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OPTIMAL LONG-TERM CARE PROVISION AND INSURANCE WITH HETEROGENEOUS PREFERENCES AND RISKS



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Optimal Long-Term Care Provision and Insurance with Heterogeneous Preferences and Risks^{*}

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Abstract

We analyze the optimal provision and insurance of long-term care in a context where preferences and risks vary across individuals. We combine a survey experiment conducted with 3,002 people aged 55 to 69 in Quebec with Quebec administrative data on care needs profiles, service provision, and health transitions. Our results suggest that an optimal scheme would reduce co-insurance for institutional care, increase it for home care, and lead to a constrained expansion of home care services. Compared with the current system in Quebec, such a reform would increase the use of home care, triple public spending, and generate a substantial gain in welfare, while highlighting the central role of capacity and labour constraints in the organization of long-term care.

Résumé

Nous analysons l'organisation et l'assurance optimales des soins de longue durée dans un contexte où les préférences et les risques varient d'une personne à l'autre. Nous combinons une expérience de sondage menée auprès de 3 002 personnes âgées de 55 à 69 ans au Québec à des données administratives québécoises sur les profils de besoins, l'offre de services et les transitions de santé. Nos résultats suggèrent qu'un régime optimal réduirait la coassurance en hébergement, l'augmenterait en soins à domicile et entraînerait une expansion contrainte des services à domicile. Par rapport au système actuel au Québec, une telle réforme accroîtrait le recours aux soins à domicile, triplerait les dépenses publiques et générerait un gain important de bien-être pour la population, tout en mettant en évidence le rôle central des contraintes de capacité et de main-d'œuvre dans l'organisation des soins de longue durée.

Mots-clés/Keywords : long-term care, insurance, preferences, risk, supply constraints.

Codes JEL/JEL Codes : H51, I18, J14, J26.

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1 Introduction

Governments around the world face mounting pressures on long-term care services. Population aging fuels long-term care needs as these increase rapidly at older ages (Gruber and McGarry, 2025). Figure 1 shows how the share of the 85+ population in the 65+ population will rise across selected countries by 2055, with some countries doubling in less than 20 years.

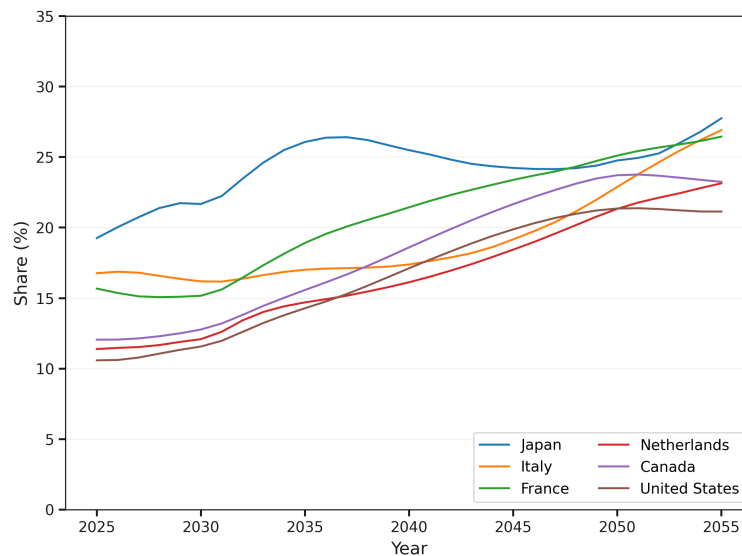


Figure 1: **Population Aged 85 and Over as a Share of the Population Aged 65 and Over:** Projected share of the 85+ population within the 65+ population for selected countries, 2020–2055. Source: United Nations Population Projections.

Long-term care systems vary along several dimensions, including care settings, service bundles, and associated user fees. Spain spends 0.9% of GDP on long-term care compared to 4.1% in the Netherlands (Gruber and McGarry, 2025). A substantial share of long-term care costs is covered by the public sector and some countries invest more heavily in home care than others. Historically, the family has played an important role in long-term care but demographic shifts toward smaller families and changing family values suggest this role may be declining in years to come (Klimaviciute and Pestieau, 2023). Because of mounting pressures, countries around the world are actively reforming their long-term care systems (Gori et al., 2016). Reform is complicated by the heterogeneity of care needs and preferences.

This paper builds an empirically tractable model to evaluate long-term care reform in a world where the population has heterogeneous risks of needing long-term care and preferences for long-term care settings and bundles of services. The model also incorporates rationing constraints in the form of capacity limits on the number of beds and staffing for various types of services. Numerical calibration of the model combines a novel survey experiment and administrative data from Quebec, the second most populous province of Canada. Despite being tailored to the institutional setting in Quebec, the model delivers interesting results relevant to long-term care reform in various countries. In particular, we study how preferences shape optimal insurance and user fees following the standard trade-off between the insurance value of public care and the potential for moral hazard. The model allows us to solve numerically for optimal insurance, accounting for behavioral reactions to incentives and supply constraints (congestion).

Our paper makes three important contributions. First, we offer a model of optimal long-term care (LTC) policy that is tractable, rich in its modelling of care needs, and allows for supply constraints. There is a sizeable theoretical literature on long-term care provision and insurance ([Cremer and Roeder, 2013](#); [Leroux et al., 2021](#)). However, these models have no empirical counterparts with information regarding preferences, risks and the granularity of care options. Furthermore, the current literature does not consider the joint problem of insurance and provision (quantity). Our paper is also related to the literature on long-term care insurance. This literature aims primarily to explain the low take-up of private LTC. Crowd-out from public insurance ([Pauly, 1990](#); [Brown and Finkelstein, 2008](#)), pricing ([Brown and Finkelstein, 2007](#)), adverse selection ([Sloan and Norton, 1997](#)), and information barriers ([Boyer et al., 2020](#)) have all been found to play a role. In this paper, we focus on public LTC while considering cases where purchase of insurance is voluntary, thereby allowing for potential adverse selection (as in [Boyer et al. \(2020\)](#)) and imperfect beliefs about risks (as in [Cremer and Roeder \(2013\)](#)).

Second, we identify a detailed set of preferences for a large cross-section of individuals nearing retirement and therefore potentially needing long-term care in the foreseeable future. Several studies have uncovered a preference for home care in terms of care settings and evidence of nursing home aversion ([Costa-Font, 2017](#); [Lehnert et al., 2018](#); [Kasper et al., 2019](#); [Achou et al., 2026](#)). However, there is little evidence on how those preferences evolve when care needs change (with the notable exception of [Santos-Eggimann and Meylan \(2017\)](#)). Some studies have uncovered variation in preferences based on limitations of activities of daily living or care settings. [Ameriks et al. \(2020\)](#) find that the marginal util-

ity of consumption is higher with ADLs, while others find that it is lower ([Finkelstein et al., 2013](#)). In this paper, we allow preference heterogeneity to vary with our rich definition of care needs and identify a set of preferences over care bundles, care settings, costs, and waiting times. We recover the cross-section of preferences using a multinomial choice model with observed and unobserved heterogeneity in preferences ([Revelt and Train, 2000](#)). Our paper is also related to [Ameriks et al. \(2016\)](#) who investigate the heterogeneity of preferences, how preferences depend on disability, and the implications for long-term care benefit design. While we do not model life-cycle savings, we account for a granular menu of long-term care options. We also account for informal family care by allowing taste shifters to depend on respondents' subjective probability of receiving family help in the future.

Third, we incorporate rich evidence on the heterogeneity of risk profiles for care needs. There is mounting evidence that long-term care risk is very heterogeneous. For example, [Brown and Finkelstein \(2008\)](#) report substantial variation in lifetime risk for the United States. [Hurd et al. \(2017\)](#) find that the lifetime risk of entering nursing homes is substantial yet very different across near retirees, with females facing the highest risk. We also use a very detailed measure of care needs. The modelling literature typically models care needs using a measure of the number of limitations in activities of daily living. For example, [Boyer et al. \(2020\)](#) and more recently [Michaud and St. Amour](#) (forthcoming) model the dynamics in terms of ADL at the individual level in Canada. However, there is no distinction in those measures of cognitive and physical limitations nor do these measures directly map to measures for the intensity of needs in terms of help with nursing, ADL or iADL services. In this paper, we have access to longitudinal data on a much more detailed care needs assessment than what is typically used in the literature. We account for 14 different needs profiles based on a care assessment tool involving a 29-item questionnaire that social workers in Quebec complete annually when interacting with users. We are not aware of other papers using such granular measures of needs. We also compare lifetime risks obtained from these measures with subjective reports of respondents. We document substantial underestimation of the risk of having multiple ADL limitations.

The paper is structured as follows. Section 2 presents the relevant features of the long-term care system in Canada, with particular focus on Quebec. Section 3 presents a model of long-term care provision and insurance. Section 4 presents the survey experiment on preferences and reports preference estimates. Section 5 estimates heterogeneity in risk profiles. Section 6 studies optimal policy using the model. Section 7 concludes.

2 Long-term Care Services in Canada and Quebec

Unlike countries with nationally standardized systems, long-term care in Canada is almost entirely designed, financed, and regulated at the provincial and territorial level. As a result, provinces differ sharply in the availability of institutional beds, the public–private ownership mix of facilities, the generosity of public subsidies, and the organization of home care services (Milligan and Schirle, 2025). The next table shows how the provision of various forms of long-term care (nursing homes and home care) varies across provinces in Canada.¹ Quebec has the lowest number of beds per 1,000 persons aged 65+ (24‰) and a slightly higher share of the 65+ who use home care (7%). Compared to Ontario, the vast majority of nursing homes in Quebec are public.

Jurisdiction	Nursing Homes			Home Care
	Beds per 1000 (65+)	Number of homes	Public own. (%)	Share receiving (% of 65+)
Newfoundland and Labrador	26	40	98	6
Prince Edward Island	39	19	47	–
Nova Scotia	33	84	14	–
New Brunswick	29	70	0	–
Quebec	24	440	88	7
Ontario	30	627	16	4
Manitoba	44	125	57	–
Saskatchewan	47	161	74	–
Alberta	26	186	46	3
British Columbia	28	308	35	3
Canada (total)	29	2076	46	–

Table 1: **Provision of Nursing Homes and Home Care across Canadian Provinces.** The table reports the number of nursing home beds per 1,000 persons aged 65 and over, the total number of facilities, the share of publicly owned facilities, and the share of the 65+ population receiving publicly funded home care, by province. Sources: Canadian Institute for Health Information (2020–2021), I-CLSC database (2020–2021), and Milligan and Schirle (2025). Notes: Own.: Ownership; –: Data not available.

A central feature of the Canadian system is the continued predominance of institutional care in public spending, despite policies intended to favor aging in place. The majority of public long-term care expenditures remain devoted to residential facilities such as

¹We exclude the Northwest Territories, Yukon and Nunavut since these are sparsely populated areas in the Northern region of Canada.

nursing homes, even though most care recipients live in the community. Home care—both paid and unpaid—plays a substantial role, particularly for seniors living outside institutions, but it is characterized by heavy reliance on informal caregivers and significant variation in access and intensity. [Milligan and Schirle \(2025\)](#) show that unpaid family care accounts for a large share of total care hours, while paid home care is more limited and often targeted toward nursing and personal support services. This mix reflects both fiscal constraints and policy choices: home care is generally less comprehensively insured than institutional care, and eligibility, cost-sharing, and service scope differ widely across jurisdictions ([Milligan and Schirle, 2025](#)). There is no integrated data infrastructure in Canada that allows us to exploit this heterogeneity within one framework. We therefore focus on one province, Quebec, which is the second most populous in Canada.

2.1 Care Needs Assessment: SMAFs

The point of entry into the Quebec long-term care system is an evaluation performed to assess care needs, producing so-called SMAF profiles. Classification into these levels is determined by mapping responses to a 29-item evaluation tool that assesses both mental and physical limitations ([Dubuc et al., 2006](#)). Scoring produces an assignment to one of the 14 profiles. Figure [B.1](#) in the appendix provides a detailed mapping of scores to the 14 profiles. Levels 1 to 3 denote minor limitations in either cognitive or mobility functions. Levels 4, 6, and 9 are characterized by predominantly moderate limitations in mobility functions, while levels 5, 7, 8, and 10 are characterized by predominantly moderate limitations in cognitive functions. Finally, levels 11 to 14 denote more severe limitations in either one or both domains, profiles 13 and 14 being for bedridden patients.

Among the population aged 70 and over in 2019, there were 154,900 potential users with SMAF evaluations (13.94% of the total population aged 70 and over). Of these, 39.90% were in profiles 1 to 3 (problems in iADL), 20.01% in profiles 4, 6, and 9 (mobility impairments), 28.53% in profiles 5, 7, 8, and 10 (cognitive impairments), and 11.56% in profiles 11 to 14 (severe disability).

Each profile is associated with hours of care required in three domains: nursing, help with ADLs, and help with iADLs (instrumental activities of daily living such as cleaning and cooking). [Tousignant et al. \(2007\)](#) compute the amount of time required for each profile, a measure of care needs. Table [B.3](#) in the appendix provides these data for all 14 SMAF profiles. Hours of nursing range from 3.25 for profile 1 to 32.48 hours per month

for profile 14. Hours for ADLs range from 8.66 to 90.93, while hours of iADLs range from 18.41 to 63.87 hours per month.

2.2 Care Settings

There are four different care settings. First, care can be received at home. Two different types of providers can offer services at home: public and non-profit. All nursing care is offered by registered nurses in the public sector. Similarly, most ADL and iADL care is provided by the public sector with some significant involvement by non-profit organizations called EESAD (*Entreprise d'économie sociale en aide à domicile*). Services provided by the public sector are free, while those from the non-profit sector are subsidized through a program called PEFSAD (*Programme d'exonération financière pour les services d'aide domestique*). Overall, users pay 34% of the cost of services for ADL and iADL when using non-profits. The use of for-profit care is not well documented and is generally considered marginal in the current environment.²

The second care setting consists of retirement homes where users generally receive care from the public and non-profit sector with the same parameters as those at home. These collective dwellings are privately owned, and users pay for housing and food.

The third type of care setting consists of assisted living facilities. These facilities, called RI (*Ressources intermédiaires*), provide room and board, integrated with constrained nursing, ADL, and iADL care provided by the public sector. They cater to SMAF profiles with moderate limitations. They are privately owned but publicly funded. Users pay fees that represent 21% of costs.

The last type of care setting is nursing homes, called CHSLD (*Centre d'Hébergement et de Soins de Longue Durée*). The vast majority are publicly owned and services are provided by public sector workers. Users pay fees that cover 21% of the costs. The cost to the government of providing one bed in nursing homes is \$98,500 on average, while it is \$67,400 in assisted living facilities, in 2019. Users who cannot pay the user fees in assisted living facilities and nursing homes (i.e., when the fee exceeds their income) have their fees reduced. Hence, user fees are only income-related at very low levels of disposable income.

Hence, home care is provided either in private homes or retirement homes (collective

²One program, the *Cheque emploi service* or CES, offers a subsidy that users can use to purchase ADL and iADL services from any provider. However, that program is small.

dwellings), whereas institutionalized care is provided in either assisted living facilities or nursing homes. Compared to private homes, residential homes allow for economies of scale in providing care as there is limited travel time between users. Compared to nursing homes, assisted living facilities provide more limited services and supervision. However, a stay in an assisted living facility is cheaper.

The next figure shows the distribution of users among the 70+ population across care settings by SMAF profile. Most users in SMAF profiles 1 to 9 are in private homes or retirement homes. Assisted living facilities are more present for profiles 5 to 12. Nursing homes become increasingly prevalent starting at profile 8, but account for the majority of users only at profile 11 and above.



