Fit to consume: How health shapes preferences for consumption

Executive summary

This research explores an important question for financial planning and insurance design: Does the enjoyment people get from spending change when their health changes? If so, by how much?

Answering these questions is necessary to assess how much money should be saved for retirement and how insurance should be structured. Previous research on this topic has reached mixed conclusions. Some studies find people derive more value from spending when they're healthy, some find the opposite, and others find no relationship.

Using detailed monthly survey data from Singapore, we estimate how consumption of nondurable goods (food, utilities, entertainment, vacations, etc.) responds to changes in people's health. By tracking more than 12,000 individuals age 50–70 each month between 2015 and 2019, we find consumption (excluding medical care) declines after people are diagnosed with new chronic conditions. Specifically, a one-standard deviation drop in health corresponds to a 1.5% reduction in nondurable consumption. We combine these findings with a theoretical model to quantify the degree to which an additional dollar of consumption is valued more highly when healthy compared to when ill. A one-standard deviation drop in health corresponds to a 3.5% reduction in the value derived from an extra dollar of nondurable consumption.

The magnitudes of our results have important implications for retirement planning and insurance design. First, because people are typically less healthy in old age and the value of consumption declines in poor health, the optimal amount to save for retirement is slightly lower after accounting for this relationship. Second, younger generations who are likely to enjoy better health in old age compared to today's retirees due to technological advances should be saving more than older cohorts. Third, ignoring the complementarity between consumption and health can lead researchers to underestimate risk and time preferences from observational data, thereby understating demand for annuities and insurance.

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Introduction

Do people get the same value from spending when they're ill as when they're healthy? In theory, the relationship between a person's health and their (non-medical) spending is unclear. Perhaps people cut back on dining out and travel if they're ill, for example. But illness might also lead people to increase spending on food delivery and entertainment at home. Or overall spending may not change after illness if such responses offset each other, or if illness doesn't diminish the value of what people consume. Whether health and spending are complements, substitutes, or simply unrelated informs how much people should save for retirement and the optimal design of health and disability insurance programs.

The existing literature provides conflicting answers to this question. Some research finds that individuals derive more value from spending when they're healthy (Finkelstein et al., 2013; Koijen et al., 2016; Blundell, 2024). Conversely, other studies find people derive greater value from spending when they're ill (Lillard & Weiss, 1997; Yogo, 2016; Ameriks et al., 2020). Other research finds no significant relationship between health and how consumption is valued (De Nardi et al., 2010) or document heterogeneous responses (Brown et al., 2016). The mix of findings may be due to data limitations—it's rare for researchers to observe detailed consumption items, measures of a person's health, and other inputs necessary to quantitatively estimate this relationship. Our research makes progress on this topic using detailed monthly data from Singapore that allow us to track how consumption changes in response to illness.

Setting and data

We use the Singapore Life Panel (SLP), which is a longitudinal survey of a representative sample of Singaporean citizens age 50 to 70 in 2015. The baseline survey was conducted in July 2015 and surveyed more than 13,000 individuals, including both the representative respondent and the spouse. The survey design is similar to the Health and Retirement Study (HRS) in the United States, but with more frequent interviews and a slightly different set of questions.[1] Respondents are surveyed monthly, with core questions about income and spending, employment, chronic conditions, health status, and life satisfaction asked each month. Other questions are included quarterly, annually, or on a one-off basis. The monthly sample size is generally around 8,000, which corresponds to a response rate of 65%. We use 55 waves of the survey, spanning the period July 2015 to December 2019.

Detailed expenditure data is collected monthly and records spending on 33 different items. Our main analysis focuses on nondurable consumption—expenditures on items such as food, utilities, entertainment, dining out, vacations, hobbies, etc. Compared to other countries, in-kind transfers are less common in Singapore. There are rebates for utilities for some low- and middle-income households, and once a quarter, the SLP asks about the amount received. We include these amounts as part of utility consumption. We exclude healthcare spending from our main consumption measure and instead measure the impact of health shocks on healthcare spending in supplementary analyses. During the annual survey, which is longer than the monthly surveys, individuals are asked to report household assets, including balances in a variety of financial accounts.

