Medicaid Expansions and Poverty: Comparing Supplemental and Health-Inclusive Poverty Measures

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ABSTRACT We estimate relationships between Medicaid expansions and poverty, using the Census Bureau's supplemental poverty measure (SPM) and a recently developed health-inclusive poverty measure (HIPM). The HIPM modifies the SPM by adding a need for health insurance to the SPM poverty threshold and by adding a family's health insurance benefits to family resources. Results from logistic regressions that control for sociodemographic characteristics, income, and benefits other than health insurance show that the (adjusted) HIPM poverty rate is 1.7 percentage points (10 percent) lower in expansion than in nonexpansion states, and the HIPM deep poverty rate is 0.9 percentage points (13 percent) lower. Differences in SPM poverty rates are generally small and insignificant. Medicaid expansion is associated with substantial HIPM poverty reductions for children, persons 55–64 years old, blacks, Hispanics, and those who have not completed high school. These populations are particularly vulnerable to proposed rollbacks in Medicaid expansions.

INTRODUCTION

Following full implementation of the Affordable Care Act (ACA) in 2014, the number of Americans without health insurance fell by more than 13 million, from 41.8 million in 2013 to 28.1 million in 2016. As a result, the uninsurance rate fell from 13.3 to 8.8 percent (Barnett and Berchick 2017, table 1). Uninsurance rates have fallen most rapidly among adults under age 65 in Medicaid expansion states. Those rates fell by 9.3 percentage points, compared

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with only 3.7 percentage points in nonexpansion states, between 2013 and 2017 (Rudowitz and Antonisse 2018, fig. 1). Yet as of July 2018, 17 states had not expanded their Medicaid programs (Kaiser Family Foundation 2018).[1]

Children and pregnant women in low-income families are generally eligible for Medicaid; alternatively, in families with somewhat higher income levels, children are eligible for the Child Health Insurance Program (CHIP). Although income limits differ, all states cover children with family incomes of up to 175 percent of the federal poverty level, and some states cover children in families with incomes of up to 400 percent of the federal poverty level (Kaiser Family Foundation 2018). Eligibility of adults for Medicaid is far more limited and varies more widely among states, especially among expansion and nonexpansion states. Medicaid expansions extend eligibility to all documented adults with family incomes of up to 138 percent of the federal poverty level. In contrast, in the median nonexpansion state, parents with children legally classified as minors lose eligibility when their incomes reach 43 percent of the federal poverty level. Furthermore, in nonexpansion states, adults under age 65 without minor children are ineligible for Medicaid, no matter how poor they are (unless they are disability-program beneficiaries). Thus, the enormous variation across states in eligibility of low-income adults for Medicaid exacerbates inequality (Bruch, Meyers, and Gornick 2018).

Medicaid expansion policy is far from settled. Several states have passed or will soon hold referenda on expanding Medicaid (Milligan 2018). Congressional Republicans have made repeated attempts to end expansions or otherwise restrict Medicaid benefits; these efforts were recently supported by the Trump administration (Armour 2018; Aron-Dine, Chaudhry, and Broaddus 2018; Center on Budget and Policy Priorities 2018; Rudowitz 2018). Understanding the effects of Medicaid expansions on the well-being of low-income families is critical. After a comprehensive literature review, Larissa Antonisse and colleagues (2018) concluded that Medicaid expansions

1. Although 19 states have not expanded their Medicaid programs fully (i.e., to cover all adults with incomes up to 138 percent of the federal poverty level), we classify Wisconsin and Maine as neither expansion nor nonexpansion states because each state partially expanded benefits: Wisconsin extended benefits to all adults with incomes of up to 100 percent of the federal poverty level; Maine extended benefits to parents (but not childless adults) with incomes of up to 100 percent of the federal poverty level.

have increased insurance coverage, decreased out-of-pocket spending, increased care, improved self-reported health statuses, and reduced financial stress, and have not reduced employment.

The few studies to date on the effect of ACA-era Medicaid expansions on poverty have been limited by the poverty measures they employed. Long-standing conceptual and practical difficulties make it difficult to incorporate health care and health insurance into poverty measures (Citro and Michael 1995; Korenman, Remler, and Hyson 2017). Although the Census Bureau's supplemental poverty measure (SPM) has proven useful for measuring the effects of many noncash benefits on poverty (see, e.g., Fox et al. 2015*b*), its ability to assess the effects of health policies is limited. In this article, we explain how our recently developed health-inclusive poverty measure (HIPM) overcomes the long-standing difficulties in measuring the poverty effects of health insurance benefits (Korenman and Remler 2016; Remler, Korenman, and Hyson 2017), and we use the HIPM to provide estimates of the association between state Medicaid expansions and poverty.

We find that the HIPM poverty and deep poverty rates are about 10 percent lower in expansion than in nonexpansion states, while differences in SPM poverty rates are generally small and insignificant. Medicaid expansion is associated with substantially lower HIPM poverty reductions for children, persons 55 to 64 years old, blacks, Hispanics, and those who have not completed high school. Thus, these populations are particularly vulnerable to incipient and proposed rollbacks in Medicaid programs.

BACKGROUND AND LITERATURE

Poverty is defined as the lack of resources sufficient to attain a minimally adequate standard of living or to meet one's basic needs. Whether health insurance is considered a need depends on social norms. Such norms evolve over time. The view that health care is a basic need can be found in article 25 of the United Nations Universal Declaration of Human Rights (1948): "Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services, and the right to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood in circumstances beyond his control." And a National Academy of Sciences (NAS) panel on poverty measurement wrote that a poverty threshold that does not include a need for health care "fails to

acknowledge a basic necessity, namely, medical care, that is just as important as food or housing" (Citro and Michael 1995, 236).

Although health care is widely considered a human necessity, in the United States proponents of this perspective often frame this need as a need for affordable health insurance (e.g., Saloner and Daniels 2011). That every wealthy nation but the United States provides some form of universal health insurance to its citizens is further evidence of the widespread belief in a basic need for health insurance. In fact, the ACA was also intended to "achieve near-universal coverage."[2]

However, political opposition to the ACA shows that not all Americans consider health insurance a basic necessity. Nonetheless, a solid majority (60 percent) of American survey respondents agreed with the statement, "It is the responsibility of the federal government to ensure all that all Americans have health care coverage" (Blendon and Benson 2017, e12(2), table 2). And those who do not consider universal health insurance a federal responsibility may consider it the responsibility of state or local government, or a need to be met some other way.

If health insurance is considered a basic need, then the poverty measure should incorporate that need, and expansion of Medicaid could, theoretically, reduce poverty in three main ways. First, it could reduce poverty directly by providing a resource, health insurance, that ensured families could obtain care when needed. Second, Medicaid could reduce poverty indirectly by decreasing the need to pay out of pocket for health care, thus freeing up income for food, shelter, and other nonhealth necessities. Finally, Medicaid could reduce poverty by promoting the health of adult or child recipients. Better health could increase labor supply, workplace productivity, and the incomes of adult recipients, and it could increase the incomes of adults who were covered by Medicaid in childhood (Buchmueller, Ham, and Shore-Sheppard [2016] provide a comprehensive description of the Medicaid program and a review of the literature on its effects).[3]

The size and income targeting of Medicaid benefits imply that Medicaid could have major, direct effects on poverty. As of July 2017, 75 million

2. Patient Protection and Affordable Care Act, Pub. L. No. 111–148, 124 Stat. 119 through 124 Stat. 1025, § 1501, pt. D (2010).

