

Supplementary Materials for Macroeconomic Effects of Medicare

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The supplementary material appendix consists of the following five (5) directories:

1. this file (Medicare_appendix.pdf);
2. an excel file with the data (Medicare-data-appendix.xlsx);
3. a folder with the Stata codes used for data preparation and estimation of life cycle labor productivity profiles (Stata);
4. a folder with the Fortran codes used to solve the overlapping generations model (Model);
5. and a folder with the codes used to compute the health transition probabilities (Health transition matrices).

ORIGINAL SERIES

A. Medical Expenditure Panel Survey (MEPS) data

The Stata file 'mepsmerged.dta' contains the original series from the Medical Expenditure Panel Survey (MEPS) data that we use in the paper. Subsections **A.0.1 – A.0.39** list the variables that we use. We use the MEPS variable code names (see MEPS codebook: https://meps.ahrq.gov/data_stats/download_data/pufs/h172/h172cb.pdf).

A.0.1 Individual ID.

A.0.2 – A.0.8 Age in different waves of the survey (years).

A.0.9 Education (highest degree).

A.0.10 Died (binary variable).

A.0.11 – A.0.15 Survey Year of each wave.

A.0.16 Year of birth.

A.0.17 Sex.

A.0.18 Longitudinal weight.

A.0.19 – A.0.21 Employment status.

A.O.22 – A.O.24 Hourly wage rate.

A.O.25 – A.O.27 Hours worked per week (current prices, dollars).

A.O.28 – A.O.29 Wage income (current prices, dollars).

A.O.30 – A.O.31 Total medical expenditure (current prices, dollars).

A.O.32 – A.O.33 Total medical expenses paid by self (current prices, dollars).

A.O.34 – A.O.35 Total medical expenses paid by Medicare (current prices, dollars).

A.O.36 – A.O.37 Total medical expenses paid by Medicaid (current prices, dollars).

A.O.38 – A.O.39 Total medical expenses paid by private insurance (current prices, dollars).

B. Medicaid eligibility criteria

The excel file 'Medicare-data-appendix.xlsx' contains the data we use to compute Medicaid eligibility criteria. The file contains state specific income and asset limits for Medicaid eligibility under the Medically Needy and Categorical criterion.

B.O.1 Medicaid medically needy income limit for a single person (percentage of FPL).

B.O.2 Medicaid medically needy asset limit for a single person (2009 dollars).

B.O.3 Medicaid categorical income limit (percentage of FPL).

B.O.4 Total health spending in the United States in 2009 by state (2009 dollars).

C. Food stamps

The excel file 'Medicare-data-appendix.xlsx' contains the data we use to compute food stamps.

C.O.1 Average monthly Supplemental Nutrition Assistance Program benefits per person, 1969-2016 (2017 dollars).

C.O.2 Federal poverty level for a household with 1 person (current prices, dollars).

CONSTRUCTED SERIES

The excel file 'Medicare-data-appendix.xlsx' contains the data we constructed from the original series.

B. Medicaid eligibility criteria

B.C.1. Medicaid medically needy income limit (percentage of FPL, weighted average limits across states).

B.C.2. Medicaid medically needy asset limit (2009 USD, weighted average limits across states).

B.C.3. Medicaid categorical income limit (percentage of FPL, weighted average limits across states).

C. Food stamps

C.C.1 Food stamps (percentage of GDP per capita).

DATA SOURCES

A. Medical Expenditure Panel Survey (MEPS) data

A.O.1 – A.O.39 Medical Expenditure Panel Survey (MEPS)

B. Medicaid eligibility criteria

B.O.1 – B.O.3 The Kaiser Family Foundation

B.O.4 Center for Medicare & Medicaid Services.

C. Food stamps

C.O.1 The United States Department of Agriculture, Participation and Costs, 1969-2016.

C.O.2 The United States Department of Health & Human Services.