Each month, the SLP asks individuals if they've ever been diagnosed with the following seven chronic conditions: diabetes, hypertension, arthritis, psychiatric conditions, heart conditions, stroke, and cancer. By tracking changes to these responses over time, we construct indicators for the development of new chronic conditions. Self-assessed health is also measured monthly on a five-point scale, with responses ranging from poor to excellent. In addition to these core questions, the SLP includes several other modules relevant to our analysis. In one wave, respondents are asked about hypothetical gambles we use to estimate risk aversion, which is a central input to models of insurance and saving.

Singapore provides a useful context to study this topic. It's among the wealthiest countries in the world, with high life expectancy for both men and women. Personal savings accounts are central to financing health care in Singapore. Created in 1984, MediSave is the country's program of individual medical savings accounts (MSAs) and covers 97% of its population. While working, citizens and permanent residents make mandatory MSA contributions ranging from 4% to 10.5% of salary, up to a ceiling. Employers make equivalent matching contributions. Contributions are deductible from taxable income, and balances grow at a fixed interest rate of 5% annually. Individuals can also make additional tax-deductible contributions to their MediSave accounts up to the statutory maximum. The contribution limits are high, exceeding 10 times the limits for Health Savings Accounts in the United States. All balances roll over each year. MSA withdrawals can be made at any age to pay for health care and to purchase supplemental health insurance.

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[1] See https://rosa.smu.edu.sg/singapore-life-panel/about-singapore-life-panelr (accessed June 20, 2025) for more details about the survey.

Overview of methods and key findings

Our analysis begins by using economic theory to derive a formula for how people value consumption when healthy or ill. The formula is a function of several components, most of which we can estimate directly from our data. The most important component is the extent to which consumption changes in response to a change in health, as it drives the sign of the relationship. If consumption falls after illness (and people are fully insured), the value of consumption is lower in bad health. If consumption rises, it's instead valued more highly in bad health. The second component is risk aversion, which scales the consumption response. The remaining components relate to dynamics and uncertainty: the probability of becoming ill, survival probabilities, interest rates, and time preferences.

We subsequently estimate these components from the SLP where possible and calibrate the rest from external sources. We begin by constructing a health index based on the incidence of chronic conditions. The index represents the probability of being in good, very good, or excellent health. By predicting health status based on chronic conditions, we use objective information about disease diagnoses while also accounting for differences in the severity of the various conditions affecting health. For example, strokes and heart attacks are likely more severe than hypertension or diabetes diagnoses, and counting the number of chronic conditions would treat them as equivalent. The prediction model maps conditions onto health status in a way that weights their relative importance to health and allows for the possibility that interactions between conditions may also matter.

We then measure how consumption responds to changes in the health index by tracking monthly variation for each person over time. Our regressions indicate that a one-standard deviation drop in health corresponds to a 1.5% reduction in nondurable consumption. An important assumption behind our approach is that individuals are adequately insured against the cost of illness. We assess this assumption by testing whether consumption responses are the same for people with different initial levels of MSA balances per capita. One might expect those with smaller balances would reduce consumption more than those with higher balances if incomplete insurance explained the changes. Instead, we find responses are quite comparable between those with MSA assets above or below the median. The sources of the spending declines provide further evidence consistent with our interpretation that consumption responses reflect preferences rather than financial constraints. We document declines in consumption across most categories of nondurables, with the strongest evidence for reductions in food and beverages, dining out, and travel.

We estimate risk aversion using a series of questions about hypothetical gambles related to permanent income. These questions follow Barsky et al. (1997) and identify bounds on risk aversion for each survey respondent. Our main estimates take the midpoint of the relevant interval, and we show state dependence estimates using the upper or lower bounds as robustness.