Figure 2: Distribution of Long-term Care Users Across Care Settings by SMAF Profile: Share of Quebec residents aged 70 and over with an active SMAF evaluation (approximately 154,900 individuals in 2019) allocated to each care setting, by SMAF profile (1–14, ordered by increasing care intensity). Care settings are home care (private home), retirement home, assisted living facility, and nursing home. Source: authors’ computations using administrative datasets from the *Ministère de la Santé et des Services sociaux du Québec*.

2.3 Constraints

Over time, there has been a very small increase in the number of nursing home beds despite rapid aging. Although the government is building new beds, it is doing so at a very slow rate. Assisted living facilities are constrained by the number of facility owners willing to sign contracts with the state. Funding for each spot is constrained, and capacity is limited. Both assisted living facilities and nursing home spots are rationed, and long queues have formed for services. For example, the current waiting time for a place in a nursing home in the Montreal region was 8 months in Spring of 2026 according to the website of the Quebec Health Ministry.

For home care, there is also a shortage due to staffing. There is a lack of nurses to meet current demand. Combining SMAF counts with care-need information, we estimate a requirement of 20,300 full-time equivalents (FTEs) in nursing, 45,200 in ADL services, and 64,800 in iADL services. This accounts for the fact that 69% of nurses' time is spent on administrative tasks and commuting when providing care in private homes and 47% in retirement homes.

Contrast this with supply. A total of 1,900 FTE nurses work in home care in the public sector. ADL and iADL staff number 3,800 and 3,200 FTEs, respectively. The average annual number of hours of care provided among public home care users is 7 for nursing, 25 for ADLs, and 19 for IADLs. However, some individuals living at home with identified long-term care needs receive no care from the public sector. When these individuals are included in the analysis, the public home care sector meets 5% of care needs for nursing, 5% for ADLs, and 2% for IADLs. Hence, supply constraints are binding for both institutional capacity and staffing.

3 Model

Consider a model in which I potential users face a risk of being assigned a health profile s in the near future. Profile $s = 0$ denotes that the user has not been assigned an SMAF profile yet. Profiles $s = 1, \dots, 14$ correspond to SMAFs. Users are indexed $i = 1, \dots, I$. Let $\omega_{i,s}$ be the probability of having profile s . Users are heterogeneous in this risk and have income y_i .

For each health profile s , the user chooses among the care settings $j \in J_s$. These settings consist of home care (HC), retirement home (RH), assisted living facilities (AL), and

nursing home (*NH*). Not all care settings are available for each health profile. In keeping with the Quebec LTC system, access to care settings vary across SMAFs. Home care is available across all SMAF levels, while retirement homes are no longer available beyond SMAF 9. Assisted living facilities are available from SMAF 6 to 10, whereas nursing homes are available for SMAF 9 and above. We experiment with this restriction when performing policy analysis.

Care bundles are specific to each care setting j and health profile s . They consist of a vector of hours per month, $\mathbf{h}_s(j) = (h_{N,s}(j), h_{A,s}(j), h_{L,s}(j))$, where each element $k = N, A, L$ corresponds to hours provided for nursing care (N), ADL care (A), and iADL care (L). Services are provided by different workers. Each type of worker has a cost per hour of w_k that is independent of j and s . For each hour of direct care, there is time dedicated to administrative tasks and commuting. Let $\tau_k(j)$ be the load factor applied to hours of direct care, such that $h_{k,s}(j)\tau_k(j)$ is the total time requirement in setting j for service k . There is also a fixed cost specific to a care setting $c_F(j)$. This cost accounts for other expenses as well as the cost of capital in institutionalized care settings (AL and NH).

The total cost of providing a care bundle in setting j for someone with health status s is given by

$$c_s(j) = \sum_k w_k \tau_k(j) h_{k,s}(j) + c_F(j). \quad (1)$$

The cost of a bundle for the user is determined by a co-insurance rate, $\mu(j)$. In the current LTC system, this co-insurance rate is care setting specific. In policy analysis, we will experiment with other forms of co-insurance rates. The out-of-pocket cost (price) of a bundle in setting j for health profile s is

$$p_s(j) = \mu(j) c_s(j). \quad (2)$$

Let $f_i(j)$ be living expenses when living in the community (either HC or RH). Those expenses are zero when in $j = AL, NH$. There is a reduced contribution in institutional care when $p_s(j) > y_i$. In this case, the net price ($p_{i,s}^n(j)$) equals income net of a \$325 consumption allowance,

$$p_{i,s}^n(j) = p_s(j) - I(p_s(j) > y_i)(p_s(j) - (y_i - 325)) \quad j = AL, NH. \quad (3)$$

$I(\cdot)$ stands for the indicator function. Final consumption in any state is $x_{i,s}(j) = y_i - f_i(j) - p_{i,s}^n(j)$.

3.1 Demand

Utility is defined over care bundles and costs. Utility is additive in a deterministic component $V_{i,s}(j)$ and a taste shock $\epsilon_{i,s}(j)$,

$$u_{i,s}(j) = V_{i,s}(j) + \epsilon_{i,s}(j). \quad (4)$$

The deterministic portion of utility may vary by health profile. Also, users may have intrinsic preferences for particular care settings. Hence, we define the deterministic part of utility as

$$V_{i,s}(j) = V_{i,s}(\mathbf{h}_s(j), x_{i,s}(j), r(j), j). \quad (5)$$

Utility is increasing in hours of care, increasing in consumption $x_{i,s}(j)$, and therefore decreasing in the price. The term $r(j)$ captures the waiting time for services, and utility is decreasing in $r(j)$. It will later be used to limit services due to supply constraints in institutional environments $j = (AL, NH)$.

Assume $\epsilon_{i,s}(j)$ is IID extreme value over J_s settings. If the user picks the setting with the highest utility (he observes taste shocks, but we do not), the probability of choosing setting j is given by

$$\pi_{i,s}(j) = \frac{e^{V_{i,s}(j)}}{\sum_{j' \in J_s} e^{V_{i,s}(j')}}. \quad (6)$$

Due to the IID extreme value properties of taste shocks, expected utility for a user with health profile s facing care settings J_s is given by

$$u_{i,s} = \log \left(\sum_{j \in J_s} e^{V_{i,s}(j)} \right) \quad (7)$$

Prior to the realization of the health profile, expected utility is

$$u_i = \sum_s \omega_{i,s} u_{i,s}. \quad (8)$$

3.2 Supply Constraints

There is a fixed number of hours $H(k)$ available for each type of service in residential settings (HC and RH). Staffing in AL and NH is assumed fixed. For settings AL and NH , there are capacity constraints in terms of beds available. Let $B(j)$ be the number of beds available in care options $j = AL, NH$.

The total number of hours that need to be supplied for care service k in home care (either private homes or retirement homes) is given by

$$H_D(k) = \sum_i \sum_s \omega_{i,s} \sum_j \pi_{i,s}(j) \tau_k(j) h_{k,s}(j), \quad k = N, A, L; \quad j = HC, RH \quad (9)$$

The number of beds demanded is

$$B_D(j) = \sum_i \sum_s \omega_{i,s} \pi_{i,s}(j), \quad j = AL, NH. \quad (10)$$

Capacity constraints determine the allocation of users across care settings and the level of care. The two constraints are

$$H_D(k) \leq H(k), \quad k = N, A, L \quad (11)$$

$$B_D(j) \leq B(j), \quad j = AL, NH \quad (12)$$

There are five constraints. The number of beds in institutional settings is constrained by waiting times $r(j)$ for $j = AL, NH$. For other settings, let $n_{k,s}$ be the unconstrained number of hours of service k that experts consider to be needed in health profile s (see Table B.3). Hence, hours provided are given by

$$h_{k,s}(j, r_k) = z_k(j)n_{k,s}. \quad (13)$$

The term $z_k(j)$ is the fraction of needs covered for service k in care setting j . We assume that $z_k(NH) = 1$ and $z_k(AL) = (0.5, 0.9, 0.7)$ for $k = N, A, L$, respectively, based on observed levels. These are exogenous. Instead, we focus on capacity adjustment in home care and residential home care. We assume that $z_k(HC) = z_k(RH) = r_k$ for $k = N, A, L$. The service rate is the same in the two settings. The three supply constraint parameters for hours of care are r_N, r_A, r_L . r_k are constrained to be less than or equal to one. The government controls these service rates indirectly by adjusting the total number of hours available in home care.

Hence, the equilibrium allocation is controlled by constraint parameters

$$\mathbf{r} = (r_N, r_A, r_L, r_{AL}, r_{NH}) \quad (14)$$

There are five parameters for five constraints using the equilibrium conditions for hours and beds.

We account for the fact that adjusting the number of hours in home care requires a labor supply adjustment. Either current workers supply more hours or more workers enter the home care market. We account for the cost of adjustment by allowing labor supply to be imperfectly elastic. Hence, an increase in supply to meet demand needs to be met with an increase in wages. Given collective bargaining in this market, wages adjust not just for marginal workers. There is also an infra-marginal effect of increasing supply: current workers also get paid more.

The literature on the wage elasticity of labor supply in the LTC sector is scarce. [Shields \(2004\)](#) reviews early estimates and concludes that the vast majority of studies estimate a small short-term response, around 0.3. However, the model requires an estimate of the wage elasticity that accounts for workers switching occupations, i.e. entering or exiting

the nursing profession. [Hanel et al. \(2014\)](#) account for these margins of adjustment and report much higher elasticities, around 1.3. We use the same elasticity for workers providing ADL and iADL home care services as we have no evidence on how it may differ from other workers in this market. Hence, we use an inverse elasticity of 0.77. A 10% increase in hours requires a 7.7% increase in wages. We adjust wages for the same workers in institutional settings even if we only vary the number of workers in home care (and residential homes). We do this to preserve wage differentials across settings. If we did not adjust wages, there would be an incentive for workers in institutional settings to migrate to home care when demand increases. By simultaneously adjusting wages in both sectors, we account for the fact that wages would need to rise in institutional settings as well. Conceptually, we assume that the increase in supply comes from other parts of the labor market or from immigration.

3.3 Optimal Insurance and Provision of Care

Define total government cost, G , and required taxes that need to be levied on the population of users, T . Naturally, we aim for $T = G$.

Expenditures are equal to

$$G = \sum_i \sum_s \omega_{i,s} \sum_{j \in J_s} \pi_{i,s}(j) (c_s(j) - p_{i,s}^n(j)) \quad (15)$$

We also add fixed costs in institutional care even when the supply constraint is not binding (beds unoccupied). The tax per user is

$$t = \frac{1}{\sum_i y_i} \sum_i \sum_s \omega_{i,s} \sum_{j \in J_s} \pi_{i,s}(j) (c_s(j) - p_{i,s}^n(j)) \quad (16)$$

Let $(\mu, \mathbf{H}, \mathbf{B})$ be the vector defining policy: co-insurance rates, staff hours in home care, and number of beds. The value of insurance to individual i of system $(\mu, \mathbf{H}, \mathbf{B})$ is given by $\Delta_i(\mu, \mathbf{H}, \mathbf{B})$ defined using

$$u_i(\mu, \mathbf{H}, \mathbf{B}) = u_i(1, \mathbf{H}, \mathbf{B}) \quad (17)$$

where

$$u_i(\mu, \mathbf{H}, \mathbf{B}) = \sum_s \omega_{i,s} \log \left(\sum_{j \in J_s} e^{V_{i,s}(\mathbf{h}_s(j), x_{i,s}(j) - \Delta_i, r(j))} \right). \quad (18)$$

Consumer surplus is

$$CS_i(\mu, \mathbf{H}, \mathbf{B}) = \Delta_i(\mu, \mathbf{H}, \mathbf{B}) - ty_i. \quad (19)$$

Welfare, using a utilitarian criterion, is given by

$$W(\mu, \mathbf{H}, \mathbf{B}) = \sum_i CS_i(\mu, \mathbf{H}, \mathbf{B}). \quad (20)$$

From the planner's perspective, the objective is to maximize $W(\mu, \mathbf{H}, \mathbf{B})$ subject to

$$\sum_i \sum_s \omega_{i,s} \pi_{i,s}(j) \leq B(j), \quad j = AL, NH \quad (21)$$

$$\sum_i \sum_s \omega_{i,s} \sum_{j \in J_s} \pi_{i,s}(j) \tau_k(j) z_k(j) n_{k,s} \leq H(k), \quad k = N, A, L \quad (22)$$

$$t = \frac{1}{\sum_i y_i} \sum_i \sum_s \omega_{i,s} \sum_{j \in J_s} \pi_{i,s}(j) (c_s(j) - p_{i,s}^n(j)). \quad (23)$$

We solve for optimal policy using numerical optimization (Powell NEWUOA algorithm). At each evaluation of the criterion function, we solve for the equilibrium tax rate and impose capacity constraints by finding adjustment parameters that fit the five supply restrictions. Appendix D describes the numerical procedure used for optimization.

4 Preferences

4.1 Survey on Preferences

To measure preferences for care settings and bundle attributes, we conducted a survey experiment in 2023 with 3,002 individuals aged 55 to 69 in Quebec. The questionnaire is divided into three tasks: 1) collecting socio-economic information, 2) a choice experiment, and 3) stated-preference questions on long-term care policy.

Table A.1 in the appendix reports statistics on the socio-economic profile of respondents in terms of gender, age, education, marital status, and family income, alongside statistics from the 2021 Canadian Census for the same age group. Compared to the Census, our sample is similar in terms of age, marital status, and family income but is generally more educated and has a lower proportion of females.

Since we condition preference heterogeneity on education and gender, we do not use weights in estimating preferences. However, we construct weights when performing counterfactuals since maximizing the utilitarian welfare criterion is not invariant to re-weighting. Weights are based on the ratio of cell counts in the Census to counts in the survey. We use 5-year age groups, gender, and education (in three categories: high school or less, college, and university). Weights aggregate up to the number of individuals in Quebec aged 70 and over.

From this first part of the questionnaire, we retain expected family income y_i , expected retirement living expenses f_i , age, and gender.³ We retain information on health status based on reported health conditions and use each respondent’s 3-digit postal code when estimating individual health risk. Finally, we retain two self-reported measures: the subjective probability of living at least one year with at least two ADLs, and the subjective probability of receiving family help if disabled. Table A.2 in the appendix reports descriptive statistics on these variables.

The core of the questionnaire is the choice experiment. The opening screens are designed to explain the experimental context. We assign each respondent a target age at which they evaluate a triplet of care options. We take several steps to ensure respondents understand the scenarios. First, mouse-over tooltips explain potentially technical terms

³We estimated expected living expenses using two survey questions. Respondents first reported their monthly living expenses at the time of the survey. They were then asked how they expect these expenses to change once retired. Expected living expenses were computed by applying the reported percentage change to current expenditures.

in each scenario. Second, we include practice scenarios with three comprehension questions. When answers are incorrect, we provide feedback to help respondents interpret the scenarios correctly. The success rate exceeds 60% (63% and 72%) for two of the three questions, which tested whether respondents understood whether the options covered their care needs. One question had a lower success rate of 36%. This question is less critical, as it tests understanding of specific functional limitations rather than comprehension of the care options themselves, which is central to the choice task.

Each respondent faces four choice situations, each characterized by a SMAF profile. We consulted with a gerontologist to write a vignette, in the form of a table, for each SMAF profile; Appendix B presents an example. To ensure adequate coverage of all 14 SMAF profiles, each respondent sees one profile from each of the four SMAF groups: mild iADL problems, moderate limitations in mobility, moderate limitations in cognition, and severe limitations. One SMAF profile is selected at random within each group.