3. Health insurance such as Medicaid protects people against the risk of bad health outcomes or financial distress. This is true even in years when those bad outcomes do not occur (e.g., Blinder 1985).

people (more than one in five Americans, nearly half of whom were children [Centers for Medicare and Medicaid Services 2018]) were enrolled in Medicaid (including CHIP). Nearly half the noninstitutionalized population covered by Medicaid/CHIP had family incomes below the federal poverty level, and 81 percent had incomes below twice the federal poverty level (MACPAC 2016, exhibit 2). Of the more than $500 billion spent annually on Medicaid (MACPAC 2016, exhibit 16), about $90 billion was spent on low-income adults, and another $90 billion was spent on low-income children (Kaiser Family Foundation 2016; other eligibility categories include the indigent disabled and the aged).[4] Indeed, Medicaid is the largest transfer program for the nonelderly low-income population. The $180 billion spent annually on low-income children and adults eclipses expenditures on any other means-tested benefit such as the Supplemental Nutrition Assistance Program (SNAP) or refundable tax credits such as the earned income tax credit, which each account for roughly $70 billion in annual spending (Joint Committee on Taxation 2017; US Department of Agriculture 2018).

The most widely used US poverty measures, the official poverty measure (OPM) and SPM, cannot fully capture the effects of the Medicaid program on poverty. The Census Bureau's OPM cannot capture either the direct or indirect effect of Medicaid on poverty because the OPM's definition of "resource" includes only cash income before taxes (not health insurance), and the OPM threshold does not recognize a need for health care or insurance (Citro and Michael 1995).[5] The SPM (Fox 2017) can capture only the indirect effect of Medicaid on poverty; by reducing out-of-pocket spending on health care and insurance, Medicaid frees up resources that can be spent on food and other nonhealth needs (Sommers and Oellerich 2013; Christopher et al. 2018; Zewde and Wimer 2019). Because the SPM threshold also does not include a need for health care or insurance, it cannot capture the direct effect of Medicaid on poverty—namely, ensuring

4. The $90 billion figure refers to the period October 1, 2013, through September 30, 2014, and therefore omits 12 full months of ACA-era Medicaid-expansion spending; it also omits spending on CHIP.

5. In principle, the OPM threshold includes a small monetary amount for out-of-pocket expenditures, but it excludes health care paid for by insurance and has not been adjusted for the massive growth in health-care costs in real terms since the early 1960s (Citro and Michael 1995, 226).

that people do not go without needed care simply because they are uninsured. This is the "access value" of health insurance (Nyman 2003; Korenman and Remler 2016). In principle, all three measures could capture any effects that Medicaid has on earnings through its improvement of health, because all poverty measures include earned income in their calculation of household resources.

Why has it been so difficult to incorporate health needs and benefits in measures of poverty? Some studies incorporate the value of health insurance benefits simply by adding a market value or actuarial value of health insurance to resources (income) without adjusting the poverty threshold to include a need for health care or benefits (e.g., Ben-Shalom, Moffitt, and Scholz 2012). This approach has two drawbacks that analysts readily acknowledge.

First, due to the enormous value of health insurance benefits, the addition of an insurance value to income suggested that some recipients could escape poverty on the basis of their insurance benefits alone (Smeeding 1982; Citro and Michael 1995, table 4-2). The problem is the implicit assumption of fungibility—that is, treating health insurance like cash implies either that health insurance benefits could be spent on goods other than health care or that they free up the equivalent in cash that, in the absence of insurance, would have been spent on health care (Smeeding 1977). Of course, health insurance benefits cannot be used to buy food or other necessities. And, because low-income, uninsured families typically do not spend the full cost of a health insurance policy on medical care, insurance does not free up the equivalent cash.[6] Efforts to make estimates of this type more realistic have attempted to include a lower fungible value rather than the full market value of health insurance benefits in resources (Smeeding 1982; US Census Bureau 1988*a*, 1988*b*; Winship 2016).

A second problem with this approach is that even if a lower, fungible value of health insurance were added to OPM resources, the resulting resource measure would remain conceptually inconsistent with the OPM needs threshold, which does not include a need for health care or insurance. About this approach, a NAS report on poverty measurement concluded that "to add the value of health insurance benefits to income (in

6. Thus, Yonatan Ben-Shalom and colleagues (2012) write that "OASI [Old-Age and Survivors Insurance], Medicaid, and Medicare have the largest impact at all poverty levels. . . . The fact that two of these programs are less valuable than cash must temper this conclusion" (725).

whole or in part) but not to add any amount to the poverty threshold—to allow either for medical care needs or for higher out-of-pocket expenses—is to ignore completely the increased costs of medical care and to assume the fungibility of medical care benefits. This approach is perverse. . . . Poverty estimates of this type are inappropriate" (Citro and Michael 1995, 231).

The NAS report included many recommendations to address problems with the OPM. These recommendations provided the conceptual basis for the SPM. A particularly important innovation of the SPM was the inclusion of tax credits and in-kind benefits such as the Earned Income Tax Credit and food assistance programs as resources. Thus, the SPM makes it possible for analysts to show the direct poverty-reducing effect of those benefits (e.g., Fox et al. 2015*b*; Kimberlin 2016; Pac, Waldfogel, and Wimer 2017).

This valuable inclusion of in-kind benefits in the SPM did not extend to health insurance benefits, such as Medicaid. The NAS panel could not find a conceptually valid and practical way to include health insurance benefits in resources because, despite considerable effort, they could not find a valid and practical method to determine health care or insurance needs (Moon 1993; Citro and Michael 1995, 223–37). The underlying barrier was that, at the time of the report (written before enactment of the ACA), the monetary amount required to purchase health insurance could depend on detailed health characteristics. Insurance companies could (and did) deny coverage for people with preexisting conditions, and they could (and did) charge premiums based on an individual's health status and history. In such an environment, it was impossible, as a practical matter, to define a health insurance need that could be added to the poverty threshold.

Instead, the NAS panel recommended a measure of nonhealth, or material, poverty. Thus, the SPM, following this recommendation, only partly addresses health-care and insurance needs, by deducting from resources all expenditures on health care and insurance. The NAS panel's justifying assumption for this deduction was that all medical out-of-pocket expenditures could be considered nondiscretionary, like taxes, and not available to meet basic needs such as food, clothing, and shelter.

By deducting health care and insurance expenditures from resources, the panel (and the SPM) implicitly defined the health need as whatever a family spends on health—no more and no less. This approach has several consequences. First, the SPM does not aim to determine whether or not health care or insurance needs are met. So the SPM does not measure the deprivation that occurs when people forego needed care because they are

uninsured. Second, the SPM poverty rate increases whenever people spend more on health insurance or care. Thus, the SPM will show people becoming poorer when they pay any amount for insurance out of pocket, even if that insurance is heavily subsidized and provides people who would otherwise be uninsured with much greater access to care. As a result of these limitations, the SPM can show only the indirect effect of Medicaid on poverty: how health insurance benefits reduce poverty by reducing out-of-pocket expenditures (e.g., Sommers and Oellerich 2013; Kimberlin 2016; Zewde and Wimer 2019). In this respect, the SPM's ability to measure the effect of health insurance on poverty is more limited than its ability to show effects of other in-kind and cash benefits.

In summary, fully accounting for the effect of Medicaid benefits on poverty requires a measure that both includes a basic need for health care or insurance and counts health insurance benefits as resources to meet that need. We refer to such a measure as an HIPM. In fact, the NAS report describes the ideal poverty measure as one that incorporates both health needs and health benefits, and the panel made efforts to develop such a measure, though it ultimately failed to do so. In light of this shortcoming, in its suggested approach, the report recommended that as the US health-care system evolves, the poverty measure be revisited (Citro and Michael 1995, 69).

