Did Marketplace Coverage Really Offer Financial Protection?

Financial Gains from the Affordable Care Act's Private Insurance Policies for the Previously Uninsured

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ABSTRACT

While the Affordable Care Act (ACA) successfully expanded access to health insurance, the law's private insurance component drew far fewer participants than projected. This study investigates the attractiveness of Marketplace insurance, relative to uncompensated care provisions for those who remain uninsured. Using restricted-access Medical Expenditure Panel Survey data, I find that for one in four previously uninsured consumers, bankruptcy would cost less than meeting the deductible of the subsidized benchmark policy. Marketplace insurance reduces spending in only the top two percent most catastrophic potential scenarios consumers face, on average. Net financial gain is more likely for individuals with assets to protect (3% vs. <1%) or in poor health (11% vs. <1%). High deductible insurance aims to protect wealth in catastrophic scenarios. In these same scenarios, hospitals substantially discount care for the uninsured. High-deductible coverage might not be an effective driver of financial security, or Marketplace enrollment, for the uninsured.

SECTION 1: INTRODUCTION

The Affordable Care Act (ACA) made substantial strides in expanding access to health insurance coverage in the United States; however, most of those who were uninsured prior to the ACA remain uninsured today.[1] The law's private insurance component, the ACA Marketplaces, drew far fewer participants than were anticipated by the premier forecasting agencies in both government and independent research organizations.[2–4] The Congressional Budget Office, Rand, Lewin, and the Centers for Medicare and Medicaid Services projected between 22 and 26 million participants by 2016. In actuality, only 11 million enrolled by that year. Most of those who were eligible did not participate.[5] Why didn't people sign up for the insurance policies?

The ACA's private insurance marketplace was designed to assist lower-income consumers to purchase insurance without inducing foreseeable healthcare consumption.[6] The resulting marketplace policies were designed to emphasize risk protection over health- maintenance with a high-deductible design. More than 90% of policies offered on the benchmark silver tier exceeded the IRS definition of a high deductible health plan, and with a median deductible of $2,900, at least half of the benchmark policies did not contribute towards most enrollees' medical expenses except in unlikely scenarios of poor health.[2,7,8]

While high-deductible policies pay off in the rare scenario of poor health, hospitals also provide substantial discounts to the uninsured in those same scenarios, through the provision of uncompensated care. Federal law requires hospital emergency departments to evaluate and treat all patients until stabilized, regardless of ability to pay. At the same time, the average uninsured household can only afford to pay for 12 percent of the potential hospitalizations they face.[9] In the aggregate, hospitals recover approximately 20 percent of the medical care rendered to the uninsured.[10] Hospital creditors tend to offer discounts in hopes of recovering at least some cost of the care provided. This system of uncompensated care through hospital discounting constitutes an "implicit" form of high deductible insurance found to compete with "formal" coverage.[11,12] The implicit coverage is considered high-deductible in that consumers are responsible for the full cost of care until exceeding their ability to pay, at which point they can negotiate or ultimately file for bankruptcy and legally end their financial responsibility.

Theory predicts that consumers are willing to pay for insurance protection against potentially catastrophic costs, even if they have to pay extra for that coverage.[13] But could the emphasis on catastrophic coverage deter uninsured consumers who have access to uncompensated care? Prior work suggests that enrollees would spend more on medical care with Marketplace coverage than by remaining uninsured, in large part because the uninsured incur very little medical expense.[14,15] Yet, evidence from Pauly and colleagues[16] suggests that many enrollees would realize a welfare gain from reduced financial uncertainty. The study authors measure financial variability by the spread of residuals from a regression of out-of-pocket spending. Though not enough to outweigh losses from increased average spending, the paper did find that Marketplace coverage produced some welfare improvement by imposing maximum out-of-pocket spending limits in catastrophic scenarios.

This paper empirically examines the extent to which the financial protections offered by the ACA's private insurance policies overlap with the financial protections of uncompensated care, which are available to the uninsured at no cost. The study will examine two questions. First, for what share of the population is the overlap in benefits complete? That is, for how many potential enrollees do the cost-sharing stipulations of Marketplace coverage exceed the cost of discharging medical debt in bankruptcy? Secondly, how likely are potential enrollees to realize a net financial benefit from coverage? Specifically, the paper uses a novel statistical technique to simulate the individual ex-ante probability distribution of potential medical expenditures, incorporating data on the demographic characteristics, prevalence of illness, and medical expenditures of population members. Simulated distributions of spending with and without Marketplace coverage are used to assess whether coverage would reduce out-of-pocket spending in the most catastrophic potential scenarios. This individual ex-ante approach complements existing literature on expected values of gains and losses by individuals' medical spending across a spread of potential medical scenarios to more directly evaluate the importance of benefit design in driving expectations of financial gains and losses.

This paper examines restricted-access data on consumers uninsured prior to the ACA, who constitute a primary target for the insurance-expansion law.[17] The study finds that approximately one in four individuals (24%) would pay less to file for bankruptcy than to meet the deductible of their subsidized benchmark Marketplace policy, including half of the population between two and three times the poverty level. Marketplace coverage offers little to no meaningful financial protection for these

consumers. Incorporating data on the medical and demographic characteristics of the population, I find that Marketplace coverage reduces total spending in only the top two percent most catastrophic potential scenarios that individuals face. Consumers with chronic health conditions are more likely to realize net financial gains from enrollment (11 percent of the time vs. 1%). Furthermore, consumers with assets to protect are more likely than average to realize a net financial gain (3 percent of the time). Those without assets at risk are not likely to realize a net financial gain in any potential scenarios (<1% of the time).

Notwithstanding this variation in the likelihood of financial gain, the data illustrate how the protections of bankruptcy and high deductible insurance are both concentrated among the most catastrophic potential scenarios. In other words, the instances in which it pays to be insured are also the instances of substantially discounted hospital care for the uninsured, implying a potential flaw inherent to the high- deductible benefit design as applied to the existing market context in which the uninsured have implicit coverage of a very similar benefit design. A robustness analysis available in the appendix further illustrates that the magnitude of benefit substitution appears to far outweigh the utility of risk-avoidance gained from catastrophic coverage.

To be sure, health insurance provides more than financial protection against bankruptcy. The coverage can facilitate consumption of critical ongoing healthcare goods and services, for example, cancer treatment. One cannot declare bankruptcy each time one requires a dose of chemotherapy. Coverage for ongoing or chronic healthcare needs cannot be substituted by negotiations and write-offs from the creditors of emergency care providers. Instead, the overlap takes importance for consumers whose potential risks are primarily catastrophic.[6] In these instances, a potentially catastrophic but unexpected financial loss to an acute hospital service is likely to be written off by the hospital creditor. Purchasing a high-deductible policy for protection against that particular financial risk might not be a compelling use of consumers' scarce household budgetary resources. This study's findings raise concerns about the value of catastrophic coverage for the financial wellbeing of the previously uninsured consumer. Moreover, the findings highlight limitations to the ability of high-deductible insurance as a vehicle to attract voluntary enrollment following recent removal of the enforcement mechanism for mandated coverage.

