At home versus in a nursing home: long-term care settings and marginal utility

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Motivation (1)

- Demographic shift in all developed countries in recent decades $\rightarrow$ increased risk of needing LTC at some point in life.
- Key questions for old-age planning and welfare:
  - How much to save?
  - Buy insurance (e.g. long-term care)?
  - Generosity of public programs?

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- Underlying question: optimal allocation of resources across states and age
- Depends on variations of marginal utility by states and age

Motivation (2) -Health-dependent utility

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- Health-state dependent utility:
  - E.g., Finkelstein, Luttmer, and Notowidigdo (2013), Brown, Goda, and McGarry (2015), Ameriks et al. (2020)
  - Here, in case of needing of long-term care (LTC)

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- This paper: **LTC setting matters for marginal utility!**

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$$U'(C, \not{\text{LTC}}) \text{ vs } U'(C, (\text{LTC,NH})) \text{ vs } U'(C, (\text{LTC,HC}))$$

- HC, unlike NH, does not provide basic amenities (room, food, etc.) $\Rightarrow$ More room to spend to improve the quality of life in HC
- Intrinsic higher valuation of spending more under HC than in a NH.

What we do in this paper

1. Estimate marginal value of resources (net of the cost of care) in HC vs NH
2. Evaluate implications for savings
3. Evaluate implications for the valuation of public LTC programs

Why important?

- NH and HC are commonly used when individuals have intensive LTC needs.
- Even before the pandemic, *"institutionalization aversion"* (Costa-Font 2017)
  Pandemic might have increased NH aversion (Achou et al., 2022)
- Policy changes to favor HC. What are the consequences in terms of savings, insurance, public intervention?

Health and LTC-type dependent utility

- When not in need of LTC:

$$\frac{X^{1-1/\theta}}{1-1/\theta}$$

- In need of LTC:

$$\boldsymbol{\eta_j}^{1/\theta}\frac{(X-\kappa_j)^{1-1/\theta}}{1-1/\theta}$$

for $j = HC, NSP, NP$

- Captures differences in minimum costs (κ_j) and marginal utility (η_j).
- κ_j calibrated, and $\{\theta, \eta_j\}$ estimated.

SSQ experiment

$$\max_{\mathbf{x}} \ \pi \times \frac{(W^{\cancel{\text{LTC}}})^{1-1/\theta}}{1-1/\theta} + (1-\pi) \times \boldsymbol{\eta_j}^{1/\theta} \frac{(W^{\text{LTC}} - \kappa_j)^{1-1/\theta}}{1-1/\theta}$$

s.t.

$$W^{\cancel{\text{LTC}}} = W - \mathbf{x} > 0$$

$$W^{\text{LTC}} = \frac{\mathbf{x}}{1-\pi} > \kappa_j$$

- exogenous treatment: LTC mode j
- κ_j, π and W given

Survey data

- Fielded by *AskingCanadians* in December 2020
- Completed by 3,004 Canadians living in Ontario or Quebec, age 50-69
  - Not eligible if currently need LTC
- 6 parts:
  - demographics
  - financial situation
  - risk perceptions
  - preferences → Estimate θ as in Barsky et al. (1997), Ameriks et al. (2020).
  - LTC-type SSQs → **next slides**: estimate the η_j
  - (COVID-related questions)

SSQ on LTC-type dependent utility

Hypothetical situation (extension of Ameriks et al. (2020)):

- 80 years old next year.
- Live alone (outlived the partner if coupled now).
- Uncertainty in health next year:
    - With a 75 percent chance, no need for help with ADLs.
    - With a 25 percent chance, need help with ADLs.
- If in need for LTC, no family care or public subsidy.

SSQ on LTC-type dependent utility

- Treatment: Respondent randomly assigned to a specific care type if LTC needed
  - Home care (HC)
  - Semi-private room in NH (NSP)
  - Private room in NH (NP)
- The minimum costs of care are given, with:

$$\kappa_{NP} = 84K\$ > \kappa_{NSP} = 78K\$ > \kappa_{HC} = 66K\$$$

based on expected cost in the absence of public subsidy (for 2,200 hours of care per year).

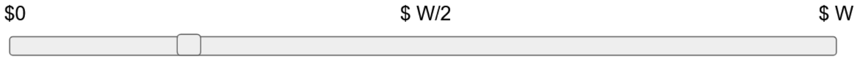
SSQ on LTC-type dependent utility

- Respondents must allocate resources $\$W$, into two lockboxes:
  - A: Pays \$1 per \$1 invested if LTC not needed.

