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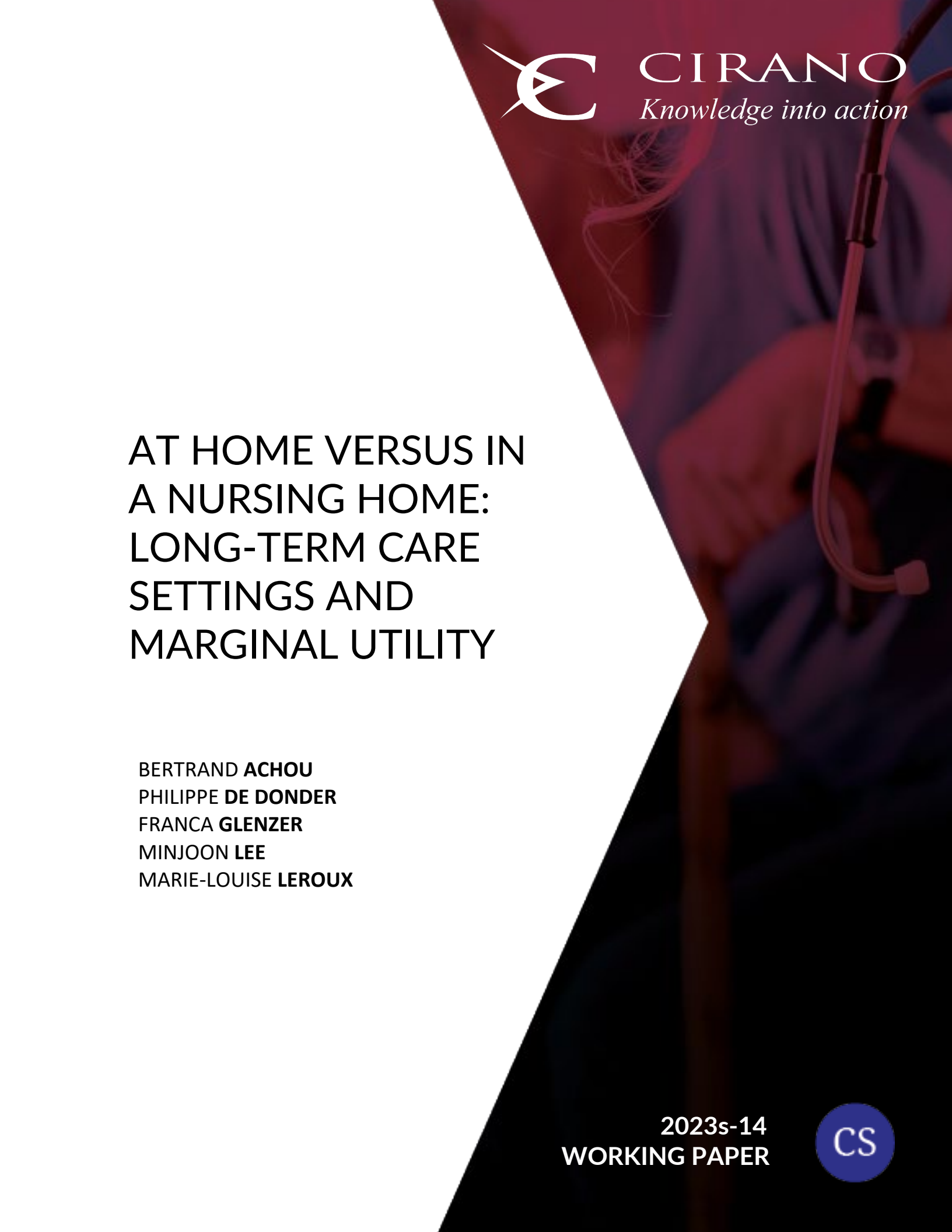

AT HOME VERSUS IN A NURSING HOME: LONG-TERM CARE SETTINGS AND MARGINAL UTILITY

BERTRAND **ACHOU**
PHILIPPE **DE DONDER**
FRANCA **GLENZER**
MINJOON **LEE**
MARIE-LOUISE **LEROUX**

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At Home versus in a Nursing Home: Long-term Care Settings and Marginal Utility[*]

Bertrand Achou[†], *Philippe De Donder*[‡], *Franca Glenzer*[§], *Minjoon Lee*[**] *and Marie-Louise Leroux*[††]

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Abstract/Résumé

Marginal utility of financial resources when needing long-term care, and the related incentives for precautionary savings and insurance, may vary significantly by whether one receives care at home or in a nursing home. In this paper, we develop strategic survey questions to estimate those differences. All else equal, we find that the marginal utility is significantly higher when receiving care at home rather than in a nursing home. We then use these estimates within a quantitative life cycle model to evaluate the impact of the expected choice of care setting (home versus nursing home) on precautionary savings and insurance valuation. The estimated marginal utility differences imply a significant increase in the incentives to save when expecting to receive care at home. Larger incentives to self-insure also translate to a higher valuation of additional subsidies for home care than for nursing homes, shedding light on an efficient way to expand public long-term care subsidies. We also examine how the magnitude of our results quantitatively vary with the existing public long-term care subsidies.

L'utilité marginale des ressources financières lorsque les personnes nécessitent des soins de longue durée (ainsi que les incitations à épargner et à s'assurer en découlant) peuvent varier substantiellement suivant que les personnes reçoivent ces soins à la maison ou en CHSLD. Dans ce travail, nous développons un sondage en vue d'évaluer ces différences. Toute chose égale par ailleurs, nous montrons que l'utilité marginale des ressources financières est plus élevée pour ceux qui restent chez eux plutôt que d'être en institution. Nos estimés sont ensuite utilisés dans un modèle de cycle de vie de manière à quantifier l'impact d'un choix de résidence spécifique sur l'épargne de précaution et la valorisation de l'assurance. Les différences d'utilité marginale des ressources impliquent que les personnes prévoyant de recevoir des soins à domicile ont des incitatifs plus fortes à épargner. Des incitatifs plus élevés à s'assurer se traduisent par une valorisation plus importante de subventions publiques additionnelles pour les soins à domicile (plutôt qu'en CHSLD), qui devraient donc être privilégiées par les autorités. L'étude examine également comment ces résultats varient en fonction du montant des subventions aux soins de longue durée déjà existantes.

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[†] University of Groningen, Groningen, The Netherlands; Netspar, Tilburg, The Netherlands. E-mail: b.j.p.achou@rug.nl

[‡] Toulouse School of Economics, CNRS, University of Toulouse, Toulouse, France. E-mail: philippe.dedonder@tse-fr.eu

[§] Department of Finance and Retirement and Savings Institute, HEC Montréal, Montréal, Canada. Email: franca.glenzer@hec.ca

[**] Department of Economics, Carleton University, Ottawa, Canada. E-mail: minjoon.lee@carleton.ca

[††] Département des Sciences Economiques, ESG-UQAM, Montréal, Canada; E-mail: leroux.marielouise@uqam.ca

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1 Introduction

The demographic shift that developed countries have undergone in recent decades has not only increased individuals' life expectancy, but also their risk of needing long-term care (LTC, hereafter) at some point in their life. According to U.S. Department of Health & Human Services (2020), a 65-year-old in the U.S. has a 69% chance of needing long-term care services at some point during his life, and a 20% chance of needing care for more than 5 years. Needing care is a key financial risk in old age, as the out-of-pocket cost for LTC can be substantial. In addition, the costs of care have risen considerably in recent years due to labor shortages and the high demand for LTC services, both exacerbated by the Covid-19 pandemic. In the U.S., the median cost for a nursing home in 2021 ranged between $94,900 and $108,400 for a semi-private and private room, respectively. The median cost of home care, the preferred setting of care delivery for many people, was $121,300 (U.S. Department of Health & Human Services, 2020), in addition to the cost of food, maintenance of one's home, etc.[1] Because of the financial burden associated with becoming dependent, care risk is an important motive for precautionary savings as has been shown by Kopecky and Koreshkova (2014) and Ameriks et al. (2020). It also explains why retirees spend down wealth more slowly than a canonical life-cycle model would predict (De Nardi et al., 2010).

While both nursing homes and home care impose a financial burden on the care recipient, the different long-term care settings might impact the level of precautionary savings to a different extent. Specifically, we expect that an individual might derive more utility from spending when receiving care at home than in a nursing home. This is because the cost structure of nursing homes and home care is very different. In a nursing home, accommodation and food are included in the nursing home fee, and the number of additional services that can be purchased is limited. When receiving care at home, however, the care recipient can use her savings for a number of services that improve her quality of life, such as better

[1] This figure is based on the assumption that a medical and homemaker service is used for 44 hours per week and 52 weeks per year each.

food, home maintenance, etc. In addition, people may intrinsically value spending more at home than in a nursing home. For these reasons, we expect the marginal utility of spending to be larger when receiving care at home. If so, this can significantly impact the demand for precautionary savings. This is particularly important for two reasons. First, even before the pandemic, researchers have documented individuals' aversion to being institutionalized, a phenomenon sometimes referred to as "institutionalization aversion" (Costa-Font et al., 2009; Costa-Font, 2017). In addition, there is evidence that the Covid-19 pandemic has further reduced individuals' willingness to enter a nursing home (Achou et al., 2022), possibly due to excess mortality in nursing homes as has been documented for many countries (Flawinne et al., 2023).

Modeling savings for different care settings requires identifying preferences over spending in these different care settings. To this end, we build on research by Ameriks et al. (2011) and Ameriks et al. (2020), who developed strategic survey questions (SSQs) as a tool for identifying preferences under various states of nature. SSQs elicit respondents' resource allocation between different states of the world in a well-defined, hypothetical scenario. SSQs have been used to analyze the marginal utility in different health states (Ameriks et al., 2011; Brown et al., 2016). Most relevant to our analysis is the survey design by Ameriks et al. (2020), who use SSQs to estimate preferences for LTC expenditures. We extend this methodology by randomly assigning respondents to different care settings (home care, a semi-private room in a nursing home, or a private room in a nursing home) for the state in which they need LTC. This allows us to examine how preferences vary by LTC settings.

Our analysis of responses from more than 3,000 survey participants in Canada shows that the median survey respondent allocates more wealth to the LTC state than to the healthy state, in line with findings by Ameriks et al. (2020). Furthermore, respondents allocate more money to the LTC state when they expect to receive home care. Specifically, the ratio of the median respondent's desired resources in the LTC state (net of the minimum cost of care) to resources in the healthy state is 1.82 for home care, 1.32 for a private room in a

nursing home, and 1.30 for a semi-private room in a nursing home. When estimating utility functions based on these responses, we find that marginal utility is significantly higher when home care is used, whereas there is no significant difference in marginal utility between a private and a semi-private room in a nursing home. Furthermore, preferences over resources in the different care settings are heterogeneous: The overall higher marginal utility under home care is mostly driven by the top two income terciles and by females.

We then develop a quantitative life-cycle model of single older individuals to analyze how the state- and care-type-dependent preferences coupled with different minimum costs of the three care settings impact precautionary savings late in life. This model also allows us to estimate how much individuals value additional public subsidies for each care setting, which sheds light on an efficient way to expand public LTC insurance. Both of these results may depend on the existing public LTC insurance. We consider a universal subsidy that lowers the cost of nursing homes (akin to the Canadian system), as well as a purely means-tested subsidy that provides free LTC and a consumption floor for individuals without sufficient income or wealth (akin to the U.S. system). We parameterize the model using survey responses on income, wealth, and health from a representative sample of Canadians. We further estimate transitions between health states using data from the Health and Retirement Study (HRS).

We find that the prospect of using home care substantially increases savings. This is particularly true under the universal subsidy, which results in the minimum cost of care being virtually the same across care options. When the minimum costs of care do not differ, the predominant driver of savings is the marginal utility. On average, those who would use home care save \$25K (8.3%) more by age 66 than those who would use a private room in a nursing home and \$29K (9.8%) more than those who would use a semi-private room in a nursing home, assuming that the LTC-type-dependent preferences are homogeneous across the population. Under an exclusively means-tested subsidy, the impacts are much smaller. This is because, in the absence of public subsidies, the minimum costs of a room in a nursing home (private or semi-private) are much higher than those of home care, thus partially

offsetting the difference in the marginal utilities of expenditures beyond the minimum costs. Comparing savings between those who would use home care and those who would use a private room in a nursing home, we find that the difference is almost null. However, comparing savings between those who would use home care and those who would use a semi-private room in a nursing home, we find that the former save more by \$14K (3.7%). These patterns are robust to allowing for heterogeneity in LTC-type-dependent preferences by gender and income, to different specifications of the bequest utility function, and to different definitions of health states requiring LTC. Overall, our results demonstrate that a higher marginal utility under home care can lead to significantly higher precautionary savings. In addition, we find that the design of the public LTC insurance is another key factor that determines how these preferences map to precautionary savings.

Finally, we find that a subsidy for home care is much more valued than a subsidy for nursing home rooms (private or semi-private). While all these subsidies are valued well above their costs, the larger marginal utility under home care translates into a higher valuation of home care subsidies in both public LTC insurance systems. Under the universal subsidy, the average valuation of a home care subsidy is \$2.98 per \$1 spent, above the average valuation of a subsidy for a private or a semi-private room in a nursing home (\$2.72 and \$2.35, respectively). Under the exclusively means-tested subsidy, the subsidy is valued at \$2.63 per dollar spent for home care, compared to \$2.38 for a semi-private room and \$2.33 for a private room in a nursing home. These valuations are shown to be the highest for the middle-income tercile individuals who are likely not eligible for means-tested programs but, at the same time, have limited self-insurance.

Our paper is related to three strands of previous research. First, we draw on the literature on the impact of LTC risk on late-in-life savings and the role of public programs. Medical expenditures have been found to be an important driver of slow wealth decumulation in old age, based on models calibrated both to observational data from the U.S. (Kopecky and Koreshkova, 2014; De Nardi et al., 2010) and to responses to strategic survey questions

(Ameriks et al., 2011 and Ameriks et al., 2020). In addition, several papers have addressed how means-tested social transfers affect welfare in the presence of health risks. De Nardi et al. (2016) find that in a partial equilibrium model, risk-averse individuals value the Medicaid program at more than its cost, but that expanding it would reduce marginal utility below its cost. In contrast, using a rich overlapping generations model, Braun et al. (2017) find that expanding Medicaid would enhance welfare.

Second, we build on previous research on the various forms of LTC, in particular home care and nursing homes. As mentioned above, several studies document that many individuals prefer to receive care at home instead of in a nursing home and that this explains a considerable portion of elderlies' wealth accumulation (Costa-Font et al., 2009; Costa-Font, 2017; Achou et al., 2022). In addition, Koreshkova and Lee (2020) analyze the impact of public subsidies on the use of home care and nursing homes by dependent elderly using an equilibrium model of a nursing home market.

Third, our methodology, in particular the design of the SSQs, finds inspiration in the literature on state-dependent preferences. While several tools have been used to elicit state-dependent preferences, such as self-assessed utility in different health states (Finkelstein et al., 2013), a structural estimation based on health transitions and saving/spending decisions (Lillard and Weiss, 1997; Koijen et al., 2016; Blundell et al., 2020; Russo, 2022), and compensating differentials between health states (Evans and Viscusi, 1991), SSQs have emerged as a robust technique for identifying preference parameters (Barsky et al., 1997; Van der Klaauw, 2012). In particular, they have been used to estimate state-dependent preferences and disentangle different motives that are observationally equivalent, such as bequest motives and public care aversion (Ameriks et al., 2011 and Ameriks et al., 2020).

Our paper is structured as follows. In Section 2, we present a model of an individual's utility over different health states and care settings. In Section 3, we present the design of the survey questionnaire and some descriptive statistics of our survey sample. In Section 4, we present the methodology and results of the preference parameter estimation. In Section 5,

we develop the life-cycle model and present results on the level of savings and the valuation of LTC subsidies. Section 6 concludes.

2 Long-term care settings and marginal value of spending

LTC needs may affect individuals' marginal value of resources in different ways. First, they come with a significant subsistence level of spending because getting the minimum level of care required when dependent is very costly. Second, the marginal value of spending above the subsistence level can be different from the marginal value of spending when individuals are healthy. It may be larger for those who care about having more than the minimum amount of care or for those who would like to enter a nursing home with good amenities; it may be smaller as a bad health state may reduce the demand for certain types of expenditures such as travel.[2] Both the subsistence level of spending and the marginal utility of spending above the subsistence level can also vary depending on the type of LTC used (e.g., whether the elderly enters a nursing home or chooses to receive home care). In this section, we introduce utility functions that capture these potential variations.

When individuals do not need LTC (the "healthy" state, hereafter), their preference is modeled using a CRRA utility function:

$$\frac{X^{1-1/\theta_i}}{1-1/\theta_i}, \tag{1}$$

where X is the amount of expenditure and θ_i is the risk tolerance parameter (the inverse of the coefficient of relative risk aversion). The subscript i implies that this parameter can potentially vary across individuals.

[2]See also Blundell et al. (2020) and De Donder and Leroux (2021), which discuss differential demands for both medical and non-medical goods as the source of differences in marginal utilities between the health states.

When individuals need LTC (the "LTC" state, hereafter), following Ameriks et al. (2020), we use the following utility function to model their preferences:

$$\eta_{j,i}^{1/\theta_i} \frac{(X - \kappa_{j,i})^{1-1/\theta_i}}{1 - 1/\theta_i}, \tag{2}$$

where $\kappa_{j,i}$ is the subsistence level of expenditure and $\eta_{j,i}$ determines the marginal value of spending beyond the subsistence level. Compared to Ameriks et al. (2020), our key contribution in modeling LTC preferences is to capture how both of these parameters depend on the LTC setting, indexed by j, namely receiving care at one's own home (home-care, HC hereafter), entering a semi-private room (a room that is shared with another resident) in a nursing home (NSP hereafter), and entering a private room in a nursing home (NP hereafter).[3] Both parameters can also potentially vary across individuals.[4]

Note that the argument in the utility function is spending net of the minimum cost of care, $\kappa_{j,i}$. The minimum cost of care depends on the preferred care mode $j \in \{HC, NSP, NP\}$. Importantly, policymakers can affect $\kappa_{j,i}$ by subsidizing LTC. In the following, in order to keep it short, we will refer to $\kappa_{j,i}$ as the minimum cost of care under LTC type j.

The set of parameters we need to identify is $\Theta_i \equiv \{\theta_i, \{\eta_{j,i}, \kappa_{j,i}\}_{j\in\{HC,NSP,NP\}}\}$. Among these, we calibrate $\{\kappa_{j,i}\}_{j\in\{HC,NSP,NP\}}$ based on the minimum cost of care under each LTC mode. We estimate the other parameters using responses to survey questions about choices in hypothetical situations designed to identify these parameters. We introduce the survey questions and our data source in the next section.

[3] From now on, we use "LTC preferences" as a shortcut for "LTC-type-dependent preferences."

[4] Following Ameriks et al. (2020), we assume the risk-preference parameter to be the same between the healthy and LTC state. This allows us to estimate preference parameters with a manageable number of survey questions.

3 Data

3.1 AskingCanadians survey

Our empirical analysis uses data from a survey we conducted in December 2020 in partnership with *Asking Canadians*, an online panel survey organization. The survey was fielded to residents of the Canadian provinces of Québec and Ontario aged 50-69 years. Because our study focuses on individual preferences under different care settings in case individuals become dependent in the future, we ensured that all respondents had no activities of daily living (ADL)[5] limitation at the time of the survey. We constructed survey weights by age, gender, and education using the 2016 Canadian Census to correct for under- and oversampling of certain subgroups, and to make it representative of the Ontarian and Québec population in the considered age range. For questions for which we expected a significant proportion of missing information, such as income, we used unfolding brackets. We then imputed missing values with information from the bracketing, conditional on basic socio-demographic covariates (age, gender, and education).

Respondents could choose to answer the survey questionnaire in English or French. Upon completion of the survey, respondents received a loyalty reward from their choice of retailer (respondents could choose from a list of major retailers such as Walmart, Petro-Canada, and Hudson's Bay). In total, 3,004 respondents completed the survey.

The questionnaire consists of six main parts. Section 1 includes questions about demographics such as age, gender, education, marital status, number of children, and health condition. Section 2 studies the financial situation including employment status, income level, savings amounts and composition, mortgage and property value, and Section 3 the risk perceptions regarding mortality and needing help with ADLs. Section 4 has strategic survey questions (SSQs) related to risk preference. Section 5 describes the LTC settings used

[5]This includes activities such as eating, dressing, bathing, walking across a room, and getting in or out of bed.

in the SSQs regarding the allocation of income under different LTC types, while Section 6 asks those SSQs. The SSQs asked in Sections 4 and 6 allow us to estimate individuals' preferences regarding risks and LTC. We introduce these questions in the next subsection. The entire questionnaire can be found in Appendix A.[6]

3.2 Strategic survey questions for preference parameter estimation

In the following, we describe the strategic survey questions used to estimate the preference parameters, first for risk tolerance and then for LTC preferences.

3.2.1 SSQs on risk tolerance

The first set of SSQs concerns respondents' preferences over risky income lotteries. These questions aim to estimate the risk tolerance parameter θ_i. We proceed as in Ameriks et al. (2020) by presenting respondents with two situations differing in income risks. Situation A offers them a guaranteed lifetime income. In contrast, situation B offers a lottery, which either doubles this lifetime income or reduces it by $x\%$ with a 50-50 chance. Our goal is to find the value of the downside risk x that makes an individual indifferent between the two situations. We start with $x = 1/3$, and then ask the second question with $x = 1/5$ (for those who preferred A in the first choice) or with $x = 1/2$ (for those who chose B). We report in Table 2 in Section 4.3 the distribution of the downside risks x that people are willing to take, and we estimate their risk tolerance in Section 4.4.

3.2.2 SSQs on LTC preferences

Our objective is to estimate the marginal value of the spending parameters, $\eta_{j,i}$. Here is an overview of our approach. We first present a hypothetical situation where the respondent is

[6]The Appendix does not include the last part of the survey containing COVID-related questions, which are exploited in Achou et al. (2022).

80 years old, outlived the spouse or partner if coupled, and may need LTC for the next year. The chance of needing LTC is set at 25%. When the respondent needs LTC, she has to pay for it out of pocket, as her family is not available to provide care and there is also no public subsidy. The respondents are randomly assigned to one of the LTC settings—home care, entering a semi-private room in a nursing home, and entering a private room in a nursing home. We flesh out each option using calibrated costs. Then we present two hypothetical plans whose benefits are contingent on the individual's health status next year. The way respondents split a hypothetical amount of money between these two plans is then used to assess their preferences for spending under the considered LTC setting.

We now explain each step in more detail.

The hypothetical scenario We ask the respondent to imagine the following situation. The respondent is 80 years old and lives alone.[7] Her health next year is uncertain. There is a 25 percent chance that she will need LTC, while with a 75 percent chance, she will not need it.

In case the respondent becomes dependent, she faces the same level of physical impairments, independent of the LTC type she is assigned to, which requires 2,200 hours of LTC per year (6 hours per day, 7 days a week). It is assumed that the respondent will not have a significant cognitive decline. Her family is unable to provide care, and there is no public LTC subsidy. Therefore, she will need to pay for it out of pocket –i.e., out of the resources from the financial plans described below. It is also assumed that COVID-19 is no longer a threat as there is a vaccine, cure, or herd immunity.

The LTC settings The respondent is randomly assigned to one of the LTC settings below. When the respondent needs LTC, she has to use the assigned option.

The first option is home care, where a paid professional comes to her place to provide care. This includes helping her with ADLs, monitoring her condition, and helping her take

[7]For coupled respondents, the scenario assumes that they outlived their spouse or partner.

medications. Home care itself does not provide any non-health-care services such as meal preparation, home cleaning, help with groceries or laundry, gardening, maintenance, etc.

The second and third options are, respectively, a semi-private or private room in a nursing home. The only difference between the two is that a "semi-private" room is shared with another resident. In those two cases, the nursing home provides the respondent with not only LTC but also housing and food. The scenario assumes that there is no waiting time for entering a nursing home and that the respondent can choose the nursing home's location.

At the end of this section, the survey asks two comprehension test questions in order to verify that the respondent has correctly understood that 1) under the home care option, they would have to pay also for non-care services, 2) in these hypothetical scenarios, there is no waiting time before entering a nursing home.[8] If the respondent gives a wrong answer to either question, the survey presents the right answer and asks the missed questions once again (but each question is asked no more than twice).

LTC costs We compute the minimum LTC costs under each option such that it exactly covers 2,200 hours of care. This is the level of care that is required for someone who becomes dependent.