SECTION 2: METHODS

Data

This study uses rich financial and medical data from the Medical Expenditure Panel Survey (MEPS), the only source of nationally representative data on the medical conditions and expenditures of the uninsured in the United States.[18] I access confidential data on respondents' assets and insurance market area from the headquarters of the Agency for Healthcare Research and Quality, which produces the MEPS. I analyze a sample of adults who were uninsured prior to the ACA and who were part of the target market. Specifically, the 2010-2012 pooled MEPS sample is restricted to full-year uninsured adults who are not eligible for Medicaid or Medicare, have no offer of Employer-Sponsored coverage, and have household income above the federal poverty level.[19] For complete data on available insurance policies, the sample is further restricted to residents of the thirty- seven states that relied on the federal information-technology platform in 2015.[20] Policy data are from the Centers for Medicare and Medicaid Services (CMS).

I compiled a list of state bankruptcy regulations from the websites of each state government. Data on federal living allowances, also protected from bankruptcy, were downloaded from the US Department of Justice. Two allowance categories have no explicitly assigned limit, instead debtors must request an amount. For these, I use average consumer spending from the 2011 Consumer Expenditure Survey to assign allowances for insurance ($333.69) and phone ($1,290.57), following the methodology developed by Neale Mahoney.[11,21] Dollar amounts are adjusted for inflation to 2015 dollars using the CPI-U for income and assets and the Personal Consumption Expenditure- Health index for healthcare costs. I weight the data using the MEPS person-level sample weights, to account for the survey's sampling design including oversampling of minority populations.

Estimation of Insurance and Bankruptcy Costs

I assign the benchmark policy according to ACA legislation. Individuals in the MEPS are assigned to the second-lowest-cost insurance policy on the silver tier according to their age and within their insurance market area, by matching geographic identifiers in the MEPS and CMS data. The benchmark policy is defined by its premium cost and carries the cost-sharing stipulations given by CMS data. Subsidy amounts are based on the household's modified adjusted gross income (see Hill [14]

for calculation methodology). Family-coverage is assigned to households with two or more potential Marketplace participants sharing a tax-filing unit. Cost Sharing Reduction policies are assigned to eligible individuals. The average premium, deductible, and out-of-pocket maximum are detailed in Appendix Exhibit A1.

Households file for bankruptcy under one of two chapters. Lower-income households (below the state median) are eligible to file under the more generous rules of chapter 7 bankruptcy. Under these terms, households lose the non-exempted portion of assets. For example, if home equity is worth $150,000 and the exemption limit is $100,000 then the household loses $50,000 in home equity. The cost of bankruptcy equals the sum of assets lost across asset categories (home, vehicle, retirement, non- retirement financial, and other). Higher-income households file under chapter 13. Under these terms, households lose their income above federal living allowances for the following five years, but retain their assets. Their cost of bankruptcy equals five times the difference between household income and the federal living allowance, or the asset-based cost, whichever is greater. Rather than risk artificially inflating the benefits of bankruptcy, I do not allow consumers to write off any consumer debts other than the medical expenditures being analyzed. Student loans in particular are not identified as such in the MEPS and would remain on the household's balance.

All filers incur the expense of hiring a bankruptcy attorney, estimated at $2,000. The legal expense is the only expense for at least a quarter of the sample and nearly the only expense for half of those with incomes between 100 and 200 percent FPL, who would not lose any assets or income in bankruptcy beyond the cost of hiring an attorney (Appendix Exhibit A2). For additional discussion on the construction of households' cost of bankruptcy, see Mahoney[11], on which this methodology is based.

Ex-Ante Expenditure Simulation

Individuals face an ex-ante uncertain spread of potential medical scenarios, against which insurance provides protection. Nevertheless, no data can exist on the range of possible scenarios, simply because no one can relive the year hundreds of times over in order to observe the statistical spread of potential medical expenditure outcomes. Instead, I assume that the distribution of expenditures

observed across a population of medically and demographically similar individuals can proxy for the uncertain spread of potential scenarios that any one member might have experienced.[22–24]

To do this, I estimate parameter values for a generalized gamma distribution of medical consumption for each individual. The generalized gamma has a uniquely flexible form that can capture variation in the shape, spread, and expected value of the distribution of medical expenditures according to each individual's health and can reflect changes in individuals' insurance status.[25,26] Each of the distribution's three parameters are estimated simultaneously using a total of 36 demographic and medical covariates including age, gender, income as a percent of the poverty level, marital status, education, an array of chronic illness diagnoses, and self-rated health.

Insurance changes more than just the out-of-pocket cost of care, coverage can affect healthcare consumption. To simulate the level of care that the uninsured sample members would consume with private insurance, I assume that they would behave similarly to the existing privately insured population. I include nonelderly adults with full-year private insurance within the regression sample and additionally include a binary indicator for being uninsured within the estimation of each gamma parameter. To simulate OOP with insurance, I deduct the uninsured coefficient from each estimated parameter value. See Appendix B in the supplemental materials for more details on the methods of estimating individual-level distribution parameters.

While I simulate medical consumption at the individual-level, I analyze out-of-pocket costs at the household-level by summing across population members within the same household in each scenario. Because family members will not necessarily experience the most catastrophic scenarios at the same time as one another (or in other words, the joint distribution might not reflect the sum of the two distributions), this assumption potentially overstates the likelihood and magnitude of catastrophic spending and thus potentially overstates the benefits of insurance, making it a conservative assumption. I make two further adjustments to better reflect the financial benefits provided by insurance. First I address the higher prices billed to the uninsured relative to the negotiated prices faced by the insured. The uninsured consumer has little ability to negotiate outside of their inability to pay for catastrophic costs, and thus face higher prices.[27] By comparison, insured consumers benefit from discounts negotiated on their behalf by insurers, who are able to leverage the large volume of

contracted patients, thus facing lower prices.[28] Empirically, I account for this difference by running two separate gamma regressions. Without insurance, I assume that individuals face the spread of un-discounted charges and use the total charges variable in the MEPS as the dependent variable in the gamma regression.[29] With insurance, I assume that individuals face the discounted prices best reflected by the MEPS total expenditures variable. Total expenditures in the MEPS measure the amount of money exchanged between any payer and any provider, rather than the charge amount initially billed.

The second adjustment addresses the ACA requirement that all insurance policies provide preventive care at no out-of-pocket cost. Empirically, I account for this insurance benefit by deducting preventive care from individuals' expenditures with insurance. Using the MEPS medical events files, which provide data on each episode of medical care received by MEPS sample members, I identify healthcare visits reported as a "checkup" and taken with a primary care, family practice, gynecological, or internist physician. I total the value of expenditures on preventive care within the year for each individual, and then deduct that amount from the individual's total medical expenditures with insurance.

In sum, individuals face an uncertain spread of potential medical scenarios, and costs that depend on insurance status. Without insurance, individuals consume less care but face higher un-discounted prices. Uninsured consumers pay the full cost of medical care until it exceeds the cost of bankruptcy, which imposes a ceiling on out-of-pocket spending. By comparison, with insurance, individuals tend to consume more care but face lower prices. The insured consumer pays for any out-of-pocket cost-sharing not paid by their insurance policy, and pays the insurance premium net of any applicable ACA subsidies.

The resulting medical distributions are analyzed by constructing discrete percentiles, weighted and averaged across the population. The 85th percentile, for example, represents the population-average of each individual's 85th percentile of potential scenarios. I construct discrete percentiles by evaluating each individual's gamma parameters at probability p=85.0%, 85.1%, 85.2%, …, 85.9%, find the individual's mean across these ten values, then find the weighted population average.