    $\Rightarrow W^{\cancel{\text{LTC}}} =$ amount put in A
  - B: Pays \$4 per \$1 invested if LTC needed.

    $\Rightarrow W^{\text{LTC}} = 4 \times$ amount put in B
- No other money to pay for LTC and non-care consumption.
- Cannot be saved for future; cannot be borrowed from future.
- Asked with two different values of W per respondent.

Plan A	Plan B
\$ W-x for the year (\$ (W-x)/12 per month)	\$ 4*x-κ for the year after having paid for the minimum care you will need at home (\$ (4*x-κ)/12 per month)
You will have the above amount if you do not need help with ADLs	You will have the above amount if you need help with ADLs



Identification

Identification of η_j based on optimality condition:

$$\eta_j = (1-\pi)^\theta \frac{\overbrace{W^{\text{LTC}} - \kappa_j}^{\text{net resources in LTC}}}{\underbrace{W^{\cancel{\text{LTC}}}}_{\text{resources when healthy}}}$$

Table: Net resources in LTC over resources when healthy by LTC type

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

credibility of responses

Parameter estimates

- Estimates without covariates:

θ	η_{HC}	η_{NSP}	η_{NP}
0.186	1.742	1.475	1.446
(0.009)	(0.016)	(0.023)	(0.021)

- Low risk tolerance and higher marginal value of resource under LTC (consistent with Ameriks et al., 2020)

- Significantly higher marginal value of resource under HC than NH

Parameter estimates

Estimates with covariates:

θ	PI 1st tercile	PI 2nd tercile	PI 3rd tercile
Male	**0.27**	**0.17**	**0.24**
Female	**0.18**	**0.08**	**0.15**
η_{HC}	PI 1st tercile	PI 2nd tercile	PI 3rd tercile
Male	1.52	1.79	1.70
Female	1.63	1.90	1.82
η_{NSP}	PI 1st tercile	PI 2nd tercile	PI 3rd tercile
Male	1.47	1.44	1.41
Female	1.61	1.59	1.56
η_{NP}	PI 1st tercile	PI 2nd tercile	PI 3rd tercile
Male	1.50	1.50	1.26
Female	1.87	1.88	1.64

Females much more risk averse.

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Females value more resources in LTC.

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High income people value more resources in HC.

Lifecycle model with estimated preferences

Analyse the impacts of preferences for different types of care on savings, given current existing LTC policies.

- Plug in the estimated preferences in a lifecycle model. lifecycle
- Individuals face health and mortality risks (health state transitions calibrated to HRS data).
- Public subsidy determines minimum cost of LTC (κ_j) for households.

$\Rightarrow$ Compare savings of those who plan to use HC vs. NH.

Public subsidy for LTC

- **Baseline: Universal** (but yet partial) public subsidy
  - Subsidy reduces the minimum costs for everyone.
  - Calibrated based on Canada. After subsidy (OOP costs):

    $$\tilde{\kappa}_{HC} = \tilde{\kappa}_{NP} = 23.6K\$ > \tilde{\kappa}_{NSP} = 19.7K\$.$$

    (The first one should be $>$ in reality; taking a conservative view.)
  - Means-tested subsidy if cannot pay the (reduced) minimum costs.

Impact on savings under universal subsidy

Under heterogenous LTC preferences:

Table: Savings by age 66 (in $1,000\$$)

Age 66		By income tercile		
	All	1st	2nd	3rd
HC	321	66	355	557
NSP	285	64	295	514
NP	307	69	340	525

- $\eta_{HC} > \eta_{NP} \Rightarrow$ increase saving by $321/307 - 1 = 4.6\%$
- driven by top PI: $+6.1\%$
- Savings in HC 12,6% higher than NSP as, in addition, $\kappa_{HC} > \kappa_{NSP}$

Public subsidy for LTC

- **Means-tested only**
  - No universal component.
    (Close to what is observed in the US, with Medicaid.)
  - Those not eligible to the means-tested subsidy pay the full cost

$$\tilde{\kappa}_{NP} = \kappa_{NP} = 84K\$$$
$$> \tilde{\kappa}_{NSP} = \kappa_{NSP} = 78K\$ > \tilde{\kappa}_{HC} = \kappa_{HC} = 66K\$.$$

  - Means-tested subsidy
- **Results (in a nutshell):**
  - Generally higher savings because of precautionary motive
  - Impact of preferences on savings more muted because of differences in minimum cost.

