.62%	11.34%
Cancer	4.09%	4.44%	7.80%	6.80%
Any condition	45.03%[n.s.]	33.33%[n.s.]	44.65%[n.s.]	43.71%
N	171	45	1102	485

Conditional on giving a valid answer to whether they own LTC insurance and/or life insurance, this table presents the proportion of respondents who said they suffer from one of seven chronic conditions as a function of their insurance portfolio. T-tests on the proportion of respondents who have "Any condition" suggest that the probability that respondents are afflicted by at least one condition does not vary significantly across insurance-portfolio buckets.

The different t-tests we conduct tell us that there are no significant differences with respect to the respondents' likelihood of having any chronic conditions across the four groups. Hence, the respondents' health condition does not seem to be a good explanation for differences in the demand for LTC insurance.[28] One possible explanation for the low to no correlation between health condition and having long-term care insurance is that LTC insurers observe the health condition and set rates accordingly. In a Canadian context, the recent legislation that reduces insurer ability to price insurance contracts based on medical or genetic conditions may change this result in the future as insurers should no longer be able to observe a policyholder's

---

[28] We obtain similar results (no health difference across groups) when comparing those with and without LTCI, leaving life insurance aside.

health condition.[29]

We could be witnessing the impact of two contradicting forces. First, healthier individuals are more likely to be able to buy a LTCI since sickly individuals would be denied insurance. Second, individuals with bad health early in their life could have greater chances to die early so that they would not need to buy LTC insurance. Those two opposing forces make it such that there could be no difference in the health conditions of the respondents across the four sub-samples.

3.3.4 Wealth

One last dimension we investigate to explain LTC insurance demand is the respondents' ability to pay for LTC services themselves. We therefore examine how income and wealth (defined as the sum of the respondent's reported total financial savings and house value) have an impact on the demand for LTC insurance. Our hypothesis is that income and wealth should have no impact on the probability of having LTC insurance since wealthy individuals could self-insure. At the lower end of the distribution, individuals may not have enough income to afford LTC insurance. Table 8 gives wealth and other personal characteristics of the respondents (are they retired, do they have access to a employer-provided pension and do they want to leave a bequest) according to three income brackets (income above \$100,000, income below \$50,000, and income in between) and whether they have LTC insurance or not.

The most striking difference between insured (Panel B) and uninsured (Panel A) respondents that we see in Table 8 is the fact that uninsured individuals are more likely to be in the lowest income bracket: 33% of uninsured respondents earn less than \$50,000 a year, compared to 21% of insured respondents. Conditional on having a low income, uninsured respondents are less likely to own a house, but conditional on owning it, their house's value, net of the mortgage, is greater. In addition, the uninsured individuals' median total wealth is greater than the insured individuals'. The combined differences in income and wealth at the lower end of the distribution of income may be due to the fact that uninsured individuals are more likely to consider themselves as retired, which would corroborate an earlier result that uninsured individuals are, on average, older by 1.5 years for the entire sample, and over 2 years for the subsample of lower earning respondents.

For middle income bracket respondents (whose current income is between \$50,000 and \$100,000), we note that uninsured respondents are as wealthy as insured respondents, even though they are less likely to be covered by an employer-provided pension plan. Their opinion as to the importance of leaving a bequest is not that different from that of insured individuals. Lastly, the only difference we observe about the

---

[29]See   http://www.newswire.ca/news-releases/manulife-financial-introduces-long-term-care-insurance-with-unique-design-and-benefits-for-canadians-and-their-partners-534616761.html (last visited 4 January 2018).

answers of higher income bracket individuals compared with those of other income brackets seems to be with respect to the likelihood of being retired. Insured individuals in the higher income bracket are more likely to consider themselves as being retired (46%) than uninsured individuals in the same income bracket (40%). In the two-lower income brackets (households earning less than 100,000 dollars), the opposite is observed as insured individuals are less likely to be retired than uninsured individuals.[30] In addition, the proportion of individuals whose income is below 100,000 dollars, the likelihood of having access to en employer-provided pension plans is 15 percentage points higher for LTC insured individuals than uninsured individuals.