These LTC costs were calibrated to be close to those observed in Québec and Ontario. In these two provinces, there are two types of nursing homes: public and private. In this paper, we make no distinction between public and private nursing homes.[9] We set the cost of a semi-private room and a private room in a nursing home based on what is observed in private nursing homes, i.e., to \$6,500 and \$7,000 a month, respectively (Girard, 2020).[10]

In order to estimate the cost of home care, we rely on Canadian Life and Health Insurance

[8]This second aspect was important since there often is moderate waiting time in both Québec and Ontario (where respondents live). We abstract from the waiting times to simplify the hypothetical situation and focus on preferences for spending under LTC.

[9]According to the several professionals from the LTC sector that we consulted, there was no clear evidence that private nursing homes offered a better quality of care than public ones. The only difference they highlighted was related to waiting times. Yet, in the survey, we abstract from the waiting time as that is not the focus of this paper.

[10]Throughout the paper, the dollar sign (\$) refers to Canadian dollars unless said otherwise.

Association (2018). At-home services can take various forms, such as personal services (e.g., toileting and dressing) and nursing services. Depending on the type of service required, the price of one hour of skilled nursing care varies between $15 and $85 in Québec, and between $23 and $70 in Ontario. We use a conservative estimate of the price by setting it to $30 per hour. We assume that the respondent receives 6 hours of care each day and 7 days a week (i.e., 2,200 hours per year), for a total of $5,500 per month.

Two hypothetical plans After being assigned to a care option, respondents are then asked to split a hypothetical amount of money between two financial plans, A and B, before knowing whether they would be healthy next year (with a 75% probability) or in need of LTC (with a 25% probability). The returns from both plans are contingent on their health status in the next year. For every $1 put in Plan A, the respondent gets $1 to spend, but only if she does not need LTC. For every $1 put in Plan B, the respondent gets $4 to spend, but only if she needs LTC. Other than the money from Plan A or Plan B, the respondent has no other resources to pay for all their expenditures (including those related to LTC and/or housing) next year.[11]

The money from Plan A or Plan B should be spent by the end of the next year. Any money that is not spent cannot be saved for the future, be given away, or left as a bequest. At the end of next year, they will be offered the same options with another hypothetical amount of money for the following year.

Some remarks are in order. First, the survey sets the hypothetical amount of resources based on the respondent's actual income and wealth. This way, the situation would be close to the consumption possibilities they are likely to face in reality. The survey also ensures that the given amount of resources is enough to cover the minimum LTC costs, κ_j. To do so, the hypothetical amount of money is computed as the sum of the respondent's income, her annuitized wealth (6 percent times her wealth), and a fourth of κ_j.[12] Note that the

[11] This means that the respondent cannot use home equity either by selling her home or getting an additional loan.

[12] Since the return to a dollar in Plan B is $4, we only had to provide 1/4 of κ_j. This additional income

survey adds an additional $15,000 when assigned to the home care option to ensure that the respondent could cover not only the minimum costs of LTC but also the costs of subsistence-level non-care consumption.

Second, the survey makes it clear that, contrary to the Québec and Ontarian LTC systems, there is no public subsidy (no tax credit or means-tested fees) and the respondent has to cover *all* LTC expenses out of pocket. This is of course counter-factual, but it is much easier to capture the existing subsidies as increases in the given resources rather than in decreases in prices. This also makes the estimation easier by ensuring the same $\kappa_{j,i}$ across respondents.

Third, after presenting the assumptions and rules under the hypothetical situation, the survey asks another set of test questions to verify their comprehension. These questions ask about the availability of family care, whether they could save resources, and whether they could sell their house or use a reverse mortgage to cover LTC expenditures. Again, these questions are asked at most twice. The responses to these questions allow us to confirm that the respondents had a good understanding of the key aspects of the SSQs (see Section 4.3).

Choice interface: the slider The survey then presents a bar with a slider. It has Plan A on the left and Plan B on the right. The respondent allocates money to one or the other plan by moving the slider to the left (more money allocated to Plan A) or to the right (more money allocated to Plan B).[13] Texts located below the bar report the exact amount of money the respondent will receive under the current choice from Plan A ($1 for $1 invested) if they remain healthy and from Plan B ($4 for $1 invested) if they need help with ADLs.[14]

This interface allows the respondent to clearly see the trade-offs at play in allocating more money to one or the other plan. The survey asks the allocation question twice with

(added to the respondent's actual income and annuitized wealth) can be considered as a replacement for public LTC subsidy, which is available for almost all Canadians while being abstracted from in the survey.

[13] As in Ameriks et al. (2020), the respondent has to click somewhere on the bar to make the slider appear. It is designed this way to avoid the anchoring effect of the initial position of the slider.

[14] If the money in Plan B is not enough to cover the minimum LTC costs, the survey displays an error message informing the respondent that she needs to allocate more money to Plan B.

two variations of hypothetical amounts of money. Eliciting multiple responses from each respondent allows us to examine the internal consistency of their responses (see Section 4.3). The difference between the hypothetical amounts in the two questions is randomly determined, typically in the range of $10,000-20,000. From the responses to these questions, we obtain a distribution of the ratio of the net resources desired under the dependency state over the net resources when healthy for each care option (see Section 4.3). The distribution then allows us to estimate parameter $\eta_{j,i}$ (see Section 4.4).

3.3 Sample characteristics

Table 1 summarizes the main socioeconomic and demographic characteristics of our weighted sample. We compare the characteristics of our sample with those of respondents aged 50 to 69 in the 2016 Census and the January 2021 Labour Force Survey. Consistent with the construction of our weights, our survey delivers statistics for age, education, and gender similar to those from the Census. In terms of marital status, our sample delivers figures broadly in line with those from the Census, although it was not used in the construction of the survey weights. In particular, about two-thirds of our respondents have a spouse or partner. A little more than half of our sample is employed and about a third is retired. These figures align well with the figures from the Labour Force Survey for the same age range, although the work status categories do not map perfectly (see table notes). About two-thirds of our respondents have at least one child and a vast majority of them have at least one child living less than 20 kilometers away.

The average individual income in our weighted sample is about $64,000. By comparison, according to Statistics Canada (2022), the average income in Ontario in 2019 was $69,000 for those aged 45 to 54 and $57,000 for those aged 55 to 65. For Québec, the figures were $65,400 and $48,600. Finally, given that our respondents are relatively old and have had time to accumulate wealth, the average household (net) wealth (or net worth) in our sample

is quite large at about 765,000 CAD.[15]

4 Preference parameter estimation

In this section, we first describe how the responses to the strategic survey questions (SSQs) map to the preference parameters and present our estimation procedure. We then present the distribution of the responses and the estimates of the preference parameters.

4.1 Mapping survey responses to preference parameters

Risk preferences The decision problem a respondent faces in the risk-preference SSQ (see Section 3.2.1) can be modeled in the following way. Let Y_i be the level of income the individual i is guaranteed to have for the rest of her life if she does not take the risky bet. She is asked about the downside risk, $x^*_{i,0}$, that makes her indifferent between the guaranteed income and the risky bet.[16] The latter is characterized by a 50% chance to have her lifetime income doubled versus a 50% chance that it falls by $100 \times x^*_{i,0}$%. She is thus asked to solve, under our CRRA preference specification, the following equation for $x^*_{i,0}$:

$$\frac{Y_i^{1-1/\theta_i}}{1-1/\theta_i} = 0.5\frac{(2Y_i)^{1-1/\theta_i}}{1-1/\theta_i} + 0.5\frac{((1-x^*_{i,0})Y_i)^{1-1/\theta_i}}{1-1/\theta_i}. \tag{3}$$

$x^*_{i,0}$ does not depend on Y_i and it is

$$x^*_{i,0} = 1 - (2 - 2^{(1-1/\theta_i)})^{\frac{\theta_i}{\theta_i - 1}}, \tag{4}$$

[15] In our structural exercise (see in particular Section 5.2.2), we use the reported income and wealth from RSI survey 1 which was conducted in 2016, instead of those from the survey 7. This choice was motivated by the fact RSI survey 7 was conducted during the COVID pandemic (fall 2020) and, therefore, may not represent stationary distributions.

[16] The second subscript of the variable $x^*_{i,0}$ refers to the SSQ being asked. We use $m = 0$ for the risk-preference SSQ and $m = 1, 2$ for the two LTC-preference SSQs.

Table 1: Descriptive statistics

	Our survey	Census/LFS
Québec province (%)	39.0	38.8
Age (%)		
50-54	28.5	28.5
55-59	27.6	27.6
60-64	23.4	23.4
65-69	20.5	20.5
Female (%)	51.4	51.4
Marital status (%)		
Married	51.8	59.0
Common-law	13.6	12.0
Widowed, separated, divorced	18.2	18.3
Never married	16.4	10.7
Education (%)		
High school or less	43.2	43.2
College	35.3	35.3
University	21.5	21.5
Has a child (%)	66.8	-
Has a child $<$ 20km (%)	51.0	-
Work status (%)		
Employed	55.0	54.4
Retired	35.3	41.1
Not working/Looking for work	9.6	5.2
Individual income (average, $)	64,028	-
Household wealth (average, $)	765,205	-

Notes: The table compares the weighted statistics from our survey to statistics for similar variables in the 2016 Census and in the January 2021 Labour Force Survey (the latter is only used for work status). There is no perfect mapping between our work status categories and those in the LFS. In the LFS, we classify those "employed at work" or "employed, absent from work" as "employed," those "absent from work/unemployed" as "not working/looking for work" and the rest (those "not in the labour force") as "retired."

which implies $dx^*_{i,0}/d(1/\theta_i) < 0$ for positive relative risk aversion. Therefore, a smaller downside risk $x^*_{i,0}$ is associated with a higher relative risk aversion $1/\theta_i$. For instance, accepting a downside risk of 20% or less occurs for relative risk aversion values of 3.8 or more.

When estimating risk aversion, we assume a trembling-hand type survey response error. In other words, we assume the actual indifference point used in responding to this question, $\tilde{x}^*_{i,0}$, is obtained as

$$\tilde{x}^*_{i,0} = x^*_{i,0} + \epsilon_{1,i}, \tag{5}$$

where $\epsilon_{1,i}$ is independently drawn from a normal distribution with mean zero and variance σ_1^2. Note that this SSQ has categorical responses. Suppose the respondent indicates that $\tilde{x}^*_{i,0} \in [\underline{x}_{i,0}, \bar{x}_{i,0}]$. This implies that, under the preference parameter θ_i, the survey response error is realized as $\epsilon_{1,i} \in [\underline{x}_{i,0} - x^*_{i,0}, \bar{x}_{i,0} - x^*_{i,0}]$. Then the likelihood of observing this response is $\Phi(\frac{\bar{x}_{i,0}-x^*_{i,0}}{\sigma_1}) - \Phi(\frac{\underline{x}_{i,0}-x^*_{i,0}}{\sigma_1})$ where $\Phi(.)$ is the CDF of the distribution of errors.

There are two parameters related to these survey responses: θ_i and σ_1. Because we have only one observation per respondent, we cannot allow for full heterogeneity in θ_i, as it is impossible to tell whether dispersion in responses comes from the heterogeneity in θ_i or from the variance of survey response error, σ_1. Therefore, we consider two restrictions on the distribution of θ_i. In the first one, we assume that θ_i is the same across all the respondents. In that model, the overall level of the chosen downside risk identifies the common value of θ while any dispersion in responses is attributed to survey response errors. In the second model, we assume that θ_i is a function of observables such as gender and income terciles. In that model, dispersion in responses between socio-demographic groups is attributed to differences in θ_i while that within each socio-demographic group is attributed to survey response errors.

Long-term care preferences. In the LTC preference SSQ (see Section 3.2.2), a respondent was given a hypothetical amount of resources $W_{i,m}$, where $m \in \{1, 2\}$ indicates that

this question is asked twice per respondent. A part of this amount, denoted by $x_{i,m}$, can be put in an account that will provide $x_{i,m}/\pi$ dollars only if she needs LTC, where π is the probability to need LTC. The remaining amount will provide $W_{i,m} - x_{i,m}$ dollars only if she is healthy. The underlying maximization problem is therefore

$$\max_{x_{i,m}} (1-\pi)\frac{(W_{i,m}-x_{i,m})^{1-1/\theta_i}}{1-1/\theta_i} + \pi\left[\eta_{j,i}^{1/\theta_i}\frac{(\frac{1}{\pi}x_{i,m}-\kappa_j)^{1-1/\theta_i}}{1-1/\theta_i}\right], \tag{6}$$

where κ_j is the minimum cost under LTC type $j \in \{HC, NSP, NP\}$, and $\eta_{j,i}$ is the LTC preference parameter to be estimated. The optimal solution, $x^*_{i,m}$, is

$$x^*_{i,m} = \frac{W_{i,m} + (1-\pi)^{\theta_i}\frac{\kappa_j}{\eta_{j,i}}}{1+(1-\pi)^{\theta_i}\frac{1}{\eta_{j,i}}\frac{1}{\pi}}, \tag{7}$$

which can be rewritten as

$$\eta_{j,i} = (1-\pi)^{\theta_i}\frac{\overbrace{\frac{1}{\pi}x^*_{i,m}-\kappa_j}^{\text{net resources in LTC}}}{\underbrace{W_{i,m}-x^*_{i,m}}_{\text{resources when healthy}}}. \tag{8}$$

Conditional on the value of the risk tolerance parameter θ_i, $\eta_{j,i}$ is thus pinned down by the respondent's desired amount of resources in the LTC state (net of the subsistence level) relative to her desired amount of resources in the healthy state.[17]

In the estimation, we again assume a trembling-hand type survey response error. The observed response, $\tilde{x}^*_{i,m}$, is modeled as

$$\tilde{x}^*_{i,m} = x^*_{i,m} + \epsilon_{2,im}, \tag{9}$$

[17] κ_j is calibrated to the minimum cost of care in the survey, which assumes no public subsidy and does not depend on the individual, so that we drop the subscript i. The chosen value of κ_j is in principle inconsequential for the estimation of $\eta_{j,i}$ as long as the value used in the estimation is consistent with that assumed in the survey.

where $\epsilon_{2,im}$ is independently drawn from a normal distribution with mean zero and variance σ_2^2. Then for any interior response, the likelihood of observing it is $\phi(\frac{\tilde{x}^*_{i,m}-x^*_{i,m}}{\sigma_2})/\sigma_2$, where ϕ is the PDF of the standard normal distribution. The likelihood of observing a boundary response is $\Phi\left(-\frac{x^*_{i,m}}{\sigma_2}\right)$ for $\tilde{x}^*_{i,m}=0$ and $\Phi\left(\frac{W_{i,m}-x^*_{i,m}}{\sigma_2}\right)$ for $\tilde{x}^*_{i,m}=W_{i,m}$, where Φ is the CDF of the standard normal distribution.

As we have seen, the identification of θ_i solely relies on the risk-preference SSQ, while the LTC SSQ allows identification of $\eta_{j,i}$ conditional on the estimated θ_i. Though we have two responses per respondent for this question, we do not aim to allow for full heterogeneity for $\eta_{j,i}$ to reduce estimation noise and keep the model consistent with the risk-preference estimation. Hence, we use two versions consistent with the estimation of θ_i: one with no preference heterogeneity and the other with preference heterogeneity explained by observables such as gender and income terciles.

4.2 Estimation algorithm

Given the preference parameters, $\Theta_i \equiv \{\theta_i, \eta_{HC,i}, \eta_{NSP,i}, \eta_{NP,i}\}$ for $i = 1, \cdots, N$, and the variance of the survey response errors, σ_1 and σ_2, we can calculate the likelihood of observing the given survey responses, $X_i \equiv \{\tilde{x}^*_{i,m}\}_{m=0,1,2}$, as explained in the text above. We estimate Θ_i by maximum likelihood estimation.[18] The following summarizes the estimation algorithm.

1. Guess initial values for Θ_i for all i, σ_1, and σ_2.[19]

2. Given the parameter values, calculate the likelihood $(q_{i,m})$ of observing each survey response $(\tilde{x}^*_{i,m})$ for all i and m.

3. Calculate the log-likelihood of the entire set of observations as $L = \sum_{i=1}^{N}\sum_{m=0}^{2} log(q_{i,m})$.

[18] In Appendix C, we show that we obtain almost the same parameter estimates using the method of moments.

[19] The preference parameters are assumed to be either identical across the sample or within each demographic group, depending on the specification used.

4. Using the Berndt-Hall-Hall-Hausman algorithm (Berndt et al., 1974), update the guess for Θ_i for all i. If the new guess is sufficiently close to the values assumed in step 1, stop. Otherwise, go to step 2 with the updated values.

4.3 Distribution of responses

Before presenting the estimation results for θ and η, we discuss the distribution of responses to the SSQs. This provides intuition about the estimated values in the next section.

Table 2 tabulates the downside risk the respondents are willing to take to have a 50% chance of doubling their income.[20] About 60% of the sample are not willing to take more than 20% of the downside risk (which would correspond to a relative risk aversion (RRA) coefficient of 3.8 or more); more than 80% of the sample are not willing to take a 50% chance to lose one-third of their income to have a 50% chance of doubling their income (which would correspond to an RRA coefficient of 2.0 or more). This indicates a rather high level of risk aversion which is consistent with findings from similar questions from the Health and Retirement Study (Barsky et al., 1997) and the Vanguard Research Initiative (Ameriks et al., 2020).

Table 2: Distribution of downside risk willing to take to double income

Downside risk willing to take	Share (%)
$[0\%, 20\%)$	59.5
$[20\%, 33\%)$	21.1
$[33\%, 50\%)$	10.5
$[50\%, 100\%]$	8.9
N	2,752

Following equation (8), Table 3 presents the distribution of the ratio between the desired resources under the LTC state (net of the minimum cost of care) and the desired resources under the healthy state. For all the care options presented, the median respondent wants to have a significantly larger amount of resources under the LTC state than under the healthy

[20] The risk-preference SSQ was not mandatory. The number of observations in this table is smaller than the sample size (3,004) due to non-responses.

state, even net of the minimum cost of care. For an RRA coefficient of 3.8, equation (8) implies that $\eta_{j,i}$ is larger than one whenever the ratio is larger than 1.08.[21] As a result, the information in Table 2 and Table 3 suggests that estimated values for $\{\eta_{j,i}\}$ should generally be larger than one.[22] The table also shows a noticeable difference between the LTC types. The respondents overall want to keep more resources under the LTC state if they are assigned to HC, where the difference is particularly large at the median and also in the left tail of the distribution. This indicates that $\eta_{HC,i}$ tends to be larger than $\eta_{NSP,i}$ and $\eta_{NP,i}$.

Table 3: Net resources under the LTC state over resources when healthy, by LTC type

LTC type	25p	50p	75p	N
HC	0.99	1.82	2.82	2,002
NSP	0.62	1.30	2.60	2,002
NP	0.65	1.32	2.79	2,004

Notes: The table shows the distribution of the ratio between the desired resources under the LTC state (net of the minimum cost of care) and the desired resources under the healthy state. Each respondent is randomly assigned to one of the LTC types. Each respondent is asked the question two times (with varying amounts of given resources) and the questions are mandatory. Hence, the number of observations for each type is one-third of the sample size times two.

The credibility of the parameter estimates hinges on the quality of the survey responses. To confirm the credibility of the survey responses, we perform two analyses. First, we examine the respondents' performance for the comprehension test questions. In the main battery of the survey, after explaining the hypothetical situation and before asking the SSQs, the survey asks comprehension test questions to confirm that the respondents understand the assumed scenario. The comprehension test scores reported in Appendix B suggest that the respondents understood the survey questions well. Second, we examine the internal consistency of the survey responses, following Manski (2004). Specifically, we examine the

[21] This threshold is decreasing in RRA. Even with an RRA coefficient of 1.5, this ratio is 1.21 and thus remains lower than the medians in Table 3.

[22] Recall that we calibrate $\{\kappa_j\}_{j\in\{HC,NSP,NP\}}$, the subsistence level of expenditure, to the minimum cost of care.

correlation between the responses to the two LTC SSQs (the same resource allocation questions with different amounts of given resources). We expect a positive correlation between the two responses if the responses reflect the underlying preference; the correlation will be close to zero if the responses are random. We examine the correlation of the variable reported in Table 3 (the ratio of net resources under the LTC state over resources when healthy) between the questions and find it to be 0.53, with a p-value virtually equal to zero.[23] Thus, we confirm the internal coherence of the survey responses.

4.4 Estimation results

Table 4 reports the estimation results.[24] The first column shows the estimates from the model that assumes no preference heterogeneity. The sample is overall highly risk averse. The estimate of homogeneous θ is 0.186, implying an RRA coefficient larger than five. This is in line with the finding from a representative sample of older U.S. individuals from Barsky et al. (1997) as well as with Ameriks et al. (2020).

For the LTC preferences, as expected from the fact that the respondents want to have a larger amount of resources in the LTC state (net of the minimum cost of care) than in the healthy state, η is larger than one for all LTC types. Also, as expected from the fact that the respondents who are assigned to HC want to have more resources (net of minimum cost of care) than those assigned to NSP or NP, $\eta_{HC} = 1.74$ is much larger than $\eta_{NSP} = 1.48$ and $\eta_{NP} = 1.45$, and the difference is statistically significant. On the other hand, η_{NSP} and η_{NP} are similar and not statistically significantly different, consistent with the differences in the allocations between these two treatments mainly reflecting differences in the minimum cost of care κ_j (hence, no noticeable differences in the net resource allocations in Table 3).

These estimates are comparable to those in Ameriks et al. (2020). Their baseline estimate of η, which to some extent can be seen as an average of the η_j's here as they do not consider

[23] To make the result less sensitive to extreme outliers of the ratio variable, we winsorize the observations at the 5th and 95th percentiles.

[24] Appendix C shows that we obtain almost the same estimates using the method of moments instead of maximum likelihood estimation.

different care settings, is 1.49. Overall, there is thus no evidence that the risk and LTC preferences differ much between the U.S. and Canada.

The model in column 2 of Table 4 investigates preference heterogeneity as a function of variables that are assumed to be non-time-varying in the structural model used in Section 5: gender and income tercile.[25] In line with Barsky et al. (1997), males in our survey are much more risk tolerant; they also care much less about resources in the LTC state. Having a higher income level slightly reduces risk tolerance. In terms of LTC preference, the income level does not have statistically significant impacts on η_{NSP} and η_{NP}, but not being in the bottom income tercile significantly increases η_{HC}. This indicates that those with higher income want to maintain a good standard of living when using HC, i.e., wanting to have more resources than the minimum care. But when NSP or NP is used, there is less room for adjustments in the quality of living, so the income level matters less for preference.

The last column of Table 4 examines how age and marital status, on top of the variables included in the second column, affect preferences.[26] Being coupled marginally increases risk tolerance while having no statistically significant impact on LTC preferences.[27] Older individuals are overall less risk tolerant and have stronger LTC preferences. Including these variables does not noticeably change the coefficients on the variables included in the second column.

In calibrating the structural model used to investigate the impact of these preferences on savings in Section 5, we use the first two specifications from Table 4. That is, we start with homogeneous preferences, and then we allow for preference heterogeneity by gender and income but not that by age and marital status. We do not consider heterogeneity by marital status because in the model, we only consider singles and abstract from the dynamics of spousal caregiving as we assume no informal care in the SSQs. We abstract from changes

[25] The cutoffs for income terciles are calculated separately for those still working and those who are not, given that a large share of our sample is retired.

[26] Age is defined as the difference from the average to make the constants more comparable across the specifications.

[27] The latter result aligns with our instructions in the LTC SSQs that ask the respondent to imagine living alone and having no family able to provide care.

