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Retirement Security and Health Costs

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Keywords

Aging, retiree health, healthcare spending

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Retirement Security and Health Costs

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Health care spending has increased faster than incomes for decades, but the pace slowed materially after the passage of the Affordable Care Act (ACA). Using data from various waves of the Medicare Current Beneficiary Survey we examine what has happened to out-of-pocket health care spending by different income groups of the elderly over time, and how that has affected resources available for other consumption. We find that the slower pace of health care spending from the ACA was particularly beneficial to the elderly, who spend a greater share of income on health care than the nonelderly. We then examine how out-of-pocket spending on health care by the elderly will change going forward, given current projections for health care spending to accelerate again, and show that resources available for other spending may fall appreciably for lower income groups.

JEL codes: H51, I11, I14, I18

Keywords: Aging, retiree health, healthcare spending

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Despite virtually universal health insurance coverage through Medicare, household spending on health care in the US accounts for a larger share of income for the elderly than it does for the non-elderly (Carman et al. 2020). In addition, Medicare beneficiaries face larger out-of-pocket costs when faced with a health shock than do many non-elderly, because traditional Medicare and, to some extent, Medicare Advantage impose high cost-sharing requirements. Furthermore, Medicare does not cover long-term care expenses. As a result of the structure of our health care system, private health care expenses rise sharply with age.

In addition to high expected costs of health care and vulnerability to health spending shocks, the elderly are also vulnerable to rising health care costs over time. Health care spending has increased faster than GDP on average for decades. Although it has slowed in recent years, both the Congressional Budget Office (CBO) and the Centers for Medicaid and Medicare Services (CMS) project that per capita Medicare spending will continue to rise at a faster pace than income over coming decades. Rising costs affect the elderly in two dimensions: by pushing up costs for individuals as they age, and by increasing the costs faced by each succeeding cohort.

Many analysts have examined the effects of health care cost growth on the sustainability of the federal budget (for example, CBO 2016), but less attention has been paid to the vulnerability of elderly households to such cost increases and what that vulnerability implies for retirement security. In a previous paper, we examined long-term health spending trends by income quintile for the elderly and the non-elderly (Follette and Sheiner 2008). We noted that, despite significant increases in national health care spending as a share of national income, household health spending had increased much less because of expansions in the share of spending financed by public programs. We argued that public policy was quite responsive to falling health care affordability, and that there would likely be pressure to further expand public financing of health care over time,

presenting a risk to the long-term federal budget projections. In this paper, we update that analysis, focusing solely on the elderly. We examine what the slowdown in health spending observed in recent years has meant for retirement security and assess how vulnerable the elderly are to future increases in health spending. An innovation in our analysis relative to other efforts (for example, Cubanski et al. 2018 and Hatfield et al. 2018) is that we allow health care spending growth to differ between Medicare and national health spending, and we also consider the extent to which rising health care prices will boost the income of the elderly through their impact on the CPI used to adjust social security and other government transfer programs.

We show that the slowdown in health care cost growth over the past decade has had a major impact on the well-being on the low- and middle-income elderly, boosting the income available to finance non-health consumption by up to 15 percent. To a large extent, this slowdown is attributable to changes in Medicare payment policy enacted as part of the Affordable Care Act (ACA). Without an expansion of public financing, however, health care is likely to become increasingly unaffordable for those in the lowest two income quintiles.

The effect of increased health spending on the elderly will be somewhat muted, to the extent that higher health costs filter into the CPI and thus raise benefits paid to the elderly; yet we find that this offset is only partial, because health care spending by the elderly is a much higher fraction of their income than it is for the population in general. In addition, not all increases in health spending are the result of faster growth of prices, also muting the benefits of the CPI adjustment.

Our metric of elderly retirement security is the amount of income available for non-health care expenditures.¹ Assuming that health spending continues to increase faster than income, retirement security will decline for each succeeding cohort and within each cohort as it ages, increasing the

vulnerability of the elderly to health-cost shocks. Of course, rising health expenditures may improve well-being even if they crowd out other consumption, if they are the result of improved treatments that boost the quality and length of life. Thus, our analysis cannot speak to overall welfare. Nevertheless, our analysis sheds light on the extent to which high health spending will strain household budgets.

Increasing unaffordability of health care for the elderly is likely to give rise to pressures to expand programs, while at the same time pressures to rein in government budget deficits will give rise to pressures to lower federal spending. An important question is the extent to which policy can continue to rely on provider cuts, which are a way of both cutting federal spending and increasing affordability.

In what follows, we first examine the structure of Medicare to explain why the elderly face such high expenses despite nearly universal health insurance coverage. Next, we discuss the evolution of health costs over time and projections from the Congressional Budget Office and the Centers on Medicare and Medicaid Services over the next decades. After describing the data we use to examine the vulnerability of households to health shocks, we examine how the burden of health care has evolved over time and the impact of the recent slowdown in health spending on the budgets of elderly households by income quintile. Next, we present simulations showing how projected health cost increases are likely to affect retirement security of current and future beneficiaries. A final section concludes.

The Structure of Health Insurance for the Elderly

Most elderly (roughly 96%) in the US are covered by Medicare. Americans who turn age 65 receive premium-free Medicare Part A, which covers inpatient hospital costs, if they or their

spouse have completed 40 quarters of work in which they paid social security taxes.² Medicare beneficiaries pay a Part B premium, which for most people is set to cover 25 percent of average Part B costs; since 2007, high-income beneficiaries have had to pay a higher Part B premium (covering up to 85 percent of average Part B costs, depending on income). Similarly, Part D premiums cover about 25 percent of expected costs, with high-income beneficiaries paying more (Cubanski and Neuman 2018).

Traditional Medicare has high out of pocket payments and no out-of-pocket maximum. For example, in 2022, the hospital deductible was \$1,556 paid per hospitalization episode. There were no other charges for the first 60 days of hospitalization, but there was a daily charge of \$389 for days 61-90, and \$778 per day after 91 days.³ In 2022, the Part B premium was \$2,041 per year for most beneficiaries and the Part B deductible was \$233.⁴ Once the deductible is met, beneficiaries pay 20 percent of the Medicare-approved amount for most doctor services, outpatient therapy, and medical equipment.

Beneficiaries have the option of choosing Medicare Advantage instead of traditional Medicare. Under Medicare Advantage, Medicare pays private plans which then provide insurance that covers the services otherwise covered by Parts A and B. Medicare Advantage plans can charge additional premiums, but many of them do not, and some even pay all or part of the Part B premium for beneficiaries. Medicare Advantage plans are required to have out-of-pocket maximums, which in 2022 were \$7,550 for in-network and \$11,300 for out-of-network providers; yet these plans typically do require considerable cost sharing, sometimes exceeding those of traditional Medicare (Freed et al. 2021).

Medicare Part D is an optional add-on to Medicare. Beneficiaries choosing Part D coverage choose among a set of private plans approved by Medicare. Beneficiaries pay a monthly premium

which averaged \$400 per year in 2022, although there was wide variation across plans. Part D also has a deductible (which varies by plan and averaged less than \$25 in 2022) and coinsurance (which varies by plan, but was no more than 25%), and an out-of-pocket maximum of \$7,050 in 2022.

Low-income beneficiaries. About 12 percent of elderly Medicare beneficiaries are also enrolled in Medicaid. About 85 percent of these ‘dual eligibles’ qualify for full Medicaid benefits, which pays for Medicare premiums and cost sharing and provides insurance coverage for services not covered by Medicare, including, importantly, nursing home care, as well as things like eyeglasses and dental services. The remaining 15 percent of dual eligibles qualify for lesser benefits.⁵

Eligibility for these different levels of coverage depends on income and assets. There are differences across the states in eligibility categories, but to qualify for full Medicaid in many states, income must be less than the federal poverty line and assets—excluding the primary home and other personal property—must be lower than \$2,000. In some states (so called ‘medically-needy states’), people with income too high to qualify for Medicaid but with large medical expenses can qualify for Medicaid if their income less their Medicaid expenses is low enough, and if they meet the assets tests. There are also special low-income subsidies for Medicare Part D, which also have both income and asset limits.

Thus, Medicaid is a much more important source of coverage for lower-income elderly: in 2019, according to the Medicare Current Beneficiary Survey, 50 percent of elderly Medicare beneficiaries in the lowest income quintile were covered by Medicaid, and about 6 percent of beneficiaries in the second income quintile.

With Medicare beneficiaries potentially exposed to large out-of-pocket expenditures as well as a lack of coverage for dental and other services, it is not surprising to find that most elderly Medicare beneficiaries have supplemental coverage. For example, in 2018, among the 60 percent

of Medicare enrollees with traditional Medicare, 83 percent have other coverage. (MEDPAC 2021). The added forms of coverage include Medigap (41%), employer-sponsored insurance (20%), and Medicaid (9%). Some people with Medicare Advantage are also enrolled in other programs, including Medicaid and employer-sponsored insurance.

National Health Spending Trends Over Time

Health care spending has exceeded income growth for decades, rising from 5 percent of GDP in 1960 to 17.6 percent in 2019.⁶ As discussed in Follette and Sheiner (2008), the rate of increase in health spending's share of GDP slowed over the 1960-2005 period, and that rate of growth has slowed even more markedly since. Indeed, the increase over the most recent decade has been the smallest since before 1960. There was an even more dramatic slowing in real spending per capita, as per capita GDP growth also slowed significantly.⁷

Medicare spending slowed considerably over this period. Lower reimbursement rates enacted as part of the ACA were the main driver, but lower utilization rates and much lower spending on drugs were also important. Regardless of whether expressed in nominal dollars or as a share of GDP, by 2019, Medicare spending was about 20 percent lower than projected by the Congressional Budget Office in 2009 (Figure 1). This saved the federal government roughly \$1 trillion from 2010 to 2019.