Additionally, I analyze results by ownership of seizable wealth, defined as having at least $50 worth

of income or assets seizable in bankruptcy, and by health status, defined by diagnosis of at least one of the nine chronic illnesses most correlated with medical spending within the raw data on this population (illnesses are: angina, cancer, coronary heart disease, diabetes, heart attack, poor perceived mental health, any physical limitation, asthma, and emphysema). I include the premium with the direct out-of-pocket costs of care when discussing total out-of-pocket costs to reflect the total price of medical care experienced by consumers.[15]

Limitations

To be sure, health insurance provides more than financial protection against bankruptcy. The coverage can facilitate consumption of critical ongoing healthcare goods and services, for example, cancer treatment. One cannot declare bankruptcy for each dose of chemotherapy. Instead, the financial overlap takes importance for consumers whose potential risks are primarily catastrophic but unexpected financial losses to an acute hospital service, which are likely to be written off by their hospital creditor.[6] Purchasing a high-deductible policy for protection against that particular financial risk might not be a compelling use of consumers' scarce household budgetary resources.

Finally, this study does not directly measure the value of protection against risk and uncertainty. Nevertheless, an exercise presented in Appendix C confirms the robustness of the findings to the added utility-value of risk avoidance. Through its limited scope, this study probes the boundaries of the financial aspect of insurance coverage, investigating the capacity of high-deductible insurance, as an instrument of financial protection, to attract voluntary enrollment among the uninsured.

SECTION 3: RESULTS

Costs of Bankruptcy and Insurance

Bankruptcy costs less than reaching the deductible of the benchmark ACA private insurance policy for nearly one in four (24%) previously uninsured, Marketplace-eligible consumers (Figure 1). Bankruptcy costs less than meeting the out-of-pocket (OOP) maximum for more than one in three (35%). Members of the lowest income group are less likely than average to face a deductible (15%) or out of pocket maximum (32%) that costs more than bankruptcy. The ACA allocates the greatest amount of subsidies towards this low-income group, substantially reducing the premium, deductible and out of pocket maximum of their insurance policies.

By comparison, members of the middle income groups are most likely to face cost-sharing obligations that are more expensive than bankruptcy. For example, half of the population between two and three times the federal poverty level would pay less to go bankrupt than to meet their plan's deductible (Figure 1). More than half in this income group would pay less for bankruptcy than to meet their plan's OOP maximum (56%). The ACA allocates moderate cost sharing subsidies to a portion of individuals in this income group, those between 200% and 250% FPL. Members of the highest income group are least likely to pay more for cost sharing than for bankruptcy, despite being ineligible for any ACA subsidies, and are thus the most likely to pass this minimum bar for having any potential to benefit financially from the ACA's insurance terms.

Potential Medical Expenses

With private insurance, consumers usually pay more than their total healthcare consumption. Figure 2 illustrates the ex-ante probability distribution of potential medical scenarios faced by each previously uninsured individual on average. In the healthiest scenarios, at lower percentiles of the ex-ante distribution, individuals consume very little care, as depicted by the black line plotting medical charges. In these healthiest scenarios, individuals would spend very little out-of-pocket on healthcare without insurance, as depicted by the light blue bars. On the other hand, if the consumer has insurance, they must always pay the premium regardless of the level of medical care consumed. As a result, total OOP with insurance (depicted by the dark red bars) is greater than medical charges and greater than OOP without insurance across of the potential scenarios consumers face on average. As

illustrated in Figure 2, total OOP with insurance will exceed medical charges nearly 80% of the time for the previously uninsured on average, which is consistent with previous findings of increases in average spending for most previously uninsured enrollees in the Marketplace.[15]

Total charges increase rapidly at the catastrophic right-tail of potential scenarios, yet OOP does not increase as dramatically with or without insurance. At the potentially catastrophic 100th percentile, representing the top 1% worst health scenarios, charges reach $25,937 on average. Yet the uninsured consumer pays approximately one-third that amount, at $8,410, due to uncompensated care practices. Insured consumers pay less still, only $5,008 in total OOP due to claims payouts from their insurance policy. The vertical distance, measured in dollars, between charges and OOP is greatest at this catastrophic end of the distribution. With or without insurance, the OOP reductions from uncompensated care and Marketplace coverage are both concentrated in the right tail.

Results by Wealth and Health

Whereas the results presented above are averaged across the full population, the less-wealthy population members do not realize net reductions to OOP even at the catastrophic right-tail of the ex-ante distribution. On average, consumers who would not lose any assets in bankruptcy spend more with Marketplace coverage even in the most catastrophic percentile of medical scenarios (Table 1). The premium alone ($1,403) costs nearly as much as the legal expense of filing for bankruptcy. By contrast, consumers who risk losing assets in bankruptcy (65.7% of the population) spend less with insurance about three percent of the time, beginning at the 98th percentile of the consumer's ex-ante distribution on average ($5,073 vs. $4,712). With or without insurance, consumers without any wealth at risk spend far less in a catastrophic medical scenario than their wealthier counterparts.

Individuals in poor health are more likely than their healthier counterparts to experience a scenario in which insurance saves them money (Table 2). Enrollees with chronic health conditions spend less with insurance eleven percent of the time, beginning at the 89th percentile of ex-ante distribution on average. On the other hand, the majority of consumers (73.9%) without a chronic condition spend less with insurance about one percent of the time, at the most catastrophic 100th percentile of the ex-ante distribution. Furthermore, individuals in poor health have a greater magnitude of savings from Marketplace coverage than do their healthier counterparts. At the 100th percentile of the ex-ante

distribution, enrollees in poor health spend less than half as much with coverage than they would without, leading to a more than $7,000 reduction on average ($12,798 vs. $5,525). By contrast, healthier enrollees pay an average of three-quarters as much with insurance than without coverage and realize a less than $2,000 reduction ($6,380 vs. $4,825) at the most catastrophic percentile (Table 2).

Discussion

Marketplace coverage could not offer meaningful protection against the financial risks of potential medical expenses for at least a quarter of the population (including half between 200% and 300% FPL) for whom bankruptcy is cheaper than their deductible. Insofar as bankruptcy creates an implicit out-of-pocket maximum, for one third of consumers, that implicit out-of-pocket maximum was lower than was available in their benchmark Marketplace policy. These results are comparable to evidence from 2004, showing that only 20% of the uninsured had the assets to meet a $1,000 deductible.[30]

Marketplace insurance reduced the cost of the top two percent most catastrophic potential scenarios on average, in particular for wealthier and chronically ill individuals. Due largely to a genuine inability to pay, individuals without wealth can negotiate or discharge a catastrophic medical debt more readily than their wealthier counterparts. By contrast, consumers in poor health were more likely to save money with coverage than their healthier counterparts and would save more on average by enrolling in the Marketplace. This result is consistent with prior Marketplace research from Maria Polyakova and colleagues, who demonstrate that most enrollees (those with medical costs below $20,000) are covered at far less than the aggregate, advertised, actuarial value.[31]

Overall, consumers faced an overlap between the financial protections of bankruptcy-driven uncompensated care, and the protections of high-deductible private insurance, notwithstanding individual variation in the likelihood and magnitude of net financial gain. In unlikely, potentially catastrophic scenarios, consumers on average paid less for medical care with the benefits of paid claims from insurance. These were scenarios in which it literally paid to be insured. At the same time, the system of uncompensated care, driven by potential medical bankruptcy, also operated primarily in catastrophic scenarios by limiting OOP spending to the cost of bankruptcy. The results point to an

overlap between the catastrophic emphases of bankruptcy protections and the high-deductible policies subsidized by the ACA.

