Analysis of the 10 Plan

A Self-Pay System Designed to Minimize the Burden of Health Care Costs

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Preface

In this report, we analyze how total health care spending, family out-of-pocket health spending, and federal costs would change under a self-pay system designed to keep the burden of health care costs for most families to less than 10 percent of a family's income. The *10Plan*, conceived by Mark Cuban, would eliminate the need for traditional health insurance for individuals currently purchasing coverage in the nongroup health insurance market or for those who are currently uninsured. Individuals would pay no premiums up front; they would pay for care only when needed, and they would be able to defer payments after a $25 copay by taking out a low-interest loan from the federal government. In the case of deferred payments, the federal government would pay providers on behalf of 10Plan participants, who would then repay the federal government over time at a rate based on income for a maximum of 15 years or until age 65. We modeled dynamic estimates of health care spending and federal costs that incorporate evidence from the empirical literature on expected changes in health care utilization as well as adjusted for expected changes in prices, as the 10Plan would be based on Medicare fee-for-service rates.

This research was conducted with funding from Mark Cuban. The work was performed independently of the sponsor and peer-reviewed in keeping with the RAND Corporation's rigorous quality assurance standards. The study was conducted within the Payment, Cost, and Coverage Program in RAND Health Care. Any opinions, findings, conclusions, and recommendations are those of the authors and do not necessarily reflect the view of Mark Cuban.

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Summary

In this report, we investigate an alternative health care financing approach, the *10Plan*, for the nearly 28 million individuals who currently are not covered by health insurance (Terlizzi, Cohen, and Martinez, 2019) and the approximately 20 million individuals who purchase private coverage in the nongroup market, including on the Affordable Care Act exchanges (Centers for Medicare and Medicaid Services [CMS], 2019; Kaiser Family Foundation, undated). The 10Plan, conceived by Mark Cuban, would eliminate the need for traditional health insurance for these individuals and allow them to pay for care only when needed, and then at Medicare prices (Shapiro and Aneja, 2019). The 10Plan is called the "10" Plan because most participants will not pay more than 10 percent of their family's income on repayment premiums. To protect participants from financial uncertainty because of health care events that are high-cost or beyond their ability to afford, participants would be able to defer payments after a $25 copay for each encounter. In the case of deferred payments, participants would be borrowing from the federal government at a 3-percent interest rate. The federal government would pay providers on behalf of the 10Plan participants, who would then repay the federal government over time at a means-tested rate (based on family income) for a maximum of 15 years or until age 65. Even though this is a loan repayment program, we refer to the loan repayments as *repayment premiums* because they would replace the traditional health insurance premiums and be paid only once care is used. The repayments would be capped based on income, ranging from 2 to 15 percent of income (10 percent or less for families at or below 600 percent of the federal poverty level [FPL]). Payments

Key Findings

- The 10Plan would cover approximately 46 million individuals, including 28 million who are currently uninsured.
- The 10Plan is predicted to reduce family-level health care spending, especially for those currently covered by a non-group plan. Average out-of-pocket costs would decline by about $1,343 per participant, per year.
- Depending on model assumptions, federal spending could decrease by $17 billion or increase by $566 billion over the first 15 years.

could be deferred cumulatively over multiple years, and repayments could change over time as an individual's or family's income changes and at certain ages (26 and 65).

The 10Plan would be available to anyone not covered by employer-sponsored insurance, Medicare, Medicaid, or another government plan (e.g., Tricare or Indian Health Services) and who is current on any repayment premiums from previous deferred payments. This would amount to approximately 15 percent of the U.S. population, or approximately 43 to 48 million individuals in about 30 million families, having access to a plan to pay for health care in a way that limits out-of-pocket costs based on income. (Of note: We determined eligibility for the 10Plan using age and health insurance coverage type and did not impute documentation status. Therefore, in our model, undocumented immigrants are eligible to receive the 10Plan, which may not be the case if the plan is implemented).

The purpose of this analysis was to determine how much the 10Plan would cost participating individuals and families and how much it would cost the federal government. We also highlighted incidences in which individuals could be negatively affected by the implementation of the 10Plan by examining family-level financial burden. On the one hand, the 10Plan could be viewed as potentially transferring the risk of high-cost and catastrophic health care events to the federal government because the plan limits a family's financial responsibility based on ability to pay. On the other hand, the 10Plan replaces

nongroup health insurance, so the extent to which this plan changes the financial burden for those already insured is unclear.

Specifically, the report addresses the following research questions:

- How would health care spending change for individuals and families under the 10Plan relative to the status quo?
- How would these changes vary for different participants, depending on insurance status and income level?
- How much would the 10Plan cost the federal government compared with the status quo?

To address these questions, we used a microsimulation model to estimate health care spending under the 10Plan compared with the status quo. The model uses individual-level microdata to simulate changes over time, including repayment of deferred payments, unexpected health problems, changes in employment or income, and family structure. We assumed that the uninsured would consume 20 percent more care because of their expected ability to defer costs relative to the status quo. Under the status quo, they may forgo care because they are afraid of not knowing exactly what their out-of-pocket liability will be for any medical encounters. Because the repayment premiums (deferred payments for medical expenses) can be spread over multiple years with the 10Plan, we built a dynamic model that accounts for year-to-year changes in medical spending, income, and family structure over a 15-year period. We chose a 15-year time horizon because after 15 years, deferred payments from the first year would be forgiven. A key outflow for the government will be forgiveness of balances after 15 years. The forgiven balances will not be considered taxable income for participating individuals.

The main outcomes that we examine are related to health care spending at the individual or family level, and in aggregate at the population level. In Table S.1, we show the measures of annual spending that we use to compare the 10Plan to the status quo spending.

In addition to presenting aggregate population totals of health care expenditures, we also present a budgetary cash flow of the effects for comparison with Congressional Budget Office (CBO) scoring approaches.

Table S.1
Measures of Health Care Spending

Measure	Status Quo	10Plan
1. Individual-level total health care expenditures	a. Total paid for health care under current insurance status by all payers	b. Amount in 1(a), adjusted for changes in prices faced
2. Individual-level total out-of-pocket costs	c. Copays and coinsurance and amounts contributed to insurance premiums	d. Copays and repayments
3. Population-level total expenditures	e. Sum of 1(a) for all 10Plan-eligible individuals	f. Sum of 1(b) for all 10Plan-eligible individuals

We conducted numerous sensitivity analyses, changing several of our modeling assumptions. The key assumptions we varied were (1) the prices that individuals face (Medicare, various fractions of Medicare, or Medicaid), (2) loan or repayment program details, (3) other plan parameters, and (4) behavioral or demand responses.

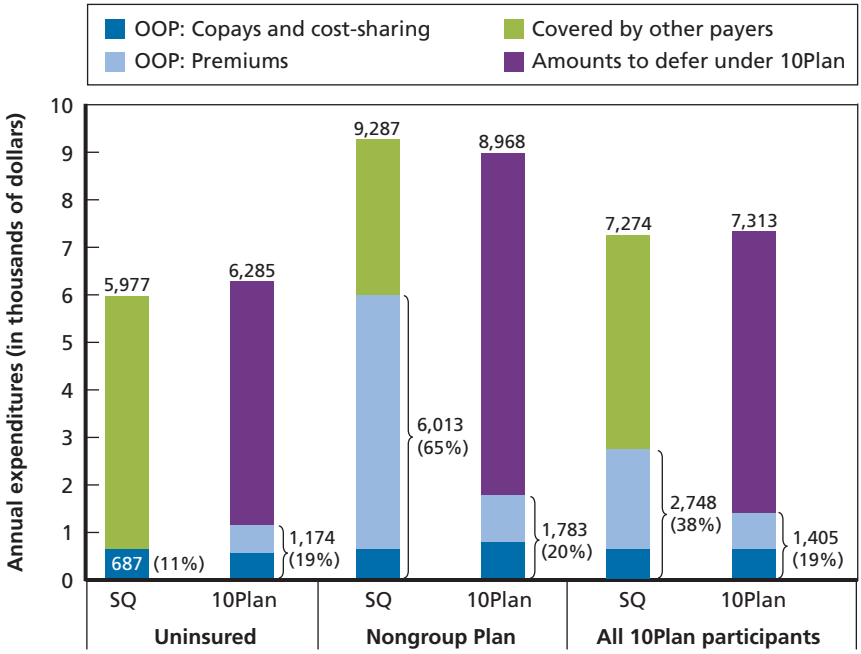
Results

Individuals and Families

We found that between 15 and 17 percent (approximately 46 million) of people in the United States would be eligible for the 10Plan each year, including the approximately 28.8 million individuals who currently have no insurance and the 18 million who are currently obtaining coverage in the nongroup market. In Figure S.1, we present the predicted total individual-level expenditures (measured as defined in row 1 of Table S.1) under the status quo and the 10Plan.

Within each bar in Figure S.1, we show the average annual amount spent on cost-sharing (dark blue) and the average annual amount spent on premiums (light blue). Under the status quo, there are no insurance premiums for those currently uninsured, but for those currently covered by a nongroup plan, this is average annual insurance premium contributions. Under the 10Plan, the premiums are the average annual

Figure S.1
Mean Individual Annual Health Care Expenditures as of Year 15, by Current Health Insurance Status



NOTE: SQ = status quo, which is projected spending assuming no 10Plan and a medical inflation rate of 5.1 percent. Each bar reflects total annual health care expenditures as defined in row 1 of Table S.1. The dark blue sections reflect out-of-pocket (OOP) spending on copays and cost-sharing (row 2 of Table S.1). The light blue sections reflect spending on premiums or repayment premiums (row 3 of Table S.1). The green sections reflect amounts covered by other payers under the status quo, and the purple sections reflect amounts deferred under the 10Plan.

repayment premiums from deferred payments in earlier years. The green or "other payers" parts of the bars reflect amounts that are currently covered by other payers under the status quo, such as employers and amounts covered by charity care (or written off) and worker's compensation. The purple segments represent the fraction of health care spending that would be deferred under the 10Plan.

Overall, the model predicted that total individual health care spending per year would be similar for both the status quo and the 10Plan, but out-of-pocket costs would be $1,343 lower on average

for individuals under the 10Plan (see the two bars on the far right in Figure S.1).

We also found significant differences depending on current health insurance status. For those currently uninsured, our model predicted total health spending per year to be about $308 higher under the 10Plan, on average ($6,285 versus $5,977), or an increase of 5 percent relative to the 20 percent increase in health care utilization assumed under the 10Plan. This translates into an increase in out-of-pocket spending (both blue-shaded segments of the bars in Figure S.1) of $487 for the uninsured.

For those currently covered by a nongroup plan, our model predicted that total annual health care spending will be $319 lower under the 10Plan ($8,968 versus $9,287), relative to the status quo. The out-of-pocket spending is predicted to be $4,230 less per year ($1,783 versus $6,013), on average, for these individuals under the 10Plan.

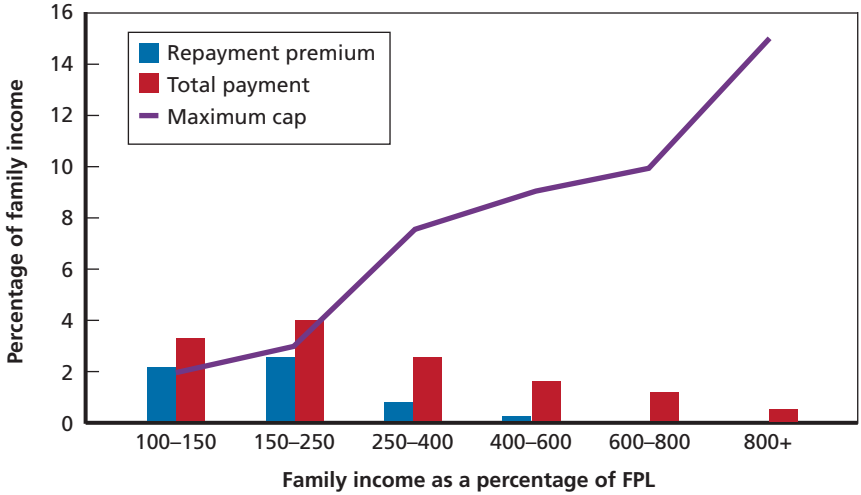
In the aggregate, 10Plan participants are predicted to spend $63 billion less per year out of pocket under the 10Plan relative to the status quo, or $940 billion less over the 15-year period.

In Figure S.2, we show the median effective repayment rate and total payment rate (repayment premium plus copayment) as a percentages of family income in year 15, compared with the maximum annual repayment cap (purple line). The annual repayment premium is capped at a percentage of family income that depends on the family's income as a percentage of FPL. Thus, the range of repayments for each cohort will fall between 0 and the annual repayment cap (up to 15 percent of income). The copays, however, are not capped. The lowest-income families (< 250 percent of FPL) effectively will pay between 3 and 4 percent of income toward the cost of health care for 10Plan participants (red bars, which include copays and repayment premiums), which is more than the repayment cap. The highest-income families will effectively pay less than 1 percent of their income toward the cost of health care for 10Plan participants.

Total Spending

Over the 15-year period, we predicted total health care spending of the 10Plan-eligible population, including administrative costs, to be about

Figure S.2
Median Effective Repayment Premium Rate and Total Payment Rate as Percentage of Family Income in Year 15, by FPL Category



NOTES: *Total payment* includes both repayment premiums and copayments. We do not show the effective repayment premium rate or total payment rate for the population with family income below 100 percent of FPL because the repayment cap at this level is 0 percent.

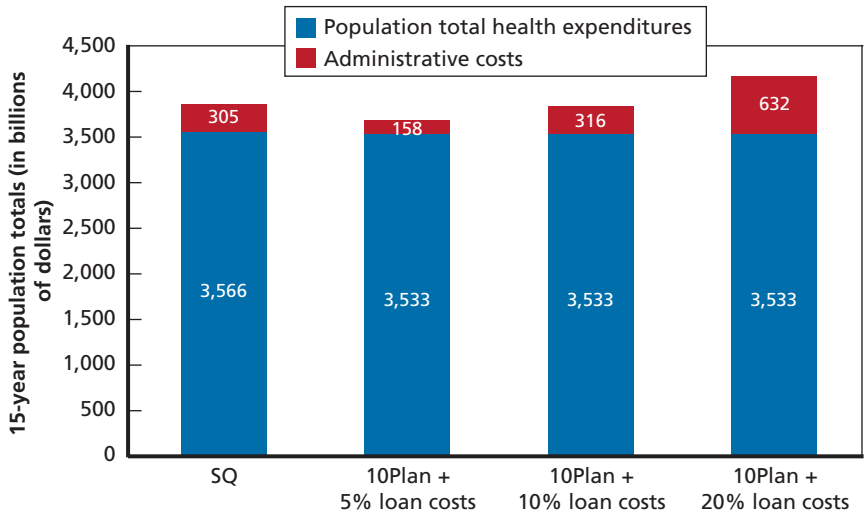
$3.87 trillion under the status quo, relative to $3.85 trillion under the 10Plan. This assumes that the 10Plan is able to achieve administrative costs that are similar to the Medicare program. *Administrative costs* for insurers are typically defined to be the difference between the premiums collected and the benefits paid out and include overhead costs. This amounts to about $21 billion in reduced total health care spending over the 15-year period because of lower prices, or about $1.42 billion less spending per year.

Savings could be achieved primarily through (1) lower prices for 10Plan participants and (2) lower administrative costs. We estimated that if 10Plan participants faced Medicare prices, total health care spending would decline by $33 billion over the 15-year period ($3.57 trillion versus $3.53 trillion). We estimated that administrative costs under the status quo are projected to be around $305 billion over the period. If the 10Plan can achieve administrative costs that are

10 percent of the value of the loans, that would amount to $316 billion over the 15-year period. Thus, we do not predict savings from administrative costs under these assumptions.

For comparison, Shapiro and Aneja (2019) assumed 5 percent administrative costs, and we expect that administrative costs are currently about 20 percent for those covered by a nongroup plan. We have reported total costs in Figure S.3, assuming these administrative costs as well.

Figure S.3
15-Year Total Population Health Care Expenditures Plus Administrative Costs



NOTES: SQ = status quo. Administrative costs under the SQ are calculated as 20 percent of the total population health expenditures, less the amounts that families pay out of pocket. Administrative costs under the 10Plan are equal to 5, 10, or 20 percent of the amount of deferred payments that the federal government will lend.

Federal Government Spending

Over the 15-year period, we predicted the federal government would save an estimated $17 billion (see Table S.2).[1] However, federal spending would increase to $3 billion a year as of year 15. Because year 15 is the first year in which the unpaid amounts from the first set of deferred payments from year 1 will be forgiven, the accounting in this year gives the best estimate of what the budgetary effect would be over the longer term. Thus, the program is likely to continue to be a net expense to the federal government. However, in the event that there are savings from federal spending on the 10Plan population, those savings can be used in a variety of ways (to be determined), such as reducing the out-of-pocket costs for the lowest-income families, investing savings into medical education scholarships, or covering additional cost-effective treatments with no cost-sharing. Across all of the scenarios, depending on model assumptions, we found a range of changes in federal spending. As noted, federal government spending could decrease by $17 billion or increase by as much as $566 billion over the first 15 years.

Sensitivity Analyses of Health Care Spending

We estimated several versions of the dynamic microsimulation varying different aspects of the assumptions. Our estimates of the change in total health care spending relative to the status quo are most sensitive to the price levels that 10Plan-eligible families and individuals will face and less sensitive to the parameters and policy features tested in the other sensitivity analyses. In other words, the prices that we assumed that 10Plan participants would face are the most significant factors in determining whether the 10Plan will generate savings or not. Assuming Medicare prices, as we did for most of the results presented, our model suggests savings of $21.5 billion over 15 years, including administrative costs. However, if 10Plan participants face 234 percent of Medicare rates, as the state of Montana was able to negotiate with hospitals (Appleby, 2018), then we predicted increased spending of $1,263 bil-

[1] The 10-year calculations are also provided to match a 10-year CBO baseline projection, but we note that because the plan does not reach the steady state until year 15, our preference is to focus on 15-year results.

Table S.2
Effects of the 10Plan on Government Spending, in Billions of Dollars

	Year 1	Year 5	Year 10	Year 15	Total over 15-Year Period	10-Year Total
Outlays						
Deferred payments	$131.83	$167.10	$232.27	$310.94	$3,161.09	$1,766.50
APTC	–$62.00	–$65.00	–$77.00	–$87.75	–$1,089.00	–$672.00
Administrative costs	$13.18	$16.71	$23.23	$31.09	$316.11	$176.65
Total	$83.02	$118.81	$178.49	$254.29	$2,388.20	$1,271.15
Revenue						
Repayment premiums	$0.00	$137.66	$191.91	$251.20	$2,405.12	$1,283.60
Tax effects	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Total	$0.00	$137.66	$191.91	$251.20	$2,405.12	$1,283.60
Budget effect						
Outlays	$83.02	$118.81	$178.49	$254.29	$2,388.20	$1,271.15
Revenue	$0.00	$137.66	$191.91	$251.20	$2,405.12	$1,283.60
Net effect	$83.02	–$18.85	–$13.41	$3.08	–$16.92	–$12.45
Number of 10Plan participants per year (in millions)	43.47	43.61	45.73	46.80		

NOTES: APTC = Advanced Premium Tax Credit. APTC amounts include all "Marketplace-Related Coverage and the Basic Health Program" expenditures. Note that the Year 15 APTC projections are linearly extrapolated from CBO estimates (Fritzsche and Masi, 2016). Administrative costs are estimated at 10 percent of deferred payments.

lion compared with the status quo over 15 years. Even though Montana hospitals may not be representative of all hospitals in the United States, we expect it may be difficult to get hospitals to accept rates lower than 234 percent of Medicare rates.

The other modeling assumption that affects whether we predicted savings from the 10Plan concerns forgiving loan balances at age 65. In our main model, we did not assume any behavioral responses from this, but 10Plan participants would have an incentive to increase their consumption of health care (especially discretionary) as they approach age 64. In particular, knowing that they would not have to repay costs in subsequent years may affect their behavior. In one sensitivity check, we increased health care utilization linearly from ages 51 to 64 to account for this possibility. In this model, we estimated that the 10Plan, with Medicare prices, would increase total expenditures by $659 billion over 15 years relative to the status quo.

Discussion

Overall, we predicted a decline in total health care spending among 10Plan participants of almost $33 billion over a 15-year period. Much of this decline results from lower prices (assuming Medicare rates) for the projected 46 million 10Plan participants.

Assuming the 10Plan can lower administrative costs to 10 percent of the amount of deferred payments or loans, costs would increase by $11 billion over the 15-year period relative to the status quo. Together, these amount to savings of about $1.4 billion per year ($21.5 billion total over 15 years) for a plan that covers 46 million individuals, including approximately 28 million who are currently uninsured. Under more-costly assumptions, we predicted federal spending to increase by about $38 billion per year, which is significantly less than estimates of $2 trillion to $3 trillion per year needed under Medicare for All proposals (Committee for a Responsible Federal Budget, 2019; Reichling and Smetters, 2020).

There are important aspects of our modeling assumptions that can change these estimates such that the 10Plan will yield *increases in*

total health care expenditures. First, the assumption that 10Plan participants will pay Medicare rates is critical. Just lowering the prices that this population faces matters significantly. More than 90 percent of physicians accept Medicare, but the extent to which these providers can be mandated to accept 10Plan patients is unclear. Secondly, because deferred payment (or loan) balances are forgiven at age 65, increasing health care utilization as individuals approach age 65 changes our results significantly. In this case, we predicted that the 10Plan would increase costs over the 15-year period.

Out-of-pocket health care costs are a major concern for many Americans, both because of uninsurance and under-insurance. Health care reform proposals that provide free care or eliminate cost-sharing (e.g., Senator Bernie Sanders's proposed Medicare for All plan) are an expensive way to reduce consumer costs. The10Plan requires a contribution, but, unlike the current cost-sharing arrangement for insured individuals—in which they pay the full cost of a medical visit up front until they hit their deductible—the 10Plan allows deferred payments that can be paid back gradually on a schedule, and repayments are capped in a manner that scales with income. On average, individuals covered by the 10Plan will spend less on health care and have lower out-of-pocket costs compared with the status quo. However, this varies by family income, current health insurance status, and health status. Lower-income families will pay about 3 to 4 percent of their incomes on repayments and copays, which is more than what uninsured individuals in those income categories currently pay out of pocket for health care. In general, uninsured individuals will face greater out-of-pocket health care costs under the 10Plan, regardless of income, but we have assumed they will consume 20 percent more health care and will gain risk protection under the 10Plan because they will not be required to pay more than their means-tested rate.