Figure 1 here

A key question is whether the slowdown in overall health spending and Medicare spending growth is likely to persist. As we discuss below, both CMS and CBO assume that the recent slowdown is largely transitory, but both predict eventual slowdowns in health spending growth. Before discussing these long-run projections, we first detail the source of the slowdown.

Factors influencing spending growth. Table 1 reports CMS’s estimates of national health expenditure growth adjusted for changes in the demographic composition of the population (CMS 2021a). The first row of the table shows that growth in real health spending per capita (using the GDP deflator to inflation adjust) has been declining gradually over time. In describing health spending growth, economists typically focus on excess cost growth—defined here as the difference between per capita GDP growth and demographically-adjusted per capita health spending growth.⁸ The third row of the table reports CMS’s estimates of excess cost growth over time. While the decline over time is clear, the pattern is a bit volatile, suggesting that a clear signal of the underlying trend can be difficult to ascertain.⁹

Table 1 here

As discussed in Heffler et al. (2021), the key contributors to excess health spending growth are increased demand owing to technological advances, more rapid increases in measured health prices compared to other goods and services, the falling price for care faced by consumers owing to insurance expansions, and population aging.¹⁰ In the following discussion, we review how each of these factors has changed over time. The middle and bottom panels of Table 1 present two different numerical decompositions of excess cost growth based on these factors. These decompositions reflect two different set of price and income elasticities: those used by CMS and an alternate set that is reasonable given the literature.

Income and technology. There is considerable uncertainty about the relationship between health care spending and income. Looking across countries at a point in time, spending does rise with income, and an income elasticity of about 1 seems reasonable. With a unit elasticity, changes in GDP growth have no effect on excess cost growth, as shown in the bottom panel of Table 1. But elasticities estimated from cross-country studies may understate the effect of income on health

spending that occurs through the availability of new technology that might be related to income, yet is available to all countries at any given time. To account for this potential relationship between health technology and income growth, CMS assumes a time varying income elasticity that averages 1.6 over 1980-2020 (Heffler et al. 2021). The middle panel of Table 1 uses this elasticity to estimate the contribution of income growth on excess cost growth over time.¹¹

Insurance. Insurance coverage can affect health spending growth by affecting the price paid by consumers at the time of purchase of health care. Since 1960, there has been rising coverage of individuals through several channels, including the expansion of government programs, an increase in the types of health services that are insured, as well as the changing structure of insurance contracts. The share of health spending paid out-of-pocket (that is, spending excluding premiums) fell from 24 cents on the dollar in 1990 to 17 cents in 2005, and then to 14 cents in 2020. Applying a demand elasticity to changes in insurance coverage of -0.2 used by the CMS, the reduction in out-of-pocket spending share may have raised demand by roughly 0.1 percentage point per year over the past 25 years (middle and bottom panels of Table 1).

Health care prices. Another source of excess growth has been faster increases in health care prices than overall inflation—Table 2.¹² Over the 2010-2020 period, health care inflation slowed markedly, even more than overall inflation. As a result, health prices increased 0.1 percentage point slower than GDP prices, compared to increasing 1.0 percentage point faster over 2000-2010, with even much larger wedges in earlier decades.

Table 2 here

Many factors can move relative prices over time. For example, the consolidation of providers can lead to higher prices, and more aggressive negotiating by health insurance companies can lower prices. Changes to Medicare pricing policies also have a large effect on

overall health prices, both because Medicare makes up about 25 percent of total health spending, and because Medicare reimbursement rates also affect non-Medicare health prices. Some states specify Medicaid payments as a percentage of Medicare's prices (Fiedler 2022). In addition, evidence suggests that Medicare reimbursement rates also have a large effect on the negotiated rates between providers and private health insurance (Clemens and Gottlieb 2017; White 2013).

Higher prices generally lower utilization, so the rise in prices contributes less than one-for-one to increased nominal spending. Using CMS's assumed price elasticity of -0.4, over the 2000-2010 period, the 1.0 average rise in relative health care prices raised excess growth by 0.6 percentage point annually, which fell to 0.1 percentage point over 2010-2019. Yet this price elasticity is higher than other estimates.¹³ As an alternative, the bottom panel of Table 1 uses an elasticity of -0.2, which raises the contribution of excess health costs during the first decade from 0.6 to 0.8 percentage point. With a lower price elasticity, the slowdown in relative prices makes a larger contribution to the deceleration in excess cost growth.

Other factors affecting excess cost growth. As shown in Table 1, the decompositions do not fully account for excess cost growth. The residual (labelled 'Other') can stem from many factors, including changes in the availability and cost of new technologies or new drugs over time, and shifts in sources of coverage not picked up by measured prices. In addition, there is huge uncertainty about the elasticity assumptions (and the model itself), and these may vary over time.

What does the recent slowdown imply about health spending going forward? Looking at the sources of the slow excess cost growth in 2010-2019, it seems likely that continued insurance expansions are not likely to have much effect on excess cost growth going forward, given that the share of health spending paid out of pocket is already so small. By contrast, relative prices could revert to playing a larger role, in line with historical experience. A shift to relative price increases

of 1.5 percent per year, the average from 1990 to 2005, would lead to excess cost growth of about 0.9 to 1.2 percentage points, depending on the assumed price elasticity.

Nevertheless, with Medicare continuing to allow only modest increases in reimbursement rates over time, it is possible that relative prices growth will stay muted. In addition, it is also possible that other forces beside Medicare payment policy have held private health prices down, and these other (unexplained) forces could persist.

In the column under ‘normal’ economic conditions in Table 1, we assume health prices increase 0.75 percentage points faster than GDP prices, in line with CMS’s estimate. With CMS’s estimate of the income elasticity in 2020 of about 1.4, a return to normal GDP growth would lead to excess cost growth of about 0.6 percentage point. In the bottom decomposition, income affects spending growth, but has no effect on ‘excess’ spending growth.

In the middle decomposition that attempts to approximate CMS’s factors model, the residual ‘other factors’ component is generally negative but shrinks over time. CMS assumes this residual fully dissipates over 25 years, and that it subtracts about 0.5 percentage point from excess cost growth in the near term. In the bottom decomposition, health spending growth has on average been higher than accounted for simply by relative price and insurance cost increases over the past 20 years, but this residual disappeared in the most recent decade. A reasonable estimate going forward might be 0.5, which would yield an equilibrium excess cost growth of 1.2 percent.

CMS and CBO projections of excess cost growth. Both CMS and CBO use a detailed bottom-up approach to project Medicare spending over the next decade, meaning that they project trends in utilization and reimbursement rates for each type of health service, and then they account for very detailed projections of reimbursement rates. Yet, they do take somewhat different approaches to projecting spending after that first decade.

For the final 50 years of its 75-year projection period, CMS uses the ‘factors model’ described above to project National Health Expenditures, along with a variety of assumptions, and factoring in the Medicare’s payment rules. Altogether, CMS assumes that excess cost growth for Medicare averages roughly 0.5 percentage point from 2031-2051, and 0.8 percentage points for NHE.¹⁴

Rather than trying to model the underlying forces giving rise to excess cost growth, CBO recently has taken a more mechanical approach for the longer-term projection, factoring in the historical excess cost growth experience along with a number of assumptions. In its March 2021 Long-Term Budget Outlook, average excess cost growth from 2031-2051 was assumed to be 1.15 percentage points for Medicare and 1.27 percentage points for Medicaid and private health insurance premiums (CBO 2021a).

Reasonable parameters for our simulations. In our view, there is some possibility that excess cost growth remains relatively low over time. This would have the effect of enhancing retirement security of the current and future elderly, and also shaping the long-run fiscal outlook for the federal government. Yet, it is also plausible that the recent lull will not persist. Furthermore, it is unclear whether the CMS projection, which assumes lower Medicare price growth and hence lower overall spending growth than non-Medicare spending, will prove correct, or whether the CBO approach, which has almost the same levels of excess cost growth for Medicare as for Medicaid and private health spending, will.

As we discuss below, it also matters the extent to which excess cost growth comes from relative (measured) prices versus from increased utilization. As a result of these considerations, we assess the implications of 0 and 1 percent excess cost growth for NHE and Medicare, allowing

the rates to move separately (e.g., 1% excess cost growth for NHE and 0% for Medicare.) We examine 2 percent excess cost growth—probably an upper bound—in the appendix.

Data Used in this Analysis

Our main source of data is the Medicare Current Beneficiary Survey (MCBS).; in our analysis, we examine spending in 1996, 2000, 2005, 2009, 2015, and 2016. The MCBS includes information on premiums paid by the elderly, which include premiums for Medicare (either through traditional Medicare or a Medicare Advantage Plan) as well as any private premiums paid for supplemental insurance through Medigap or other private plans, including plans from a former employer to which they contribute. The MCBS also contains information on the source of funds that providers receive—for example, private insurance, Medicaid, or Medicare.