<table>
<tr><td colspan="7">Table 8. Respondents who believe their have LTC insurance or not as a function of their income and assets, and whether they are retired, have access to a pension, or plan on leaving a bequest.</td></tr>
<tr><td colspan="7">Panel A: Respondents with no long-term care insurance</td></tr>
<tr><td rowspan="3">$I > \$100k$
410 (25.7%)</td><td colspan="3">Wealth</td><td colspan="3">Characteristic of respondent</td></tr>
<tr><td colspan="2">House: own / $</td><td>Assets $</td><td>Retired</td><td>Pension</td><td>Bequest</td></tr>
<tr><td>92.4%</td><td>450k</td><td>665k</td><td>40.5%</td><td>68.5%</td><td>25.6%</td></tr>
<tr><td rowspan="3">$I \in [\$50k, \$100k]$
663 (41.5%)</td><td colspan="3">Wealth</td><td colspan="3">Characteristic of respondent</td></tr>
<tr><td colspan="2">House: own / $</td><td>Assets $</td><td>Retired</td><td>Pension</td><td>Bequest</td></tr>
<tr><td>85.1%</td><td>315k</td><td>433k</td><td>49.3%</td><td>60.8%</td><td>24.4%</td></tr>
<tr><td rowspan="3">$I < \$50k$
525 (32.9%)</td><td colspan="3">Wealth</td><td colspan="3">Characteristic of respondent</td></tr>
<tr><td colspan="2">House: own / $</td><td>Assets $</td><td>Retired</td><td>Pension</td><td>Bequest</td></tr>
<tr><td>61.3%</td><td>225k</td><td>260k</td><td>61.1%</td><td>40.6%</td><td>18.4%</td></tr>
<tr><td colspan="7">Panel B: Respondents who believe they have LTC insurance</td></tr>
<tr><td rowspan="3">$I > \$100k$
74 (33.5%)</td><td colspan="3">Wealth</td><td colspan="3">Characteristic of respondent</td></tr>
<tr><td colspan="2">House: own / $</td><td>Assets $</td><td>Retired</td><td>Pension</td><td>Bequest</td></tr>
<tr><td>97.3%</td><td>455k</td><td>589k</td><td>45.9%</td><td>70.3%</td><td>28.8%</td></tr>
<tr><td rowspan="3">$I \in [\$50k, \$100k]$
101 (45.7%)</td><td colspan="3">Wealth</td><td colspan="3">Characteristic of respondent</td></tr>
<tr><td colspan="2">House: own / $</td><td>Assets $</td><td>Retired</td><td>Pension</td><td>Bequest</td></tr>
<tr><td>82.2%</td><td>337k</td><td>450k</td><td>40.6%</td><td>75.2%</td><td>27.8%</td></tr>
<tr><td rowspan="3">$I < \$50k$
46 (20.8%)</td><td colspan="3">Wealth</td><td colspan="3">Characteristic of respondent</td></tr>
<tr><td colspan="2">House: own / $</td><td>Assets $</td><td>Retired</td><td>Pension</td><td>Bequest</td></tr>
<tr><td>67.4%</td><td>170k</td><td>230k</td><td>45.7%</td><td>59.0%</td><td>45.5%</td></tr>
</table>

The table decomposes the respondents' answers to our survey as a function of whether they believe they have LTC insurance or not, and their access to financial resources as a function of their current income brackets ($I > \$100,000$; $I \in [\$50,000; \$100,000]$; and $I < \$50,000$). *House own / $* gives the proportion of respondents who own their house and its median value, *Asset $* gives the median total savings (including housing), all in thousands of dollars. Finally, with respect to *Characteristic of respondent*, we have the proportions of respondents who consider themselves *Retired*, have access to an employer-sponsored *Pension* plan, and agree or strongly agree that leaving a *Bequest* is important.