Table 4: Estimates of the preference parameters

Parameters	specifications 1	2	3
θ			
constant	0.186	0.177	0.170
	(0.009)	(0.016)	(0.018)
Income 2nd tercile		-0.096	-0.099
		(0.019)	(0.019)
Income 3rd tercile		-0.027	-0.038
		(0.019)	(0.019)
Male		0.093	0.088
		(0.016)	(0.016)
Coupled			0.023
			(0.016)
Age			-0.006
			(0.001)
η_{HC}			
constant	1.742	1.633	1.608
	(0.016)	(0.053)	(0.053)
Income 2nd tercile		0.269	0.258
		(0.073)	(0.079)
Income 3rd tercile		0.187	0.185
		(0.054)	(0.060)
Male		-0.116	-0.117
		(0.038)	(0.038)
Coupled			0.038
			(0.039)
Age			0.010
			(0.003)
η_{NSP}			
constant	1.475	1.611	1.606
	(0.023)	(0.170)	(0.175)
Income 2nd tercile		-0.024	-0.038
		(0.183)	(0.181)
Income 3rd tercile		-0.054	-0.061
		(0.168)	(0.166)
Male		-0.146	-0.132
		(0.045)	(0.047)
Coupled			0.006
			(0.065)
Age			0.010
			(0.004)
η_{NP}			
constant	1.446	1.872	2.170
	(0.021)	(0.212)	(0.221)
Income 2nd tercile		0.007	0.008
		(0.218)	(0.214)
Income 3rd tercile		-0.234	-0.158
		(0.213)	(0.208)
Male		-0.376	-0.213
		(0.045)	(0.058)
Coupled			-0.596
			(0.605)
Age			0.012
			(0.004)
σ_1	0.252	0.247	0.246
	(0.007)	(0.007)	(0.007)
σ_2	14.8K	14.8K	14.7K
	(0.06K)	(0.07K)	(0.07K)

Notes: Specification 1 assumes preference homogeneity. Specification 2 incorporates heterogeneity explained by the variables that are assumed to be non-time-varying in the structural model in Section 5 (income tercile and gender). Specification 3 incorporates heterogeneity explained by age and marital status as well. Age is normalized as the difference from the mean to make the constants more comparable across specifications. Standard errors are in parentheses.

in preferences over age because we assume the preference parameters to be structural and hence fixed for each individual in the model.[28]

While η_{HC} is significantly larger than η_{NSP} and η_{NP} under the homogeneous preferences (column 1 of Table 4), under the heterogeneous preferences, rankings vary depending on gender and income group. Table 5 lists the parameter values used by gender and income tercile.[29] These numbers are calculated as the sum of the estimates of the constant and the coefficients on the corresponding dummy variables from column 2 of Table 4. For the comparison between η_{HC} and the other two, the ranking from the homogeneous preferences holds except for the lowest income tercile, where the gap is almost null for males while η_{HC} is smaller than η_{NP} for females. This implies that the impact of the LTC preferences for the lowest income tercile will not be as clear as in the other two terciles. For the ranking between η_{NSP} and η_{NP}, the evidence is more mixed, with η_{NSP} being significantly higher than η_{NP} for males in the top tercile and the opposite being true for females throughout the income distribution.

5 Implications for precautionary savings and optimal long-term care subsidies

All else equal, a larger marginal utility under HC than under NSP and NP ($\eta_{HC} > \eta_{NSP}, \eta_{NP}$) implies that those planning to use HC when needing LTC should build larger precautionary savings. At the same time, how these preferences map to savings also depends on the type of public LTC insurance provided by the government (which affects the respective κ's) as well as other motivations for late-in-life savings, such as leaving bequests. In this section,

[28] We should also note that the cross-sectional differences in preferences across age groups mix age and cohort effects.

[29] In the model, we assume that the income tercile the individual belongs to does not change over time. In that sense, we treat the observed income from the survey as an indicator of permanent income, and we abstract from income uncertainty late in life. See Section 5 for more details on how we model the income process.

Table 5: Preference parameter calibration

θ	Income 1st tercile	Income 2nd tercile	Income 3rd tercile
Male	0.2698	0.1734	0.2417
Female	0.1773	0.0809	0.1492
η_{HC}	Income 1st tercile	Income 2nd tercile	Income 3rd tercile
Male	1.5169	1.7859	1.7038
Female	1.6331	1.9021	1.8200
η_{NSP}	Income 1st tercile	Income 2nd tercile	Income 3rd tercile
Male	1.4655	1.4411	1.4119
Female	1.6113	1.5869	1.5577
η_{NP}	Income 1st tercile	Income 2nd tercile	Income 3rd tercile
Male	1.4961	1.5031	1.2625
Female	1.8724	1.8794	1.6388

Notes: This table shows the values used for preference parameters in the structural model in Section 5, by gender and income tercile. The numbers are calculated as the sum of the estimate of the constant term and the coefficients on the corresponding dummy variables from Table 4, column 2.

we build and calibrate a life-cycle model with two types of public LTC insurance (based on the Canadian and U.S. setups respectively) and bequest motives to study the implications of our estimated LTC preferences on the precautionary savings and on the design of public LTC insurance.

5.1 Life-cycle model

In the model, single individuals decide the optimal level of spending and savings over the life cycle, facing idiosyncratic health and mortality risks. Each individual has a pre-determined preferred LTC type among HC, NSP, and NP. When needing LTC, the utility functions estimated in Section 4 govern the preferences for expenditures. Public LTC insurance partially covers LTC expenditures. It is a partial-equilibrium model in that individuals face a fixed risk-free return and financing of public LTC insurance is not explicitly modeled. In the welfare analyses, we compare the changes in the individuals' welfare with the changes in the public LTC insurance expenditures.

5.1.1 Optimization problem of individuals

We consider the following optimization problem of older single individuals.[30] In each period, the individual decides how much to spend and save to maximize the expected lifetime utility. The flow utility function is health-state dependent. Utility when the individual does not need LTC is given by

$$U(X|g, PI) = \frac{X^{1-1/\theta_{g,PI}}}{1 - 1/\theta_{g,PI}}, \tag{10}$$

where X is the level of expenditures. We allow preferences to vary with gender (g) and permanent income group (PI) based on the heterogeneity documented in Section 4.

Utility when needing care is given by

$$U_j(X|g, PI) = (\eta_{j,g,PI})^{1/\theta_{g,PI}} \frac{(X - \tilde{\kappa}_j)^{1-1/\theta_{g,PI}}}{1 - 1/\theta_{g,PI}}, \tag{11}$$

where our key marginal utility parameter $\eta_{j,g,PI}$ is a function of care type j, gender, and permanent income, where j is pre-determined as HC, NSP, or NP, based on the type of LTC that the individual will use.[31] $\tilde{\kappa}_j \leq \kappa_j$ captures the out-of-pocket cost of basic care, which depends on the public LTC insurance in place (see below for further details). Finally, the individual discounts future utilities with the discount factor β.

The individual faces health and mortality risks. There are four health states s: two non-LTC states ($s = 1,\ 2$), an LTC state ($s = LTC$), and death ($s = D$) which is absorbing. When $s = 1$ or 2, the individual does not need LTC. The difference between the two states lies in the probabilities of health states in the next period. The health state evolves based on a first-order Markov process. The transition probabilities, $\pi_{ss'}(t, g, PI)$, are functions of

[30] We focus only on singles to abstract from spousal caregiving and joint survival dynamics, as in De Nardi et al. (2010) and Ameriks et al. (2020). This modeling choice is also consistent with the hypothetical situation used in the survey, which assumes that the currently coupled individuals have outlived their spouses when they need LTC.

[31] Switching between different modes of LTC is rare, at least among singles. Among 1,906 singles who needed help with at least two ADLs (the threshold we use for the LTC state in the model; see Section 5.2) at some point in their lives and whose deaths are observed from HRS 2004-2014, about 90 percent used only HC or NH in their lifetime.

the current state (s), age (t), gender, and permanent income. When the individual passes away, the individual leaves the remaining wealth as bequests. The utility from bequests is given by

$$U_{Beq}(X|g,PI) = (\eta_{Beq})^{1/\theta_{g,PI}} \frac{(X+\kappa_{Beq})^{1-1/\theta_{g,PI}}}{1-1/\theta_{g,PI}}, \tag{12}$$

where $\kappa_{Beq} \geq 0$ corresponds to bequests being a luxury good.

In each period, the individual faces the following budget constraint:

$$W' = W - X + (y + rW) - \tau(y + rW) + \Xi_j, \tag{13}$$

where W is wealth at the beginning of the period (prime denotes variables in the next period), y is non-capital income, r is the risk-free return on savings, $\tau(.)$ is the income tax function, and Ξ_j is the transfer from the public LTC insurance. This transfer will depend on the LTC setting j as we describe in greater detail in the next subsection.

Borrowing is not allowed, so W' must be non-negative. We abstract from income uncertainty as we focus on older individuals that are already retired or close to retiring. Each individual has fixed non-capital income $y = \bar{y}$ before an exogenously given retirement age; after that age, fixed non-capital income changes to $y = \xi\bar{y}$, where $\xi \in (0, 1]$ is the replacement rate of retirement income that captures public and private pensions. For the tax function, we use a specification à la Benabou (2002):

$$\tau(y + rW) = y + rW - (y + rW)\lambda_1 \left(\frac{y + rW}{E(y + rW)} \right)^{-\lambda_2}, \tag{14}$$

where λ_1 determines the level and λ_2 determines the progressivity of the tax. $E(y + rW)$ is the population average of the income to be calibrated.

This model is solved recursively based on the following Bellman equation:

$$
\begin{aligned}
V_j(W,t,s|g,PI) = \max_X\, & I_{s=LTC}U_j(X|g,PI) + I_{s=1,2}U(X|g,PI) \\
& + \beta E[\sum_{s'=1,2,LTC} \pi_{ss'}(t,g,PI)V_j(W',t+1,s'|g,PI) + \pi_{sD}U_{Beq}(W'|g,PI)], \\
& \text{for } \; j \in \{HC, NSP, NP\}, \\
& \text{s.t. } \; W' = W - X + (y + rW) - \tau(y + rW) + \Xi_j, \; W' \geq 0,
\end{aligned}
\tag{15}
$$

where $V_j(\cdot)$ is the value function and I_s is an indicator variable for the individual's health state.

5.1.2 Modeling public LTC insurance

Public LTC insurance is modeled through two components: universal subsidies that reduce the out-of-pocket cost of LTC for everyone and means-tested transfers that guarantee a minimum level of consumption when needing LTC. Modeling public LTC insurance through these two components is clearly a simplification, but this approach allows us to examine how LTC types affect the level of savings, taking into account specific designs of the public LTC insurance (e.g., degree of universality and of generosity) while keeping the model tractable.

Universal subsidies lower the minimum cost of LTC, making the effective subsistence level of expenditure under the LTC state in the model, $\tilde{\kappa}_j$ in (11), different from κ_j used in the preference estimation in Section 4 which assumed no government subsidy. The government can provide different amounts of subsidies across LTC types, so the gap between $\tilde{\kappa}_j$ and κ_j can be different for HC, NSP, and NP.

Means-tested transfers – Ξ_j in the budget constraint (equation (13)) – guarantee that the individual can have a minimum level of expenditure, $\underline{X}$, after paying the minimum cost of LTC, $\tilde{\kappa}_j$. In other words, it is determined as

$$
\Xi_j = \max\{0, \underline{X} - (W + (y + rW) - \tau(y + rW) - \tilde{\kappa}_j)\}. \tag{16}
$$

Modeling the means-tested transfers as a consumption floor is a common approach in the literature on late-in-life medical spending (see, for example, De Nardi et al., 2010, Kopecky and Koreshkova, 2014, and Ameriks et al., 2020). Note that Ξ_j depends on the type of LTC (j) as the minimum cost in the RHS varies with the type of LTC.

We will consider two versions of public LTC insurance, one based on the Canadian system and the other based on the U.S. system. The difference between the two systems can be expressed as the different sets of calibration of the two components above, as explained in the next subsection.

5.2 Calibration

We calibrate the baseline model using Canadian data and characteristics of public LTC insurance in Canada. As we detail below, most parameters are calibrated based on the literature, direct estimation from the data, and regulations. The time discount factor is calibrated to match the observed level of retirement savings. Table 6 lists the parameters and summarizes their calibration. A period in the model is two years, but the parameters are shown per annum for easier interpretation.

5.2.1 Parameters calibrated based on the literature, direct estimation from data, and regulations

Preferences The risk-preference parameter, $\theta_{g,PI}$, and the parameter that governs the marginal utility of spending under the LTC state, $\eta_{j,g,PI}$, are calibrated based on the estimates that incorporate the heterogeneity by gender and income tercile (Table 5). The value of $\tilde{\kappa}_j$ depends on the public LTC insurance system considered (see below).

In the baseline model, the parametrization of the bequest utility function (equation (12)) is based on Ameriks et al. (2020). We set $\eta_{Beq} = 0.92$ and $\kappa_{Beq} = 11.9K$.[32] We do not allow for heterogeneity in these two parameters. As in the utility function under the LTC state,

[32]The estimate of κ_{Beq} in their paper is 7.8K USD. We adjusted its value to calibrate the model in 2020 Canadian dollars.

Table 6: List of calibrated parameters and their values

Parameter	Value	Description	Source/target
A. Preferences			
θ	See Table 5	Risk preference	Estimated from the survey
η_j for $j \in HC, NSP, NP$	See Table 5	Preference under the LTC state	Estimated from the survey
η_{Beq}, κ_{Beq}	0.92, 11.9K	Bequest motive	Ameriks et al. (2020)[a]
β	0.91	Time discount factor	Average wealth at age 66 from RSI survey 1
B. Public LTC insurance			
1) With universal subsidies (Canada)			
$\underline{X}$	18K	Expenditure floor	Canadian public LTC insurance
$\tilde{\kappa}_{HC}, \tilde{\kappa}_{NSP}, \tilde{\kappa}_{NP}$	23.6K, 19.7K, 23.6K	Effective minimum LTC cost	Canadian public LTC insurance
2) Means-tested only (U.S.)			
$\underline{X}$	18K	Expenditure floor	See text
$\tilde{\kappa}_{HC}, \tilde{\kappa}_{NSP}, \tilde{\kappa}_{NP}$	66K, 78K, 84K	Effective minimum LTC cost	U.S. public LTC insurance
C. Other parameters			
r	2%	Interest rate	Canadian neutral interest rate
λ_1, λ_2, $E(y + rW)$	0.889, -0.046, 114K	Income tax parameters	Kurnaz and Yip (2022)
$\pi_{ss'}$	See text and Appendix D	Health transition matrices	Health and Retirement Study
ξ	See text	Retirement income replacement rate	See text

Notes: [a]We also consider the bequest utility function à la Lockwood (2018); see text. When applicable, all numbers are in Canadian Dollars.

the sign in front of κ determines whether the considered spending is a necessity or a luxury good. The negative sign in front of κ_{LTC} in (11)—i.e., the subsistence level of spending being significant under the LTC state—means that spending under the LTC state is viewed more as a necessity, while the positive sign in front of κ_{Beq} in (12) implies that bequest is viewed more as a luxury. Alternatively, we consider a calibration based on Lockwood (2018) (Table 3, column 3), with $\eta_{Beq} = 19$ and $\kappa_{Beq} = 727K$. In the latter calibration, the bequest motive becomes operative at a higher level of wealth, but it tends to be stronger once it becomes operative.

Public LTC insurance We consider two versions of public LTC insurance.

We use Canada as our baseline setup. In Canada, even those with high income generally pay less than the full cost of care, though they may pay more than low-income individuals. We model this setup as a combination of (i) a universal subsidy that reduces the minimum cost care from κ_j to $\tilde{\kappa}_j$ and (ii) a means-tested component whose generosity is measured by $\underline{X}$. We call this public LTC insurance the "universal subsidy" to contrast it with the U.S.

case for which component (i) is mostly absent.[33]

We calibrate $\tilde{\kappa}_{NSP}$ and $\tilde{\kappa}_{NP}$ based on the rules in Québec (Québec Régie de l'Assurance Maladie, 2022), with $\tilde{\kappa}_{NSP}$ equal to \$19.7K per year and $\tilde{\kappa}_{NP}$ to \$23.6K per year. There is no readily available data for $\tilde{\kappa}_{HC}$, but due to the limited universal subsidy for HC, the minimum cost under HC must be larger than that under NP. To be conservative on the impact of LTC preferences on savings, we assume $\tilde{\kappa}_{HC}$ to be the same as $\tilde{\kappa}_{NP}$. For the expenditure floor, $\underline{X}$, following Brown and Finkelstein (2008), we calibrate it based on the minimum income guaranteed for the older population by the federal government. Government of Canada (2022) shows that the combined monthly Old Age Social Security and Guaranteed Income Supplement for a single with no income is \$1,562 in 2020. So we set $\underline{X}$ to \$18K per year.

In the U.S., public LTC insurance is generally provided by Medicaid. Those not eligible for Medicaid due to their high income and/or assets usually pay the full cost of LTC. Only those with low enough income and/or assets relative to their LTC needs will receive Medicaid benefits. The U.S. setup mostly lacks a universal component and we therefore call it "means-tested only." In this case, there is no universal subsidy, so those not eligible for the means-tested subsidy pay the full cost of LTC assumed in the survey ($\tilde{\kappa}_{HC} = \kappa_{HC} = 66K$, $\tilde{\kappa}_{NSP} = \kappa_{NSP} = 78K$, and $\tilde{\kappa}_{NP} = \kappa_{NP} = 84K$). We use the same expenditure floor $\underline{X}$ as in the universal subsidy system in order to isolate the effect of the universal subsidies.

Health states and transition Since RSI surveys are repeated cross-sections, we use the Health and Retirement Study (HRS) to estimate the health transition process.[34] We define the *LTC* state as needing help with at least two ADLs. This is to be consistent with the hypothetical situation in the survey where the individual needs significant amount of care. Needing help with just one ADL may not put an individual in that situation. We also check that our quantitative findings are similar under different cutoffs (needing help with any ADL

[33] We do not aim to reproduce precisely the Canadian setup nor the American one. Instead, we aim to highlight how the implications of our estimates differ depending on the degree of universality of the public LTC insurance system.

[34] There is no significant health gap among older individuals between Canada and the U.S. For example, though Canadians tend to live longer than Americans, the gap is not large (see Gruber, 2022).

and needing help with at least three ADLs). The individuals are in health state $s = 1$ if self-stated health is excellent or very good and they do not need LTC; they are health state $s = 2$ if self-stated health is good, fair, or poor and they do not need LTC.

We estimate the biennial health transition process using the HRS data (waves 2004-2014). Following Jones et al. (2018), we estimate a multinomial logit model where the dependent variable is the health state in the next period (including death) while the independent variables are the current health state, gender, age and age squared, permanent income tercile, and interactions of these variables. The estimates are directly translated to the health transition matrices. See Appendix D for more details.

Tax function parameters There are three parameters in the progressive tax function (equation (14)): λ_1, which determines the overall level of tax, λ_2, which determines the progressivity of tax, and $E(y + rW)$, the average income used as a scale parameter. For the first two, we use the estimates from Kurnaz and Yip (2022) for Canadian income tax: $\lambda_1 = 0.889$ and $\lambda_2 = -0.046$. For $E(y + rW)$, we cannot estimate it directly from the RSI surveys since they cover individuals in certain age groups only, while the average needed in the formula is from the entire population. We calibrate it such that the tax rate faced by the single household with median income ($58,400) is 13.8%, as reported in Kurnaz and Yip (2022). $E(y + rW) = \$114K$ yields this result.

Retirement income replacement rate We assume that individuals retire at a fixed age. We set that age to be 60, as that is the age when we start to see more retirees than non-retirees in the RSI survey.

The replacement rate for retirement income, ξ, depends on the income level before retirement to capture the progressivity in the public pension system. To be specific, individuals younger than 60 and still working are classified into income terciles. Similarly, we classify retirees 60 years or older into income terciles. Then we compare the median income of each tercile between retirees and non-retirees and translate those ratios into the income replace-

ment rate. The ratios are close to 0.9 for the bottom tercile, 0.8 for the middle, and 0.7 for the top, so we use these numbers. These numbers are also in line with the estimates from LaRochelle-Côté et al. (2010).

Interest rate The interest rate, r, is set to 2% per year to reflect low interest rates at the time of the survey.

5.2.2 Calibrating time preference by matching retirement wealth accumulation

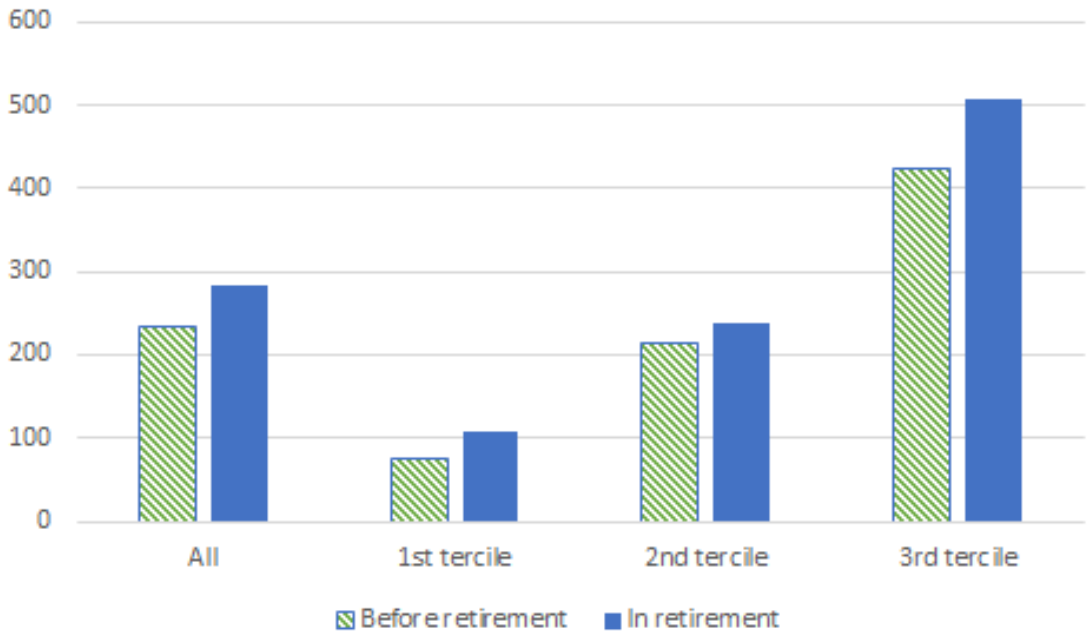
In our model, the role of time preference is to generate a realistic retirement wealth accumulation. Therefore, we calibrate the time preference parameter (β) such that the retirement wealth generated by simulating the model at a certain age matches the corresponding moment in the data. Note that we use the sampling weights in creating both the empirical and model moments.

To construct the empirical target, we calculate the average wealth, defined as total net worth (i.e., the housing value minus mortgages plus net financial wealth) held by single retirees aged 60 to 70 from the RSI survey 1 conducted in 2016. We use wealth distributions (as well as other simulation inputs including income) from the RSI survey 1 (after adjusting for inflation) instead of the RSI survey 7 because the latter survey was conducted during the pandemic and, therefore, does not represent stationary distributions.[35] In Figure 1, under the "in retirement" label, we show the average wealth in retirement. On average, retired singles have slightly less than $300K. There is a large variation across income terciles: It is only around $100K for the lowest income tercile while it is around $500K for the top income tercile. We also compare these numbers with the average wealth of single non-retirees younger than 60 (but at least 50 years old due to the sample construction) to visualize wealth accumulation before retirement (under the "before retirement" label). Overall, wealth is larger for those who entered retirement, where the change is mostly driven by the individuals in the top

[35]RSI survey 1 data are available through the Retirement and Savings Institute (RSI) of HEC Montréal at: https://borealisdata.ca/dataset.xhtml?persistentId=doi:10.5683/SP2/PP5U7Y.

income tercile. We only match the average wealth of the entire sample in calibrating the time preference, but we also show how good the match is by income tercile.

Figure 1: Average wealth before and in retirement: data



Notes: "Before retirement" is the average among single non-retirees younger than 60 years. "In retirement" is the average among single retirees at least 60 years old. The vertical axis is in thousand dollars.

We begin simulations using all the observations in the "before retirement" category in Figure 1 as initial inputs: their age, gender, income (and income tercile), wealth, and health. The RSI survey 1 does not ask self-evaluated health questions. Instead, it asks whether the individuals are diagnosed with any of the following: heart disease, stroke, lung disease, diabetes, hypertension, depression or other mental health problems, and cancer. We classify them as $s = 2$ if one is diagnosed with any of those conditions (except hypertension which is relatively more common); otherwise, they are classified as $s = 1$. Since they are all younger than 60 at the beginning of the simulation, no one is classified to be in the LTC state.

By construction, the average wealth at the beginning of the simulation exactly matches the "before retirement" average in Figure 1 for all the income terciles. Then we calibrate

the time preference parameter, β, such that the average wealth from the simulation at age 66[36] matches the "in retirement" average in Figure 1 for the entire sample (not by income tercile).

In the simulations, we need to decide which LTC setting the individuals would use. We assume that 50% of the individuals would use HC while the other 50% would enter a nursing home; among the latter, 50% would use NSP, while the other 50% would use NP. This rough calibration is based on the following observations. First, Clavet et al. (2021) reports that about half of individuals at least 75 years old and needing help with any ADL enter a nursing home. Second, Statistics Canada (2018) documents that among those who stay in a nursing home, 56% of females and 37% of males live alone (i.e., likely to be in a private room). Because we do not know how these choices are correlated with observables among singles, we equally distribute LTC types to the individuals in the sample in the following way: We create 20 clones of each individual and assume that 10 will use HC, 5 will use NSP, and 5 will use NP. This is a clean way to compare savings between individuals with different LTC plans that are otherwise similar. Creating many clones also makes the results robust to random seeds used for simulations: There are 240 single non-retirees younger than 60 in the RSI survey 1, and we simulate 4,800 individuals.