We then aggregate each of these components to quantify the degree to which an additional dollar of consumption is valued more highly when healthy compared to when ill. A one-standard deviation drop in health corresponds to a 3.5% reduction in the value derived from an extra dollar of nondurable consumption. We document heterogeneity in magnitude but not in sign of this relationship across several observable characteristics, and our findings are robust to several alternative specifications.

Two supplemental approaches provide corroboration that consumption and health are complements. First, we implement the approach suggested by Finkelstein et al. (2013), which tests whether the influence of additional spending on life satisfaction differs by health status. Second, we leverage random variation in lottery winnings, which are measured in three waves of the SLP. Motivated by the result from Kim and Oswald (2021) and Kim and Koh (2021) that lottery winnings increase life satisfaction and consumption, we test whether the effect of lottery winnings on these outcomes differ by baseline health status. In both cases, we find evidence consistent with our main result that people value consumption more when they're healthy.

Implications for retirement saving

We show how our estimated magnitudes of the complementarity between health and consumption meaningfully change conclusions about the level of optimal retirement saving in a simple model. We calculate how much people should save for retirement under different assumptions about the degree of complementarity and the profile of health shocks over the life cycle. The model allows for mortality risk but abstracts away from the role of uncertainty in health status, unemployment, or other consumption shocks. It's intended to be simple to focus on the complementarity between health and consumption and to illustrate potential implications, rather than to provide precise recommendations.

This exercise yields several insights. First, the complementarity between health and consumption leads optimal retirement savings—defined as assets at age 65—to be slightly lower compared to benchmark in which health doesn't affect the valuation of consumption. The reason for this is that people typically experience better health when they're younger, with

health declining later in life. Some resources should therefore be shifted to earlier in life when they're valued more highly.

A second and related insight is that younger generations should be saving more than older generations because of this complementarity. Technological advancements and medical improvements are likely to improve health at older ages, as they have in the past. Consequently, younger generations will derive greater value from spending during their retirement years. In anticipation of a healthier retirement, younger generations should increase saving rates compared to a situation in which health in old age remains the same as it does today.

Third, our results have important implications for how researchers often estimate risk aversion and discount rates. It's common for studies to estimate risk and time preferences by matching observed choice data to predicted behavior from a structural economic model of consumption and savings. As described above, the complementarity between consumption and health results in a less smooth consumption profile over the life cycle. If researchers assume the value of consumption doesn't depend on health, they'll infer the reason for this profile is lower risk aversion or a lower discount rate, rather than a higher valuation of consumption when healthy. Underestimating risk and time preferences would then understate demand for annuities and other forms of insurance.

These results are intended to be illustrative and to motivate the importance of incorporating complementarity between health and consumption in future work. We expect a richer model with additional features to lead to different quantitative magnitudes, but the same qualitative conclusions regarding these three points.

Limitations and future research

Our research has several limitations. Like prior studies, we rely on data from a single country. Most survey respondents are between ages 50 and 70 given the survey's sampling frame. These features naturally raise questions about generalizability to other settings. Singapore's population is relatively small, but it's reasonably diverse along several dimensions, including race, religion, language spoken, and income. In our setting, we found relatively little evidence of heterogeneity across observable characteristics of individuals, suggesting that our results may be applicable in other contexts. In terms of measuring health, we're limited to the seven chronic conditions recorded each month. While these conditions represent important ones that are standard in other surveys, there are naturally important dimensions of health we miss. Generalizing our findings to other conditions requires assuming that the chain of influence from conditions to self-reported health and from self-reported health to consumption is similar for other conditions.

Our results open several directions for future research. More complex models of saving that incorporate additional sources of uncertainty and institutional features could yield precise policy recommendations. The implications of our results for the optimal design of health and disability insurance programs could also be explored. Finally, our methods have assumed that consumption responds to changes in health but doesn't influence health. Future work could consider frameworks allowing non-health spending to also represent investments that can improve health.

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