Lastly, with respect to the bequest motive, we note that it is for those poorer households, with income below 50,000 dollars, that the intention to leave a bequest is the most correlated with the purchase of LTC

[30] When we run a probit analysis on whether the respondent has insurance or not, none of the income, asset, home ownership, and pension income variables are significant.

insurance, with 18.4% of uninsured low-income households feeling that bequests are important compared to 45.5% of insured low-income respondents. In untabulated results, we find that having children is significantly negatively correlated with the respondents' perception that leaving a bequest is important. It thus seems that the demand for LTC insurance is related to the wealth elasticity of bequests. Prior evidence (see Auten and Joulfaian 1996) shows that a retiree's risk aversion over bequests is not sufficient to make them purchase LTC insurance. Moreover, Hurd and Smith (2002) show that households in the 70-74 age bracket intend to bequeath merely 39% of their wealth; this suggests that many retirees prefer setting aside precautionary savings as a means of self-insuring against the cost of LTC (Lockwood 2018). But because these savings will not be needed to cover the cost of LTC, an unintended bequest will occur. In a sense, heirs are bearing the LTC cost risk of their parents.

3.3.5 To summarize demand characteristics

To sum up, there is little evidence that reporting having LTC insurance is correlated with risk aversion or health. There is, however, some evidence that having LTC insurance is positively correlated with having an employer-sponsored pension plan and, for low income individuals, being not yet retired and having a bequest motive. As these demand-side findings seem insufficient to explain the low penetration of LTC insurance, we now turn our attention to supply-side explanations.

3.4 Supply characteristics: Cost of Underwriting, Adverse Selection, and Lapse Risk

The supply-side explanations we propose differ from those presented in Brown and Finkelstein (2004). They write that on "the supply side, four market problems have been suggested as potential explanations for the small size of the market...: high transactions costs, imperfect competition, and asymmetric information (either adverse selection or moral hazard), (and) the uninsured aggregate[31] risk of rising long-term care costs." Cutler (1996) adds the possibility that long-term care insurance provides inefficient coverage due to information acquisition cost and lapse risk. Although transaction costs may play a role in the Canadian LTC insurance market, our explanation will focus mostly on the lack of information provided to individuals, and on governments crowding out the private market.

Based on the same survey as the one used in this paper, Boyer *et al.* (2017) show, using a stated-preference approach that adverse selection is not an important problem in long-term care insurance. The reason rests in the long-term nature of the risk such that no individual has better information than insurers

---

[31]Grignon and Bernier (2012) use the term "systemic risk" to refer to the "uninsured aggregate risk".

about his or her risk of needing nursing home services in 15 to 20 years. They estimate that the adverse selection problem "generates a very small welfare cost, of the order of 2$ per year per person".

Looking back at Table 6, we note that 50.7% of uninsured respondents mentioned not knowing that LTC insurance products even existed. Moreover, of the 39% of the respondents who refused to purchase such a product, 27.9% told us that their level of knowledge about the product is "none". This 27.9% of uninsured individuals who refused the insurance despite knowing nothing about it can be contrasted with the 3.7% of individuals who have LTC insurance and whose level of knowledge about the product is "none". This means that over 60% of uninsured individuals are characterized by a knowledge of the product that is very low. It is natural to think that they would have had a higher probability of opting to be covered had they been better informed. At the same time, the higher LTCI take-up by those with pension plans does suggest that transaction costs may also be a factor.

In Table 9, we compare the average characteristics of uninformed individuals who did not have LTC insurance − either because they never were offered one (for instance by a financial advisor) or because they did not know what that was − to the characteristics of those who knew what a LTC insurance contract was − either because they owned one or answered that they knew what it was.

As we see, informed respondents[32] are generally younger, reside in the province of Quebec, and are in better health than uninformed respondents. The proportions of women, retirees and married respondents are not different across the two categories. The same can be said about income and total assets, and about home ownership and access to a pension plan (numbers not displayed).

With respect to the insured respondents in particular, they reported that the main reason for purchasing LTC insurance is that it was once offered to them. Only 9.6% declared having actively searched for such a protection. This means that LTC insurance is more likely a "push product" in the sense that it is not naturally purchased by consumers but it has to be explained and sold to them. As individual insurance companies do not seem to have enough private incentives to increase the long-term care insurance take-up rate, the apparent need for an intensive information campaign could possibly be provided by some para-governmental entity or an industry task force.

---

[32]Differences are qualitatively the same if we were to define the informed as only those who are both uninsured and informed.

