

## THE INFLUENCE OF PUBLIC POLICY ON HEALTH, WEALTH AND MORTALITY

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Understanding of the process through which life span and quality of life are produced and how this affects the living standards of the elderly is a central challenge of social science research. The varied mechanisms that result in a given individual's health and income (and material well-being) are complex. To better understand the links between health, wealth and aging, we develop a dynamic model of household behavior that blends a model of health capital and production, where households spend on medical needs both because it enhances their satisfaction and because it promotes longevity, with a sophisticated model of lifecycle consumption. Households may respond to adverse income or health shocks or to changes in government policy by adjusting health investment as well as consumption. Changes in health investment can alter individuals' health and have longer-run implications for mortality. To explore these links, however, a behavioral model of household decision-making is needed.

The model we develop matches quite closely the joint distribution of medical expenditures and wealth over time observed in data. It is perhaps not surprising that we can do that for the average household in the sample, since we calibrate selected underlying behavioral parameters to the behavior of the average household in the sample. It is considerably more striking that we match behavior in the tails of the distribution and, more broadly, that we do a reasonable job matching behavior household-by-household after calibrating the model to behavior of the average household.

We use the model to conduct a series of suggestive policy simulations related to Medicare and Social Security. At this stage in our work, the experiments are chosen to highlight the important mechanisms that arise in our behavioral model. We develop, for example, an experiment to further our understanding of the effect of Social Security on mortality and asset accumulation. In our model, Social Security has two distinctive features relative to Medicare. First, it is not a tied transfer — Social Security benefits are not targeted at medical expenses and may be used by the household to enhance consumption or longevity. Second, the benefit structure of Social Security ensures it has a larger redistributive component than Medicare.

The Social Security experiments that we examine are extreme versions of policy. Namely, earnings do not adjust so, in a modeling sense, households continue to pay Social Security taxes but simply do not receive any benefits. The lifetime resources shock to low lifetime income households is larger (in a relative sense) than it is to high lifetime income households as a consequence of Social Security's redistributive component.

When Social Security is eliminated in this manner, households increase their private savings to smooth consumption across time. At the same time, poor households experience a drop in income by more than their richer counterparts. Hence, the negative income effect leads to a cutback in medical spending. This leads to higher mortality at both age 60 and at age 75. Lifecycle models in the literature do not model health investments, so all household responses to policy occur through changes in precautionary saving. These responses are overstated when households can adjust by altering their health investments or labor supply (including retirement dates).

Four themes emerge from this project. First, it is computationally feasible to embed a model of health capital into an augmented lifecycle model of consumption. Doing so allows us to study two behavioral responses that to date have not been explored: the tradeoff between consumption and health investments and the effects of policy on longevity. Existing models

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will overstate the effects of policy on consumption/saving/wealth by ignoring the likelihood that people may respond to adverse shocks by altering health investments (whether through direct expenditures or through their health-promoting investments of time).

Second, our model calibration implies consumption and health are complements. This implies that as health depreciates with age, households will get less utility from consumption than would be in the case of a lifecycle model that does not endogenize health. This result has implications for the timing of consumption over the lifecycle, and practical implications for the amount of wealth households will want to accumulate to maintain living standards in retirement. In particular, households will want to move consumption earlier in the lifecycle, which in turn implies households need less wealth to maintain living standards in retirement relative to the implications of a model that ignores health capital.

Third, while we need to be very cautious about the channel, due to the extreme nature of our policy experiments to date, it appears that forward-looking households, when confronted by a substantially reduced safety net, might respond both by reducing consumption and by reducing their health investment. Indeed, in some very poor countries, it does not appear that households engage in substantial precautionary saving. Instead, they largely run down their health capital. Large policy changes can affect survival probabilities of low lifetime income households.

Fourth, there is a potentially important difference between short- and long-run responses to policy. Short-run changes in survival probabilities, even to very large policies affecting the elderly, appear to be small because health capital is largely determined by the time an individual reaches retirement. Long-run changes can be substantial, however. With fewer lifetime resources, households will both consume less and die earlier. The consumption/saving responses in a model with endogenous health will be smaller than those in a model that ignores these channels. But our model provides a more complete understanding of policy by capturing effects on health and longevity as well as consumption.

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