Late-in-Life Risks and the Under-Insurance Puzzle

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Long Term Care

- Brown Finkelstein (2011)
  - Expenditures on long-term care services in 2004 accounted for 8.5 percent of all health care spending in the United States and about 1.2% of GDP
  - One in three 65-year-olds will eventually enter a care facility
- Private nursing home room averages $84K per year
- Less than 10% of households own LTCI
  - Even in our relatively wealthy population, only 22% own LTCI
Explanations of low insurance holdings

1. People value wealth relatively little in state when need help with activities of daily living (ADLs).
   - Crowding out by public insurance (Pauly (1990))
   - Strong linear bequest motives (Lockwood (2015))

2. There exists a substantial demand for insurance for ADL state that isn’t currently met in the market
   - Underdeveloped market due to product imperfections and failure to insure relevant risk

3. Behavioral resistance
   - Framing; Status quo; etc.
   - Annuity puzzle?
Question

- Room for improvement?
  - Depends on counterfactual demand
  - Can we quantify to what extent these three explanations contribute the low observed demand?
  - Understanding willingness to purchase improved products policy relevant
  - Can not introduce ideal LTCI, requires new methods
Our Approach

- Measure motives and use to predict demand
- Study demand for hypothetical ADL insurance (ADLI)
  - Arrow security that pays out in the state where an individual needs help with ADLs
- Estimating demand
  - Sample: Vanguard Research Initiative
  - Measurement: Estimate individual preferences using SSQs
  - Model: LTC-state dependent utility function (Standard)
The Underinsurance Puzzle

- Result: significantly higher extensive and intensive margin demand for improved product
- Robust to alternative sample and prices
- Reasonable: follows from simple feature of expressed preferences
Beyond the Model

- **Stated Demand**
  - Beshears, Choi, Laibson, Madrian, and Zeldes (2013)
  - Survey demand for product that is identical to modeled
  - Again indicates potential for market expansion
  - Little evidence of market potential for perfect annuities

- **What do we learn from comparing two quantitative demand measures?**
  - Promising indications on missing elements: adverse selection, family motives, and survey response patterns.
ADL Background

- Need long-term care (LTC) if need help with the activities of daily living (ADL)
- ADL include: eating, dressing, bathing, walking across a room, and getting in or out of bed
- In U.S., public provision of long-term care when in need of help with ADL is complicated—LTC is not a typical health expenditure covered by Medicare
- About one third of 65-year-olds will eventually enter a nursing home
Care Choice Can be Very Expensive

Data Source: Genworth Cost of Care Study 2013
Model: Health-dependent Utility Functions

- Healthy or Sick (s=0,1)
  \[ U(c) = \frac{c^{1-\sigma_i}}{1 - \sigma^i} \]

- Need LTC (s=2)
  \[ U(e_{ADL}) = (\theta_{ADL}^i)^{-\sigma_i} \frac{(e_{ADL} + \kappa_{ADL}^i)^{1-\sigma_i}}{1 - \sigma^i} \]

- Bequests (s=3)
  \[ v(b) = (\theta_{beq}^i)^{-\sigma_i} \frac{(b + \kappa_{beq}^i)^{1-\sigma_i}}{1 - \sigma^i} \]
Vanguard Research Initiative (VRI)

- Sample of approximately 9,000 Vanguard clients aged 55+
  - Appropriate sample
  - Same cross-section size as HRS, 4x SCF (for seniors)
  - Surveys linked to Vanguard administrative data
- Individual respondent, but has info on household (oversample singles)
- Not representative sample of US: wealthier, more educated, etc.
- So far, 3 surveys
  1. Wealth, income, expectations
  2. Annuities, LTC, public care, and bequests
  3. Family structure, intervivos transfers, portfolio choice
- http://ebp-project.isr.umich.edu/VRI/
Strategic Survey Questions

- Strategic Survey Questions (SSQs) are designed to provide data on preferences using answers to strongly identifying hypothetical questions

- The structure of SSQs:
  - describe hypothetical environment
  - describe hypothetical state
  - describe hypothetical future
  - describe hypothetical choice set
  - verify understanding
  - record a choice
The Four SSQs

We’ve developed and fielded four types of SSQs:

1. Risk aversion SSQ (BJKS modification)
2. LTC state utility function SSQ
3. Bequest utility function SSQ
4. Public care aversion SSQ

Will now walk through SSQ 3 in detail.
SSQ 3 Word Problem

- Verbal translation of technical maximization aided by pre-pilot cognitive interviews
- Free form pop-up interviews with subset of pilot sample
- Direct and (relatively) simple wording (grade level check)
- Preamble before each SSQ
Allocate wealth between LTC and bequest state

Translate following optimization problem:

\[
\max \left\{ x_1, x_2 \mid x_1 + x_2 = W \right\} \quad \frac{\theta_{ADL}^{\sigma} (x_1 + \kappa_{ADL})^{1-\sigma}}{1 - \sigma} + \frac{\theta_{beq}^{\sigma} (x_2 + \kappa_{beq})^{1-\sigma}}{1 - \sigma}
\]

\[x_1, x_2 \geq 0; \quad x_1 \geq -\kappa_{ADL}; \quad x_2 \geq -\kappa_{beq}.\]

\( W = $100,000 \)
Suppose you are 85 years old, live alone, rent your home, and pay all your own bills. You know with certainty that you will live for only 12 more months and that you will need help with *ADLs for the entire 12 months. You have $100,000 that you need to split into Plan E and Plan F.

