Income Differences and Health Care Expenditures over the Life Cycle

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Motivation

- How do the low- and high-income households differ in the lifetime profile of medical expenditures (consumption)?

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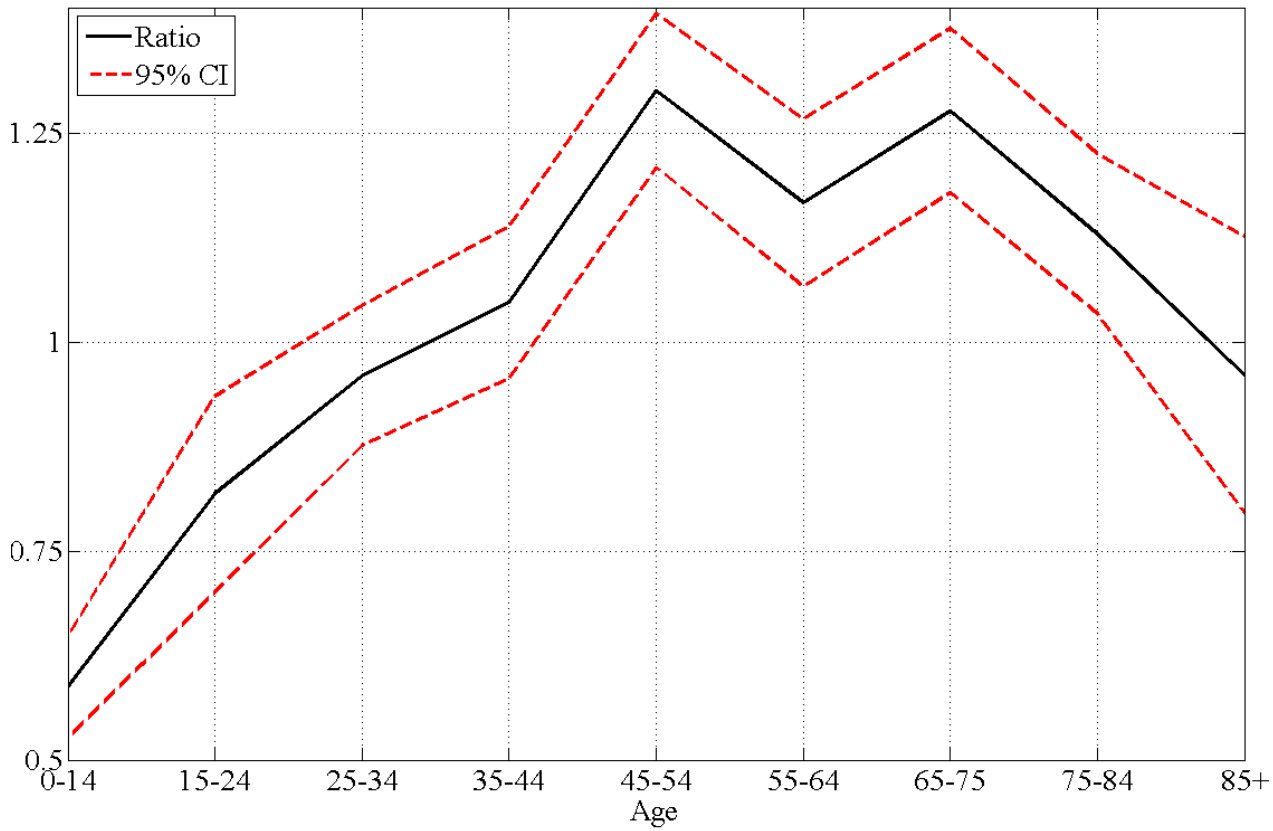

Figure: Average Medical Spending of Bottom Income Quntile Relative to Top Income Quintile

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- How do the low- and high-income households differ in the lifetime profile of medical expenditures (consumption)?
- Why do they differ?
- Why is it important?
  - The ObamaCare aims to reduce the disparities in health outcomes.
  - Expanding health insurance coverage to the poor.
  - Private insurance firms will provide basic preventive services free of charge.