Health insurance provides some risk protection against high-cost catastrophic health events. The 10Plan offers similar protections by capping the loan or amount of the deferred repayments depending on the individual's or family's income. This feature addresses the problem of people being unprepared for an unexpected bill without requiring the government to shoulder the entire burden. It follows the logic of

proponents of high-deductible health plans and universal catastrophic coverage, who argue that "skin in the game" can be a good thing (or, conversely, that first-dollar coverage can lead to overconsumption and may be impractically expensive),[2] and addresses the number one criticism of such plans, that high deductibles put people at risk of being unable to pay.

One potential concern is that individuals who do not make premium repayments under the 10Plan would not be able to continue to use the plan. However, under the status quo, individuals who do not pay for health insurance or do not pay medical bills face the same scenario. Moreover, the 10Plan would adjust repayments or suspend them in the event that someone loses employment. The 10Plan also provides this risk protection to everyone not covered by a public or private health insurance plan, while, as of this writing, there are approximately 28 million people without any risk protection provided by health insurance.

The 10Plan would change the federal government's cash flow. In particular, the government would increase outlays to cover individuals' health care spending up front and then receive repayment premiums to help cover these amounts in subsequent years. Some amounts would be forgiven after 15 years of repayment premiums, upon death, or as individuals age into Medicare. However, as noted previously, increased utilization may yield longer-term improvements in health, and the 10Plan would essentially facilitate low-interest loans for some individuals who may not be able to obtain credit otherwise or would have to pay significantly higher interest.

Study Limitations

There are several limitations and caveats to our estimates that should be considered when interpreting our results. First, we note that there are both potential advantages and disadvantages to the 10Plan that we have not modeled that are important to consider in light of our estimates. As discussed previously, the 10Plan offers the advantage of risk

[2] *First-dollar coverage* refers to who is responsible for the up-front and initial costs of care. Insurance plans with deductibles, for example, require enrollees to cover the first-dollar amounts until the deductible is met.

protection for both those currently purchasing a plan in the nongroup health insurance market and for those who are uninsured. Currently, those without insurance are less likely to receive regular or preventive care and are less likely to get prescriptions filled (Christopher et al., 2016; Fernandez-Lazaro et al., 2019; Liang, Beydoun, and Eid, 2019; McMorrow, Kenney, and Goin, 2014). The uninsured also have higher rates of emergency department use relative to those with private insurance and the cost of care tends to be higher in that setting relative to outpatient settings (Greenwood-Ericksen and Kocher, 2019; Xu et al., 2017). Although we make broad assumptions about utilization increasing as a result of the 10Plan, we do not account for the possibility that health outcomes and spending might improve for those who are currently uninsured who would be able to seek treatment earlier and in less costly settings without the risk of catastrophic medical bills.

This point is important because we found that out-of-pocket spending would increase, on average, for those who are currently uninsured, and who do not have protection from a costly catastrophic health event under the status quo. About 56 percent of adults report a *medical financial hardship*, defined as having a problem paying a medical bill, worrying about paying for the cost of care for a serious illness (e.g., "financial toxicity"), or delaying or forgoing care because of worries about costs (Yabroff et al., 2019). Ideally, we would compare health outcomes with quality of care (e.g., access) given the amounts spent under the two options, but we were unable to quantify the change in benefits using the data that we had.

There may also be broader market-level effects that influence prices and the supply of health care; we have not modeled these effects. We have assumed that individuals who are currently covered by employer-sponsored plans will keep their current coverage. However, firms may have an incentive to stop providing insurance and instead offer their employees a subsidy to participate in the 10Plan, under which health care prices are lower. This would result in greater participation in the 10Plan, which would have implications for federal cash flows that are associated with managing this program. We also have not modeled potential effects of the 10Plan on health; that is, if the 10Plan increases access, we may observe improved health outcomes over the longer term, which can reduce costs.

Other researchers have predicted that the number of uninsured individuals will increase without any reform to health care delivery in the United States (Reichling and Smetters, 2020), but we have not accounted for growth in this population. If more individuals use the 10Plan, there may be increased costs to the federal government.

We also have not adjusted for potential provider response to this plan. In particular, as the 10Plan may increase demand for health care, there is no reason, a priori, to expect a corresponding increase in the supply of providers. In fact, if the 10Plan results in downward pressure on reimbursement rates broadly, we may expect supply to contract (e.g., fewer hospitals and providers). Whether supply remains constant or contracts, an increase in demand likely means unmet demand and increases in wait times to receive care.

There are likely to be logistical and infrastructure changes to the implementation of this plan that we have not included in our cost estimates. Administration of such a plan would impose additional costs on CMS, as well as on the federal entity that would handle the deferred payments and repayment premiums. In our federal budgetary analysis, we assumed administrative costs of 10 percent of the deferred payments, which should be interpreted with caution because we are unclear what actual administrative costs would be. There may also be benefits to the federal government from providing administrative services for a wider segment of the population, such as a potential increase in bargaining power in setting prices and additional data to analyze outcomes of care, fraud, and areas where savings may be achieved. For example, CMS makes additional payments to qualifying hospitals that are known as Disproportionate Share Hospital that serve a large number of Medicaid and uninsured individuals. To the extent that the 10Plan eliminates those who are technically without coverage, the amounts that hospitals spend on uncompensated and charity care may decline.

Finally, our models required several assumptions that we detail in the report; all interpretations of our findings should be caveated with these assumptions. Note that this analysis does not account for the coronavirus disease 2019 pandemic, because we wanted to address how the 10Plan would work in a typical year.

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Abbreviations

ACA	Affordable Care Act
APTC	Advanced Premium Tax Credit
ASEC	Annual Social and Economic Supplement to the Current Population Survey
CART	classification and regression tree
CBO	Congressional Budget Office
CDC	Centers for Disease Control and Prevention
CDHP	consumer-directed health plan
CHIP	Child Health Insurance Program
CMS	Center for Medicare and Medicaid Services
CPS	Current Population Survey
ED	emergency department
FFS	fee for service
FPL	federal poverty level
GDP	gross domestic product
HCUP	Healthcare Cost and Utilization Project
HIE	RAND Health Insurance Experiment

HMD	Human Mortality Database
IRS	Internal Revenue Services
MAGI	modified adjusted gross income
MEPS	Medical Expenditure Panel Survey
NHEA	National Health Expenditures Accounts
OHE	Oregon Health Experiment
PHC	personal health care
PSID	Panel Study of Income Dynamics

CHAPTER ONE

Introduction

This study investigates an alternative health care financing approach—the *10Plan*—for the nearly 28 million individuals who currently are not covered by health insurance and the approximately 20 million individuals who purchase private coverage in the nongroup health insurance market, including on the Affordable Care Act (ACA) exchanges (Centers for Medicare and Medicaid Services [CMS], 2019; Kaiser Family Foundation, undated; Terlizzi, Cohen, and Martinez, 2019). The 10Plan, conceived by Mark Cuban, would eliminate the need for traditional health insurance for these individuals and allow them to pay only for the health care services that they use, and then at Medicare prices (Shapiro and Aneja, 2019). The 10Plan is called the "10" Plan because most participants will not pay more than 10 percent of their family's income on repayment premiums. To protect participants from uncertainty from health care events that are high-cost or beyond their ability to afford, participants would be able to defer payments after a $25 copay for each encounter. In the case of deferred payments, participants would essentially be borrowing from the federal government at 3-percent interest rate. The federal government would pay providers on behalf of the10Plan participants, who would then repay the federal government over time at a means-tested rate (based on family income) for a maximum of 15 years or until age 65. Even though the 10Plan is a loan repayment program, we refer to the loan repayments as *repayment premiums* because they would replace the traditional health insurance premiums and be paid only once care is used. The repayments would be capped on the basis of income, ranging from 2 to 15 percent of

income (10 percent or less for most families). Payments can be deferred cumulatively over multiple years, and repayments could change over time as income changes and at certain ages (26 and 65). Note that this analysis does not account for the coronavirus disease 2019 pandemic, because we wanted to address how the 10Plan would work in a typical year.

The 10Plan would be available to anyone not covered by employer-sponsored insurance, Medicare, Medicaid, or another government plan (e.g., Tricare or Indian Health Services), who is current on any repayment premiums from previous deferred payments. This would amount to approximately 15 percent of the population of individuals younger than age 65, or approximately 45 million individuals in about 30 million families. The 10Plan would eliminate all nongroup health insurance plan options.

This report builds on earlier studies by incorporating evidence from the empirical literature on expected changes in health care utilization as well as adjusting for expected changes in prices. We used individual-level microdata to construct estimates of health care expenditures in a dynamic microsimulation model that accounts for changes over time, including repayment of the deferred payments, health shocks, changes in employment and income, and family structure. We assessed the economic implications of the 10Plan, including federal outlays, federal revenues, and individual costs over a 15-year period. We did not seek to determine broader macroeconomic effects or narrow implications for insurance companies or their workforces.

Our objective was to determine how much the 10Plan would cost the individuals and families participating in it and how much it would cost the federal government.

Specifically, in this report, we address the following research questions:

- How would health care spending change for individuals and families under the 10Plan relative to the status quo?
- How would these changes vary for different participants, based on insurance status, health status, and income level?

- How much would the 10Plan cost the federal government compared with the status quo?

The remainder of the report is organized as follows:

- In Chapter Two, we describe how the 10Plan works for providers, consumers, and the federal government.
- In Chapter Three, we describe our analytic approach.
- In Chapter Four, we provide our results.
- In Chapter Five, we discuss results.
- The appendixes present a primer for nonexpert readers on the existing empirical literature about health care supply and demand. They also present key assumptions for readers seeking to know more about how we modeled changes in utilization and prices under the 10Plan.

CHAPTER TWO

How the 10Plan Works

In this chapter, we outline the key attributes of the 10Plan, while noting that some details have not been finalized and may require additional consideration. We also compare this plan to the status quo.

Consumers

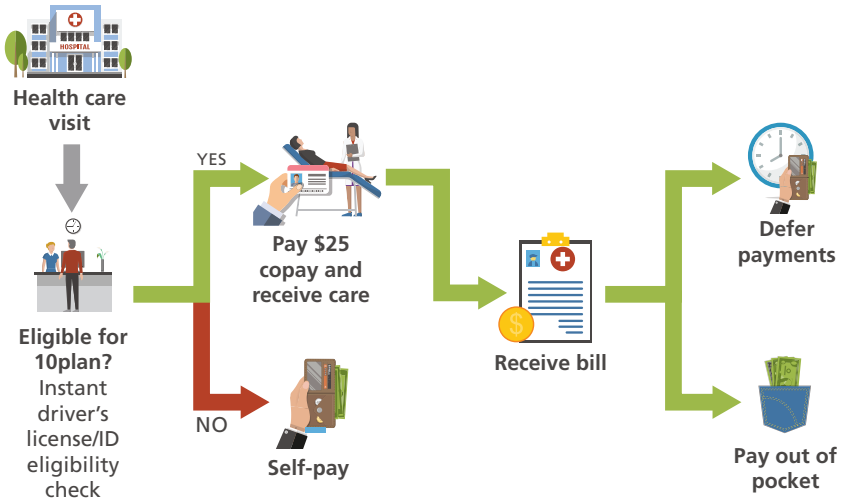
In Figure 2.1, we present a high-level overview of how the 10Plan would work in practice for consumers, who would pay a $25 copay for each encounter, which would be billed at Medicare fee-for-service rates. The balance of the bill could either be deferred and repaid over time or paid in full out of pocket. We discuss this in more detail in the following sections.

Eligibility and Participation

Eligibility would be limited to individuals who are not currently covered by an employer-sponsored plan, Medicare, Medicaid, or another government plan (e.g., Tricare or Indian Health Services). At the time of service, participating providers would need to verify a patient's identity and eligibility. We determined eligibility for the 10Plan on the basis of age and health insurance coverage type and we did not impute documentation status. Therefore, in our model, undocumented immigrants are eligible to receive the 10Plan, which may not be the case if the plan is implemented.

In our primary analysis, we assumed that individuals covered by a private group plan will not be allowed to use the 10Plan, but we

Figure 2.1
How the 10Plan Would Work



also discussed how our estimates would change if this assumption were relaxed. We also modeled year-to-year changes in insurance status as a result of changes in employment and income in our dynamic estimates.

For the purposes of modeling, we have assumed that the 10Plan would eliminate the market for current exchange and other nongroup health insurance plans. In this way, those currently covered by a nongroup plan and the uninsured would have to choose to pay out of pocket for care or to participate in the 10Plan. However, individuals could choose to participate at any time as long as they are in *good standing* with the 10Plan—that is, if they have previously deferred health care expenses through this plan, they must be current on making repayment premiums. How long an individual who is not in good standing would be ineligible and what would be necessary to regain eligibility have not be delineated, but we note that the implications are that these individuals would be required to pay for the full cost of care that they received. To the extent that these are low-income individuals, this may increase uncompensated care.

Because the 10Plan reimbursement rates are substantially below those of other types of insurance coverage, we have assumed participation will be universal among the eligible population, but we have also modeled costs assuming less than 100 percent take-up.

Health Care Utilization

10Plan participants can seek care directly from participating providers and will be responsible for a $25 copay. Services will be billed to participants at the Medicare fee-for-service (FFS) rates. Participants will then either pay the remaining balance (less the $25 copay) out of pocket or defer payment, to be deducted from paychecks at a rate based on one's family income.

There are two competing forces when assessing utilization. Because the cost of care is much lower under the 10Plan, one might expect additional consumption. Alternatively, because individuals are exposed to first-dollar costs,[1] increases in consumption could be mitigated for the population that is currently enrolled in a nongroup plan.

Repayment

If 10Plan participants choose to defer payment, the visit balance would be paid to providers by CMS and the federal government would initiate the automatic repayment in concert with the Internal Revenue Service (IRS) and the federal entity administering the 10Plan. This system of automatic repayment premiums shares some features with other income-based loan repayment plans. Unlike traditional insurance premiums, these are only paid once a 10Plan participant uses care and defers payment. Unlike a typical loan, the balance will be bundled together with other qualifying 10Plan health care expenses over the course of the year, and the repayment premiums will be capped based on family income. The 10Plan is called the "10" Plan because most participants will not pay more than 10 percent of their family's income on repayment premiums (see Table 2.1). The 10Plan uses the Federal

[1] *First-dollar coverage* refers to who is responsible for the up front and initial costs of care. Insurance plans with deductibles, for example, require enrollees to cover the first-dollar amounts until the deductible is met.

Poverty Guidelines, which several other federal programs use to determine financial resources and ability to pay. These guidelines define the federal poverty level (FPL) based on a family's modified adjusted gross income (MAGI) and the number of individuals in the family.

The repayment cap within each bracket (each row in the table) will increase uniformly as income increases. This mitigates situations

Table 2.1
Repayment Premiums as Percentage of Income

Income as a Percentage of FPL	Annual Repayment Amount Range (in percent)	Maximum Percentage of Income for Second-Lowest Silver Plan[a]
100–150	2–3	2.06–4.12
150–200	3–5.25	4.12–6.49
200–250	5.25–7.5	6.49–8.29
250–300	7.5–8	8.29–9.78
300–400	8–9	9.78
400–600	9–10	N/A
600–800	10–15	N/A
More than 800	15.0	N/A

NOTE: N/A = not applicable. The ranges within each bracket (row) will increase linearly, so that the repayment percentage increases proportionally within the income range. Income is defined using modified gross adjusted income. A government program like the 10Plan, which seeks to charge repayment premiums on the basis of an individual's ability to pay, needs to define a concept of financial resources. The 10Plan will use MAGI, which is also used to determine financial eligibility for Medicaid, the Children's Health Insurance Plan (CHIP), and premium tax credits for plans purchased through the ACA exchanges. MAGI includes adjusted gross income from an individual's federal tax return plus foreign income, nontaxable Social Security benefits, and tax-exempt interest. Individuals who purchase a health care plan on the exchanges can use their expected income to qualify. For the 10Plan, if income is allowed to be self-attested at the time of service or payment deferral, MAGI could be approximated and reconciled at the end of the tax year using documentation similar to Form 8962 (IRS, 2020). 10Plan-eligible individuals at less than 100 percent of FPL face an annual repayment rate of 0 percent. In some states, families above 133 percent of FPL would be covered by Medicaid; we have used self-reported Medicaid coverage to exclude these families from the 10Plan target population.

[a] 26 CFR 601.105.

in which moving across an income threshold would sharply increase repayment premiums. Sharp increases would create an incentive for individuals just below a particular threshold to avoid employment changes that would increase their income and would therefore distort labor market decisions.

We also show the premium cap under the ACA, which is the maximum percentage of income for the second-lowest silver plan (IRS, 2020). If the cost of an exchange plan exceeds this cap, individuals are eligible for the premium tax credit. The 10Plan maximum repayment amount is lower than these caps, but there is no cap on amounts spent on copays. However, at $25 per encounter, individuals are unlikely to reach the maximum annual limits for exchange plans, which are $8,150 for individual coverage and $16,300 for other coverage in 2020 (CMS, undated).

The federal government would charge simple interest at a low rate. We assumed a 3-percent interest rate, which is slightly higher than the monthly average of the 10-year U.S. Department of the Treasury rates over the last ten years (Federal Reserve Bank of St. Louis, 2020), but significantly lower than the average student loan interest rate. In sensitivity runs, we assumed interest rates of 1.6 percent and 4.5 percent, respectively. Any outstanding deferred health care expenditures would be forgiven after 15 years of repayment premiums or enrollment in Medicare. The latter forgiveness may generate an increase in utilization as individuals approach age 65, in anticipation of having deferred payments forgiven. We discuss in Chapter Four how we expect this to change our estimates.

Parents or legal guardians would be responsible for their dependents' deferred payment balances until age 26. We have modeled an alternative in which we assume any deferred payments under the 10Plan from before age 26 are forgiven at age 26.

As income and employment change, participation and repayments would also change. For example, if someone moved from a job without employer-provided coverage to one with employer-provided coverage, they would no longer be eligible for the 10Plan but would be required to continue paying any repayment balances. If someone

became unemployed or had a reduction in income, they would be able to reduce their repayment threshold.

Implementation of Repayment Premiums

The 10Plan proposes to draw payments automatically from participating individuals' paychecks, using gross salary and wage earnings to approximate earners' MAGI as the income base. Ideally, the percentage of income drawn would be accurate each month. In reality, there are several additional variables that need to be accurately measured to draw the right payments over the course of a year.

Similar to the Advance Premium Tax Credit (APTC) for current users of ACA exchanges, 10Plan payments can be reconciled based on end-of-year tax filings that take into account the spouse's income, other sources of cash income, and other factors (IRS, 2020).

Although we have assumed that payments would be withdrawn automatically and end-of-year tax reconciliations would be made, we note that there is still a possibility of default. This may be particularly problematic for individuals who are self-employed, work multiple jobs, or have changes in income. The 10Plan specifies that default would result in ineligibility for participation, but the exact rules regarding ineligibility, regaining eligibility, and how those individuals receive care still need to be determined.

When multiple expenses are accrued, the repayments for each one are collectively limited to the income percentage so that the total payment for 10Plan health care does not exceed 10 percent of income for most families. The repayment premiums are applied to each expense until they are paid off or until 15 years after the expense was incurred. After 15 years, remaining balances are forgiven, and the forgiveness is not considered taxable income. Repayment is also stopped when the individual enrolls in Medicare or Medicaid. Those who age into Medicare will have any remaining deferred balances forgiven. Those who become eligible for Medicaid will have their repayments paused while covered by Medicaid, though the 15-year repayment clock would continue.

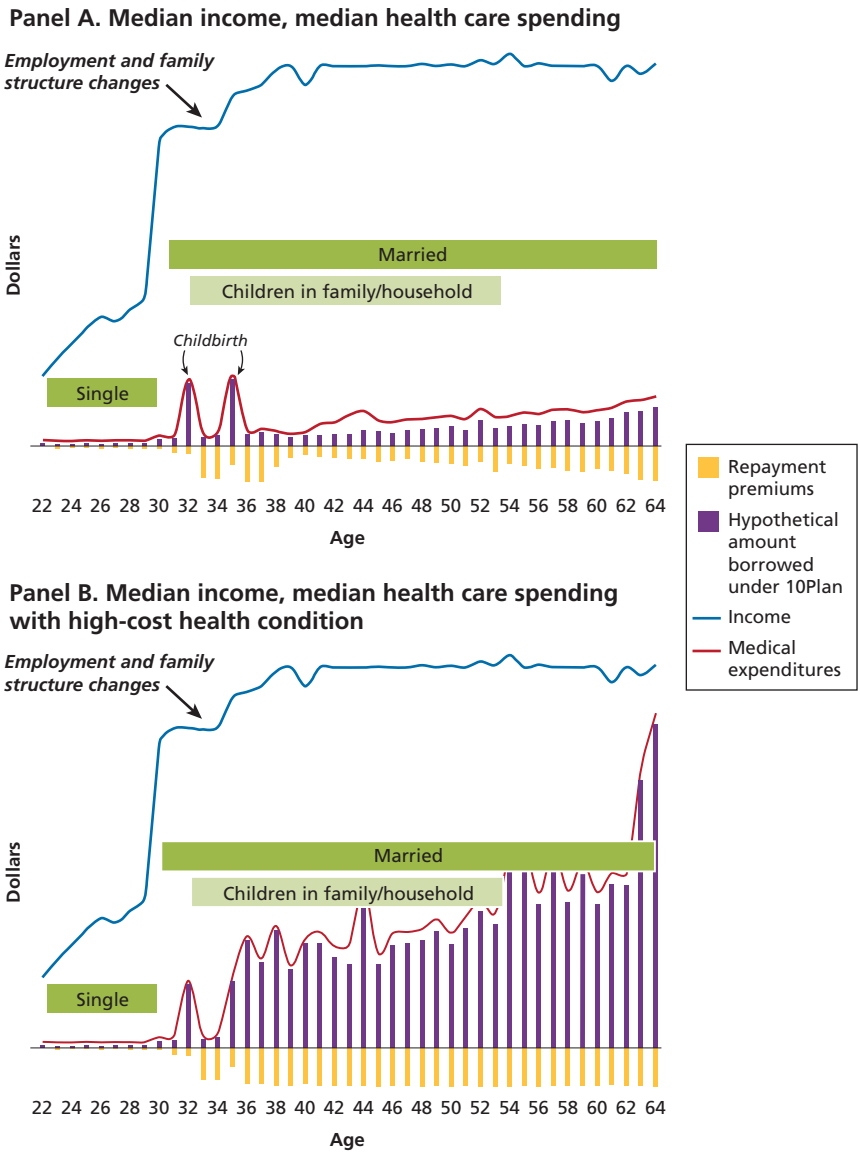
In Figure 2.2, we present two simplified examples of how spending could evolve under the 10Plan over a consumer's life course. In

Panel A, we show trajectories of a median-income individual with age-adjusted median health care costs while single and whose expenditures increase as the individual gets married, has a family, and ages. For simplicity, we have assumed the individual's spouse is the same age (though this illustration would be similar unless there were large age differences between the spouses). We have assumed the individual's family members have median age-adjusted health care expenditures and included health "shocks" (high-cost events) for childbirth and later in adulthood for the parents. In this example, the family would be repaying costs every year, but the total of these costs would never exceed 10 percent of family income.