Each scenario first presents a description of care needs drawn from [Tousignant et al. \(2007\)](#), stating the number of hours of care needed per week. Second, we present a table with three care options whose attributes mirror those in the model. We randomly select three care settings.⁴ We randomize service rates across the three care types (iADL, ADL, and nursing) and apply these to care needs to produce the hours offered in each option.⁵ We produce the out-of-pocket cost ($p_{i,s}^n(j)$) by randomizing a co-insurance rate applied to the full cost $c_s(j)$ and we also randomize waiting times.⁶ A final attribute is the care provider type (public, non-profit, or for-profit), included to test for provider preferences. Respondents then choose one of the three care options. The complete survey instrument is available in Appendix E.

4.2 Specification

We estimate a mixed logit model for these repeated choice situations. Denote by t each choice situation with $t = 1, 2, 3, 4$. In particular, we assume the following functional form

⁴For SMAF profiles below 7, only two care settings could be drawn: home and retirement home. For SMAF profiles of 7 and higher, four care settings could be drawn: home, retirement home, assisted living facility, and nursing home. For these profiles, we ensured that at least one care setting was either an assisted living facility or a nursing home.

⁵Service rates ranged from 10% to 100%, and hours offered were rounded to the nearest 15 minutes.

⁶The co-insurance rate ranged from 5% to 75% for home and retirement home, while the cost was fixed at \$1,700 for assisted living facility and at \$2,500 for nursing home. The cost was rounded to the nearest \$100. Waiting time ranged from zero to four months for home and retirement home, and from zero to sixteen months for assisted living facility and nursing home.

for utility,

$$V_{i,s}(j, t) = \sum_k \alpha_{k,s,i} \log h_{k,s}(j, t) + \alpha_{c,s,i} \log x_{i,s}(j, t) - \alpha_{r,s,i} r(j, t) + \alpha_{j,s,i}(j) + \sum_e \alpha_{e,s,i} d_e(j, t) \quad (24)$$

where $d_e(j, t)$ equals one if supplier e provides services in this care option. Each parameter $\alpha_{m,s,i}$ for attribute m , is specified as

$$\alpha_{m,s,i} = a_i \gamma_{s,m} + v_{s,i,m}, \quad m = j, e \quad (25)$$

and parameter $\alpha_{q,s,i}$ for attribute q , is specified as

$$\alpha_{q,s,i} = \exp(a_i \gamma_{s,q} + v_{s,i,q}), \quad q = k, c, r \quad (26)$$

a_i is a vector of observable preference shifters that includes indicators for impairment types (mobility and cognitive) and demographics (education, gender, self-reported probability of receiving family help). We impose non-negativity on attribute preferences, except for $\alpha_{j,i}(j)$ and $\alpha_{e,i}$, which are left unrestricted. We assume that the unobserved heterogeneity vector v is normally distributed with a diagonal covariance matrix, except for care setting shifters, for which we leave the correlation structure unrestricted. We estimate by maximum simulated likelihood using 100 draws along each dimension per respondent (Train, 2009).⁷ We use the sandwich estimator (Huber-White) for standard errors.

4.3 Results

Table 2 reports parameter estimates along with standard errors. Each row of the table corresponds to a utility attribute: care setting indicators (relative to home care), supplier type indicators (relative to public), hours of care by type (nursing, ADL, iADL), consumption,

⁷For tractability, we excluded respondents with annual or expected family income over \$200,000, and respondents who have a replacement rate at retirement higher than 2 while having a family income over \$50,000, yielding 2,856 respondents. We imputed missing values for expected family income (38% missing), probability of getting help from family if disabled (18% missing), and expected living expenses (17% missing). For expected family income and expected living expenses, we used truncated regression with reported income or expenses ranges when available; for other variables, we used standard regressions.

and waiting time. Columns represent the elements of the vector γ_q in the parameterization: the first column is the constant (baseline preference), and the remaining columns capture the effect of observable preference shifters. In the appendix, Table C.8 presents parameter estimates for unobserved heterogeneity.

Consider first the direct preference for care settings. Individuals with mild impairments (only iADL) generally prefer home-based care to other settings, as found in the literature (Costa-Font, 2017; Lehnert et al., 2018; Kasper et al., 2019; Achou et al., 2023). When more severe impairments (mobility and cognitive) are present, the preference for home care relative to institutional settings (whether assisted living or nursing homes) is weaker. Hence, respondents do not appear to have an unconditional preference for home care when care needs become more severe, as found by Santos-Eggimann and Meylan (2017). Some factors increase the preference for institutional settings. First, the preference for home care is stronger when the family is likely to help with ADLs (i.e., institutional settings become less attractive). These results suggest that informal care complements home care but substitutes for institutional care, thus increasing the relative value of home-based options. Santos-Eggimann and Meylan (2017) also found evidence of a higher preference for home care in the presence of informal care in the form of an able-bodied spouse. Females have a stronger preference for institutional settings relative to home care, and education does not generate significant heterogeneity in care setting preferences. The latter finding diverges somewhat from Kasper et al. (2019), who found that higher education is associated with a stronger preference for institutional settings. This difference is likely because these authors relied on descriptive statistics that do not separate the direct preference for a care setting from the indirect effect through hours of care offered. Our results show that more educated individuals have a higher valuation of care hours, and institutional settings generally offer more complete care than is obtained in home care. Once this channel is accounted for, the apparent preference for institutional settings among the more educated is consistent with our estimates.

We uncover a weak preference for public over private care suppliers, though this holds only for males. Generally, provider type has little effect on choices. For that reason, the equilibrium model abstracts from modelling interactions between suppliers.

	Constant	Mobility Impairments	Cognitive Impairments	Help from relatives ADL	Female	Education Level College	University
Care settings (Ref.: Home care)							
Retirement home	-0.937*** (0.104)	0.348*** (0.066)	0.596*** (0.073)	-0.416*** (0.126)	0.089 (0.085)	-0.057 (0.098)	-0.220** (0.105)
Assisted living	-1.029*** (0.344)	0.261*** (0.187)	1.188*** (0.280)	-0.868*** (0.300)	0.584*** (0.206)	-0.168 (0.246)	-0.097 (0.262)
Nursing home	-2.548*** (0.324)	1.136*** (0.168)	1.576*** (0.227)	-1.134*** (0.302)	0.371* (0.202)	-0.062 (0.241)	0.268 (0.265)
Suppliers (Ref.: Public)							
Private	-0.188** (0.091)	0.071 (0.069)	-0.021 (0.071)	-0.079 (0.108)	0.150** (0.073)	0.098 (0.086)	0.064 (0.090)
NPO	-0.071 (0.095)	0.034 (0.073)	-0.071 (0.073)	-0.062 (0.111)	0.121* (0.074)	0.081 (0.087)	0.048 (0.092)
Care types							
Nursing	-3.305*** (0.609)	-0.412 (0.252)	-0.803** (0.336)	1.079*** (0.320)	0.309 (0.240)	0.488 (0.372)	1.075*** (0.399)
ADL	-2.920*** (0.488)	0.070 (0.275)	-0.361 (0.274)	0.021 (0.403)	0.613* (0.335)	-0.132 (0.507)	0.660 (0.431)
iADL	-2.526*** (0.333)	-0.303* (0.184)	-0.511** (0.214)	0.485** (0.239)	0.302 (0.188)	0.703** (0.292)	0.893*** (0.289)
Consumption							
	-2.140*** (0.417)	0.127 (0.231)	-0.085 (0.302)	0.357 (0.432)	0.286 (0.296)	-0.372 (0.350)	-0.631* (0.373)
Waiting time							
	-1.455*** (0.824)	-0.312 (0.310)	0.566 (0.743)	-0.115 (0.583)	1.017** (0.512)	-1.405 (1.093)	0.142 (0.434)
Observations	2856						

Table 2: Mixed Logit Parameter Estimates with Observed Heterogeneity: Parameter estimates and standard errors (in parentheses) from the mixed logit model of preferences for long-term care settings and services (2,856 observations). Each row of the table corresponds to a utility attribute: care setting indicators (relative to home care), supplier type indicators (relative to public), hours of care by type (nursing, ADL, iADL), consumption, and waiting time. Columns represent the elements of the vector γ_q in the parameterization: the first column is the constant (baseline preference), and the remaining columns capture the effect of observable preference shifters—indicators for mobility and cognitive impairments, the subjective probability of receiving help from relatives for ADLs, gender (female), and education level (college and university, relative to high school or less). Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Regarding the quantity of care received (hours), we uncover a marginal valuation that decreases with impairment severity. Both nursing and iADL care appear to be complements to informal family ADL help, while formal ADL care is a substitute (not statistically significant). [Bonsang \(2009\)](#) found that iADL care is a substitute for formal care but that nursing care is a complement. Differences in our results for iADL care may reflect the fact that we specifically ask about informal care for ADL rather than iADL. One possible explanation is that when informal care substitutes for formal ADL services, individuals reallocate their budget toward formal nursing and iADL care. Females demonstrate higher marginal valuations of care hours, though this is statistically significant only for ADL services. Individuals with university education generally have a higher marginal valuation of hours of care.

While prior studies ([Ameriks et al., 2020](#); [Finkelstein et al., 2013](#)) document conflicting evidence regarding whether ADLs increase or decrease marginal utility of consumption, our results suggest that marginal utility remains relatively constant across SMAF groups (the exponentiated coefficients are close to one for mobility and cognitive impairments). However, individuals with higher education (college or university) exhibit lower marginal utility of consumption, which translates to a higher willingness to pay for care.

Let $\Pr(c_i|\mathbf{x}_i, \alpha_i)$ be the probability of observing the choice sequence c_i for respondent i across the four choice situations, given observed attributes and characteristics $\mathbf{x}_i$ and unobserved heterogeneity α_i . If $F(\alpha_i)$ is the estimated distribution of the unobserved heterogeneity vector and

$$\Pr(c_i|\mathbf{x}_i) = \int \Pr(c_i|\mathbf{x}_i, \alpha_i) dF(\alpha_i) \quad (27)$$

The expected heterogeneity of respondent i by Bayes' Law is

$$E(\alpha_i|c_i, \mathbf{x}_i) = \int \alpha_i \frac{\Pr(c_i|\mathbf{x}_i, \alpha_i)}{\Pr(c_i|\mathbf{x}_i)} dF(\alpha_i) \quad (28)$$

We use these posterior means in simulations, yielding a set of preference estimates α_i for each respondent. Because utility levels are not comparable across individuals, it is useful to express attribute valuations as willingness to pay. [Figure C.2](#) presents the cumulative distribution of willingness to pay for care settings and care types, and [Table 3](#)

reports mean willingness to pay across attributes and SMAF groups.⁸ On average, there is a strong preference for avoiding retirement homes, ranging from a required compensation of \$157 per month to \$1,021.

There is also a strong preference for avoiding nursing homes, except for SMAFs featuring severe limitations, for which the sign flips and respondents are willing to pay more to be in a nursing home, confirming that users do not have an unconditional preference for home care. The willingness to pay for additional hours of care is strongest for nursing care and declines with the severity of the health profile. This likely reflects the fact that users with more severe profiles more frequently choose assisted living or nursing homes (from 13.4% with mobility impairments to 47.0% with severe disability), where the survey provides a 100% service rate; since these users already receive more care at their observed choice, their marginal willingness to pay for an additional hour is lower. The average willingness to pay for those with problems in iADL ranges from \$28.0 for iADL to \$159.5 per month for nursing. Finally, the average willingness to pay to reduce the waiting time by one month ranges from \$16.8 to \$39.4 per month. Figure C.2 shows that there is substantial variation in WTP: some users have an unconditional preference for home care while others favor institutionalized settings.

Figure 3 presents the demand curve for care settings as a function of price (co-insurance rate) and quantity (service rate). Starting from observed levels, we vary both the co-insurance and the service rate and recompute choice probabilities. The demand curve is most price-elastic for institutional settings and less elastic for home care. The price elasticity of demand for home care is -0.31 , similar to the value of -0.39 found by Roquebert and Tenand (2017) but slightly lower than the -0.59 found by Coulibaly et al. (2025). The latter authors estimated the elasticity of demand for iADL care in a given month among individuals who purchased iADL care at some point during the year. This subgroup is likely more price-sensitive than those who never purchased this type of care, potentially overstating the elasticity for the overall population. Nursing home price elasticity estimates ranging from -0.69 to -3.85 have been reported in the literature (Chiswick, 1976; Headen, 1993; Mukamel and Spector, 2002). Our mean price elasticity estimates for assisted living (-1.75) and nursing homes (-2.45) are in the middle of this range. Price elasticity is generally higher for individuals with low disability than for those with severe disability (Reschovsky, 1998; Alders, 2024), consistent with our results.

⁸Means are winsorized, excluding values below the 1st percentile and above the 99th percentile.

	Problems in iADL	Mobility Impar.	Cognitive Impar.	Severe Disability
Care Settings (Ref.: Home Care)				
Retirement Home	-1020.6	-582.4	-477.8	-156.6
Assisted Living	–	-555.6	64.4	312.0
Nursing Home	–	-1075.0	-827.6	116.1
Suppliers				
Private	-97.8	-31.4	-109.1	-43.0
NPO	-7.1	17.1	-59.1	-28.5
Care types				
Nursing	159.5	59.9	35.9	12.4
ADL	45.8	18.6	11.8	4.2
iADL	28.0	11.6	9.9	6.0
Waiting time				
	27.6	16.8	39.4	26.9

Table 3: **Average Willingness to Pay for Attributes by SMAF Group:** Average willingness to pay (dollars per month), derived from the estimated mixed logit model, by attribute and SMAF group (Problems in iADL: profiles 1–3; Mobility impairments: profiles 4, 6, and 9; Cognitive impairments: profiles 5, 7, 8, and 10; Severe Disability: profiles 11–14). For care settings, values represent the monthly compensation required to accept the given setting relative to home care (negative values indicate aversion to that setting). For care types, values represent the willingness to pay for one additional hour of care per month. For waiting time, values represent the willingness to pay to reduce the wait by one month.

The elasticity of demand is a key input in the traditional tradeoff between the insurance motive and moral hazard in an optimal insurance design. If the insurance motive is weak, the stronger price sensitivity in institutional settings suggests that a more efficient design would involve higher co-insurance for institutional care and lower co-insurance for home care, which is consistent with the current design of the Quebec LTC system. However, if the insurance motive is strong, the optimal design may involve more uniform co-insurance across settings to ensure that users with a strong preference for institutionalized care are not underinsured.

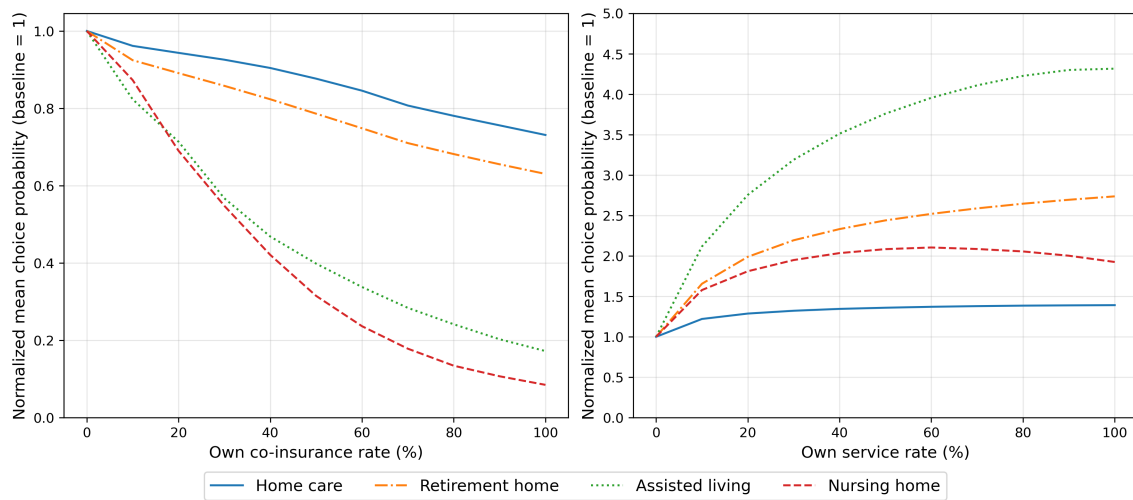


Figure 3: Demand for Care Settings as a Function of Price and Quantity: Mean probability of choosing each care setting (home care, retirement home, assisted living, and nursing home) as a function of the co-insurance rate (price panel) and the service rate (quantity panel), derived from the estimated mixed logit model. Probabilities are normalized to 1 at a co-insurance rate of zero and at a service rate of zero, respectively, to facilitate comparison across settings.