Outline

- Empirical Facts on Differences in Health Care Usage
- A Life-Cycle Model of Health Capital
- Calibration/Estimation
- Counter-Factual Policy Experiments

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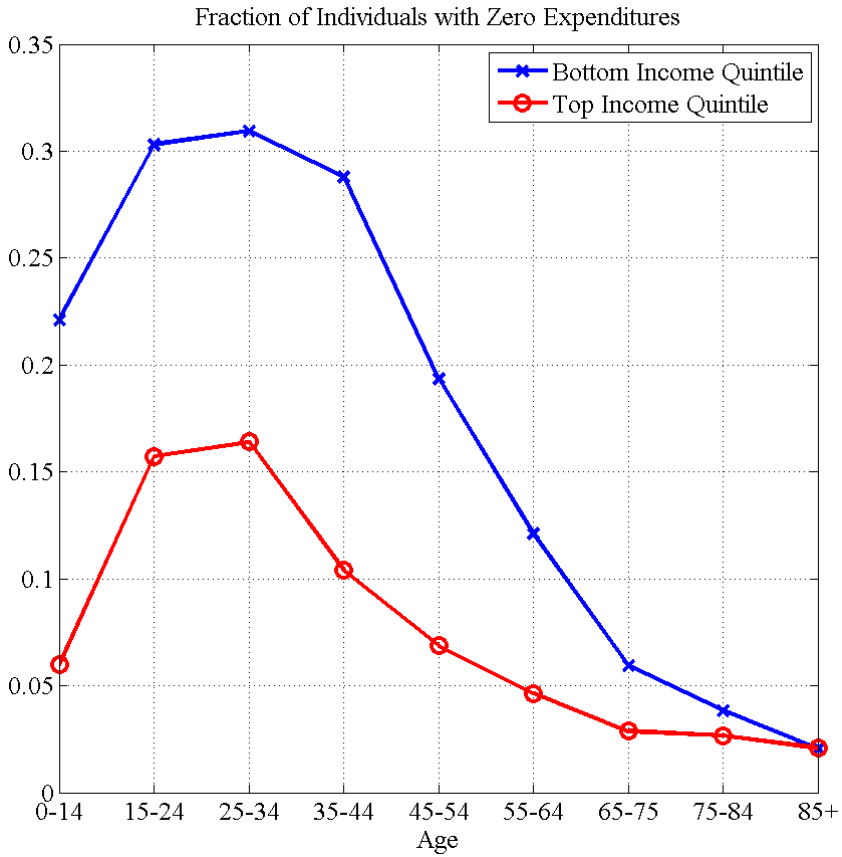

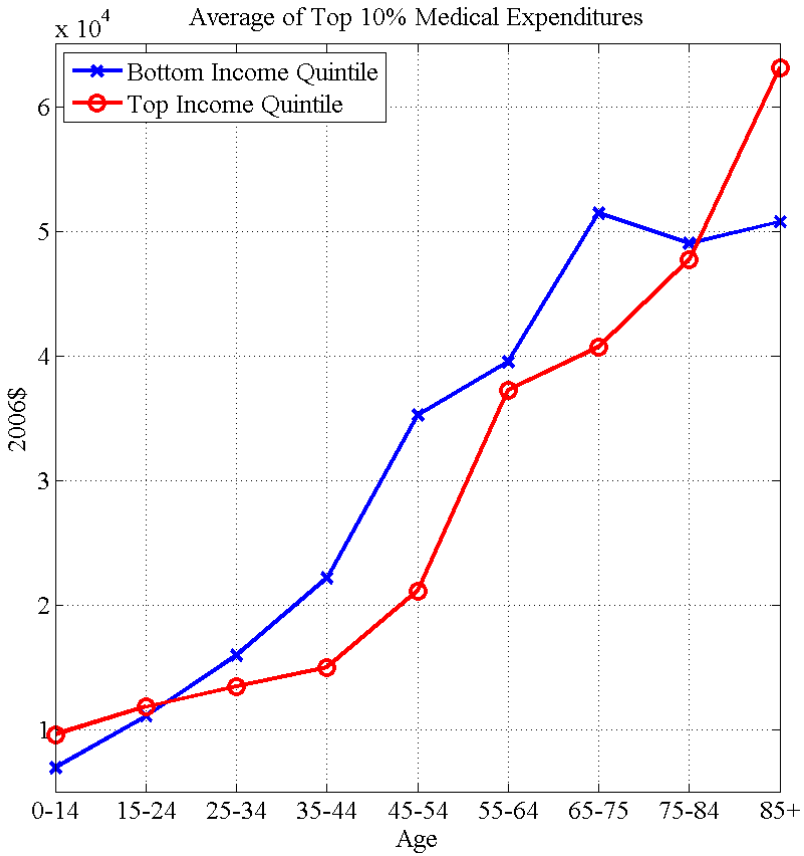

Empirical Facts on Differences in Health Care Usage

1. Medical spending of the poor relative to the rich exhibits humped-shaped pattern over the lifecycle.

2. The distribution of medical expenditures of the poor is more widely spread to the tails.

   - A higher fraction of the poor does not incur any medical expenditures in a year (24% vs 10%).
   - Health care spending of the poor is more extreme.