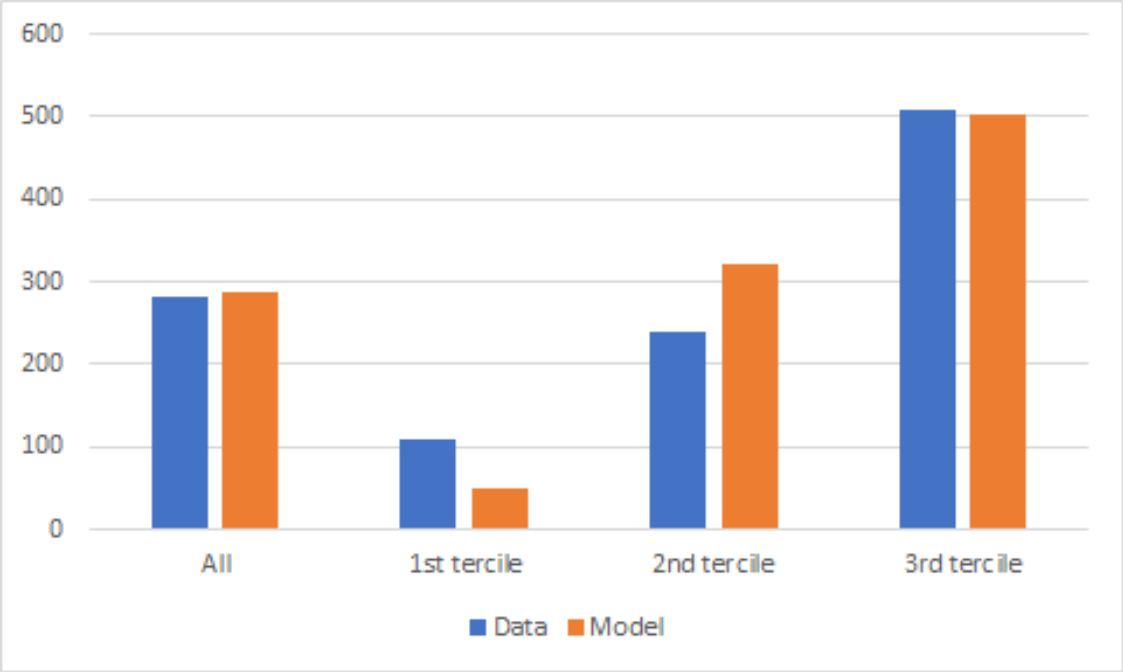
The value of β that matches the average level of retirement wealth is 0.91 (per annum) under the specification where the preference parameters vary by income tercile and gender.[37] Figure 2 compares the average retirement wealth between the data and model (with preference heterogeneity), both overall and by income tercile. Though we do not target the average wealth by income tercile, the overall fit is quite good, with some undersaving at the bottom tercile and oversaving at the middle tercile in the model compared to the data.[38]

[36] We use this age as it is the median age among the retirees in the RSI survey 1.

[37] It is 0.94 (per annum) under homogeneous preferences.

[38] When we use the bequest calibration based on Lockwood (2018), we recalibrate β to match average retirement wealth under that preference. Because the strength of the bequest motive among richer individuals is stronger in Lockwood (2018)'s specification, it generates more savings under the same β. Hence, β is calibrated to be lower (0.84 per annum with preference heterogeneity) under that specification.

Figure 2: Average retirement wealth: data and model



Notes: The data moments are identical to the "In retirement" moments in Figure 1. The model moments are the average wealth at age 66 from the simulations. The vertical axis is in thousand dollars.

5.3 Impacts of the LTC preferences on savings

In this subsection, we examine how LTC preferences (i.e., differences in η's) affect savings by comparing the retirement wealth of individuals with different LTC plans. We first examine the effect under the universal subsidy. We then consider that under the means-tested only subsidy. In all the analyses in this and the following subsection, the sampling weights are used to make the results representative.

5.3.1 Under universal subsidy

For a clearer presentation of the role of estimated preference parameters, we start with the specification where the preference parameters are common across income groups and gender (based on the first column in Table 4). Then we present the results under the heterogeneous

preferences (based on Table 5).

Homogeneous LTC preferences We first compare retirement wealth at age 66. This age corresponds to the peak of savings over the life cycle. The difference in wealth at this age is driven by the difference in precautionary saving motives under various LTC types instead of past expenditures on LTC, as it is rare to need help with ADLs before age 66. Panel A of Table 7 shows the retirement wealth at this age, averaged over the entire population as well as by income tercile. Panel (a) of Figure 3 visualizes the additional savings by those who use HC compared to those who use other forms of LTC (NSP and NP).

Table 7: Average retirement savings by LTC type under the universal subsidy (in $1,000s): homogeneous preferences

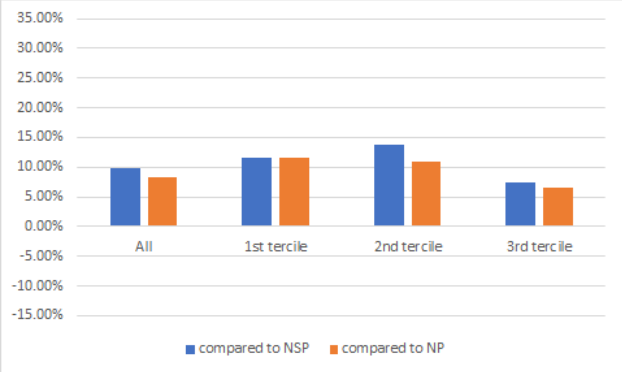
A. Age 66		By income tercile		
	All	1st	2nd	3rd
HC	326	86	296	626
NSP	297	77	260	583
NP	301	77	267	587
B. Age 76		By income tercile		
	All	1st	2nd	3rd
HC	282	76	286	506
NSP	229	60	223	423
NP	236	59	236	432

Individuals who would use HC save significantly more. Compared to those who would use NP, their wealth at age 66 is $25K (or 8.3%) larger. Note that the wealth gap between HC and NP only reflects the difference in η's—η_{HC} being larger than η_{NP}—as the minimum cost of care in HC and NP are set to be the same: $\tilde{\kappa}_{HC} = \tilde{\kappa}_{NP}$. Hence, the difference in the marginal utility of spending above the minimum cost alone can generate quite a significant difference in savings.

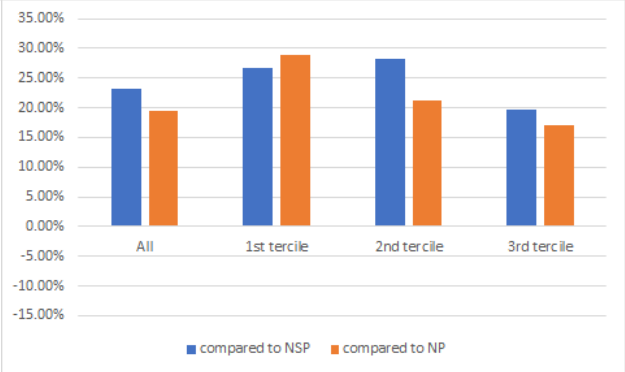
The wealth gap is slightly larger when HC is compared to NSP, namely $29K (or 9.8%). For this comparison, note that the difference in η's between HC and NP is almost the same as that between HC and NSP since η_{NSP} is close to η_{NP}, but the minimum cost of care of HC is higher than that of NSP ($\tilde{\kappa}_{HC} > \tilde{\kappa}_{NSP}$). Recall that the latter difference stems from the

Figure 3: Additional savings by HC under the universal subsidy (%): homogeneous preferences

(a) Age 66



(b) Age 76



Notes: The bars indicate how much more individuals who would use HC save compared to those who would use other types of LTC (NSP and NP).

universal subsidy that is less generous toward HC. The higher minimum cost of HC results in the larger wealth gap, though its impact is relatively small. Therefore, under our estimated preference parameters and the calibration of the universal subsidy, the difference in savings is driven mostly by the marginal utility of spending above the minimum cost, rather than by the difference in the minimum cost.[39] This demonstrates the importance of understanding how LTC types affect marginal utilities in studying demand for precautionary savings.

Under homogeneous LTC preferences, the differences in savings (in percentage) are fairly evenly distributed across income terciles (Panel (a) of Figure 3). For every income group, the differences in the marginal utilities result in sizeable differences in savings, ranging between 6% and 12%.

We also examine wealth at age 76 (Panel B of Table 7; Panel (b) of Figure 3). Overall, we see a much larger difference at this age as the individuals had more time to adjust their savings based on their needs.[40] The gap between HC and NP, which is again driven only

[39]To isolate the impact of the minimum cost ($\tilde{\kappa}$) more clearly, we also examined a specification where the minimum cost varies across the LTC types as in the universal subsidy case ($\tilde{\kappa}_{HC} = \tilde{\kappa}_{NP} > \tilde{\kappa}_{NSP}$), while η is (counterfactually) common across the LTC types (fixed at η_{NP}). In this specification, the wealth gap between HC and NSP at age 66 is small at \$6K (or 2.0%). The wealth gap between HC and NP is null by construction.

[40]At the same time, the savings at this age will partially reflect the past expenditures on LTC as it becomes

by the difference in the marginal utilities, is on average \$46K (or 19.5%), almost double the age-66 gap. The gap between HC and NSP, where the difference in the minimum cost also contributes to savings, is \$53K (or 23.1%). The fact that these two savings gaps are close to each other, as was already the case at age 66, confirms that they are mainly driven by differences in marginal utilities, and not by differences in minimum costs. The wealth gap is again similarly distributed across income groups under homogeneous preferences.

Heterogeneous preferences Next, we examine the role of heterogeneous LTC preferences in understanding how the LTC type affects savings. Table 8 (Panel A) reports the savings at age 66; Figure 4 (Panel (a)) visualizes the savings differences.

Table 8: Average retirement savings by LTC type under the universal subsidy (in \$1,000s): heterogeneous preferences

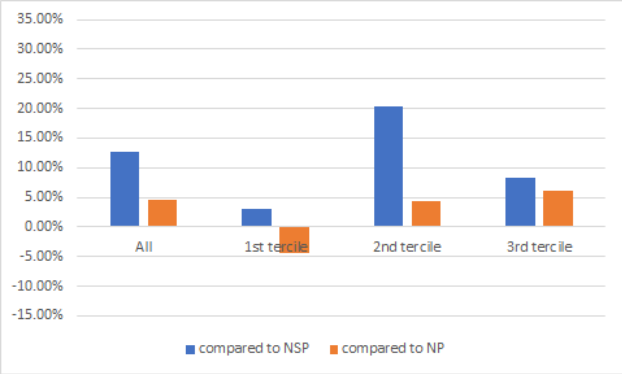
A. Age 66		By income tercile		
	All	1st	2nd	3rd
HC	321	66	355	557
NSP	285	64	295	514
NP	307	69	340	525
B. Age 76		By income tercile		
	All	1st	2nd	3rd
HC	290	47	397	430
NSP	227	44	294	350
NP	266	52	374	372

The average wealth gap between HC and NP is somewhat smaller under heterogeneous preferences (\$14K or 4.6%) than under homogeneous preferences (\$25K or 8.3%). Under homogeneous preferences, the difference between η_{HC} and η_{NP} was 0.29 for all the income groups and gender (Table 4, column 1). Under heterogeneous LTC preferences, the difference varies across income groups and gender. It can be much smaller than 0.29 in particular for females (Table 5), who have longer life expectancies and hence are more influential for savings late in life. For the females in the bottom income tercile, the rank between η_{HC} and η_{NP} is actually reversed, resulting in more savings under NP than HC for that group.

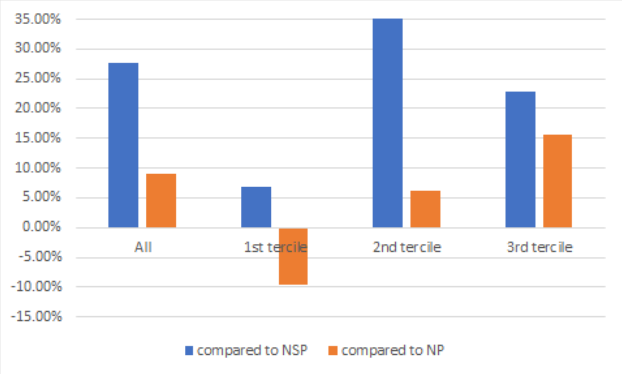
less uncommon to need help with ADLs in their 70s.

Figure 4: Additional savings by HC under the universal subsidy (%): heterogeneous preferences

(a) Age 66



(b) Age 76



Notes: The bars indicate how much more individuals who use HC save compared to those who use other types of LTC (NSP and NP).

On the contrary, the average wealth gap between HC and NSP is larger under heterogeneous preferences ($36K or 12.6%) than under homogeneous preferences ($29K or 9.8%). The larger wealth gap under heterogeneous preferences is driven by the middle income tercile, where the wealth gap is as large as $60K (or 20.3%). For this group, the difference in η_{HC} and η_{NSP} is 0.35 for males and 0.31 for females under heterogeneous preferences, larger than 0.26 under homogeneous preferences. This is also the group where the difference in the minimum cost of care ($\tilde{\kappa}_{HC} > \tilde{\kappa}_{NSP}$) matters the most for precautionary savings. Their income is too high to be eligible for the means-tested subsidies and too low to shrug off the difference in the minimum costs. Combined with a larger gap in the marginal utilities, this explains the large wealth gap among this income group.

The wealth gap is again much larger at age 76 (Table 8, Panel B; Figure 4, Panel (b)). The gap between HC and NP is on average $24K (or 9.0%) and that between HC and NSP is on average $63K (or 27.8%). Both of them are almost twice the gaps at age 66. The gap between HC and NP is the largest at the top income tercile (15.6%) and that between HC and NSP is the largest at the middle income tercile (35.0%).

Alternative model specifications In Appendix E.1, we examine the impact of LTC

preferences on retirement savings under the universal subsidy using different model specifications. Under the bequest utility function à la Lockwood (2018), the bequest motive among wealthier individuals is much stronger than what is implied by the function à la Ameriks et al. (2020). As a result, the savings among the top income tercile is mostly driven by the bequest motive, and the impact of the LTC type among that group is smaller than in the baseline. Yet, LTC preference has a large impact on savings among the middle income tercile: The difference between HC and NSP is more than 20% at age 66.

In the baseline model, we define the LTC state as needing help with at least two ADLs. When we change the definition to needing help with one or more ADLs or at least three ADLs, the impact of LTC preferences is slightly larger for the former and smaller for the latter, but the differences are not large.

Also, in the baseline model, we assume that $\tilde{\kappa}_{HC}$ is the same as $\tilde{\kappa}_{NP}$ under the universal subsidy. As explained in Section 5.2, this likely underestimates the minimum costs of HC in Canada. So, we consider instead a specification where $\tilde{\kappa}_{HC}$ is 10% larger than the baseline value. The wealth gaps increase with $\tilde{\kappa}_{HC}$ by construction, but at the same time, given that the marginal utilities are the main drivers of savings under the universal subsidy, the size of the increase is not large.

Summary Overall, those who use HC face a significantly larger burden to build up precautionary savings for LTC under the universal subsidy akin to the current Canadian public LTC insurance. The gap is as large as between 15 and 35% for those in the middle income tercile for the comparison between HC and NSP. The difference between HC and NP is most pronounced at the top income tercile, where it amounts to 5-15%. Finally, a large share of the savings differences between LTC types is driven by differences in marginal utilities (η's), highlighting the importance of carefully estimating them.

5.3.2 Under means-tested only

We then examine the impact of LTC preferences on retirement savings under the means-tested only subsidy. Given that NSP and NP were more subsidized in the universal subsidy system we consider, removing the universal subsidy makes NSP and NP relatively more expensive. Under the means-tested only system, we have $\tilde{\kappa}_j = \kappa_j$ for all j, with $\kappa_{NP} > \kappa_{NP} > \kappa_{HC}$.[41] Again, we first consider homogeneous preferences and then heterogeneous preferences.

Homogeneous LTC preferences We report the saving levels in Table 9 (Panel A for age 66 and Panel B for age 76). Figure 5 reports the additional savings by the individuals who use HC compared to those who use NSP or NP (Panel (a) for age 66 and Panel (b) for age 76).

Removing the universal subsidy increases retirement savings due to a stronger precautionary motive. Compared to Table 7, the average wealth at age 66 (Panel A) is higher by about \$70K to \$80K, and that at age 76 (Panel B) is higher by about \$130K to \$170K. The increase is the largest for the top income tercile while it is almost null at the bottom tercile, as the latter group will rely on the means-tested subsidies in either system. Opposite to what we saw under the universal subsidy, the aggregate savings are larger at age 76 than at age 66 as households keep increasing their wealth until that age.

The overall impact of LTC preferences on savings is smaller than under the universal subsidy, as the impact of the higher η under HC is now muted by that of the higher κ under NSP and NP. For the comparison between HC and NP, the difference in the aggregate savings is \$11K (2.8%) at age 66 and \$19K (4.8%) at age 76. The difference is not evenly distributed across income groups. The relative difference is the largest at the bottom income tercile (14.3% at age 66 and 29.0% at age 76), while the absolute difference is the largest at the middle income tercile (\$20K at age 66 and \$36K at age 76). The difference is null at

[41] Note that we do not recalibrate β in this exercise, as we aim to study what happens to the savings of the same individuals but under different public LTC insurance.

Table 9: Average retirement savings by LTC type under the means-tested only (in $1,000s): homogeneous LTC preferences

A. Age 66		By income tercile		
	All	1st	2nd	3rd
HC	398	88	384	756
NSP	384	78	364	744
NP	387	77	364	756
B. Age 76		By income tercile		
	All	1st	2nd	3rd
HC	417	80	445	756
NSP	391	63	408	735
NP	398	62	409	757
C. Age 66 (common $\tilde{\kappa}$)		By income tercile		
	All	1st	2nd	3rd
HC	425	88	407	814
NSP	391	78	368	762
NP	387	77	364	756
D. Age 76 (common $\tilde{\kappa}$)		By income tercile		
	All	1st	2nd	3rd
HC	465	81	485	864
NSP	405	64	417	767
NP	398	62	409	757

Notes: Panels C and D assume $\tilde{\kappa}_j = \kappa_{NP}$ for all j.

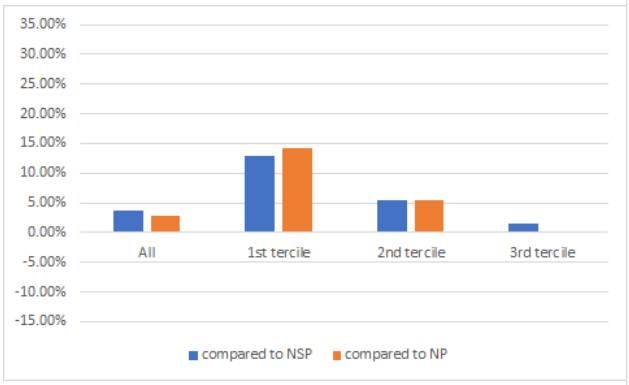
the top income tercile, where the impact of the η difference is exactly offset by that of the κ difference.

The gap between HC and NSP is also smaller than under the universal subsidy. It is $14K (3.7%) at age 66 and $26K (6.6%) at age 76. As for the comparison between HC and NP, the relative difference is the largest at the bottom income tercile (12.8% at age 66 and 27.0% at age 76), while the absolute difference is the largest at the middle income tercile ($20K at age 66 and $37K at age 76). The difference is almost null at the top income tercile.

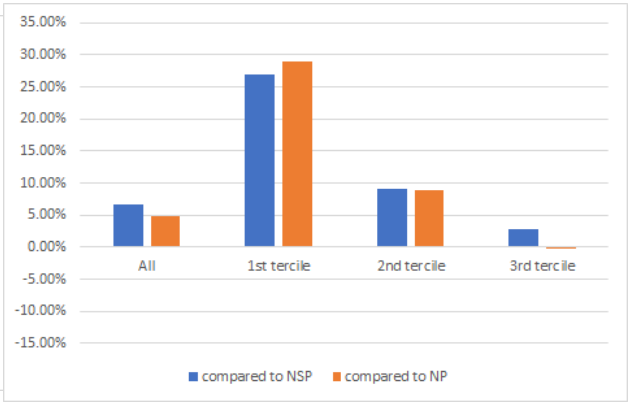
Since the ranking of η's tends to be the opposite of that of κ's under the means-tested only subsidy, to disentangle the role of each parameter more clearly, we run exercises where $\tilde{\kappa}_j$ is set to κ_{NP}, which is $84K per year, for all $j \in \{HC, NSP, NP\}$. The result of this exercise (Table 9, Panels C and D; Figure 5, Panels (c) and (d)) demonstrates the impact of the differences in the marginal utility alone in the economy akin to the means-tested only

Figure 5: Additional savings by HC under the means-tested only (%): homogeneous LTC preferences

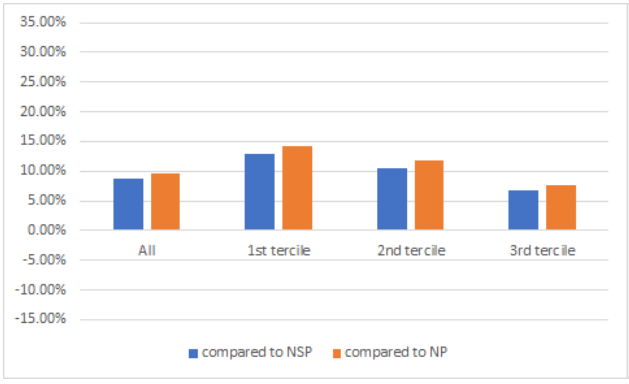
(a) Age 66



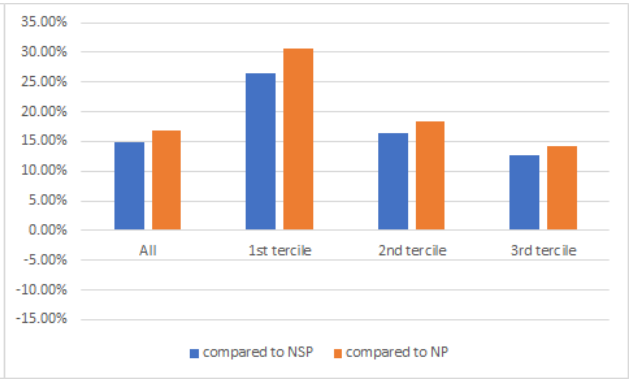
(b) Age 76



(c) Age 66 (common $\tilde{\kappa}$)



(d) Age 76 (common $\tilde{\kappa}$)



Notes: The bars indicate how much more individuals who use HC save compared to those who use other types of LTC (NSP and NP). Panels (c) and (d) assume $\tilde{\kappa}_j = \kappa_{NP}$ for all j.

system. The impact is sizeable: For both the comparison with NP and that with NSP, those who would use HC have on average about 10% more wealth at age 66 and 15% more wealth at age 76. The significant difference between these results and those under heterogeneous κ's (i.e., the difference between panels (a) and (c) and that between panels (b) and (d) in Figure 5) reveals the importance of the minimum costs. Hence, this exercise demonstrates the importance of correctly assessing the values of the marginal utility and of the minimum costs of LTC to understand the demand for savings late in life under the means-tested only system.

In short, the marginal utility differences that we estimate substantially impact late-in-life

savings, also in the absence of universal subsidies. Their impacts are partially muted by the differences in the minimum costs of LTC that go in the opposite direction. Still, those who use HC noticeably save more, in particular those in the bottom two income terciles. The wealth difference at the middle income tercile, for example, is around 5% at age 66 and close to 10% at age 76.

Heterogeneous LTC preferences Next, we examine the role of heterogeneous LTC preferences under the means-tested only system. Table 10 reports the average levels of wealth. Figure 6 visualizes the saving differences.

Table 10: Average retirement savings by LTC type under the means-tested only subsidy (in $1,000s): heterogeneous preferences

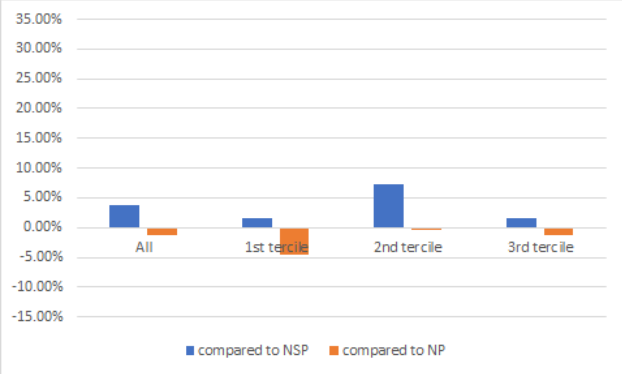
A. Age 66		By income tercile		
	All	1st	2nd	3rd
HC	409	64	477	703
NSP	394	63	445	692
NP	414	67	479	712
B. Age 76		By income tercile		
	All	1st	2nd	3rd
HC	459	45	629	696
NSP	430	44	576	679
NP	469	51	644	717

The role of LTC preference heterogeneity is the same as under the universal subsidy. For the comparison between HC and NP, the dominant factor is that the difference between η_{HC} and η_{NP} is much smaller among females who have more influence on late-in-life savings due to their longer life expectancy. In fact, for females, the higher minimum cost under NP dominates the higher marginal utilities under HC. As a result, those who would use NP on average save more than those who would use HC, though the difference is almost null at $5K (or 1.2%) at age 66.