Characteristics of respondents	Informed		Uninformed		T-test RankSum
Table 9. Personal characteristics as a function of whether respondents are informed or uninformed as it comes to LTC insurance					
Age	58.7 (5.59)	943	59.5 (5.73)	799	5% 5%
% Women	45.4 (49.8)	943	53.2 (49.9)	799	10% 10%
% Quebec	46.9 (1.60)	943	32.8 (47.0)	799	1% 1%
Number of sicknesses	0.590 (0.845)	943	0.639 (0.927)	799	n.s. n.s.
% Retired	44.7 (49.7)	943	46.9 (49.9)	799	n.s. n.s.
% Married / with significant other	75.4 (49.7)	943	66.1 (47.4)	799	n.s. n.s.
Subjective probability of needing a nursing home	39.0 (31.0)	656	32.3 (30.7)	543	1% 1%
"Error" in nursing home need probability	7.12 (32.1)	656	12.3 (32.2)	543	1% 1%

Weighted mean, standard deviation, and number of answers for a subset of socio-demographic characteristics, the subjective probability of needing a nursing home, and the difference between the subjective and objective probability of needing a nursing home as a function of the respondent's level of knowledge about long-term care insurance. The last column gives the level probability with which we can reject the hypothesis that the means (resp. medians) are the same based on a two-sided t-test (resp. rank-sum test) as a function of the respondents' level of knowledge at the 1%, 5%, and 10% levels, or that the difference is not significant (n.s.).

Another possible supply-side explanation is that the sales force necessary to distribute LTC insurance in the Canadian population is not informed enough about the benefits of such a product, or that they feel that they are not compensated enough to invest time, resources and energy in learning how LTC insurance products could make Canadians better off. Although we have no direct evidence, an executive from Munich Reinsurance was quoted on March 1st saying

"Sales for this niche product (LTC insurance) have been stagnating despite 20 years of efforts in promoting it... Sales were not there. Their growth was weak, just as much at the *sales' force interest* in the product." (our emphasis).[33]

One last direct supply-side explanation has to do with lapse-risk. In our context, lapse risk is defined as good risks dropping their coverage as time passes while bad risks continue paying for the protection. One can think of this as *ex post* adverse selection (*ex ante* adverse selection occur when market participants have

---

[33]Loose translation of "Ce créneau stagnait, malgré plus de 20 ans de promotion du produit au Canada... Les ventes n'étaient pas au rendez-vous. Leur croissance demeurait faible, *tout comme l'intérêt de la force de vente*" Quote of Cedric Thibault, directeur principal, développement des affaires, réassurance individuelle, at Munich Re, in *Journal de l'assurance* https://journal-assurance.ca/article/des-assureurs-se-retirent-faute-de-reassurance/ (last visited on March 2nd 2018).

private information at contract initiation). When agents learn more about their health status as time passes, good risks end up paying too much for the protection. As a result, good risks are more likely to let their policy lapse so that only the bad risks are left in the pool. Given the survey we conducted, it is impossible for us to assess whether what we could call *adverse selection lapse risk* is enough of a phenomenon in general to lead to the entire collapse of the long-term care insurance market.

4 Who Are the Guilty Parties? Conclusion and Public Policy Implications

We examined many reasons why the market for long-term care insurance is so small in Canada. More precisely, we investigated whether the reasons for the low take-up rate lie on the demand side of the market, including risk perceptions, or on the supply side, including whether the government crowds out the private insurance sector.

Using a survey of Canadians aged 50 to 70 living in Quebec and Ontario, we conclude based on survey responses that erroneous risk perceptions and other demand characteristics are not the main drivers of the low penetration of LTC insurance. Because purchasers and non-purchasers of LTC insurance have essentially the same risk perceptions, and the same personal characteristics, it is difficult to argue that these should be the determinants of the low penetration. We believe that we are not missing some personal characteristics that correlate with the demand for LTC insurance, since we asked a very large (albeit non exhaustive) set of questions, all related to the explanations proposed by the literature on the LTC puzzle. Another often cited source of market failure can also be ruled out: Adverse selection. Individual respondents to our survey do not seem to know more about their future need for LTC services than what can be commonly known from Canadian mortality and morbidity databases. Adverse selection (which would be the result of individuals having meaningful private medical information) is thus marginal on the Canadian LTC insurance market, despite Manulife's recent announcement[34] that restrictive rules regarding the use of an individual's medical information in insurance underwriting have exacerbated the private LTC insurance supply-side problems. The limited market acceptance of such products is more likely to be a valid explanation for Manulife discontinuing the sale of LTC insurance. It would be quite surprising that individuals learn enough information through time for lapse risk to be much different across risk categories.