SECTION 4: CONCLUSION

The Health Insurance Portability and Accountability Act (HIPAA) of 1996 could have been "the most significant federal health care reform in a generation."[32] In the hindsight of its limited impact on the individual market[33], the primary question for future reforms was whether anybody would show up.[34] Relative to HIPAA, or any healthcare reform of the past half century, the ACA created unprecedented access to real and meaningful coverage, specifically for those with the least ability to pay and those with the greatest need for healthcare and insurance. Yet, in the end, most people did not show up for its private insurance policies.

In academic and political discussions about the future of health reform, arguments in favor of catastrophic, high-deductible coverage primarily rest on the somewhat conflicting imperatives to one, protect consumers' financial assets; and two, minimize external spill-over costs to hospitals who would otherwise not be compensated by the uninsured.[35,36] As this study highlights, the uninsured own little in the way of assets that require protection against the kind of random extreme medical event or hospitalization invoked by the standard theoretical model of health insurance as asset protection. Most of the uninsured will spend much less than the actual cost of a hospitalization, due in large part to the fact that they cannot afford it. On the other hand, hospitals themselves stand to gain directly from catastrophic coverage, as corroborated by soaring hospital stocks in the moments immediately following Supreme Court authorization of penalties enforcing insurance participation, despite the same judgement striking down national Medicaid expansion.[37–39] Even while establishing a funding channel for otherwise uncompensated care, high-deductible policies will offer only limited financial protection directly to the uninsured.

SUPPLEMENTAL MATERIALS

Appendix A: Insurance and Bankruptcy Costs

Appendix Exhibit A1 summarizes populatiom members' costs of purchasing ACA Marketplace insurance, net of any available ACA subsidies. Exhibit A2 summarizes population members' average and distributional costs of filing for bankruptcy. These figures reflect households filing under either Chapter 7 or Chapter 13. Exhibit A3 summarizes state bankruptcy exemptions for households that are income-eligible to file under the more generous rules of Chapter 7 Bankruptcy. Most states exempt a substantial amount of property from seizure in bankruptcy. Approximately forty states exempt at least $100,000 in home equity and forty-six exempt an unlimited amount of retirement savings. Exemptions operate in the following way. If a household owns outright a home worth $200,000 and files for bankruptcy in Arkansas, they would keep the full value of their home because Arkansas has unlimited home-equity exemption. On the other hand, if that household were in Arizona, they would lose $50,000 of the home's value.

Exhibit A1: Average and Distributional Costs of Marketplace Insurance, Previously Uninsured Adults

	All Uninsured Adults	Income Groups			
		100-200	200-300	300-400	400+
Income Distribution	100%	49.2%	24.5%	13.1%	13.2%
Premiums and Cost Sharing with Marketplace Coverage					
Premium	$2,061	$836	$2,393	$3,489	$4,589
Deductible	$2,713	$695	$4,185	$5,341	$4,889
OOP Maximum	$4,643	$1,741	$6,604	$8,082	$8,401

This table lists the mean costs of ACA Marketplace insurance, overall and by income as a percent of the federal poverty level, for all adults uninsured the full year in the 2010-2012 MEPS.

Exhibit A2: Average and Distributional Costs of Bankruptcy, Previously Uninsured Adults

	All Uninsured Adults	Income Groups			
		100-200	200-300	300-400	400+
Income Distribution	100%	49.2%	24.5%	13.1%	13.2%
Cost of Bankruptcy					
Mean	$26,474	$10,251	$25,796	$31,473	$83,051
25th	$2,000	$2,000	$2,000	$8,885	$18,414
Median	$9,377	$2,207	$5,316	$15,409	$28,956
75th	$21,512	$13,012	$20,821	$26,261	$94,894

This table lists the mean cost of filing for bankruptcy overall and by income as a percent of the federal poverty level for adults uninsured the full year in the 2010-2012 MEPS.

Exhibit A3: Summary of State Bankruptcy Exemptions

State	Residential Property	Retirement	Vehicle	Financial	Wildcard	Federal Option
Alabama	$10,000	Unlmtd.	$0	$0	$6,000	No
Alaska	$67,500	Unlmtd.	$7,500	$3,500	$0	No
Arizona	$150,000	Unlmtd.	$10,000	$300	$0	No
Arkansas	Unlmtd.	$40,000	$2,400	$0	$500	Yes
California	$75,000	Unlmtd.	$3,050	$0	$0	No
California- B	$26,800	Unlmtd.	$5,350	$0	$1,425	No
Colorado	$90,000	Unlmtd.	$6,000	$0	$0	No
Connecticut	$150,000	Unlmtd.	$3,000	$0	$2,000	Yes
Delaware	$125,000	Unlmtd.	$0	$0	$500	No
D.C.	Unlmtd.	Unlmtd.	$5,150	$0	$17,850	Yes
Florida	Unlmtd.	Unlmtd.	$2,000	$0	$2,000	No
Georgia	$10,000	Unlmtd.	$7,000	$0	$11,200	No
Hawaii	$40,000	Unlmtd.	$5,150	$0	$0	Yes
Idaho	$50,000	Unlmtd.	$6,000	$0	$1,600	No
Illinois	$15,000	Unlmtd.	$2,400	$0	$4,000	No
Indiana	Unlmtd.	Unlmtd.	$0	$0	$20,000	No
Iowa	Unlmtd.	Unlmtd.	$1,000	$0	$200	No
Kansas	Unlmtd.	Unlmtd.	$40,000	$0	$0	No
Kentucky	$10,000	Unlmtd.	$5,000	$0	$2,000	No
Louisiana	$25,000	Unlmtd.	$0	$0	$0	No
Maine	$70,000	Unlmtd.	$10,000	$0	$12,800	No
Maryland	Unlmtd.	Unlmtd.	$0	$0	$22,000	No
Massachusetts	$1,000,000	Unlmtd.	$1,400	$1,250	$0	Yes
Michigan	$7,000	Unlmtd.	$0	$0	$0	No
Minnesota	$200,000	Unlmtd.	$7,600	$0	$0	Yes
Mississippi	$150,000	Unlmtd.	$0	$0	$10,000	No
Missouri	$15,000	Unlmtd.	$6,000	$0	$1,250	No
Montana	$200,000	Unlmtd.	$5,000	$0	$0	No
Nebraska	$1,250	Unlmtd.	$0	$0	$5,000	No
Nevada	$400,000	$1,000,000	$30,000	$0	$0	No
New Hampshire	$200,000	Unlmtd.	$8,000	$0	$8,000	Yes
New Jersey	Unlmtd.	Unlmtd.	$0	$0	$2,000	Yes
New Mexico	$60,000	Unlmtd.	$8,000	$0	$4,000	Yes
New York	$20,000	Unlmtd.	$0	$0	$10,000	No
North Carolina	$13,000	Unlmtd.	$3,000	$0	$8,000	No
North Dakota	$80,000	$200,000	$2,400	$0	$15,000	No
Ohio	$10,000	Unlmtd.	$2,000	$800	$800	No
Oklahoma	Unlmtd.	Unlmtd.	$6,000	$0	$0	No
Oregon	$33,000	$15,000	$3,400	$15,000	$800	No
Pennsylvania	Unlmtd.	Unlmtd.	$0	$0	$600	Yes
Rhode Island	$200,000	Unlmtd.	$20,000	$0	$0	Yes
South Carolina	$10,000	Unlmtd.	$2,400	$0	$2,000	No
South Dakota	Unlmtd.	$500,000	$0	$0	$4,000	No
Tennessee	$7,500	Unlmtd.	$0	$0	$8,000	No
Texas	Unlmtd.	Unlmtd.	$0	$0	$60,000	Yes
Utah	$40,000	Unlmtd.	$5,000	$0	$0	No

Vermont	$150,000	Unlmtd.	$5,000	$1,400	$8,400	Yes
Virginia	Unlmtd.	$35,000	$4,000	$0	$32,000	No
Washington	$40,000	Unlmtd.	$5,000	$0	$4,000	Yes
West Virginia	Unlmtd.	Unlmtd.	$4,800	$0	$51,600	No
Wisconsin	$40,000	Unlmtd.	$0	$2,000	$10,000	Yes
Wyoming	$20,000	Unlmtd.	$4,800	$0	$0	No
Federal	$18,500	Unlmtd.	$5,900	0	$20,450	--

Note: Exhibit summarizes state bankruptcy exemptions compiled from respective state agency websites.