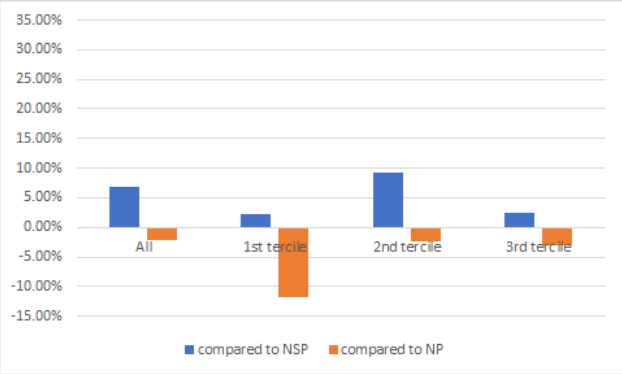
For the comparison between HC and NSP, the dominant factor is that the difference between η_{HC} and η_{NSP} is larger among the middle income group. The average wealth difference among that group at age 66 is $32K (or 7.2%), compared to $20K (or 5.5%) under

Figure 6: Additional savings by HC under the means-tested only subsidy (%): heterogeneous LTC preferences

(a) Age 66



(b) Age 76



Notes: The bars indicate how much more individuals who use HC save compared to those who use other types of LTC (NSP and NP).

homogeneous preferences. Yet, its impact on aggregate savings is limited, so the average wealth gap among the population is similar to that under homogeneous preferences.

All the wealth gaps are amplified at age 76 compared to age 66. The wealth gap between HC and NSP is 6.7% on average and 9.2% among the middle income group. The gap between HC and NP is still small.

Alternative model specifications In Appendix E.2, we examine the impact of LTC preferences on retirement savings under the means-tested only subsidy using different model specifications. Under the bequest utility function à la Lockwood (2018), again, the impact among the top income tercile is smaller as the bequest motive mainly drives their savings. However, the impact among the middle income tercile is actually larger than under the baseline.

Changing the definition of the *LTC* state to needing help with one or more ADLs or at least three ADLs (the baseline is at least two ADLs) barely affects the results.

We also consider a specification where κ_{HC}, κ_{NSP}, and κ_{NP} are all set to be \$84K, which is the minimum cost of NP with no subsidies, to concentrate on the impact of the differences in the marginal utilities on savings, which is large. Overall, the difference between HC and

NSP is \$32K (or 7.9%), and that between HC and NP is \$21K (or 5.0%).

Summary The comparison between the two public LTCI schemes shows that the universal subsidy, which affects the minimum cost of LTC ($\tilde{\kappa}$), significantly affects both the overall savings level and the saving gaps between LTC types. Though the impact of LTC preferences is smaller under the means-tested only system, the larger marginal utility under HC still makes individuals save more compared to those who use NSP. For the middle income tercile, who are less likely to be eligible for a means-tested subsidy but are also not affluent, HC induces significantly more savings than NSP. Thus, these results demonstrate the importance of correctly understanding the marginal value of spending under different LTC plans in studying the precautionary savings of older individuals.

5.4 Value of LTC subsidies

So far, we have examined the impact of LTC preferences on precautionary savings late in life. Self-insuring against the LTC risk (or the residuals of LTC risk after the public LTCI) is costly for individuals as it implies less current consumption. Hence, differential needs for precautionary savings may translate into different valuations of additional public subsidies for LTC. In this subsection, we consider how subsidies for HC, NSP, and NP will be evaluated. This will shed light on the optimal ways to (re-)design LTC subsidies.

We consider providing an additional subsidy of \$10K per year for each type of LTC, that is, a reduction of $\tilde{\kappa}$ by \$10K for each LTC type. We calculate the individuals' valuations of this additional subsidy by calculating the amount of wealth transfer to the individuals (at the ages when they enter the simulations) in the baseline economy without such additional subsidy, such that their expected lifetime utility in this case is the same as that with the additional subsidy. In other words, we compute the wealth transfer, λ, that satisfies

$$V_j(W + \lambda, \underline{t}, s|g, PI) = \tilde{V}_j(W, \underline{t}, s|g, PI), \tag{17}$$

where V is the value function without the additional subsidy, $\tilde{V}$ is the value function with the additional subsidy, and $\underline{t}$ is the age when the individual enters the simulation. We examine the distribution of λ across LTC types as well as across income terciles. We also compare the average λ to the average spending from the subsidy, which can be considered the bang-to-buck ratio.[42] We examine the results under heterogeneous LTC preferences in this section while relegating the results from homogeneous LTC preferences to Appendix F.

We first examine the valuation of the additional subsidies under the universal subsidy scheme. The first four columns in Table 11 (Panel A) tabulate the λ distribution for each type of LTC. The distribution is hump-shaped over the income distribution with the peak at the middle income tercile. For those in the bottom income tercile, the additional subsidies do not mean much as they are likely to be eligible for the means-tested subsidy if they need LTC. For the middle income tercile, the valuation is the largest as they are less likely to be eligible for the means-tested subsidy and, at the same time, they do not have much financial resources to self-insure unlike those in the top income tercile. The HC subsidy is the most valued. The gap is the largest at the top income tercile, where the differences in η's matter the most.

The bang-for-buck is larger than 2 for all LTC types, indicating that the values of the subsidies are considered to be more than two times larger than their average costs (Table 11, Panel A, last column). This implies that the additional subsidies are considered to be valuable insurance, even in the universal subsidy system. Therefore, introducing these subsidies will improve welfare unless raising revenue for them creates much distortion. The bang-for-buck is the largest for HC, though the gap between HC and NP is not large. This means that if the government has to choose one type of LTC to subsidize more, it should be HC.

We then consider the valuation of a similar reduction in $\tilde{\kappa}$ but starting from the situation

[42] For each simulated individual, we compute the total change in government transfers received following the policy change over her remaining lifetime. We then compute the average of λ over the average of this change in government transfers.

Table 11: Valuation of additional $10K (per year) subsidies: heterogeneous preferences

A. Universal subsidy	Distribution of λ ($1,000s)				Bang-for-buck
		By income tercile			
	All	1st	2nd	3rd	
HC	52.6	11.5	97.9	41.5	2.98
NSP	42.4	12.6	78.4	30.5	2.35
NP	49.0	13.4	92.9	33.6	2.72
B. Means-tested only	Distribution of λ ($1,000s)				Bang-for-buck
		By income tercile			
	All	1st	2nd	3rd	
HC	42.6	5.4	59.2	63.7	2.63
NSP	36.8	4.3	49.6	57.4	2.38
NP	36.3	4.8	47.2	57.9	2.33

Notes: The first four columns tabulate the distribution of the valuation of the additional $10K subsidy, i.e., λ that satisfies equation (17). The last column tabulates the ratio between the average valuation of the subsidy and the average cost for the subsidy.

in which only a means-tested subsidy existed previously. Panel B shows that the additional subsidy is less valued in this context (which corresponds to the introduction of a universal component). This may be counter-intuitive given that the individuals have initially less protection against LTC risk under this system (i.e., they had to pay the full costs of LTC). This is due to the fact that, given the high minimum LTC costs, a small additional subsidy does not do much to prevent individuals from running down wealth and eventually being eligible for the means-tested subsidy. As a result, the decrease in λ is concentrated among the two bottom income terciles, while for the individuals in the top income tercile, who are the least likely to be eligible for the means-tested subsidy, λ is actually larger in the absence of the universal subsidy.

The bang-for-buck is the largest for HC, reflecting the larger value of HC subsidies throughout the income distribution. So overall, our results suggest that providing additional subsidies to HC could be an efficient way to use public resources under the two realistic public LTCI systems considered.

In Appendix F, we examine the value of the additional LTC subsidies under various

alternative specifications, including homogenous preferences, the bequest utility function à la Lockwood (2018), and a higher minimum cost of HC (under the universal subsidy). There are some differences across the specifications in terms of the average valuation of the LTC subsidies and the difference across the LTC types. But the following two main findings are robust to different model specifications: (i) the values of the additional subsidies are all well above the costs and (ii) HC subsidies are much more appreciated than NSP and NP subsidies.

6 Conclusion

Quantifying individuals' marginal utility across different health states in retirement is crucial for accurately assessing their need for savings and insurance, as well as for the design of public policies. This is particularly relevant as demographic change brings about an increasing share of retirees who rely on their own savings as well as publicly provided funds to finance their spending. An important element of late-in-life spending is the risk of needing costly long-term care (LTC), which can be provided either at home or in a nursing home. There is reason to believe that these care settings impact how individuals value their available resources, since receiving care in a nursing home as opposed to at home limits individuals' care and non-care consumption needs and opportunities. People may also intrinsically value spending more at home than in a nursing home. However, the effect of the care setting on marginal utility has not yet been addressed in the literature. In this paper, we seek to fill this gap by designing strategic survey questions eliciting the marginal value of consumption beyond the minimum cost of care across different health states and care settings. We further develop a life-cycle model to assess how state-dependent marginal utility together with varying minimum costs of care for the different care settings impacts the level of optimal savings as well as the value of different subsidy structures.

This paper has three key findings. First, we find that consistent with the previous

literature, individuals allocate significantly more resources to the LTC state than to the healthy state. In addition, individuals allocate more money to the LTC state if they are to receive care at home. Estimating a utility function based on respondents' resource allocation confirms that marginal utility is indeed significantly higher when receiving care at home versus in a nursing home, but that there is no difference between marginal utility in a private and in a semi-private room at a nursing home. Second, results from our life-cycle model suggest that optimal savings are higher for those who plan on using home care. Finally, we analyze the value of subsidies for the different care options and find that the higher marginal utility of spending under home care translates to a higher valuation of a subsidy for home care than for nursing homes.

Our results point to the importance of explicitly considering that individuals' marginal utility depends on the care setting when studying their savings and when evaluating policies designed to reduce the financial burden resulting from dependency. In particular, previous research has pointed out individuals' aversion to entering a nursing home, which was likely exacerbated by the Covid pandemic. As policymakers are rethinking ways to best support retirees' care needs, they should take into account the fact that the value of a subsidy depends on the targeted care option.

References

Achou, Bertrand, Philippe De Donder, Franca Glenzer, Minjoon Lee, and Marie-Louise Leroux, "Nursing home aversion post-pandemic: Implications for savings and long-term care policy," *Journal of Economic Behavior & Organization*, 2022, *201*, 1–21.

Ameriks, John, Andrew Caplin, Steven Laufer, and Stijn van Nieuwerburgh, "The Joy of Giving or Assisted Living? Using Strategic Surveys to Separate Public Care Aversion from Bequest Motives," *Journal of Finance*, 2011, *66*, 519–561.

_ , **Joseph Briggs, Andrew Caplin, Matthew D. Shapiro, and Christopher Tonetti**, "Long-Term-Care Utility and Late-in-Life Saving," *Journal of Political Economy*, 2020, *128*, 174–209.

Barsky, Robert, F. Thomas Juster, Miles Kimball, and Matthew D. Shapiro, "Preference Parameters and Behavioral Heterogeneity: An Experimental Approach in the Health and Retirement Study," *Quarterly Journal of Economics*, 1997, *112*, 537–579.

Benabou, Roland, "Tax and Education Policy in a Heterogeneous-Agent Economy: What Levels of Redistribution Maximize Growth and Efficiency?," *Econometrica*, 2002, *70*, 481–517.

Berndt, Ernst R., Bronwyn H. Hall, Robert E. Hall, and Jerry A. Hausman, "Estimation and Inferences in Nonlinear Structural Models," *Annals of Economic and Social Measurement*, 1974, *3*, 653–665.

Blundell, Richard, Margherita Borella, Jeanne Commault, and Mariacristina De Nardi, "Why does consumption fluctuate in old age and how should the government insure it?," *NBER-27348*, 2020.

Braun, R. Anton, Koren Kopecky, and Tatyana Koreshkova, "Old, Sick, Alone, and Poor: A Welfare Analysis of Old-Age Social Insurance Programs," *Review of Economic Studies*, 2017, *84*.

Brown, Jeffrey R. and Amy Finkelstein, "The Interaction of Public and Private Insurance: Medicaid and the Long-Term Care Insurance Market," *American Economic Review*, 2008, *98*, 1083–1102.

Brown, Jeffrey R, Gopi Shah Goda, and Kathleen McGarry, "Heterogeneity in state-dependent utility: evidence from strategic surveys," *Economic Inquiry*, 2016, *54* (2), 847–861.

Canadian Life and Health Insurance Association, 2018. http://clhia.uberflip.com/i/405133-a-guide-to-long-term-care-insurance/0?

Clavet, Nicholas-James, Yann Décarie, Réjean Hébert, Pierre-Carl Michaud, and Julien Navaux, "Le Financement du Soutien à l'Autonomie des Personnes Âgées à la croisée des chemins," *CIRANO Papers*, 2021, *2021pe-02.*

Costa-Font, Joan, ""Institutionalization aversion" and the willingness to pay for home health care," *Journal of Housing Economics*, 2017, *38*, 62–69.

_ , David Elvira, and Oscar Mascarilla-Miró, "'Ageing in place'? Exploring elderly people's housing preferences in Spain," *Urban studies*, 2009, *46* (2), 295–316.

De Nardi, Mariacristina, Eric French, and John Bailey Jones, "Why Do the Elderly Save? The Role of Medical Expenses," *Journal of Political Economy*, 2010, *118*, 29–72.

_ , _ , and _ , "Medicaid Insurance in Old Age," *American Economic Review*, 2016, *106.*

der Klaauw, Wilbert Van, "On the use of expectations data in estimating structural dynamic choice models," *Journal of Labor Economics*, 2012, *30* (3), 521–554.

Donder, Philippe De and Marie-Louise Leroux, "Long Term Care Insurance with State-Dependent Preferences," *Health Economics*, 2021, *30* (12), 3074–3086.

Evans, William N and W Kip Viscusi, "Estimation of state-dependent utility functions using survey data," *The Review of Economics and Statistics*, 1991, pp. 94–104.

Finkelstein, Amy, Erzo FP Luttmer, and Matthew J Notowidigdo, "What good is wealth without health? The effect of health on the marginal utility of consumption," *Journal of the European Economic Association*, 2013, *11* (suppl_1), 221–258.

Flawinne, Xavier, Mathieu Lefebvre, Sergio Perelman, Pierre Pestieau, and Jérôme Schoenmaeckers, "Nursing homes and mortality in Europe: Uncertain causality," *Health Economics*, 2023, *32* (1), 134–154.

Girard, S, "Quel est le coût d' hébergement en CHSLD," 2020, pp. 134–169. https://bonjourresidences.com/blogue/couts-hebergement-chsld/.

Government of Canada, *Guaranteed Income Supplement (GIS) Amounts* 2022. https://www.canada.ca/en/services/benefits/publicpensions/cpp/old-age-security/payments/tab1-1.html.

Gruber, Jonathan, "Financing Health Care Delivery," *NBER Working Paper*, 2022, *30254*.

Jones, John, Mariacristina De Nardi, Eric French, Rory McGee, and Justin Kirschner, "The Lifetime Medical Spending of Retirees," *NBER Working Paper*, 2018, *24599*.

Koijen, Ralph, Stijn Van Nieuwerburgh, and Motohiro Yogo, "Health and Mortality Delta: Assessing the Welfare Cost of Household Insurance Choice," *Journal of Finance*, 2016, *LXXI* (2), 957–1010.

Kopecky, Karen and Tatyana Koreshkova, "The Impact of Medical and Nursing Home Expenses on Savings," *American Economic Journal: Macroeconomics*, 2014, *6*, 29–72.

Koreshkova, Tatyana and Minjoon Lee, "Nursing Homes in Equilibrium: Implications for Long-term Care Policies," *Michigan Retirement and Disability Research Center Working Paper*, 2020, *UM20-13*.

Kurnaz, Musab and Terry A. Yip, "The Canadian Income Taxation: Statistical Analysis and Parametric Estimates," *Canadian Journal of Economics*, 2022, *55*, 272–311.

LaRochelle-Côté, Sébastien, Garnett Picot, and John Myles, "Income Replacement during the Retirement Years," *Perspectives on Labour and Income*, 2010, *11*.

Lillard, Lee and Yoram Weiss, "Uncertain health and survival: Effects on end-of-life consumption," *Journal of Business & Economic Statistics*, 1997, *15* (2), 254–268.

Lockwood, Lee, "Incidental Bequests and the Choice to Self-insure Late-life Risks," *American Economic Review*, 2018, *108*, 2513–2550.

Manski, Charles F, "Measuring expectations," *Econometrica*, 2004, *72* (5), 1329–1376.

Québec Régie de l'Assurance Maladie, *Accommodation in a Public Facility* 2022. https://www.ramq.gouv.qc.ca/en/citizens/aid-programs/accommodation-a-public-facility.

Russo, Nicolo, "Health-Dependent Preferences, Consumption, and Insurance," *Working Paper*, 2022.

Statistics Canada, *Distribution of Characteristics of Residents of Private Dwelling, Nursing Homes, Seniors' Residences, and Private Dwellings with Additional Family, Separately for Women and Men* 2018. https://www150.statcan.gc.ca/n1/pub/82-003-x/2018005/article/54966/tbl/tbl01-eng.htm.

_ , *Income of Individuals by Age Group, Sex and Income Source, Canada, Provinces and Selected Census Metropolitan Areas* 2022. https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1110023901.

U.S. Department of Health & Human Services, "How Much Care Will You Need?," https://acl.gov/ltc/basic-needs/how-much-care-will-you-need 2020.

A Appendix: Survey questionnaire

INSTRUCTIONS INCLUDED WITH AN ANONYMOUS QUESTIONNAIRE

Paying for long-term care

The following pages contain an anonymous questionnaire, which we invite you to complete. This questionnaire was developed as part of a research project at HEC Montréal.

Since your first impressions best reflect your true opinions, we would ask that you please answer the questions without any hesitation. We ask, however, that you take the time needed to consider certain questions on knowledge, which might involve concepts you are less familiar with. There is no time limit for completing the questionnaire, although we have estimated that it should take approximately 20 minutes.

The information collected will be anonymous and will remain strictly confidential. It will be used solely for the advancement of knowledge and the dissemination of the overall results in academic or professional forums. It is possible that the collected data will be shared with other researchers, solely for non-commercial research purposes, but for projects other than the one for which the data was originally collected. The anonymized dataset resulting from the survey may, at a later date, be made publicly available for academic research purposes.

The online data collection provider agrees to refrain from disclosing any personal information (or any other information concerning participants in this study) to any other users or to any third party, unless the respondent expressly agrees to such disclosure or unless such disclosure is required by law.

You are free to refuse to participate in this project and you may decide to stop answering the questions at any time. By completing this questionnaire, you will be considered as having given your consent to participate in our research project and to the potential use of data collected from this questionnaire in future research. Since the questionnaire is anonymous, you will no longer be able to withdraw from the research project once you have completed the questionnaire, because it will be impossible to determine which of the answers are yours.

If you have any questions about this research, please contact the principal investigator, Pierre-Carl Michaud, at the telephone number or email address indicated below.

HEC Montréal's Research Ethics Board has determined that the data collection related to this study meets the ethics standards for research involving humans. If you have any questions related to ethics, please contact the REB secretariat at cer@hec.ca.

Thank you for your valuable cooperation!

Pierre-Carl Michaud
Professor
Department of Applied Economics
HEC Montréal
514-340-6466
pierre-carl.michaud@hec.ca

Section 1: Background

QA Which of the following best describes your gender?
1 Male
2 Female

QB How old are you? *Please Enter.* [PN: MUST ENTER THE 2 CHARACTERS.] [RANGE 50-69]
Numeric
[PN: TERMINATE IF NOT 50-69 INCLUSIVELY]

QC Which province or territory do you live in?
1. British Columbia
2. Alberta
3. Saskatchewan
4. Manitoba
5. Ontario
6. Quebec
7. New Brunswick
8. Nova Scotia
9. Prince Edward Island
10. Newfoundland and Labrador
11. Northwest Territories
12. Nunavut
13. Yukon
14. None of the above

[PN: TERMINATE IF QC IS NOT 5 or 6]

[PN:
DEFINE NH_LONG = « long-term care home (CHSLD) » IF QC==6;
DEFINE NH_LONG = « long-term care home» IF QC==5;

DEFINE NH_SHORT = « CHSLD » IF QC==6;
DEFINE NH_SHORT = « long-term care home » IF QC==5

DEFINE NH_SHORT2 = « long-term care homes» IF QC==6;
DEFINE NH_SHORT2 = « long-term care homes» IF QC==5

]

QD Do you need help with any activities of daily living, that is help with activities such as bathing, dressing, eating, walking across a room, and getting in or out of bed?
1 Yes
2 No
[PN: TERMINATE IF QD IS 1]

*****

Q1 What is the highest degree, certificate or diploma you have obtained?
1 Less than high school diploma or its equivalent
2 High school diploma or a high school equivalency certificate
3 Trade certificate or diploma
4 College, CEGEP or other non-university certificate or diploma (other than trade certificates or diplomas)
5 University certificate or diploma below the bachelor's level
6 Bachelor's degree (e.g. B.A., B.Sc., LL.B.)
7 University certificate, diploma, degree above the bachelor's level

Q2 What is your marital status?
1 married
2 living common-law
3 widowed
4 separated
5 divorced
6 single, never married

Q2a [PN: ASK IF Q2==1 or 2] How old is your partner (spouse)? [RANGE 18 - 100]

Q3 Do you have any children?
1 Yes
2 No

Q3a [PN: ASK IF Q3==1] How many children do you have who live less than 20km away from your main residence? [RANGE 0 - 20]

Q4 At the present time, do you smoke cigarettes daily, occasionally or not at all?
1 Daily
2 Occasionally
3 Not at all

[PN: ASK IF Q4==2 or 3][SHOW ON SAME PAGE AS Q4]

Q4a Have you ever smoked cigarettes daily?
1 Yes
2 No

Q5 Looking at the following list of health conditions, has a doctor ever told you that you had:
[PN: MULTIPLE SELECT]
1 Heart disease
2 Stroke

3 Lung disease
4 Diabetes
5 Hypertension
6 Depression or other mental health problems
7 Cancer

Section 2: Financial situation

[PN: THE VARIABLES "RETIRED", "INCOME" AND "WEALTH" ARE DEFINED THROUGH THIS SERIES OF QUESTIONS AND WILL BE USED IN THE EXPERIMENT IN SECTION 6.]

Q6 Which of the following statements best describes your current work situation? Note that by being "retired", we mean that you have stopped working entirely.

1 Employed (full time, part time, seasonal work)
2 Retired
3 Looking for work
4 Not working, but for reasons other than retired
8888888 Prefer not to say
[PN: DEFINE RETIRED=1 IF Q6==2. DEFINE RETIRED=0 OTHERWISE.]

Q7

For 2019, what is your best estimate of your **total income**, before taxes and deductions? Please include all sources of income, such as salaries and wages, tips, gross self-employment income and fees, parental benefits, income received from sole-owner small businesses, pensions, investment income, workers' compensation benefits, social benefits, and gross rental income. If you did not have any income in 2019, please enter 0 (zero).
[PN: PROVIDE BOX FOR NUMERICAL ANSWER] [RANGE: 0 - 2 000 000 $]
Numeric
9999999 Don't know or prefer not to say

[PN: ASK IF Q7==9999999 (ON SAME SCREEN)]
Q7a Is it more than $60,000? 1 Yes 2 No 7777777 Don't know 8888888 Prefer not to say
[PN: IF Q7a==7777777 OR 8888888, TYPE_INCOME==12]

[PN: ASK IF Q7a==1 (ON SAME SCREEN)]
Q7b Is it less than $80,000? 1 Yes 2 No 7777777 Don't know 8888888 Prefer not to say
[PN: IF Q7b==1, TYPE_INCOME==2
IF Q7b==7777777 OR 8888888, TYPE_INCOME==3]

[PN: ASK IF Q7b==2 (ON SAME SCREEN)]
Q7c Is it more than $100,000? 1 Yes 2 No 7777777 Don't know 8888888 Prefer not to say
[PN: IF Q7c==1, TYPE_INCOME==4
IF Q7c==2, TYPE_INCOME==5
IF Q7c==7777777 OR 8888888, TYPE_INCOME==6]

[PN: ASK IF Q7a==2 (ON SAME SCREEN)]
Q7d Is it more than $40,000? 1 Yes 2 No 7777777 Don't know 8888888 Prefer not to say
[PN: IF Q7d==1, TYPE_INCOME==7
IF Q7d==7777777 OR 8888888, TYPE_INCOME==8]

[PN: ASK IF Q7d==2 (ON SAME SCREEN)]

Q7e Is it more than $20,000? 1 Yes 2 No 7777777 Don't know 8888888 Prefer not to say

[PN: IF Q7e==1, TYPE_INCOME==9
IF Q7e==2, TYPE_INCOME==10
IF Q7e==7777777 OR 8888888, TYPE_INCOME==11]

[PN: CREATE VARIABLE "INCOME" AND DEFINE IT IN THE FOLLOWING WAY:

TYPE_INCOME	INCOME
1	Q7
2	70,000
3	80,000
4	130,000
5	90,000
6	100,000
7	50,000
8	40,000
9	30,000
10	10,000
11	20,000
12	60,000

[PN: DEFINE WEALTH = 0 BEFORE THIS QUESTION.]

