Cognitive Ability and Retiree Health Care Expenditure

Hanming Fang (UPenn and NBER) Lauren Nicholas (Michigan)
Dan Silverman (Michigan and NBER)

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Motivation

- Rising costs of medical care are straining retiree incomes and (public) insurance programs that serve them.
- Medicare spending was 3.2% of GDP in 2008. Total health spending on elderly may be twice that.
- Retirees will increasingly need to accumulate private resources and navigate markets to secure both health and consumption.
- Those efforts to accumulate and navigate face many difficulties
- We focus on one: A deficiency in the cognitive abilities necessary to make effective choices.

Background

- Existing evidence suggests that older people have special difficulty navigating markets for health care and insurance
- Our prior work, Fang, Keane and Silverman (2008), found *advantageous* selection in the Medigap market:
- Advantageous selection in Medigap is importantly explained by cognitive ability.

Research Questions

1. How big is the cross-sectional relationship between cognitive ability and health care expenditure among older Americans?
2. What drives the differences in expenditure by level of cognitive ability/functioning?
3. Are less able people in worse health and, if so, why does this correlation emerge?
4. Are less able people receiving different (more expensive) care and, if so, why does that happen?

Data: The HRS-Medicare Link

- Important recent data innovation.
- Medicare claims data has been linked to responses of thousands of HRS subjects.
- Claims data include summary expenditure files, by category of expenditure, as well as detailed utilization/expenditure records.
- Allows us to connect HRS panel data on cognitive functioning to high quality panel data on large portion of health expenditure among older Americans.

Warning: Results are Very Preliminary

- Access to sensitive Medicare data requires special permissions and data protection plans.
- The process to obtain those permissions took longer than expected.
- Results thus remain preliminary.
- Thank you Professor McGarry!

Research Question 1

- How big is the cross-sectional relationship between cognitive ability and health care expenditure among older Americans?
- Estimate

$$y_{it} = \alpha + \beta_1 f_{1it} + \beta_2 f_{2it} + \mathbf{X}'_{it}\boldsymbol{\beta}_3 + \iota_t + \varepsilon_{it}$$

Question 1: Some Results

Raw correlation is large

	Total Eligible Expenditure b/se	Home Health Expenditure b/se	Skilled Nursing Expenditure b/se
Cog. Factor 1	-938.430***	-123.287***	-133.334***
	(99.61)	(13.75)	(13.77)
Cog. Factor 2	-566.046***	-83.425***	-131.065***
	(103.43)	(18.82)	(24.45)
Observable Health	no	no	no
Education and Household Inc.	no	no	no
Work Status # of Children	no	no	no
Constant Term	3440.543***	45.691	53.628*
	(182.23)	(23.51)	(26.63)
Adj R-squared	0.0214	0.0308	0.0292
N	34535	34535	34535

Research Questions 2-3

- What drives the differences in expenditure by level of cognitive ability/functioning?
- Are less able people in worse health and, if so, why does this correlation emerge?

Question 2: Some Results

Observable health, demographics explain much, but not all, of the raw correlation

	Total Eligible Expenditure b/se	Home Health Expenditure b/se	Skilled Nursing Expenditure b/se
Cog. Factor 1	-240.244*	-32.194*	-43.212**
	(93.54)	(12.54)	(14.07)
Cog. Factor 2	-75.728	-2.786	-49.801*
	(98.82)	(17.38)	(23.75)
Observable Health	yes	yes	yes
Education and Household Inc.	yes	yes	yes
Work Status # of Children	yes	yes	yes
Constant Term	5332.350***	121.927	-36.895
	(468.79)	(73.79)	(83.82)
Adj R-squared	0.1224	0.0897	0.0682
N	34029	34029	34029

Research Question 3

- Why do lower cognitive ability have in, relevant ways, worse observable health?
- Is it due to the coincident decline of general health and cognitive functioning?
- Is it due to persistent heterogeneity in cognitive functioning and differential health investments

Question 3: Some Results

Add fixed effects: Co-incident declines of health and cognition play important role.