Appendix B: Simulation Methods

Estimating Parameters

As described in the text, I simulate each individual's ex- ante probability distribution of medical consumption by estimating individual- level parameters of the gamma distribution. I run two separate regressions, one with the dependent variable total charges to approximate the distribution of costs that consumers would face if they remain uninsured. In the other regression, the dependent variable is total expenditures, which reflects insurer negotiated discounts.[40] I estimate two separate models, rather than indexing by a discount-factor, to capture potential non- linearity in the amount of insurer- negotiated discount, which would be present if, for example, insurers get larger discounts on more expensive services like hospitalizations than on physician office visits. I run the same gamma regression each time, with the same sample and same specifications for independent variables, and change only the dependent variable. For each model, I run the following three equations simultaneously within Stata software and estimate the coefficients.

(1) $\lambda_i = \beta_0 + \beta_1 Ins + \beta_2 Dx + \beta_3 Demog + \varepsilon_i$

(2) $\sigma_i = \delta_0 + \delta_1 Ins + \delta_2 Dx + \delta_3 Demog + \varepsilon_i$

(3) $\kappa_i = \zeta_0 + \zeta_1 Ins + \zeta_2 Dx + \zeta_3 Demog + \varepsilon_i$

Here, λ_i represents XB, the expected value parameter of the probability distribution of medical consumption. σ_i represents the distribution's spread, and κ_i represents the shape parameter of the distribution.

I implement the gamma regressions using a survival analysis tool in Stata (the 'streg' command).[41] While survival analysis was originally developed to illustrate the conditional probability of surviving beyond a given amount of time, I use it to model the probability of consuming a given amount of medical care and treat total annual charges or expenditures as the 'time' dimension of the model. I use an accelerated failure-time (AFT) model, the only one of the two commonly used survival models that supports estimation of the generalized gamma distribution. The generalized gamma distribution is only defined over strictly positive values of the dependent variable, in this case total annual medical consumption. To run the regression, I replace each $0 observation with a uniformly distributed integer between $1 and $15. In the regression sample overall, 26% has $0

of medical consumption. Among previously uninsured members of the primary analytic sample, 51% has $0 of medical consumption.

I include binary indicators for a number of chronic illness diagnoses, each of which represents whether the individual has ever been diagnosed with the condition. I also include binary indicators for poor perceived mental health, fair or poor perceived physical health, and any functional or sensory limitation. Each condition is listed in Exhibits B1 and B2, along with the variables' estimated parameter coefficients.

Demographic variables in the model include age, gender, race, marital status, education, income as a percent of the federal poverty level, region of residence, metropolitan statistical area residence (MSA), and year of MEPS survey participation. Age is represented categorically by 5 binary variables, with age 46- 58 years left out as the referent group. Race includes 4 binary categories: Hispanic, non-Hispanic black, Asian, and the referent group white and other. I estimate the effect of income with a continuous measure of household income as a percent of the Federal Poverty Level, which incorporates the absolute level of income as well as family size. Marital status includes one binary indicator of whether the individual has never been married. Region is represented with four binary indicators corresponding to each of the census bureau US regions, with the southern region left out as the referent group because it is most represented in the sample. Finally, year of MEPS survey participation is represented by MEPS panel indicators. I control for year of participation in addition to adjusting respondents' reported income and medical expenditures to constant dollars.

Each of the variables predicts the expected value of sample members' medical consumption distributions, and a sub-set is used to predict the shape and spread. There are not enough data to use all of the medical, demographic, and insurance variables to estimate each parameter. The spread parameter requires a larger sample to compute variable effects, and the shape parameter a still larger sample. Spread is predicted by all variables except year of survey participation, and

the shape parameter is predicted by four binary variables: physical limitation, fair or poor perceived health, age above 59 years and no insurance.

After running the gamma regressions, I use the packaged command in Stata ("predict lambda, xb") to generate the expected value parameter. I construct the individual- level values of the shape and spread parameters, κ and σ, by implementing equations (2) and (3). Specifically, I multiply each parameter coefficient with the individual's observed value of the independent variable, and sum each of these values together with the parameter's constant value generated in the regression. Finally, I create individual percentile-intervals as described in the main text. The "100th" percentile of the distribution, which represents scenarios with the poorest health outcomes, is constructed by averaging across p = 99.91% through 99.99% and 99.999%.

Evaluating Gamma

Finally, I evaluate probability points along the gamma distribution for each sample member using their individually- constructed parameters. The generalized gamma distribution takes the following functional form, rearranged but using consistent notation with the Stata manual.[41]

(4) $$F(MEDcons) = \begin{cases} \exp\{\lambda + \frac{\sigma}{sign(\kappa)\cdot|\kappa|} \cdot \ln\left[{\text{invgtail}(a,p)}/{a}\right]\} & if\ \kappa > 0 \\ \exp\{\lambda + \frac{\sigma}{sign(\kappa)\cdot|\kappa|} \cdot \ln\left[{\text{invg}(a,p)}/{a}\right]\} & if\ \kappa < 0 \end{cases}$$, where

(5) $a = |\kappa|^{-2}$

(6) invg (a, p) = inverse cumulative gamma distribution

(7) invgtail (a, p) = 1 – invg (a, p) = reverse inverse cumulative gamma distribution

The function 'invg (a, p)' represents the inverse cumulative gamma distribution. If the gamma distribution returns a probability value of p = .25 for G~ (a, m) the inverse gamma would return the value m for invg~ (a, p= .25). Using the inverse gamma distribution function, and its complement the inverse gamma tail distribution when kappa < 0, I find the value of medical consumption at probability points along the probability distribution of medical consumption scenarios.

Exhibit B3 summarizes the simulation results illustrated in Exhibit 2 of the main text.