TECHNICAL APPENDIX

D Stata

D.1 DataPreparation.do. This Stata do-file cleans the merged longitudinal MEPS data.

Processing

Real health expenditure. All current price medical expenditure series are converted to 2010 dollars using the Personal Consumption Expenditure Health Price Index (source: Bureau of Economic Analysis, Table 3 Column 1. See https://meps.ahrq.gov/about_meps/Price_Index.shtml).

Non-college educated. Individuals are classified as non-college educated if their educational attainment belongs to one of the following categories: Less than or equal to 8th grade; 9-12th grade;

No high school diploma; GED or equivalent; High school diploma; Some college but no degree; Associates degree; or Technical vocation.

College educated. Individuals are classified as college educated if their educational attainment belongs to one of the following categories: Bachelor's degree; Master's degree; or Doctoral degree.

Excluded observations. We exclude data after 2010 since we model the United States health insurance system prior to the passing of the 2010 Patient Protection and Affordable Care Act. The MEPS top-codes the age variable at 85 years for confidentiality purposes. We therefore exclude individuals whose age is greater than 84. We also exclude individuals if their age is less than 20 since individuals enter the economy as adults in our model. Lastly, we exclude individuals with missing values for education or total medical expenditure.

Total number of observations	258729
Dropped due to year cutoff ≤ 2010	35463
Dropped due to age cut off < 20	71021
Dropped due to age cut off ≥ 85	4554
Missing: Education	1107
Missing: Medical expenditure	417
Number of observations used in the analysis	146167

D.2 Productivity.do. This Stata do-file estimates labor productivity profiles.

E. Model

This folder contains the Fortran codes used to solve the overlapping generations model.

To solve the model, run the program "revise.f90." This program calls the different subroutines needed to solve the model in section 5.1 of the paper. "calibrate.f90" calibrates the parameters in the model. "instst.f90" and "fistst.f90" solve for the initial and final steady state. "transition.f90" computes the transition between the steady states. This subroutine calls "welfare.f90" to compute the welfare effects of the policy reforms.

Eliminating Medicare and Medicaid. To replicate the "Eliminating Medicare and Medicaid" results in section 5.2, set "cov_md(3:time,)=0" in "policies.f90."

Lower Medicare copayment parameter. To replicate the "Lower Medicare copayment parameter" results in section 6, set "cov_m(1:2)=0.708573760986328" in "policies.f90."

Median Medicaid income and asset limits. To replicate the "Median Medicaid income and asset limits" results in section 6, set "ycatparam=.64*FPL," "ymnparam=.505*FPL," and "amnparam=2000.0/47001.55535" in "params.f90."

F. Health transition matrices

This folder contains the Fortran codes used to compute the health transition matrices in the paper.

'input_raw_data.txt' contains data where each row is one observation from the MEPS sample. The columns are the associated age, education, medical expenses in the current period, medical expenses in the next period, a dead or alive indicator, and weight.

Given 'input_raw_data.txt', the Fortran codes compute the 60 and 99.9 medical expense cutoffs for each age and education bin. The weights are used to ensure that, given age and education, 60 percent of the population is in the low health state, 39.9 percent of the population is in the high health state, and 0.1 percent of the population is in the catastrophic health state. Then the code assigns the current period health status and next period health status for each observation. The code saves the data to 'output_raw_data.txt'.

Using the data from 'output_raw_data.txt', the Stata code "TransitionProbability.do" in the Stata folder estimates the health transition probabilities and survival probabilities by running an ordered probit regression of next period's health on current age, age squared, education, health, and interaction terms. 'input_health_probabilities_reg.txt' contains the ordered probit estimates.

The remainder of the Fortran code uses the RAS method to ensure that a simulation with the probit estimates leads to 60 percent of the population in the low health state, 39.9 percent of the population in the high health state, and 0.1 percent of the population in the catastrophic health state. The code also adjusts the probit survival probability estimates such that the average survival probability given age matches that from the Social Security Administration.