Panel B is the same hypothetical family, but here we have assumed a chronic health condition for one of the parents at age 36, such that his expenditures are now at the 95th percentile of the age-adjusted health care spending. In this case, the family defers significantly greater health care costs, but is still never paying more than 10 percent in repayment premiums. However, in this example, the federal government would end up forgiving a significant amount of those deferred payments by the time the high-spending individual ages into Medicare.

We can consider other potential scenarios in which an individual obtains private health insurance through their employer or ages into Medicare. If a family obtained private employer-sponsored insurance, they would still owe any remaining balances from deferred payments after changing plans until those balances are repaid or age 65 is reached. For example, if one parent in Panel A became covered by employer-provided coverage at age 36, the family would simply need to make repayments of accrued amounts up until the point at which they obtained employer-provided coverage, which would include the costs of the childbirths. The 10Plan assumes children's health care costs incurred up until age 26 will be the responsibility of their parents. Finally, at age 65, we have assumed that any accrued deferred payments would be forgiven as per the plan design. In the case of our median family, as shown in Panel A, this would not be a significant amount because the family would have been mostly covering expenditures through the repayment premiums. However, we might expect individuals to increase discretionary care utilization as they approach

Figure 2.2
Hypothetical Family Health Care Expenditures, Deferred Payments, and Repayments Under the 10Plan



age 65, in anticipation of this debt forgiveness. We discuss this more in Chapter Four, where we conduct a sensitivity test of how costs might change if we accounted for this.

Providers

One key rule for providers under the 10Plan is the acceptance of reimbursement at current Medicare FFS rates. Although the infrastructure for billing, information-sharing, and payment exists for Medicare, there are aspects of the system that would require modification. The rules, regulations, and procedures for enrollment as a Medicare provider could be used to allow providers to agree to the 10Plan rules.

Although we have assumed providers would participate in the 10Plan and accept Medicare rates for these patients for modeling purposes, the extent to which this would hold in practice is unknown. Providers may prefer not to participate, given that Medicare rates tend to be lower than commercial rates (White and Whaley, 2019), or they may prioritize commercially insured patients (resulting in increased wait times). In sensitivity analyses, which we present in Chapter Three, we have assumed higher reimbursement rates.

Comparison with Status Quo

In this section, we highlight several key differences between the 10Plan and how eligible individuals currently use and pay for health care (see Table 2.2 for a nonexhaustive list). We have noted potential challenges regarding elements of the plan that have not yet been determined that have implications for how this plan would be implemented and their effects on relevant stakeholders. As previously noted, we have assumed that other aspects of the health care market would remain unchanged for modeling purposes, providing caveats and sensitivity checks in subsequent chapters. We have assumed the nongroup health insurance market, including the ACA exchanges and the corresponding APTCs, would be eliminated.

There have been two previous estimates of health care expenditures under the 10Plan. First, Shapiro and Aneja (2019) derived one-

year estimates using aggregated statistics on spending for individuals who would participate in the 10Plan, and they suggested savings on the order of $80 billion.

District Economics Group also produced estimates of health care expenditures using a dynamic microsimulation model for 10Plan-eligible families, excluding families with members covered by other sources (District Economics Group, 2019). It used a different primary data source (Panel Study of Income Dynamics, whereas we used the Current Population Survey [CPS]) and made no assumptions about behavioral or demand responses to the 10Plan. District Economics Group found that health care expenditures for the 10Plan population would total $2.726 trillion over a 15-year period for approximately 50 million individuals. It reported that the federal cost of the deferred payments, including amounts forgiven, would amount to $433.6 billion over 15 years, or $29 billion per year, on average. It estimated that the federal outlays would amount to between $94 billion and $131 billion per year.

Table 2.2
Overview of Status Quo Versus the 10Plan

	Status Quo	The 10Plan	Potential Challenges with the 10Plan
Uninsured	• 28 million	• All individuals without coverage from another public plan or a group private plan are eligible	• N/A
Insurance premiums	• Uninsured: Pay none • Nongroup: Obtain coverage through ACA exchange or nongroup market	• No nongroup health insurance markets and no APTCs	• Movement from the group health insurance market to the 10Plan could occur without rules in place.
Out-of-pocket costs	• Uninsured: Pay full amount, borrow or repayment plan with provider, default (uncompensated or charity care) • Nongroup: Cost-sharing as per insurance plan.	• $25 copayment for each encounter • Repayment premiums in subsequent years that are capped on the basis of family income	• Individuals could opt to not participate and be responsible for costs on own.
Borrowing to cover costs of care	• Individuals obtain loans or credit in the private market with potentially high interest rates and unfavorable terms. • Catastrophic events significantly increase medical debt and bankruptcy.[a]	• Individuals are essentially borrowing from the federal government at a low interest rate • Repayment would be automatically deducted from paychecks and could be paused or reduced as income or employment status changes	• Logistical challenges and administrative complexities in implementing and managing the 10Plan repayment program are likely.

Table 2.2—Continued

	Status Quo	The 10Plan	Potential Challenges with the 10Plan
Provider participation	• Providers can decide to see uninsured (self-pay) patients and whether to enroll as a Medicare provider.	• Providers participating in Medicare would be required to accept Medicare FFS rates for 10Plan patients.	• As Medicare reimbursement rates are lower than commercial rates, providers may prioritize privately insured patients. • As the 10Plan would increase the demand for health care, we might also expect increased wait times or access to care challenges without increases in the supply of providers.

NOTE: N/A = not applicable.
[a] Himmelstein et al., 2009; Dobkin et al., 2018.

CHAPTER THREE

Approach

Because payments for medical expenses can be spread over multiple years in the 10Plan, it is important to model the system dynamics around medical spending, income, and family structure over a 15-year period.[1] We developed a microsimulation model that tracks individuals' medical expenditures over time and factors that influence expenditures and payments.

Data and Methods

We started with the 2019 Annual Social and Economic supplement to the CPS (ASEC) (Flood et al., 2015). The CPS is a nationally representative survey with information on demographics (e.g., age, race, and sex), income (e.g., wages, salary, and other income sources), family structure (e.g., number of children in the household and marriage status), and health (e.g., self-reported health status and insurance source). From these data, we created a sample of individuals and families that we simulated over the 15-year period, predicting the following changes in each year:

- family structure, including marriage, births, and deaths, using births, mortality, and CPS data

[1] We model the 10Plan dynamically for 15 years because this is the minimum time span required to capture deferred payment expiration.

- employment and family income, using the Panel Study of Income Dynamics (PSID)
- migration, using U.S. Census Bureau projections
- aging and health status, using the Medical Expenditures Panel Survey (MEPS) and Centers for Disease Control and Prevention (CDC) data
- health spending using the MEPS
- health insurance status, including participation in the 10Plan.

In Table 3.1, we summarize these key measures, how they are used in our model, and the data sources.

Table 3.1
Key Model Inputs and Data Sources

Inputs	Model Use	Data Source
Family structure	Used to calculate family size and income relative to FPL	CPS
Births	Same as above, and used to include the cost of childbirth	National Vital Statistics Births data
Death	Same as above, and used to adjust cost of health care in the last year of life	National Vital Statistics Deaths data
Employment status and income	Used to predict health insurance coverage and family-level income	PSID
Migration	Used to make sure population growth matches Census projections	Census projections
Health status	Assigned to "good" or "bad" health each year as a function of previous health status, age, and gender. "Bad" health is either an acute condition from which someone can recover or a chronic condition from which someone does not recover	MEPS, CDC
Health expenditures	Imputed from MEPS and projected to grow based on health status, age, and gender	MEPS
Health insurance status	Predicted on the basis of employment and income and previous year coverage	CPS, PSID

To understand health care spending dynamics, we used the 2015–2016 MEPS Panel 20 Longitudinal Data File. The 2015–2016 MEPS file contains information about an individual's medical expenditures for a two-year period spanning 2015 and 2016. We mapped the medical spending distribution from the MEPS to the CPS population to produce a comprehensive picture of income and medical spending for a single year.

Once the initial distribution was produced, we updated each individual's income, medical spending, and other characteristics to produce estimates for 15 years. The income distribution was updated using income change distributions derived from the PSID from 2006 to 2018. We used a classification and regression tree (CART)-based model,[2] which is a predictive modeling approach that uses machine learning to estimate a distribution for a person's medical spending in a year based on their demographic characteristics and spending in the prior year. Family and demographic characteristics were updated with fertility and mortality data from the CDC. Other relevant values, such as the distribution of spending for pregnancy and end-of-life care, were derived from the academic literature. For a more detailed explanation of the dynamic model, refer to Appendix B.

Key Outcomes

Our main measures of interest are health care expenditures under the status quo and the 10Plan. We calculated these at both the individual and family levels and aggregated to population totals to provide government-level impacts. We imputed health care expenditures to individuals in the CPS based on the MEPS measure of total annual health care expenditures, which includes all direct payments for care during the year and both out-of-pocket payments and payments by

[2] CART is a predictive modeling approach that identifies groups with meaningfully distinct relationships between the predictor and outcome variables—in this case, demographic data and medical spending patterns. We then developed a spending model for each identified group, conditional upon a prediction of nonzero medical expenses.

insurers.[3] All expenditure amounts have been adjusted to 2019 real dollars,[4] and also have been adjusted to match the National Health Expenditures Accounts (NHEA).[5] In Table 3.2, we describe our approach to reporting expenditures.

Modeling Assumptions

It was necessary to make several assumptions and simplifications to build a tractable model of the 10Plan. We highlight the main assumptions in this section.

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[3] Payments for over-the-counter drugs and phone contacts with medical providers are not included in MEPS total expenditure estimates. Indirect payments not related to specific medical events, such as Medicaid Disproportionate Share and Medicare Direct Medical Education subsidies, also are not included. Any charges associated with uncollected liability, bad debt, and charitable care (unless provided by a public clinic or hospital) are not counted as expenditures.

[4] Nominal amounts were adjusted using the CPI to convert to January 2019 real dollars.

[5] NHEA are calculated using aggregate measures of provider revenue, administrative records, and other sources by the Office of the Actuary at CMS. There are well-documented differences in the NHEA estimates and the MEPS estimates of health care expenditures (see Bernard et al., 2012). The NHEA estimates include several categories of health care spending, from individual-level purchases of products and services consumed to government administrative costs and public health services. One component of the NHEA is the amount spent on personal health care (PHC), which includes out-of-pocket spending on hospital care; physician and clinical services; dental services; other professional services; other health, residential, and personal care; home health care; nursing care facilities and continuing care retirement communities; prescription drugs and other nondurable medical products; and durable medical equipment. In comparison, the MEPS estimates are based on a nationally representative survey of noninstitutionalized individuals. MEPS respondents and their providers give details on health care utilization and expenditures for health care received during the year. Thus, the NHEA and MEPS estimates of health care expenditures differ for several reasons, including differences in the data and populations that were surveyed, the types of services that were counted, and how the services were categorized and excluded. The MEPS estimates exclude several types of spending, including on over-the-counter medications; other health, residential, and personal care services; grants and supplemental payments; and public health programs (see Stagnitti et al., 2018). After subtracting these expenditures from NHEA PHC estimates, the Agency for Healthcare Research and Quality estimated that the adjusted NHEA estimate of PHC was $1,718 billion in 2012, which was still $369 billion more than the MEPS estimate of total health care spending ($1,351 billion). Thus, the adjusted NHEA PHC estimate was 1.27 times greater than the MEPS estimate.

Table 3.2
Measures of Health Care Spending

Measure	Status Quo	10Plan
1. Individual-level total health care expenditures	a. Total paid for health care under current insurance status by all payers	b. Amount in 1(a), adjusted for changes in prices faced
2. Individual-level total out-of-pocket costs	c. Copays and coinsurance and amounts contributed to insurance premiums	d. Copays and repayments
3. Population-level total expenditures	e. Sum of 1(a) for all 10Plan-eligible individuals	f. Sum of 1(b) for all 10Plan-eligible individuals

A key feature of the dynamic model is the projection of medical spending from year to year. The determinants of medical spending in this model are age group (< 19, 19–34, 35–49, 50–64), sex (male/female), health status (good/bad),[6] income (continuous measure), race (White/Black/Hispanic/Other), insurance category (Medicaid/Other Public/Private NonGroup/Other Private/Uninsured), and medical spending in the previous year (continuous measure). We assumed a medical inflation rate of 5.1 percent based on projections of Medicare per capita spending through 2028 (Cubanski, Neuman, and Freed, 2019), and an interest rate or administrative fee on deferred payments of 3 percent. We adjusted the prices that the 10Plan-eligible population will face to be equivalent to Medicare rates by using average per-encounter payments according to MEPS (see Appendix B for more details). However, we did not project health care expenditures at the event level in the dynamic model, so we created a composite adjustment factor for the expenditures of both the currently uninsured and previously nongroup private populations. We assumed that currently uninsured individuals were 20 percent more likely to have nonzero medical spending under the 10Plan relative to the status quo, but otherwise do not account for any price elasticity or behavioral responses to the 10Plan, except in rel-

[6] Although the MEPS provides a 5-level scale of health status from Excellent to Poor, the model was not as sensitive to the 5-level scale as to the aggregated 2-level scale.

evant sensitivity analyses (see the next section for a description of sensitivity analyses).

We assumed that children remain in their parents' households until age 26, at which point the entire deferred payment balance is left with the parents' household unless there are no living parents.[7] We assumed that rates of birth, death, and migration follow the Census Bureau 2017 National Population Projections Tables, in which the number of deaths for individuals under age 65 is approximated using the CDC 2019 National Vital Statistics Reports (Heron, 2019). Deferred payment balances are assumed to be forgiven upon death.

We assumed that all individuals retire at age 65, and we adjusted family income according to the proportion of family income that was previously attributable to the retiring family member's wages or salary. This assumption likely leads to an underestimation of family income in many cases, especially considering the trend toward later retirement and the tendency for unearned income to increase as a proportion of total income as individuals age. Deferred payment balances are assumed to be forgiven at age 65, and we assumed no gaming behavior or increase in utilization as individuals approach retirement except in the relevant sensitivity analysis (see the following section for a description of sensitivity analyses).

We assumed that transitions in insurance status accompany income shocks in which family income changes by 10 percent or more. We did not make any assumptions about changes in the insurance status distribution resulting from the 10Plan, and instead assigned new insurance status based on the original distribution of insurance status by income level. We assumed that all individuals eligible for the 10Plan would use it.

We assigned individuals' primary source of health insurance coverage for the year using a hierarchical approach to reduce potential measurement error (Call et al., 2013) from individuals reporting one type of coverage but having another (e.g., reporting a group plan, but really having Medicaid). In particular, we were concerned that individuals might report that they were covered by a private plan when,

[7] In this case, the deferred payment balance is forgiven.

in reality, they were covered by a Medicaid managed care plan, which would result in us overestimating the number of 10Plan-eligible individuals who would participate in the 10Plan. Although the following hierarchical assignment will mitigate this concern, there still may be reporting error. The hierarchy that we used was as follows (higher on the list means that category dominates): Medicaid/CHIP; Medicare; other public plan (not Medicare or Medicaid/CHIP); private plan on the exchange; private, nongroup off the exchange; private plan through employer or other group; and uninsured.[8]

We note that we have made additional refinements to this approach in our model using income and employment status to correct insurance status discrepancies as a sensitivity check (see Model 27 in Table 3.3).

Sensitivity Analyses

Several aspects of the 10Plan parameters and our modeling assumptions may have significant impact on our results. We discussed assumptions necessary for modeling in the prior section; potential behavioral demand responses are discussed in the appendixes. In this section, we summarize the set of additional estimates we ran to test the sensitivity of our results to various parameters (see Table 3.3). Model 1 is the status quo, and Model 2 is our "baseline" 10Plan model; results in Chapter Four are based on Model 2, unless otherwise noted.

In Model 3, we modified the calculation of repayment rates to increase marginally instead of continuously over the income category. The 10Plan specifies that the repayment rate is calculated as a simple percentage of income with the percentage calculated on the basis of income level. In this model, the repayment rate was calculated by applying increasing rates to income in increasingly higher categories, similar to a marginal tax rate system. Models 4 and 5 are the lower and upper bounds on expected elasticity or demand changes; we

[8] In particular, if someone reports Medicaid coverage in any month, we assign Medicaid coverage for the year. Then, if they report Medicare in any month, we assign Medicare coverage for the year; and so on. This approach accounts for individuals who may report multiple sources of coverage in a given month as well as addresses our concern that someone with Medicaid might misreport their coverage.

have assumed small/conservative and large/moderate estimates of the change in demand for health care (see Appendix A for more details).

Models 6 through 11 vary the prices that the 10Plan-eligible population would face. Models 12, 13, and 28 vary aspects of the repayment program, allowing for forgiveness of deferred payments at age 26 (instead of transferring to parents) and charging a higher or lower interest rate on deferred payment balances. Models 14 and 15 are hybrid versions of the 10Plan that include a single-payer plan for those under a certain income threshold; these versions attempt to adopt elements of other single payer plans currently being considered. Models 25 and 26 are other potential ways to lower costs—particularly for lower-income families—by reducing copayments (Model 25) and repayment caps (Model 26).

The remaining models vary particular elements of our modeling assumptions: medical inflation (Model 16), scaling of the distribution of health status to match the MEPS (Model 17), allowing health care demand to increase further as individuals reach age 65 because of deferred payment forgiveness (Model 18),[9] end-of-life utilization (Model 19), the relationship between health spending and mortality rates (Models 20 and 21), additional adjustments to utilization among the currently uninsured (Models 22 and 23), assuming individuals do not borrow everything after the copayment (Model 24), and insurance status assignment corrections (Model 27).

[9] We linearly increased the behavioral shift from 0.13 to 0.64 (Pendzialek, Simic, and Stock, 2016).

Table 3.3
Overview of Sensitivity Checks

Model	Description
1	Status quo policies and prices
2	Baseline: Medicare prices, continuous repayment cap, no behavioral changes
	Changes to Modeling Compared with Baseline
3	Marginal repayment cap
4	"Small" behavioral changes (see Appendix A)
5	"Large" behavioral changes (see Appendix A)
6	Medicaid prices
7	Medicare prices + 10%
8	Medicare prices + 50%
9	Medicare prices + 100%
10	Medicare prices + 134%
11	Medicare prices − 10%
12	Deferred payments forgiven for children at age 26 (instead of parents)
13	4.5 percent interest rate instead of 3 percent
14	Expand Medicaid up to 400 percent of FPL
15	Expand Medicaid up to 250 percent of FPL
16	4.4 percent medical inflation instead of 5.1 percent
17	No adjustments to the distribution of health status; instead, scaling to match MEPS
18	Increase utilization as individuals approach age 65
19	Utilization and spending increases prior to death only for those with chronic conditions
20	Increase the mortality scaling as a function of health spending
21	Decrease the mortality scaling as a function of health spending

Table 3.3—Continued

Model	Description
22	Uninsured are not any more likely to have nonzero spending instead of a 20 percent increase in likelihood of nonzero spending
23	Uninsured 35 percent more likely to have nonzero spending instead of a 20 percent increase in likelihood of nonzero spending
24	Individuals do not borrow full amounts, but instead pay 115 percent of the repayment cap up front, out of pocket, in addition to copayments
25	Reduce copay to $10 for individuals with income < 400 percent of FPL
26	Reduce repayment caps for low income[a]
27	Insurance status corrections to account for possible underestimation of target population[b]
28	1.6 percent interest rate instead of 3 percent

[a] Maximum repayment caps reduced to 1 percent, 2 percent, 3 percent, and 5 percent for individuals between 100–150 percent of FPL, 150–250 percent of FPL, 250–400 percent of FPL, and 400–600 percent of FPL, respectively. See Table 2.1 for the original maximum repayment caps.

[b] Insurance status corrections included reassigning individuals according to the following three rules: (1) correct anyone on Medicaid at or over 400 percent of FPL to have group private insurance, (2) correct anyone on Medicaid between 200–400 percent of FPL to have nongroup private insurance, and (3) correct anyone at or below 100 percent of FPL with nongroup private insurance to be uninsured. These corrections allow us to evaluate the sensitivity of the model to potential misreporting of insurance status.

CHAPTER FOUR

Results

In this chapter, we present results comparing status quo policies with the 10Plan using Medicare prices (Models 1 and 2, respectively) unless stated otherwise. We present results for families and individuals participating in the 10Plan, then aggregate amounts to the federal government level. In some results, we present the full 15-year trajectory, but in other cases, we present either the results as of the end of the 15th year or cumulatively summing aggregated amounts over the full period. The former results are important because they reflect the *steady state* of our dynamic model—the point at which all aspects of the 10Plan, including the forgiveness of deferred payment balances after 15 years, would factor into our calculations. In years prior to this, we would not have reached the point at which deferred payment balances from year 1 are forgiven and in every year after year 15, these amounts will continue to be forgiven.

We also present cumulative population-level estimates for our government-level analysis, whereby we calculate federal costs. In these cases, we report results over time when there are significant year-to-year changes that are important to illustrate; otherwise, we show results in the steady state (as of the end of year 15) or cumulatively over the entire 15-year period.

10Plan Participants

We found that between 15 and 17 percent of the model population would participate in the 10Plan in each year of the simulation, includ-

ing all individuals under 65 years of age who are currently uninsured or purchase nongroup private insurance.

In Table 4.1, we show the number of 10Plan participants at the end of years 1, 5, 10, and 15, by gender, race, and age group, and by mean family income.