Exhibit B1: Generalized Gamma Parameter Estimates for Ex-Ante Medical Charges

	λ		Ln (σ)		κ	
	Coeff.	Std. Error	Coeff.	Std. Error	Coeff.	Std. Error
Constant	4.884	0.118	0.905	0.035	0.610	0.028
Uninsured	-3.062	0.110	0.084	0.018	-1.099	0.061
Demographic						
Age 19-28	-0.019	0.074	0.011	0.023	--	--
Age 29-36	0.134	0.064	0.007	0.021	--	--
Age 37-45	-0.049	0.056	-0.025	0.019	--	--
Age 59-64	0.112	0.084	-0.015	0.024	-0.058	0.057
Hispanic	-0.409	0.056	0.002	0.017	--	--
Black	-0.341	0.057	0.086	0.017	--	--
Asian	-0.494	0.076	0.094	0.023	--	--
No degree	-0.107	0.068	0.003	0.020	--	--
Bachelors	0.364	0.054	-0.054	0.019	--	--
Graduate	0.369	0.053	-0.079	0.019	--	--
Northeast	0.187	0.060	0.008	0.020	--	--
Midwest	0.255	0.053	-0.045	0.018	--	--
West	0.113	0.051	-0.009	0.018	--	--
MSA	0.183	0.062	-0.014	0.021	--	--
Male	0.803	0.040	-0.040	0.014	--	--
%FPL	0.000	0.000	0.000	0.000	--	--
Never married	-0.144	0.055	-0.043	0.017	--	--
MEPS Panel 14	0.010	0.047	--	--	--	--
MEPS Panel 15	0.063	0.047	--	--	--	--
Medical						
High Blood Pressure	0.044	0.081	-0.002	0.027	--	--
Multiple Blood Press. Dx.	0.348	0.089	-0.019	0.029	--	--
Coronary heart disease	0.276	0.168	0.045	0.052	--	--
Angina	-0.020	0.197	-0.030	0.068	--	--
Heart attack	0.328	0.220	0.182	0.059	--	--
Other heart disease	0.212	0.073	-0.092	0.027	--	--
High Cholesterol	0.260	0.049	-0.071	0.018	--	--
Fair/ poor physical health	0.885	0.086	0.115	0.018	0.010	0.050
Poor mental health	0.174	0.150	0.006	0.044	--	--
Stroke	0.411	0.172	0.008	0.056	--	--
Emphysema	-0.110	0.231	0.133	0.063	--	--
Diabetes	0.425	0.083	-0.060	0.029	--	--
Cancer	0.608	0.081	-0.054	0.030	--	--
Any activity limitations	0.854	0.080	0.024	0.020	0.022	0.052
Asthma	0.328	0.070	-0.065	0.024	--	--
Arthritis	0.525	0.054	-0.097	0.021	--	--

Note: This table presents estimated parameter values of the generalized gamma distribution approximating ex-ante probability distributions of medical charges.

Exhibit B2: Generalized Gamma Parameter Estimates for Ex-Ante Medical Expenditures

	λ		Ln (σ)		κ	
	Lambda	Std. Err.	Sigma	Std. Err.	Kappa	Std. Err.
Constant	5.337	0.104	0.840	0.038	0.769	0.030
Uninsured	-2.686	0.109	0.198	0.017	-0.881	0.067
Demographic						
Age 19-28	-0.191	0.067	0.002	0.024	--	--
Age 29-36	0.002	0.057	0.007	0.023	--	--
Age 37-45	-0.115	0.049	-0.021	0.020	--	--
Age 59-64	0.013	0.069	0.002	0.026	-0.152	0.062
Hispanic	-0.508	0.050	0.033	0.018	--	--
Black	-0.443	0.050	0.112	0.018	--	--
Asian	-0.599	0.068	0.137	0.024	--	--
No degree	-0.170	0.066	0.001	0.021	--	--
Bachelors	0.316	0.046	-0.041	0.020	--	--
Graduate	0.320	0.045	-0.093	0.020	--	--
Northeast	0.111	0.052	0.008	0.021	--	--
Midwest	0.173	0.046	-0.012	0.020	--	--
West	0.079	0.045	0.006	0.018	--	--
MSA	0.156	0.055	-0.017	0.023	--	--
Male	0.696	0.036	-0.081	0.015	--	--
%FPL	0.000	0.000	0.000	0.000	--	--
Never married	-0.133	0.049	-0.017	0.017	--	--
MEPS Panel 14	0.056	0.041	--	--	--	--
MEPS Panel 15	0.080	0.042	--	--	--	--
Medical						
High Blood Pressure	0.070	0.068	-0.038	0.027	--	--
Multiple Blood Press. Dx.	0.414	0.073	-0.054	0.030	--	--
Coronary heart disease	0.416	0.114	-0.053	0.050	--	--
Angina	-0.105	0.142	-0.026	0.069	--	--
Heart attack	0.308	0.141	0.083	0.059	--	--
Other heart disease	0.127	0.060	-0.117	0.028	--	--
High Cholesterol	0.310	0.042	-0.113	0.019	--	--
Fair/ poor physical health	0.740	0.070	0.081	0.019	-0.083	0.051
Poor mental health	0.161	0.132	0.069	0.050	--	--
Stroke	0.208	0.123	-0.035	0.051	--	--
Emphysema	0.146	0.165	0.036	0.056	--	--
Diabetes	0.749	0.060	-0.200	0.029	--	--
Cancer	0.409	0.068	-0.023	0.032	--	--
Any activity limitations	0.648	0.068	-0.002	0.021	-0.005	0.054
Asthma	0.438	0.055	-0.150	0.027	--	--
Arthritis	0.454	0.046	-0.063	0.024	--	--

Note: This table presents estimated parameter values of the generalized gamma distribution approximating ex-ante probability distributions of medical expenditures.

Exhibit B3: Probability Distribution of Potential Medical Spending Scenarios with and without Marketplace Insurance

Percentile of Ex- Ante Distribution	Charges (1)	OOP No Insurance (2)	Total OOP Insurance (3)
0th	$0	$0	$2,061
25th	$601	$464	$2,372
Median	$1,244	$826	$2,595
75th	$2,455	$1,432	$2,932
95th	$6,164	$2,906	$3,599
96th	$6,816	$3,127	$3,694
97th	$7,734	$3,427	$3,818
98th	$9,234	$3,891	$3,969
99th	$13,395	$5,082	$4,366
100th	$25,743	$8,055	$5,008

This table presents the simulated ex-ante probability distribution of potential medical expenditure scenarios faced by previously uninsured individuals on average. The ex-ante spread ranges from scenarios of better health requiring little medical care at lower percentiles to potentially catastrophic scenarios in the tail. The 0th percentile presents spending with no medical consumption. Column (1) lists total charges (2) OOP costs with no insurance, but with uncompensated care and (3) Total OOP with insurance, including direct OOP and premium.

Appendix C: Risk Aversion

This section evaluates the utility of risk avoidance provided by marketplace insurance, distinct from the dollar value of savings an enrollee would get from the benefits of medical claims payouts. To illustrate the concept of risk avoidance evaluated here, consider the following thought experiment posed by Meier and Wolfe.[42] Suppose two families have the same income and that neither incurs any medical expenses over the course of a year. Now suppose one of these families had been given insurance coverage at no cost at the beginning of the year. Even without drawing medical benefits, the insured family consumed something of value. The insured family had the comfort of knowing they were protected against the possibility of experiencing a poor financial scenario caused by a large medical expense. Here, I evaluate and compare the financial risk faced by the average uninsured adult with no protections, with Marketplace coverage, and with uncompensated care. I illustrate using an exemplar individual with median income and assets who faces the average ex-ante distribution of medical consumption, and I use a standard measure of Arrow-Pratt risk aversion.[43,44]

The exemplar individual starts with an initial endowment of $59,000 worth of income and assets and faces the average spread of medical spending summarized in Exhibit B3. I calculate the amount of income and assets the individual would have remaining across the spread of potential medical scenarios, defined by $59,000 minus out-of-pocket spending of each scenario. Next, I calculate the level of utility derived from consumption under each potential scenario using the formula for Constant Absolute Risk Aversion:

$$u(c) = \frac{-1}{a} exp^{-ac}$$

Above, *c* denotes the level of consumption remaining after medical spending and *a* denotes a coefficient of risk aversion estimated in the existing literature equal to 4.22*10-4.[24] I find the expected value of utility across the ex-ante spread, and use it to back out a certain-consumption equivalent to the uncertain distribution. Namely, I impose the expected value of utility in the left-hand side of the above equation and solve for *c*, the level of certain consumption generating the equivalent utility as the uncertain spread. Finally, I find the risk premium over a given spread of

losses, which equals the difference between the certainty-equivalent and the expected value of consumption.