- Plan E is reserved for your spending. From Plan E, you will need to pay all of your expenses, including long-term care and any other wants, needs, and discretionary purchases.

- Plan F is an irrevocable bequest.
Here are the rules for this scenario.

- You have no money other than the $100,000.

- Other than Plan E, you have no other resources available to help with your long-term care. You have to pay for any long-term care you may need from Plan E.

- Any money in Plan E that you do not spend cannot be given away or left as a bequest.

- You have full insurance that covers all of your hospital, doctor, and medications, but you have no long-term care insurance.

- There is no public-care option or Medicaid if you do not have enough money to pay for a nursing home or other long-term care.
SSQ 3 (3/3)

Please make your decision on splitting money into Plan E and Plan F by clicking on the scale below. To put more money in Plan E, move the slider to the right. To put more money in Plan F, move the slider to the left. The numbers in the box will change as you move the slider to let you know how much you will have to spend and how much you will leave as a bequest.

Please move the slider to see how it works. When you are ready, place the slider at the split you want and click NEXT to enter your choice.

Plan F
$50,000
You will leave the above amount as an irrevocable bequest.

Plan E
$50,000
You will have the above amount during the next year when you need help with ADLs.
SSQ Responses

- Respondents with
  1. children assign more wealth to bequest
  2. higher reported costs of ADL care assign more to ADL care.

- Other internal and external validity checks in paper
# SSQs and Identification

<table>
<thead>
<tr>
<th>Question</th>
<th>Motives</th>
<th>Scenario Parameters</th>
<th>Preference Parameters</th>
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<tbody>
<tr>
<td>SSQ 1 Lottery over spending</td>
<td>Ordinary consumption</td>
<td>(a) $W = 100K$</td>
<td>$\sigma$</td>
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<td></td>
<td></td>
<td>(b) $W = 50K$</td>
<td></td>
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<tr>
<td>SSQ 2 Allocation between ordinary and ADL</td>
<td>Ordinary consumption</td>
<td>(a) $W = 100K$, $\pi = 0.75$</td>
<td>$\sigma$, $\theta_{ADL}$, $\kappa_{ADL}$</td>
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<tr>
<td>states</td>
<td>and ADL expenditure</td>
<td>(b) $W = 100K$, $\pi = 0.50$</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>(c) $W = 50K$, $\pi = 0.75$</td>
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<tr>
<td>SSQ 3 Allocation between ADL and bequest</td>
<td>ADL expenditure</td>
<td>(a) $W = 100K$</td>
<td>$\sigma$, $\theta_{ADL}$, $\kappa_{ADL}$</td>
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<tr>
<td>states</td>
<td>and bequest</td>
<td>(b) $W = 150K$</td>
<td>$\theta_{beq}$, $\kappa_{beq}$</td>
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<tr>
<td></td>
<td></td>
<td>(c) $W = 200K$</td>
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<tr>
<td>SSQ 4 Indifference between public and private LTC</td>
<td>ADL expenditure</td>
<td>(a) Public Care Available</td>
<td>$\sigma$, $\theta_{ADL}$, $\kappa_{ADL}$</td>
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<tr>
<td></td>
<td>and bequest</td>
<td></td>
<td>$\theta_{beq}$, $\kappa_{beq}$, $\psi_G$</td>
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- Assume additive response error and derive likelihood function
- Estimate preference parameters from SSQ using MLE
Model-implied ADLI Demand

- Used SSQ responses to estimate individual preferences
- Use estimated preferences and risks in life-cycle saving model to recover demand for hypothetical LTC insurance
- Activities of daily living insurance (ADLI)
  - is an Arrow security that pays out in state when need help with ADL
  - is priced to be actuarially fair (conditioning on age, gender, health)
  - has no default risk
  - is inflation protected
The LTCI Puzzle and Preferences

- 66 percent of respondents are predicted to have positive demand for ADLI
- 22 percent of respondents hold private LTCI
- Those predicted to purchase have similar states, different preferences: higher risk aversion, stronger ADL-utility, lower bequest luxury
The LTCI Puzzle Across Wealth and Income

Fraction of respondents with private LTCI and predicted to demand ADLI

Figure: Wealth Quintiles

Figure: Income Quintiles
Robustness of the LTCI Puzzle

The LTCI Puzzle holds with

- Higher return on saving (equivalently 20-30 percent loads)
- Using wealth data to estimate preferences
- In a subsample linked to Vanguard through an employers choice
- When reweighting the sample to match HRS wealthholder statistics