Q8 For each of these saving accounts**,** please indicate the approximate market value held by [IF Q2==1,2, DISPLAY "you and your partner (spouse)", ELSE DISPLAY "yourself"], if any, as of today. If you do not have a certain type of account, please enter 0 (zero) for that account.

Account type	**A. Market value held by household (in $)**
_1 RRSP (Registered Retirement Savings Plan), both individual and group-based	**[FORMAT $99,999,999- RANGE $0- $99,999,999]**
_2 TFSA (Tax Free Savings Account), both individual and group-based	**[FORMAT $99,999,999 RANGE $0- $99,999,999]**
_3 Other registered savings plans (for instance, RESP, RDSP, LIRA, RRIF, LIF) **[PN: Mouse-over definitions: Registered Education Savings Plan (RESP), Registered Disability Savings Plan (RDSP), Locked-In Retirement Account (LIRA), Registered Retirement**	**[FORMAT $99,999,999 RANGE $0- $99,999,999]**

Income Fund (RRIF), Life Income Funds (LIF)]	
_4 Other savings / investments not included above (cash, bank accounts, investment accounts that are not registered, etc.)	**[FORMAT $99,999,999 RANGE $0- $99,999,999]**

[PN: WEALTH = Q8_1+Q8_2+Q8_3+Q8_4.]

Q9 Do you [IF Q2==1,2, DISPLAY "or your partner (spouse)"] own any of the real estate properties listed below? Please select all that apply.

[PN: MULTI-SELECT, FOR 1 AND 2 ONLY]

1 Primary residence

2 Secondary residence or other residential real estate

9999999 Do not own any residences or other real estate

[PN: ASK IF Q9==1 or 2]

Q9a Please indicate in the table below your best estimate of the **total combined** market value and mortgage balance outstanding of all your real estate properties.

A. Total real estate market value	**B. Total of mortgage balances outstanding**
[FORMAT: $99,999,999- RANGE $0 TO $99,999,999.]	**[FORMAT: $99,999,999- RANGE $0 TO 2*[value in column A]]**

Section 3: Risk Perception

Next we would like to ask your opinion about how likely you think various events might be. When we ask a question, we'd like you to give us a number from 0 to 100, where "0" means that you think there is absolutely no chance, and "100" means that you think the event is absolutely certain to happen. For example, no one can ever be sure about tomorrow's weather, but if you think that rain is very unlikely tomorrow, you might say that there is a 10 percent chance of rain. If you think there is a very good chance that it will rain tomorrow, you might say that there is an 80 percent chance of rain.

[PN: SHOW Q10-Q12 ON THE SAME SCREEN]

[PN: ASK IF QB<=65]

Q10 What do you think is the likelihood you will live to **age 70**? Please enter a number between 0 and 100, 0 meaning you expect there is no chance you will live to 70, and 100 meaning that you will live to 70 with certainty.
[PN: PROVIDE BOX FOR NUMERICAL ANSWER] [RANGE: 0 – 100]
Numeric
7777777 Don't know
8888888 Prefer not to say

[PN: ASK IF QB>65 OR (Q10>0 AND IS NUMERIC)]

Q11 What do you think is the likelihood you will live to **age 80**? Please enter a number between 0 and 100, 0 meaning you expect there is no chance you will live to 80, and 100 meaning that you will live to 80 with certainty.
[PN: PROVIDE BOX FOR NUMERICAL ANSWER] [RANGE: 0 – [RESPONSE TO Q10]]
Numeric
7777777 Don't know
8888888 Prefer not to say

[PN: Ask if Q11>0 and is Numeric]

Q12 What do you think is the likelihood you will live to **age 90**? Please enter a number between 0 and 100, 0 meaning you expect there is no chance you will live to 90, and 100 meaning that you will live to 90 with certainty.
[PN: PROVIDE BOX FOR NUMERICAL ANSWER] [RANGE: 0 – [RESPONSE TO Q11]]
Numeric
7777777 Don't know
8888888 Prefer not to say

[PN: SHOW Q13 – Q14 ON THE SAME SCREEN]

Q13 What do you think is the likelihood that you will need help with any activities of daily living, that is activities such as bathing, dressing, eating, walking across a room, and getting in or out of bed, **for at least one year** before you die?
[PN: PROVIDE BOX FOR NUMERICAL ANSWER] [RANGE: 0 – 100]

Numeric
7777777 Don’t know
8888888 Prefer not to say

[ASK IF Q13>0 AND IS NUMERIC]

Q14 What do you think is the likelihood that you will need help with any activities of daily living, including bathing, dressing, eating, walking across a room, and getting in or out of bed, **for at least three years** before you die?

[PN: PROVIDE BOX FOR NUMERICAL ANSWER] [RANGE: 0 – [RESPONSE TO Q11]]

Numeric
7777777 Don’t know
8888888 Prefer not to say

Section 4: Preferences

[PN: All calculated dollar values in this section are to be rounded to the nearest dollar and formatted as $X,XXX in English and X XXX $ in French]

Q15 Do you agree with the following statements?
[PN: ANSWERS: 5 Strongly Agree; 4 Agree; 3 Disagree; 2 Strongly Disagree; 1 Don't know]
Q15a Parents should set aside money to leave to their children or heirs once they die, even when it means somewhat sacrificing their own comfort in retirement.
Q15b I prefer to live well but for fewer years than to live long and have to sacrifice my quality of life.
Q15c I would rather spend down my wealth quickly because I might not be healthy enough to enjoy the money later in life.

[Programming Note: Define INCOME_RISK as INCOME ROUNDED TO THE NEAREST 10,000. If INCOME<5,000, define INCOME_RISK as 10,000]

Q16 Please imagine you could choose between the two following situations.

Situation A: Your income is guaranteed to be [INCOME_RISK] per year for the rest of your life.
Situation B: There is a 50% chance your income will be [2*INCOME_RISK] per year for the rest of your life and a 50% chance that it will be [(2/3)*INCOME_RISK] [PN: Please round this to the nearest 1,000] per year for the rest of your life.

Which situation would you prefer?

1 Situation A
2 Situation B
9999999 Don't know/refuse to answer

[PN: Ask if Q16==1]

Q16a Now please consider slightly different situations.

Situation A: Your income is guaranteed to be [INCOME_RISK] per year for the rest of your life.
Situation B: There is a 50% chance your income will be [2*INCOME_RISK] per year for the rest of your life and a 50% chance that it will be [(4/5)*INCOME_RISK] [PN: Please round this to the nearest 1,000] per year for the rest of your life.

Which situation would you prefer?

1 Situation A
2 Situation B
9999999 Don't know/refuse to answer

[PN: Ask if Q16==2]

Q16b Now please consider slightly different situations.

Situation A: Your income is guaranteed to be INCOME_RISK per year for the rest of your life.
Situation B: There is a 50% chance your income will be [2*INCOME_RISK] per year for the rest of your life and a 50% chance that it will be [(1/2)*INCOME_RISK] [PN: Please round this to the nearest 1,000] per year for the rest of your life.

Which situation would you prefer?

1 Situation A
2 Situation B
9999999 Don't know/refuse to answer

Section 5: Description of the care settings used in the rest of the survey

In the following sections of the survey, we will ask you questions related to long-term care. Those questions will involve considering different care settings. To familiarize you with these care settings, we will provide you short descriptions of them. We will also ask you to answer a small number of questions to make sure you have understood them.

[NEW SCREEN]

For the remainder of this survey, we will present hypothetical scenarios regarding your health in the future. To be specific, in these scenarios, you may need help with activities such as eating, dressing, bathing, walking across a room, and getting in or out of bed. We call these *activities of daily living* (ADLs).

[PN: FROM THIS POINT, EVERY TIME "ADLs" IS MENTIONED, PLEASE PROVIDE THE FOLLOWING HOVER-SCREEN:

"Activities of daily living (ADLs) include activities such as eating, dressing, bathing, walking across a room, and getting in or out of bed."]

Although care provided by family or friends might be important in reality, in this research we seek to understand your care choices if your family or friends were unable to provide this care. Therefore, if you need help with ADLs, then you will need to use some form of professional care (called long-term care). Specifically, in these hypothetical scenarios, there will be three options for long-term care that we will describe now. Please read the descriptions for each option carefully.

1. Home care

- You receive long-term care at home. A paid professional will come to your place to provide care to you. This includes helping you with ADLs, monitoring your condition, and helping you take medications.

Home care itself **does not** provide any non-health-care services such as meal preparation, home cleaning, help with groceries or laundry, gardening, maintenance, etc. If you are to use home care while you need help with ADLs, it is also likely that you will need to purchase those non-health-care services.

2. A semi-private room at a NH_LONG

- You receive long-term care at a NH_SHORT.
- It will provide you with not only long-term care but also housing and food.
- A "semi-private" room means that you are going to share the room with one more resident.

- There is no waiting time for entering a NH_SHORT, and you can choose a NH_SHORT in the location you like.

3. A private room at a NH_LONG

- This care setting is similar to the previous one except that you will not share your room with any other resident.

[NEW SCREEN]

For research purposes, it is important to verify your understanding of the different care options in these hypothetical scenarios. We will now ask you two questions (each question no more than two times). At the end, we will give you the correct information for any question which you haven't answered correctly just to make sure that everything is clear.

[PN: SET Q17_1_correct = 0; Q17_2_correct = 0. SET Ntrial = 1.]

[PN: ASK IF Q17_1_correct == 0]

Q17_1. Suppose you choose the home care option. Does home care also provide non-care services, such as meal preparation, home cleaning, help with groceries or laundry, gardening, maintenance, etc.?

1 Yes

2 No

[PN: SET Q17_1_correct = 1 IF Q17_1 == 2]

[PN: ASK IF Q17_2_correct==0]

Q17_2. Suppose you enter either a semi-private or a private room at a NH_LONG. In these hypothetical scenarios, is there any waiting time for entering a NH_SHORT?

1 Yes

2 No

[PN: Set Q17_2_correct = 1 IF Q17_2 == 2]

[PN:

IF Q17_1_correct + Q17_2_correct==2

- Display: "You have correctly answered all of the questions. Thank you for verifying your understanding of the care options."
- Then go to next section.

ELSE IF Q17_1_correct + Q17_2_correct<2 & Ntrial==1

- DISPLAY: "You have correctly answered [Q17_1_correct + Q17_2_correct] question(s) so far. Please review the features of the care options and try answering the remaining questions again."

- IF Q17_1_correct = 0, THEN DISPLAY: "Home care does not provide non-care services such as meal preparation, home cleaning, help with groceries or laundry, gardening, maintenance, etc. If you need them, you will need to purchase those services separately."
- IF Q17_2_correct = 0, THEN DISPLAY: "In these hypothetical scenarios, there is no waiting time for entering a NH_LONG of your choice."
- Then set Ntrial == 2 and go back to programming note immediately before Q17_1.

ELSE IF Q17_1_correct + Q17_2_correct<2 & Ntrial==2

- DISPLAY: "You have correctly answered [Q17_1_correct + Q17_2_correct] question(s). Please review the features of the care options."
- If Q17_1_correct = 0, THEN DISPLAY: "Home care does not provide non-care services such as meal preparation, home cleaning, help with groceries or laundry, gardening, maintenance, etc. If you need them, you will need to purchase those services separately."
- If Q17_2_correct = 0, THEN DISPLAY: "In these hypothetical scenarios, there is no waiting time for entering a NH_LONG of your choice."
- Then go to next section

]

Section 6: Financial resources in good and in bad health

PN:

All calculated dollar values in this section are to be rounded to the nearest dollar and formatted as $X,XXX in English and X XXX $ in French

DEFINE VARIABLES “HC_cost”, “NH_SP” and “NH_P” AS SHOWN IN TABLE 1:

Table 1 – Fixed Variables Section LTC Fixed

Meaning	Variable Name	Value
Cost of an hour of home care	HC_cost	30
Monthly cost of semi-private room in nursing home	NH_SP	6,500
Monthly cost of private room in nursing home	NH_P	7,000

Table 2 – Wealth values (see calibration document for details)

Variable Name	Value
SSQ_wealth1_HC	39000
SSQ_wealth2_HC	95000
SSQ_wealth3_HC	114000
SSQ_wealth4_HC	208000
SSQ_wealth1_SP	35000
SSQ_wealth2_SP	80000
SSQ_wealth3_SP	125000
SSQ_wealth4_SP	170000
SSQ_wealth1_P	36000
SSQ_wealth2_P	81000
SSQ_wealth3_P	126000
SSQ_wealth4_P	171000
Dist_HC	56333.33
Dist_SP	45000
Dist_P	45000
extra_HC	15000
interest_rate	0.06
replacement_rate	0.7
min_cons_healthy	15000

max_cons_healthy	180000

- CREATE A RANDOM VARIABLE “LTC_type”.
  - Values: HC, NH_SP, or NH_P
  - Respective probabilities: 1/3, 1/3, 1/3
- CREATE VARIABLE “SSQ_age” = 80.

IF LTC_type==HC:

- DEFINE VARIABLE “minimum_cost” = HC_cost*2200.

ELSE IF LTC_type==NH_SP:

- DEFINE VARIABLE “minimum_cost” = NH_SP_cost*12.

ELSE IF LTC_type==NH_P:

- DEFINE VARIABLE “minimum_cost” = NH_P_cost*12

THE FOLLOWING QUESTION USES THE VARIABLES “RETIRED”, “INCOME”, AND “WEALTH” AS DEFINED IN SECTION 2; ALL OTHER VARIABLES ARE DEFINED IN TABLE 2:

IF RETIRED ==1:
    totinc_gross = INCOME+ interest_rate *WEALTH;
ELSE:
    totinc_gross = replacement_rate * INCOME + interest_rate * WEALTH

IF QC == 5 (Ontario):
    totinc = 4.373*totinc_gross^0.836
ELSE IF QC == 6 (Quebec):
    totinc = 5.248* totinc_gross^0.826

IF LTC_type == HC:
    Actual_W = 1/4 * (HC_cost*2200 + extra_HC + totinc) + totinc (rounded to the nearest **thousand** dollars)
ELSE IF LTC_type == NH_SP:
    Actual_W = 1/4 * (NH_SP_cost * 12) + totinc (rounded to the nearest **thousand** dollars)
ELSE IF LTC_type == NH_P:
    Actual_W = 1/4 * (NH_P_cost * 12) + totinc (rounded to the nearest **thousand** dollars)

IF LTC_type == HC:
    SSQ_wealth1 = SSQ_wealth1_HC
    SSQ_wealth2 = SSQ_wealth2_HC
    SSQ_wealth3 = SSQ_wealth3_HC
    SSQ_wealth4 = SSQ_wealth4_HC
    Dist = Dist_HC
ELSE IF LTC_type == NH_SP:
    SSQ_wealth1 = SSQ_wealth1_SP

```
        SSQ_wealth2 = SSQ_wealth2_SP
        SSQ_wealth3 = SSQ_wealth3_SP
        SSQ_wealth4 = SSQ_wealth4_SP
        Dist = Dist_SP
ELSE IF LTC_type == NH_P:
        SSQ_wealth1 = SSQ_wealth1_P
        SSQ_wealth2 = SSQ_wealth2_P
        SSQ_wealth3 = SSQ_wealth3_P
        SSQ_wealth4 = SSQ_wealth4_P
        Dist = Dist_P

IF (Actual_W <= SSQ_wealth1):
        SSQ_baseW = SSQ_wealth1
ELSE IF (Actual_W >= SSQ_wealth4):
        SSQ_baseW = SSQ_wealth4
ELSE:
        SSQ_baseW = Actual_W

Set SSQ_iteration=1.
DEFINE SSQ_baseW1 = SSQ_baseW
]
```

We are interested in how you may value financial resources differently when you are healthy compared to when you need help with ADLs. For this purpose, we will present you hypothetical situations. In these situations, you will be given a hypothetical amount of money, and you will have to decide how much to set aside for when you are healthy and for when you need help with ADLs.
Even if it is hard to imagine yourself in these situations, please try your best.

[NEW SCREEN]

Suppose you are 80 years old and that for the next year:

- You live alone. [PN: IF Q2==1 or 2, DISPLAY: "You outlived your partner (spouse)."]
- Your family is unable to provide care if you need it.
- COVID-19 is no longer a threat as there is a vaccine, cure, or herd immunity.

Your health next year is uncertain, and there is a possibility that you will need help with ADLs.

- With a 75-percent chance, you do not need any help with ADLs.
    - In this situation, you will be responsible for all your expenditures and bills, including the rent, mortgage, maintenance, or taxes on your home.

- With a 25-percent chance, you need help with ADLs.
    - In this situation, you will need at least 2,200 hours of long-term care per year (6 hours per day).
    - However, you do not experience a significant cognitive decline.

[PN:
IF LTC_type==HC, THEN DISPLAY:
"If you need help with ADLs, you will stay at your home and receive home care.

- You will need to pay for all the care you receive. There is no public subsidy. An hour of home care costs [HC_cost]. The minimum care you need will thus cost you [2,200*HC_cost] per year (or [2,200*HC_cost/12] per month).
- Please note that this cost only covers the minimum personal care you need (2,200 hours per year). You might want to purchase additional non-health-care services such as meal preparation, home cleaning, help with groceries or laundry, gardening, maintenance, etc. Please think about how much of these additional services you may need if you need help with ADLs.
- In addition, you will still be responsible for all your other expenditures including food, as well as bills including the rent, mortgage, maintenance, or taxes on your home."

ELSE IF LTC_type==NH_SP, THEN DISPLAY:
"If you need help with ADLs, you will enter a semi-private room (one that is shared with another resident) at a NH_LONG.

- It will cost at least [NH_SP_cost*12] per year (or [NH_SP_cost] per month). There is no public subsidy. This cost covers the care, housing, and food services provided by the NH_SHORT.
- You will still be responsible for all your other expenditures. However, you will not need to continue to pay for the rent, mortgage, maintenance, or taxes on your home.
- There is no waiting time for entering a NH_SHORT, and you can choose a NH_SHORT in the location you like."

ELSE IF LTC_type==NH_P, THEN DISPLAY:
"If you need help with ADLs, you will enter a private room (one that is not shared with another resident) at a NH_LONG.

- It will cost at least [NH_P_cost*12] per year (or [NH_P_cost] per month). There is no public subsidy. This cost covers the care, housing, and food services provided by the NH_SHORT.
- You will still be responsible for all your other expenditures. However, you will not need to continue to pay for the rent, mortgage, maintenance, or taxes on your home.

- There is no waiting time for entering a NH_SHORT, and you can choose a NH_SHORT in the location you like."

]

[NEW SCREEN]

Imagine that you are given [SSQ_baseW] in this hypothetical situation.
Before you learn whether you will need help with ADLs, you will need to split this money between two plans: Plan A and Plan B.

- Plan A gives you money only if you **do not** need help with ADLs.
  - For every $1 you put in Plan A, you will get **$1** to spend if you do not need help with ADLs.
- Plan B gives you money only if you **do** need help with ADLs.
  - For every $1 you put in Plan B, you will get **$4** to spend if you need help with ADLs.

You only have money from Plan A or Plan B next year to pay for all your expenditures (including those related to long-term care and/or housing). You do not have any other money. This means, in particular, that you cannot use the wealth in your home either by selling it, or by borrowing out of your home equity through a loan. Remember that there is no public subsidy for long-term care. Thus, you will have to pay for **all** care costs using money from Plan B.
The money from Plan A or Plan B should be spent by the end of the next year. Any money that is not spent at the end of next year cannot be saved for the future, be given away, or left as a bequest. At the end of next year, you will be offered the same choice with another [SSQ_baseW] for the following year.

[NEW SCREEN]

For research purposes, it is important to verify your understanding. We will now ask you a series of questions (each question no more than twice). At the end, we will give you the correct information for any questions which you haven't answered correctly just to make sure that everything is clear.

[PN: Set Q18_1_correct = 0; Q18_2_correct = 0; Q18_3_correct = 0. Set Ntrial_SSQ = 1.]

[ASK IF Q18_1_correct==0]

Q18_1. In the hypothetical scenario, if you need help with ADLs, is your family able to provide the care you need?

1 Yes
2 No

[PN: SET Q18_1_correct = 1 IF Q18_1 == 2]

[PN: ASK IF Q18_2_correct==0]

Q18_2. In the hypothetical scenario, can you save any money left at the end of the next year for the future or bequests?

1 Yes
2 No

[PN: Set Q18_2_correct = 1 if Q18_2 == 2]

[ASK IF Q18_3_correct==0]

Q18_3. In the hypothetical scenario, can you either sell your home or get a reverse mortgage to use your home equity to cover your care- or non-care-related expenditures?

1 Yes
2 No

[PN: Set Q18_3_correct = 1 if Q18_3 == 2]

[PN:

If Q18_1_correct + Q18_2_correct + Q18_3_correct == 3:

- DISPLAY: "You have correctly answered all of the questions. Thank you for verifying your understanding of the hypothetical scenario."

ELSE IF (Q18_1_correct + Q18_2_correct + Q18_3_correct) < 3 AND Ntrial_SSQ==1:

- DISPLAY: "You have correctly answered [Q18_1_correct + Q18_2_correct + Q18_3_correct] question(s) so far. Please review the hypothetical scenario and try the remaining questions again."

ELSE IF (Q18_1_correct + Q18_2_correct + Q18_3_correct) < 3 & Ntrial_SSQ==2:

- DISPLAY: "You have correctly answered [Q18_1_correct + Q18_2_correct + Q18_3_correct] question(s). Please review the hypothetical scenario."

Table 3 - Display

Question	Display_text
Q18_1	In the hypothetical scenario, your family cannot help you if you need help with ADLs. You should pay out of your own pocket to receive long-term care.

Q18_2	In the hypothetical scenario, the money left unused at the end of next year cannot be saved for the future. Instead, please assume that you will receive another [**SSQ_baseW]** and make the same choices in the following year.
Q18_3	In the hypothetical scenario, you cannot sell your house or get a reverse mortgage to use home equity to cover care- or non-care-related expenses.

For *num_question* in 1, 2, 3:

IF Q18_1_correct = 0: USING TABLE 3, DISPLAY THE TEXT IN COLUMN "Display_text" CORRESPONDING TO QUESTION Q18_1.
IF Q18_2_correct = 0: USING TABLE 3, DISPLAY THE TEXT IN COLUMN "Display_text" CORRESPONDING TO QUESTION Q18_2.
IF Q18_3_correct = 0: USING TABLE 3, DISPLAY THE TEXT IN COLUMN "Display_text" CORRESPONDING TO QUESTION Q18_3.

IF (Q18_1_correct + Q18_2_correct + Q18_3_correct) < 3 AND Ntrial_SSQ==1:

- Set Ntrial_SSQ = 2;
- Go back to the programming note immediately before Q18_1.

ELSE:

- go to Q19.

]

Q19 Please make your decision on splitting [SSQ_baseW] into Plan A and Plan B by clicking on the red scale below. A slider will appear where you click. The amount on the scale corresponds to the money you decide to put in plan B. Move the slider to the left or right until it reflects your choice. To put more money in Plan A, move the slider to the left. To put more money in Plan B, move the slider to the right.

The numbers in the box will change as you move the slider to let you know how much you will receive if you need help with ADLs and if you do not.

[PN:
IF LTC_type==HC*:*

- DISPLAY: "Note that you will receive home care if you need help with ADLs. It will cost [HC_cost] per hour and you will need at least 6 hours of care per day (2,200 hours per year). Thus, it will cost at least [2,200*HC_cost] per year (or [2,200*HC_cost/12] per month)."

ELSE IF LTC_type==NH_SP

- DISPLAY: "Note that you will enter a semi-private room (that is shared with another resident) in a NH_LONG if you need help with ADLs. It will cost at least [NH_SP_cost*12] per year (or [NH_SP_cost] per month)."