One might be concerned that the preference heterogeneity we uncover reflects noise rather than true underlying differences in preferences. One test we can perform is to compare these measures with direct survey questions on policy preferences. As part of the survey, we asked respondents whether they would support a shift toward more home care, whether they would agree to pay more for home care, and whether nursing homes should be the priority for expanding care. Table 4 reports correlations between willingness to pay measures and responses to these questions. We generally find that our WTP

measures correlate as expected with stated policy preferences.

	Shift HC	Pay More for HC	Priority NH	Should Be HC
Care Settings				
Retirement Home	-0.008	-0.059***	0.035***	-0.063***
Assisted Living	0.008	-0.017	0.064***	-0.013
Nursing Home	0.010	-0.038***	0.064***	-0.020*
Care Types				
Nursing	-0.016	0.034***	0.007	0.003
ADL	-0.006	0.075***	0.018	0.024**
iADL	-0.014	0.052***	-0.001	0.032***
Waiting Time				
	0.010	0.128***	0.006	0.068***

Table 4: **Willingness to Pay: Correlations with Policy Preferences:** Pairwise correlations between estimated willingness to pay for long-term care attributes and measures of stated policy preferences ($n = 2,856$). Columns report correlations with three policy preference survey items: support for shifting towards more home care (Shift HC), willingness to pay more for home care (Pay More for HC), and whether nursing homes should be the expansion priority (Priority: NH or HC). Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

5 Health Risks

To retrieve the distribution of $\omega_{i,s}$, we draw on the *Réseau de services intégrés pour personnes âgées* (RSIPA) database, which contains SMAF profiles for the Quebec 70+ population between 2014 and 2020.⁹ We also account for death, yielding a longitudinal dataset of transitions across all 16 states (profiles 0–14 and death).

We model health transitions as a Markov process, allowing transition matrices to depend on age, gender, health status markers, and income.¹⁰ We estimate separate multinomial logit models for each origin state in year t to one of the 15 destinations (states 0–14

⁹Evaluations are triggered by changes in health rather than recorded annually. We manually impute missing years, assuming profiles do not change between consecutive evaluations. We use state $s = 0$ when the potential user has not yet been evaluated.

¹⁰As health status markers, we use recorded diagnoses for heart disease, lung disease, stroke, diabetes, hypertension, cancer, and mental health problems. Since family income is available in the survey but not in the administrative data, we proxy it with the log average family income of each respondent’s 3-digit postal code from the 2021 Census.

and death).

We then simulate health profiles for each survey respondent using the estimated logits, recording SMAF profiles from each path from age 70 onward.¹¹ Using 5,000 simulated paths per individual, we obtain a distribution of years spent in each SMAF profile and compute $\omega_{i,s}$ for each respondent.

Table 5 presents the average length of stay in each health profile group by sex, income quintile, and health condition status. As expected, higher-income individuals have longer life expectancy and spend more years without care needs, while those with health conditions have lower life expectancy and spend fewer years without care needs. Women live longer on average than men (21.08 versus 18.76 years) but spend relatively more years in more severe care-needs profiles. Table C.4 in the Appendix presents the share of post-70 life spent in each profile group by sex, income quintile, and disease status, which serve as estimates of $\omega_{i,s}$.

Characteristic		No needs	Problems in iADL	Mobility Impair.	Cognitive Impair.	Severe Disability	Total
Sex	Male	16.00	0.51	1.06	0.56	0.63	18.76
	Female	16.67	0.85	1.82	0.76	0.98	21.08
Income Q	1	15.83	0.75	1.39	0.66	0.74	19.37
	2	16.14	0.67	1.37	0.65	0.77	19.60
	3	16.23	0.69	1.51	0.72	0.86	20.01
	4	16.62	0.66	1.49	0.66	0.85	20.28
	5	17.10	0.60	1.48	0.64	0.88	20.70
Hlth Cond.	With	15.51	0.80	1.71	0.84	0.96	19.82
	None	17.18	0.56	1.17	0.49	0.65	20.05
Total		16.34	0.68	1.44	0.67	0.82	19.95

Table 5: Simulated Length of Stay (in Years) in SMAF Groups: Simulated number of years spent in each SMAF profile group from age 70 onward, stratified by gender, income quintile, and health condition status. The Total column reports remaining life expectancy from age 70. Each respondent is simulated 5,000 times using age, gender, income, and health status dependent Markov transition models, assuming no care needs prior to age 70. SMAF groups are defined as: Problems in iADL (profiles 1–3), Mobility Impairment (profiles 4, 6, and 9), Cognitive Impairment (profiles 5, 7, 8, and 10), and Severe Disability (profiles 11–14).

¹¹The maximum age is set to 110.

We elicited respondents’ subjective probability of spending at least one year with two or more ADL limitations and compare this with simulated lifetime SMAF probabilities.¹² Table C.9 in the appendix reports the comparison by gender, income quintile, and health condition status. Subjective probabilities are systematically lower than their objective counterparts, indicating that respondents generally underestimate care risk. The demographic patterns also diverge: females report lower subjective disability risk than males yet face a substantially higher objective risk, and higher-income individuals report higher subjective risk despite having lower objective risk. Only for health conditions do subjective and objective patterns align—those with health conditions correctly estimate a higher disability risk. The objective probability of having any SMAF is approximately 55%, and of having SMAF 4 or above is close to 50%.

6 Optimal Policy

With preference and risk estimates in hand, we turn to optimal policy design. We first present the benchmark calibration of the current system, then solve numerically for optimal insurance and provision under several configurations.

6.1 Benchmark

We calibrate effective co-insurance rates using program parameters and out-of-pocket expenditure data. In home care, the co-insurance rate is 5%, while it is 21% in both assisted living facilities and nursing homes. Home care provision is constrained by available care hours: 257,009 hours per month for nursing, 500,485 for ADL, and 251,062 for iADL. Beds for the 70+ population are set at 9,711 in assisted living facilities and 33,075 in nursing homes. Load factors $\tau_k(j)$ accounting for travel and administrative time are reported in Appendix Table C.5; for example, one hour of direct nursing care in a private home requires 3.3 hours in total, so less than one-third of a nurse’s time is spent on direct care. Wages and fixed costs by care setting and worker type are drawn from administrative records and reported in Appendix Table C.6.¹³ Access to care settings is restricted to mirror the current system: retirement homes are accessible to individuals with SMAF below

¹²ADLs do not map exactly into SMAF profiles; the relevant cutoff likely falls between profiles 1 and 4 based on vignette descriptions. We therefore compare subjective probabilities against both the probability of having any SMAF and the probability of having SMAF 4 or above.

¹³We adjust the sum of weights to match the 1.1 million persons aged 70 and over in Quebec.

9, assisted living to those with SMAF between 6 and 10, and nursing homes to those with SMAF above 8.

Marginal cost per hour of care is reported in Appendix Table C.7 by care type and care setting. Comparing these costs with the distribution of individual willingness to pay (Table 3 and Figure C.2) reveals that most individuals value care below its cost of provision. However, a substantial share of individuals exceeds this threshold in retirement homes for mild incapacities (iADL limitations only): 22.7% for nursing care, 19.6% for ADL care, and 16.9% for iADL care. A similar pattern holds for home care, though the shares are somewhat lower due to higher load factors: 14.1% for nursing care, 17.1% for ADL care, and 16.5% for iADL care. At higher incapacity levels (mobility or cognitive impairments), the considerably lower marginal cost of nursing care in assisted living and nursing homes drives a larger share of individuals above the willingness-to-pay threshold in these settings relative to home care and retirement homes: 10.1% in both institutional settings, compared to 2.2% for home care and 4.9% for retirement homes.

6.2 Optimal Insurance and Provision

Table 6 presents the optimal insurance and provision scheme alongside the benchmark and two alternative scenarios. Under the constrained scenario, bed capacity and service rates are fixed (only co-insurance rates $\mu(j)$ are flexible). Under the elastic scenario, labor supply is perfectly elastic.

Compared with the benchmark, optimal provision increases substantially but unevenly. The nursing care service rate rises eightfold, from 4.8% to 39.2%, while ADL and iADL service rates remain largely unchanged. Bed capacities in assisted living and nursing homes do not increase. The desired expansion of home and retirement home care is dampened by the need to raise wages to attract workers, which is reflected in an equilibrium tax rate more than three times larger than in the benchmark.

Another factor contributing to rising costs is the reduction in co-insurance rates across most care settings (except home care). The optimal co-insurance rate reaches 23.8% in home care, while it falls to 3.2% in retirement homes, 4.6% in assisted living, and 7.3% in nursing homes. The higher wages under the optimal scenario also drive up total bed costs in the institutional sector, requiring lower co-insurance rates to maintain bed occupancy. This mechanism is evident in the constrained scenario, where only co-insurance rates are optimized and home care provision is substantially smaller: in that case, optimal

	Reference	Optimal	Constrained	Elastic
μ_{HC}	0.0500	0.2381	0.0162	0.3198
μ_{RH}	0.0500	0.0316	0.0172	0.0080
μ_{AL}	0.2100	0.0463	0.2758	0.0310
μ_{NH}	0.2100	0.0729	0.1961	0.2092
z_N	0.0475	0.3919	0.0475	1.0000
z_A	0.0500	0.0532	0.0499	1.0000
z_L	0.0219	0.0230	0.0219	1.0000
Beds AL	9711	9730	9711	9738
Beds NH	33075	33112	33075	33282
Tax rate	0.0702	0.2315	0.0707	0.1848
Net CV (1st pct.)	-946	-2337	-950	-1994
Net CV (10th pct.)	-348	-350	-345	-68
Net CV (25th pct.)	-149	-104	-142	61
Net CV (50th pct.)	-8	144	-4	503
Net CV (75th pct.)	137	547	143	1023
Net CV (90th pct.)	273	942	280	1491
Welfare (\$M)	-23.40	258.54	-15.40	721.63
Cost (\$M)	405.83	1339.14	409.06	1068.75

Table 6: **Optimal Provision and Insurance Computation Results:** The first column reports equilibrium outcomes with the current co-insurance rates and constrained provision of care. The second columns reports the results from maximizing welfare (consumer surplus) where number of beds and labor supply (elasticity is set to 1.3) are flexible. The third column shows results where the number of beds and labor supply are fixed (only μ_j are flexible), while the last column sets the elasticity to infinity (perfectly elastic). The first set of results report co-insurance rates by settings: HC home care, RH retirement homes, AL assisted living and NH nursing homes. The second set of results report service rates for each of the type of services in home care (same as in retirement homes). We also report the equilibrium tax rate levied on the 70+ population to fund expenditures. Selected percentiles of the consumer surplus distribution are reported. Welfare corresponds to the weighted sum of consumer surplus in this population while cost provides the public cost estimate (monthly).

co-insurance rates in the institutional sector are considerably higher, reaching 27.6% in assisted living and 19.6% in nursing homes. Meanwhile, the higher home care co-insurance rate reflects the strong preference for that setting at low to moderate disability levels, which creates moral hazard pressure. Ultimately, welfare improves overall and across almost the entire distribution despite rising costs.

The optimal insurance scheme suggest that moral hazard concerns are minimal in setting policy. Despite being more price sensitive, institutional care creates a stronger insurance motive than home care, as users with a strong preference for institutional settings face higher financial risk. The optimal design therefore involves lower co-insurance rates in institutional settings to ensure that these users are adequately insured, while home care has a higher co-insurance rate reflecting its lower insurance value.

Although institutional capacity does not increase, Figure 4 shows that the optimal scheme induces substantial shifts in care choices across SMAF profiles. Relative to the reference scenario (solid bars), the optimal scenario (hatched bars) exhibits a shift from institutional care toward non-institutional care for SMAF profiles 6 to 8, while the pattern reverses from SMAF 9 onward. The expansion of non-institutional care settings therefore appears concentrated in lower SMAF profiles, and is driven primarily by retirement homes. Home care declines at all SMAF levels, by 1.6 to 27.9 percentage points. This reflects the lower markup on care hours in retirement homes ($\tau_k(RH)$) relative to home care, combined with the higher co-insurance rate in home care, both of which make retirement homes more attractive in equilibrium. At higher SMAF levels, however, lower co-insurance in institutional settings dominates, with institutional shares rising by as much as 18.6 percentage points at SMAF 14.

6.2.1 The Labor Market for Home Care

The two alternative scenarios highlight the central role of labor market frictions in shaping optimal policy. With perfectly elastic labor supply, the optimal policy strongly favors expanding home and retirement home care, with service rates reaching 100% for each care type, while institutional care remains important for higher SMAF levels. Figure 5 shows that institutional care disappears below SMAF 9 but increases by 1.1 to 7 percentage points relative to the optimal scheme from SMAF 9 onward. Labor market frictions thus constrain an otherwise more efficient allocation across care settings.

Labor supply elasticity has markedly different effects on co-insurance rates depending

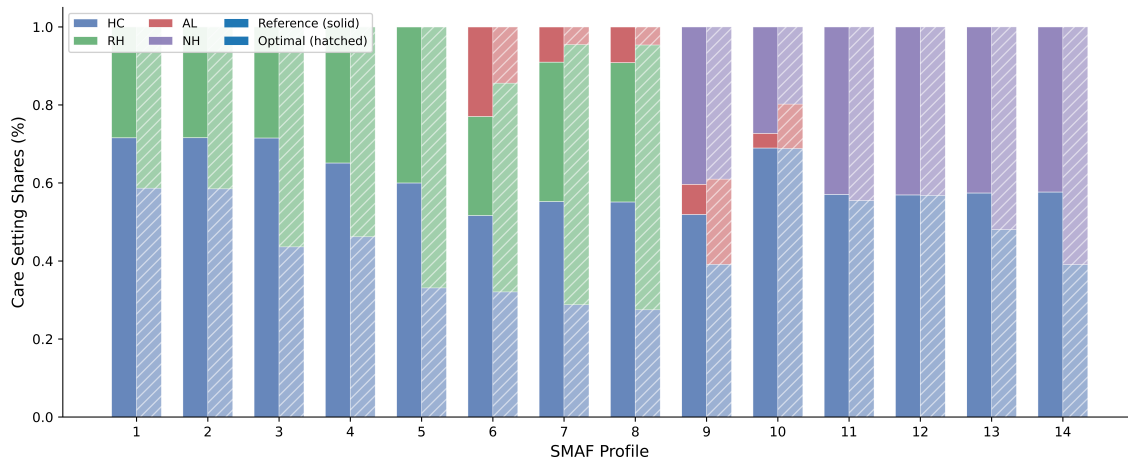


Figure 4: **Care Setting Shares by SMAF Profile: Reference vs Optimal:** Share of users in each care setting by SMAF profile under the reference policy (solid bars) and the optimal policy (hatched bars). Care settings are home care (HC), retirement home (RH), assisted living facility (AL), and nursing home (NH). The figure compares the composition of care settings across profiles (1–14, ordered by increasing care intensity) between the two policy scenarios.