<table>
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<th>% &gt; 0</th>
<th>mean</th>
<th>p5</th>
<th>p10</th>
<th>p25</th>
<th>p50</th>
<th>p75</th>
<th>p90</th>
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<td>66</td>
<td>42,116</td>
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<td>0</td>
<td>0</td>
<td>22,997</td>
<td>65,419</td>
<td>110,436</td>
<td>149,072</td>
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<td><strong>Alt. Estimates</strong></td>
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<td></td>
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<tr>
<td>r = 3%</td>
<td>60</td>
<td>37,311</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>15,440</td>
<td>58,706</td>
<td>106,636</td>
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<td>Wealth</td>
<td>84</td>
<td>91,381</td>
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<td>0</td>
<td>75,803</td>
<td>88,758</td>
<td>110,805</td>
<td>160,386</td>
<td>192,111</td>
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<tr>
<td>Employer</td>
<td>57</td>
<td>27,821</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>12,157</td>
<td>40,097</td>
<td>78,173</td>
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<td>HRS Weighted</td>
<td>53</td>
<td>24,302</td>
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<td>0</td>
<td>0</td>
<td>6,099</td>
<td>33,717</td>
<td>74,786</td>
<td>105,826</td>
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Survey Description of ADLI

Please suppose that you are offered a hypothetical new form of insurance called *ADL insurance with the following features:

- You pay a one-time, nonrefundable lump sum to purchase this insurance.
- If you need help with activities of daily living (*ADLs), you will immediately receive a monthly cash benefit indexed for inflation.
- For each $10,000 you pay for this insurance, you will receive $Y per month indexed for inflation in any month in which you need help with *ADLs.
- The monthly cash benefit is set at the time of purchase and is not dependent on your actual expenses.
- There is no restriction on the use of the insurance benefits. You are free to use benefits in any way you wish: to pay for a nursing home; a nurse to help at home; for some other form of help; or in literally any other way you would like.
- An impartial third party who you trust will verify whether or not you need help with *ADLs immediately, impartially, and with complete accuracy.
- The insurance is priced fairly based on your gender, age, and current health.
- There is no risk that the insurance company will default or change the terms of the policy.
Stated ADLI Demand

- Higher fraction of stated demand than observed holdings suggest
- Poor existing LTCI products partially, not fully, resolve LTCI puzzle

**Figure:** Fraction of Population Owning LTCI: This figure presents various measures of the fraction of the population with positive LTCI ownership. Column 1 is actual holdings of a private LTCI in the sample. Column 2 is stated ADLI demand. Column 3 is the union of private ownership and stated demand. Column 4 is model predicted ADLI demand.
Model-implied vs. Stated ADLI Demand: Intensive Margin

- Sizable intensive margin stated demand for many people
- Higher predicted demand than stated demand

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<tr>
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<th>mean</th>
<th>p5</th>
<th>p10</th>
<th>p25</th>
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<td>22,997</td>
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<td>Stated</td>
<td>6,443</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>6,000</td>
<td>28,000</td>
<td>36,000</td>
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<tr>
<td>Difference</td>
<td>34,814</td>
<td>-17,763</td>
<td>-7,800</td>
<td>0</td>
<td>17,144</td>
<td>60,102</td>
<td>105,105</td>
<td>141,246</td>
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Predictors of the Demand Gap

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<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
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<td>II Transfers</td>
<td>8,638*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>9,703*</td>
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<td></td>
<td>(5,792)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(6,509)</td>
<td></td>
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<tr>
<td>II child</td>
<td>5,669</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3,204</td>
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<tr>
<td></td>
<td>(6,049)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(7,139)</td>
<td></td>
</tr>
<tr>
<td>II Real Estate</td>
<td></td>
<td>-2,424</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-1,446</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>(6,147)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(6,113)</td>
<td></td>
</tr>
<tr>
<td>II College</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>-2,439</td>
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<td></td>
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<td>(5,979)</td>
<td></td>
<td></td>
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<td>(6,152)</td>
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<td>II Comp. Test</td>
<td></td>
<td></td>
<td></td>
<td>-7,208*</td>
<td></td>
<td></td>
<td>-8,037*</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>(5,272)</td>
<td></td>
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<td>(5,334)</td>
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<tr>
<td>II Family Care</td>
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<td></td>
<td>(5,442)</td>
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<td>(5,791)</td>
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<td>II ADL help</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-8,568**</td>
<td></td>
<td>-8,805**</td>
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<td></td>
<td></td>
<td></td>
<td>(5,175)</td>
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<td>(5,163)</td>
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</table>
Conclusion

- LTCI is a large risk for which few insure
- In VRI find high demand for ideal products
  - Market expansion if products improve
- Stated demand also indicates higher demand
  - Market potential not as large as model predicts
- Hints as to next steps
Big Picture

- In a field dominated by counterfactuals, improved measurement is key to advance understanding
  - Requires engineering of new data
  - Quantitative surveys high potential
  - Data and theory should be developed symbiotically