	Total Eligible Expenditure b/se	Home Health Expenditure b/se	Skilled Nursing Expenditure b/se
Cog. Factor 1	-450.295***	-30.322	-80.613**
	(109.02)	(23.92)	(24.98)
Cog. Factor 2	-289.224*	-33.284	-93.970**
	(119.60)	(25.68)	(36.39)
Observable Health	yes	yes	yes
Constant Term	607780.296	-84778.275	52735.898
	(386221.98)	(56829.80)	(96883.31)
Adj R-squared	0.0916	0.0521	0.0476
N	34515	34515	34515

Question 3: Some Results

- Do utilization data show the telltales of persistent heterogeneity in cognitive functioning?

Background on Utilization

- *Ambulatory Care Sensitive* (ACS) admissions are hospitalizations that are preventable with better ambulatory care or adherence to care. Examples: complications of diabetes and high blood pressure, pneumonia.
- Acute ACS – better reflect access to care, timely interventions.
- Chronic ACS – better reflect good monitoring and patient adherence.

Question 3: Some Results

Those with lower cognitive ability much more likely to have an ACS admission. Differences persist, even conditional on health and demographics.

	ACS Acute b/se	ACS Chronic b/se	ACS Acute b/se	ACS Chronic b/se
Cog. Factor 1	-0.027***	-0.010***	-0.009**	-0.005***
	(0.00)	(0.00)	(0.00)	(0.00)
Cog. Factor 2	-0.019***	-0.009***	-0.006	-0.005**
	(0.00)	(0.00)	(0.00)	(0.00)
Observable Health	no	no	yes	yes
Education and Household Inc.	no	no	yes	yes
Work Status # of Children	no	no	yes	yes
Constant Term	0.051***	0.017***	0.098***	0.034***
	-(0.01)	(0.00)	-(0.02)	-(0.01)
Adj R-squared	0.0161	0.011	0.0694	0.0289
N	34535	34535	34029	34029

Research Question 4

- What accounts for the conditional correlation between cognitive functioning and expenditure or utilization?
- Is it due to unobserved health or to differences in care for the same underlying health?

More Background on Utilization

- *Referral Sensitive* (RS) admissions are hospitalizations for high-cost procedures that generally require a referring physician. These are procedures for which a less aggressive and less expensive option exists.
  - Examples: joint replacement, when joint isn't broken, coronary artery bypass graft (CABG).
- *Marker* admissions are hospital admissions such that ambulatory care just before is unlikely to affect the need to be hospitalized. Options for care are limited.
  - Examples: broken hip, appendicitis, gastrointestinal obstruction.

Question 4: Some Results

Markers: Lower cognitive ability people in worse unobserved health.
RS: No indication of substantial differences.

	Marker 1 Hip Fracture b/se	RS CABG b/se	RS Joint b/se	Marker 1 Hip Fracture b/se	RS CABG b/se	RS Joint b/se
Cog. Factor 1	-0.003**	0	0.001	-0.002	0	0.002*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Cog. Factor 2	-0.003*	0	-0.001	-0.002	0	-0.001
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Observable Health	no	no	no	yes	yes	yes
Education and Household Inc.	no	no	no	yes	yes	yes
Work Status # of Children	no	no	no	yes	yes	yes
Constant Term	0.001	0.007***	0.008***	-0.005	0.007*	-0.011**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Adj R-squared	0.0065	0.0026	0.0013	0.0434	0.0086	0.0181
N	34535	34535	34535	34029	34029	34029

Summary

- Results remain preliminary
- Cognitive ability has strong, negative correlation with health expenditure
- Observable health explains much but not all of that correlation.
- Coincident declines of cognitive functioning and relevant health play important role.
- Utilization differences suggest consequences of persistent differences in cognitive functioning are also important.
- No indication that those with lower cognitive function are receiving more expensive care for the same underlying health.