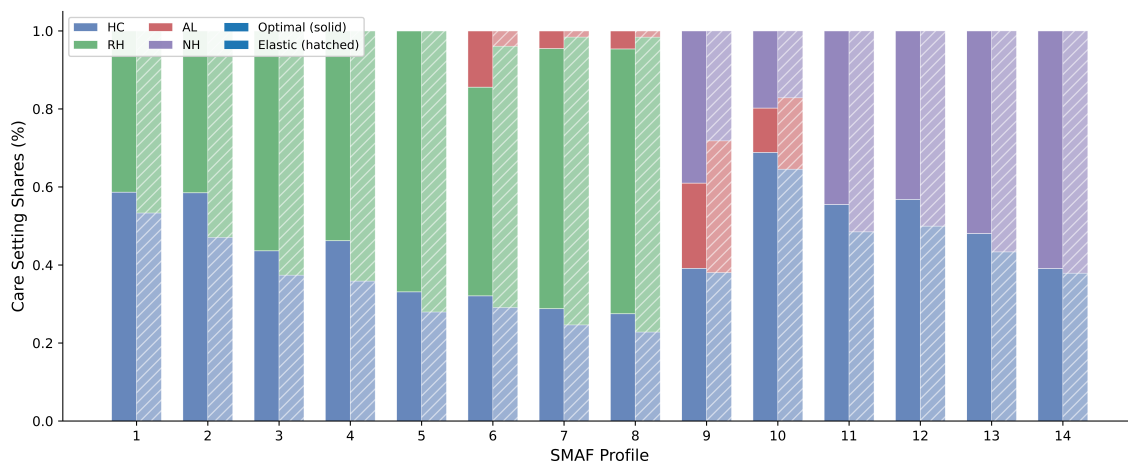


Figure 5: **Care Setting Shares by SMAF Profile: Optimal vs Elastic:** Share of users in each care setting by SMAF profile under the optimal scenario (solid bars) and the elastic scenario (hatched bars) when labor supply is perfectly elastic. Care settings are home care (HC), retirement home (RH), assisted living facility (AL), and nursing home (NH). The figure compares the composition of care settings across profiles (1–14, ordered by increasing care intensity) between the two policy scenarios.

on the care setting. The home care co-insurance rate increases with the wage elasticity, reflecting the greater attractiveness of home care as provision expands. The nursing home co-insurance rate also increases, but for a different reason: as elasticity rises, smaller wage increases suffice to expand home care provision, removing the need to lower co-insurance to maintain bed occupancy. Co-insurance rates for retirement homes and assisted living are relatively unaffected.

Strikingly, the largest welfare gain occurs under perfectly elastic labor supply (\$721.6M vs. \$258.5M) at a lower public cost than under imperfect elasticity, despite service rates reaching 100% across all care types—underscoring how labor market frictions impose a substantial welfare cost on optimal provision.

6.2.2 Heterogeneity in Preferences and Risks

We contrast the optimal scenario with two alternatives: one with homogeneous preferences (average parameters assigned to all) and one with homogeneous risks (average risk profiles assigned to all). Table 7 shows that heterogeneity matters for the co-insurance structure but has limited impact on aggregate welfare. Omitting risk heterogeneity lowers co-insurance rates in institutional settings and raises the nursing care service rate slightly (43.0% vs. 39.2%), with a larger increase in assisted living beds (3.2% vs. 0.2%), at a modestly higher tax rate. Omitting preference heterogeneity shifts co-insurance rates upward for home care (0.2917 vs. 0.2381) and dramatically for assisted living (0.3066 vs. 0.0463), while leaving the tax rate largely unchanged.

6.2.3 Distributional Impacts

Figure 6 shows the distribution of individual changes in consumer surplus under the optimal relative to the reference policy. Overall, 59.3% of respondents gain while 39.9% lose. Losses are small for most of those affected (under 10% of average income), but they indicate that a non-trivial share would not support the optimal policy, which entails higher out-of-pocket costs for some users.

We next ask whether losers differ systematically from winners. Table 8 shows that winners tend to have lower living expenses, higher severe disability risk, and are more likely to be female. Since women have longer expected duration in disability profiles (see Table 5), these results indicate that winners are those more likely to become intensive care users. Winners also appear better able to pay for home care, with similar income but

	Optimal	Homo. Risks	Homo. Prefs
μ_{HC}	0.2381	0.2308	0.2917
μ_{RH}	0.0316	0.0063	0.0018
μ_{AL}	0.0463	0.0074	0.3066
μ_{NH}	0.0729	0.0165	0.0864
z_N	0.3919	0.4299	0.4064
z_A	0.0532	0.0567	0.0638
z_L	0.0230	0.0230	0.0242
Beds AL	9730	10021	9711
Beds NH	33112	33187	33120
Tax rate	0.2315	0.2502	0.2278
CS (1st pct.)	-2337	-1891	-2114
CS (10th pct.)	-350	-210	-193
CS (25th pct.)	-104	-70	-38
CS (50th pct.)	144	277	256
CS (75th pct.)	547	582	597
CS (90th pct.)	942	831	1000
Welfare (\$M)	258.54	351.66	373.26
Cost (\$M)	1339.14	1447.26	1318.05

Table 7: Optimal Insurance and Provision: The Role of Heterogeneity in Preferences and Risks: Comparison of optimal co-insurance rates (μ), service rates (z), institutional bed counts, tax rates, consumer surplus (CS, dollars per month) percentiles, total welfare, and public cost (millions of dollars per month) across three scenarios: the baseline optimal with heterogeneous preferences and risks, an alternative in which all individuals are assigned average risk profiles (Homo. Risks), and an alternative in which all individuals are assigned average preference parameters (Homo. Prefs). See Table 6 for variable definitions and methodology.

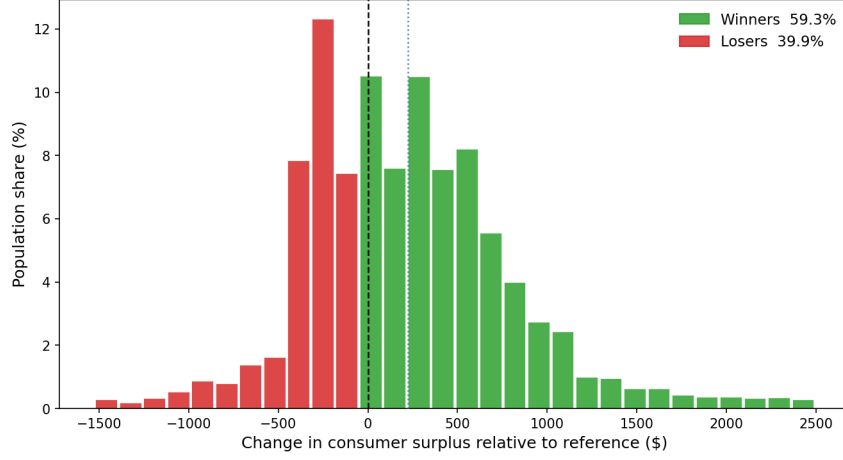


Figure 6: **Distributional Impacts of the Optimal Long-term Care Policy:** Distribution of individual changes in monthly consumer surplus (dollars per month) under the estimated optimal policy relative to the current Quebec long-term care policy (reference), with labor supply elasticity set to 1.3. Approximately 59.3% of respondents experience a welfare gain, while 39.9% experience a loss.

lower living expenses on average. In contrast, Table 9 examines correlations between loser status and preferences or policy opinions. Losers exhibit higher willingness to pay for alternatives to home care and lower disutility from waiting time. No statistically significant correlation emerges for care type preferences or policy opinions.

7 Conclusion

We construct a model of optimal long-term care provision and insurance with rich heterogeneity in care needs, settings, preferences, and risks. Preferences are elicited through a novel survey experiment; risk profiles and institutional details for Quebec are calibrated from administrative data.

The optimal policy favors home care and retirement homes, with expanded nursing care to serve users at low to mid-level disability, while lowering co-insurance rates in assisted living and nursing homes to accommodate those with higher disability. Existing institutional bed capacity proves adequate under the optimal scheme: with greater home and retirement home availability, users are willing to wait longer for an institutional bed. When labor supply is elastic, the optimal policy shifts resources toward expanding

Group	Income	Expenses	$P(\text{SMAF} > 10)$	Age	Female (%)
Winners	4,645 (2,625)	1,279 (930)	0.048 (0.023)	61.9 (4.2)	54.7
Losers	4,486 (4,146)	1,699 (1,408)	0.044 (0.024)	61.8 (4.1)	44.7
All	4,544 (3,335)	1,436 (1,167)	0.046 (0.024)	61.8 (4.2)	50.4

Table 8: **Winners and Losers Characteristics:** Comparison of average characteristics between respondents who gain ($\Delta CS > 0$) and those who lose ($\Delta CS < 0$) under the optimal policy relative to the reference scenario. Table reports monthly family income in retirement (in dollars), monthly living expenses in retirement (in dollars), probability of having severe disabilities, age, and share of women (in percent). Standard deviation are in parentheses.

care hours rather than building new institutional capacity—highlighting that labor market frictions are a binding constraint on optimal provision.

The policy generates welfare gains for the vast majority of users, though a minority lose, particularly those less likely to become intensive care users. Because aggregate surplus is positive, transfers to losers are in principle feasible. However, the optimal policy also entails a substantial increase in public costs, which may be politically challenging. An interesting avenue for future research is to explore the design of second-best policies that balance welfare gains with fiscal constraints, and examine the political economy of reform given the distributional impacts.

	Correlation
A. Preferences	
Care settings	
Retirement Homes	0.088***
Assisted Living	0.077**
Nursing Homes	0.100***
Care types	
Nursing	-0.031
ADL	-0.022
iADL	-0.023
Waiting time	-0.099***
B. Policy Opinions	
Priority to	
Nursing home	-0.018
Home care	0.010
Pay more for home care	-0.036
Shift home care	0.004

Table 9: **Losers: Correlations with Preferences and Policy Opinions:** Pairwise correlations between an indicator for being a loser under the optimal policy ($\Delta CS < 0$) and preference or policy-opinion measures. Panel A reports correlations with expected willingness-to-pay (aggregated using ω) for care settings, care types, and waiting time. Panel B reports correlations with policy-opinion variables (priority to nursing homes or home care, willingness to pay more for home care, and support for shifting toward home care). Positive values indicate that higher values of the attribute are associated with a higher probability of being a loser. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

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A Descriptive Statistics

	Population	Sample
Age	61.75 (4.03)	63.05 (4.12)
Female (%)	50.45	39.73
Marital Status (%)		
Married or Common-Law	66.56	64.87
Widowed, Separated or Divorced	17.97	18.06
Never Married	15.48	17.07
Education (%)		
High School or Less	59.68	30.82
College or Some University	21.31	35.92
Bachelor Degree or More	19.01	33.26
Annual Family Income ('000 \$)	92.33 (65.78)	90.98 (163.73)

Table A.1: **Descriptive Statistics: Quebec Population Aged 55–69 versus Survey Sample:** Means and standard deviations (in parentheses) for key socio-demographic characteristics. The Population column reports 2021 Canadian Census statistics for Quebec residents aged 55–69. The Sample column reports statistics for the 3,002 survey respondents. Annual family income is in thousands of dollars.

	Mean (SD)
A. Income and Expenses when Retired (\$)	
Monthly Income	4,544 (3,335)
Monthly Living Expenses	1,528 (1,347)
B. Health Conditions (%)	
Heart Disease	6.49
Stroke	2.12
Lung Disease	7.64
Diabetes	15.1
Hypertension	28.68
Depression and Other Mental Problems	11.31
Cancer	6.81
C. Subjective Probability (%)	
Living with at Least 2 ADLs	32.94
Getting Help from Family if Disabled	34.49

Table A.2: **Descriptive Statistics: Income, Health Conditions, and Subjective Beliefs:** Sample means and standard deviations (in parentheses) for additional characteristics of the 2,856 observations. Panel A reports expected monthly income and living expenses in retirement (in dollars). Panel B reports the prevalence of each self-reported health condition (in percent). Panel C reports subjective probabilities elicited in the survey (in percent).

B SMAF Profiles

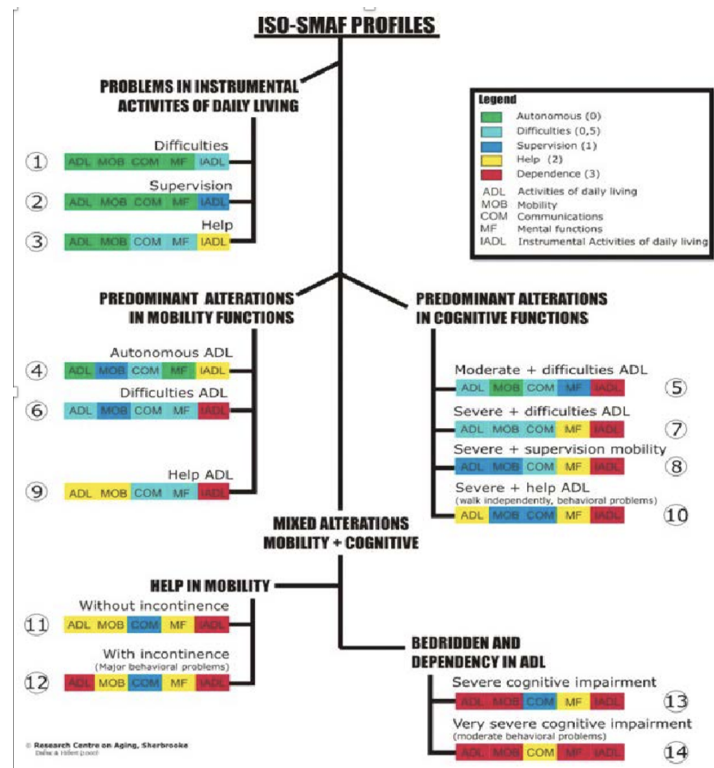


Figure B.1: **SMAF Profiles of Long-term Care Needs:** Classification of care needs into 14 profiles using the Functional Autonomy Measurement System (SMAF), based on a 29-item assessment covering physical and cognitive functioning and social support. Profiles 1–3 correspond to mild iADL limitations; profiles 4, 6, and 9 to moderate mobility limitations; profiles 5, 7, 8, and 10 to moderate cognitive limitations; and profiles 11–14 to severe limitations (including bedridden patients at profiles 13–14). Source: [Dubuc et al. \(2006\)](#).

SMAF	Nursing	ADL	iADL
1	3.25	8.66	18.40
2	3.25	11.91	44.38
3	8.66	15.16	57.37
4	5.41	18.40	53.04
5	9.74	21.65	60.62
6	9.74	28.15	61.70
7	11.91	32.48	61.70
8	12.99	40.05	62.79
9	16.24	66.03	62.79
10	15.16	62.79	62.79
11	17.32	77.94	63.87
12	16.24	76.86	62.79
13	23.82	83.35	63.87
14	32.48	90.93	62.79

Table B.3: **Required Hours of Care Per Month by SMAF Profile and Service Type:** For each of the 14 SMAF profiles, the table reports the standard number of hours of care required per month for nursing care (Nursing), help with activities of daily living (ADL), and help with instrumental activities of daily living (iADL). These estimates are used to calibrate care bundles in the model. Source: [Tousignant et al. \(2007\)](#).