Specific insurance regulations in the ACA make an HIPM possible and conceptually valid, as we explain in the next section. The HIPM we implement is a recently developed measure that builds directly on the SPM and treats health insurance as a basic need, like food and shelter (Korenman and Remler 2016). The HIPM allows analysts to measure the direct effect of health insurance benefits on poverty, just as the SPM allows analysts to measure the direct effects of nonhealth, in-kind benefits and tax credits on poverty (Remler et al. 2017). The omission of health insurance benefits from widely used poverty measures reduces estimates of the poverty-reducing effects of those benefits, both in absolute terms and relative to other antipoverty programs.

THE HEALTH-INCLUSIVE POVERTY MEASURE

Nearly all poverty measures designate a household as poor if its resources are less than the poverty threshold, defined as the expenditures required to attain a minimally adequate standard of living. Poverty measures differ in how they define resources and the poverty threshold. Our HIPM revises

the Census Bureau's SPM to account for health insurance needs, health insurance resources, and cost sharing. In this section, we explain the adjustments to the SPM needed to construct the HIPM.

The HIPM adjusts the SPM as follows: (1) It adds health insurance needs to the SPM threshold; (2) it does not deduct from resources out-of-pocket expenditures on health insurance premiums; (3) it adds health insurance benefits to resources; (4) it caps the deduction from resources of out-of-pocket expenditures on health care, including copayments and deductibles. Table 1 summarizes the principal differences between the OPM, SPM, and HIPM, with the main differences between the SPM and HIPM shown in bold. Table A2 shows a more detailed comparison (see also Korenman and Remler 2016; Remler et al. 2017 and their appendixes on methods).

HIPM Needs Threshold

The SPM threshold is defined as expenditures required for non–health-care and noninsurance needs: adequate food, clothing, shelter, and utilities (Fox 2017).[7] The HIPM threshold for a family unit equals the family's SPM threshold plus a value for basic health insurance. Conceptually, the health insurance need is the amount of cash needed by a family with no public or private health benefits of any kind to purchase insurance to meet their basic need for preventive care, or for physical or mental health care should they become injured or suffer from physical or mental illness. For those who are not Medicare recipients, the health insurance need is the unsubsidized premium of the second-least-expensive silver plan on the ACA marketplace "rating area" in which the family resides.[8] We selected this plan as the basic health insurance need because (*a*) it is required to cover a socially and politically determined set of care services; and (*b*) through subsidies, regulations, and insurance market institutions, the ACA intended to make the benefits conferred by this plan available and affordable to all. We present the reasons for and implications of our choice of this benchmark silver plan as the specific health insurance need in the discussion section.

7. For brevity, hereafter we will use the term "nonhealth needs" to mean needs other than health care and health insurance.

8. The ACA "rating areas" typically consist of a group of counties or, in some cases, an entire state. We use this geographical schema whenever possible. However, due to limited geographic information in the public-use Current Population Survey, we sometimes needed to aggregate rating areas. When we did so, we defined the basic plan as the most expensive of the second-least-expensive silver plan in the aggregated rating areas.

TABLE 1. Overview of Poverty Measures: OPM, SPM, and HIPM

	OPM	SPM	HIPM
Needs threshold	3× basic food needs in 1960s, updated for inflation with CPI	33rd percentile of spending on food, shelter, clothing, and utilities, plus a bit	33rd percentile of spending on food, shelter, clothing, and utilities, plus a bit + **cost of basic health insurance**
Resources	Pretax cash income	After-tax cash income: + tax credits + in-kind benefits (non–health insurance)	After-tax cash income: + tax credits + in-kind benefits (non–health insurance) + **health insurance benefits**
Subtractions from resources		Work and childcare expenses: Out-of-pocket expenditures on care (nonpremium MOOP) Out-of-pocket expenditures on insurance (premium MOOP)	Work and childcare expenses: **Capped** out-of-pocket expenditures on care (nonpremium MOOP)

Note.—OPM = official poverty measure; SPM = supplemental poverty measure; HIPM = health-inclusive poverty measure; CPI = consumer price index; MOOP = medical out-of-pocket expenditures.

This definition of health-care needs fits well with the SPM threshold, which is the amount of resources a family needs to consume a socially determined minimally adequate level of food, clothing, shelter, and utilities (plus a bit more for other items). However, some adjustment is required to handle the need to pay for cost sharing, such as copayments and deductibles, which we discuss further below.

For Medicare recipients, the basic health insurance need is the least expensive Medicare Advantage prescription drug plan available in their area.[9] Medicare Advantage plans are intended to provide all needed services and prescriptions for Medicare beneficiaries (Jacobson et al. 2016; Kaiser Family Foundation 2017). These plans have much less cost sharing than traditional Medicare and have legal limits on out-of-pocket expenditures on care. However, the Medicare population is not the focus of Medicaid expansion policies discussed in this article.

It is possible to define a need, in dollars, for health insurance for inclusion in the poverty threshold if, given sufficient income, anyone could be

9. The basic health insurance need includes the full cost of that plan: average government Medicare spending plus the Part B premium plus the Medicare Advantage prescription drug premium.

assured of the ability to meet that need by purchasing insurance. The ACA regulations of "guaranteed issue" and "community rating" made this possible throughout the United States. *Guaranteed issue* means that insurance companies cannot refuse to sell insurance to individuals. *Community rating* means that the premiums charged cannot depend on a person's health. Under the ACA, premiums can depend only on smoking status, family size, and, in a limited way, age and family structure. These regulations mean that the health insurance need added to the SPM threshold to form the HIPM threshold is determined by the health insurance premium for the silver plan available in a family's ACA rating area, and the number and ages of persons covered by the policy. We use the premium rate for nonsmokers.

Table 2 presents average SPM and HIPM thresholds for families of different sizes and age compositions. The health insurance need makes up a considerable portion of the HIPM threshold. For example, for a family with two parents and two children, the average SPM threshold is about $26,000 and the average HIPM threshold is about $36,700.

The HIPM poverty thresholds may strike some readers as high. However, these thresholds accurately reflect the high cost of US health care and the high price of health insurance that pays for that care. Indeed, the high cost of health care is the reason for the enormous value of employer and public health insurance in meeting health-care needs.

TABLE 2. SPM and HIPM Average Thresholds by Family Type, 2015

Family Composition	SPM Threshold ($)	HIPM Threshold ($)	Health Insurance Need ($)	*n*
All families (SPM units)	24,275	35,831	11,556	148,683
Families without children present:				
Lone adult	12,028	16,061	4,034	12,255
Adult couple, no children	16,486	26,660	10,174	22,073
3 or more adults, no children	29,234	45,850	16,617	14,704
Families with children present:				
Single parent:				
1 child	17,660	23,456	5,797	3,975
2 children	21,044	28,226	7,182	3,933
≥3 children	25,310	34,112	8,803	3,262
2 parents:				
1 child	22,618	32,001	9,383	17,234
2 children	25,956	36,734	10,778	25,635
≥3 children	29,790	42,191	12,401	20,035
≥3 adults:				
1 child	32,098	48,356	16,258	11,263
2 children	34,907	52,903	17,996	8,046
≥3 children	39,429	59,556	20,127	6,268

Note.—Weighted means. SPM = supplemental poverty measure, HIPM = health-inclusive poverty measure.

HIPM Resources

SPM resources include all nonhealth resources: in-kind benefits, such as housing vouchers, and cash income after taxes, tax credits, and work expenses. To partly address health needs, the SPM subtracts from resources all out-of-pocket expenditures on health care, insurance, and over-the-counter medication. Because the HIPM instead accounts for health insurance needs by adding an explicit insurance need to the threshold, the HIPM resource measure begins with the SPM resource measure, but without deducting any out-of-pocket health expenditures.