The calculations used to evaluate risk premiums are displayed in Exhibit C1. The first set of columns list the ex-ante distribution of potential financial losses faced by the pre-ACA uninsured individual, first without any insurance or uncompensated care, next with uncompensated care measured as an out-of-pocket maximum equal to the cost of bankruptcy, and third with the benchmark Marketplace policy. These costs are listed in Exhibit B2. The next set of columns list the level of income and assets remaining after incurring medical spending, defined as the difference between $59,000 and the medical cost listed in the first set of columns. For example, at the 25th percentile of the distribution representing the 25% healthiest scenarios with the least medical spending, total charges equal $606, which translates into $486 in out-of-pocket spending without insurance or $2,732 with insurance including the premium. These expenses leave approximately $58,500 without insurance (with or without uncompensated care) and $56,628 with insurance. Using the utility equation above, each of these levels of consumption generate the levels of utility listed in the final set of columns for the 25th percentile, between -4.7 and -9.9 times 10^{-8}. At the bottom of the table, the final row displays expected values of each column, which incorporate all distribution percentiles and not solely those displayed in the rows presented.

If the uninsured consumer faced the full price of medical care, the risk premium over those losses would exceed the expected value of losses several times over (Exhibit C2). The risk premium for this hypothetical individual with slightly above median income and assets exceeds the expected expense by an order of magnitude ($12,878 vs $2,173). One percent of the time, the individual would lose half of his total available consumption. By comparison, incorporating uncompensated care brings the risk premium down to $560. In other words, uncompensated care reduces the value of financial risk by 96% from a base of $12,878. Finally, with Marketplace insurance, the uninsured consumer faces a still smaller level of risk. The risk premium of losses with insurance falls to $58.

The coverage did provide utility-generating protection against financial risk, reducing the risk premium by $552 from $560 to $58. Still, the marginal reduction to risk (relative to uncompensated care) is much smaller in magnitude than the total reduction (relative to the full price of care), which is consistent with prior research (e.g. Pauly, Lieve, & Harrington). [45] This exercise supports, or in the least fails to rule out, the notion that the high-deductible benchmark policy offered in the ACA's Marketplace exchanges might provide a duplication in benefits already available to the uninsured through uncompensated care.

Exhibit C1: Ex-Ante Distribution of Medical Expenses, Non-Medical Consumption, and the Utility of Consumption

Percentile of Ex-Ante Distribution	Medical Expenses			Income and Assets			Utility of Consumption		
	Charges	OOP No Insurance	Total OOP Insurance	Charges	No Insurance	Insurance	Charges	No Insurance	Insurance
25	$606	$486	$2,372	$58,394	$58,514	$56,628	-4.71E-08	-4.47E-08	-9.92E-08
50	$1,254	$858	$2,595	$57,746	$58,142	$56,405	-6.19E-08	-5.23E-08	-1.09E-07
75	$2,475	$1,490	$2,932	$56,525	$57,510	$56,068	-1.04E-07	-6.83E-08	-1.26E-07
95	$6,213	$3,029	$3,599	$52,787	$55,971	$55,401	-5.02E-07	-1.31E-07	-1.66E-07
96	$6,871	$3,262	$3,694	$52,129	$55,738	$55,306	-6.62E-07	-1.44E-07	-1.73E-07
97	$7,795	$3,576	$3,818	$51,205	$55,424	$55,182	-9.78E-07	-1.65E-07	-1.83E-07
98	$9,307	$4,059	$3,969	$49,693	$54,941	$55,031	-1.85E-06	-2.02E-07	-1.95E-07
99	$13,499	$5,301	$4,366	$45,501	$53,699	$54,634	-1.09E-05	-3.41E-07	-2.30E-07
100	$25,937	$8,410	$5,008	$33,063	$50,590	$53,992	-2.07E-03	-1.27E-06	-3.02E-07
Expected Value	$2,173	$1,197	$2,726	$56,827	$57,803	$56,274	-2.09E-05	-7.65E-08	-1.18E-07

Table C1 displays calculations used to evaluate the level of financial risk faced by a slightly wealthier than median previously uninsured adult with Marketplace *Insurance*, with *No Insurance* but with uncompensated care protections, and with no insurance and no uncompensated care, facing the total *Charges* billed by providers. The ex-ante distribution is simulated to reflect the spread of potential medical scenarios facing previously uninsured adults on average. The middle set of columns equal $59,000, representing the individual's initial endowment, minus the medical expense listed in the corresponding column from the first set. The final set of columns equals the level of utility derived from consumption under CARA preferences specified in equation C1.

Exhibit C2: Risk Premiums

	Charges	No Insurance	Insurance
Expected Consumption	$56,827	$57,803	$56,274
Certainty Equivalent	$43,949	$57,244	$56,217
Risk Premium	$12,878	$560	$58

This table presents results for the risk evaluation exercise described above. The difference between the ex-ante expected value of consumption (1st row) and the certain-consumption equivalent to the uncertain distribution of utility (2nd row) provides the risk premium estimate presented in the final row.

REFERENCES

1. Uberoi N, Finegold K, Gee E. Health Insurance Coverage and the Affordable Care Act, 2010 - 2016 [Internet]. ASPE; 2016 Mar [cited 2018 Jan 19]. Available from: https://aspe.hhs.gov/pdf-report/health-insurance-coverage-and-affordable-care-act-2010-2016

2. Blumberg LJ, Holahan J. After King v. Burwell: Next Steps for the Affordable Care Act [Internet]. Urban Institute. 2015 [cited 2018 Jan 19]. Available from: https://www.urban.org/research/publication/after-king-v-burwell-next-steps-affordable-care-act

3. Congressional Budget Office. CBO's Record of Projecting Subsidies for Health Insurance Under the Affordable Care Act: 2014 to 2016 [Internet]. Washington, DC; 2017 Dec. Report No.: 53094. Available from: https://www.cbo.gov/system/files/115th-congress-2017-2018/reports/53094-acaprojections.pdf

4. Glied S, Arora A, Solís-Román C. The CBO's Crystal Ball: How Well Did It Forecast the Effects of the Affordable Care Act? Issue brief (Commonwealth Fund). 2015 Dec 1;35:1–13.