IF LTC_type==NH_P

- DISPLAY: "Note that you will enter a private room (that is not shared with another resident) in a NH_LONG if you need help with ADLs. It will cost at least [NH_P_cost*12] per year (or [NH_P_cost] per month)."

]

Reminder: there is a 75% chance you will not need help with ADLs and a 25% chance you will need help with ADLs. You are responsible for the payment of all the care you receive. So you need to put enough money in Plan B to at least cover the cost of care when you need help with ADLs. If you move the slider to the right by one dollar, you will receive 4 more dollars if you need help with ADLs, and 1 dollar less if you do not need help with ADLs.

Plan A	Plan B
$ _____ for the year	$ 4x_____ - minimum_cost for the year after having paid for [PN: IF LTC_TYPE==HC DISPLAY "the minimum care you will need at home." ELSE DISPLAY "your room at a [NH_SHORT]."]
($ _____/12 on average each month)	($ (4x_____ - minimum_cost) /12 on average each month
You will have the above amount if you do not need help with ADLs	You will have the above amount if you need help with ADLs.

[PN:

- The slider has the scale of $0 - $SSQ_baseW. Please make the smallest unit of change as $100.
- The money in the box for Plan A is calculated as $SSQ_baseW - $x, where x is the location of the slider.
- The money in the box for Plan B is calculated as $4*x, where x is the location of the slider.

IF LTC_type==HC and $4*x < $minimum_cost:

- DISPLAY ERROR MESSAGE: "The money you will have when you need help with ADLs is not enough to cover the minimum cost of home care. Please allocate more money to Plan B."

ELSE IF LTC_type==NH_SP and $4*x < $minimum_cost:

- DISPLAY ERROR MESSAGE: "The money you will have when you need help with ADLs is not enough to cover the minimum cost of a semi-private room in a NH_LONG. Please allocate more money to Plan B."

ELSE IF LTC_type==NH_P and $4*x < $minimum_cost:

- DISPLAY ERROR MESSAGE: "The money you will have when you need help with ADLs is not enough to cover the minimum cost of a private room in a NH_LONG. Please allocate more money to Plan B."

]

[PN: Define two new variables ADL_resource = $4*x-minimum_cost and Healthy_resource = $ SSQ_baseW - x]

[ASK IF SSQ_iteration == 1 AND Healthy_resource > 0]

Q20 Your previous response indicates that you will have [Healthy_resource] per year (or [Healthy_resource/12] per month) if you do not need help with ADLs.

What will be the main use of this money if you **do not need** help with ADLs? Please choose **up to** three options in order of importance by dragging the options on the left to the red box on the right.

Most important: _____

Second-most important: _____

Third-most important: _____

[PN: Options presented:

- Clothing and apparel
- Food-related expenses (food, drinks, restaurant …)
- Hiring someone for chores (meal preparation, home cleaning, help with groceries or laundry, gardening, maintenance, etc.)
- Housing-related expenses (rent/maintenance, mortgage, taxes, electricity…)
- Leisure activities (sport, movie, music…)
- Additional health-related expenses (additional care above the minimum care required, prescription drugs, health-related home adaptation, etc.)

- Personal care services (massage, pedicure, company-maid…)
- Telecommunication/ Electronics (phone, tablet, computer, internet, video games…)
- Transport-related expenses
- Trips and Vacations]

[PN: This can be implemented either drop-down or drag-and-drop. It should be designed in a way that the option selected as most important does not appear in the second-most important, and the same between the second-most and the third-most.]

[ASK IF SSQ_iteration == 1 AND ADL_resource > 0]

Q21 Your previous response indicates that, if you need help with ADLs, you will have about [ADL_resource] left to spend per year (or [ADL_resource/12] per month) after covering the cost of basic care.

What will be the main use of this money if you **need** help with ADLs, after covering the minimum cost of care? Please choose **up to** three options in order of importance by dragging the options on the left to the red box on the right.

Most important: _____

Second-most important: _____

Third-most important: _____

[PN: Options presented:

- Clothing and apparel
- Food-related expenses (food, drinks, restaurant …)
- Hiring someone for chores (meal preparation, home cleaning, help with groceries or laundry, gardening, maintenance, etc.)
- Housing-related expenses (rent/maintenance, mortgage, taxes, electricity…) [only if LTC_type==HC]
- Leisure activities (sport, movie, music…)
- Additional health-related expenses (additional care above the minimum care required, prescription drugs, health-related home adaptation, etc.)
- Additional personal care services (massage, pedicure, company-maid…)
- Telecommunication/ Electronics (phone, tablet, computer, internet, video games…)
- Transport-related expenses
- Trips and Vacations]

[PN: This can be implemented either drop-down or drag-and-drop. It should be designed in a way that the option selected as most important does not appear in the second-most important, and the same between the second-most and the third-most.]

[PN:
Set SSQ_iteration=2
Generate a random value: uniform_val = uniform(0.25,1)
IF ADL_resource <= $1,000 :
SSQ_baseW_new = SSQ_baseW + uniform_val*Dist (rounded to the nearest **thousand** dollars)
ELSE:
IF SSQ_baseW > SSQ_wealth2:
With probability = 0.5: SSQ_baseW_new = SSQ_baseW + uniform_val*Dist (rounded to the nearest **thousand** dollars)

With probability = 0.5: SSQ_baseW_new = SSQ_baseW - uniform_val*Dist (rounded to the nearest **thousand** dollars)

ELSE:
SSQ_baseW_new = SSQ_wealth1 + uniform_val * Dist (rounded to the nearest **thousand** dollars)

SET SSQ_baseW = SSQ_baseW_new.
CREATE SSQ_baseW2 = SSQ_baseW
Display the following text and go back to Q19:
"Now, we will ask you to allocate a different amount of money, $SSQ_baseW, between Plan A and Plan B."]

Section 7: LTC-WTP for different care types

[PN:

- Create the following variables:
  Actual_W_WTP = HC_cost*2200 + extra_HC + totinc (rounded to the nearest **thousand** dollars)

  If WTP_type == NH_SP:
  WTP_wealth_min = NH_SP_cost*12
  Else If WTP_type == NH_P:
  WTP_wealth_min = NH_P_cost*12
  Endif

  WTP_wealth_LB = (HC_cost*2200) + extra_HC + min_cons_healthty
  WTP_wealth_UB = (HC_cost*2200) + extra_HC + max_cons_healthy
  Dist_WTP = Dist_HC; rounded to the closest 100
- Generate a random variable WTP_type. WTP_type will take a value of NH_SP or NH_P with equal probabilities (1/2,1/2).

IF (Actual_W_WTP <= WTP_wealth_LB):
WTP_resource1 = WTP_wealth_LB
ELSE IF (Actual_W_WTP >= WTP_wealth_UB):
WTP_resource1 = WTP_wealth_UB
IF
WTP_resource1 = Actual_W_WTP
]

In this section of the survey, we are interested in understanding what would be your choice of care if you need help with ADLs. For that purpose, we will present you slightly different hypothetical situations to those presented before. Even if it is hard to imagine yourself in these situations, please try your best.

As in the previous section, imagine you are 80 years old. Suppose, further, that:

- You will need help with ADLs this year. You will need at least 2,200 hours of help per year (or 6 hours per day).
- You do not experience a significant cognitive decline.
- You live alone. [PN: IF Q2==1 OR 2, DISPLAY: "You outlived your partner (spouse)."]
- Your family or relatives are unable to provide care.

- If you need long-term care, you need to pay for its full cost.
- COVID-19 is no longer a threat as there is a vaccine, cure, or herd immunity.

[NEW SCREEN]

Suppose you have [WTP_resource1] to spend just for this year on care- and non-care expenditures and you have to choose a care option between the two options presented here.

Option A: Using home care

- You will be receiving care at your home.
- To cover the minimum care you need, it will cost you [HC_cost*2200/12] per month (or [HC_cost*2200] per year). (Reminder: you need 2,200 hours of care and an hour of home care costs [HC_cost]).
- After having paid for the minimum care you need, you will have [WTP_resource1 – HC_cost*2200)/12] per month (or [WTP_resource1 – HC_cost*2200] per year) left to cover your other expenditures including food.
- You will still be responsible for all your other expenditures including food, as well as bills including the rent, mortgage, maintenance, or taxes on your home.
  You may also need to purchase services such as meal preparation, home cleaning, help with groceries or laundry, gardening, maintenance, etc.

[PN:

IF WTP_type==NH_SP, DISPLAY:

Option B: Entering a semi-private room at a NH_LONG

- You will be sharing a semi-private room with another resident.
- The room will cost you [NH_SP_cost] per month (or [NH_SP_cost*12] per year). This cost covers the care, housing, and food services provided by the NH_SHORT.
- After having paid for your room, you will have [(WTP_resource1 – NH_SP_cost*12)/12] per month (or [WTP_resource1 – NH_SP_cost*12] per year) left to cover your other expenditures.
- You will not need to continue to pay for the rent, mortgage, maintenance, or taxes on your home.
- There is no waiting time for entering a NH_SHORT, and you can choose a NH_SHORT in the location you like.

ELSE IF WTP_type==NH_P, DISPLAY:

Option B: Entering a private room at a NH_LONG

- You will not be sharing your room with another resident.
- The room will cost you [NH_P_cost] per month (or [NH_P_cost*12] per year). This cost covers the care, housing, and food services provided by the NH_SHORT.
- After having paid for your room, you will have [WTP_resource1 – NH_P_cost*12)/12] per month (or [WTP_resource1 – NH_P_cost*12] per year) left to cover your other expenditures.
- You will not need to continue to pay for the rent, mortgage, maintenance, or taxes on your home.
- There is no waiting time for entering a NH_SHORT, and you can choose a NH_SHORT in the location you like.

]

Regardless of the option you choose, as in the previous hypothetical scenarios, the following rules commonly apply:

- Any money that is not spent at the end of next year cannot be saved for the future, be given away, or left as a bequest. At the end of next year, you will be offered the same choice with another [WTP_resource1] for the following year.
- You cannot use the wealth in your home either by selling it, or by borrowing out of your home equity through a loan.

Q22 Between Option A and Option B, which one do you prefer?

Option A: Using home care.

- You will be receiving care at your home.
- To cover the minimum care you need, it will cost you [HC_cost*2200/12] per month (or [HC_cost*2200] per year)
- After having paid for the minimum care you need, you will have [(WTP_resource1 – HC_cost*2200)/12] per month (or [WTP_resource1 – HC_cost*2200] per year) left to cover your other expenditures.

[PN:
IF WTP_type==NH_SP, DISPLAY:

Option B: Entering a semi-private room at a NH_LONG.

- You will be sharing your room with another resident.
- The room will cost you [NH_SP_cost] per month (or [NH_SP_cost*12] per year).
- After having paid for your room, you will have [(WTP_resource1 – NH_SP_cost*12)/12] per month (or [WTP_resource1 – NH_SP_cost*12] per year) left to cover your other expenditures.

ELSE IF WTP_type==NH_P, DISPLAY:

Option B: Entering a private room at a NH_LONG.

- You will not be sharing your room with another resident.
- The room will cost you [NH_P_cost] per month (or [NH_P_cost*12] per year).
- After having paid for your room, you will have [(WTP_resource1 – NH_P_cost*12)/12] per month (or [WTP_resource1 – NH_P_cost*12] per year) left to cover your other expenditures.

]

1 Option A
2 Option B

[IF Q22 == 1, DEFINE
- Q22 = « Option A »
- Q22not = "Option B"
- Chosen_Option = « home care »
- Non_Chosen_Option = "a semi-private room in a NH_SHORT" if WTP_type ==NH_SP
- Non_Chosen_Option = "a private room in a NH_SHORT" if WTP_type ==NH_P

IF Q22 == 2, DEFINE
- Q22 = « Option B »
- Q22not = "Option A"
- Chosen_Option = "a semi-private room in a NH_SHORT" if WTP_type ==NH_SP
- Chosen_Option = "a private room in a NH_SHORT" if WTP_type ==NH_P
- Non_Chosen_Option = "home care"

]

Q23 In the previous question, you said that you would choose [Q22] ([Chosen_Option]) over [Q22not] ([Non_Chosen_Option]) if you had [WTP_resource1] per year to spend for yourself on care- and non-care expenditures.

Would you consider choosing [Q22not] ([Non_Chosen_Option]) instead of [Q22] ([Chosen_Option]) if you have more or less resources than [WTP_resource1]?

1 Yes, if I have more resources than [WTP_resource1]
[PN: Define WTP_resource2 = WTP_resource1 + Dist_WTP]

2 Yes, if I have less resources than [WTP_resource1]
[PN: IF $WTP_resource1 == WTP_wealth_LB:
DEFINE $WTP_resource2 = WTP_wealth_min

ELSE

DEFINE $WTP_resource2 = Max(WTP_resource1 - Dist_WTP; WTP_wealth_min)]

]

3 No, I would not choose [Q22not] ([Non_Chosen_Option]) with any amount of money

[PN: Skip to Section 8 if Q23 == 3]

Q24 Suppose you now have [WTP_resource2] per year to spend for yourself on care- and non-care expenditures instead of [WTP_resource1].

Which option would you now prefer between Option A and Option B?

Option A: Using home care.

- You will be receiving care at your home.
- To cover the minimum care you need, it will cost you [HC_cost*2200/12] per month (or [HC_cost*2200] per year)
- After having paid for the minimum care you need, you will have [(WTP_resource2 – HC_cost*2200)/12] per month (or [WTP_resource2 – HC_cost*2200] per year) left to cover your other expenditures.

[PN:

IF WTP_type==NH_SP, DISPLAY:

Option B: Entering a semi-private room at a NH_LONG.

- You will be sharing your room with another resident.
- The room will cost you [NH_SP_cost] per month (or [NH_SP_cost*12] per year).
- After having paid for your room, you will have [(WTP_resource2 – NH_SP_cost*12)/12] per month (or [WTP_resource2 – NH_SP_cost*12] per year) left to cover your other expenditures.

ELSE IF WTP_type==NH_P, DISPLAY:

Option B: Entering a private room at a NH_LONG.

- You will not be sharing your room with another resident.
- The room will cost you [NH_P_cost] per month (or [NH_P_cost*12] per year).
- After having paid for your room, you will have [(WTP_resource2 – NH_P_cost*12)/12] per month (or [WTP_resource2 – NH_P_cost*12] per year) left to cover your other expenditures.

]

1 Option A

2 Option B

[PN: IF Q24 == 1, DEFINE

- Q24 = « Option A »
- Q24not = "Option B"
- Chosen_Option2 = « home care »
- Non_Chosen_Option2 = "a semi-private room in a NH_SHORT" if WTP_type ==NH_SP
- Non_Chosen_Option2 = "a private room in a NH_SHORT" if WTP_type ==NH_P

IF Q24 == 2, DEFINE

- Q24 = « Option B »
- Q24not = "Option A"
- Chosen_Option2 = "a semi-private room in a NH_SHORT" if WTP_type ==NH_SP
- Chosen_Option2 = "a private room in a NH_SHORT" if WTP_type ==NH_P
- Non_Chosen_Option2 = "home care"

]

[PN:

If (Q22=Option A and Q24=Option B) or (Q22= Option B and Q24=Option A):

- go to Q25.
- Define WTP_resource1_bis = min(WTP_resource1,WTP_resource2)
- Define WTP_resource2_bis = max(WTP_resource1,WTP_resource2)

ElseIf (Q22=Option A and Q24=Option A) or (Q22= Option B and Q24=Option B):

- go to Q26

]

Q25 In the previous questions, you said that you would choose [Q22] ([Chosen_Option]) over [Q22not] ([Non_Chosen_Option]) if you had [WTP_resource1] per year to spend for yourself on care- and non-care expenditures. And you said that you would choose [Q24] ([Chosen_Option2]) over [Q24not] ([Non_Chosen_Option2]) if you had [WTP_resource2].

We now would like to know at approximately what level of resources between [WTP_resource1_bis] and [WTP_resource2_bis] would [Q22] ([Chosen_Option]) be as attractive as [Q24] ([Chosen_Option]).

For this purpose, we ask you to click on the scale below and to move the slider that will appear until the two care options shown in the table below are equally attractive to you. The numbers in this table correspond to the money you will have left after having paid the minimum cost of care corresponding to each care option.

[PN: The scale should vary between $WTP_resource1_bis and $WTP_resource2_bis, in $100 increments. The position of the slider that is chosen by the respondent is WTP_resource3.]

[slider here]

Option A (Using Home Care)	Option B ([IF WTP_type==NH_SP, DISPLAY: "Entering a semi-private room at a [NH_SHORT]"; IF WTP_type==NH_P, DISPLAY: "Entering a private room at a [NH_SHORT]"])
You will have [(WTP_resource3 – HC_cost*2200)/12] per month (or [WTP_resource3 – HC_cost*2200] year) left to cover your other expenditures, after having paid for the minimum care you will need at home.	[IF WTP_type==NH_SP, DISPLAY: " You will have [WTP_resource3/12 – NH_SP_cost] per month (or [WTP_resource3 – NH_SP_cost*12] per year) left to cover your other expenditures, after having paid for your room at a [NH_SHORT].." IF WTP_type==NH_P, DISPLAY: " You will have [WTP_resource3/12 – NH_P_cost] per month (or [WTP_resource3 – NH_P_cost*12] per year) left to cover your other expenditures, after having paid for your room at a [NH_SHORT]."]

[Box] I confirm that both options as shown in the table are equally attractive to me.
[PN: MUST TICK BOX]
[PN: SKIP TO SECTION 8]

Q26 We now want to ask you around what level of resources [PN: IF Q23 ==1 ("more resources"), DISPLAY: "higher than [WTP_resource2]"; IF Q23 == 2 ("less resources"), DISPLAY: "lower than [WTP_resource2]"] would Q22not (Non_Chosen_Option) be as attractive as Q22 (Chosen_Option).

For this purpose, we ask you to click on the scale below and to move the slider that will appear until the two options shown in the table below are equally attractive to you. The numbers in this table correspond to the money you will have left after having paid the minimum cost of care corresponding to each care options.

[Programming Note:
IF Q23 == 1 ("more resources"):

- the scale should vary between [WTP_resource2] and [2*WTP_wealth_UB]. Value of resources chosen is [WTP_resource3].

ELSE IF Q23 == 2 ("less resources"):

- lower bound of scale: NH_SP_cost*12 if WTP_type==NH_SP and NH_P_cost*12 if WTP_type==NH_P
- upper bound of scale: [WTP_resource2].
- Value of resources chosen is WTP_resource3
- **If lower bound on the scale == upper bound on the scale**, skip this section and go to Q27.

]

[slider here]

Option A (Using Home Care)	Option B ([PN: If WTP_type==NH_SP, DISPLAY: "Entering a semi-private room at a NH_SHORT"; IF WTP_type==NH_P, DISPLAY: "Entering a private room at a NH_SHORT")
You will have [(WTP_resource3 – HC_cost*2200)/12] per month (OR [WTP_resource3 – HC_cost*2200] per year) left to cover your other expenditures, <u>after having paid for the minimum care you will need at home.</u>	[IF WTP_type==NH_SP, DISPLAY: "You will have [WTP_resource3/12 – NH_SP_cost] per month (OR [WTP_resource3 – NH_SP_cost*12] per year) left to cover your other expenditures, <u>after having paid for your room at a</u> [NH_SHORT]." IF WTP_type==NH_P, DISPLAY: "You will have [WTP_resource3/12 – NH_P_cost] per month (OR [WTP_resource3 – NH_P_cost*12] per year) left to cover your other expenditures, <u>after having paid for your room at a</u> [NH_SHORT]."]

[Box] I confirm that both options as shown in the table are equally attractive to me. [PN: IF Q23 ==1 ("more resources"), DISPLAY: "(If this is not the case, please move the scale to the right until both options are equally attractive to you. If you move the slider to the maximum on the

scale and still prefer [Q22] ([Chosen_Option]), please check the box below (which will then be activated).)"
[Box] I confirm that with the options as shown in the table, I still prefer [Q22] ([Chosen_Option]).

[PN:
If Q23 == 2 ("less resources"):
present only the first box. It will always be ticked.
ELSE IF Q23 == 1 ("more resources"):
present both boxes, but only one of them will be activated. If the slider is at the maximum value allowed in the slider, the second one will be activated. Otherwise, the first one will be activated.

Please use faint gray color for the non-activated box.

Respondents must tick one box in this question.

]

B Appendix: Comprehension test results

The strategic survey questions that are key to our analysis involve hypothetical situations. The credibility of the survey responses depends on whether the respondents fully understood the nature of the hypothetical situations. To test the respondents' understanding, the survey asks a total of five comprehension test questions about the nature of the hypothetical situations before the main questions are asked. If the respondent does not provide a correct answer in the first round, the survey asks the missed questions again.

The results suggest that the respondents overall understood the strategic survey questions well. Table B1 reports that even for the first round, the median respondent got four correct out of five questions. After the second round, a majority got the full score, while only less than a quarter of the sample missed more than one question.

Table B1: Comprehension test score distribution

	25p	50p	75p	N
After 1st round	2	4	5	3,004
After 2nd round	4	5	5	3,004

Notes: Full score is five.

C Appendix: Preference parameter estimation using the method of moments

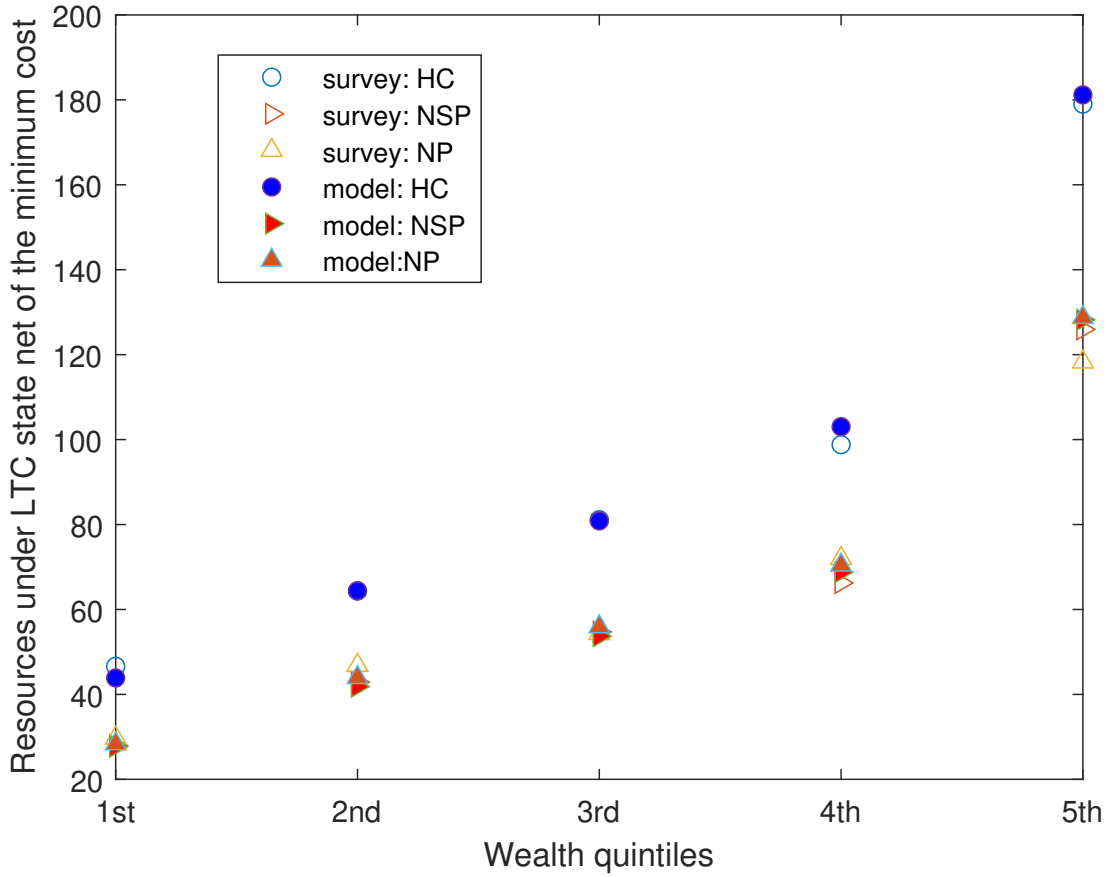
In the main text, we estimate the preference parameters based on maximum likelihood estimation. In this Appendix, we show that we obtain almost the same parameter estimates using the method of moments. In this illustration, we focus only on the estimation of $\{\eta_{j,i}\}_{j\in HC,NSP,NP}$, while using the estimate of θ (0.186) from the main text.[43]

To create the moments to target, we first construct the wealth quintiles based on the amount of resources ($W_{i,m}$) given in the LTC SSQ (the horizontal axis in Figure C1). Then for each wealth quintile, we calculate the average resources available in the LTC state (net of the minimum LTC costs) under the allocation chosen by the respondents (the vertical axis in Figure C1). These moments are indicated by the unfilled markers in Figure C1. The moments reveal that the desired resources available in the LTC state are increasing with wealth and also that those assigned to HC are willing to have a larger amount of resources net of the minimum costs in the LTC state. We then estimate the preference parameters to minimize the sum of squares of the differences between these survey moments and the averages of optimal allocations (equation (7)) under the chosen preference parameters.