The HIPM then adds any health insurance benefits the family receives to this starting nonhealth resource measure. For those provided health insurance by an employer or government, the health insurance resource is the same as the health insurance need minus required out-of-pocket premium payments. Because health insurance cannot be used to purchase other necessities, such as food, we do not allow the value of health insurance benefits to exceed the need for health insurance.[10]

For those who buy individual insurance either on an ACA marketplace or directly from an insurance company, we add to resources the ACA premium subsidies for which such persons are eligible based on their income and family structure. These subsidies are paid through the federal personal-income-tax system. Thus, our assignment of ACA premium subsidies based on income and health insurance type is consistent with the Census Bureau's practice of imputing taxes paid and tax credits received based on reported income and family relationships (Short, Donahue, and Lynch 2012).

The uninsured and those who purchase insurance without subsidies have no health insurance resources. If they lack income to pay for unsubsidized health insurance and other needs, they are poor.

Cost Sharing

Even those with insurance must pay for some care out of pocket, such as deductibles and copayments. The HIPM addresses these cost-sharing needs by subtracting from resources out-of-pocket expenditures on care only, a

10. The SPM treats housing benefits in a similar fashion. "Thus, the values for housing subsidies included as income are limited to the proportion of the threshold that is allocated to housing costs. The subsidy is capped at the housing portion of the appropriate threshold MINUS the total tenant payment" (Fox 2018, 17).

modification of the SPM deduction of all out-of-pocket health spending. In addition, the HIPM caps the deduction of care expenses at the relevant out-of-pocket maximum, such as $6,600 for an individual in 2015. The cap is much lower, often zero, for Medicaid recipients, depending on state policy.[11]

WHO CAN MEDICAID LIFT OUT OF POVERTY?

Under the HIPM, Medicaid moves a family out of poverty when it increases their resources from below to above the HIPM threshold. This can occur only for families with resources within a certain range. Figure 1 illustrates how Medicaid benefits affect poverty status under the HIPM for two hypothetical families, each consisting of one adult and two children. The lower horizontal line shows the SPM needs threshold ($21,000); the upper line shows the HIPM threshold ($28,000); and the distance between the two equals the health insurance need ($7,000). Both families receive Medicaid benefits that fully meet their health insurance needs and have no required out-of-pocket premium. Medicaid benefits therefore add $7,000 to HIPM resources.

Family A has $19,800 in nonhealth resources (dark-gray bar), which is below the SPM threshold and which is, therefore, insufficient to meet their material needs. Because their nonhealth resources are below the SPM threshold, they are more than $7,000 below the HIPM threshold. So, even though Medicaid fully meets their health insurance need, Medicaid cannot remove them from HIPM poverty because their material needs are not met.

Family B has $25,000 in nonhealth resources. Medicaid lifts family B out of HIPM poverty: the HIPM resource bar (dark-gray plus light-gray) stands above the HIPM threshold. In general, Medicaid can remove from HIPM poverty families with nonhealth resources between the SPM and HIPM thresholds. Medicaid can also prevent families with incomes just above the HIPM threshold from falling into poverty as a result of out-of-pocket medical care expenses.

We restrict some analyses to persons potentially affected by Medicaid expansion: that is, for HIPM poverty, families with nonhealth resources

11. The SPM deducts spending on over-the-counter medications from resources. The HIPM does not.

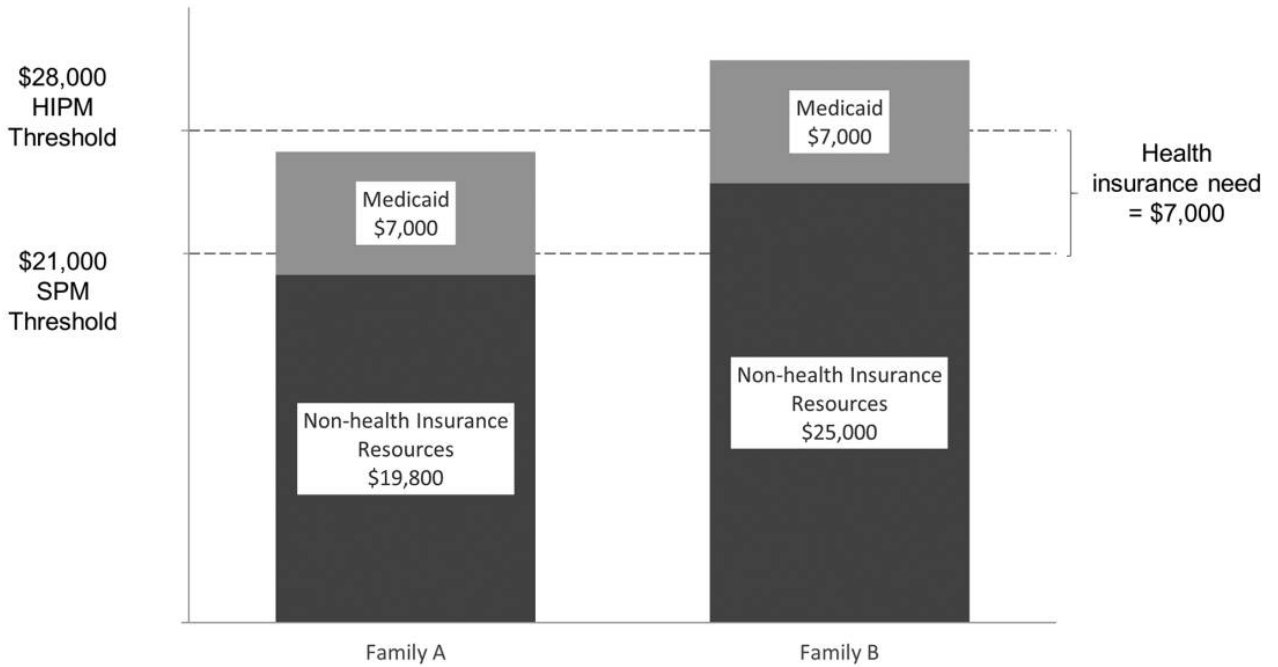

FIGURE 1. Examples of families for whom Medicaid can (B) and cannot (A) reduce poverty, according to the health inclusive poverty measure (HIPM). SPM = supplemental poverty measure. Medicaid benefits can lift a family out of HIPM poverty when the family's nonhealth resources fall between the SPM and HIPM thresholds (family B) but not when they fall below the SPM threshold (family A). In this example, the basic health insurance need is $7,000, and Medicaid meets that need with no required premiums or cost sharing.

between the SPM and HIPM threshold, and for deep HIPM poverty, families with nonhealth resources between one-half the SPM threshold and the HIPM threshold. In those analyses, we include families with resources up to 150 percent of the HIPM threshold to capture effects of Medicaid expansions in preventing falls into poverty from out-of-pocket expenditures.

To capture Medicaid's effects on families that are too poor to be removed from HIPM poverty by Medicaid expenses, we also study HIPM deep poverty. Deep poverty is traditionally defined as having resources equaling less than one-half the poverty threshold (e.g., Fox et al. 2015*a*; Kimberlin 2016; Berger, Cancian, and Magnuson 2018). We define HIPM deep poverty as having HIPM resources of less than one-half the SPM threshold plus the full health insurance need. This definition is consistent with the deep poverty threshold used by other analysts, though it adds a need for health insurance.