The most likely culprit for the low LTC insurance penetration in Canada (and possibly elsewhere in the

---

[34]See http://www.newswire.ca/news-releases/manulife-financial-introduces-long-term-care-insurance-with-unique-design-and-benefits-for-canadians-and-their-partners-534616761.html (last visited 4 January 2018).

world) must then reside in the consumers' ignorance of these products, transactions costs, and the crowding-out by public policies. Consumer ignorance may, of course, be rational, if there is a cost to becoming informed, if there is a general perception that government programs are adequate, and if the perception is that the loading factor on long-term care insurance policies (that is, the direct transaction cost) is high. All these reasons boil down to putting part of the blame on the supply of LTC insurance

Given that merely 10% of individuals having LTC insurance actively searched for such coverage and that over 50% of uninsured individuals have never heard of such a product, the industry, as a whole, must bear part of the blame for consumers being unaware that these products exist. And although it is true that our survey was only conducted in the provinces of Ontario and of Quebec, there is no reason to believe that insurers elsewhere in Canada are any more innovative in their LTC insurance sales strategy.

In addition to the consumers' lack of awareness, a second likely culprit for the low take-up rate of LTC insurance in Canada is the public system's provision of similar services. By subsidizing basic services in nursing homes, provincial governments are likely crowding out the private supply of LTC insurance. This crowding out is not only due to the subsidies that nursing homes receive, but also to the structure of the Canadian pension system (such as the Canada Pension Plan, la Régie des rentes du Québec, the federal government's Old Age Security / Guaranteed Income Supplement) which offers promises of retirement income independently of any risk-underwriting. Contributions to the Canadian pension system independently of one's risk may thus come at the possible cost of limiting the market of private LTC insurance (in addition to reducing private savings as shown in Veall 1986). This may nonetheless be a small price to pay in the grand scheme of social protection. If crowd out is the problem, but there is a need to retain some kind of government backstop, there is the possibility to lessen the population's reliance on it. To do so, three avenues appear to us. First, we could make the backstop even more basic by increasing waiting times in order to provide a market for private LTC insurance that would cover the waiting time period. Second, governments could subsidize, directly or indirectly, the acquisition of LTC insurance by making premiums tax deductible.[35] Finally, the government could use its heavy hand and make personal provision mandatory through an entity similar to the CPP or the RRQ because, as argued by Veall (1986) in a different context, public backstops lead to an inefficient amount of self-insurance so that compulsory purchase of some minimum level of LTC insurance would become mandatory.

---

[35]In other words, and instead of focusing on the public provision of LTC insurance, another tool, which was not covered in Adams and Vanin (2016) would be to offer tax credits to individuals who purchase LTC insurance as it is proposed by the insurance industry. Unfortunately, given our paper's findings about the lack of individuals' knowledge about LTC insurance, it is unlikely that tax credits would increase the level of information, and thus the take-up rate of LTC insurance.

Extending the LTC insurance coverage to the entire Canadian population (through, say, a change in the Canada Health Act) was proposed by Grignon and Bernier (2012) and Grignon (2016). Although one could argue that this is already the case, it comes with a "time deductible" in the sense that one must be willing to wait a number of months before obtaining a spot in a nursing facility. In particular, Grignon and Bernier (2012) argue that the best possible solution to the challenges of providing adequate LTC services to a growing elderly population is through the public provision of LTC services because 1- individuals are misinformed about long-term care needs or in denial of the risk they face, 2- between 25% and 70% of individuals cannot afford insurance, 3- there are important market failures (such as lapse and systemic risk which reduce coverage and increase loading fees) in the long-term care insurance market. The analysis we provide in the current paper does not support such policy because we find that 1- there are no differences in the risk perceptions of insured and uninsured individuals, 2- the cost of purchasing LTC insurance is not high considering the household incomes of our survey respondents, 3- asymmetric information-based market failures (including adverse selection) are not that important, and 4- pension plans also suffer from systemic risk, if not more than long-term care insurers, and yet they exist and have survived.