In the MCBS, total health spending, or the total amount paid to providers, is equal to the sum of amounts paid by Medicare and Medicaid, amounts paid directly by beneficiaries (copayments, deductibles, coinsurance), amounts paid by private insurance, and uncollected bills (bad debts). This decomposition of health spending does not account for the fact that Medicare beneficiaries pay premiums that cover some of the payments by Medicare and private insurance. Accordingly, to gauge the burden on the household, we decompose health spending as the sum of amounts paid by Medicare beneficiaries (premiums, copayments, deductibles, and coinsurance), publicly-financed spending (Medicare and Medicaid less premiums), and other spending (private payments less private premiums paid directly by Medicare beneficiaries, and bad debt).

In our decomposition, other spending includes spending financed by previous employers (the part of retiree health insurance not paid for directly by Medicare Beneficiaries, as well as

insurance profits or losses in a particular year and monies owed but not paid to hospitals, physicians, and other providers).

Adjustment of income. The main focus of the MCBS is on capturing health spending, and there is less focus on accurately measuring income; in fact, the income measures used are known to understate income (Cubanski et al. 2018). In addition, the questions used to capture income have changed over the course of the years that we analyze, making comparisons difficult. As discussed in Chen et al. (2018), the income measures in the Health and Retirement Study are reasonably accurate. We therefore use income measured in the Health and Retirement Study (HRS) to adjust the MCBS income. In particular, because the composition of the MCBS and the HRS populations are somewhat different (even with sample weights), we adjust as follows: for each year, we calculate adjustment factors by quintile, marital status, and age group equal to the ratio of HRS income to MCBS income, and we then multiply MCBS income by that adjustment factor.¹⁵ We are assuming that the ranking of income in the MCBS matches the ranking of income in the HRS, which should be reasonably accurate at the quintile level of aggregation.

The MCBS includes measures of income for respondents and spouses, if present. For households where the respondent is married, we create an equivalence-adjusted per capita income measure by dividing household income by 1.7, following Follette and Sheiner (2008) and De Nardi et al. (2016).

Health care budget shares. The slowdown in aggregate health care spending described above shows through to real health spending per beneficiary. Figure 2 illustrates the rise and flattening of spending per beneficiary, adjusted for the changing age distribution, since 1996, which is apparent for all income quintiles. It also shows that health spending generally declines as household income rises, reflecting the fact that age-adjusted health spending is actually highest for

those in the lowest income quintiles and relatively flat across the other quintiles (not shown). Health spending tends to be higher for lower-income people because they are on average in worse health. Those with life-long health problems are likely to have low income, and low education is thought to contribute both to low income and poor health. Furthermore, lower-income elderly may have experienced more physically demanding jobs and more stressful lives, which could also affect health status later in life.

Figure 2 here

Panel (a) of Figure 3 shows the evolution of private health spending (the amount paid by beneficiaries through premiums for Medicare and other health insurance plans and other out-of-pocket payments like coinsurance and deductibles) as a share of income by quintile over time.

Two results are noteworthy. First, the private share of health spending has been declining over time, reflecting the relative stability in spending per beneficiary since about 2005, a small decline in the share of spending paid privately, and rising income. Second, despite the fact that the average share of health spending paid privately is much lower for those in the lowest income quintiles because of Medicaid, private health spending accounts for a larger share of income for those in the lowest income quintiles. This reflects the fact that health spending is actually somewhat higher for those in the lowest income quintiles, as we discussed above, income is much lower, and Medicaid coverage is far from universal even among the poor elderly.

Figure 3 here

Panel (b) of Figure 3 shows the distribution of spending on premiums for Medicare (either through traditional Medicare or a Medicare Advantage Plan) as well as any private premiums for supplemental insurance through Medigap or other private plans. Overall, beneficiaries in the lowest two income quintiles pay about 10 percent of income in premiums alone.

These *average* out-of-pocket shares significantly understate the burden of health care spending for elderly households in poor health. Panels (c) and (d) of Figure 3 show the shares of beneficiaries who are cost burdened and severely cost burdened, which we define as private spending (premiums, co-pays, and deductibles) exceeding 20 percent and 50 percent of income, respectively. About 40 percent of beneficiaries in the two lowest income quintiles spent more than 20 percent of their income on health care in 2016. Twenty one percent of the lowest income beneficiaries and 8 percent of those in the second quintile spent more than 50 percent of income on health care in 2016. Of course, it is not likely that the same individuals will continue to spend this much year after year. Yet, as shown by De Nardi et al. (2016), health costs can be quite persistent.

Because health status deteriorates over time, and because the elderly face significant cost sharing, total health expenditures and private health spending increase with age. In addition, the ratio of health spending to income rises with age because income falls with age (for social security, for example, the initial benefit is indexed to wages, but benefits thereafter are indexed to prices, meaning that benefits do not rise overtime as quickly as wages.) Consequently, out-of-pocket spending as a share of income rises with age (see Figure 4).

Figure 4 here

Evaluating Changes in Real Income Available for Non-Health Consumption

Our measure of retirement security is real income available for non-health consumption—that is, after paying for health care, how much do households have left and how does this change over time? This differs from changes in budget shares, for two reasons. First, any increase in health spending as a share of the budget will have a larger effect on non-health consumption the larger is

the share of health spending in the budget. Second, income itself may be affected by changes in health prices in such a way as to limit the effect of higher health spending on consumption of other goods and services. For example, if health prices increase but income increases by enough to offset that rise, health spending will increase as a share of nominal income, but income available for non-health expenditures will be unaffected.¹⁶

The key channel for the interaction of health prices and income is the annual CPI adjustment in social security and many defined benefit retirement programs. In the simulations below, we account for these interactions and also allow for differences between Medicare and private sector health prices. The appendix shows the derivation of our burden measure and our inflation adjustment. The intuition for the inflation adjustment is straightforward: If overall health care prices are increasing, the CPI adjustment will hold households harmless in the face of health prices increases, if their health spending share of income is the same as the health spending share in the CPI basket and if the prices they face—Medicare prices—are rising as quickly as overall health prices. Of course, elderly households typically spend more on health care than households in general, and health spending rises not just because of rising prices, and thus the CPI adjustment will be inadequate to protect the elderly from a rising burden of health spending over time.

The effect of the recent Medicare slowdown on retirement security. Figure 5 reports the effects of slower Medicare growth from 2009 to 2019 discussed above on income available for non-health expenditures. Because virtually all health expenditures of the elderly are tied to Medicare spending, it is reasonable to assume that the 20 percent drop in Medicare spending will result in a roughly 20 percent drop in beneficiary out-of-pocket spending. With that assumption, we estimate that the slower growth of Medicare expenditures over the 2009-2019 period provided a significant increase in resources available for non-health care consumption by 2019, amounting to a 16

percent increase for the lowest quintile, 9 percent for the second quintile, falling to only 1 percent for the highest quintile.

Figure 5 here

To the extent that the value of health care received hasn't been affected, the Medicare slowdown since 2009 represents a substantial increase in living standards for poor elderly households. This seems likely to be largely the case. Most of the slowdown reflects cuts to payments to health care providers rather than reductions in utilization, and very few physicians have opted out of Medicare, suggesting that access to providers for Medicare beneficiaries has not deteriorated as a result of these cuts to provider payments (Ochieng et al. 2020). But some of the reduction is because of lower utilization, which might be associated with a reduction in the quality of care. Others have noted that Medicare Advantage—which covers a growing share of Medicare beneficiaries—often denies needed care, which also suggests the possibility of some reduction in the quality of care (Abelson 2022), though not necessarily associated with the slowdown in spending.

Looking Forward

To gauge the importance of future health care costs to elderly retirement security, we undertake two sets of simulations. In the first, we follow individuals of age 65 in 2019 and evaluate how the income available to finance non-health spending over time depends on the rate of increase in overall health care spending, health prices, and overall Medicare spending. In the second set of simulations, we examine the same set of issues through the lens of different cohorts by comparing retirees of the same age over time—that is, a retiree who is 65 in 2019, in 2029, in 2039, and 2049.

Our analysis takes into account increases in health spending over time as a function of quintile, age, and time. To measure the effects of aging on out-of-pocket expenditures, we use the average growth rates of health spending for each year of age by income quintile and Medicaid status (for bottom two quintiles) from 2009, 2015, 2016, and 2019.¹⁷ We redefine quintiles for this exercise as the distribution of income of 65-year-olds, in order to capture the trajectory of out-of-pocket spending for people with the same real income over time.

Given that we are following people who are mostly retired, we assume that income rises with inflation. Health spending increases depend on our assumptions. We follow the Social Security Trustees (2021) by assuming that nominal per capita GDP growth will be roughly 3.5 percent, and that real per capita GAP growth (using the CPI-W deflator that rises 2.3 percent per year) is 1.2 percent. Thus, with 0 excess cost growth, real health spending rises 1.2 percent per year.

In order to isolate the effects of rapid health spending increases, in all our results we measure the income available for non-health spending relative to what it would be if health spending (Medicare and NHE) increased with overall inflation. In this base case, health spending rises as someone ages only because health status deteriorates with age. Our simulations capture the effects of rising relative prices or changes in health technology or practices.

Following current 65-year-olds over time. Table 3 presents our results. The first set of columns ‘NHE Prices Rise with Overall Inflation’ shows the results when any NHE excess health spending growth is the result of higher utilization, not measured prices; NHE spending growth therefore has no effect on the CPI and, as a consequence, no effect on the elderly for any given Medicare excess cost growth.