DATA

We use the Current Population Survey Annual Social and Economic Supplement, conducted in March 2016—the data the Census Bureau used for the 2015 OPM and SPM (US Census Bureau 2016). We calculate poverty rates for individuals, which are the share of individuals who are poor, based on the poverty status of their family unit. We use the broad definition of the family unit under the SPM, "resource unit," which includes unmarried cohabiters, among others. We present poverty rates for individuals who are under age 65. However, because those individuals may reside with persons over age 65, we retain full family units in our analysis sample. We exclude families with a disability recipient, because eligibility for Medicaid for those families was not affected by Medicaid expansion. We used Borjas's (2017) method to impute undocumented status and used that information in our calculations of eligibility for ACA premium subsides, and to form controls for immigration status.

We gathered information on health insurance premiums and cost sharing from three sources: ACA marketplace plan data from the Robert Wood Johnson Foundation (2017) Health Insurance Exchange (HIX) Compare database; Medicare Advantage prescription drug plans data from the Centers for Medicare and Medicaid Services via the National Bureau of Economic Research (2016); and information on rules for Medicaid and the Children's Health Insurance Program, primarily from Henry J. Kaiser Family

Foundation reports (National Academy for State Health Policy 2014; Smith et al. 2014; Brooks et al. 2015).[12] Finally, to determine eligibility for means-tested ACA premium subsidies and reduced cost-sharing caps, we used the family health insurance units defined in the Integrated Public Use Microdata Series–Current Population Survey (IPUMS-CPS) data file (Flood et al. 2017).

Our definition of "expansion state" includes any state that had fully expanded Medicaid as of February 2015.[13] Therefore, expansion states include states that expanded as a result of the ACA, as well as states with ACA-like expansions that took place before January 2014. We also conduct supplemental analyses to examine differences between pre-ACA expansions and expansions resulting from the ACA. We exclude Alaska because it did not expand until September 2015. We also exclude Wisconsin and Maine, which had only partly expanded as of 2015. For Vermont and Washington, DC, only, we exclude from the analysis sample families with a member imputed to be undocumented because, in those locations, individual plans can be purchased only on the ACA marketplaces, and undocumented persons are not eligible.

ANALYTIC STRATEGY

We compare rates of poverty between expansion and nonexpansion states according to three measures: the SPM, the SPM with no deduction of out-of-pocket medical spending, and the HIPM. Comparing the SPM poverty rate with and without the deduction of out-of-pocket medical spending shows how the SPM captures the indirect effect of Medicaid on poverty—the effect through reduced payments for care or insurance out of pocket. We also compare health insurance coverage between expansion and nonexpansion states.

12. Whenever possible, we used information on ACA marketplace plans available in the ACA rating area in which a family resides—usually a group of counties, sometimes an entire state. However, the geographic information available on the CPS public-use files does not always allow exact geographic match to ACA rating areas. In such cases, we aggregated rating areas to the smallest unit available in the CPS, most often a metropolitan area within a state, and defined the basic plan as the most expensive of the second-least-expensive silver plan within the rating areas contained in the larger geographic area.

13. The nonexpansion states as of February 2015 were Tennessee, South Carolina, Nebraska, Utah, Wyoming, South Dakota, Oklahoma, North Carolina, Virginia, Kansas, Georgia, Florida, Mississippi, Idaho, Missouri, Texas, and Alabama.

We estimate differences between expansion and nonexpansion states in rates of HIPM poverty and deep poverty as unadjusted rate differences and unadjusted odds ratios (ORs). These are, of course, descriptive differences, which are due to a combination of Medicaid expansion policies and other differences between expansion and nonexpansion states, including incomes, cost of living, and generosity of other benefits (e.g., Bruch et al. 2018). If the goal is to isolate the causal effect of expansions on poverty, then one would not want to include the effects of these other variables to the extent that they are confounders rather than mediators. In other words, to the extent that Medicaid expansion changes incomes, perhaps by improving health and increasing labor supply, a causal estimate would incorporate these mediators and they should not be used as controls (Baron and Kenny 1986; Remler and Van Ryzin 2015, chap. 12). To the extent that the political process and other drivers and correlates of expansion include income, other benefits, and cost of living, a causal estimate would control for these confounders.

The most common method of estimating the effects of Medicaid expansion on most outcomes is difference-in-differences (e.g., Antonisse et al. 2018).[14] Because HIPM validity requires specific health insurance regulations, we cannot calculate a nationwide HIPM before 2014 and therefore cannot create a difference-in-difference estimate of the causal effect of expansions on HIPM poverty. Instead, our goal is to isolate the effect of the expansion on HIPM poverty through the channel of health insurance. This channel should include the direct consequences of health insurance, such as out-of-pocket expenditures on care.

This approach means that our preferred models with controls for confounders miss the effects that Medicaid expansion might have on income or other benefits. So far, however, the literature has found the effects of expansion on these other variables to be modest at best. Specifically, there is little evidence for an effect of Medicaid on labor supply or income (Ben-Shalom et al. 2012; Antonisse et al. 2018) and at most small effects on means-tested program benefits (Schmidt, Shore-Sheppard, and Watson 2018). In contrast, the effect of Medicaid expansions on insurance coverage is well established (Courtemanche et al. 2017; Kaestner et al. 2017; Antonisse et al. 2018).

14. In fact, difference-in-differences analyses of Medicaid expansion effects may not be valid for a variety of outcomes because the parallel-trends assumption is not credible or because the study designs lack statistical power (Black et al. 2019).

Moreover, our approach of isolating the effect of expansion that works through the health insurance channel is consistent with common approaches to estimating the effects of public benefits on poverty, which capture only direct effects (e.g., Fox et al. 2015*b*). These include estimates of the causal effect of the entire Medicaid program on SPM poverty by Sommers and Oellerich (2013) and Zewde and Wimer (2019, exhibit 2). These studies estimate the effect of Medicaid on poverty through out-of-pocket spending on care, insurance, and over-the-counter medications only, and not through changes in labor market income or other social benefits.

To isolate the effect of expansions on poverty through the channel of health insurance and to understand which confounders are important, we estimate logistic regressions with various sets of controls. We first adjust poverty differences between expansion and nonexpansion states for race and ethnicity, age, family composition, education, and immigration status, hereafter "sociodemographics." We then further adjust for the SPM threshold and nonhealth resources, which are income and benefits other than health insurance, as well as the premium of the basic silver plan. The SPM threshold captures regional differences in housing costs, in addition to adjusting for family size, age composition, and homeownership status (Fox 2017).

The question of whether to control for the benchmark silver plan premiums is complicated. On the one hand, expansion has been estimated to reduce silver plan premiums by between 11 and 15 percent, because expansion takes less healthy people out of the individual insurance market and into the pool of Medicaid recipients, making the remaining marketplace risk pool healthier and less costly (Peng 2017; Sen and DeLeire 2018). If our goal were to include all effects through health insurance, we would not want to control for this mechanism of expansion. However, premiums differ between expansion and nonexpansion states for exogenous reasons that are effectively confounders: cost of labor and real estate and preexisting differences in styles of medical practice. In fact, in our data, silver plan premiums are higher by about $145 per month in expansion states (at age 27), probably reflecting their generally higher costs of real estate and labor. We do want to control for differences in premiums due to those reasons, but our non–health insurance resources and the SPM threshold should partly control for the cost-of-care differences component of premium differences. To examine these issues, we estimate our final models both with and without controls for the silver premium.