Insurance Valuation

Consider providing an additional subsidy of $10K per year for each type of LTC

We calculate the wealth transfer $\boldsymbol{\lambda}$ such that

$$\underbrace{V_j(W + \boldsymbol{\lambda}, \underline{t}, s|g, PI)}_{\text{value function without extra subsidy}} = \underbrace{\widetilde{V}_j(W, \underline{t}, s|g, PI)}_{\text{value function with extra subsidy}}$$

- $\boldsymbol{\lambda}$: valuation of the extra subsidy
- $\underline{t}$: age when individual enters the simulation

Insurance Valuation

Under universal subsidy and heterogenous preferences

Table: Valuation of additional \$10K (per year) subsidies

	Distribution of λ (\$1,000s)				
		By income tercile			
	All	1st	2nd	3rd	Bang-for-buck
HC	52.6	11.5	97.9	41.5	2.98
NSP	42.4	12.6	78.4	30.5	2.35
NP	49.0	13.4	92.9	33.6	2.72

Valuation under Means-tested only

Robustness

- above results robust to:
  - alternative bequest motives calibration (Lockwood)
  - homogenous preferences
  - at age 76
- in all specifications: $\eta_{HC} > \eta_{NSP},\ \eta_{NP} \Rightarrow$ significantly increase savings and valuation of subsidies in HC
- shift from NH to HC does not necessarily increase savings however: depends on relative public subsidies in different care settings

Conclusion

- The effect of the care setting on marginal utility has not yet been addressed in the literature.
  $\rightarrow$ This paper seeks to fill this gap.

- We design strategic survey questions eliciting the marginal value of consumption beyond the minimum cost of care across different health states and care settings.

- We find:
  1. Marginal utility is significantly higher in HC than in a NH, but no difference between marginal utility between NP and NSP.
  2. Optimal savings are higher for those who plan on using home care.
  3. Higher marginal utility of spending under HC translates to a higher valuation of a subsidy for HC than for NH.

Credibility of responses

- Internal consistency: correlation for ratio in previous table is 0.53.
- Confirm that hypothetical situation well understood.
- Ask 5 comprehension test questions, over maximum of 2 rounds.
- Distribution of scores:

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

back

Life-cycle model back

Preferences

- **If alive:**

$$\text{Flow utility:} \quad I_{s=ADL}U_j(X) + I_{s=G,B}U(X)$$

with $j = HC,\ NSP,\ NP$ exogenously given for an individual

Preferences vary by gender and income terciles → based on our estimates

- **If dead**:

$$\text{Bequest utility:} \quad U^{Beq}(W_{Beq}) = \eta_{Beq}{}^{1/\theta} \frac{(W_{Beq} + \kappa_{Beq})^{1-1/\theta}}{1 - 1/\theta}$$

Baseline: Ameriks et al. (2020). Alternative: Lockwood (2018).

Life-cycle model

Budget constraint

$$W' = W - X + (y + rW) - \tau(y + rW) + \Xi_j$$

- Income process (y):
  - Before retirement: $y = \bar{y}$; after retirement: $y = \xi\bar{y}$
  - $\xi \in (0, 1)$ captures the replacement rate of public and private pensions. Calibrated by income tercile.
- Rate on return of saving (r) is set to be 2%.
- Progressive income tax $\tau(\cdot)$ à la Benabou, 2002.
- Ξ_j, a means-tested transfer from the public LTC insurance to ensure that individuals can have a minimum level of expenditure $\underline{X}$.

Life-cycle model

Optimization problem

$$V_j(W,t,s,g) = \max_X I_{s=ADL}U_j(X) + I_{s=G,B}U(X)$$

$$+ \quad \beta E\left\{ \sum_{s'=G,B,LTC} \pi_{ss'}(t,g)V_j(W',t+1,s',g) + \pi_{sD}U_{Beq}(W') \right\}$$

$$s.t. \qquad W' = W - X + (y + rW) - \tau(y + rW) + \Xi_j,\ W' \geq 0.$$

β calibrated to match wealth accumulation observed in the data

Insurance valuation under Means-tested only

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

	Distribution of λ ($1,000s)				
		By income tercile			
	All	1st	2nd	3rd	Bang-for-buck
HC	42.6	5.4	59.2	63.7	2.63
NSP	36.8	4.3	49.6	57.4	2.38
NP	36.3	4.8	47.2	57.9	2.33

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