5. Larry Levitt, Gary Claxton, Anthony Damico, Cynthia Cox. Assessing ACA Marketplace Enrollment [Internet]. Kaiser Family Foundation; 2016 Mar [cited 2018 Feb 2]. Available from: https://www.kff.org/health-reform/issue-brief/assessing-aca-marketplace-enrollment/

6. Gruber J. Covering the Uninsured in the United States. Journal of Economic Literature. 2008;46(3):571–606.

7. Internal Revenue Service. Health Savings Accounts and Other Tax-Favored Health Plans [Internet]. Department of the Treasury; 2016 Jan [cited 2017 Sep 14]. Report No.: 969. Available from: https://www.irs.gov/pub/irs-prior/p969--2015.pdf

8. Gabel JR, Whitmore H, Green M, Stromberg S, Oran R. Consumer Cost-Sharing in Marketplace vs. Employer Health Insurance Plans, 2015 [Internet]. 2015 [cited 2018 Jan 17]. Available from: http://www.commonwealthfund.org/publications/issue-briefs/2015/dec/cost-sharing-marketplace-employer-plans

9. Chappel A. Value of Health Insurance: Few of the Uninsured Have Adequate Resources to Pay Potential Hospital Bills [Internet]. 2015 Nov [cited 2019 Feb 27]. Available from: https://aspe.hhs.gov/basic-report/value-health-insurance-few-uninsured-have-adequate-resources-pay-potential-hospital-bills

10. Coughlin T, Holahan J, Caswell K. Uncompensated care for the uninsured in 2013: A detailed examination. The Henry J Kaiser Family Foundation: The Kaiser Commission on Medicaid and the

Uninsured [Internet]. 2014 May 30; Available from: https://www.kff.org/uninsured/report/uncompensated-care-for-the-uninsured-in-2013-a-detailed-examination/

11. Mahoney N. Bankruptcy as Implicit Health Insurance. The American Economic Review. 2015 Feb;105(2):710–46.

12. Finkelstein A, Hendren N, Luttmer EFP. The Value of Medicaid: Interpreting Results from the Oregon Health Insurance Experiment. Journal of Political Economy [Internet]. 2018 Dec 17 [cited 2019 Feb 5]; Available from: https://www.journals.uchicago.edu/doi/abs/10.1086/702238

13. Arrow KJ. Uncertainty and the Welfare Economics of Medical Care. The American Economic Review. 1963;53(5):941–73.

14. Hill SC. Medicaid Expansion in Opt-Out States Would Produce Consumer Savings and Less Financial Burden Than Exchange Coverage. Health Affairs. 2015 Feb;34(2):340–9.

15. Pauly M, Leive A, Harrington S. Losses (and Gains) from Health Reform for Non-Medicaid Uninsureds. Journal of Risk and Insurance [Internet]. 2018 [cited 2018 Dec 12];0(0). Available from: https://onlinelibrary.wiley.com/doi/abs/10.1111/jori.12255

16. Pauly M, Leive A, Harrington S. The Price of Responsibility: The Impact of Health Reform on Non-Poor Uninsureds [Internet]. National Bureau of Economic Research; 2015 Sep [cited 2018 Jan 19]. (NBER Working Paper Series). Report No.: w21565. Available from: http://www.nber.org/papers/w21565

17. Obama B. United States Health Care Reform: Progress to Date and Next Steps. JAMA. 2016 Aug 2;316(5):525–32.

18. Lund JL, Yabroff KR, Ibuka Y, Russell LB, Barnett PG, Lipscomb J, et al. Inventory of Data Sources for Estimating Health Care Costs in the United States. Medical care. 2009 Jul;47(7 Suppl 1):S127.

19. ASPE. Estimates of the QHP Eligible Uninsured by Designated Market Area for the Third Open Enrollment Period [Internet]. aspe.hhs.gov. 2015 [cited 2019 Mar 26]. Available from: https://aspe.hhs.gov/basic-report/estimates-qhp-eligible-uninsured-designated-market-area-third-open-enrollment-period

20. Uberoi NK, Uzel JC. Maps of 2015 Individual Exchange Enrollment by Zip Code. Library of Congress, Congressional Research Service; 2015.

21. CE Expenditure Tables [Internet]. [cited 2019 Feb 27]. Available from: https://www.bls.gov/cex/csxstnd.htm#2011

22. Farley PJ. Who Are the Underinsured? The Milbank Memorial Fund Quarterly Health and Society. 1985;63(3):476–503.

23. Short PF, Banthin JS. New Estimates of the Underinsured Younger Than 65 Years. JAMA. 1995 Oct 25;274(16):1302–6.

24. Handel BR. Adverse Selection and Inertia in Health Insurance Markets: When Nudging Hurts. American Economic Review. 2013 Dec;103(7):2643–82.

25. Meier SK. Examining risk classification strategies for the development of a measure of medical care economic risk in the United States. Journal of Economic and Social Measurement. 2016 Jan 1;41(3):289–305.

26. Manning WG, Basu A, Mullahy J. Generalized modeling approaches to risk adjustment of skewed outcomes data. Journal of Health Economics. 2005 May 1;24(3):465–88.

27. Anderson GF. From 'Soak the Rich' to 'Soak the Poor': Recent Trends in Hospital Pricing. Health Affairs. 2007 May 1;26(3):780–9.

28. Institute of Medicine (U.S.). America's uninsured crisis: consequences for health and health care [Internet]. Washington, D.C.: National Academies Press; 2009 [cited 2018 May 1]. Available from: http://public.eblib.com/choice/publicfullrecord.aspx?p=3378496

29. Cohen JW, Cohen SB, Banthin JS. The Medical Expenditure Panel Survey: A National Information Resource to Support Healthcare Cost Research and Inform Policy and Practice. Medical Care. 2009;47(7):S44–50.

30. Jacobs PD, Claxton G. Comparing The Assets Of Uninsured Households To Cost Sharing Under High-Deductible Health Plans. Health Affairs. 2008;w214–21.

31. Polyakova M, Hua LM, Bundorf MK. Marketplace Plans Provide Risk Protection, But Actuarial Values Overstate Realized Coverage for Most Enrollees. Health Affairs. 2017 Dec 1;36(12):2078–84.
32. Atchinson BK, Fox DM. From The Field: The Politics of The Health Insurance Portability and Accountability Act. Health Affairs. 1997 May 1;16(3):146–50.

33. Pollitz K, Tapay N, Hadley E, Specht J. Early Experience with 'New Federalism' in Health Insurance Regulation. Health Affairs. 2000 Jul 1;19(4):7–22.

34. Oliver TR. The dilemmas of incrementalism: logical and political constraints in the design of health insurance reforms. J Policy Anal Manage. 1999;18(4):652–83.

35. Goldman DP, Hagopian K. It Is Time for Universal Coverage Without Breaking the Bank. Journal of Policy Analysis and Management. 2018 Jan 1;37(1):182–8.

36. Ho V. Refinement of the Affordable Care Act. Annu Rev Med. 2018 Jan 29;69(1):19–28.

37. CNBC. Obamacare's Insurance Rule Is Upheld by Supreme Court [Internet]. 2012 [cited 2019 Feb 27]. Available from: https://www.cnbc.com/id/47946647

38. Hartley J. Health Care Reform and Health Care Stocks: Evidence from the Affordable Care Act Supreme Court Ruling. 2012 Jul 16 [cited 2018 Feb 12]; Available from: https://papers.ssrn.com/abstract=2111642

39. Udovich J. Trading the Obamacare Ruling: For-Profit Hospital Stocks THC, HCA & CYH : Small Stock Gems [Internet]. smallcapnetwork. 2012 [cited 2018 Feb 9]. Available from: http://www.smallcapnetwork.com/Trading-the-Obamacare-Ruling-For-Profit-Hospital-Stocks-THC-HCA-CYH/s/via/3414/article/view/p/mid/1/id/784/