We take two approaches to adjusting for nonhealth resources relative to needs. First, we adjust for the SPM threshold and nonhealth resources as continuous variables. Alternatively, we control for categories of nonhealth resources relative to needs. Because logistic regression cannot estimate effects of covariates that perfectly predict the outcome, regressions with categorical resource controls cannot include indicators for portions of the nonhealth resource distribution in which everyone or no one is classified as poor according to the HIPM ("HIPM poor"). Specifically, we cannot estimate effects for the entire sample and include indicators for nonhealth resources below the SPM threshold, where everyone is HIPM poor, and for nonhealth resources greater than 150 percent of the HIPM threshold, where no one is poor. Consequently, for analyses that include controls for categories of resource variables, we must restrict our analytic sample to the range where people might or might not be HIPM poor. Similarly, for deep HIPM poverty, we could not include groups with nonhealth resources equaling less than half the SPM threshold or non–health insurance resources above the HIPM threshold.

Because the ACA (including the Medicaid expansion) increased health insurance coverage by different amounts for different demographic groups (Buchmueller, Levinson, et al. 2016), we also estimate models to estimate adjusted effects of Medicaid expansion for each of the following subsamples: individuals in families headed by someone who had not completed high school, Hispanics, non-Hispanic blacks, non-Hispanic whites, children, adults aged 55–64, single adults with no children present, couples with no children present, and individuals in single-mother families.

In all analyses, we apply CPS March Supplement weights to produce estimates representative of the US population. We also use replicate weights to correct confidence intervals and other inferential statistics for the complex sampling design of the CPS.[15]

For logistic regressions, we present ORs and average marginal effects (AMEs). The AME is the average predicted probability of HIPM poverty if the entire sample resided in an expansion state minus the average

15. The appropriate Stata 14.2 svy commands and successive difference replication are used to estimate standard errors adjusted for the complex sample design; see US Census Bureau (2006, chap. 14). When these standard errors could not be estimated for at least one replicate, we report standard errors clustered on the SPM unit, multiplied by the ratio of the svy standard error to clustered standard error in a simpler version of the same model. These ratios ranged from 0.9 to 1.1.

predicted probability of HIPM poverty if the entire sample resided in a nonexpansion state, with all other variables set to their observed values (Wooldridge 2002; StataCorp 2015, 1271–72). The AME is interpretable as the adjusted percentage point difference in poverty rates between expansion and nonexpansion states.

RESULTS

POVERTY AND HEALTH INSURANCE DIFFERENCES BY STATE MEDICAID EXPANSIONS

Poverty rates depend on the measure of poverty used. For example, in nonexpansion states, the HIPM poverty rate is 2 percentage points higher than the SPM rate (15.5 vs. 13.6 percent; table 3).

TABLE 3. Poverty Rates and Health Insurance Coverage by Medicaid Expansion Status, 2015

	Nonexpansion States (1)	Expansion States (2)	Difference (1) – (2)	[95% CI for Difference]
A. Poverty rates (%):				
SPM	14.7	14.1	.6	[−.3, 1.5]
SPM, no medical out-of-pocket deduction	11.3	11.1	.2	[−.6, 1.0]
HIPM	16.9	15.3	1.6*	[.7, 2.5]
B. Deep poverty rates (%):				
SPM	5.5	4.8	.7*	[.2, 1.2]
HIPM	7.0	5.7	1.3*	[.7, 1.9]
C. HIPM poverty rate, by non–health insurance resources (%):				
Below SPM threshold	100.0	100.0	.0	NA
SPM threshold to HIPM threshold	43.2	31.9	11.3*	[8.3, 14.3]
Above HIPM threshold	.3	.3	.01	[−.1, .1]
D. Distribution of non–health insurance resources (%):				
Below SPM threshold	11.3	11.1	.2	[−.6, 1.0]
SPM threshold to HIPM threshold	12.5	12.6	−.1	[−.8, .6]
Above HIPM threshold	76.2	76.3	−.1	[−1.1, .9]
E. Health insurance coverage (%):				
Medicaid	14.0	17.9	−3.8*	[−4.5, −3.1]
Uninsured	14.7	8.3	6.4*	[5.8, 7.0]
Individual purchase (nongroup)	9.0	8.9	.1	[−.5, .7]
Medicare, employer, and other	62.2	64.9	−2.7*	[−3.7, −1.7]
No. states	19	29	. . .	. . .
Unweighted *n*	60,768	87,915	. . .	. . .

Note.—CI = confidence interval; SPM = supplemental poverty measure; HIPM = health-inclusive poverty measure; NA = not applicable; by construction, the HIPM poverty rate must be 100% in this resource range. Expansion states are those that expanded by February 1, 2015. Maine and Wisconsin are excluded from the analysis sample because they incompletely expanded. Alaska is excluded because it expanded late in 2015. Estimates are for persons under age 65 and exclude persons who report disability benefit receipt and families in Washington, DC, and Vermont with an imputed undocumented person.

* $p < .05$ for tests of difference in rates and proportions.

Differences in poverty rates between expansion and nonexpansion states also depend on the poverty measure employed. According to the SPM, nonexpansion states are poorer than expansion states (14.7 vs. 14.1 percent; table 3), though the difference is not statistically significant. The SPM rates without the medical out-of-pocket expenditure deduction are more similar (11.1 percent in expansion states vs. 11.3 percent in nonexpansion states), suggesting rough comparability of material poverty. The larger difference in SPM poverty with the medical out-of-pocket expenditure deduction than the difference observed without the deduction suggests that Medicaid expansion is associated with reduced poverty through lower out-of-pocket expenditures on care and insurance.

The HIPM poverty rate, which more fully accounts for health insurance needs and benefits, is 1.6 percentage points (9.5 percent) lower in expansion than in nonexpansion states (a rate of 16.9 vs. 15.3 percent). The difference in HIPM poverty is statistically significant, while the corresponding difference in SPM poverty is not. SPM deep poverty is 0.7 percentage points (13 percent) lower in expansion than in nonexpansion states, while the HIPM deep poverty rate is 1.3 percentage points (19 percent) lower.

Differences in HIPM poverty rates are entirely accounted for by the 11.3 percentage point difference between those with nonhealth resources between the SPM and HIPM thresholds (table 3, panel C); the difference is zero for those with resources below the SPM threshold or above the HIPM threshold. Consequently, differences between expansion and nonexpansion states in the distribution of nonhealth resources could, in theory, affect HIPM poverty differences. However, the distribution of family resources is fairly similar: 11.3 percent below the SPM threshold in nonexpansion states compared with 11.1 percent below in expansion states and, respectively, 76.3 percent above the HIPM threshold in nonexpansion states versus 76.2 percent in expansion states. The great similarity in the distribution of nonhealth resources suggests that differences in HIPM poverty are primarily due to differences between nonexpansion and expansion states in health insurance benefits among families with nonhealth resources (income and other benefits) between the SPM and HIPM thresholds.

Medicaid expansion should lower health-inclusive poverty by improving health insurance coverage in the low-income population. Panel E of table 3 confirms that, overall, the proportion covered by Medicaid is lower (by 3.8 percentage points) and the proportion uninsured is higher (by 6.4 percentage points) in nonexpansion than in expansion states. Figure 2