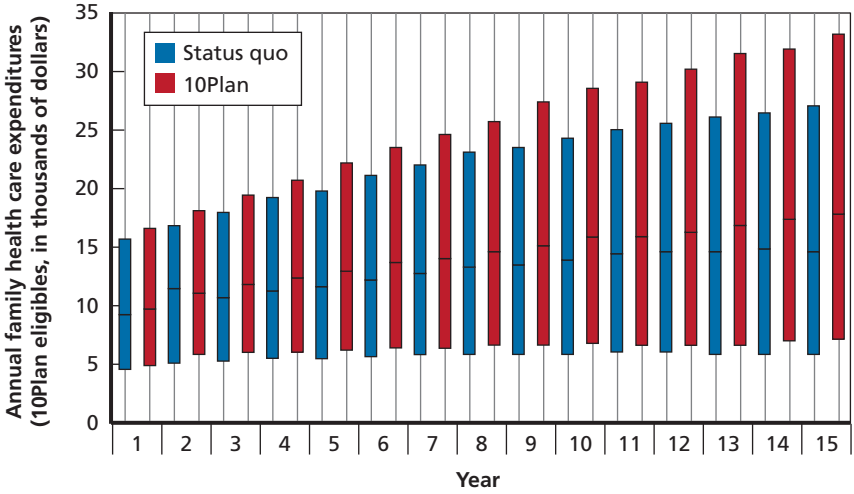
Family Health Care Spending

In Figure 4.1, we show the distribution of annual health care expenditures (as defined by row 1 of Table 3.2) for families with at least one person participating in the 10Plan over the 15-year period. For each year, we show the box and whisker plot of the predicted health care expenditures for 10Plan-eligible family members under the status quo (blue) and under the 10Plan (red). The *boxes* represent the interquartile range—from the 25th to 75th percentiles—and the middle

Table 4.1
10Plan Participation at the End of Years 1, 5, 10, and 15

	Year 1	Year 5	Year 10	Year 15
Number of Individuals (millions)	43.5	43.6	45.7	46.8
% Female	50	51	50	50
% Male	50	49	50	50
% White	53	52	52	50
% Black	16	16	15	16
% Hispanic	24	24	25	26
% < 19	29	30	30	29
% 19 to 34	26	25	24	24
% 35 to 49	22	23	25	24
% 50 to 64	23	22	21	23
Mean Family Income ($ thousands)	86.8	90.5	89.7	88.0

Figure 4.1
Distribution of Total Annual Health Care Expenditures Among 10Plan Families

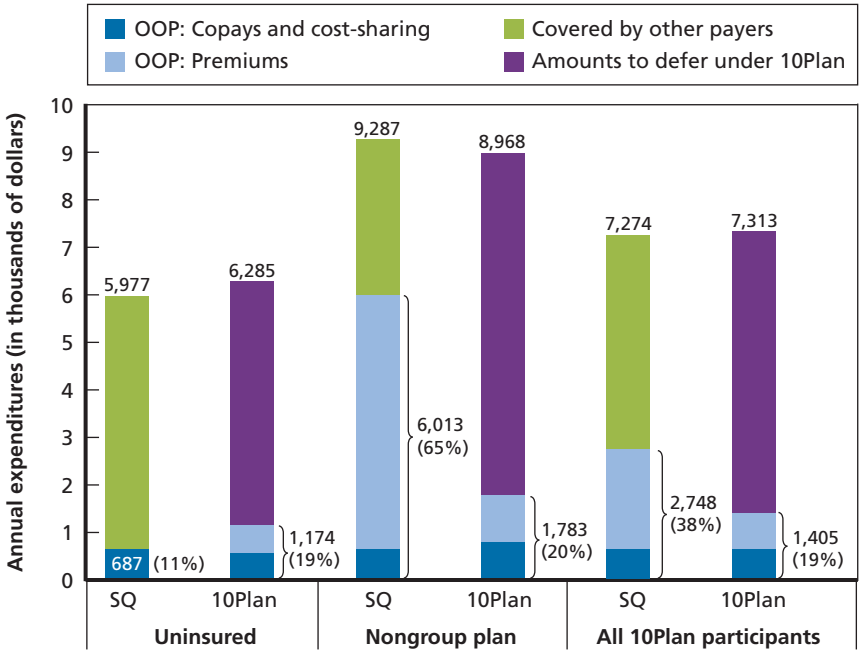


NOTES: SQ = status quo. Boxes represent the interquartile range of predicted health care spending under the 10Plan, assuming Medicare prices; lines (or whiskers) represent other quartiles. Family spending includes only amounts for 10Plan-eligible members.

line represents the median. The lines from each box, called *whiskers*, represent the other two quartiles (from 0 to 25th percentile and from 75th to 100th percentile). Note that Figure 4.1 is truncated and does not show maximums here to avoid skewing the figure (see Table C.1 for full results). Overall, median family health care expenditures under the 10Plan are not very different from predicted amounts under the status quo.

In Figure 4.2, we present the predicted total individual-level expenditures (defined in row 1 of Table 3.2) under the status quo and the 10Plan. Within each bar, we show the average annual amount spent on cost-sharing (dark blue) and the average annual amount spent on premiums (light blue). Under the status quo, there are no insurance premiums for those currently uninsured, but for those currently covered by a nongroup plan, these are the average annual insurance premium contributions. Under the 10Plan, the premiums are the average

Figure 4.2
Mean Individual Annual Health Care Expenditures as of Year 15, by Current Health Insurance Status



NOTE: SQ = status quo, which is projected spending assuming no 10Plan and a medical inflation rate of 5.1 percent. Each bar reflects total annual health care expenditures as defined in row 1 of Table 3.2. The dark blue sections reflect out-of-pocket (OOP) spending on copays and cost-sharing (row 2 of Table 3.2). The light blue sections reflect spending on premiums or repayment premiums (row 3 of Table 3.2). The green sections reflect amounts covered by other payers under the status quo, and amounts deferred under the 10Plan. *N* = 46.8 million participants (28.8 million currently uninsured and 18 million currently covered by a nongroup plan).

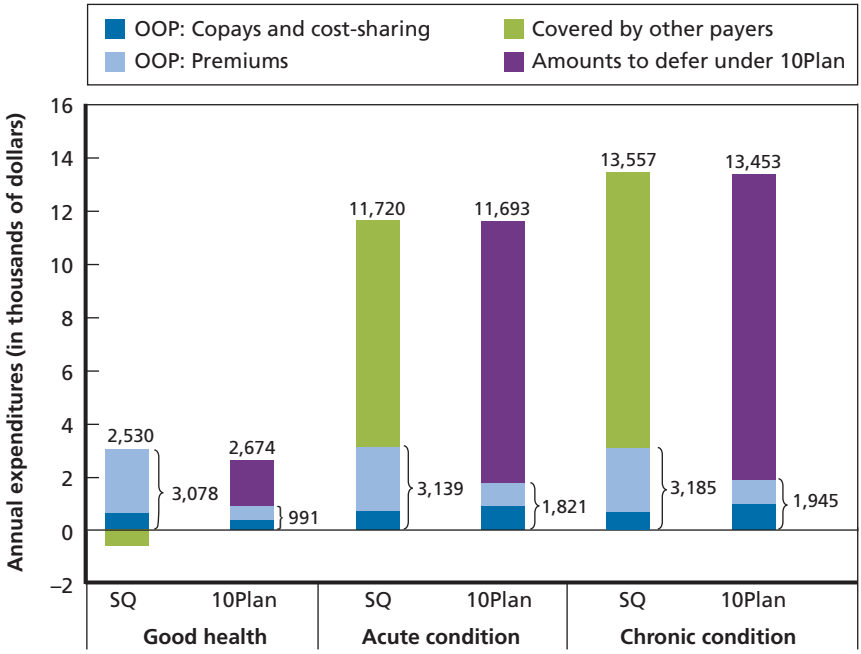
annual repayment premiums from payments deferred in earlier years. The green parts of the bars reflect amounts that are currently covered by other payers under the status quo, such as worker's compensation and other amounts covered by employers or by charity care (or written off). The purple segments represent the fraction of health care spending that would be deferred under the 10Plan.

Overall, we predict that total individual health care spending per year will be similar under both the status quo and the 10Plan, but out-of-pocket costs would be $1,343 lower under the 10Plan (see the two bars on the far right in Figure 4.2).

We also found significant differences by current health insurance status. For those currently uninsured, our model predicted total health spending per year to be about $308 higher under the 10Plan, on average ($6,285 versus $5,977). This would translate into an increase in out-of-pocket spending (blue-shaded segments of bars) of $487 for the uninsured. For those currently covered by a nongroup plan, our model predicted that total annual health care spending would be $319 lower under the 10Plan ($8,968 versus $9,287) relative to the status quo. The out-of-pocket spending is predicted to be $4,230 less per year ($1,783 versus $6,013), on average for these individuals under the 10Plan.

We also break out predicted total health care expenditures by the health status of 10Plan-eligible individuals (see Figure 4.3). Health is defined as *good health* and *bad health*, where *bad* reflects either an acute condition (from which someone can recover) or a chronic condition. We used the average amount currently paid for nongroup health insurance premiums inflated to year 15 in the out-of-pocket calculations for the status quo. These health insurance premiums may vary by health status, but we have assumed the same average across all three health states (good health, bad health with an acute condition, and bad health with a chronic condition). Overall, average total annual expenditures in Year 15 will be about $144 more for individuals in good health. However, those in good health are predicted to spend $3,078 per year in cost-sharing and health insurance premiums under the status quo. This means that some of the amount they pay in premiums is being used to offset the costs of care of less-healthy enrollees. Those in good health would have $991 in out-of-pocket costs per year under the 10Plan, a savings of $2,087 per year. Those with acute and chronic conditions will have about $27 and $103 less in average total health care expenditures per year, respectively, under the 10Plan relative to the status quo. Out-of-pocket costs will fall significantly for those with an acute and chronic condition, as well, by $1,368 and $1,213, respectively.

Figure 4.3
Change in Mean Total Annual Health Care Expenditures in Year 15, by Health Status

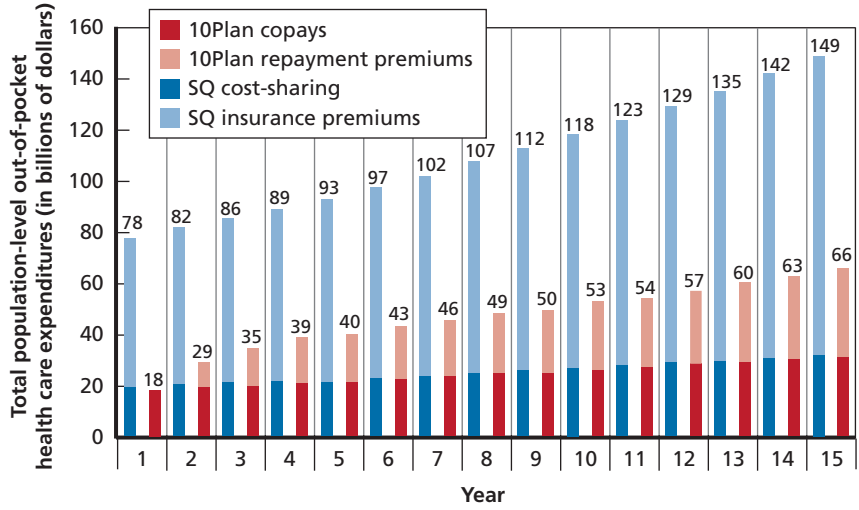


NOTE: SQ = status quo, which is projected assuming there is no 10Plan and a medical inflation rate of 5.1 percent. *N* = 46.8 million participants.

Repayments and Copays

In Figure 4.4, we show the total population-level aggregate amounts (as defined by row 3 of Table 3.2, summed across all 10Plan participants) predicted to be spent on out-of-pocket costs under the status quo (blue bars) and the 10Plan (red bars). For each year, we predicted the aggregated amounts that would be spent on cost-sharing (dark blue bar) and health insurance premiums (light blue bar) under the status quo. We inflated health insurance premiums using a 5.1 percent medical inflation rate to be consistent with other inflation adjustments in the model. The dark red bars reflect the aggregated amounts predicted to be spent on copayments under the 10Plan, and the light red bars reflect aggregated repayment premiums. On average, 10Plan participants are

Figure 4.4
Population Totals of Out-of-Pocket Health Care Expenditures



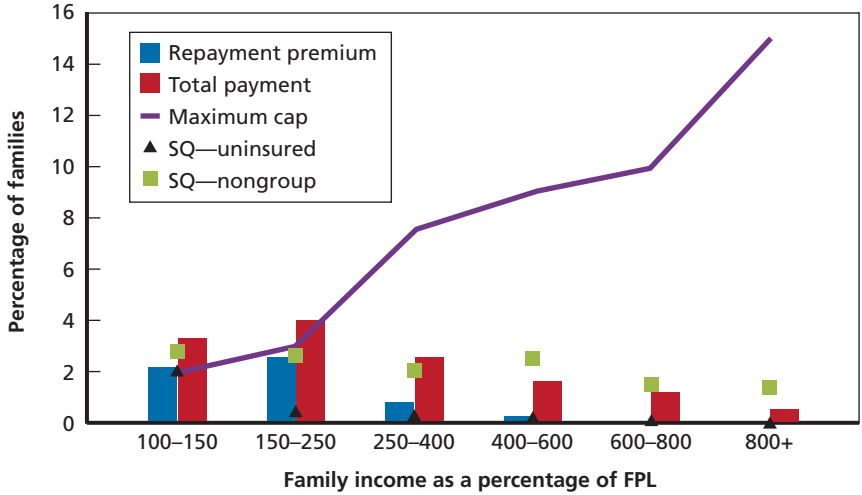
NOTES: SQ = status quo, which is projected spending assuming there is no 10Plan and a medical inflation rate of 5.1 percent. *N* = 46.8 million participants.

predicted to spend $63 billion less per year in out-of-pocket spending under the 10Plan relative to the status quo, or $940 billion less over the 15-year period.

Another way to examine a family's burden under the 10Plan is to examine the fraction of income that would be spent on health care. Under the 10Plan, families are responsible for paying a $25 copayment for each health care interaction (including visits and prescriptions) in addition to a repayment premium toward the deferred payment balance from previous years' health interactions, if nonzero. The required annual repayment premium is capped at a percentage of family income that depends on the family's income as a percentage of FPL. Thus, the range of repayments for each cohort will fall between 0 and the annual repayment cap, given in Table 2.1.

In Figure 4.5, we show the median effective repayment rate (blue bar) and total payment rate (repayment premium plus copayment, shown in the red bar) as a percentage of family income in year

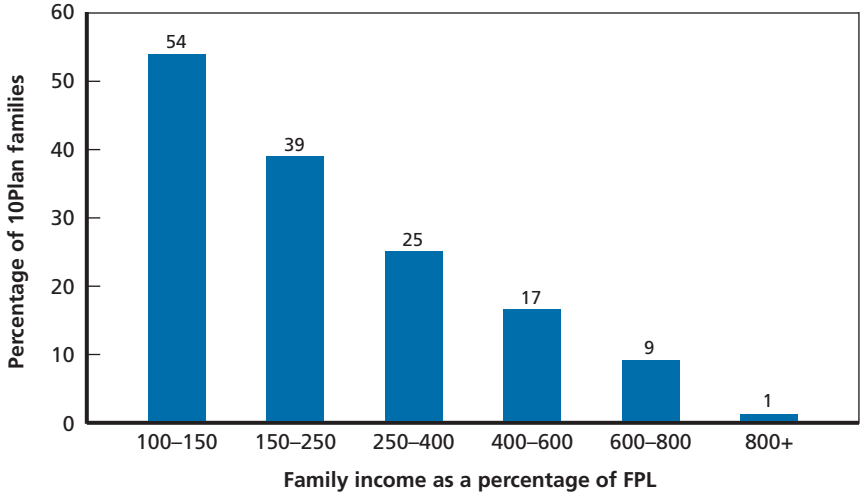
Figure 4.5
Median Effective Repayment Premium Rate and Total Payment Rate as a Percentage of Family Income in Year 15, by FPL Category



NOTES: SQ = status quo. *Total payment* includes both repayment premiums and copayments. We do not show the effective repayment premium rate or total payment rate for the population with family income below 100 percent of FPL because the repayment cap at this level is 0 percent. *N* = 46.8 million participants (28.8 million currently uninsured and 18 million currently covered by a nongroup plan.)

15, compared with the maximum annual repayment cap (purple line). These metrics account for utilization levels, amounts forgiven, and the median percentage of income actually paid by families. The lowest income families (< 250% of FPL) will effectively pay between 3 and 4 percent of income toward the cost of health care for 10Plan participants (including copayments and repayment premiums). The highest-income families will effectively pay less than 1 percent of their income toward the cost of health care for 10Plan participants. For comparison, we also show the median percentage of income that individuals currently pay for out-of-pocket health care expenses (the triangle represents those who are currently uninsured, and the square represents those who are currently covered by a nongroup plan).

Figure 4.6
Percentage of 10Plan Families Paying Maximum Repayment Cap in Year 15, by FPL Category



NOTE: 10Plan families are families with at least one 10Plan-eligible member. We do not show the effective repayment premium rate or total payment rate for the population with the family income below 100 percent of FPL because the repayment cap at this level is 0 percent. *N* = 46.8 million participants.

When we consider the percentage of 10Plan households at each income level that pay the maximum repayment rate (Figure 4.6), we see that these families are primarily lower-income households. This is consistent with the findings illustrated in Figure 4.5. Over 50 percent of households with at least one 10Plan-eligible member and income between 100 and 150 percent of FPL pay at the maximum repayment cap in year 15. This percentage drops as income level increases.

Government-Level Analysis

In this section, we report details on population-level changes in health care spending among 10Plan participants; amounts that would be forgiven because of expiration, death, or age; predicted effects on the federal budget; and a set of sensitivity results.

Total Health Care Expenditures Among 10Plan Participants

Over the 15-year period, we predicted total health care spending (not including administrative costs) under the status quo to be about $3.57 trillion relative to $3.53 trillion under the 10Plan. This amounts to about $33 billion in reduced total health care spending over the 15-year period because of lower prices, or about $2.18 billion less in spending per year.

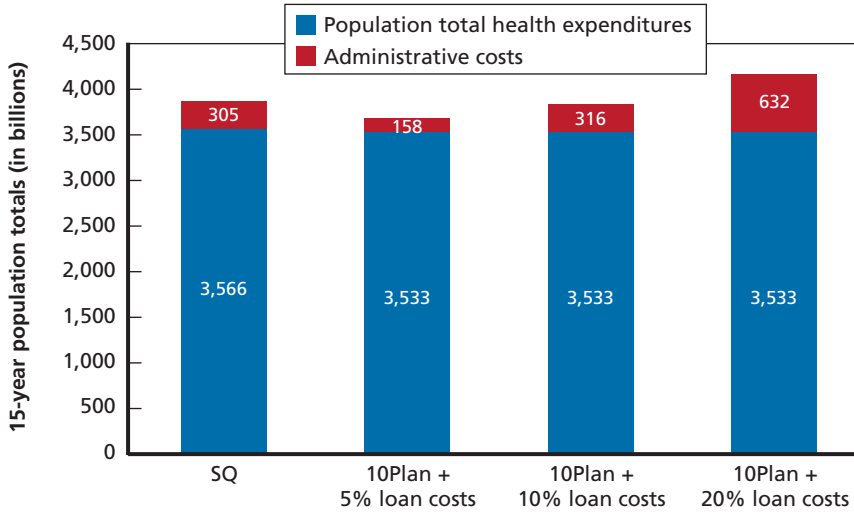
We do not know how much is currently spent on administrative costs under the status quo from the data we used, but other studies have estimated administrative costs at between 12 and 22 percent of net premiums earned (which are essentially premiums paid in, less claims paid out) (Hall, McCue, and Palazzolo, 2018; McCue, Hall, and Liu, 2013; Snyder and Rudowitz, 2015).

Administrative costs were 10.4 percent for Medicaid enrollees in 2017 (Snyder and Rudowitz, 2015; Wolfe, Rennie, and Truffer, 2017). Estimates of the administrative costs for Medicare vary depending on whether they include administrative expenses incurred by the insurance companies managing the Medicare Advantage and Part D plans, and range from 1.4 to 6 percent. Under the status quo, insurers are required to spend 80 percent of amounts collected in premiums (actuarially) on health care expenditures (Berwick and Johnson, 2019): This means that not more than 20 percent should go to cover insurer administrative and overhead costs.

In Figure 4.7, we show 15-year cumulative totals of population-level health care expenditures and estimated administrative costs under the status quo and 10Plan. We assumed administrative costs under the status quo of 20 percent of health care expenditures not covered by the family. We separately assumed 5, 10, and 20 percent of the amounts that would be borrowed (repayment premiums) under the 10Plan as the administrative costs. If the 10Plan is able to achieve administrative costs at 5 percent, the 10Plan would yield an additional $147 billion in savings from lower administrative costs, respectively. However, with 10 or 20 percent administrative costs, the 10Plan would be more expensive to administer than the current nongroup plans.

Our preferred assumption regarding 10Plan administrative costs is that they will be 10 percent of deferred payments. Although this is

Figure 4.7
15-Year Total Population Health Care Expenditures Plus Administrative Costs



NOTES: SQ = status quo. The population total health expenditures refer to row 3 in Table 3.2. Administrative costs under the status quo are calculated as 20 percent of the total population health expenditures, less amounts that families pay out of pocket. Administrative costs under the 10Plan are equal to 5, 10, or 20 percent of the amount of deferred payments that the federal government will lend out.

greater than the 5 percent assumed by Shapiro and Aneja (2019), it is similar to recent estimates of administrative costs for Medicaid enrollees (10.4 percent) (Holahan and McMorrow, 2019). Thus, our model suggests that the 10Plan will result in savings of $33 billion from lower prices but would increase administrative costs by $11 billion over the 15-year period (net savings of $21.5 billion total). This amounts to around $1.4 billion in savings per year, assuming Medicare prices and no behavioral changes in demand for health care.

Forgiveness of Deferred Payment Balances

Deferred payment balances are forgiven for any of the following four reasons: the balance expires after 15 years, an individual dies, an individual turns 65 and rolls into Medicare, or an individual without living parents turns 26. Note that we generally assumed that the balances of

Table 4.2
Deferred Payment Balances Forgiven by the Government, Stratified by Reason for Forgiveness by Year, in Billions of Dollars

Year	1	5	10	15
Total Forgiven	6.3	14.5	17.6	29.0
Forgiven due to expiration	0	0	0	0.1
Forgiven due to death	3.5	8.6	13.4	23.6
Forgiven at age 65	2.1	3.3	3.0	4.7
Forgiven at age 26	0.7	2.7	1.2	0.6

NOTE: Values are rounded to the nearest $100 million and are not cumulative.

26-year-olds are left with their parents, but in cases in which a 26-year-old is predicted to have no living parents, we assumed balances were forgiven.[1] Table 4.2 shows that forgiveness due to death accounts for by far the largest share of total balances forgiven.

Federal Budgetary Effects

To evaluate the 10Plan's impact on government spending, we evaluated the projected outlays and revenue associated with the 10Plan, shown in Table 4.3. Government outlays include deferred payments, which can be compared with the government's current spending on APTCs, and administrative costs.[2] The Congressional Budget Office (CBO) provides projections for marketplace-related APTC outlays from 2019 to 2029, which we extended an additional four years (Fritzsche, McNellis, and Vreeland, 2019). Revenue consists only of repayment premiums

[1] We also conducted a sensitivity analysis in which the balances of all 26-year-olds are completely forgiven rather than left with the parents.

[2] The 10-year calculations are also provided to match the CBO baseline projections, but we note that because the plan does not reach the steady state until year 15, our preference is to focus on 15-year results.