C Additionnal Results

Characteristic		No Needs	Problems in iADL	Mobility Impair.	Cognitive Impair.	Severe Disability
Gender	Male	85.60	2.75	5.33	3.11	3.22
	Female	79.29	4.07	8.33	3.74	4.59
Income Quintile	1	81.99	3.92	6.81	3.60	3.68
	2	82.83	3.44	6.58	3.43	3.72
	3	81.75	3.45	7.07	3.62	4.11
	4	82.67	3.20	6.91	3.25	3.98
	5	82.98	2.87	6.87	3.15	4.14
Health Cond.	With	79.03	4.04	7.92	4.40	4.60
	Without	85.86	2.78	5.74	2.43	3.19
Total		82.41	3.42	6.84	3.43	3.91

Table C.4: **Simulated Probability of Spending Time in SMAF Profile Groups ($\omega_{i,s}$, Percent)**: Share of the period from age 70 onward spent in each SMAF profile group, stratified by gender, income quintile, and health condition status. Each respondent is simulated 5,000 times using age, gender, income, and health status dependent Markov transition models, assuming no care needs prior to age 70. Problems in iADL (profiles 1–3), Mobility Impairment (profiles 4, 6, and 9), Cognitive Impairment (profiles 5, 7, 8, and 10), and Severe Disability (profiles 11–14).

	HC	RH	AL	NH
Nursing	3.2918	1.8987	1.3393	1.3393
ADL	1.6705	1.3852	1.1969	1.1969
iADL	1.2245	1.1977	1.1969	1.1969

Table C.5: **Administrative and Commuting Multipliers (τ) by Care Type and Setting:** For each hour of direct care delivered, τ gives the total worker time required including travel and administrative tasks. Rows correspond to service types: nursing care (Nursing), help with activities of daily living (ADL), and help with instrumental activities of daily living (iADL). Columns correspond to care settings: HC (home care), RH (retirement home), AL (assisted living), NH (nursing home). Values greater than 1 indicate overhead above direct care time. Source: authors' computations from administrative data.

	HC	RH	AL	NH
w_N	65.10	65.10	44.46	44.46
w_A	30.23	30.23	31.38	31.38
w_L	22.15	21.82	24.48	24.48
c_F	561.44	561.44	2306.34	2619.58

Table C.6: **Cost Parameters by Care Type and Setting:** Hourly wage rates (w_k , in dollars per work hour) and monthly fixed costs per user (c_F , in dollars) by care setting. w_N , w_A , and w_L denote wages for nursing care, ADL care, and iADL care, respectively. c_F captures overhead, capital, and other non-labor costs per user per month. Columns correspond to care settings: HC (home care), RH (retirement home), AL (assisted living), NH (nursing home). Source: administrative wage records.

	HC	RH	AL	NH
Nursing	214.30	123.61	59.55	59.55
ADL	50.50	41.87	37.56	37.56
iADL	27.12	26.13	29.30	29.30

Table C.7: **Marginal Cost of Care by Type and Setting:** Marginal cost per hour of care ($w_k \tau_k(j)$, in dollars per hour) by care setting. Rows correspond to service types: nursing care (Nursing), help with activities of daily living (ADL), and help with instrumental activities of daily living (iADL). Columns correspond to care settings: HC (home care), RH (retirement home), AL (assisted living), NH (nursing home). Source: author's computation.

	Care Settings			Suppliers		Care Types			Consump.	Waiting Time
	RH	AL	NH	Private	NPO	Nursing	ADL	iADL		
Care Settings										
RH	1.683*** (0.175)	1.712*** (0.228)	2.485*** (0.27)							
AL	1.712*** (0.228)	3.913*** (0.848)	5.910*** (0.691)							
NH	2.485*** (0.270)	5.910*** (0.691)	9.525*** (1.196)							
Suppliers										
Private				0.095 (0.070)						
NPO					0.025 (0.038)					
Care Types										
Nursing						3.286*** (0.928)				
ADL							2.359** (0.941)			
iADL								2.278*** (0.76)		
Consumption									3.176*** (1.130)	
Waiting time										0.033 (0.084)

Table C.8: **Estimated Variance-Covariance Matrix of Unobserved Heterogeneity:** Estimated variance and covariance parameters of the random coefficients $\nu_{i,q}$ in the mixed logit model, with standard errors (in parentheses). Each entry represents the (co)variance between the unobserved heterogeneity components for the row and column attribute. Notes: RH: Retirement home, AL: Assisted living, NH: Nursing home, NPO: Non-profit organization, Consump.: Consumption. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

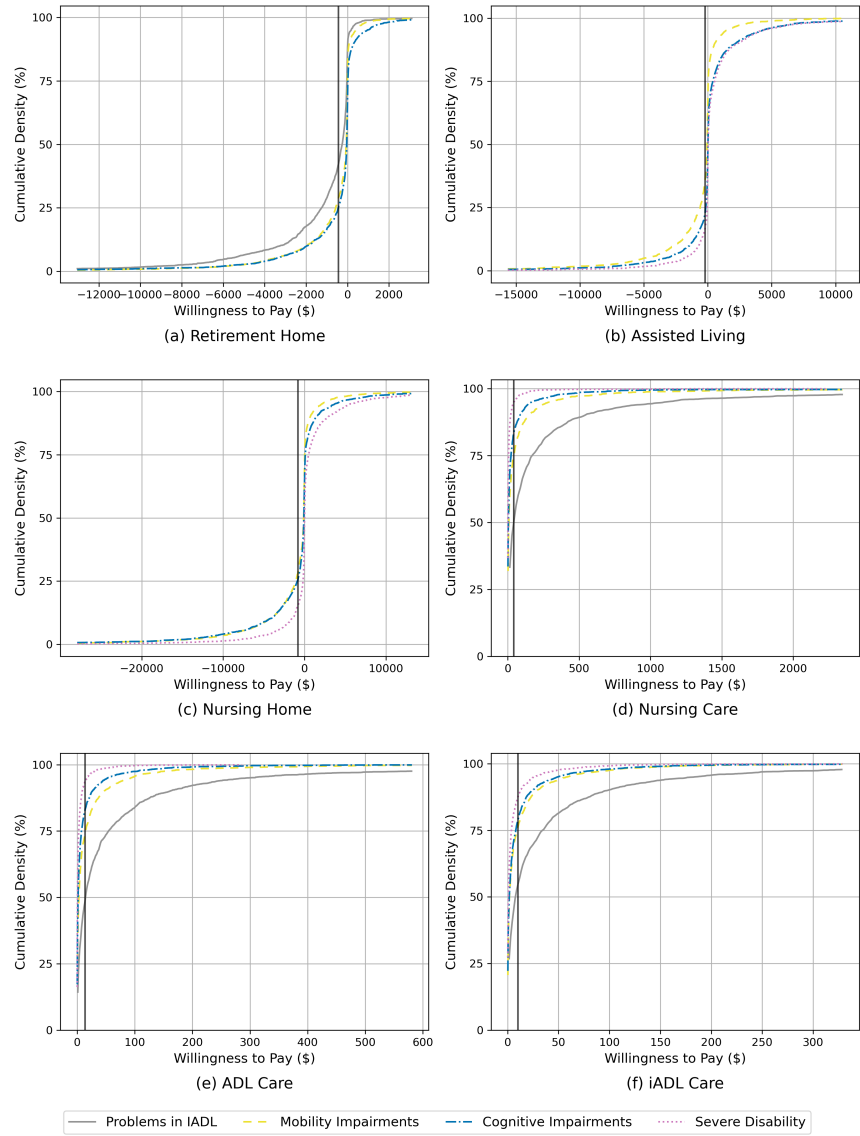


Figure C.2: Cumulative Distribution of Willingness to Pay for Care Settings and Care Types: Cumulative density functions of individual willingness to pay (dollars per month), derived from the estimated mixed logit model for the survey sample ($n = 2,856$). For care settings, willingness to pay represents the monthly compensation required to accept the given setting relative to home care. For care types, it represents the marginal value of one additional hour of care per month. The solid vertical line indicates the average willingness to pay for each attributes.

	Subjective	SMAF Prob.		Difference	
		Any SMAF	SMAF>4	Any SMAF	SMAF>4
Gender					
Male	37.20	49.27	43.44	-12.07	-6.24
Female	33.70	60.59	54.57	-26.89	-20.87
Income Quintiles					
1	33.28	55.55	49.07	-22.27	-15.79
2	36.60	54.35	48.24	-17.75	-11.64
3	37.95	56.13	50.28	-18.18	-12.33
4	34.23	54.59	48.87	-20.36	-14.64
5	35.47	54.06	48.82	-18.59	-13.35
Health Cond.					
With	37.35	60.86	54.96	-23.51	-17.61
Without	33.52	48.98	43.03	-15.46	-9.51
Total	35.49	54.98	49.06	-19.49	-13.57

Table C.9: **Subjective and Objective Lifetime Probability of Disability (Percent):** Comparison of the subjective probability of spending at least one year with two or more ADL limitations against simulated objective lifetime probabilities of having any SMAF profile (Any SMAF) or a SMAF profile of 4 or above (SMAF>4), stratified by gender, income quintile, and health condition status. The Difference columns report the gap between objective and subjective probability (objective minus subjective), with negative values indicating underestimation of risk. Objective probabilities are simulated using 5,000 draws per respondent from age at survey, assuming no care needs prior to age 70.

D Optimization Algorithm

This appendix describes the numerical algorithm used to solve the optimal policy problem stated in Section 3. The policy levers — co-insurance rates, workforce levels, and bed capacity — are chosen to maximize welfare subject to supply and budget constraints.

D.1 Policy Levers

Nine policy levers are collected in a vector $\theta \in \mathbb{R}^9$:

1. **Co-insurance rates** $\mu(j)$ for $j \in \{HC, RH, AL, NH\}$, the share of the bundle cost paid by the user in each of the four care settings (home care, retirement home, as-

sisted living, nursing home). These are parameterized via the logistic transform $\mu_j = \sigma(\theta_j) = 1/(1 + e^{-\theta_j})$ to enforce the unit-interval constraint without bounded optimization.

2. **Workforce expansion** $\delta_k^w = e^{\theta_k}$ for $k \in \{N, A, L\}$: the proportional increase in the supply of each worker type (nursing, ADL, iADL) relative to the baseline level $\bar{H}_k$, so that $H_k = \bar{H}_k(1 + \delta_k^w)$.
3. **Bed capacity expansion** $\delta_j^b = e^{\theta_j}$ for $j \in \{AL, NH\}$: the proportional increase in the number of beds for assisted living and nursing homes relative to baselines $\bar{B}_j$, so that $B_j = \bar{B}_j(1 + \delta_j^b)$.

These reparameterizations allow the use of an unconstrained optimizer while automatically satisfying the economic restrictions on each instrument.

D.2 Welfare Function Evaluation

For a given θ , we evaluate the welfare criterion (Equation 20),

$$W(\theta) = \sum_{i=1}^I w_i [\Delta_i(\theta) - t(\theta) \cdot y_i],$$

in three steps: (1) solve for the constraint clearing parameters $\mathbf{r}$, (2) compute the tax rate t , and (3) compute individual compensating variations Δ_i .

Constraint clearing. Given co-insurance rates $\mu(j)$, workforce $H(k)(1 + \delta_k^w)$, and beds $B(j)(1 + \delta_j^b)$, we solve for the five constraint parameters $\mathbf{r} = (r_N, r_A, r_L, r_{AL}, r_{NH})$ that clear the labor and bed constraints (Equations 9–12).

For the labor constraint, we find service rates $r_k = z_k(HC) = z_k(RH)$ such that aggregate demand for hours $H_D(k)$ (Equation 9) equals supply. Since $H_D(k)$ depends on choice probabilities $\pi_{i,s}(j)$ (Equation 6), which in turn depend on r_k through the care hours $h_{k,s}(j) = r_k n_{k,s}$ (Equation 13), we solve this fixed-point problem by damped iteration:

$$r_k^{(t+1)} = \lambda \cdot \min\left(\max(r_k^{(t)} \cdot H(k)/H_D^{(t)}(k), \epsilon), 1 - \epsilon\right) + (1 - \lambda) \cdot r_k^{(t)}, \quad (29)$$

with damping factor $\lambda = 0.3$, $\epsilon = 10^{-6}$, and convergence tolerance 10^{-10} on $\|\mathbf{r}^{(t+1)} - \mathbf{r}^{(t)}\|_\infty$.

For the bed constraint, if demand $B_D(j)$ (Equation 10) exceeds capacity $B(j)$ for $j \in \{AL, NH\}$, we find the waiting-time r_j that reduces demand to match supply. This is done via Brent’s method on the occupancy residual $B_D(j)/B(j) = \bar{o}$, where $\bar{o}$ is a target occupancy rate (midpoint between a minimum threshold and full occupancy). If demand does not exceed capacity, $r_j = 0$.

Because adjusting r_j for one bed type can affect demand for the other through the choice probabilities $\pi_{i,s}(j)$ (Equation 6), the algorithm iterates between solving for r_{AL} and r_{NH} , re-solving the labor constraint at each step, until both occupancy constraints are simultaneously satisfied.

Expanding the workforce by δ_k^w raises wages through the inverse labor supply elasticity discussed in Section 3. The adjusted wage $\tilde{w}_k = w_k(1 + \delta_k^w/\varepsilon_k)$ enters the cost function $c_s(j)$ (Equation 1), affecting both prices and the government budget.

Tax rate. Given the equilibrium $\mathbf{r}$, we compute government expenditures G (Equation 15), including fixed costs $c_F(j)$ for any unused bed capacity, and obtain the tax rate $t = G/\sum_i w_i y_i$ (Equation 16).

Compensating variation. For each individual i , Δ_i is the income the individual would forgo to remain indifferent between the subsidized policy and the unsubsidized alternative. It solves Equation (17), where expected utility under the policy is given by Equation (18). The root $\Delta_i \in [0, 0.95 y_i]$ is found by Brent’s method. The preference parameters α_i entering the choice probabilities (Equation 6) are obtained from the posterior means (Equation 28) of the mixed logit estimated in Section 4 (Equations 24–26).

D.3 Numerical Implementation

We maximize $W(\theta)$ using NEWUOA (Powell, 2006), a derivative-free trust-region method based on quadratic interpolation, as implemented in the NLOpt library (Johnson, 2024). This method is well-suited because: (i) the objective is not differentiable in closed form (it involves the nested fixed-point and root-finding iterations described above), (ii) the dimension is moderate ($d = 9$), and (iii) function evaluations are expensive. The convergence tolerance on θ is 10^{-5} .

E Survey

GUIDELINES FOR COMPLETING THIS ANONYMOUS QUESTIONNAIRE

CARE PREFERENCES FOR THE MANAGEMENT OF FUNCTIONAL DECLINE

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 included in this questionnaire without any hesitation. We ask, however, that you take the time needed to consider certain questions that might involve concepts with which you are less familiar, or which require more specific information about your situation. Once you have provided an answer and moved on to the next page, you will not be able to go back and change your answer. 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 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 (514) 340-6051 or by email at cer@hec.ca.

Thank you for your valuable cooperation!

Pierre-Carl Michaud
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Background

QA. What is your gender?

- 1 Male
- 2 Female
- 3 I prefer to self-describe
- 8888888 I prefer not to say

QB. How old are you? Please write it in numbers.

Numeric

QC. What are the first three characters of your postal code? Please write it down.

Alpha numeric

8888888 I prefer not to say

Q1. What is the highest certificate, diploma or degree 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 trades 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

Q3. Do you have children?

- 1 Yes
- 2 No

Q4. How far from your home does your nearest child live?

- 1 Less than 5 km
- 2 5 to 25 km
- 3 26 to 99 km
- 4 100 km or more

Q5. How many of your children are girls?
Numeric (0-10)

Q6. Do you own your primary residence?
1 Yes
2 No

Q7. According to your best estimate, what was your **family income** in 2021, **from all sources**, before taxes and deductions?

Numeric (0-9999998)
9999999 Don't know or prefer not to say

Q7a Was it more than \$60,000?
1 Yes
2 No
7777777 Don't know
8888888 I prefer not to say

Q7b Was it less than \$160,000?
1 Yes
2 No
7777777 Don't know
8888888 I prefer not to say

Q7c Was it more than \$90,000?
1 Yes
2 No
7777777 Don't know
8888888 I prefer not to say

Q7d Was it more than \$30,000?
1 Yes
2 No
7777777 Don't know
8888888 I prefer not to say

Q8. According to your best estimate, what was the combined balance of all your savings accounts at the end of 2021 (for instance RRSPs, TFSAs, defined-contribution pension plan)?