The estimated parameters are $\eta_{HC} = 1.77$, $\eta_{NSP} = 1.48$, and $\eta_{NP} = 1.53$. Note that these estimates are very close to those from the maximum likelihood estimation (Table 4, column 1). The moments of the optimal allocations (the filled markers in Figure C1) are also almost the same as the moments of survey responses. Note that this goodness-of-fit is not mechanical because we only have three parameters to estimate to match the fifteen moments. Overall, this exercise demonstrates not only that the estimates are robust with respect to the estimation methods but also that the estimated preference parameters and the chosen utility functions explain the survey responses very well.

[43] Recall that the identification of θ_i is entirely from the risk-preference SSQ, while the LTC SSQ provides the identification of $\eta_{j,i}$ conditional on the estimated θ_i.

Figure C1: LTC SSQ responses and optimal allocations by LTC type and wealth quintile



Note: The horizontal axis indicates wealth quintiles based on the amount of resources given in the LTC SSQs. The vertical axis is the amount of resources under the LTC state net of the minimum LTC costs. The unfilled markers indicate the survey response average in each wealth quintile. The filled markers indicate the average of optimal allocation under the estimated preference parameters in each wealth quintile.

D Appendix: Health transition process estimation

We follow the approach from Jones et al. (2018). The transition matrix from the current health state ($s \in \{1, 2, LTC\}$) to the next period's health state ($s' \in \{1, 2, LTC, D\}$) is obtained from multinomial logit estimation. The dependent variable is the health state in the next period and the independent variables are a constant, current health, gender, age, age squared, permanent income tercile, as well as interactions of these. For the permanent income, we use the sum of Social Security benefits and defined benefit pensions as a proxy (for those who are not receiving those benefits yet, we use the expected values).

To be specific, for each potential transition from $i \in \{1, 2, LTC\}$ to $j \in \{1, 2, LTC, D\}$, the probability of that event is determined as:

$$\begin{aligned} \pi_{ij} &= Pr(s' = j | s = i) \\ &= \gamma_{ij} / \sum_k \gamma_{ik}, \\ \gamma_{iD} &= 1, \quad \forall i, \\ \gamma_{ik} &= exp(x_{s=i}\beta_k), \ k \in \{1, 2, LTC\}, \end{aligned} \tag{18}$$

where $\{\beta_k\}$ is the set of coefficient vectors and $x_{s=i}$ is the vector of the control variables with $s = i$. We estimate $\{\beta_k\}$ by maximum likelihood estimation, using all observations of single individuals from the HRS, between waves 2004 to 2014.

We present some examples of the estimated transition matrices in Table D1 (for age 54) and Table D2 (for age 90). Rows represent the current state and columns represent the next period's state. At age 54, good health ($s = 1$) is a persistent state and the more so for a female and for those with high permanent income. At age 90, needing LTC or death two years later becomes much more likely, even conditional on being in $s = 1$ in the current period.

Table D1: Health transition matrix at age 54

		PI 1st quartile				PI 3rd quartile			
		D	LTC	2	1	D	LTC	2	1
Male	LTC	0.051	0.490	0.246	0.213	0.102	0.338	0.255	0.304
	2	0.019	0.051	0.282	0.648	0.022	0.021	0.222	0.734
	1	0.003	0.006	0.026	0.965	0.003	0.002	0.015	0.979
Female	LTC	0.039	0.497	0.275	0.189	0.064	0.390	0.260	0.286
	2	0.011	0.051	0.296	0.641	0.011	0.024	0.209	0.757
	1	0.002	0.005	0.022	0.971	0.002	0.002	0.011	0.985

Table D2: Health transition matrix at age 90

		PI 1st quartile				PI 3rd quartile			
		D	LTC	2	1	D	LTC	2	1
Male	LTC	0.493	0.426	0.047	0.035	0.460	0.456	0.042	0.041
	2	0.299	0.218	0.213	0.271	0.234	0.200	0.207	0.360
	1	0.173	0.175	0.098	0.554	0.133	0.156	0.067	0.643
Female	LTC	0.453	0.458	0.055	0.034	0.349	0.563	0.046	0.043
	2	0.223	0.236	0.243	0.298	0.139	0.240	0.210	0.410
	1	0.141	0.168	0.088	0.603	0.084	0.161	0.052	0.703

E Appendix: Retirement wealth comparison under alternative specifications

E.1 Under universal subsidy

This appendix presents retirement wealth comparisons under the universal subsidy using different model specifications than the baseline model. We use heterogeneous preferences for these exercises. Note that in all these exercises, we recalibrate β to match the aggregate savings in retirement. Table E1 presents the wealth levels at age 66. Figure E1 shows the additional savings by the individuals who would use HC compared to those who would use NSP or NP.

We first consider the bequest utility function à la Lockwood (2018) (Panel A of Table E1; Panel (a) of Figure E1). According to this utility function, a bequest is more of a luxury good, but once it becomes effective (i.e., for richer individuals), the motive is much stronger than what is implied in the function à la Ameriks et al. (2020). This means that the savings of the top income tercile are mainly driven by the bequest motive. As a result, the impact of LTC preferences is much smaller for that group than the baseline. However, for the middle income tercile, the effects are as large as in the baseline. The difference between HC and NSP amounts to more than 20%, while that between HC and NP is close to 5%. Given that the top income tercile mostly drives the aggregate savings, the average effect is smaller than the baseline.

We then consider applying different thresholds to define the LTC state (Panels B and C of Table E1; Panels (b) and (c) of Figure E1). We consider both directions: relaxing the definition of the LTC state to needing help with any ADLs (instead of needing help with at least two ADLs) and strengthening it to needing at least three ADLs. We re-estimate the health transition matrices under each new definition. These do not change the results noticeably. For example, the average difference between HC and NSP is between 10-12% in

Table E1: Average retirement savings by LTC type under the universal subsidy (in $1,000s): age 66, alternative specifications

A. Lockwood bequest motive				
		By income tercile		
	All	1st	2nd	3rd
HC	326	50	329	629
NSP	311	49	273	615
NP	321	53	314	623
B. LTC: needing help with 1+ ADLs				
		By income tercile		
	All	1st	2nd	3rd
HC	315	67	346	556
NSP	283	65	290	520
NP	303	69	334	531
C. LTC: needing help with 3+ ADLs				
		By income tercile		
	All	1st	2nd	3rd
HC	317	68	347	561
NSP	286	67	292	527
NP	306	71	335	537
D. Larger $\tilde{\kappa}_{HC}$				
		By income tercile		
	All	1st	2nd	3rd
HC	321	63	363	552
NSP	280	62	292	502
NP	302	67	337	513

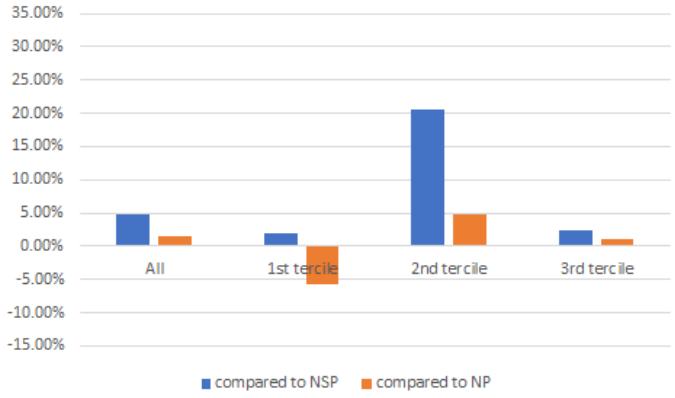
Notes: Panel A reports the results under the bequest utility function à la Lockwood (2018). Panel B reports the results when the *LTC* state is defined as needing help with at least one ADL, while for Panel C, it is defined as needing help with at least three ADLs. Panel D assumes that $\tilde{\kappa}_{HC}$ is $26K per year, 10% larger than the baseline value.

all three specifications. The patterns across the income groups are also similar.

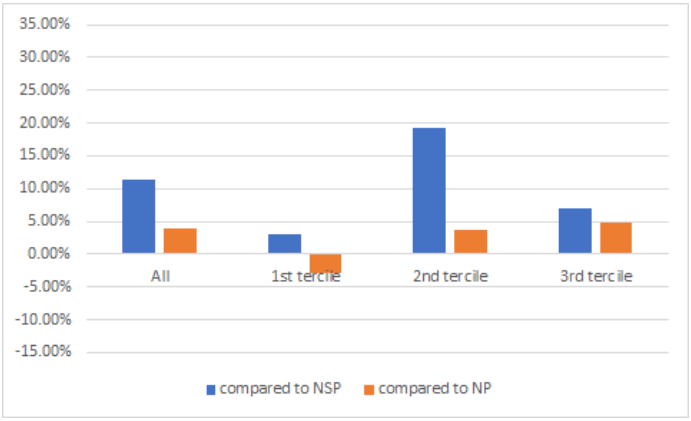
In the baseline model, we assume that the minimum costs are the same between HC and NP (i.e., $\tilde{\kappa}_{HC} = \tilde{\kappa}_{NP}$). As explained in Section 5.2, the calibration of $\tilde{\kappa}_{NP}$ is based on data, while for $\tilde{\kappa}_{HC}$, there is no readily available data, so we used a conservative estimate. Given the limited universal subsidy for HC in Canada, the actual $\tilde{\kappa}_{HC}$ is likely to be larger than $\tilde{\kappa}_{NP}$. To make the comparison of the minimum costs more realistic and examine how

Figure E1: Additional savings by HC under the universal subsidy (%): age 66, alternative specifications

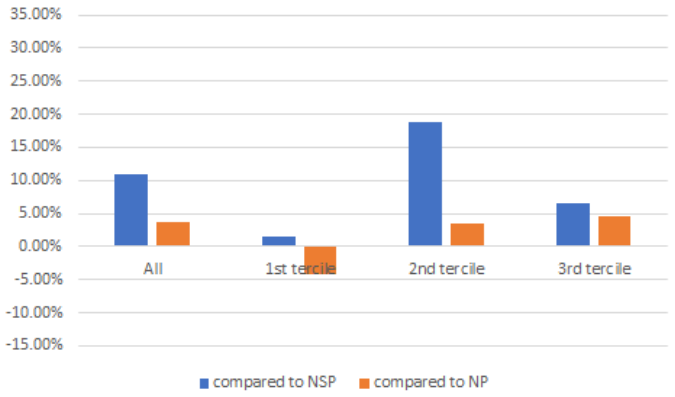
(a) Lockwood bequest motive



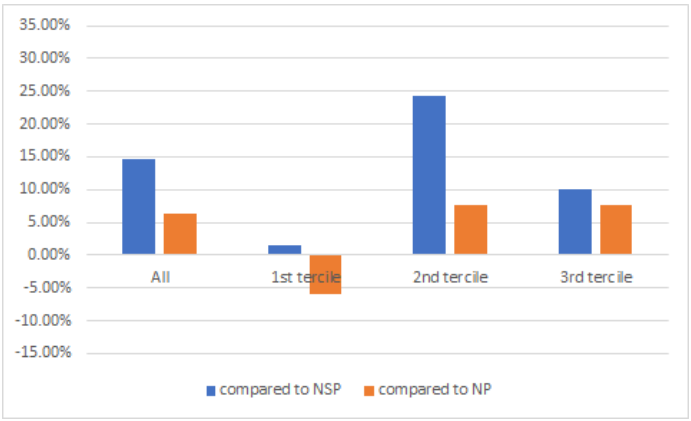
(b) LTC: needing help with 1+ ADLs



(c) LTC: needing help with 3+ ADLs



(d) Larger $\tilde{\kappa}_{HC}$



Notes: The bars indicate how much individuals who would use HC save more compared to those who would use other types of LTC (NSP and NP). Panel (a) reports the results under the bequest utility function à la Lockwood (2018). Panel (b) reports the results when the LTC state is defined as needing help with at least one ADL, while for Panel (c), it is defined as needing help with at least three ADLs. Panel (d) assumes that $\tilde{\kappa}_{HC}$ is \$26K per year, 10% larger than the baseline value.

sensitive results are with respect to the assumed minimum costs, we consider setting $\tilde{\kappa}_{HC}$ to \$26K per year, which is 10% larger than the baseline value. As expected, this increases the wealth gaps. The gap between HC and NP is 6.3% (compared to 4.6% in the baseline) and that between HC and NSP is 14.6% (compared to 12.6% in the baseline). The increase is the largest for the middle income tercile, where the gap between HC and NP increases from 4.4% to 7.7% and that between HC and NSP increases from 20.3% to 24.4%. Therefore, the

baseline results might be underestimating the impact of LTC preferences under the universal subsidy, though the size of the attenuation is not too large, at least on average.

E.2 Under means-tested only

This appendix presents retirement wealth comparisons under the means-tested only using different model specifications than the baseline model. We use heterogeneous preferences for these exercises. Table E2 presents the wealth levels. Figure E2 shows the additional savings by the individuals who would use HC compared to those who would use NSP or NP. Note that in all these exercises, β is set to be the same as the equivalent exercise under the universal subsidy in Appendix E.1.

Under the bequest utility function à la Lockwood (2018) (Panel A of Table E2; Panel (a) of Figure E2), again, the savings of the top income tercile are mainly driven by the bequest motive. LTC preferences have little impact for that income group. On the other hand, for the middle income tercile, the impact of LTC preferences is actually larger than the baseline. The savings gap is \$41K (or 10.1%), while it was \$27K (or 6.0%) in the baseline.

We then consider applying different thresholds to define the LTC state (Panels B and C of Table E2; Panels (b) and (c) of Figure E2). Relaxing the definition of the LTC state to needing help with any ADLs (instead of needing help with at least two ADLs) slightly increases the impact of LTC preferences while strengthening it to needing at least three ADLs slightly decreases it. But the differences are almost negligible.

In both the universal subsidy and means-tested only public LTCI, both η and κ vary across different LTC types. To isolate the impact of the marginal value of spending above the minimum costs, we also consider an exercise where we set $\kappa_{HC} = \kappa_{NSP} = \kappa_{NP} = \$84K$, where \$84K is the minimum cost of NP with no subsidies. The results are shown in Panel D of Table E2 and Panel (d) of Figure E2. All the differences in savings here can be contributed to differences in η. As expected, the marginal value of spending has a significant impact on savings. Overall, the difference between HC and NSP is \$34K (or 8.5%) and that between

Table E2: Average retirement savings by LTC type under means-tested only (in $1,000s): age 66, alternative specifications

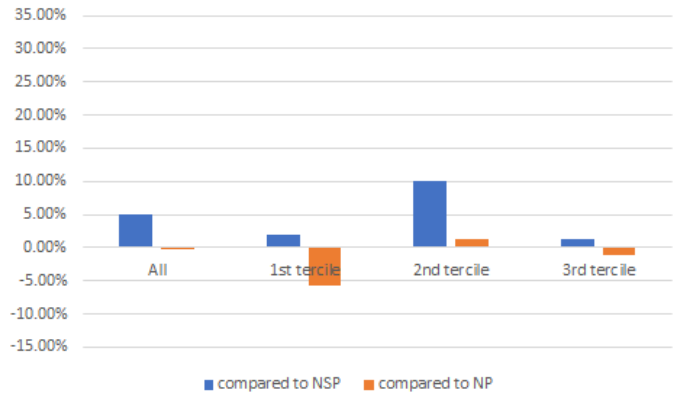
A. Lockwood bequest motive				
		By income tercile		
	All	1st	2nd	3rd
HC	402	50	448	728
NSP	383	49	407	719
NP	403	53	442	737
B. LTC: needing help with 1+ ADLs				
		By income tercile		
	All	1st	2nd	3rd
HC	415	60	485	737
NSP	397	58	451	721
NP	416	61	480	744
C. LTC: needing help with 3+ ADLs				
		By income tercile		
	All	1st	2nd	3rd
HC	396	66	466	681
NSP	382	66	436	673
NP	401	69	469	692
D. Common κ (= 84K)				
		By income tercile		
	All	1st	2nd	3rd
HC	436	64	501	766
NSP	402	63	451	711
NP	414	67	479	712

Notes: Panel A reports the results under the bequest utility function à la Lockwood (2018). Panel B reports the results when the LTC state is defined as needing help with at least one ADL, while for Panel C, it is defined as needing help with at least three ADLs. In Panel D, we assume that κ_{HC}, κ_{NSP}, and κ_{NP} are all equal to $84K, which is the same as κ_{NP} under means-tested only.

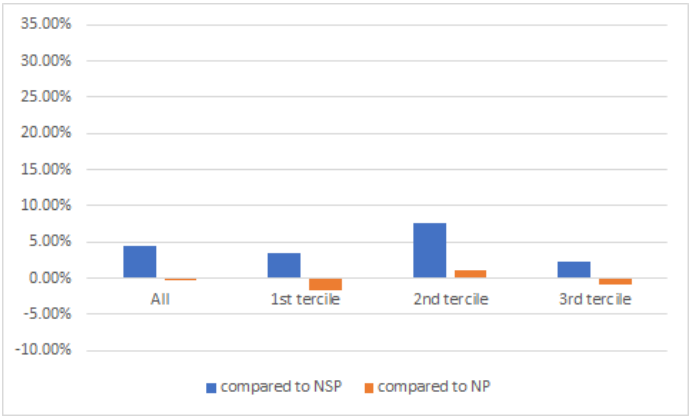
HC and NP is $22K (or 5.3%). For relative differences, it is the largest in the middle income tercile for HC versus NSP (11.1%) while it is the largest in the top income tercile for HC versus NP (7.6%).

Figure E2: Additional savings by HC under means-tested only (%): age 66, alternative specifications

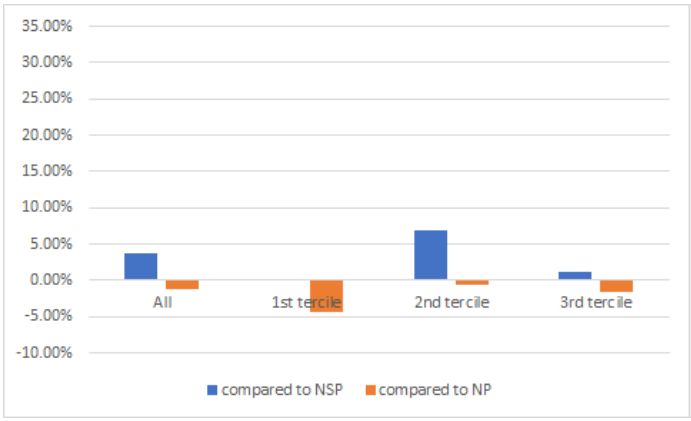
(a) Lockwood bequest motive



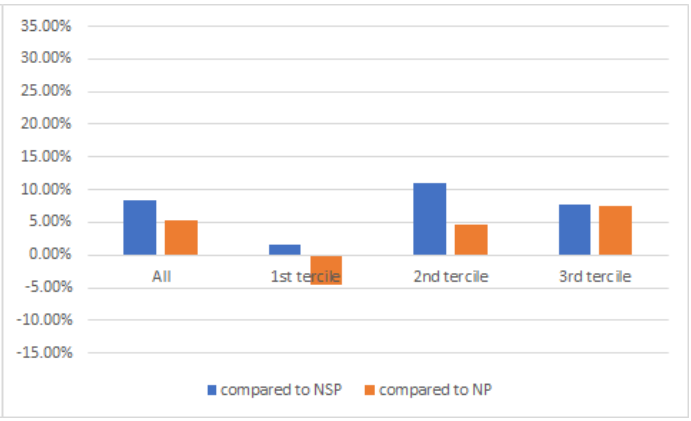
(b) LTC: needing help with 1+ ADLs



(c) LTC: needing help with 3+ ADLs



(d) Common κ (= \$84K)



Notes: The bars indicate how much individuals who use HC save more compared to those who use other types of LTC (NSP and NP). Panel (a) reports the results under the bequest utility function à la Lockwood (2018). Panel (b) reports the results when the *LTC* state is defined as needing help with at least one ADL, while for Panel (c), it is defined as needing help with at least three ADLs. In Panel (d), we assume that κ_{HC}, κ_{NSP}, and κ_{NP} are all equal to \$84K, which is the same as κ_{NP} under means-tested only.

F Appendix: Value of LTC subsidies under alternative specifications

This Appendix reports the value of additional LTC subsidies under alternative model specifications. The specifications we consider are homogeneous preferences, a higher minimum cost of HC (only for the universal subsidy), and the Lockwood (2018) bequest utility function.

Table F1 reports the results under homogeneous preferences. Note that the calibrated β to match the average savings at 66 is higher (0.94) under homogeneous preferences compared to that (0.91) under heterogeneous preferences. As a lower time discount rate is another driver for accumulating savings under homogeneous preferences, the overall valuation of additional subsidies is lower than under heterogeneous preferences (Table 11), in particular among the top two income terciles. Nonetheless, the bang-for-buck (the last column) is well above one for both public LTCI systems. This means the subsidies are all valued above their costs under both public LTCI systems considered. Also, it is still the case that HC subsidies are valued the most.

As mentioned in Section 5.2, the value of κ_{HC} used in the baseline specification of the universal subsidy system is likely to be an underestimate. In the second row of Panel A in Table F1, we examine how the valuation of additional HC subsidy changes when we increase κ_{HC} by 10%. The comparison with the first row shows that the impact of the increase in the minimum cost of HC is limited. This again confirms that under the universal subsidy, the main driver for the savings is the marginal utilities, not the minimum costs, as demonstrated in Appendix E.1.

Table F2 reports the valuation of the additional \$10K LTC subsidies under the bequest utility function à la Lockwood (2018). Compared to the baseline results (Table 11), λ is smaller for all LTC types, throughout the income distribution, and under both public LTCI systems. This is because the bequest motive is stronger under the utility function à la Lockwood (2018), which reduces the relative importance of the precautionary saving motive.

Table F1: Valuation of additional $10K (per year) subsidies: homogeneous preferences

A. Universal subsidy	Distribution of λ ($1,000s)				Bang-for-buck
		By income tercile			
	All	1st	2nd	3rd	
HC	38.3	17.9	55.4	39.8	2.07
HC (Larger κ_{HC})	38.6	16.7	55.9	41.3	2.12
NSP	30.4	15.8	43.9	30.1	1.66
NP	31.0	14.0	45.7	31.7	1.73
B. Means-tested only	Distribution of λ ($1,000s)				Bang-for-buck
		By income tercile			
	All	1st	2nd	3rd	
HC	36.5	8.7	43.0	60.0	2.23
NSP	31.0	5.6	35.2	54.5	2.07
NP	30.1	4.9	33.6	54.1	2.06

Notes: The first four columns tabulate the distribution of the valuation of the additional $10K subsidy, i.e., λ that satisfies equation (17). The last column tabulates the ratio between the average valuation of the subsidy and the average cost for the subsidy.

The increase in the importance of the bequest motive is concentrated among more affluent individuals, so the decrease in λ is most noticeable among the top income tercile, while the decrease is limited for the other two groups.

Table F2: Valuation of additional $10K (per year) subsidies: under the bequest utility function à la Lockwood (2018)

A. Universal subsidy	Distribution of λ ($1,000s)				Bang-for-buck
		By income tercile			
	All	1st	2nd	3rd	
HC	40.8	8.5	90.3	14.6	2.42
NSP	31.1	9.3	68.8	7.9	1.82
NP	38.0	10.0	84.7	10.3	2.22
B. Means-tested only	Distribution of λ ($1,000s)				Bang-for-buck
		By income tercile			
	All	1st	2nd	3rd	
HC	33.2	4.5	54.2	38.8	2.09
NSP	27.5	3.5	44.1	33.6	1.88
NP	27.3	3.6	42.0	35.4	1.85

Notes: The first four columns tabulate the distribution of the valuation of the additional $10K subsidy, i.e., λ that satisfies equation (17). The last column tabulates the ratio between the average valuation of the subsidy and the average cost for the subsidy.

The additional $10K subsidies are still deemed valuable insurance, even under this preference specification. The bang-for-buck (the last column) is well above one for all LTC types and under both public LTCI systems, meaning that the average values of the subsidies are all far above their costs. As in the baseline, the bang-for-buck is the largest for HC, implying that subsidizing HC would be the most efficient way to provide further public insurance against LTC.