Table 4.3
Effect of the 10Plan on Government Spending, in Billions of Dollars

	Year 1	Year 5	Year 10	Year 15	Total over 15-Year Period	10-Year Total (CBO)[a]
Outlays						
Deferred payments	$131.83	$167.10	$232.27	$310.94	$3,161.09	$1,766.50
APTC	–$62.00	–$65.00	–$77.00	–$87.75	–$1,089.00	–$672.00
Administrative costs	$13.18	$16.71	$23.23	$31.09	$316.11	$176.65
Total	$83.02	$118.81	$178.49	$254.29	$2,388.20	$1,271.15
Revenue						
Repayment premiums	$0.00	$137.66	$191.91	$251.20	$2,405.12	$1,283.60
Tax effects	$0.00	$0.00	$0.00	$0.00		
Total	$0.00	$137.66	$191.91	$251.20	$2,405.12	$1,283.60
Budget effect						
Outlays	$83.02	$118.81	$178.49	$254.29	$2,388.20	$1,271.15
Revenue	$0.00	$137.66	$191.91	$251.20	$2,405.12	$1,283.60
Net effect	$83.02	–$18.85	–$13.41	$3.08	–$16.92	–$12.45
Number of 10Plan participants (in millions)	43.47	43.61	45.73	46.80		

NOTES: APTC amounts include all "Marketplace-Related Coverage and the Basic Health Program" expenditures. Year 15 APTC projections are linearly extrapolated from CBO estimates (Fritzsche and Masi, 2016). Administrative costs are estimated at 10 percent of deferred payments.

[a] The 10-year calculations are also provided to match the CBO baseline projections, but we note that because the plan does not reach the steady state until year 15, our preference is to focus on 15-year results.

paid toward 10Plan participants' deferred payment balances each year because there is no effect on tax revenue. Although we do not know what the administrative costs of the 10Plan would be, we used 10 percent of deferred payments as an estimate for these administrative costs.

Our federal budgetary analysis suggests that the federal costs will be the highest in the first two years of 10Plan implementation, but will decline as deferred payments are repaid. Then, once the first set of deferred payments (from year 1) are forgiven at the end of year 15, we expect the 10Plan to cost the federal government about $3 billion per year. Still, we estimated that the federal government would need about $83 billion for the 10Plan program in year 1. The current plan does not include a plan to raise revenues to cover these costs.

Over the 15-year period, we predicted the net effect on federal spending will be a decrease of almost $17 billion. As year 15 is the first year in which the first set of deferred payments will be forgiven, the accounting in this year gives the best estimate of what the budgetary effect will be over the longer term. Thus, although we found government savings over the entire 15-year period, those are likely not sustainable. In the event that there are savings from federal spending on the 10Plan population, those savings can be used in several ways, such as reducing out-of-pocket costs for the lowest-income families, investment in medical education scholarships, or covering additional cost-effective treatments with no cost-sharing.

Sensitivity Analyses

We tested several versions of the dynamic microsimulation varying different aspects of the assumptions in isolation.[3] In Table 4.4, we present the results from these additional runs focusing on the 15-year totals of health care expenditures for all 10Plan-eligible individuals, estimated administrative costs, the comparison to the status quo, and the net effect on federal spending.

Our estimates of the change in total health care spending relative to the status quo are most sensitive to the price levels that 10Plan-eligi-

[3] Importantly, we varied assumptions one at a time. In reality, there may be interactive effects between many of the policy features and parameters considered here.

ble families and individuals will face, and less sensitive to the parameters and policy features tested in the other sensitivity analyses. In other words, the prices that we assume that 10Plan participants would face are the most significant factor in determining whether the 10Plan will generate savings. Assuming Medicare prices, as we did for most of the results presented, our model suggests savings of $21.5 billion over 15 years, including administrative costs of 10 percent. However, if 10Plan participants face rates that are 234 percent that of Medicare, as the state of Montana was able to negotiate with hospitals (Appleby, 2018; Liang, Beydoun, and Eid, 2019) then we predicted *increases in health care expenditures of $1,236 billion over 15 years* (see Model 10). Even though Montana hospitals may not be representative of all hospitals in the United States, we expect getting hospitals to (systematically) accept rates lower than those of Montana hospitals may be difficult.

Forgiveness of loan balances at age 65 is another modeling assumption that predicts whether the10Plan saves money. In our main model, we did not assume any behavioral responses from this, but 10Plan participants would have an incentive to increase their consumption of health care (especially discretionary health care) as they approach age 65, especially at age 64. In particular, knowing that they would not have to repay costs in subsequent years may affect their behavior. In one sensitivity check, we increased health care utilization linearly from ages 51 to 64 to account for this. In this model, we estimated that the 10Plan, with Medicare prices, would increase total expenditures by $659 billion over 15 years (see Model 18).

Using a marginal repayment rate calculation (similar to the way that income tax brackets are applied, in which the repayment rate on the next dollar of income increases) would yield lower repayment premiums (and hence, greater costs to the federal government) than using a continuous cap as we assumed (comparing Model 2 with Model 3) but would not change the overall total health care expenditures.

Varying our assumptions about demand elasticities changed our estimates. If we assumed smaller changes in demand (see Appendix A), we still found savings, though to a slightly lesser degree than in our baseline estimates (compare Model 2 with Model 4). However, assuming larger changes in demand resulted in increased spending relative to

the status quo, such that total costs would be about $19 billion higher than under the status quo (Model 5).

In Models 12, 13, and 28, we varied aspects of the repayment program. Forgiving the deferred payment balances of all children at age 26 (as opposed to transferring remaining balances to parents) would cost the federal government an additional $46 billion over the 15 years relative to the status quo (Model 12). Charging a higher interest rate of 4.5 percent instead of 3 percent would reduce federal costs by about $70 billion over the 15-year period (Model 13). Charging a lower interest rate of 1.6 percent, which is the current ten-year Treasury rate, would increase federal costs to $31 billion over the 15-year period (Model 28).

Models 14 and 15 are hybrid programs combining the 10Plan with an expansion of Medicaid. These models do not include the amount of federal funding that would be required to cover new Medicaid enrollees. The CBO projects that Medicaid spending will be about $549 billion in 2029 and would cover 64 million beneficiaries. Model 14 would expand coverage to an additional 126 million individuals by 2029, increasing Medicaid spending to $1.42 trillion. We predicted that Medicaid enrollment would increase by about $129 million as of year 15 ($125 million as of 2029), and Medicaid spending would increase to $2.10 trillion as of year 15 (or $1.429 trillion as of year 2029). For comparison with the CBO budget projections, this would be an additional $1.39 trillion in Medicaid spending as of year 15 (or $870 billion in Medicaid spending as of 2029). This amount would cover 129 million individuals with incomes up to 400 percent of FPL, and almost eight million under the 10Plan. These estimates suggest lower total health care costs for the target group (uninsured and nongroup private) relative to the status quo.

Models 25 and 26 are additional alternative approaches to the 10Plan that could potentially lower family costs, particularly for lower-income families. Model 25 assumes lower copayments for families under 400 percent of FPL, but they would still face the same repayment rules; this increased the predicted federal costs by $42 billion over the 15 years. Similarly, reducing the repayment caps would reduce revenue and thus increase federal costs by about $144 billion over the 15 years.

Changing the following modeling assumptions resulted in greater savings: lower medical inflation (Model 16), inflating end-of-life costs only for those with chronic conditions (Model 19), scaling down the mortality factor (Model 20), increasing the amount that families will pay by an additional 115 percent of their repayment cap up front (and thus reducing the amount borrowed; Model 24), and making additional adjustments to health insurance status (Model 27).

The results of other sensitivity analyses on our modeling assumptions still tend to predict higher total health care expenditures under the 10Plan, similar to Model 2.

In summary, our estimates of the change in total health care spending relative to the status quo are most sensitive to price levels that 10Plan-eligible families and individuals will face, and less sensitive to the parameters and policy features tested in the other sensitivity analyses. The price level element of the 10Plan matters significantly: Assuming Medicare rates yields an estimated $21.5 billion decrease in total health care expenditures (including administrative costs) over the 15 years, but assuming 234 percent of Medicare rates yields an estimated increase of $1,263 billion in total health care expenditures relative to the status quo. Using Medicare prices would net the federal government $17 billion over the 15 years, but using 234 percent of Medicare would cost the federal government an additional $566 billion.

Discussion

Our model estimates $3.53 trillion in total annual spending by 10Plan participants summed over the 15-year period, after adjusting prices to Medicare levels and not accounting for changes in demand. This amount is almost $33 billion less than we predicted under the status quo. Our estimate with no demand change is about $39 billion higher than District Economic Group's estimates of health care spending over the 15-year period, $3.146 trillion under the 10Plan (they do not present the counterfactual).

If under the status quo, administrative costs are around 20 percent (Hall, McCue, and Palazzolo, 2018) and if the 10Plan can achieve administrative costs on par with Medicaid (at approximately 10 per-

Table 4.4
Sensitivity Analyses, Estimated Total Spending in Year 15 and Across 15-Year Period, in Billions of Dollars

Model	Total 10Plan Population Health Care Expenditures	Estimated Administrative Costs	Total	Difference from Status Quo	Net Effect on Federal Spending
1. Status quo	$3,566	$305	$3,871		
2. Medicare prices, no demand changes	$3,533	$316	$3,849	–$21	–$17
3. Medicare prices, no demand changes, marginal repayment cap	$3,533	$316	$3,849	–$21	$39
4. Medicare prices, small demand changes	$3,539	$317	$3,856	–$15	–$8
5. Medicare prices, large demand changes	$3,570	$320	$3,889	$19	$23
6. Medicaid prices, no demand changes	$2,792	$247	$3,039	–$832	–$341
7. Medicare + 10% prices, no demand changes	$3,553	$319	$3,872	$1	–$11
8. Medicare + 50% prices, no demand changes	$4,017	$362	$4,380	$509	$213
9. Medicare + 100% prices, no demand changes	$4,452	$404	$4,856	$985	$416

Table 4.4—Continued

Model	Total 10Plan Population Health Care Expenditures	Estimated Administrative Costs	Total	Difference from Status Quo	Net Effect on Federal Spending
10. Medicare +134% prices, no demand changes	$4,707	$427	$5,133	$1,263	$566
11. Medicare –10% prices, no demand changes	$3,408	$306	$3,714	–$157	–$65
12. Model 2 with forgiveness of deferred payments of all children at age 26	$3,533	$316	$3,849	–$21	$46
13. Model 2 with higher (4.5%) interest on deferred payments	$3,533	$316	$3,849	–$21	–$70
14. Hybrid 10Plan with Medicaid expansion for all under 400 percent of FPL	$973	$89	$1,062	–$2,809	–$663
15. Hybrid 10Plan with Medicaid expansion for all under 250 percent of FPL	$1,573	$141	$1,714	–$2,157	–$618
16. Model 2 with lower rate of medical inflation	$3,511	$314	$3,825	–$46	–$30
17. Model 2 with no adjustments to distribution of health status	$3,543	$317	$3,860	–$11	$50

Table 4.4—Continued

Model	Total 10Plan Population Health Care Expenditures	Estimated Administrative Costs	Total	Difference from Status Quo	Net Effect on Federal Spending
18. Model 2 with demand for health care increasing as individuals approach retirement	$4,152	$378	$4,530	$659	$323
19. Model 2 with end-of-life health care consumption inflated only for those with chronic health conditions	$3,510	$314	$3,824	–$47	–$27
20. Model 2 with deflation of mortality scaling factor	$3,523	$315	$3,838	–$32	–$40
21. Model 2 with inflation of mortality scaling factor	$3,533	$316	$3,849	–$21	-$17
22. Model 2 with no adjustment of consumption of currently uninsured population	$3,530	$316	$3,846	–$25	–$19
23. Model 2 with larger adjustment of consumption of currently uninsured population	$3,533	$316	$3,849	–$21	–$25
24. Model 2 with individuals borrowing above 115% of their repayment cap (i.e., paying 115% of their repayment cap up front, out of pocket, in addition to copayments)	$3,533	$141	$3,674	–$197	–$528

Table 4.4—Continued

Model	Total 10Plan Population Health Care Expenditures	Estimated Administrative Costs	Total	Difference from Status Quo	Net Effect on Federal Spending
25. Model 2 with reduced copay ($10) for all under 400 percent of FPL	$3,533	$332	$3,865	–$5	$42
26. Model 2 with reduced repayment caps	$3,533	$316	$3,849	–$21	$144
27. Model 2 with insurance category corrections	$3,522	$315	$3,838	–$33	–$35
28. Model 2 with lower (1.6%) interest on deferred payments	$3,533	$316	$3,849	–$21	$31

NOTES: The analysis in this chapter is for Model 2, unless otherwise stated. See Table 3.3 for more details on these different models and sensitivity tests.

cent), administrative costs would increase by about $11 billion over the 15-year period.

Our estimated net cash flow, assuming 10 percent administrative costs, suggests that the federal government would need as much as $83 billion in year 1 (under Model 2), but only $3 billion per year as of year 15 (when the first set of deferred payment balances would be forgiven). Our amounts have subtracted what the federal government would have spent on APTC subsidies, which would no longer exist (CMS, 2019).

We have assumed that individuals who are currently covered by an employer-sponsored plan would keep their plan; but, as noted, this is an unrealistic expectation. Although our dynamic model allows movement into and out of the 10Plan from year to year, we have maintained the distribution of individuals in the private group market as constant over the 15-year period. On the one hand, greater participation in the 10Plan would drive up the federal cost of providing deferred payment up front. On the other hand, it is difficult to predict what would happen more broadly in the health care market. Perhaps, this movement would put downward pressure on commercial prices. Alternatively, an increase in the demand for health care that we predict under the 10Plan, more broadly, without a corresponding change in supply, may put upward pressure on prices or result in increased waiting or decreased access.

The 10Plan effectively caps out-of-pocket costs for those who are 10Plan-eligible. For the population below 400 percent of FPL, individuals typically spend 3 to 4 percent of their income on health care. For higher-income groups, the share of income is typically lower. This implies that, despite the progressivity of the required repayment rates, the 10Plan is slightly regressive in practice. However, from a financial risk standpoint, the lower-income groups have lower cost variability than they may have under the status quo.

CHAPTER FIVE

Conclusion

Overall, we predicted a decline in total health care spending among 10Plan participants of almost $33 billion over a 15-year period. The results stems largely from lower prices (assuming Medicare rates). Assuming that the 10Plan can lower administrative costs to 10 percent of the amount of deferred payments or loans, administrative costs would increase by $11 billion over the 15-year period, relative to the status quo. Together, these amount to savings of $21.5 billion total over 15 years, or about $1.4 billion per year. Under more-costly assumptions, we predicted federal spending to increase by around $38 billion per year, which is significantly less than estimates of $2 trillion to $3 trillion per year needed under Medicare for All proposals (Berwick and Johnson, 2019; Committee for a Responsible Federal Budget, 2019).

However, there are important aspects of our modeling assumptions that can change these estimates such that the 10Plan will *increase total health care expenditures*. First, the assumption that 10Plan participants will pay Medicare rates is critical. Lowering the prices that this population faces matters significantly. The feasibility of implementing these lower rates, however, is unclear. Second, as deferred payment (or loan) balances are forgiven at age 65, increasing health care utilization as individuals approach age 65 changes our results significantly. In this case, we predicted that the 10Plan would increase costs over the 15-year period.

On average, individuals covered by the 10Plan will spend less on health care and have lower out-of-pocket costs when compared with

the status quo. However, this varies by family income, current health insurance status, and health status. Lower-income families will pay about 3 to 4 percent of their income on repayments and copayments, which is more than what uninsured individuals in those income categories currently pay out of pocket for health care. In general, uninsured individuals will face greater out-of-pocket health care costs under the 10Plan, regardless of income. On the other hand, under the 10Plan, these individuals gain risk protection against large, unexpected medical bills. They will not be required to pay more than their means-tested rate in any given year, excluding copayments. The 10Plan also provides this risk protection to everyone not covered by a public or private health insurance plan, whereas currently there are approximately 28 million people without any risk protection from health insurance.

Higher-income individuals currently covered by a nongroup plan (with incomes above 400 percent of FPL) will pay less out of pocket, as they will have no insurance premiums. Lower-income individuals will pay a higher percentage of income on health care, however.

We also found differences in the changes in predicted health care expenditures by health status, with those who are in good health experiencing increases and those with chronic or acute conditions experiencing decreases in expenditures.

One potential concern about the 10Plan: In eliminating the nongroup health insurance market, those currently covered by a nongroup plan will lose the risk protection they have through an insurance plan. However, the ability to defer payments under the 10Plan and make means-tested repayments over time provides similar risk protection to paying premiums on a nongroup plan and having limited cost-sharing. Under the latter arrangement, someone could incur large health care expenses in one year, pay their maximum in cost-sharing, and then drop coverage, whereas under the 10Plan, the individual could be making repayments on that high-cost event for up to 15 years. Furthermore, for those in the highest-income groups covered by 10Plan, 10Plan may provide less risk protection than insurance. In our modeling, we are not able to determine the extent to which risk protection changes beyond comparing predicted out-of-pocket costs for 10Plan families under the status quo with such costs under the 10Plan.

The 10Plan would change the federal government's cash flow. In particular, the government would increase outlays to cover individuals' health care spending up front and then receive repayment premiums to cover these amounts in subsequent years. Some amounts would be forgiven after 15 years or as individuals age into Medicare. However, as noted previously, increased utilization may yield longer-term improvements in health, and the 10Plan would essentially facilitate low-interest loans for individuals who may not be able to obtain credit otherwise or would have to pay significantly higher interest.

Limitations and Caveats

As noted throughout the report, there are several limitations to our estimates that should be considered when interpreting our results. In this section, we briefly review these limitations to remind readers that all interpretations of our findings should be caveated with these assumptions.

Plan Implementation

Implementation of the 10Plan would likely require significant logistical and infrastructure changes that we have not included in our cost estimates. Convincing providers to agree to participate and accept Medicare rates may be politically challenging or even infeasible. Although CMS could require providers that currently accept Medicare beneficiaries as patients to accept 10Plan participants, providers may not be willing to do this. Currently, the 10Plan does not have specific rules that would compel participation.

Even with provider buy-in, some elements of Medicare reimbursement would be difficult to translate to the 10Plan. For example, hospitals are currently reimbursed by Medicare using the inpatient prospective payment system, which calculates payments for a particular discharge based on the patient's Medicare-Severity Diagnosis-Related Group and attributes of the hospital (i.e., whether it provides medical education, local wages). Payment can also be reduced if a patient is readmitted. The extent to which these payment systems could be used

to bill individuals using the 10Plan is unclear. For modeling purposes, we have just scaled expenditures down to the Medicare average, but how this would work in practice would need to be decided.

We have not estimated the costs of 10Plan administration (which would include enrollment of providers, processing of bills and repayment premiums, and fraud management), but instead have presented a range of what those costs would be, given total population-level health care spending (between 5 and 20 percent). In our federal budgetary cash flow analysis, we have assumed administrative costs of 10 percent of deferred payments, which is greater than the 5 percent assumed by Shapiro and Aneja (2019) but on par with recent estimates of administrative costs for Medicaid enrollees, at 10.4 percent (Holahan and McMorrow, 2019).

Although we have assumed that payments would be withdrawn automatically and end-of-year tax reconciliations would be made, we note that there is still a possibility of default. This may be particularly problematic for individuals who are self-employed, work multiple jobs, or have changes in income. The 10Plan specifies that default would result in ineligibility, but the exact rules regarding ineligibility, regaining eligibility, and how those individuals would receive care still need to be determined. We have not estimated how many individuals would potentially default.

There are also several other aspects of plan implementation that still need to be decided, including how to handle undocumented individuals,[1] family structure dynamics, how to prevent migration from other health insurance sources, and other behavioral responses that could negatively affect the sustainability of the plan. There may also be benefits to the federal government from providing administrative services for a wider segment of the population, such as a potential increase in bargaining power in setting prices, and additional data to analyze outcomes of care, fraud, and areas in which savings may be achieved. For example, CMS currently makes additional payments to qualifying hospitals that serve a large number of Medicaid and uninsured individuals that are known as Disproportionate Share Hospital

[1] See Appendix B for our sampling strategy, which does not exclude these individuals.

payments. To the extent that the 10Plan eliminates those who are technically without coverage, the amounts that hospitals spend on uncompensated and charity care may decline.

Modeling

It was necessary to make several assumptions to model the costs of the 10Plan, either because of complexity, a lack of appropriate data, or uncertainty regarding the effects of the 10Plan on the health care system. Although we have endeavored to provide several estimates to demonstrate the sensitivity of our results to these assumptions, we acknowledge that we were not able to capture all sources of uncertainty in our results. We note that implementation of the 10Plan would be a significant change to the current health care delivery landscape in the United States. Therefore, there may be additional effects that we are not anticipating and have not accounted for that could change our estimates. We review several of our key assumptions in the following paragraphs.

First, we note that there are both potential advantages and disadvantages to the 10Plan—that we have not modeled—that are important to consider in light of our estimates. As discussed in the prior section, the 10Plan offers risk protection for both those currently purchasing a plan in the nongroup health insurance market and those who are uninsured. Currently, those without insurance are less likely to receive regular or preventive care and are less likely to get prescriptions filled (Fernandez-Lazaro et al., 2019). The uninsured also have higher rates of emergency department use relative to those with private insurance and the cost of care tends to be higher in that setting relative to outpatient settings (Greenwood-Ericksen and Kocher, 2019; Xu et al., 2017). Although we make broad assumptions about utilization increasing as a result of the 10Plan, we do not account for the possibility that health outcomes and spending might improve for those who are currently uninsured and who, under the 10Plan, can seek treatment earlier and in less-costly settings without the risk of catastrophic medical bills.

This point is important, as we predicted that out-of-pocket spending would increase, on average, for those who are currently uninsured, and who do not have the protection from a costly catastrophic health

event under the status quo. Currently 56 percent of adults report a medical financial hardship, defined as having a problem paying a medical bill, worrying about paying for the cost of care for a serious illness (e.g., "financial toxicity"), or delaying or forgoing care due to worries about costs (Yabroff et al., 2019). We would like to compare health outcomes and quality of care (e.g., access) given the amounts spent under the two options, but we were unable to quantify the change in benefits using the data available.

There may also be broader market-level effects that influence prices and the supply of health care; we have not modeled these effects. Introducing a new approach to health care delivery will likely have spillover effects on other groups, not just the uninsured or those in the nongroup market. We have assumed that individuals who are currently covered by employer-sponsored plans will keep their current coverage. However, firms may have an incentive to stop providing insurance and instead offer their employees a subsidy to participate in the 10Plan, under which health care prices are lower. We have made no assumptions about the employer mandate from the ACA. This would result in greater participation in the 10Plan, which has implications for federal cash flows associated with managing this program.

We have also assumed that individuals currently covered by Medicaid would maintain their coverage, though some may prefer to use the 10Plan if access to care is better or easier.