Numeric (0-9999998)

9999999 Don't know or prefer not to say

Q8a Was it more than \$100,000?

1 Yes

2 No

7777777 Don't know

8888888 I prefer not to say

Q8b Was it less than \$200,000?

1 Yes

2 No

7777777 Don't know

8888888 I prefer not to say

Q8c Was it more than \$50,000?

1 Yes

2 No

7777777 Don't know

8888888 I prefer not to say

Q8d Was it more than \$25,000?

1 Yes

2 No

7777777 Don't know

8888888 I prefer not to say

Q9. According to your best estimate, what will be your family income when retired (around years old), from all sources, before taxes and deductions?

*Do not take into account the effect of inflation in your answers, imagine **that price increases will be negligible**. Also imagine that **your marital status will not change**.*

Numeric (0-9999998)

9999999 Je ne sais pas ou je préfère ne pas répondre

Q9a Will it be more than \$60,000?

1 Yes

2 No

7777777 Don't know

8888888 I prefer not to say

Q9b Will it be less than \$160,000?

1 Yes

2 No

7777777 Don't know

8888888 I prefer not to say

Q9c Will it be more than \$90,000?

1 Yes

2 No

7777777 Don't know

8888888 I prefer not to say

Q9d Will it be more than \$30,000?

1 Yes

2 No

7777777 Don't know

8888888 I prefer not to say

Q10. Looking at the following list of health conditions, has a doctor ever said you suffered from:

[Check any of:]

1 Heart disease

2 Stroke

3 Lung disease

4 Diabetes

5 Hypertension

6 Depression or other mental health problems

7 Cancer

8 None of the above

Q11. On a scale of 0 to 100, where 0 is absolutely no chance and 100 is absolutely certain, what do you believe is the probability (in %) that you will live **more than 1 year** during your lifetime **with two or more limitations in the following activities?**

- 1) Eating;
 - 2) Washing;
 - 3) Grooming (combing hair, shaving, putting on make-up, nail trimming, etc.);
 - 4) Dressing;
 - 5) Continence (control over your bowels and bladder);
 - 6) Mobility (transfers bed → chair → standing, walking, negotiating stairs).
- Numeric (0-100) 9999999 Don't know or prefer not to say

Q12. On a scale of 0 to 100, where 0 is absolutely no chance and 100 is absolutely certain, what would be the probability (in %) that you would be able to count on substantial help from one or more relatives or close friends to take care of you at least 4 hours a day **if** you had at least two limitations in your activities of daily living ?

Numeric (0-100)
9999999 Don't know or prefer not to say

We would now like to ask you about your current household expenses. Remembering past expenses is never easy; we therefore ask you to give us the best estimate you can make.

Q13. Think about the past 12 months. How much did your household spend in a typical month on all of the following: rent or mortgage payment, heat, electricity, and groceries?

Numeric (0-9999998)
9999999 Don't know or prefer not to say

Q13a Was it more than \$1,500?

- 1 Yes
 - 2 No
- 7777777 Don't know
8888888 I prefer not to say

Q13b Was it less than \$2,000?

- 1 Yes
 - 2 No
- 7777777 Don't know
8888888 I prefer not to say

Q13c Was it more than \$1,000?

1 Yes

2 No

7777777 Don't know

8888888 I prefer not to say

Q13d Was it more than \$2,500?

1 Yes

2 No

7777777 Don't know

8888888 I prefer not to say

Q13e Was it more than \$3,500?

1 Yes

2 No

7777777 Don't know

8888888 I prefer not to say

We would now like to ask you about your **future expenses at the age of years old**. *Do not take into account the effect of inflation in your answers, **imagine that the price increases will be negligible**. Also imagine that **you will still reside in your current residence and your marital status will not change**.*

Q14. According to your best estimate, do you think that at years old, the sum of your expenses for rent or mortgage, heating, electricity and groceries will be:

1 Same as today;

2 Greater than today;

3 Less than today;

9999999 Don't know or prefer not to say

Q14a In your estimation, in total, what do you think these expenses will represent at [] years old compared to today?

1 from 90% to 99% of today's expenses;

2 from 80% to 89% of today's expenses;

3 from 70% to 79% of today's expenses;

4 from 60% to 69% of today's expenses;

5 from 50% to 59% of today's expenses;

6 less than 50% of today's expenses;

7777777 Don't know

8888888 I prefer not to say

Support for Persons Presenting Functional Decline

In Quebec, support for persons presenting functional decline involves cost sharing between the government and users. Users generally pay part of the cost, and this contribution may vary according to the financial capacities of the users. A complex system of providers and care locations supports persons presenting functional decline: there are several living environments, for example the home, seniors' residences (RPA), intermediate resources or CHSLD . Several providers can also provide care and services: the Government of Quebec through its public system , non-profit organizations (NPOs) , and businesses (private for-profit sector).

We would now like to ask you a few questions about your knowledge of support for persons presenting functional decline in Quebec. Please answer the following questions as best you can.

Do you think the following statements are true or false?

Q15. The user does not have to pay any fees to receive home support from the public system .

1 True

2 False

You answered correctly! **At home, the cost of interventions by professionals from the public system is fully covered by the Government of Quebec. On the other hand, services from the public system are generally not sufficient to meet all users' needs.** It is common for relatives or close friends to become caregivers in order to meet some or all of the unmet needs. It is also possible to purchase services from a private company or a non-profit organization . In this case, there are various government support measures to help reduce the net cost of the purchased services (tax credit, service employment paycheck, and Financial Assistance Program for Domestic Services-PEFSAD-).

The correct answer was “True”. **At home, the cost of interventions by professionals from the public system is fully covered by the Government of Quebec. On the other hand, services from the public system are generally not sufficient to meet all users' needs.** It is common for relatives or close friends to become caregivers in order to meet some or all of the unmet needs. It is also possible to purchase services from a private company or a non-profit organization. . In this case, there are various government support measures to help reduce the net cost of the purchased services (tax credit, service employment paycheck, and Financial Assistance Program for Domestic Services-PEFSAD-).

Q16. No contribution is required from the user to reside in a CHSLD.

- 1 True
- 2 False

The correct answer was “False”. In CHSLDs, a contribution is requested from the user, but it can be reduced or even canceled depending on the user's ability to pay.

You answered correctly! In CHSLDs, a contribution is requested from the user, but it can be reduced or even canceled depending on the user's ability to pay.

Q17. Once a professional determines that a person needs to be accommodated in a CHSLD, the waiting time to obtain a place is always less than 30 days.

- 1 True
- 2 False

The correct answer was “False”. The waiting time can vary greatly depending on several factors, in particular the availability of places in CHSLDs in your region. Currently, the waiting period in Quebec can be several months and can even sometimes exceed a year.

You answered correctly! The waiting time can vary greatly depending on several factors, in particular the availability of places in CHSLDs in your region. Currently, the waiting period in Quebec can be several months and can even sometimes exceed a year.

Q18. The terms “housework” and “activities of daily living” are not synonyms. They correspond to different activities.

- 1 True
- 2 False

You answered correctly!

Housework includes the following activities:

- Meal preparation;
- Housekeeping and laundry;
- Groceries;
- Making phone calls;
- Budgeting;
- Medication use;
- Using transportation.

Activities of daily living include the following activities:

- Eating;
- Washing;
- Grooming (combing hair, shaving, putting on make-up, nail trimming, etc.);
- Dressing;
- The ability to control bladder and bowel function (continence).

The correct answer was “True”.

Housework includes the following activities:

- Meal preparation;
- Housekeeping and laundry;
- Groceries;
- Making phone calls;
- Budgeting;
- Medication use;
- Using transportation.

Activities of daily living include the following activities:

- Eating;
- Washing;
- Grooming (combing hair, shaving, putting on make-up, nail trimming, etc.);
- Dressing;
- The ability to control bladder and bowel function (continence).

We are now going to present you with a series of four hypothetical situations in which you could find yourself when you will be years old. It is not pleasant to project yourself into the future in situations of functional decline. But we are interested in the care and service choices you might make in each situation presented.

Before we begin, we will show you **an example of a hypothetical situation**. In this example, **you will not be asked to make any choices**. The objective is to **help you understand** what a hypothetical situation corresponds to and what are the choices of care and services that will be offered to you. On the other hand, following this example, we will ask you some **comprehension questions**, always with the aim of helping you understand what will be asked of you next.

*For each situation, consider **that your marital status will not change until the age of years and that the health status of your spouse will remain similar to what it is today.***

*Also consider that **you will have sufficient financial resources to pay the net price of any option.***

*Do not take into account the effect of inflation in your answers, imagine that **price increases will be negligible.***

*Please provide your preference in each situation **based on the information provided.** Please also consider the possibility that your relatives or close friends might take care of you **if the proposed options do not cover all your needs.***

At years old, imagine that you find yourself in the following situation:

You regularly need help with housework and you need monitoring when you move around and for some activities of daily living.

The following table gives more details about your situation:

Housework (Meal preparation, housekeeping, laundry, groceries, making phone calls, budgeting, medication use, using transports)	Communication (Vision, hearing, speaking) Mental functions (Memory, orientation, comprehension, judgment, behaviour)	Mobility (Transfers bed → chair → standing, walking, negotiating stairs)	Activities of daily living (Eating, washing, grooming, dressing, continence)
• Need help with all housework; • Need assistance to use transport; • Need supervision to use the phone.	• Mild mental function disorders that sometimes require counseling or supervision; • Difficulties seeing and hearing.	• You don't climb stairs anymore; • Need supervision to walk outside; • Difficulties walking indoors.	• Need monitoring with washing and grooming; • Difficulties eating and dressing.

Each week, you need **2 h 15 min of nursing** , **6 h 30 min of help with activities of daily living**, and **14 h 15 min of help with housework** .

In such a situation, you are offered the following care options.

	Option 1	Option 2	Option 3
Living environment	Home	Seniors' residences (retirement home)	CHSLD (nursing home)
Supplier	Non-profit organization (NPO)	For-profit private company	Public system
Nursing , <u>per week</u>	2 h 15	1 h 15	2 h 15
Help with activities of daily living, <u>per week</u>	1 h 45	3 h 15	6 h 30
Help with housework, <u>per week</u>	7 h 00	3 h 30	14 h 15
Waiting time, <u>in months</u>	1	1	4
Net price you pay, <u>per month</u>	\$2,500	\$1,900	\$2,500

After learning about your needs for care and services and the 3 options available to you, you will then be asked to choose one of the three options:

Comprehension questions

Q19. In the situation presented, are you able to prepare your lunch without any help?

1 Yes

2 No

The correct answer was “No”. The hypothetical situation specifies that you need help with all housework activities and meal preparation is one of them.

You answered correctly! The hypothetical situation specifies that you need help with all housework activities and meal preparation is one of them.

Q20. Does option 3 meet all your nursing care in the situation described?

1 Yes

2 No

You answered correctly! Option 3 includes 2 hours and 15 minutes of nursing care and this corresponds exactly to your nursing care needs in the hypothetical situation.

The correct answer was “Yes”. Option 3 includes 2 hours and 15 minutes of nursing care and this corresponds exactly to your nursing care needs in the hypothetical situation.

Q21. Do you cover all of your care and service needs in a seniors' residences (RPA) by paying the net \$1,900 indicated?

1 Yes

2 No

The correct answer was “No”. The living environment with option 2 is a seniors' residence (RPA). In this option, you pay \$1,900 and you only receive part of your needs for nursing care, assistance with activities of daily living and assistance with housework (you receive a total of 8 hours of care and services per week even though you need 23 hours).

You answered correctly! The living environment with option 2 is a seniors' residence (RPA). In this option, you pay \$1,900 and you only receive part of your needs for nursing care, assistance with activities of daily living and assistance with housework (you receive a total of 8 hours of care and services per week while you need 23 hours).

The example is now complete: click here to start with the 1st hypothetical situation

*For each situation, consider that **your marital status will not change until the age of [] years and that the health status of your spouse will remain similar to what it is today.***

*Also consider that **you will have sufficient financial resources to pay the net price of any option.***

*Do not take into account the effect of inflation in your answers, imagine that **price increases will be negligible.***

*Please provide your preference in each of the scenarios presented **based on the information provided.** Please also consider the possibility that your relatives or close friends might take care of you **if the proposed options do not cover all your needs.***

Hypothetical situation 1

Example:

At 85 years old, imagine that you find yourself in the following situation:

[Description of SMAF profile drawn (see complete description examples in section “SMAF Profile Description” below)]

In such a situation, you are offered the following care options.

	Option	Option	Option
Living environment	Home	Seniors' residences (retirement home)	Intermediate resource (assisted living)
Supplier	For-profit private company	Non-profit organization (NPO)	Public system
Nursing, per week	0 h 45	0 h 45	1 h 15
Help with activities of daily living, per week	3 h 45	2 h 15	4 h 15
Help with housework, per week	7 h 00	3 h 30	10 h 00
Waiting time, in months	5	1	2
Net price you pay, per month	\$3,500	\$2,400	\$4,500

Q22. Which of the three options above do you prefer?

- 1 Option 1
- 2 Option 2
- 3 Option 3

Hypothetical situation 2

Q23. Which of the three options above do you prefer?

- 1 Option 1
- 2 Option 2
- 3 Option 3

Hypothetical situation 3

Q24. Which of the three options above do you prefer?

- 1 Option 1
- 2 Option 2
- 3 Option 3

Hypothetical situation 4

Q25. Which of the three options above do you prefer?

- 1 Option 1
- 2 Option 2
- 3 Option 3

Preferences and Opinions

In Quebec, while health care provided by professionals at home is paid for by the public health system, most home care services are provided by external organizations, either for profit or not. Moreover, the Government of Quebec does not meet all the needs of people presenting functional decline who wish to remain at home. A large part of these needs is currently met by informal caregivers, generally by spouses and children. Finally, labour scarcity affects the ability of the government and its external partners to provide services.

Q26. In this context, to what extent do you agree or disagree with the following statement:
“The Quebec government needs to make a shift that will significantly increase the supply of home support services for people presenting functional decline who want to stay at home.”

- 1. Totally agree
- 2. Somewhat agree
- 3. Somewhat disagree
- 4. Totally disagree
- 9999999 Don't know or prefer not to say

Q27. Suppose the government makes a shift to increase the supply of home support services, how should it finance this increase? Please list your choices in order of preference from 1 to 4, with 1 being your first choice and 4 your last choice.

- 9999999
- a. By decreasing other public services
 - b. By raising taxes
 - c. By increasing the share of the total cost paid by users of home support services
 - d. By establishing new contributions from employees and employers paid into a fund dedicated to people presenting functional decline
 - 9999999 Don't know or prefer not to say

Q28. To what extent do you agree or disagree with the following statements: In order to improve the supply of home support services, the health system should promote the use of external partners, more specifically...

Q28a ... non-profit organizations (NPO).

1. Totally agree
 2. Somewhat agree
 3. Somewhat disagree
 4. Totally disagree
- 9999999 Don't know or prefer not to say

Q28b ... for-profit private companies.

1. Totally agree
 2. Somewhat agree
 3. Somewhat disagree
 4. Totally disagree
- 9999999 Don't know or prefer not to say

Q29. In your opinion, which of the following elements should be a priority for the Government of Quebec? Please list your choices in order of preference from 1 to 4, with 1 being your first choice and 4 your last choice. 9999999

- a. Additional investments in long-term care centres, such as increased funding for CHSLDs
 - b. Additional investments in home support services directly funded by the government
 - c. Additional investments in financial aid for home support users in the form of tax credits or direct allowances (e.g. service employment paycheque)
 - d. Additional investments in hospitals
- 9999999 Don't know or prefer not to say

At present, the costs of non-medical support services for housework and for activities of daily living are paid in part by the government and in part by users.