Table 3 here

Examining the bottom quintile, Medicare excess cost growth of 0 percent—which means that Medicare costs are rising with GDP while income is rising with inflation—has little effect on the young elderly, because they spend a smaller share of their income on health costs and because the impact of faster health spending growth accumulates over time. By the time they are 75-79, however, income available for non-health goods and services is 12 percent lower than it would be if health costs rose with inflation, and the effect is much larger by the time they are in their 80s. Looking across Table 3, the third column shows what happens if there is no excess cost growth in Medicare but NHE excess cost growth is 1 percent and it is all due to relative price growth. The effects are just a bit more muted. Changes in the NHE prices only have a modest effect on people in the bottom quintile because the share of health spending in the CPI—roughly 7 percent—is much smaller than the share of out-of-pocket health spending for those in the bottom quintile, particularly at later ages.

A 1 percent rate of excess cost growth in Medicare—still below the average expected by CBO over the next 30 years—has a larger effect on the income available for non-health consumption, lowering it by almost 25 percent for 75-79 years old in the bottom quintile, compared to 12 percent for the case with no excess cost growth. And, again, the assumptions about how fast NHE prices rise has only modest effects.

The results for Quintile 2 are remarkably similar to those for Quintile 1, except for when people reach their 80s. The similarity reflects the fact that, while income is higher in Quintile 2, fewer people have Medicaid and thus private health spending is a similar share of income. The differences for those in their 80s reflects the much higher income shares of health spending for 80 years olds in quintile 1.

Of course, as one moves up the income quintiles, health spending as a share of income falls, meaning that any given increase in health costs has less effect on the resources available for non-health consumption. For people in the middle quintile, income available for non-health consumption is about 4 percent lower by their early 70s, assuming 0 excess cost growth, and 8 percent lower for 1 percent excess cost growth. Changes in NHE prices have a larger effect on those in Quintile 3 and above, however, because any offset from a CPI adjustment has a constant effect as a share of income across the quintiles, and thus provides a bigger relative reduction in the harm of higher health prices the smaller that effect is.

Turning to the bottom rows of the table, for Quintile 5, we see that rapid health spending growth has only very small effects on income available for non-health consumption. If NHE prices are increasing as well, higher health spending growth can even make them better off. (In addition, the assumption that income rises with the CPI for people in the top quintile is probably too restrictive for this group; their income likely rises faster than that over time, owing to their significant asset income.)

The main reason that the burdens differ so much by quintiles has to do with the fact that out-of-pocket health spending is a much larger share of income for lower income people (see Appendix Table 2). The actual dollar amounts of health spending do not differ much by income quintile, and the main reason that the burden increases with age is that health spending increases so much with age.

In sum, low-income elderly are quite vulnerable to rising health care costs. As we discuss below, we assume here that Medicaid rates do not vary over time—given that income or asset limits generally are not indexed to inflation, this might overstate the protection offered by Medicaid coverage. But because Medicaid take-up is fairly low, it is possible that as a result of

increasing cost burden, take-up could increase. If not, there will undoubtedly be pressure to further expand the federal role in financing health costs for the elderly.¹⁸

The lack of importance of the CPI for the low-income elderly is also notable. That implies that any changes made to the CPI to better account for health care quality would have only small effects on the retirement security of the low-income elderly. The variation in the income share of private health spending by income quintile also means that measures like the CPI-E that attempt to capture the inflation experienced by the elderly will still not fully compensate the low-income elderly for increases in health costs.

Comparing different cohorts over time. The second set of simulations compare retirees of the same age over time—that is, a retiree who is 65 in 2019, in 2029, in 2039, and 2049—to gauge how different cohorts are affected by health care utilization and prices. We assume income before retirement grows at the rate assumed in the Social Security Trustees projections, and health spending rises at the pace described above. We account for changes in the CPI in the same manner as described above. When health spending rises faster than wages, health spending will be a larger share of income, but to the extent that increase is in the form of relative prices, some of the effect is offset by lower prices for non-health consumption items.

Table 4 presents our results, comparing different cohorts ten years (2026) and twenty years (2036) after our most recent data. We examine only the effects of 1 percent excess cost growth, because with no excess cost growth in Medicare and no change in NHE prices, future cohorts spend the same share of income on health spending as current cohorts.

Table 4 here

Looking at the right column of the top panel, with 1 percent excess cost growth in Medicare owing to higher utilization and no change in the relative price of non-health goods, the burden of

health spending in the bottom quintile increases sharply over time. For 70-74-year-olds in the bottom quintile, the income available for non-health spending falls 6 percent over the 10 years from 2016 to 2026 and 13 percent after 20 years; for the 80-85 cohort, the estimated reduction in income for non-health is dramatic, and would likely result in sizable pressures for government relief.

The bottom panel of the table analyzes the effects when NHE prices rise 1 percent, and therefore, relative prices of non-health goods and services fall. With 1 percent excess Medicare cost growth, real income available for non-health consumption still declines for those in the bottom two quintiles, albeit a bit less. But for those in the top income quintiles, real resources for non-health consumption are actually higher, because the fall in non-health prices is large enough to more than offset the rise in spending on health.

Conclusions and Policy Implications

Our earlier work showed that the higher the share of health spending in income, the more an increase in health care spending affected income available for other consumption (Follette and Sheiner 2008). We also noted, however, that despite rapid increases in health spending from 1980-2005, private health spending over that period had been relatively stable as a share of income because public policy had responded when health care threatened to become unaffordable to lower-income households. Our earlier study also focused on policy responses that expanded health coverage by increasing the government share of health spending, and it argued that such responsiveness created an upside risk to long-term federal budget projections, which assume no such expansions.

These policy expansions have continued in recent years, most notably by the introduction of Medicare Part D and the ACA. But for the elderly, an even more important development has been the slowdown in health spending growth. While the source of the slowdown is not fully understood, a large part of it is no doubt due to lower reimbursement rates in the ACA—essentially requiring *providers* to make health care more affordable, rather than simply increasing the federal share of health spending. Other ACA innovations, like the Hospital Readmissions Reductions Program and the introduction of the various Medicare Shared Savings Programs, may also have led to a reduction in utilization by making health care more efficient.

An important question is whether these provider cuts will remain sustainable over the long run, and whether even greater reductions may be possible in the future if health spending starts increasing rapidly again. The pace of health spending growth has significant implications for the Federal budget, but as we showed, it is also a key determinant of retirement security, especially for low-income elderly households. With zero excess cost growth, retirees will still face increasing health spending as a share of income over time, both because of aging, and also because their income rises with inflation instead of GDP. For those in the lowest quintile, excess cost growth of zero—that is where health care spending rising with per capita GDP—still results in lower resources available for non-health consumption by 5 percent at age 70-74, and 12 percent at ages 75-79, relative to a counterfactual where health spending only increased with inflation. Even if the CPI does adjust to reflect rapid health costs, and even if the health prices tracked by the CPI increase much faster than Medicare's, low-income elderly will receive only modest protection from higher health spending, because health spending represents a much larger share of their budget than the weight in the CPI.

With 1 percent excess cost, still modest by historical standards and below CBO's projections, resources for those in the bottom quintile are projected to decline 9 percent over the next 10 years, and 24 percent for 75-79-year-olds. If excess cost growth remains high, future cohorts will be at a further disadvantage, because they have more years during which health spending growth will exceed income growth. It is worth remembering that it is not just the rate of excess cost growth that determines the effect on resources available to support non-health consumption, but also the share of health spending in income. While excess cost growth has been higher in the past, the share of health spending in income was lower. The high share of health care in household budgets now implies that even modest excess cost growth could have material effects on affordability going forward.

Even assuming that the CMS projections of fairly modest excess cost growth are correct, pressure will likely grow over time for policymakers to take steps to preserve or increase affordability. If further cuts in provider payments are possible (including, for example, negotiating drug prices), affordability could be increased without much effect on the federal budget. But if there are limits to the extent to which provider payments can be cut without impairing access to quality health care, then the pressure to increase federal financing of health care for the elderly will increase overall pressures on the budget.

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Endnotes

¹ This is related to the Supplemental Poverty Rate, which subtracts out-of-pocket medical expenses from income to assess poverty.

² State and local workers, even those not covered by social security, are typically eligible for Medicare as well. A few beneficiaries (for example, recent immigrants) enroll in Part A by paying the Part A premium.

³ Beneficiaries only have 60 lifetime reserve days over their lifetime. (These are additional days of coverage if one is hospitalized from more than 90 days). Once these are used up, Medicare only pays for 90 days of hospitalization for each hospitalization episode. A new hospitalization episode begins after a beneficiary has been out of the hospital for 60 consecutive days.

⁴ In 2020, about 8% of beneficiaries were subject to high-income premiums. About 5% of beneficiaries paid a reduce premium through Medicare Advantage enrollment or through the hold-harmless provision of the Medicare B part system (CMS 2021b).

⁵ For example, Qualified Medicare Beneficiaries (QMBs) pay no premiums or cost sharing but they do not qualify for additional services not covered by Medicare, whereas Specified Low-income Medicare Beneficiaries (SLMBs) do not have to pay the Part B premium but are responsible for cost sharing.

⁶ Throughout this chapter, we focus on data through 2019, because the pandemic had significant, but probably transitory effects on both health spending and GDP. In CMS's national health expenditures accounts, health spending surged in 2020 owing to a doubling of public health expenditures and enormous federal aid (largely subsidies) to support the medical system in response to Covid. In BEA's National Income and Product Accounts, which excludes these subsidies, personal health spending actually fell.