We also have not adjusted for the potential provider response to this plan. As the 10Plan may increase demand for health care, there is no reason, a priori, to expect a corresponding increase in the supply of providers. In fact, if the 10Plan results in downward pressure on reimbursement rates broadly, we may expect supply to contract (e.g., fewer hospitals and providers). Whether supply remains constant or contracts, an increase in demand likely means unmet demand and increases in wait times to receive care.

We note that we have not modeled the borrowing behavior of 10Plan participants, though this could be done using a utility maximization framework. We assumed that all 10Plan participants would elect to defer all medical payments beyond the required copayment each year and make repayments at the minimum required rate (the

repayment cap). In reality, however, 10Plan participants might opt to pay some or all of their medical expenses up front; for example, if the expenses are particularly low or if the participants are averse to incurring debt.

Another key limitation relevant to enrollee behavior is that we did not estimate any change in medical spending behavior on the basis of the current deferred payment balance. However, it is likely that in a situation in which, for example, an individual incurs a large expense and expects to pay the required repayment premium each year for several years, that individual might exhibit different spending behavior than if the payment balance were zero. Similarly, individuals with chronic health conditions who expect to pay at or near the repayment cap each year might exhibit different spending behavior than individuals who do not expect to reach the cap.

APPENDIX A

Health Care Demand and Supply

In this appendix, we describe key features of the U.S. health care system, the empirical evidence on demand for health care, and the market structure of the U.S. health care system. The appendix is intended as a primer for nonexpert readers.

Health Insurance and Risk

Health care is a unique good in that individuals consume or use it for the purposes of improving or preserving their health, and not because they derive utility from going to medical visits per se. In this way, individuals "demand" health care in the economics sense because they want better health (Grossman, 1972). In the United States, the majority of individuals pay for their health care through private or public health insurance. The vast majority of individuals younger than 65 have health insurance through a private source, though this varies somewhat by age (Cohen, Martinez, and Zammitti, 2018).

The rationale for using health insurance to pay for health care expenditures is that it mitigates individuals' risk of high or unexpected health care expenditures. Health insurers can pool risks so that the costs of expensive illnesses or conditions are spread across numerous enrollees. Health insurance is also a way for individuals to "smooth" their health care consumption costs over time. Insurance premiums and expected out-of-pocket copays and coinsurance will be more stable from month to month than health care costs incurred without health insurance.

The market for health care is characterized by what economists call "information asymmetries" and "principal-agent" problems, which theoretically can result in market distortions (i.e., the market does not reach the most-efficient outcomes) (Hurley, 2000). *Information asymmetries* arise when one person involved in a transaction does not have the same information as the other party. This can lead to suboptimal decisionmaking. The *principal-agent problem* refers to the challenges that arise when one person (the agent) makes decisions for another party (the principal). In health, the medical provider (agent) advises the patient (principal) about what medical care to consume; the medical provider is also often an agent to the payer or insurer through negotiated contracts; and similarly, insurers and their enrollees have a contractual relationship. By having individuals pay the "first dollar" for coverage, the principal-agent problem is mitigated by the 10Plan, but it is not eliminated because some individuals can be fairly certain that they will not repay the full amount.

Informational asymmetries arise in health for a variety of reasons, including: (1) prices are not always transparent; (2) the consumer (patient) and the supplier (physician) have different levels of understanding of medicine, meaning that patients often do not know what procedures they need; and (3) third-party insurers lack both information on patients prior to insuring them and on what care is needed after they are insured (Cutler and Zeckhauser, 2000; Zweifel and Manning, 2000).

Although we would expect lack of price transparency to lead to higher prices charged, the empirical evidence is mixed (Brown, 2019; Cutler and Dafny, 2011; Whaley, 2019). Lack of a clear price may also lead patients to agree to more care (including unnecessary care) than they might have agreed to "buy" if they had known the price. However, over time, consumers may use less of certain types of medical care, such as preventive care, because they are concerned about what they may be billed. Patients' lack of information under a fee-for-service health care system can contribute to overuse of unnecessary care as providers get paid for each service they provide. There is a large body of empirical evidence documenting this so-called physician-induced demand (Johnson, 2014). There is also extensive evidence on informa-

tion gaps between insurers and patients that can lead to suboptimal decisionmaking. The 10Plan implementation will require some degree of price transparency, which should mitigate some of these negative effects. However, the scale of this mitigation will depend on the specifics of the implementation.

These informational asymmetries and the principal-agent problem in health insurance markets result in two challenges to optimizing health care utilization and spending: adverse selection and moral hazard (Cutler and Zeckhauser, 2000; Zweifel and Manning, 2000). *Adverse selection* refers to the phenomenon in which individuals who choose to purchase health insurance are likely to be systematically different from those who choose to go without health insurance. In particular, individuals who are sick or expect high medical expenditures in the future are more likely to purchase health insurance and may seek more-generous plans than their healthier counterparts.

Moral hazard occurs when, once covered by health insurance, individuals have an incentive to use more health care services than they would in the absence of insurance. Subject to the cost-sharing terms of their coverage, individuals may engage in less-healthy behaviors, knowing that their health insurance will pay for care regardless of their behavior. Some have more aptly labeled moral hazard as "hidden action" to avoid negative connotations of the term—it merely reflects differences in incentives to consume health care among those who are insured relative to those who are not (Anderson, Dobkin, and Gross, 2012; Card, Dobkin, and Maestas, 2008; Pauly, 1968; Zeckhauser, 1970). For example, individuals paying out of pocket may be more conscientious about the services that their providers are recommending, ask more questions about health care prices, and be more willing to forgo services. For most of the population, the 10Plan will have less of a moral hazard concern than traditional insurance products because individuals will be required to pay off accumulated spending. However, for the highest-cost individuals with sufficiently low income, there is a potential for moral hazard because they will likely see their accumulated health costs forgiven on the margin.

Health Care Prices

The United States spends more on health care than any other country, and research suggests that the main reason is that the prices paid for any given type of care are higher in the United States than in other developed nations. The 10Plan directly addresses this by limiting the prices paid by the population covered by the 10Plan to the lower prices negotiated by Medicare.

The United States spends a much higher portion of its gross domestic product (GDP) on health care than any other country. In 2016, health care spending accounted for 17.8 percent of U.S. GDP. Among other developed nations, the share ranged from 9.6 percent in Australia to 12.4 percent in Switzerland (Papanicolas, Woskie, and Jha, 2018). As summarized by Irene Papanicolas and colleagues (2018), there are several potential explanations for these differences. First, U.S. consumers may be sicker and thus require more care than other nations. However, compared with ten other high-income countries (Japan, Switzerland, France, Canada, the Netherlands, Sweden, Australia, the United Kingdom, Germany, and Denmark), the United States has similar utilization rates of many health care services. On a per-capita basis, the United States has similar numbers of physicians and nurses, hospital beds, hospital discharges, and surgical procedures. Despite similar rates of health care utilization, the United States has worse outcomes than the comparison countries. The United States has the shortest life-expectancy and the highest infant mortality rate. Although the United States has the second-lowest smoking rate, it has the highest rate of adults who are overweight or obese; though there may be some differences in health outcomes, it is not clear that these would explain higher health care costs. Thus, differences in the use or quality of health care do not appear to explain the difference in health care spending between the United States and other high-income nations.

The explanation that does hold is the price of care (Anderson, Hussey, and Petrosyan, 2019). Prices for health care goods and services are much higher in the United States than in other developed nations. For example, U.S. per capita spending on prescription drugs is 52 per-

cent higher than the next highest Organisation for Economic Co-operation and Development (OECD) country, France (Danzon and Furukawa, 2008). The use of prescription drugs is 39 percent higher in France than in the United States, but prices are 26 percent lower. In France, the share of lower-cost generic versus brand-name drugs is 14 percent higher. Among other services, a 2014 report by the International Federation of Health Plans shows that the average price of diagnostic magnetic resonance imaging (MRI) ranges from $130 in Spain to $811 in New Zealand, compared with $1,119 in the United States (International Federation of Health Plans, 2015). For diagnostic colonoscopies, the same study finds that average prices range from $372 in Australia to $1,421 in New Zealand, much less than the United States' $3,059 average price.

One potential downside to lower prices in the United States is that they might negatively affect provider supply and patient wait times (Davis et al., 2007).

Much of the price difference between the United States and other countries occurs among the population with employer-sponsored insurance or insurance purchased on the individual (nongroup) market as opposed to public insurance (e.g., Medicare). Even within the United States, there is wide variation in prices. For example, average reimbursement rates for hospital services within the employer-sponsored market are 241 percent of Medicare rates (White and Whaley, 2019). Medicaid reimbursement rates are much lower than Medicare reimbursement rates. In exchange for generous prescription drug insurance coverage, pharmaceutical manufacturers are mandated by statute to give Medicaid the "best prices" for prescription drugs.

Sources of High Prices for the Privately Insured Population

Understanding the source of higher prices in the United States is critical to determining the extent to which prices can be lowered.

Prices for Medicare services are set administratively by CMS. CMS adjusts prices on the basis of geography-specific cost differences and provider characteristics, but prices are similar overall among providers. Medicaid reimbursement rates are set by both individual states and, in states where Medicaid services are contracted out to private

insurers, through Medicaid managed care plans. Managed care plans use networking strategies to manage care utilization and negotiate preferential prices.

Prices for the privately insured population, however, are established through a complex negotiation process. Every insurance carrier negotiates separately with every hospital or health care provider to determine reimbursement rates for that insurer's enrollee population. Insurers use preferential networks and the threat of exclusion from these networks to bargain for lower prices. Hospitals use reputation, quality, and status to negotiate for higher prices. There is little empirical evidence that supports the hypothesis that high prices for private insurance payers are primarily because of low reimbursement rates from Medicare and Medicaid. In other words, high private insurer prices are not the result of shifting costs from public payers, and private insurer prices would remain high even if public payers increased their reimbursement rates (Frakt, 2011).

This negotiation system has resulted in a chaotic landscape with high and variable prices. For hospital services, a recent report found negotiated prices for hospitals range all the way up to 646 percent of Medicare prices (Frakt, 2011). Several other studies document the wide variation in prices among the privately insured population for common services (Baker, Bundorf, and Royalty, 2013; Cooper et al., 2019; Franzini et al., 2014). Wide variation exists both within markets and across markets. One recent example includes a BlueCross BlueShield report that found a 267 percent range in the price for knee replacement surgeries in Dallas and a 313 percent range in the price for hip replacements in Boston (BlueCross BlueShield, 2015).

Price Transparency and Price Shopping

One rationale behind a self-insurance plan, such as the 10Plan, is that individuals who are paying out of pocket for health care will have more incentive to pay attention to prices. In other words, perhaps they will demand to know prices up front, be more conscientious about using costly discretionary services, or do both.

As noted previously, price transparency is an issue in health care. Many hospitals and health care providers cannot readily provide their

own prices (Bernstein and Bernstein, 2014), even for common services and for patients without insurance. State regulations mandating that providers disclose prices have not led to increased price transparency because many providers do not comply with these regulations (Anthony and Haller, 2015; Anthony and Haller, 2017; Saloner et al. 2017; Williams, 2019), and consumers have difficulty interpreting price information. Combined with the wide variation in provider prices, the lack of price transparency limits patient ability to price shop for common services.

Several "price transparency tools" have been developed to fill these gaps. These tools range from state-administered websites, tools developed by insurance carriers, and third-party companies. Current estimates suggest that over 90 percent of the privately insured population has access to some form of price transparency (White et al., 2014). Although these tools should enable patients to shop for lower-priced providers, the current evidence found very modest effects on lowering the prices that the average patient pays (Brown, 2019; Desai et al., 2016; Desai et al., 2017; Mehrotra, Brannen, and Sinaiko, 2014; Whaley, 2019). One potential reason why price transparency tools have not led to meaningful savings is that they do not change the underlying incentives to price-shop. Many Americans have generous insurance coverage. The financial incentives to price-shop are limited when patients pay the same copayment regardless of providers or coinsurance.

In recent years, high-deductible health plans and consumer-directed health plans (CDHPs) have become increasingly popular. In 2018, 47 percent of privately insured patients were enrolled in a CDHP, an 88 percent increase from 2010, when CDHP enrollment was 25 percent of this population. These plans require patients to bear the first portion of health care spending in a year before insurance coverage kicks in. These deductibles can be quite large. In 2010, the average deductible for an employer-sponsored CDHP plan was $1,729 for an individual plan (Kaiser Family Foundation, 2018). By 2018, the average deductible amount increased to $2,349. Many ACA exchange enrollees have deductibles of $5,000 and higher. The motivation for these plans is that the increased "skin in the game" will lead patients to shop for lower-priced providers. However, substantial empirical evi-

dence suggests that patients instead cut back on care, and there is no observed change in price-shopping (Sood et al., 2013). Patients are just as likely to cut back on high-value care as they are on low-value and potentially wasteful care (Brot-Goldberg et al., 2017).

However, there is evidence that other, less blunt, programs can induce price-shopping. One such example is reference pricing and tiered cost-sharing, which use more-targeted cost-sharing incentives to encourage the use of lower-priced providers. Patients who receive care from higher-priced providers are required to pay much higher costs than patients who go to less expensive providers. Across several populations and services, reference pricing programs have led to savings of 10 percent to 32 percent (Robinson, Brown, and Whaley, 2017). The services eligible for this type of program account for 30 to 40 percent of health care spending.

How Will the 10Plan Change Health Care Utilization?

The 10Plan will eliminate the need for participating families to purchase health insurance in the nongroup market and allow them to pay for care directly out of pocket or through repayment premiums. Each of these features of the plan may change how much health care individuals consume. In addition, limiting prices to Medicare FFS rates will lower the amount that providers receive. The extent to which such a plan would affect health care utilization and spending is unknown, but we can draw on empirical evidence on the demand elasticity of health care.

Variation in consumer demand for health care (*elasticity*) reflects how sensitive patients are to seeking health care when the price of health care changes or when income changes. More specifically,

- *Price elasticity of demand* reflects how responsive patients are to changes in the price of medical services. Mathematically, it is calculated as the percentage change in quantity of medical services demanded, divided by the percentage change in the price. An elasticity of less than one means that demand is relatively inelas-

tic, or that consumers do not change their utilization much when prices change. An elasticity of more than one means that demand is relatively elastic, that is consumers are sensitive to price changes.

- *Income elasticity of demand* reflects how individuals' demand for a good or service changes with income. Typically, as income increases, the demand for goods will rise, (except in the case of so-called inferior goods that households purchase less of as their income rises).

We discuss empirical evidence on the expected behavioral responses to each of the key changes under the 10Plan. This evidence is critical to informing the assumptions of our microsimulation model, which predicts how individual health care use and spending would change if the 10Plan were implemented.

Reduced expenditures on health insurance plan premiums. Families currently purchasing health insurance in the nongroup market will no longer incur premium costs under the 10Plan. In 2018, the average premium for plans obtained on the exchanges was $594 per month (CMS, 2019). About 87 percent of enrollees in exchange plans received an APTC, and the average monthly tax credit among those individuals was $518. Thus, not having to pay these premiums will result, on average, in an additional $912 and $7,128 per year in savings, for individuals with and without APTCs, respectively.

To the extent that these reduced expenditures can be seen as increasing families' incomes, we might expect a change in the demand for health care. In other words, because individuals have more income to spend, they may "buy" more health care (e.g., use more preventive services) or they may save more for unexpected health care. Empirical estimates, however, suggest that this increased income is unlikely to affect individuals' demand for health care; a meta-analytic review found no evidence of an income elasticity for health care greater than one (Costa-Font, Gemmill, and Rubert, 2011; Getzen, 2000).

Reduced medical prices. The 10Plan will have a reference price list delineating the maximum amount that providers can charge for different services, which will be based on Medicare FFS rates. For families currently covered by a nongroup plan, this may mean lower prices than

what they currently face. Previous studies have estimated that Medicare rates are about 80 percent lower for physician services and 60 percent lower for hospital services than private insurance rates (American Hospital Association, 2018; Federal Hospital Insurance and Federal Supplementary Medical Insurance Trust Funds Boards of Trustees, 2012). As the price of health care decreases, we would expect the amount of health care demanded to increase.

However, under the 10Plan, individuals would also become directly responsible for their health care costs, which may cause individuals to use less health care (see below). The out-of-pocket financial exposure at the point of service may be higher under the 10Plan, even though prices may be lower, but families' out-of-pocket exposure will also be capped.

For individuals currently uninsured, it is unclear how the reference price list will compare with prices they currently face and the extent to which this would influence their behavior. There is significant evidence that uninsured individuals consume less health care than those who have health insurance (as we review later in this section).

However, they may pay out of pocket for a significantly smaller fraction of their expenditures because expenditures for the uninsured are often *uncompensated*—expenditures unpaid by the patient and covered by indirect sources (Coughlin et al., 2014). Some have referred to this gap between what the uninsured pay for their care and the expenses they incur as *implicit insurance* (Finkelstein, Mahoney, and Notowidigdo, 2018). The implication from this work is that the uninsured may be less sensitive to prices because of the existence of this substantial implicit insurance. Those who are currently uninsured may face other financial and legal threats that influence their use of care. However, we found that, among those who were uninsured in 2017 with any health care expenditures, out-of-pocket costs amounted to 60 percent of the total cost of care. Under the 10Plan, even though all costs will be compensated through the removal of implicit insurance, the currently uninsured may be more willing to seek care.

Paying out of pocket. The 10Plan will require enrollees to pay for their care out of pocket or by borrowing from the federal government. To gauge how we might expect health care utilization to change, we

first turn to the extensive literature on expansions of health insurance coverage in the United States. We note that these quasi-experimental studies on expansions of health insurance coverage (and, in a few cases, true experiments) can offer significant insight into how we might expect individuals to respond to changes in prices under a health insurance plan, but responses under the 10Plan, which is not an insurance plan, may be different.

The impact of health insurance expansion on health care utilization and expenditures among those who are already covered has largely been studied by examining changes in health insurance coverage, including within-firm changes in plans (Beeuwkes Buntin et al., 2011; Bundorf, 2016; Fronstin and Roebuck, 2013; Haviland et al., 2016; Kozhimannil et al., 2013; Lo Sasso, Helmchen, and Kaestner, 2010; Wharam et al., 2011), recent reforms in Massachusetts (Finkelstein, Hendren, and Shepard, 2019; Smulowitz et al., 2014), Medicaid expansions stemming from the ACA (Ladhania et al., 2019), and experiments, like the RAND Health Insurance Experiment (HIE) in the 1970s (Keeler and Rolph, 1988; Manning et al., 1987), and the recent Oregon Health Insurance Experiment (OHE) (Finkelstein et al., 2012; Finkelstein et al., 2016; Taubman et al., 2014) as part of the ACA Medicaid expansions.

Summary of Previous Empirical Studies

The HIE, conducted in the 1970s, is the foremost experimental study on health insurance design in the United States (Keeler and Rolph, 1988; Manning et al., 1987). Randomization is the gold standard in research design for establishing convincing evidence on causal impacts, but is often not possible in health policy (Choudhry, 2017; Finkelstein and Taubman, 2015). The HIE randomized almost 3,000 families (7,700 individuals) to five types of health insurance plans offering varying degrees of cost-sharing, ranging from 0 to 95 percent, and followed them for three to five years. Researchers found that individuals consumed less health care as the amount they were required to pay for their care increased, on average. Across all types of care, the average price elasticity of demand was estimated at −0.20, which means that for a 1 percent increase in the price of health care, we would expect

individuals to consume 0.20 percent less health care (Keeler and Rolph, 1988; Manning et al., 1987).

In 2008, the state of Oregon used a lottery to expand Medicaid to uninsured low-income adults, which allowed for a strong assessment of the causal effects of providing health care with no cost-sharing but with low monthly premiums (ranging from $0 to $20) (Finkelstein et al., 2016; Finkelstein et al., 2012; Taubman et al., 2014). Researchers found a significant increase in self-reported utilization, particularly for outpatient visits, inpatient visits (not originating in the emergency department), and prescription drugs, resulting in around a 25 percent increase in annual health care expenditures (Finkelstein et al., 2012). Using administrative hospital data in Oregon, researchers subsequently found a significant increase in emergency department use among currently uninsured individuals who enrolled in Medicaid, relative to a comparison group that remained uninsured (Taubman et al., 2014). Several quasi-experimental and observational studies of other state Medicaid expansions and reforms have generally found that lower out-of-pocket liability for medical expenditures is associated with higher utilization (Nikpay et al., 2017; Smulowitz et al., 2014; Sommers et al., 2016; Wharam et al., 2011; Wherry and Miller, 2016).

In addition, studies examining associations between health care utilization and being on a high-deductible and consumer-directed plan have found that spending is negatively correlated with the deductible and that, overall, utilization declines between 5 and 15 percent when individuals switch to a plan that requires greater out-of-pocket responsibility.

As others have noted (Einav and Finkelstein, 2018), plans tend to be more complicated than just requiring a set cost-sharing percentages. Instead, there are often deductibles, cost-sharing that varies by type of care, and then 0 percent cost-sharing after a maximum out-of-pocket amount has been reached. This means that behavioral responses may vary, not only by type of care, but with aspects of the plan's budget set.

For the purposes of modeling behavioral responses, we have estimated changes in utilization and cost with and without changes in demand, using a range of elasticities from the previous literature, and we have allowed these changes to vary by the individual's current

health insurance status (e.g., uninsured versus covered by a nongroup plan). Specifically, we assumed a set of "small" and "large" elasticities to give a range of estimates.

In Table A.1, we present the key studies we reviewed in formulating our modeling assumptions.

Modeling Assumptions

Currently Uninsured

Those who are currently uninsured may respond differently under the 10Plan than those currently insured because of pent-up demand for health care that they could not afford previously or because of moral hazard. The studies examining the expansion of Medicaid are most relevant for predicting how those who are currently uninsured would respond to the 10Plan, which does not require any up-front premiums. Across most studies of Medicaid expansions—including the OHE, which included randomization to address potential selection issues—uninsured individuals who became covered by Medicaid increased their utilization, with estimates ranging as follows (see studies described in previous section):

- outpatient care increased between 7 and 55 percent
- inpatient care increased by 2 to 29 percent
- emergency department visits ranged from decreases of 29 percent to increases of 41 percent
- total spending increased by 25 percent.