So, what can be done to increase the insurers' interest in offering LTC protection to Canadians? Assuming that crowding out remains, one candidate policy could simply be to better inform individuals about the risks of becoming dependent in the old age as well as to better inform them about the costs associated with dependency and to promote financial knowledge. In this sense, our results echo part of the analysis of Grignon and Bernier (2012) where the authors write, on page 9, "if lack of information... is the main cause of the low take-up rate of private long-term care insurance, governments could undertake to better inform the population (and) private insurance companies could launch advertising campaigns to convince consumers of the need to buy private long-term care insurance".

Another possibility, which is not currently provided by the private market, could reside in coupling LTC insurance with a life insurance benefit to the heirs in case of early death with no loss of autonomy. The government could also mandate that some minimum LTC insurance protection be linked to private pension and/or public pension benefits to eliminate adverse selection problems (if they exist) and thus decrease loading fees. For such solutions to make any sense, one must accept that a problem exists. Of course, it is also quite possible that there is no problem on this market and that private long-term care insurance is already provided optimally, albeit to only 10% of the population in the age bracket where such insurance can realistically be purchased.

5 References

1. Adams, O., and Vanin, S. (2016). Funding Long-Term Care In Canada: Issues and Options. *HealthcarePapers*, 15(4) April 2016: 7-19

2. Ameriks, J., Briggs, J., Caplin, A., Shapiro, M. D., and Tonetti, C. (2016). Late-in-Life Risks and the Under-Insurance Puzzle. NBER Working Paper 22726.

3. Auten, G. and D. Joulfaian (1996). Charitable contributions and intergenerational transfers. *Journal of Public Economics*, 59: 55-68.

4. Baker, D. (2009). Long-term Care Insurance - an Industry Perspective. As cited in Grignon and Bernier (2012).

5. Blomqvist, Å. and C. Busby (2014). Paying for the Boomers: Long-Term Care and Intergenerational Equity. C.D. Howe Institute Commentary no. 415.

6. Boisclair, D., Coté-Sergent, A., Laliberté-Auger, F., Marchand, S., and Michaud, P.-C. (2016). A health microsimulation model for Quebec and Canada. Technical report, HEC Montreal - CEDIA.

7. Boisclair, D., Lusardi, A., and Michaud, P.-C. (2015). Financial literacy and retirement planning in Canada. *Journal of Pension Economics and Finance*, pages 1-20.

8. Bonsang, E. (2007). How do middle-aged children allocate time and money transfers to their older parents in Europe? *Empirica*, 34(2): 171-188

9. Bonsang, E. (2009). Does informal care from children to their elderly parents substitute for formal care in Europe? *Journal of Health Economics*, 28(1): 143-154.

10. Boyer, M.M. (2018). La gestion et le dépistage des risques liés au vieillissement, et le rôle des régimes de retraite dans le marché de l'assurance de soins de longue durée. CIRANO Report 2018-RP03, https://www.cirano.qc.ca/files/publications/2018RP-03.pdf.

11. Boyer, M.M., De Donder, P., Fluet, C., Leroux, M.-L. and Michaud, P.-C. (2017). Long-Term Care Insurance: Knowledge Barriers, Risk Perception and Adverse Selection. Working Paper, http://www.cedia.ca/sites/cedia.c 01_ltc_insurance.pdf

12. Boyer, M.M., De Donder, P., Fluet, C., Leroux, M.-L. and Michaud, P.-C. (2019). Long-Term Care Risk Misperceptions. *Geneva Papers on Risk and Insurance - Issues and Practice*, forthcoming.

13. Boyer, M.M. and Glenzer, F. (2016). Pensions, annuities, and long-term care insurance: On the impact of risk screening. Working Paper, www.cedia.ca/sites/cedia.ca/files/cahier_16-03_pensions_annuities.pdf

14. Brown,J. R. and Finkelstein, A. (2004). Supply or Demand: Why is the Market for Long-Term Care Insurance So Small? NBER Working Paper http://users.nber.org/~afinkels/papers/Brown_Finkelstein_Supply_or_Dem

15. Brown, J.R. & A. Finkelstein (2007). Why is the market for long-term care insurance so small? *Journal of Public Economics* 91: 1967-1991.