⁷ The real spending estimates are derived by deflating health spending by overall GDP prices rather than health prices because it facilitates decomposing sources of growth of the health share of GDP and it provides a better measure of alternative uses of resources. We examine the role of health prices separately.

⁸ CBO defines excess cost growth as the difference between demographically-adjusted health spending growth and *potential* GDP.

⁹ It is worth noting that, in the mid-2000s, there was considerable uncertainty about whether the 1990s slowdown would persist, or whether it reflected a series of one-time factors from various health reforms, such as the shift to managed care.

¹⁰ Most analysts believe that measured health price inflation is biased upward because prices do not adequately account for improving quality of health services. See Sheiner and Malinovskaya (2016), Cutler et al. (2006) and Dauda et al (2019).

¹¹ CMS assumes income growth affects health spending over a seven-year period (i.e., income growth in 2020 affects health spending from 2020-2027), with larger effects in more recent years. To approximate CMS's lag structure, we apply an elasticity of 1.6 to the five-year average change in real GDP per capita. To get the impact on excess cost growth (which uses only current GDP) we subtract actual real GDP per capita from this estimated effect.

¹² To some extent, the relatively higher level of inflation in the health care sector owes to difficulties in measuring quality changes in health goods and services. Indeed, Dauda et al. (2019) estimated that true health care prices were actually falling, not rising. Consequently, what appears as inflation in the national accounts is likely increasing real quantities. Both factors will be captured in excess growth.

¹³ For example, Gruber et al. (2020) estimated a price elasticity of about 0.2, in line with the elasticity from the Rand Health Insurance Experiment (Manning et al. 1987). CMS argues, however, that a broader definition of the elasticity is necessary for time-series analysis, because prices can also affect the choice of insurance. For example, higher prices could lead consumers to choose lower-priced policies with smaller networks. On the other hand, changes in prices over time are likely capturing, to a meaningful extent, quality increases, suggesting a lower price elasticity than that derived from experiments that vary out of pocket costs in a particular time period.

¹⁴ This is a rough estimate that is derived from Chart 2 in Heffler et al. (2021); we estimated excess cost growth rates for Parts A, B, and D of Medicare from the graph and then weighted by CMS projected spending for each part.

¹⁵ The HRS survey data are available every two years. As such, we take the average of 2004 and 2006, 2008 and 2010, and 2014 and 2016 to compute the income adjustment factors for 2005, 2009, and 2015 respectively.

¹⁶ Consider, for example, someone who has \$80 in income in period one and spends \$20 on health. In period two, income increases to \$100 and health spending increases to \$40. The share of health spending in income has increased from 25% to 40%, but the income available for non-health spending remains constant at \$60.

¹⁷ We do not have the HRS for 2019 yet, and so begin the simulation with 2016, but we are able to use the information on health spending by age in the 2019 MCBS sample.

¹⁸ The most common pathway to Medicaid for the elderly is through SSI. According to the Office of Evaluation Services and the Social Security Administration (2018), take up for SSI is likely

significantly less than 60%. Take up for the Medicare Savings Programs for the elderly (QMB, SLM, QI) is estimated to be less than 50% (Caswell and Waidmann 2017).

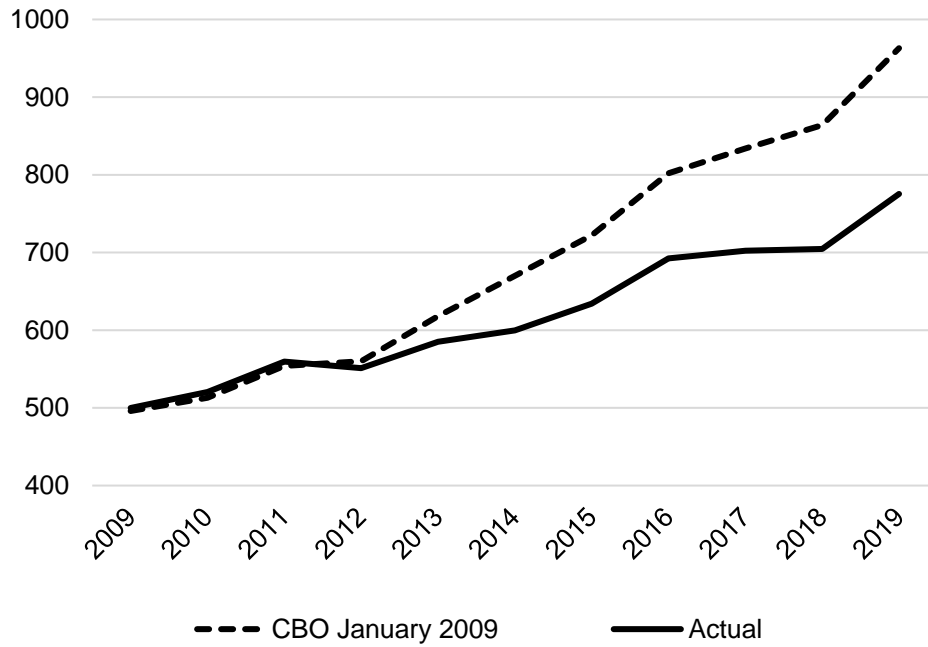


Figure 1. Medicare spending, projected as of 2009, and actual

Source: Authors' calculations using CBO Budget Projections, January 2009; CBO Historical Budget Data, February 2021.

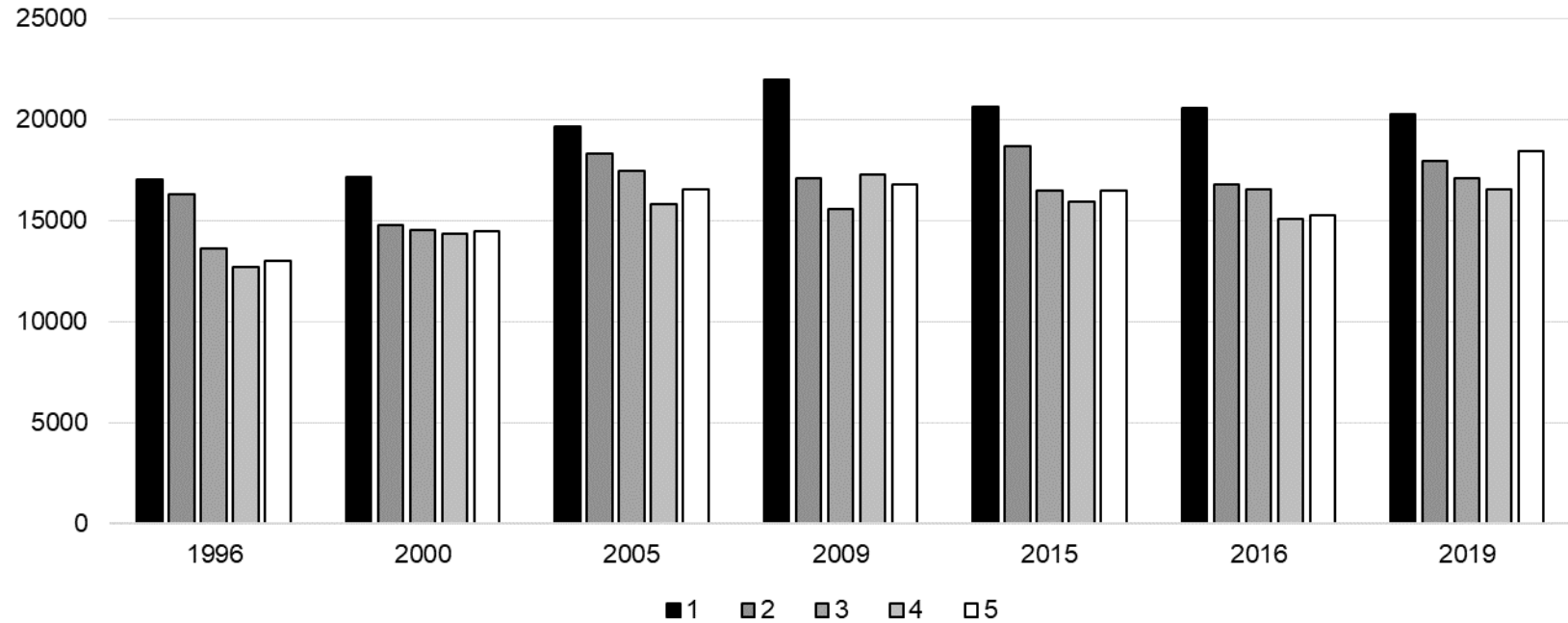
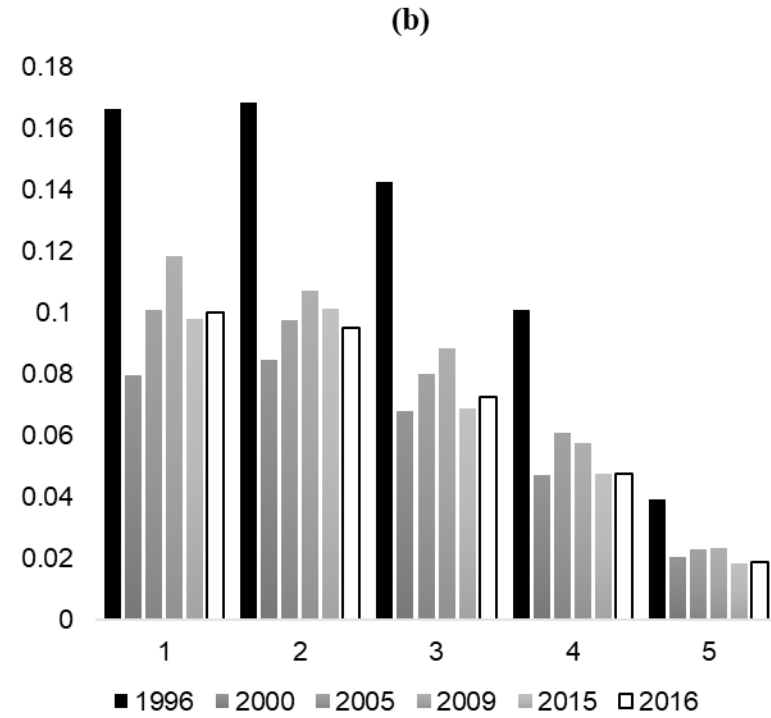
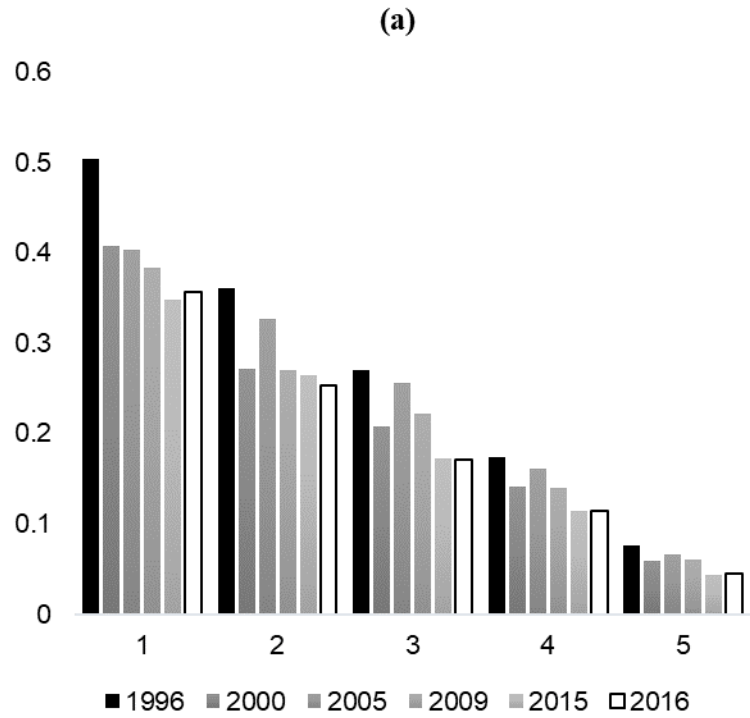