However, although the 10Plan may increase access to care for those currently uninsured, they will still be directly responsible for the copayment and, in the case of those earning more than 150 percent of FPL, the cost of all nonpreventative care that they use, either through immediate or deferred repayment. Thus, we might expect to observe smaller increases in utilization than we observed from Medicaid expansions. To adjust for this out-of-pocket financial exposure, we adjusted the Medicaid demand elasticities shown above downward using estimates from the HIE. Specifically, we adjusted all amounts downward by 20 percent. We present two sets of assumptions we use to

Table A.1
Summary of Empirical Evidence: How Utilization Changes in Response to Changes in Required Out-of-Pocket Spending

Type of Care		Estimated Effects	Study
Outpatient Care	Acute visits	Elasticity: –0.16	RAND Health Insurance Study[a,b]
	Chronic visits	Elasticity: –0.20	RAND Health Insurance Study[a,b]
	Well visits	Elasticity: –0.14	RAND Health Insurance Study[a,b]
	Outpatient visits	Medicaid coverage → 1.08 additional outpatient visits (55%)	OHE[c]
	Outpatient visits	Medicaid expansion in Kentucky relative to none in Texas → 25% increase	Medicaid expansion[d]
	General practicioner visits	Medicaid expansion → visits increased by 6.6%	Medicaid expansion[e]
	Outpatient and pharmaceutical spending	Elasticity: −0.17	Insurance plans offering high deductible plans[f]
Inpatient Care	Hospital use	Elasticity: −0.17	RAND Health Insurance Study[a,b]
	Hospital admissions	Medicaid coverage → increased hospital admissions by 30%	OHE[c]
	Hospital admissions	Medicaid expansion states → 29% increase in admissions	Medicaid expansion[g]
	Overnight hospital stays	Medicaid expansion → 2.4% increase	Medicaid expansion[e]

Table A.1—Continued

Type of Care		Estimated Effects	Study
Emergency Department	Emergency Department (ED) visits	Medicaid coverage → increased probability of ED use by 7 percentage points and increased number of ED visits by 0.41 per new enrollee (41% increase)	OHE[h]
	ED visits	Medicaid expansion in Kentucky relative to none in Texas → 29% decrease	Medicaid expansion[d]
	ED visits	Medicaid coverage → increased ED visits by 0.59 per new enrollee (9% increase)*	Medicaid expansion[i]
	ED visits	Massachusetts reform → 1-2% increase	Massachusetts health care reform[j]
	ED visits	High deductible plans → 15 and 15.7% declines in first and second post-years	Analysis of multiple private plans[k]
	ED visits	Switch led to 21.5 to 34% decline in visits, depending on severity and gender	Natural experiment switch to high deductible plan[l]
Total spending	Annual spending	Medicaid coverage → total spending increases by $778 (25% increase)	OHE[c]
	Annual spending	Switch → 16.45% decline	Natural experiment switch to high deductible plan[m]
	Annual spending	HSA enrollees → 5-7% spending relative to non-enrollees	Analysis of multiple private plansn
	Annual spending	High deductible plans →5% decline	Analysis of multiple private plans[o]
	Annual spending	High deductible plans → 14% decline	Analysis of multiple private plans[p]
	Annual spending	Switch → 25% decline	Single firm switching[q]

Table A.1—Continued

Type of Care	Estimated Effects	Study

NOTES: Elasticities are calculated as the percentage change in quantity demanded divided by the percentage change in price. Thus, an elasticity of –0.20 indicates that for a 1% decline in the price, the quantity demanded increased by 0.20 percent.
* Nikpay et al. (2017) find a 2.5 increase in additional ED visits per 1,000 individuals, which is about a 9 percent increase on the baseline rate of 46.74 per 1,000 in expansion states.
[a] Keeler and Rolph, 1988.
[b] Manning et al., 1987.
[c] Finkelstein et al., 2012.
[d] Sommers et al., 2016.
[e] Wherry and Miller, 2016.
[f] Lo Sasso, Helmchen, and Kaestner, 2010.
[g] Ladhania et al., 2019.
[h] Taubman et al., 2014.
[i] Nikpay et al., 2017.
[j] Smulowitz et al., 2014.
[k] Wharam et al., 2011.
[l] Kozhimannil et al., 2013.
[m] Brot-Goldberg et al., 2017.
[n] Lo Sasso, Shah, and Frogner, 2010.
[o] Haviland et al., 2016.
[p] Beeuwkes Buntin et al., 2011.
[q] Fronstin and Roebuck, 2013.

model changes in uninsured individual's behaviors in Table A.2: a set of changes with the smaller magnitude of expected change from the empirical estimates (labeled "small changes") and a set with the largest expected change (labeled "large changes").

Currently Insured

In general, previous studies have demonstrated that, as individuals' out-of-pocket financial responsibility for health care increases, their utilization decreases. However, as noted previously, the change for those who are currently covered by a nongroup health insurance plan is likely to depend on various aspects of the current plan. First, among individuals who currently face deductibles, we would expect an increase in health care utilization under the 10Plan relative to the status quo because, under the status quo, all care used up to the amount of the deductible would require individuals to pay out of pocket and would be applied to the annual deductible. However, after the annual deductible is met, individuals currently insured would have lower out-of-pocket liabilities, as they would only be responsible for the coinsurance amounts after the deductible has been met. Thus, we would expect utilization to decline under the 10Plan relative to the status quo for those currently insured after spending an amount equivalent to their status quo deductible. In the MEPS data, we know whether individuals currently have an annual deductible and whether it is more or less than $1,300 per person (or $2,600 per family) per year. We therefore assumed behavioral responses to the 10Plan that depend on the year-to-date

Table A.2
Range of Predicted Changes in Utilization for Currently Uninsured

Type of Care	Small Changes	Large Changes
Outpatient	Increases 5.6%	Increases 44%
Inpatient	Increases 1.6%	Increases 23.2%
ED	Decreases 23.2%	Increases 32.8%
All other care	Increases 20%	Increases 20%

spending and whether that amount has exceeded $1,300. We list these assumptions in Table A.3.

10Plan Versus Private Insurance

This section presents a set of other factors that would influence individuals' preference for the 10Plan relative to existing health insurance product options, including employer-sponsored insurance and nongroup insurance.

Although eligibility for the 10Plan is restricted to those without offers of private group insurance, we consider a counterfactual in which an individual could choose between the two. The extent to which someone would prefer private insurance over the 10Plan will depend on their out-of-pocket costs, their risk exposure, and their risk and debt aversion preferences. We discuss each of these aspects in turn.

Out-of-Pocket Costs

If the 10Plan is able to set reimbursement rates to Medicare FFS levels (or slightly higher), private insurance may be less attractive to the extent that the higher private rates translate into higher out-of-pocket costs relative to the 10Plan (Frakt, 2011). Even though privately insured enrollees often do not pay those rates, the higher commercial rates directly affect an enrollee's cost-sharing and premium costs.

Under the 10Plan, the repayment premiums would be limited on the basis of income, but there is no cap on copays. Under a private health insurance plan, enrollees face annual premium costs and cost-

Table A.3
Range of Predicted Changes in Utilization for Currently Insured

Year to Date Spending	Type of Care	Small Changes	Large Changes
< $1,300	All care	Increases 20%	Increases 20%
>=$1300	Outpatient	Decreases 14%	Decreases 20%
	Inpatient	Decreases 17%	Decreases 20%
	ED	Decreases 21%	Decreases 34%
	All other care	Decreases 5%	Decreases 25%

sharing, with the latter capped both annually and across their lifetime. In general and on the basis of out-of-pocket costs, if the premium and cost-sharing for a private insurance plan are higher than the copays and annual repayment premiums under the 10Plan, individuals would prefer the 10Plan. This will generally be the case for people with lower income and those with low utilization. In general, if the maximum out-of-pocket spending under a private plan is less than the total copayments and annual repayment premiums under the 10Plan, individuals would prefer the private plan.

For those with chronic conditions or high utilization, the out-of-pocket cost comparison is not as straightforward. There may be differences in the quality or access to provider networks, as well as other factors to consider, including one's income trajectory, myopia, risk exposure, and preferences.

Myopia and Income

Part of this calculus will require individuals to think about future income and health care expenditures. There is a large body of behavioral economics literature on individuals' *myopia*—a focus on near-term versus longer-term—with respect to decisionmaking (Cairns and van der Pol, 2000; Dasgupta and Maskin, 2005; Story et al., 2014). Comparing only the one-year costs under the 10Plan with a private plan might yield different preferences than would comparing costs over the longer-term.

For someone who expects to have very low utilization and health care costs, the longer-term and myopic preferences are both likely to be for the 10Plan, especially if there is a large difference between expected spending under the 10Plan and a private plan premium.

For someone with a chronic condition that permanently elevates health care spending (such as diabetes or high blood pressure), one might prefer a private plan if one expects to reach their maximum out-of-pocket ($8,150 in 2020 under current law) every year, and if that amount plus the annual premium is less than what one would expect to pay under the 10Plan. Thus, those with a chronic condition and higher income would likely prefer a private plan.

Someone expecting a very high-cost event in one year would also likely prefer private insurance because of the annual maximum out-of-pocket. Under the 10Plan, one would be likely to defer those payments as a debt and then have to pay back over time with interest.

Finally, one's expectations about future income matter, as well. If someone expects to have a much lower income in the future, that individual may prefer the 10Plan because their repayment premiums would be tied to the lower income in the future (and eventually forgiven). On the other hand, if someone expects future income to grow, the preference may be for a private health insurance plan, particularly if the plan provides access to better or more providers and the cost of the premium and cost-sharing is expected to be less than the copays and repayments under the 10Plan.

Risk and Debt Aversion

Individual tolerance for risk (in this context, we will use *risk* to mean variability in spending) is another consideration when comparing the 10Plan with status quo insurance options. Because the 10Plan has individuals pay out-of-pocket for the first dollar of care and can spread costs out over time, it is structurally a riskier option than private insurance. However, in practice, it will be lower risk for many people because the government will pay off some portion of their spending. In particular, while the maximum out-of-pocket cap limits the risk for individuals with private insurance, people on the 10Plan know that their annual costs will be a fixed share of their income in a year, but because there may be volatility in their future income, they may not know how much they will be responsible for in the future (either as a share of their income or as a dollar value). This uncertainty around future income translates into financial risk with the 10Plan. Thus, the risk associated with the 10Plan will be higher for people with higher incomes, those who are younger, and those who have more-volatile incomes (in particular, those who may expect to have substantive income growth in the future).

Additionally, the 10Plan essentially allows individuals to borrow money from the federal government at a low interest rate to pay for medical care. Some individuals will strongly prefer not to hold this

debt (i.e., debt aversion) and may prefer a private insurance plan, even at a higher cost, to avoid this.

In summary, although we can discuss potential behavioral responses to the 10Plan in abstraction, modeling these decisions—and the impetus for them—is much more complicated.

Fundamentally, the 10Plan will be a substantive disruption to the insurance market. Based on the cost to individuals alone, health insurance companies will have trouble competing with the existing business model. Structurally, there are portions of the population who would likely prefer existing insurance products to the 10Plan, but there may be substantive changes to the underlying risk pool. For the work in this study, we assumed that the 10Plan would only be taken up by those who are currently uninsured or those currently in the nongroup insurance market.

APPENDIX B

Methodology

As discussed in Chapter Four, we developed a microsimulation model that tracks individuals' medical expenditures, demographic characteristics, and deferred payments over time. In this section, we provide a more detailed explanation of the data, methodologies, and limitations.

Data

To construct a representative population, we relied on demographic and income information from the 2019 ASEC supplement to the CPS, which allows us to create a sample of individuals and families with the required information to determine whether they would be 10Plan-eligible and what their maximum costs could be.

To understand the medical expenditures faced by individuals and families, we used the 2015 and 2016 MEPS. The 2015–2016 MEPS has longitudinal data about an individual's medical expenditures for both 2015 and 2016. Thus, we were able to build and test a model of expected medical spending in 2016 based on the details from 2015.

In addition to the MEPS and CPS, we relied on other sources to provide information necessary to inform the dynamics. We used National Vital Statistics data from the CDC from 2017 to produce estimates for pregnancy and birth rates (Martin et al., 2018; Matthews and Hamilton, 2019). Data from the Healthcare Cost and Utilization Project (HCUP) provided a distribution of the costs associated with pregnancy (Agency for Healthcare Research and Quality, 2016). We used a combination of the U.S. life expectancy tables given by both the Human Mortality Database (HMD) (D'Addio and d'Ercole, 2005)

and the United Nations Mortality projections (United Nations, 2019) to provide data on national death rates by age and gender. We obtained target numbers for births, deaths, and immigration per year from the U.S. Census Bureau 2017 National Population Projections Tables and the CDC 2019 National Vital Statistics to inform the proportion of deaths attributable to the population under 65 years of age (CDC, undated; U.S. Census Bureau, 2017).

Because a substantial portion of medical expenditures are in the last few months of one's life and the MEPS does not capture some end-of-life spending, we relied on information from Einav et al. (2018) to produce estimates for medical expenditures in the last six months of life.

We used various data sources to model health status transition rates. First, we considered the incidence rates by gender and age groups for two major chronic conditions that have very few comorbidities, namely, all cancers and heart disease. We used statistics from recent analyses by the CDC (American Cancer Society, 2019) and other researchers (Crimmins et al., 2008) to obtain incidence rates by gender and age for all cancers, heart disease, and all other chronic and acute conditions paired with National Vital Statistics cause of death data (Murphy et al., 2018) from 2017 age and gender.

To model how income evolves over time, we used the income mobility estimates from the PSID (U.S. Department of the Treasury, 2008).

Model Structure

We modeled the cost implications for the federal government and individuals under the 10Plan by evolving the starting population built from the CPS over a 15-year period. This is necessary because the 15th year is the first year in which deferred payment balances can be forgiven because of expiration.

Starting from the CPS population, our dynamic model produces life trajectories for each record—or individual—in our population. The dynamic model is a discrete time microsimulation model that advances the population from year to year by annually updating the following four major components of the dynamic model:

1. demographic attributes, including age and family size
2. family income, based on employment changes and including health insurance status
3. health status, including good or bad health, chronic and acute conditions, end-of-life care, and pregnancy
4. medical spending for all 10Plan participating family members.

Individuals belonging to different family units are assumed not to interact with each other. We projected the model forward as a Markov chain, where the state in year t is predicted based on the state in year t–1. Income and health care expenditures are stochastically generated for each record using the methods described previously. Each year, individual records are also sampled for childbirth (if female), a negative health shock (such as an acute injury), the onset of a chronic disease, and death. Each of these events helps further specify an individual record's health care expenditures for the year. We describe the key transitions in more detail in the following section.

Demographic Changes

Births introduce new individuals to the active population and are tracked by the dynamic model. To model births, we assumed that each female's annual probability of giving birth depends on age and race, according to CDC fertility statistics (Matthews and Hamilton, 2019). Infants introduced to the population were given the same race, insurance status, and family ID as their mothers, and received new individual identifiers. Gender was randomly assigned with equal probability, and health status was randomly assigned based on probabilities from the MEPS data. Medical spending in the first year of life was modeled based on health status and statistics from the National Conference of State Legislatures (2013) memo on the costs of prenatal care.

We also added families to the model population by simulating immigration. Each year, we sampled from the immigrant family IDs in the CPS to attain a sample weight roughly equal to the appropriate projection from the Census Bureau 2017 National Population Projections Tables. We sampled from the group of eligible and ineligible (for the 10Plan) immigrants proportionally, and did not make any further

assumptions about immigration levels or their eligibility for the 10Plan (U.S. Department of Homeland Security, 2018).

Deaths removed individuals from the active population and were tracked by the dynamic model. To model deaths, we used national 2017 U.S. life tables taken from the HMD. We made minor adjustments by assuming a smooth transition from the 2017 HMD tables to 2018 using United Nations life-expectancy table projections for the United States. From the life tables, we extracted the age- and gender-specific average probabilities of death. Individual-level variability of these probabilities and their indirect dependence on health status was introduced using an analysis given by Einav et al. (2018).

Income Changes

We modeled the evolution of each individual's income over time using data from the PSID. We used data covering 2006 to 2018. Because the PSID collects information for every other year for this time period, we have six datapoints per record in this timeframe. We inflated all income to 2018 dollars using the Consumer Price Index research series using current methods (R-CPI-U-RS) and estimated the annual change to real income by comparing income in consecutive observations for each individual (U.S. Bureau of Labor Statistics, 2020).

We updated incomes on the basis of income quintile, age group (18 to 24, 25 to 34, 35 to 49, and 50 to 64), and sex, then sampled from the distribution of income changes for the relevant CPS records. We assumed that individuals whose income fell 90 percent or more between years, occurring in 1 to 3 percent of cases for most age and income groups, experienced job loss. We randomly assigned these individuals an income in the bottom 15th percentile of the income distribution. To model the effect of transitioning from unemployment to employment, we randomly assigned individuals in the bottom 15th percentile to an income based on transitions of those who moved out of the bottom 15th percentile in the PSID.

Finally, we applied an inflation rate of 2.1 percent to the income projections so that all income numbers are in nominal dollars for the respective year.

The timeframe involved in the PSID data covers portions of the 2001 to 2007 business cycle, the 2008 recession, and the current business cycle up to 2016. This period saw slower income growth and lower labor force participation than did the U.S. economy prior to 1980. If macroeconomic conditions in the future are better or worse than during this time frame, our projections would be off. Specifically, if income growth is higher, more people would fall in the upper bands of the 10Plan and therefore be less likely to require debt forgiveness. Alternatively, if the growth rate is lower or if the job loss rate is higher, there may either be more participants in the 10Plan, or those individuals that do participate may be in the lower bands and require more debt forgiveness.

Insurance Status Changes

As insurance status is often correlated with employment status, we modeled the transition of people onto and off of the 10Plan based on income transitions. For families whose household income changed by over 10 percent of their previous income, we randomly assigned insurance status based on the original distribution of insurance status by poverty level. Thus, when a family transitioned to a higher income level, they were more likely to be enrolled in employer-sponsored insurance, for example, and if they transitioned to a lower income level, they were more likely to be enrolled in Medicaid. This method is clearly limited, as there may be many scenarios in which an individual or family changes insurance status without a significant change in income. Furthermore, the transition rates are poorly defined. However, it is uncertain how the 10Plan would affect transitions between insurance statuses, and adding a more complicated model of insurance status transitions would only add uncertainty to the model.

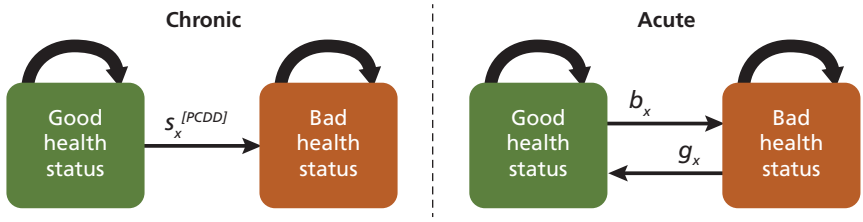
Health Status Changes

The health status of individuals in our model takes on two possible levels, namely "good" and "bad" health. The CART model, a predic-

tive modeling approach that uses machine learning,[1] uses health status defined by self-reported health in the MEPS, which is initially provided on a five-level scale from Excellent (1) to Poor (5). This raw variable was not a significant predictor in the CART model, so we considered a collapsed metric. The best separation was between states 3 and 4, leading us to classify individuals with health status 1–3 as being in "good" health and individuals with health status 4–5 as being in "bad" health. Although the two-level scale was not highly predictive of key partitions for the CART model, it had higher significance than the raw variable.

In our dynamic model, we evolved the good or bad health status from year to year and also predicted whether someone suffered from an acute or chronic condition when in "bad" health (see Figure B.1). A bad health status because of a chronic condition is an absorbing state; an individual with a chronic condition is assumed to have that condition henceforth and cannot transition back to a good health status. In

Figure B.1
Overview of Health Status Changes



NOTES: PCDD refers to progressive chronic degenerative diseases, which we simply refer to as a chronic condition. S_x is the probability of transitioning from good health to bad health because of a chronic condition, b_x is he probability of transitioning from good health to bad health because of an acute condition, and g_x is the probability of recovering from an acute condition and thus transitioning from bad health to good health.

[1] CART is a predictive modeling approach that identifies groups with meaningfully distinct relationships between the predictor and outcome variables—in this case, the demographic data and medical spending patterns. Each group is defined by its combination of values for certain key variables identified as being highly predictive of the outcome variable. We then developed a spending model for each identified group, conditional on a prediction of nonzero medical expenses.

contrast, those with an acute condition have a chance to recover and transition back to good health status in subsequent periods.

We stochastically changed the health status of each individual using a Bernoulli process with transition rates informed by CDC data (Heron, 2019). We obtained the proportions of 2017 deaths for each age group attributable to each of the top ten causes of death, which we labeled as either "chronic" or "acute" conditions,[2] and assumed that these rates are reflective of incidence rates by age for various other chronic and acute conditions. We smoothly increased the incidence rate of acute conditions for younger ages in our sample so that our rates matched those found in the MEPS data. The impact of omitting this adjustment was evaluated in Model 17.

Health Care Spending Changes

We used the MEPS 2015–2016 longitudinal data file to model the trajectory of health care expenditures. Because we were mainly interested in modeling the medical spending of potential 10Plan-eligible individuals, we restricted this analysis to individuals under 65 years of age. We also excluded pregnant women from the sample because the costs associated with pregnancy are not easily determined from the MEPS longitudinal file, and instead modeled the costs associated with maternity separately.

We used a two-part method in which we first predicted whether an individual had nonzero medical spending in a given year, and, conditional on this, predicted the log-transformed level of medical spending. The log-transform is necessary because the distribution is skewed because of the many individuals with no health care expenditures and outliers with very high expenditures. We assumed a medical inflation rate of 5.1 percent (Cubanski, Neuman, and Freed, 2019).

We incorporated adjustments to medical prices and expenditures to approximate the different price levels that 10Plan participants may

[2] We classified heart disease, cancer, chronic lower respiratory diseases, stroke (cerebrovascular diseases), Alzheimer's disease, diabetes, and nephritis (including nephrotic syndrome and nephrosis) as "chronic" conditions, and influenza, pneumonia, accidents, and intentional self-harm or suicide as "acute" conditions.

face, as well as to account for changes in the use of care. As described in Appendix A, we assumed different behavioral or demand responses for 10Plan participants depending on whether they were currently uninsured or covered by a nongroup plan. To adjust utilization for currently insured individuals, we estimated each individual's deductible level using average 2019 figures from eHealth ("How Much Does Individual Health Insurance Cost?" 2020), because this information is not provided in the CPS or the MEPS longitudinal file. Finally, to adjust prices to the appropriate level (i.e., Medicare, Medicare plus some percentage), we created a composite adjustment factor using the average cost of a visit of each type of care for each insurance status, and the relative proportions of each type of care consumed.

We used a logistic regression to predict a binary indicator of nonzero spending in a given year using age group, sex, health status, insurance category, race, income, pregnancy status, nonzero spending in the previous year, and total spending in the previous year.