3. The poor use less preventive care.

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3. The poor use less preventive care.

4. The life expectancy of the poor is dramatically shorter.

A Life-Cycle Model of Health Capital

1. **Two distinct types of health capital**

   - Physical health capital determines the survival probability
   - Preventive health capital governs the distribution of health shocks
   - Endogenous distribution of health shocks, thereby endogenous life expectancy.

A Life-Cycle Model of Health Capital

1. **Two distinct types of health capital**
2. **Important features of the US health care system**

   - Non-elderly are offered private health insurance with copayment and deductible.
     - Endogenous insurance premia.
   - Children of the poor are covered by Medicaid
   - All elderly are covered by Medicare.
   - In case of severe health shocks, default is allowed.

A Life-Cycle Model of Health Capital

1. **Two distinct types of health capital**
2. **Important features of the US health care system**
3. **Government budget balances**

   - Progressive US tax scheme on income
   - Finances social security, Medicaid, Medicare
   - Budget surplus or deficit is distributed in a lump sum fashion

Estimate Model Using Micro and Macro Data

1. **Set some of the parameter values outside of the model**
   - income process
   - deductible - co-payment coverage schemes, etc.

Estimate Model Using Micro and Macro Data

1. **Set some of the parameter values outside of the model**

2. **Match model moments to data moments**

   - From the MEPS
     - Distribution of medical expenditures
     - Differences in the lifetime profile of health care spending
   - From aggregate data
     - Age profile of conditional survival probability
     - Differences in life expectancy between the rich and the poor
     - Wealth to income ratio, etc.

Counter-Factual Policy Analysis

Universal Health Insurance Coverage

- Government provides all non-elderly private health insurance.
- To finance this policy an additional flat income tax is imposed on household income.
- All elderly are still covered by Medicare.

Counter-Factual Policy Analysis

Universal Health Insurance Coverage

Table: Life Expectancy

	Q1	Q2	Q3	Q4	Q5
Benchmark	71.95	75.2	76.3	76.5	76.8
Policy I	**73.2**	75.3	76.3	76.5	76.8

- Aggregate medical spending increases by only 0.8%
- Per capita medical expenditures increase from $4750 to $4755

Counter-Factual Policy Analysis

Universal Health Insurance Coverage

- Health insurance premia decrease 2.5% for 30-year old and younger.
- Increase 1.5% for older than 30.

Counter-Factual Policy Analysis

Universal Health Insurance Coverage

Welfare Analysis

$$\mathbb{E}\sum_{t=1}^{T}\beta^{t-1}s(h_t^B-\omega_t)u(c_t^B,h_t^B-\omega_t)=\mathbb{E}\sum_{t=1}^{T}\beta^{t-1}s(h_t^P-\omega_t)u(\phi c_t^P,h_t^P-\omega_t)$$

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Table: Welfare Gains, $1-\phi$

	Bottom 2%	Median	Top 2%
Policy I w.r.t Benchmark	0.6%	2.1%	-0.88%

Counter-Factual Policy Analysis

Free Basic Preventive Care

- Mammograms, colonoscopies, cervical screenings, and treatment for high blood pressure etc.
- Patients will still have to pay for doctor visits.
- Not all preventive care is covered

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- Patients will still have to pay for doctor visits.
- Not all preventive care is covered
- Policy Experiment: Private insurance pays 75% of preventive care expenditures.
- Policy change takes place in universal health insurance economy

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- Fraction of preventive spending in total health care expenditures increase from 22% to 39%.

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Policy II	**74.65**	**75.9**	**76.5**	**76.6**	**76.8**

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- Aggregate medical spending **DOES NOT** increase!
- Per capita medical expenditures decrease from \$4755 to \$4738.

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- $1-\phi=2.5\%$

Table: Welfare Gains, $1-\phi$

	Bottom 2%	Median	Top 2%
Policy I w.r.t Benchmark	0.6%	2.1%	-0.88%
Policy II w.r.t Benchmark	0.35%	3.13%	-1.2%
Policy II w.r.t Policy I	-0.24%	1.105%	-0.29%

Conclusion

- Subtle differences in the lifetime profile of medical expenditures between low and high income groups.
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  - enables the poor to incur medical spending higher than their income.
  - hampers incentives of the poor to use preventive care.
- Policies encouraging the use of health care by the poor early in life have significant welfare gains.