Figure 2. Real health expenditures by income quintile (2021 \$), age adjusted

Note: Real health expenditures are adjusted according to the age distribution of Medicare beneficiaries over the full sample period.

Source: Authors' calculations using the Medicare Current Beneficiary Survey.



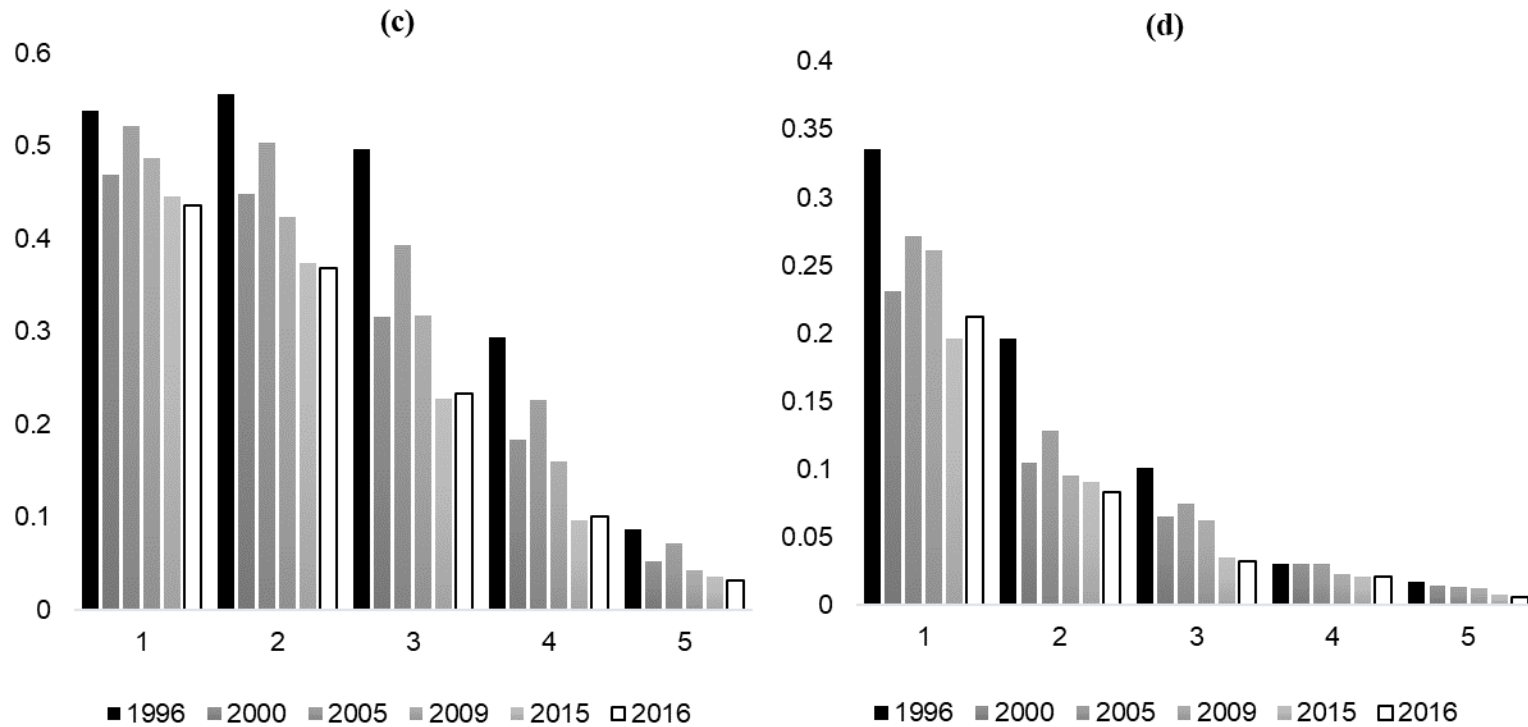


Figure 3. (a) Private spending as share of income by income quintile. (b) Premiums as a share of income by income quintile. (c) Cost burdened share of beneficiaries by income quintile (private spending > 20% income). (d) Cost burdened share of beneficiaries by income quintile (private spending > 50% income).

Note: Private spending includes premiums, co-pays and deductibles. Premiums include premiums for Medicare (either through traditional Medicare or a Medicare Advantage Plan), and any private premiums paid for supplemental insurance. Income is adjusted using the Health and Retirement Study.

Source: Authors' calculations using the Medicare Current Beneficiary Survey and Health and Retirement Study.

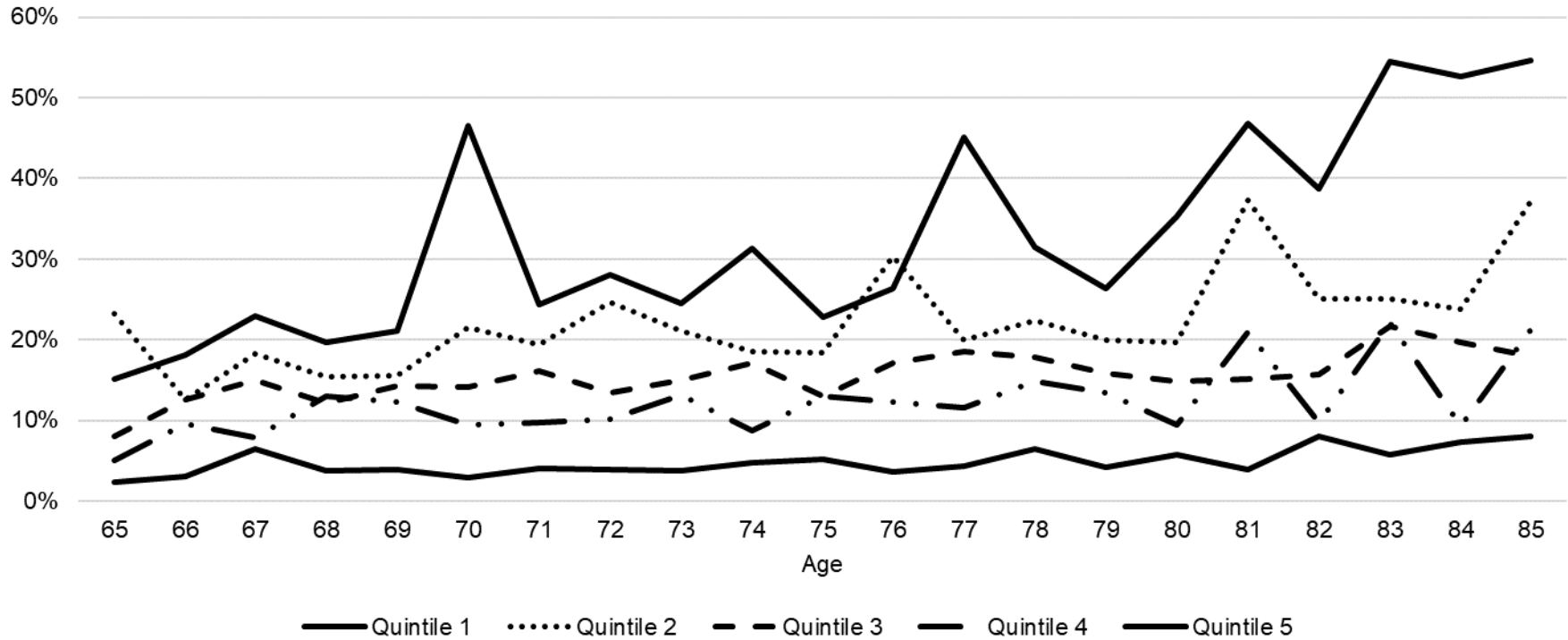


Figure 4: Out-of-pocket spending by age as a share of income in 2016.