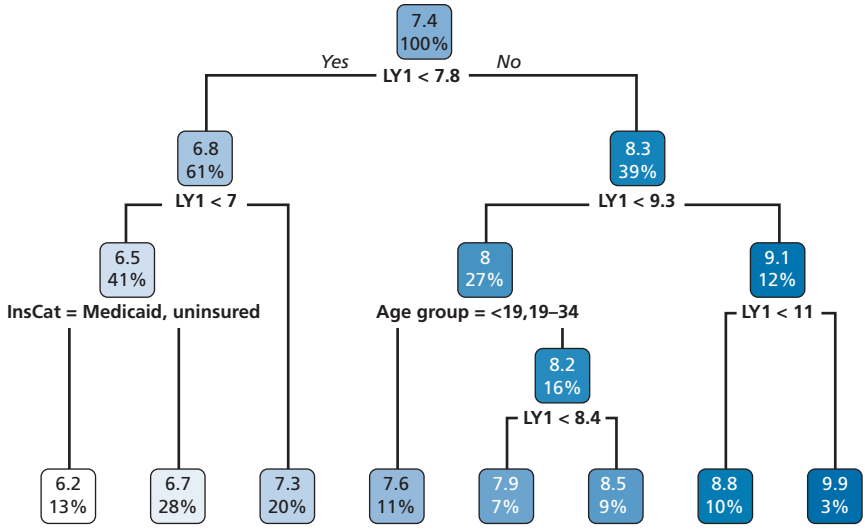
To project medical expenditures from year to year, given a prediction of nonzero spending, we built a CART model to identify groups with meaningfully distinct medical spending patterns. The CART determined that medical spending in the previous year and age group were typically the most important factors by which to partition the population, though insurance category, sex, income, race, and health status were also significant predictors. We then built a unique regression model for each group to predict the next year's health expenditures, again using spending in the previous year, age group, insurance category, sex, income, race, and health status as predictor variables.

We developed a unique CART model and set of regressions for each pricing scheme and behavioral scenario considered. Figure B.2 shows the CART built with Medicare prices, assuming no behavioral changes. Although all predictors considered in the dynamic model (spending in the previous year, age group, insurance category, sex, income, race, and health status) were available to the CART algorithm, the data with this pricing scheme was best partitioned based on *LY1* (the log transform of medical expenditures in year *t*), age group, and insurance category. Recall that the CART and regression models are based on the log-transform of medical expenditures, *LY1*, in Figure B.2,

because of the skewness of the distribution. The CARTs trained on the MEPS data in this way achieved an *R*-squared of approximately 0.3, which provided a good base for our partition-specific regression models.

Although it would have been preferable to develop a model of spending patterns with more than two years of data, the MEPS is not designed to link data across more than two years, and the authors are unaware of a publicly available dataset of comparable quality containing the required information for more than two years. However, the literature suggests that the relationship between medical spending in year *t* and year *t+2* is much weaker than that between spending in year *t* and year *t+1* (Eichner, McClellan, and Wise, 1997), so additional data of this nature would be unlikely to dramatically improve results.

Figure B.2
Example Classification and Regression Tree



SOURCE: Analysis of 2016–2017 longitudinal MEPS data, weighted using person-level year weights.
NOTES: InsCat = insurance category. Developed with Medicare prices and no behavioral changes. Predictor variable *LY1* is the log-transform of medical spending in year *t*, and outcome variable *LY2* is the log-transform of medical spending in year *t*+1 (not shown in figure).

Because all dependent variables used in the CART analysis were present in the CPS except for medical spending, we were able to use the CART informed by MEPS data to produce unbiased estimates of the medical spending of individuals in the CPS. We assigned preliminary spending levels to our CPS dataset using a "matching" technique in which we drew a spending level from a sample of similar individuals on the basis of age group and insurance category, the two main determinants of health care expenditures in the MEPS.

We used data from the HCUP and previous literature (Hsia, Antwi, and Weber, 2014; Xu et al., 2015) to estimate pregnancy costs, which we modeled separately from other health care expenditures. These costs were generated stochastically using a log-normal distribution with the average pregnancy cost matching the national averages given by the HCUP. We further set the variance of the log-normal to statistically reproduce the variability in the costs across different insurance statuses and states to capture outlier costs in pregnancy.

To inform medical spending in the year of death, we drew from Einav et al. (2018). This study produced a prediction model for end-of-life medical spending for those aged 65 years and over, modeling medical spending in the final year of life as a function of the predicted mortality rate. Their model predicted that the average end-of-life medical costs are $30,000 for those with a mortality rate below 10 percent. However, end-of-life medical costs rise sharply for those with higher mortality rates, reaching costs over $60,000.

Although the model by Einav et al. for end-of-life costs applies to those 65 and older, we assumed that the model linking predicted mortality rate to end-of-life-spending could also be used for the younger population to predict the minimum final year of life total health costs.[3] Hence, we inflated medical spending incurred in the year of death based on individuals' age-adjusted mortality rate in the year of death.

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[3] Although those aged 65 and above will obviously exhibit higher predicted mortality distributions and hence higher predicted end-of-life spending distributions, we assume here that the *relationship* between mortality rate and end-of-life spending can be extended to younger groups. In other words, we assume that an individual at any age with a given probability of mortality (i.e., because of a certain chronic condition) has the same end-of-life spending distribution as an individual of any age with that same probability of mortality.

Limitations

Several assumptions were made in developing this dynamic model. For example, we did not model the borrowing behavior of 10Plan participants, and instead assumed that all 10Plan-eligible individuals would elect to defer payment for all medical expenses beyond the required copayment each year.[4] In reality, however, some 10Plan participants will likely borrow less than the maximum possible amount.

We also did not make any assumptions about the potential movement of individuals from other health plans to the 10Plan, and instead preserved the distributions of each coverage type at each family income level. In addition, we only allowed for transitions in insurance coverage type in the event of a transition in income level. Although it is common that these two events coincide, this likely underestimates the transition in insurance coverage type for our population.

The dynamic model required several other, more-technical assumptions. For example, we assumed that pregnancy rate is independent of health status. In reality, females in poor health may be much less likely to become pregnant. To predict mortality, we used a scaled version of the plots produced by Einav et al. (2018) linking mortality rate to health spending. Though these plots were developed for the Medicare population, we assumed that they apply to all age groups.

Our characterization of health status permits multiple transitions to bad health because of an acute condition and may thus overweight the proportion of acute conditions relative to chronic conditions in the population. Furthermore, end-of-life spending is indirectly dependent on health status in our model because of the assumed dependence of mortality rate on health spending and the dependence of health spending on health status. However, controlling for mortality rate, it is possible that end-of-life spending should be greater for those suffering from a chronic condition than for those with an acute condition, for example. Thus, a more direct dependence could improve the model.

In addition to limitations related to necessary assumptions regarding health characteristics, we made assumptions regarding income distribution and growth. We used data from the PSID from 2006 to 2018

[4] However, this assumption is modified in Model 24.

to evolve the income distribution over time. This period saw limited wage growth for the majority of the population and included the significant recession beginning in 2008. If future economic conditions have a recession less (or more) severe than in 2008, or if wage growth differs from recent historical trends, the share of the population that would participate in the 10Plan at some point in their lives could differ from that predicted by our model.

Although we made assumptions regarding behavioral or demand responses, there are additional potential changes that could affect the results. As previously discussed, there may be changes in the broader health care market—in the employer-sponsored market and on the supply (provider) side. Additionally, because any deferred payments are forgiven once a person ages into Medicare, there may be increases in utilization as individuals approach age 65. For example, individuals may have an incentive, at age 64, to utilize more elective health care knowing that the payments can be deferred, and the deferred payment balances will be forgiven in the next year.

APPENDIX C

Additional Results

In Table C.1, we present results that were used to create Figure 4.1.

Deferred Payment Balances

To understand the implications of the 10Plan on household expenditures, we must first consider its utilization by different cohorts of the population over time. In year 15, 96.5 percent of 10Plan-eligible individuals have a nonzero deferred payment balance, with a median total balance of $3,280.

In Figure C.1, we show the number of individuals with nonzero deferred payment balances in the final year of the simulation, stratified by age group and family income as a percentage of FPL. We see that the vast majority of deferred payment balances are held by lower-income individuals with family income under 400 percent of FPL. The transfer of deferred payment balances to parents at age 26 contributes to the relatively lower number of nonzero balances for individuals in the 19–34 age group,[1] and costs associated with infancy contribute to the high number of nonzero balances in the < 19 age group.

The distribution of the value of the deferred payment balances in year 15 is shown in Figure C.2, stratified by age group. These box plots show the median (center black line), interquartile range (upper and lower edges of the box), and outliers (black dots). The value of deferred

[1] We assumed that the deferred payment balances of 26-year-olds are passed to their parents. In the case where a 26-year-old does not have parents in our simulated population, the balances are forgiven.

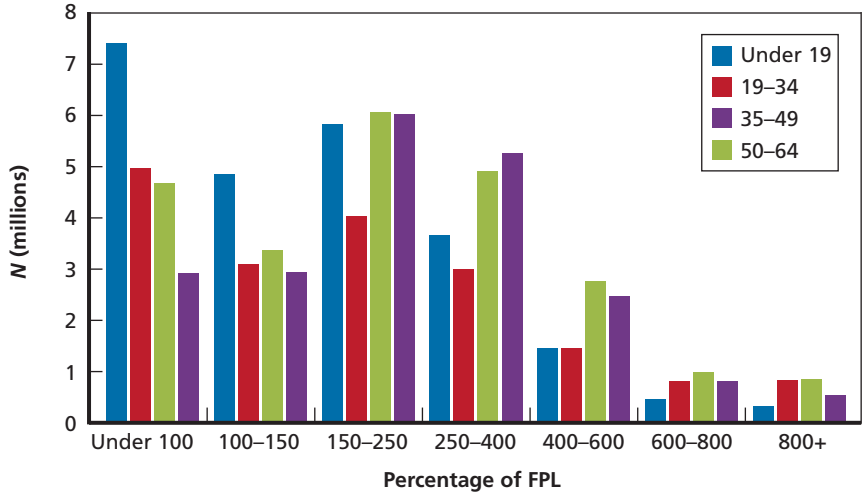
Table C.1
Distribution of Health Care Spending for 10Plan-Eligible Family Members Under the 10Plan and Status Quo

Year	Minimum	25th Percentile	50th Percentile	75th Percentile	Maximum
			10Plan		
1	$0	$4,902	$9,782	$16,717	$235,154
2	$0	$5,898	$11,430	$18,593	$237,178
3	$0	$6,043	$12,136	$19,875	$254,731
4	$0	$6,258	$12,781	$21,339	$177,559
5	$0	$6,334	$13,282	$22,711	$196,651
6	$0	$6,342	$13,835	$24,446	$174,904
7	$0	$6,571	$14,514	$26,115	$201,152
8	$0	$6,591	$15,209	$27,420	$223,859
9	$0	$6,668	$15,723	$28,668	$222,751
10	$0	$6,614	$15,894	$29,710	$235,516
11	$0	$6,643	$16,050	$30,755	$231,766
12	$0	$6,652	$16,504	$31,956	$212,139
13	$0	$6,723	$17,203	$32,820	$246,130
14	$0	$6,930	$17,605	$33,851	$246,521
15	$0	$7,079	$17,914	$34,895	$264,072

Table C.1—Continued

Year	Minimum	25th Percentile	50th Percentile	75th Percentile	Maximum
Status Quo					
1	$0	$4,858	$9,466	$16,558	$252,119
2	$0	$5,734	$10,652	$17,813	$220,143
3	$0	$5,749	$11,182	$19,002	$275,713
4	$0	$5,858	$11,953	$20,484	$231,458
5	$0	$6,033	$12,514	$21,959	$296,924
6	$0	$6,137	$13,141	$22,900	$312,314
7	$0	$6,494	$14,212	$24,240	$342,550
8	$0	$6,337	$14,951	$25,584	$382,639
9	$0	$6,660	$15,442	$26,693	$377,908
10	$0	$6,575	$15,758	$27,952	$412,040
11	$0	$6,824	$15,931	$28,647	$428,519
12	$0	$6,620	$15,940	$29,485	$415,202
13	$0	$6,703	$16,072	$30,095	$382,109
14	$0	$6,613	$15,812	$30,929	$414,481
15	$0	$6,316	$15,823	$31,360	$403,045

Figure C.1
Number of 10Plan-Eligible Individuals with Nonzero Deferred Payment Balance in Year 15, by Income and Age Group



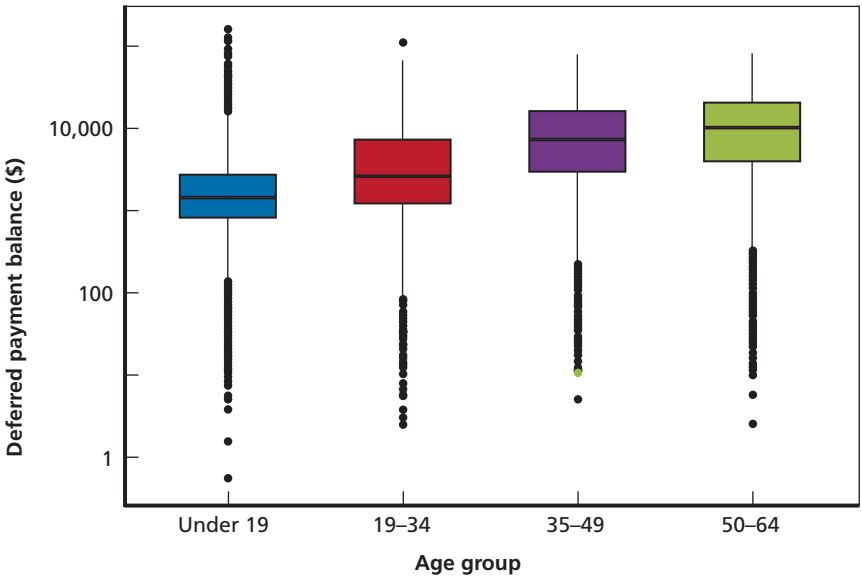
payment balances increases with age, though there is considerable variation among all age groups.

We might expect that individuals in poor health would spend more on health care than those in good health, particularly because our model does not account for health improvements that might result from more health care utilization. In Figure C.3, we show the proportion of the total deferred payment balances for all 10Plan participants stratified by income group and health status. Low-income individuals in poor health contribute most to the total value of all deferred payment balances.

Accordingly, median repayment premiums are higher for individuals in poor health across all income levels (except the very lowest, where they are nearly equivalent), as seen in Figure C.4.

In Figure C.5, we show the 50th, 75th, 95th, and 99th quantile effective repayment rate by income group for year 15. In the lowest income group, the spread between 50th and 99th quantile effective repayment rate is low, largely because the maximum repayment cap is very low (between 2 and 3 percent for families between 100 and

Figure C.2
Value of Deferred Payment Balances in Year 15, by Age Group



NOTE: The vertical axis is on a log-transformed scale.

150 percent of FPL). For the highest-income groups, over 50 percent of households pay 0 percent of their yearly household income in repayment premiums. These results demonstrate that in lower-income groups, there is little spread between those who fare better or worse, though in higher-income groups, those with high expenditures (and thus high payments) pay a great deal more than the rest of the population. It is also the case that high-income families pay back their deferred payments in fewer years than do low-income families because of the relatively high repayment premium rates they face.

Finally, we present results comparing the 10Plan with two alternatives incorporating expansion of Medicaid in Table C.2. In both cases of Medicaid expansion, the first extending to those under 250 percent of FPL and the second extending to those under 400 percent of FPL, the additional costs incurred by Medicaid enrollees far outweigh the drop in deferred payments by the 10Plan-eligible population.

Figure C.3
Proportion of Total Deferred Payment Balances for All 10Plan Participants, by Income Group and Health Status

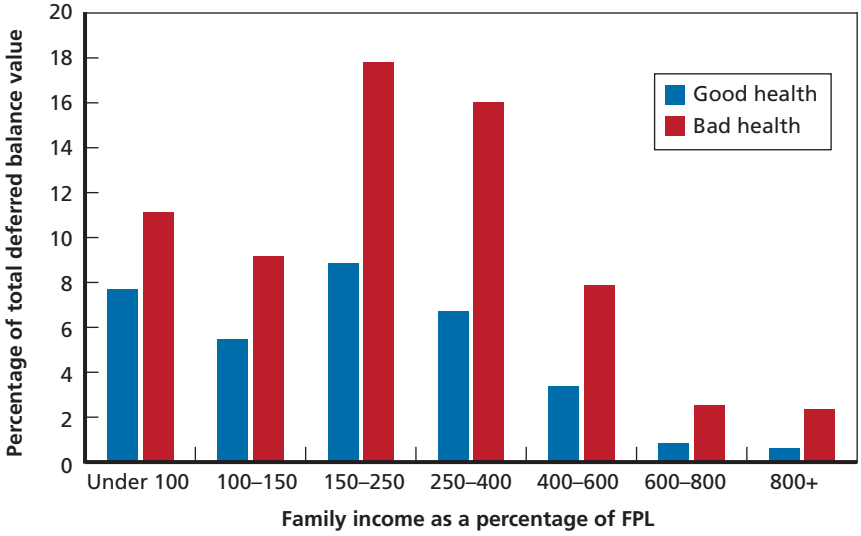


Figure C.4
Average Repayment Premiums in Year 15 by Health Status, Stratified by Income Level

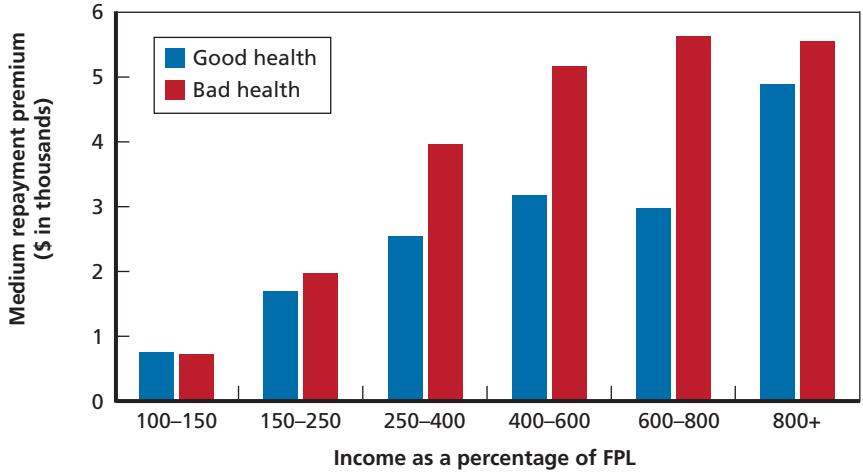


Figure C.5
Quantiles of Effective Repayment Rate by Income Group in Year 15

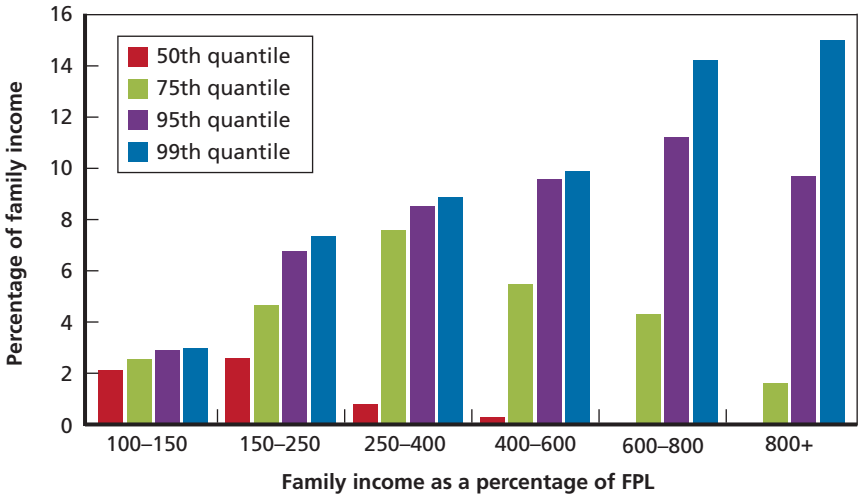


Table C.2
Comparison of 10Plan and Hybrid Policies Across 10Plan Target Group Medical Spending, Medicaid Population Medical Spending, Payments Deferred, and Forgiven Balances per Year, in Billions

	Year	1	5	10	15
Total spending	10Plan-eligible	150.1	188.7	258.8	342.3
	Hybrid (250%) 10Plan-eligible	69.7	95.6	117.7	131.5
	Hybrid (400%) 10Plan-eligible	46.6	62.2	73.9	78.1
	Difference—10Plan and Hybrid (250%)	80.4	93.1	141.1	210.8
	Difference—10Plan and Hybrid (400%)	103.5	126.5	184.8	264.1
Medicaid spending	10Plan	367.2	393.9	547.5	817.2
	Hybrid (250%) (Medicaid expansion)	654.5	740.1	1.1	1.6
	Hybrid (400%) (Medicaid expansion)	855.3	1.0	1.4	2.0
	Difference—10Plan and Hybrid (250%)	–287.3	–346.1	–533.7	–776.1
	Difference—10Plan and Hybrid (400%)	–488.2	–608.8	–872.1	–1.2
10Plan payments deferred	10Plan payments deferred	131.8	167.1	232.3	310.9
	Hybrid (250%) payments deferred	61.0	85.1	106.1	119.3
	Hybrid (400%) payments deferred	41.5	56.5	67.9	72.2
	Difference—10Plan and Hybrid (250%)	70.8	82.0	126.2	191.6
	Difference—10Plan and Hybrid (400%)	90.3	110.6	164.3	238.8

Table C.2—Continued

	Year	1	5	10	15
Amounts forgiven	10Plan	6.3	14.5	17.6	29.0
	Hybrid (250%)	1.8	7.2	8.1	11.8
	Hybrid (400%)	1.1	4.1	6.9	11.6
	Difference—10Plan and Hybrid (250%)	4.5	7.3	9.5	17.3
	Difference—10Plan and Hybrid (400%)	5.2	10.4	10.7	17.4

NOTE: Values greater than $5 billion are rounded to the nearest $10 billion.

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The authors of this report investigate an alternative health care financing approach, *the 10Plan*, for the nearly 28 million individuals who are not covered by health insurance and the approximately 20 million individuals who purchase private coverage in the nongroup health insurance market, including on the Affordable Care Act exchanges.

The 10Plan, designed by Mark Cuban, would eliminate the need for traditional health insurance for these individuals and allow them to pay only for the healthcare services that they use, and then at Medicare prices. The 10Plan is called the "10" Plan because most participants will not pay more than 10 percent of their family's income on repayment premiums.

To protect participants from financial uncertainty stemming from healthcare events that are high-cost or beyond participants' abilities to afford, participants in the 10Plan would be able to defer payments after a $25 copay for each encounter. In the case of deferred payments, participants would be borrowing from the federal government at a 3-percent interest rate.

In this analysis, the authors built a microsimulation model to estimate how much the 10Plan would cost participating individuals and families and what portion of the cost would be shouldered by the federal government. The authors also examine cases in which individuals could be negatively affected by the 10Plan's implementation.

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