16. Brown, J. R. and Finkelstein, A. (2008). The Interaction of Public and Private Insurance: Medicaid and the Long-Term Care Insurance Market. *American Economic Review*, 98(3): 1083-1102.

17. Brown, J. R. and Finkelstein, A. (2009). The Private Market for Long-Term Care Insurance in the United States: A Review of the Evidence. *Journal of Risk and Insurance*, 76(1): 5-29.

18. Brown, J. R. and Finkelstein, A. (2011). Insuring Long-Term Care in the United States. *Journal of Economic Perspectives*, 25(4): 119-142.

19. Brown, J. R. and Poterba, J.M.(2000). Joint Life Annuities And Annuity Demand By Married Couples. *Journal of Risk and Insurance*, 67(4): 527-553.

20. Canadian Institute for Health Information (CIHI). 2005. Exploring the 70/30 Split: How Canada's Health Care System Is Financed. Ottawa.

21. Canadian Life and Health Insurance Association (CLHIA). 2012. No Plan at all: Majority of Canadian Ill Prepared for Long-Term Health Care Costs.

22. Canadian Life and Health Insurance Association (CLHIA). 2014. Improving the Accessibility, Quality and Sustainability of Long-Term Care in Canada.

23. Canadian Union of Public Employees (CUPE). 2009. Residential Long-Term Care in Canada: Our Vision for Better Seniors Care. Ottawa.

24. Caplin, A.. 2002. Turning Assets into Cash: Problems and Prospects in the Reverse Mortgage Market." In Innovations in Retirement Financing. Eds O.S. Mitchell, Z. Bodie, B. Hammond, and S. Zeldes. Pension Research Council. Philadelphia, PA: University of Pennsylvania Press: 234-253.

25. Charles, K. K. and Sevak, P. (2005). Can family caregiving substitute for nursing home care? *Journal of Health Economics*, 24(6): 1174-1190.

26. Cremer, H., De Donder, P., and Pestieau, P. (2009). Providing Sustainable Long Term Care: A Looming Challenge. Technical Report 3.

27. Cutler, D. (1996). Why Don't Markets Insure Long-Term Risk?" Unpublished working paper. http://post.economics.har

28. Davidoff, T. (2009). Housing, health, and annuities. *Journal of Risk and Insurance*, 76(1): 31-52.

29. Dick, A., A.M. Garber, and T.E. MaCurdy (1994). "Forecasting Nursing Home Utilization of Elderly Americans." in Studies in the Economics of Aging. Chicago, IL: University of Chicago Press: 365-394.

30. Dohmen, T., Falk, A., Huffman, D., Sunde, U., Schupp, J., and Wagner, G.G. (2011). Individual Risk Attitudes: Measurement, Determinants, and Behavioral Consequences. *Journal of the European Economic Association*, 9(3): 522-550.

31. Einav, L., Finkelstein, A., and Cullen, M. R. (2010). Estimating Welfare in Insurance Markets Using Variation in Prices. *The Quarterly Journal of Economics*, 125(3): 877-921.

32. Finkelstein, A. and McGarry, K. (2006). Multiple Dimensions of Private Information: Evidence from the Long-Term Care Insurance Market. *American Economic Review*, 96(4): 938-958.

33. Friedberg, L., W. Hou, W. Sun, A. Webb, and Z. Li (2014). New Evidence on the Risk of Requiring Long-Term Care. Working Paper 2014-12, Center for Retirement Research at Boston College.

34. Greb, J., Chambers, L.W., Gafni, A., Goeree, R., and Labelle, R. (1994). Interprovincial Comparisons of Public and Private Sector Long-Term Care Facilities for the Elderly in Canada. *Canadian Public Policy / Analyse de Politiques*, 20: 278-296.

35. Grignon, M. (2016). Funding for Long-Term Care: Why Public Insurance Makes Sense. *HealthcarePapers*, 15(4): 21-24.

36. Grignon, M. and Bernier, N. (2012). Financing Long-Term Care in Canada. IRPP Study, 33.

37. Halek M. and J.G. Eisenhauer (2001). The Demography of Risk Aversion. *Journal of Risk and Insurance*, 68: 1-24.

38. Hurd, M. D., Michaud, P.-C., and Rohwedder, S. (2013). The Lifetime Risk of Nursing Home Use. In *Discoveries in the Economics of Aging*, pages 81-109. University of Chicago Press.