Note: Income quintiles are defined based on the income distribution of 65-year-olds in 2016. Out-of-pocket spending includes premiums, co-pays, and deductibles.

Source: Authors' calculations using the Medicare Current Beneficiary Survey, 2016.

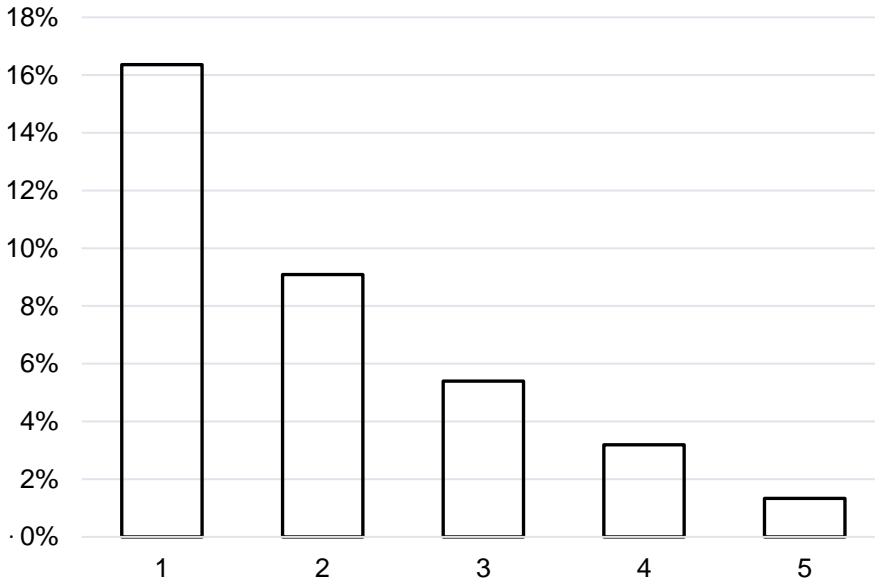


Figure 5. Increase in non-health consumption by 2019 from slower growth of Medicare savings since 2009, by income quintile

Note: Income quintiles are defined based on the income distribution of 65-year-olds in 2016.

Source: Authors' calculations using the Medicare Current Beneficiary Survey, 2016.

Table 1. Decomposition of Health Spending 1980-2019

	1980- 1990	1990- 2000	2000- 2010	2010- 2019	Estimate of Excess Cost Growth Under 'Normal' Economic Conditions
<hr/>					
CMS Adjusted Real Health Spending Growth per Capita	4.5	2.3	2.5	0.9	
Real GDP Growth Per Capita	1.3	1.3	-0.1	0.9	
CMS Excess Cost Growth	3.2	1	2.6	0	
Contributions					
Approximation of CMS Factor Model					
Income	2.4	1.9	2.7	0.5	0.6
Relative Prices	2.4	1.1	0.6	-0.1	0.5
Insurance	0.4	0.5	0.3	0.1	0.0
Other	-2.0	-2.5	-1.0	-0.5	-0.4
<i>Total</i>	3.2	1.0	2.6	0.0	0.7
Alternative Decomposition					
Income	0.0	0.0	0.0	0.0	
Relative Prices (0.2)	3.2	1.5	0.8	-0.1	0.6
Insurance	0.4	0.5	0.3	0.1	0.1
Other	-0.4	-1.0	1.5	0.0	0.5
<i>Total</i>	3.2	1.0	2.6	0.0	1.2

Note: The middle panel denoted ‘Approximation of CMS Factor Model’ uses the income and price elasticities used by CMS to decompose changes in Excess Cost Growth over time. The bottom panel uses an alternative set of elasticities from the literature (income elasticity of 1 and a relative price elasticity of 0.2) to create an alternative decomposition. In the column marked ‘Normal’ Economic Conditions, we estimate excess cost growing forward assuming that health prices increase 0.75 percentage points faster than GDP prices, GDP rises x% a year, increases in insurance coverage have the same effect going forward as over the last decade, and ‘other’ contributes the same amount as it did on average from x to y.

Source: Authors’ calculations using Centers for Medicaid and Medicare Services (CMS 2021a, 2021c) National Health Expenditure Data, 2021, and Bureau of Economic Analysis (BEA).

Table 2. Relative Health Care Inflation

	Average Relative Inflation Rate, Ten Years Ending							2019 less 2010
	1990	1995	2000	2005	2010	2015	2019	
Excess Inflation Relative to GDP Prices	4.0	3.5	1.8	0.8	1.0	0.4	0.0	-1.0
Medical products, appliances, and equipment	2.9	2.1	1.1	0.9	0.8	0.7	0.6	-0.2
Outpatient services	3.0	2.9	1.5	0.3	0.3	-0.2	-0.6	-0.9
Hospital and nursing home services	5.1	4.4	2.1	1.2	1.7	0.8	0.3	-1.4

Source: Authors' calculations using Bureau of Economic Analysis (BEA), Table 2.4.4

Table 3. Difference in Real Non-Health Consumption Share of Income Relative to Baseline Scenario where Medicare Costs Increase with Inflation

Medicare Excess Cost Growth	NHE Prices Rise with Overall Inflation		NHE Excess Cost Growth = 1%, All Prices	
	0%	1%	0%	1%
	Quintile 1			
70-74	-5%	-9%	-3%	-7%
75-79	-12%	-24%	-10%	-22%
80-84	-61%	-123%	-60%	-124%
	Quintile 2			
70-74	-5%	-9%	-3%	-7%
75-79	-12%	-22%	-10%	-21%
80-84	-29%	-57%	-26%	-56%
	Quintile 3			
70-74	-2%	-3%	0%	-2%
75-79	-4%	-8%	-2%	-6%
80-84	-8%	-16%	-5%	-13%
	Quintile 4			
70-74	-1%	-2%	0%	-1%
75-79	-2%	-4%	0%	-2%
80-84	-5%	-10%	-2%	-7%
	Quintile 5			
70-74	0%	-1%	1%	1%
75-79	-1%	-2%	1%	0%
80-84	-2%	-3%	2%	0%

Source: Authors' calculations using the Medicare Beneficiary Survey, 2009-2016.

Table 4. Difference in Non-Health Consumption Share of Income Compared to 2016 Cohort
NHE Prices Rise with Overall Inflation

	0% Excess Medicare Cost Growth				1% Excess Medicare Cost Growth			
	65-69	70-74	75-79	80-85	65-69	70-74	75-79	80-85
	Quintile 1							
2026	0%	0%	0%	0%	-3%	-6%	-6%	-12%
2036	0%	0%	0%	0%	-7%	-13%	-13%	-25%
	Quintile 2							
2026	0%	0%	0%	0%	-3%	-3%	-4%	-5%
2036	0%	0%	0%	0%	-6%	-7%	-8%	-11%
	Quintile 3							
2026	0%	0%	0%	0%	-2%	-2%	-3%	-3%
2036	0%	0%	0%	0%	-4%	-5%	-5%	-6%
	Quintile 4							
2026	0%	0%	0%	0%	-1%	-1%	-2%	-2%
2036	0%	0%	0%	0%	-3%	-3%	-4%	-5%
	Quintile 5							
2026	0%	0%	0%	0%	-1%	-1%	-1%	-1%
2036	0%	0%	0%	0%	-1%	-1%	-1%	-2%
NHE Excess Cost Growth = 1%, All Prices								
	0% Excess Medicare Cost Growth				1% Excess Medicare Cost Growth			
	65-69	70-74	75-79	80-85	65-69	70-74	75-79	80-85
	Quintile 1							
2026	2%	2%	2%	2%	-1%	-4%	-4%	-10%
2036	5%	5%	5%	5%	-2%	-8%	-8%	-21%
	Quintile 2							
2026	2%	2%	2%	2%	0%	-1%	-1%	-3%
2036	5%	5%	5%	5%	-1%	-3%	-3%	-6%
	Quintile 3							
2026	2%	2%	2%	2%	0%	0%	0%	0%
2036	5%	5%	5%	5%	1%	0%	-1%	-1%
	Quintile 4							
2026	2%	2%	2%	2%	1%	1%	0%	0%
2036	5%	5%	5%	5%	2%	2%	1%	0%
	Quintile 5							
2026	2%	2%	2%	2%	2%	2%	2%	1%
2036	5%	5%	5%	5%	4%	4%	4%	3%

Source: Authors' calculations using the Medicare Beneficiary Survey, 2016.

Appendix

This appendix provides detail on our measure of health care burden and some additional simulation table. To measure the changing burden of health care spending, it is important to model how changes in health costs affect both health spending and real income.