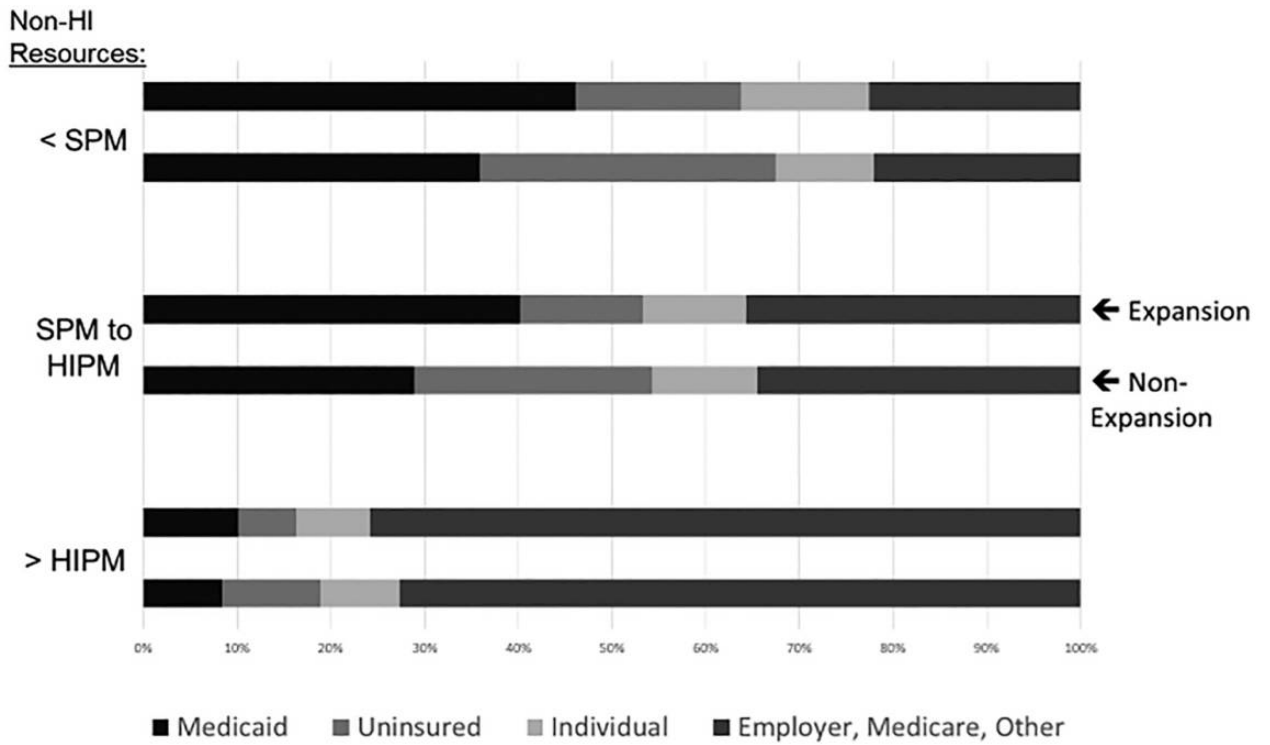

FIGURE 2. Health insurance status by non–health insurance resources in expansion and nonexpansion states. HI = health insurance; HIPM = health-inclusive poverty measure; SPM = supplemental poverty measure.

shows how insurance status differs by level of non–health insurance resources; within resource categories, it shows how insurance status differs between expansion and nonexpansion states. Medicaid expansion is associated with especially large difference in insurance coverage among families with nonhealth resources between the SPM and HIPM thresholds. In this range, the rate of Medicaid coverage is 11 percentage points lower, and the percentage uninsured is 12 points higher in nonexpansion than expansion states. We see no obvious evidence of crowding out of employer insurance by Medicaid expansion in this range, and we observe only slightly higher rates of individual insurance in nonexpansion states; these findings are consistent with other evidence (Dworsky and Eibner 2016).

REGRESSION-ADJUSTED MEDICAID EXPANSION EFFECTS

Table 4 shows logistic regression estimates of differences between nonexpansion and expansion states in SPM and HIPM poverty and deep poverty, unadjusted and adjusted. Unadjusted, SPM and SPM deep poverty are each 0.6 and 0.7 percentage points lower in expansion states with ORs of 0.95 and 0.87, respectively (model 1).[16]

Adjusting for demographics, differences in SPM poverty rates are not statistically significant (+0.5 percentage points for SPM poverty and −0.3 percentage points for SPM deep poverty; see table A1 for covariate means by Medicaid expansion status).

In contrast, unadjusted, HIPM poverty is 1.6 percentage points lower and HIPM deep poverty is 1.3 percentage points lower in expansion than in nonexpansion states ($p < .05$). Adjusting for sociodemographics, HIPM poverty is 0.4 percentage points lower and HIPM deep poverty is 0.9 percentage points lower in expansion than in nonexpansion states (model 2; $p < .05$ for HIPM deep poverty). Because the HIPM deep poverty rate is, on average, less than half the HIPM poverty rate, adjusted effects on HIPM deep poverty are proportionately larger than on HIPM poverty.

Further adjusting for the silver plan premium, nonhealth resources and the SPM threshold raises the differential between nonexpansion and expansion states to 1.7 percentage points for HIPM poverty; the difference remains at 0.9 percentage points for HIPM deep poverty (model 3; $p < .05$ for both HIPM poverty and HIPM deep poverty). Thus, Medicaid expansion is

16. Tables with results for the complete logistic regression models are presented in app. B.

TABLE 4. Unadjusted and Regression-Adjusted Differentials in Poverty and Deep Poverty Rates between Medicaid Expansion and Nonexpansion States, Health-Inclusive and Supplemental Poverty Measures, 2015

	Poverty		Deep Poverty	
Outcome	OR or AOR [95% CI]	AME [95% CI]	OR or AOR [95% CI]	AME [95% CI]
SPM:				
Model 1, unadjusted	.95 [.89, 1.0]	−.60 [−1.4, .20]	.87* [.79, .96]	−.70* [−1.1, −.20]
Model 2, adjusted for sociodemographics and silver plan premium	1.0 [.97, 1.1]	.50 [−.3, 1.3]	.93 [.84, 1.0]	−.30 [−.80, .20]
Mean of outcome in nonexpansion state (%)	14.7		5.5	
HIPM:				
Model 1, unadjusted	.89* [.83, .95]	−1.6* [−2.5, −.70]	.80* [.73, .89]	−1.3* [−1.8, −.70]
Model 2, adjusted for sociodemographics	.96 [.90, 1.0]	−.40 [−1.2, .40]	.85* [.77, .94]	−.90* [−1.4, −.3]
Model 3, adjusted for sociodemographics, silver plan premium, SPM threshold, and non–health insurance resources	.53* [.46, .61]	−1.7* [−2.1, −1.3]	.54* [.43, .64]	−.90* [−1.2, −.60]
Mean of outcome in nonexpansion state (%)	16.9		7.0	

Note.—OR = odds ratio from univariate logistic regressions, AOR = adjusted odds ratio from multivariable logistic regressions; AME = average marginal effect; CI = confidence interval; SPM = supplemental poverty measure; HIPM = health-inclusive poverty measure. AME is the average predicted probability of HIPM poverty if the entire sample resided in an expansion state minus the average predicted probability of HIPM poverty if the entire sample resided in a nonexpansion state, with all other variables set to their observed values. For the estimated effect of Medicaid expansion on HIPM deep poverty in model 3, standard errors could not be estimated using svy logit. Instead, we used the estimates from an identical logit specification where standard errors were clustered at the SPM unit. We further adjusted these standard errors by the ratio of the standard errors from the svy logit estimate of model 2 to a logit with clustered standard errors.

* $p < .05$.

associated with 10 percent lower HIPM poverty and 13 percent lower HIPM deep poverty.[17] Not adjusting for the benchmark silver plan premium changes our results only slightly: 1.6 and 0.8 percentage points for HIPM poverty and deep poverty, respectively.