Q30. How should the user-paid portion be calculated?

1. The portion paid by users should be calculated based on the quantity of support received
 2. The portion paid by users should be calculated based on their ability to pay
 3. The portion paid by users should be calculated based on both the quantity of support received and their ability to pay
 4. Other
- 9999999 Don't know or prefer not to say

Q31. In your opinion, by what mechanism should the government pay its share?

1. Users should pay for their services in full and then receive reimbursement from the government (for example, in the form of a tax credit).
2. Users should only pay a fixed hourly rate (e.g. \$4 per hour) and the government should cover the rest of the costs.
3. Users should receive an allowance from the government in the form of a bank of service hours or an amount that they are free to use as they wish.
4. Users should pay for services up to a maximum annual amount beyond which the government would assume the costs.
5. Users should be responsible for saving for the cost of their future needs in a tax-sheltered savings account, to which the government would contribute through grants (for example, as for registered education savings plan (RESP)).

9999999 Don't know or prefer not to say

Q32. If you needed it, would you be willing to pay more out of pocket to receive home support services?

1. Yes
2. No

9999999 Don't know or prefer not to say

SMAF Profile Description

SMAF 1

You have slight difficulties. You occasionally need monitoring and help with housework.

The following table gives more details about your situation:

Housework (Meal preparation, housekeeping, laundry, groceries, making phone calls, budgeting, medication use, using transports)	Communication (Vision, hearing, speaking) Mental functions (Memory, orientation, comprehension, judgment, behaviour)	Mobility (Transfers bed → chair → standing, walking, negotiating stairs)	Activities of daily living (Eating, washing, grooming , dressing, continence)
• Need monitoring and occasional help with home maintenance, shopping and groceries; • Need assistance to use transport; • Difficulties preparing meals and managing the budget.	Not affected	Occasional difficulties for walking outdoors and going up/down stairs.	Difficulty cutting toenails.

Each week, you need **0 h 45 min of nursing, 2 h 00 min of help with activities of daily living, and 4 h 15 min of help with housework.**

SMAF 2

You regularly need help with some housework.

The following table gives more details about your situation:

Housework (Meal preparation, housekeeping, laundry, groceries, making phone calls, budgeting, medication use, using transports)	Communication (Vision, hearing, speaking) Mental functions (Memory, orientation, comprehension, judgment, behaviour)	Mobility (Transfers bed → chair → standing, walking, negotiating stairs)	Activities of daily living (Eating, washing, grooming, dressing, continence)
• Need help with home maintenance, meal preparation, laundry, shopping and groceries; • Need assistance to use transport; • Difficulties with some financial transactions.	Not affected	Autonomous	Autonomous

Each week, you need **0 h 45 min of nursing**, **2 h 45 min of help with activities of daily living**, and **10 h 15 min of help with housework**.

SMAF 3

You regularly need help with several household chores and you have difficulty with certain mental functions.

The following table gives more details about your situation:

Housework (Meal preparation, housekeeping, laundry, groceries, making phone calls, budgeting, medication use, using transports)	Communication (Vision, hearing, speaking) Mental functions (Memory, orientation, comprehension, judgment, behaviour)	Mobility (Transfers bed → chair → standing, walking, negotiating stairs)	Activities of daily living (Eating, washing, grooming , dressing, continence)
• Need help with home maintenance, meal preparation, laundry, and taking medication; • Need help planning shopping and groceries, and doing some major financial transactions; • Need assistance to use transport; • Need supervision to dial phone numbers.	• Minor memory problems with recent events; • Need advice to make decisions.	Autonomous	Difficulties with washing and grooming.

Each week, you need **2 h 00 min of nursing, 3 h 30 min of help with activities of daily living, and 13 h 15 min of help with housework.**

SMAF 4

You regularly need help with several household chores and you have difficulty getting around.

The following table gives more details about your situation:

Housework (Meal preparation, housekeeping, laundry, groceries, making phone calls, budgeting, medication use, using transports)	Communication (Vision, hearing, speaking) Mental functions (Memory, orientation, comprehension, judgment, behaviour)	Mobility (Transfers bed → chair → standing, walking, negotiating stairs)	Activities of daily living (Eating, washing, grooming , dressing, continence)
• Need help with home maintenance, meal preparation, shopping and groceries, laundry, and with some major financial transactions; • Need assistance to use transport; • Difficulties using the phone and taking medication.	Not affected.	• Difficulty walking inside; • Need supervision to walk outside; • Need help going up/down stairs.	Difficulties with washing and grooming.

Each week, you need **1 h 15 min of nursing**, **4 h 15 min of help with activities of daily living**, and **12 h 15 min of help with housework**.

SMAF 5

You regularly need help with most of your housework, you also need monitoring for some activities of daily living, and you have mild problems with several mental functions.

The following table gives more details about your situation:

Housework (Meal preparation, housekeeping, laundry, groceries, making phone calls, budgeting, medication use, using transports)	Communication (Vision, hearing, speaking) Mental functions (Memory, orientation, comprehension, judgment, behaviour)	Mobility (Transfers bed → chair → standing, walking, negotiating stairs)	Activities of daily living (Eating, washing, grooming , dressing, continence)
• Need complete help with most of your housework; • Need assistance to use transport; • Need help using the phone.	• Minor memory problems with recent events; • Difficulty recalling words, names of places or people or things in the house; • Problems orienting oneself in time and space; • Slow to understand explanations; • Problems assessing situations and making the right decisions: need supervision in certain less familiar tasks.	• Difficulty walking outdoors.	• Need monitoring and supervision with washing and grooming; • Difficulty dressing and using the toilet; • Occasional incontinence.

Each week, you need **2 h 15 min of nursing**, **5 h 00 min of help with activities of daily living**, and **14 h 00 min of help with housework**.

SMAF 6

You regularly need help with housework and you need monitoring when you move around and for some activities of daily living.

The following table gives more details about your situation:

Housework (Meal preparation, housekeeping, laundry, groceries, making phone calls, budgeting, medication use, using transports)	Communication (Vision, hearing, speaking) Mental functions (Memory, orientation, comprehension, judgment, behaviour)	Mobility (Transfers bed → chair → standing, walking, negotiating stairs)	Activities of daily living (Eating, washing, grooming, dressing, continence)
• Need help with all housework; • Need assistance to use transport; • Need supervision to use the phone.	• Mild mental function disorders that sometimes require counseling or supervision; • Difficulties seeing and hearing.	• You don't climb stairs anymore; • Need supervision to walk outside; • Difficulties walking indoors.	• Need monitoring with washing and grooming; • Difficulties eating and dressing.

Each week, you need **2 h 15 min of nursing**, **6 h 30 min of help with activities of daily living**, and **14 h 15 min of help with housework**.

SMAF 7

You need complete help with housework, monitoring with activities of daily living and you have moderate problems with mental functions.

The following table gives more details about your situation:

Housework (Meal preparation, housekeeping, laundry, groceries, making phone calls, budgeting, medication use, using transports)	Communication (Vision, hearing, speaking) Mental functions (Memory, orientation, comprehension, judgment, behaviour)	Mobility (Transfers bed → chair → standing, walking, negotiating stairs)	Activities of daily living (Eating, washing, grooming, dressing, continence)
• Need full help with all housework; • Need assistance to use transport.	• Difficulties seeing, hearing, and speaking; • Moderate impairment of all mental functions; • Mild behavioral problems (complaints, mood swings, stubbornness); • Need for ongoing monitoring and supervision.	Difficulty walking outdoors and going up/down stairs.	• Need monitoring and supervision with washing and grooming; • Difficulties eating, and dressing; • Occasional incontinence.

Each week, you need **2 h 45 min of nursing**, **7 h 30 min of help with activities of daily living**, and **14 h 15 min of help with housework**.

SMAF 8

You need complete help with housework and monitoring in carrying out activities of daily living.
You need help with mobility and you have moderate problems with mental functions.

The following table gives more details about your situation:

Housework (Meal preparation, housekeeping, laundry, groceries, making phone calls, budgeting, medication use, using transports)	Communication (Vision, hearing, speaking) Mental functions (Memory, orientation, comprehension, judgment, behaviour)	Mobility (Transfers bed → chair → standing, walking, negotiating stairs)	Activities of daily living (Eating, washing, grooming , dressing, continence)
• Need full help with all housework; • Need assistance to use transport.	• Difficulties seeing and hearing; • Moderate impairment of all mental functions; • Mild behavioral problems (complaints, mood swings, stubbornness); • Need constant monitoring and supervision.	• Need help walking outside; • You no longer use the stairs; • Difficulties walking indoors.	• Need monitoring and supervision with washing and grooming; • Difficulties eating and dressing; • Occasional incontinence.

Each week, you need **3 h 00 min of nursing, 9 h 15 min of help with activities of daily living, and 14 h 30 min of help with housework.**

SMAF 9

You need full assistance with housework, activities of daily living, and mobility. You have mild problems with mental functions.

The following table gives more details about your situation:

Housework (Meal preparation, housekeeping, laundry, groceries, making phone calls, budgeting, medication use, using transports)	Communication (Vision, hearing, speaking) Mental functions (Memory, orientation, comprehension, judgment, behaviour)	Mobility (Transfers bed → chair → standing, walking, negotiating stairs)	Activities of daily living (Eating, washing, grooming, dressing, continence)
• Need help with all housework; • Need adapted transport and help to use it (for example minibus or adapted taxi).	• Difficulties seeing, hearing, and speaking; • Spatial orientation and memory problems. • Slow to understand explanations; • Judgment problems: difficulty evaluating situations and making decisions.	• Need help getting up and going to bed; • You no longer use the stairs and you no longer walk outside; • Wheelchair except for short distances (with help).	• Need help with dressing, washing, grooming, and to use the toilet; • Need supervision when eating and the food must be prepared (example: cut, chopped); • Occasional urinary incontinence.

Each week, you need **3 h 45 min of nursing**, **15 h 15 min of help with activities of daily living**, and **14 h 30 min of help with housework**.

SMAF 10

You need complete help with housework, you need help with activities of daily living, monitoring for mobility, you have significant problems with mental functions, and you have behavior issues.

The following table gives more details about your situation:

Housework (Meal preparation, housekeeping, laundry, groceries, making phone calls, budgeting, medication use, using transports)	Communication (Vision, hearing, speaking) Mental functions (Memory, orientation, comprehension, judgment, behaviour)	Mobility (Transfers bed → chair → standing, walking, negotiating stairs)	Activities of daily living (Eating, washing, grooming , dressing, continence)
• Need full help with all housework; • Need adapted transport (for example minibus or adapted taxi) and assistance (need for help getting in/out of the vehicle).	• Difficulties seeing, hearing, and speaking; • Significant problems with all mental functions; • Behavioral problems that require close monitoring (risk of running away).	• Need help walking outside and using the stairs; • Difficulties walking indoors.	• Need help with dressing, washing, and grooming; • Need assistance or help for eating; • Occasional incontinence; • Need monitoring to use the toilet.

Each week, you need **3 h 30 min of nursing**, **14 h 30 min of help with activities of daily living**, and **14 h 30 min of help with housework**.

SMAF 11

You need full help with housework and activities of daily living, you need help with mobility and you have significant problems with mental functions.

The following table gives more details about your situation:

Housework (Meal preparation, housekeeping, laundry, groceries, making phone calls, budgeting, medication use, using transports)	Communication (Vision, hearing, speaking) Mental functions (Memory, orientation, comprehension, judgment, behaviour)	Mobility (Transfers bed → chair → standing, walking, negotiating stairs)	Activities of daily living (Eating, washing, grooming, dressing, continence)
• Need full help with all housework; • Need adapted transport (for example minibus or adapted taxi) and assistance (need for help getting in/out of the vehicle).	• Difficulty seeing, hearing, and speaking but you can communicate; • Significant problems with all mental functions; • Behavioral problems that require close monitoring.	• Need help getting up and laying down; • Need help walking indoors; • You use a wheelchair pushed by another person; • You no longer walk outside or use the stairs.	• Need full help with bathing, dressing, and grooming; • Need assistance or help for eating; • Occasional incontinence; • Need help to use the toilet.

Each week, you need **4 h 00 min of nursing**, **18 h 00 min of help with activities of daily living**, and **14 h 45 min of help with housework**.

SMAF 12

You need full help with housework, you need help with activities of daily living, monitoring for mobility and you have incontinence issues and serious problems with mental functions.

The following table gives more details about your situation:

Housework (Meal preparation, housekeeping, laundry, groceries, making phone calls, budgeting, medication use, using transports)	Communication (Vision, hearing, speaking) Mental functions (Memory, orientation, comprehension, judgment, behaviour)	Mobility (Transfers bed → chair → standing, walking, negotiating stairs)	Activities of daily living (Eating, washing, grooming , dressing, continence)
• Need full help with all housework; • Need adapted transport (for example minibus or adapted taxi) and assistance (need for help getting in/out of the vehicle).	• Difficulty seeing, hearing, and speaking but you can communicate; • Significant problems with all mental functions; • Behavioral problems that require close monitoring.	• Need help walking outside; • You no longer use the stairs; • Need monitoring to walk indoors.	• Need supervision when eating; • Need help with bathing, dressing, and grooming; • Frequent incontinence (need for diapers).

Each week, you need **3 h 45 min of nursing**, **17 h 45 min of help with activities of daily living**, and **14 h 30 min of help with housework**.

SMAF 13

You need full help with housework and activities of daily living, you need help with mobility and you have serious problems with mental functions.

The following table gives more details about your situation:

Housework (Meal preparation, housekeeping, laundry, groceries, making phone calls, budgeting, medication use, using transports)	Communication (Vision, hearing, speaking) Mental functions (Memory, orientation, comprehension, judgment, behaviour)	Mobility (Transfers bed → chair → standing, walking, negotiating stairs)	Activities of daily living (Eating, washing, grooming, dressing, continence)
• Need full help with all housework; • Need to be transported on a stretcher.	• Difficulty seeing, hearing, and speaking but you can communicate; • Significant problems with all mental functions; • Behavioral problems that require close monitoring.	• You no longer walk; • You use a wheelchair pushed by another person; • To get up and lay down, you require a lift or the help of two people.	• Need full help with eating, bathing, dressing, and grooming; • Total incontinence (need for diapers); • You no longer use the toilet.

Each week, you need **5 h 30 min of nursing**, **19 h 15 min of help with activities of daily living**, and **14 h 45 min of help with housework**.

SMAF 14

You need full help with housework, activities of daily living, and mobility. You have very significant problems with mental functions, your communication skills are severely affected, and you have important behaviour issues.

The following table gives more details about your situation:

Housework (Meal preparation, housekeeping, laundry, groceries, making phone calls, budgeting, medication use, using transports)	Communication (Vision, hearing, speaking) Mental functions (Memory, orientation, comprehension, judgment, behaviour)	Mobility (Transfers bed → chair → standing, walking, negotiating stairs)	Activities of daily living (Eating, washing, grooming , dressing, continence)
• Need full help with all housework; • Need to be transported on a stretcher.	• You are almost blind, have great difficulty hearing and cannot speak; • Very significant problems with all mental functions; • Significant behavioral problems: aggression, shouting, etc.	• You no longer walk; • You are confined to bed or need to use a positioning chair []; • To get up and lay down, you require a lift or the help of two people.	• Need to be fed by another person; • Need full help with bathing, dressing, and grooming; • Total incontinence (need for diapers); • You no longer use the toilet.

Each week, you need **7 h 30 min of nursing**, **21 h 00 min of help with activities of daily living**, and **14 h 30 min of help with housework**.