In our simulations, we measure the burden of health care spending as follows:

Let R be the percent change in real income available for non-health expenditures =

$$R_t = \frac{\frac{(Y_t - H_t)}{(1 + \pi_c)}}{(Y_{t-1} - H_{t-1})} - 1,$$

where Y is nominal income, H is health expenditures, and π_c is inflation for consumer items excluding health. When R is 0, households can afford the same basket of non-health consumption as in the previous period.

Health spending increases over time because of measured prices and because of growth in utilization.¹ Furthermore, because Medicare prices are set administratively, they can and do diverge from private prices, as discussed above.

Denote health spending increases in Medicare due to utilization as g , and due to prices π_M . Let the share of health spending in income for the elderly be b , and let the increase in the CPI be π . Assume for simplicity that the increase in health care utilization is the same for Medicare as for private health spending, but that prices of health spending in the CPI increase at a different rate, π_P . Finally, let the share of health care spending in income for the elderly be b , and the share for the population as a whole as measured by the CPI be x .² Then CPI inflation, can be written as: $\pi = x_{t-1}\pi_P + (1 - x_{t-1})\pi_C$. Then, equation (1) can be rewritten as:

$$\begin{aligned} R_t &= \frac{\frac{(Y_{t-1}(1 + \pi) - b_{t-1}Y_{t-1}(1 + \pi_M + g))}{(1 + \pi_c)}}{(Y_{t-1} - b_{t-1}Y_{t-1})} - 1 \\ &= \frac{\frac{((1 + \pi) - b_{t-1}(1 + \pi_M + g))}{(1 + \pi_c)}}{(1 - b_{t-1})} - 1 \\ &= \frac{\frac{(1 + x_{t-1}\pi_P + (1 - x_{t-1})\pi_C) - b_{t-1}(1 + \pi_M + g)}{(1 + \pi_c)}}{(1 - b_{t-1})} - 1. \end{aligned}$$

With a little bit of algebra, this can be rewritten as:

$$= \frac{x_{t-1}(\pi_P - \pi_C) - b_{t-1}(\pi_M + g - \pi_C)}{(1 - b_{t-1})(1 + \pi_c)}.$$

Increases in Medicare health spending, holding constant the prices of consumption and health in the CPI, lower the growth of real non-health income. The larger the share of health spending in the household budget, the larger is the impact of an increase in health spending. An increase in overall health prices, holding constant Medicare prices, will increase income, but here it is the share of health spending in the CPI that affects the magnitude of the effect.

¹ Measured health prices do not control adequately for changes in quality, and it is likely that real health price inflation is lower than that picked up in official inflation measures like the CPI. (See National Academy of Sciences, 2022, Chapter 5.) However, for our purposes, it is measured inflation that matters, since social security benefits are indexed to it. Any changes to the CPI to improve health care measurement would make decrease health care affordability for the elderly.

² The CPI captures out of pocket health spending—thus it includes premiums and copays paid directly by workers and retirees, but not spending financed by employers or the government.

Appendix Table 1
 Difference in Real Non-Health Consumption Share of Income Relative to Baseline Scenario
 where Medicare Costs Increase with Inflation

Medicare Excess Cost Growth	NHE Prices Rise with Overall Inflation	NHE Excess Cost Growth = 1%, All Prices	NHE Excess Cost Growth = 2%, All Prices
	2%	2%	2%
Quintile 1			
70-74	-12.8%	-11.7%	-11.1%
75-79	-37.0%	-35.6%	-34.7%
80-84	-195.7%	-199.4%	-201.9%
Quintile 2			
70-74	-12.9%	-11.7%	-11.1%
75-79	-34.5%	-33.0%	-32.1%
80-84	-90.7%	-90.5%	-90.3%
Quintile 3			
70-74	-4.8%	-3.6%	-2.9%
75-79	-11.8%	-9.7%	-8.6%
80-84	-26.0%	-23.4%	-21.8%
Quintile 4			
70-74	-2.9%	-1.6%	-0.9%
75-79	-6.6%	-4.5%	-3.2%
80-84	-16.4%	-13.5%	-11.6%
Quintile 5			
70-74	-1.1%	0.2%	0.9%
75-79	-3.0%	-0.7%	0.6%
80-84	-5.5%	-2.2%	0.0%

Source: Authors' calculations using the Medicare Beneficiary Survey, 2009-2016.

Appendix Table 2
 Difference in Resources Available for Non-Health Consumption Relative to Baseline Scenario
 where Medicare Costs Increase with Inflation (2016 \$)

Medicare Excess Cost Growth	NHE Prices Rise with Overall Inflation			NHE Excess Cost Growth = 1%, All Prices			NHE Excess Cost Growth = 2%, All Prices		
	2%	1%	0%	2%	1%	0%	2%	1%	0%
	Quintile 1								
65-69	-153	-104	-56	-127	-77	-29	-113	-64	-15
70-74	-832	-554	-292	-757	-475	-210	-718	-433	-166
75-79	-1996	-1294	-666	-1914	-1195	-552	-1866	-1137	-485
80-84	-5143	-3234	-1616	-5223	-3245	-1570	-5276	-3254	-1540
	Quintile 2								
65-69	-388	-264	-142	-342	-218	-96	-319	-195	-72
70-74	-1608	-1070	-565	-1466	-922	-410	-1390	-842	-326
75-79	-3714	-2409	-1240	-3549	-2213	-1017	-3453	-2098	-886
80-84	-7617	-4791	-2395	-7585	-4659	-2177	-7567	-4574	-2037
	Quintile 3								
65-69	-321	-218	-118	-207	-104	-3	-151	-48	54
70-74	-1469	-978	-517	-1089	-591	-124	-885	-384	88
75-79	-3426	-2222	-1144	-2834	-1601	-498	-2487	-1238	-120
80-84	-6989	-4394	-2196	-6292	-3604	-1327	-5844	-3096	-767
	Quintile 4								
65-69	-346	-235	-127	-143	-32	77	-43	69	178
70-74	-1595	-1062	-561	-897	-357	151	-522	22	534
75-79	-3564	-2312	-1191	-2404	-1123	25	-1726	-426	737
80-84	-8210	-5163	-2581	-6742	-3585	-910	-5796	-2568	167
	Quintile 5								
65-69	-427	-290	-157	145	283	417	430	568	703
70-74	-1775	-1181	-624	260	862	1427	1353	1959	2528
75-79	-4568	-2961	-1524	-1096	549	2020	936	2604	4095
80-84	-8371	-5265	-2631	-3305	-87	2640	-37	3254	6043

Source: Authors' calculations using the Medicare Beneficiary Survey, 2009-2016.

Appendix Table 3

Difference in Non-Health Consumption Share of Income Compared to 2016 Cohort

NHE Prices Rise with Overall Inflation NHE Excess Cost Growth = 1%, All Prices

	2% Excess Medicare Cost Growth				2% Excess Medicare Cost Growth			
	65-69	70-74	75-79	80-85	65-69	70-74	75-79	80-85
	Quintile 1							
2026	-7%	-13%	-13%	-24%	-4%	-11%	-10%	-23%
2036	-15%	-29%	-28%	-54%	-10%	-25%	-24%	-51%
	Quintile 2							
2026	-5%	-7%	-8%	-11%	-3%	-5%	-6%	-8%
2036	-12%	-16%	-18%	-23%	-8%	-12%	-13%	-20%
	Quintile 3							
2026	-4%	-5%	-5%	-6%	-2%	-3%	-3%	-3%
2036	-9%	-11%	-12%	-12%	-4%	-6%	-7%	-8%
	Quintile 4							
2026	-3%	-3%	-4%	-5%	-1%	-1%	-2%	-3%
2036	-6%	-7%	-9%	-11%	-2%	-2%	-4%	-6%
	Quintile 5							
2026	-1%	-1%	-1%	-2%	1%	1%	1%	0%
2036	-2%	-2%	-3%	-4%	2%	3%	2%	1%

NHE Excess Cost Growth = 2%, All Prices

	0% Excess Medicare Cost Growth				1% Excess Medicare Cost Growth				2% Excess Medicare Cost Growth			
	65-69	70-74	75-79	80-85	65-69	70-74	75-79	80-85	65-69	70-74	75-79	80-85
	Quintile 1											
2026	4%	4%	4%	4%	0%	-3%	-2%	-8%	-3%	-10%	-9%	-22%
2036	8%	8%	8%	8%	1%	-5%	-5%	-18%	-7%	-22%	-21%	-50%
	Quintile 2											
2026	4%	4%	4%	4%	1%	0%	0%	-2%	-2%	-4%	-4%	-7%
2036	8%	8%	8%	8%	3%	1%	0%	-3%	-5%	-9%	-10%	-17%
	Quintile 3											
2026	4%	4%	4%	4%	2%	1%	1%	1%	0%	-1%	-2%	-2%
2036	8%	8%	8%	8%	4%	3%	3%	2%	-1%	-3%	-4%	-5%
	Quintile 4											
2026	4%	4%	4%	4%	2%	2%	2%	1%	1%	0%	-1%	-1%
2036	8%	8%	8%	8%	5%	5%	4%	3%	2%	1%	-1%	-4%
	Quintile 5											
2026	4%	4%	4%	4%	3%	3%	3%	3%	3%	3%	2%	2%
2036	8%	8%	8%	8%	7%	7%	7%	6%	6%	6%	5%	4%

Source: Authors' calculations using the Medicare Current Beneficiary Survey, 2016