39. Hurd, M.D. and J.P. Smith (2002). Expected Bequests and their Distribution. NBER Working Paper 9142.

40. Kapteyn, A. and F. Teppa (2011). Subjective measures of risk aversion, fixed costs, and portfolio choice. *Journal of Economic Psychology*, 32 (4): 564-580

41. Kemper, P. and C. Murtaugh (1991). Lifetime Use of Nursing Home Care. *New England Journal of Medicine* 324: 595-600.

42. Lockwood, L. M. (2018). Incidental Bequests and the Choice to Self-Insure Late-Life Risks. *American Economic Review*, 108(9):2513-50..

43. Lusardi, A., Michaud, P.-C., and Mitchell, O. S. (2017). Optimal Financial Knowledge and Wealth Inequality. *Journal of Political Economy*, 125(2): 431-477.

44. Lusardi, A. and Mitchell, O. S. (2014). The Economic Importance of Financial Literacy: Theory and Evidence. *Journal of Economic Literature*, 52(1): 5-44.

45. McGregor, M.J. and L.A. Ronald (2011). Residential Long-Term Care for Canadian Seniors. *IRPP Study*, January 2011, number 14.

46. Nakajima, M. and I.A. Telyukova (2017). Reverse Mortgage Loans: A Quantitative Analysis. *The Journal of Finance* 72(2): 911-949.

47. OECD (2011). Help Wanted? - Providing and Paying for Long-Term Care. OECD Press.

48. Pestieau, P. and Ponthiere, G. (2011). The Long Term Care Insurance Puzzle. In *Financing Long-Term Care in Europe−Institutions*. J. Costa-Font Ed., Palgrave-Macmillan Publishers.

49. Pinquart, M. and Sorensen, S. (2002). Older Adults' Preferences for Informal, Formal, and Mixed Support for Future Care Needs: A Comparison of Germany and the United States. *The International Journal of Aging and Human Development*, 54(4): 291-314.

50. Robinson, J. 1996. "A Long-Term Care Status Transition Model," presented at the 1996 Bowles Symposium on the Old-Age Crisis: Actuarial Opportunities. Georgia State University (https://www.soa.org/library/monograp systems/the-old-age-crisis-actuarial-opportunities-the-1996-bowles-symposium/1999/january/m-rs99-1-08.pdf).

51. Sloan, F. A. and Norton, E. C. (1997). Adverse Selection, Bequests, Crowding Out, and Private Demand for Insurance: Evidence from the Long-term Care Insurance Market. *Journal of Risk and Uncertainty*, 15(3): 201-219.

52. Tennyson, S. and Yang, H. K. (2014). The role of life experience in long-term care insurance decisions. *Journal of Economic Psychology*, 42: 175-188.

53. The Retirement Project (2007) Meeting the Long-Term Needs of the Baby Boomers: How Changing Families Will Affect Paid Helpers. From http://www.urban.org/UploadedPDF/311451_Meeting_Care.pdf (retrieved, June 2017))

54. Van Houtven, C. H. and Norton, E. C. (2004). Informal care and health care use of older adults. *Journal of Health Economics*, 23(6): 1159-1180.

55. Veall, M. (1986). Public pensions as optimal social contracts. *Journal of Public Economics*, 31(2): 237-251.

56. Vidal-Melia, C. and A. Lejarraga-Garcia (2006). Demand for life annuities from married couples with a bequest motive. J*ournal of Pension Economics & Finance*, 5(2): 197-229.

57. Wiener, J., L.H. Illston, and R. Hanley (1994). Sharing the Burden: Strategies for Public and Private Long-Term Care Insurance. The Brookings Institution, Washington DC.

58. Wiener, J., J. Tilly and S. Goldenson (2000). Federal and State Initiatives to Jump Start the Market for Private Long-Term Care Insurance. *The Elder Law Journal* 8(1): 57-99.

59. Zhou-Richter, T., Browne, M. J., and Gründl, H. (2010). Don't They Care? Or, Are They Just Unaware? Risk Perception and the Demand for Long-Term Care Insurance. *Journal of Risk and Insurance*, 77(4): 715-747.