Only families with nonhealth resources in specific ranges can be lifted from HIPM poverty or deep poverty by Medicaid benefits, as explained in

17. Adjusted differences in HIPM poverty and deep poverty (according to model 3) are statistically significant, whether states expanded before or after January 1, 2014 (table A3). However, the adjusted difference in HIPM poverty is about 0.9 percentage points greater among states that expanded before 2014, and the adjusted difference in HIPM deep poverty is 0.7 percentage points greater.

the "Analytic Strategy" section. Table 5 shows results of logistic regression models estimated for the subsample of such families. After adjustment, the HIPM poverty rate and deep poverty rate are 4.8 and 4.5 percentage points lower in expansion than in nonexpansion states, respectively ($p < .05$). Because HIPM poverty and deep poverty rates in nonexpansion states are 16.3 and 14.5 percent, respectively, for families with resources in these ranges, the proportional effects of Medicaid expansion on poverty are very large for these families: 29 and 31 percent.

Differences in HIPM poverty and deep poverty adjusted for nonhealth resources should result overwhelmingly from effects of Medicaid expansion on insurance benefits. We confirmed that our methods produced effects on health insurance consistent with those in the literature, although the effects were near the upper end of the ranges estimated (Courtemanche et al. 2017; Kaestner et al. 2017; Antonisse et al. 2018). Specifically, table 6 shows the result of regressions in which indicators for "uninsured" and "has any health insurance benefits" are the dependent variables. In these regressions, Medicaid expansion is associated with a decrease in uninsurance of 5.3–6.1 percentage points, depending on controls, and an increase in

TABLE 5. Regression-Adjusted Differentials in HIPM Poverty and Deep Poverty Rates between Medicaid Expansion and Nonexpansion States, Families Whose Poverty or Deep Poverty Status Could Be Affected by Medicaid Expansion, 2015

	HIPM Poverty		HIPM Deep Poverty	
	AOR [95% CI]	AME [95% CI]	AOR [95% CI]	AME [95% CI]
Sociodemographics, silver plan premium, SPM threshold and non–health insurance resources	.52* [.45, .60]	−4.8* [−5.9, −3.8]	.50* [.41, .62]	−4.5* [−5.9, −3.2]
Subsample:				
Mean outcome in nonexpansion states (%)	16.3		14.5	
Weighted population share, all states (%)	34.3		19.8	
n unweighted, all states	52,876		29,016	

Note.—HIPM = health-inclusive poverty measure; AOR = adjusted odds ratio from multivariable logistic regressions; AME = average marginal effect; CI = confidence interval; SPM = supplemental poverty measure. For HIPM poverty, analysis subsamples are families with nonhealth resources between the SPM threshold and 1.5 times the HIPM threshold. For HIPM deep poverty, subsamples are families with non–health insurance resources between one-half the SPM threshold and the HIPM threshold. AME is the average predicted probability of HIPM poverty if the entire sample resided in an expansion state minus the average predicted probability of HIPM poverty if the entire sample resided in a nonexpansion state, with all other variables set to their observed values.

* $p < .05$.

TABLE 6. Unadjusted and Regression-Adjusted Differentials in HI Benefits and Uninsurance between Medicaid Expansion and Nonexpansion States, 2015

	Any HI Benefits		Uninsured	
	OR or AOR [95% CI]	AME [95% CI]	OR or AOR [95% CI]	AME [95% CI]
Model 1, unadjusted	1.47 [1.40, 1.55]	5.4 [4.7, 6.1]	.53 [.50, .56]	−6.1 [−6.7, −5.6]
Model 2, adjusted for sociodemographics	1.51 [1.43, 1.59]	5.3 [4.7, 6.0]	.52 [.49, .55]	−5.8 [−6.3, −5.3]
Model 3, adjusted for sociodemographics, SPM threshold, and non–health insurance resources	1.47 [1.39, 1.55]	5.0 [4.3, 5.7]	.55 [.52, .58]	−5.3 [−5.8, −4.8]

Note.—All $p < .05$; $n = 148{,}683$. HI = health insurance; OR = odds ratio from univariate logistic regressions; AOR = adjusted odds ratio from multivariable logistic regressions; CI = confidence interval; SPM = supplemental poverty measure; HIPM = health-inclusive poverty measure. AME is the average predicted probability of HIPM poverty if the entire sample resided in an expansion state minus the average predicted probability of HIPM poverty if the entire sample resided in a nonexpansion state, with all other variables set to their observed values.

the proportion of individuals with any insurance benefits of 5.0–5.4 percentage points ($p < .05$).

MEDICAID EXPANSION DIFFERENCES BY SELECTED CHARACTERISTICS

Figures 3 and 4 show adjusted differences in HIPM deep poverty and HIPM poverty associated with Medicaid expansion for different subsamples. The light-gray portion of each bar shows the adjusted expansion–nonexpansion differential from logistic regression models with full controls (including nonhealth resources and the SPM needs threshold), while the sum of the dark-gray and light-gray portions shows the actual deep poverty or poverty rate for the group in nonexpansion states.

Figure 3 suggests Medicaid expansion is associated with lower HIPM poverty, especially for persons in families headed by someone without a high school degree (nearly 5 percentage points lower in expansion than in nonexpansion states) and Hispanics (4 percentage points lower in expansion than in nonexpansion states). There are also sizable and statistically significant differences for non-Hispanic blacks, children, single parents, and persons ages 55–64. The small differential for one-person families is surprising, as lone adults have high poverty rates and gained eligibility though Medicaid expansion. This result partly reflects the preponderance of lone-adult families with incomes too low to be lifted out of HIPM poverty by Medicaid: 22.2 percent of lone-adult families have nonhealth

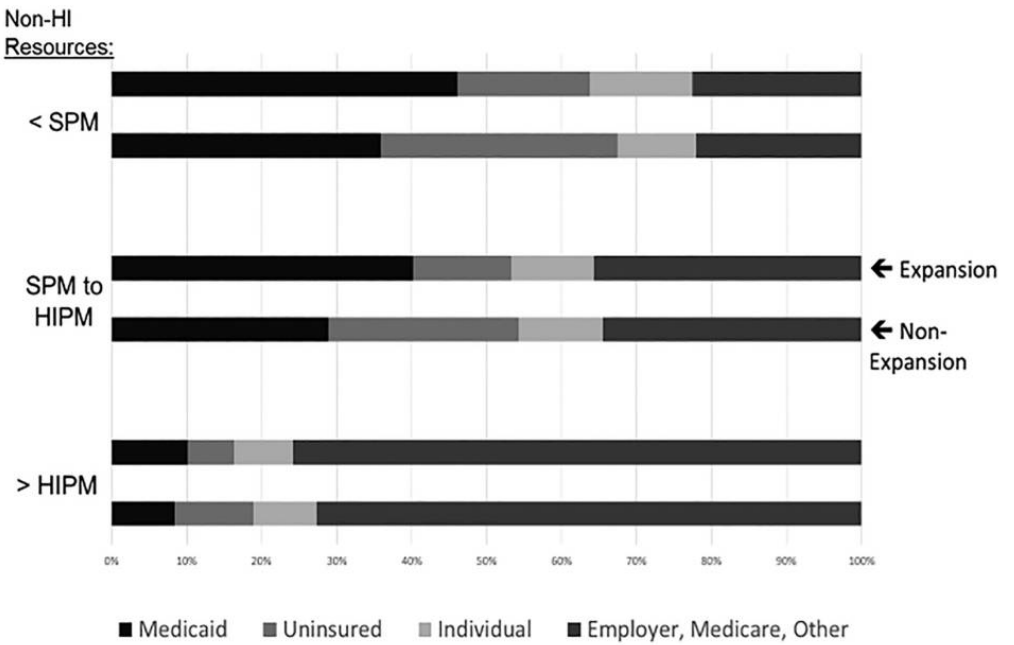

FIGURE 3. Adjusted differences (nonexpansion minus expansion) in health-inclusive poverty measure (HIPM) poverty for selected populations: Current Population Survey, United States, 2015. <HS = head of family had not completed high school; Hisp = Hispanic; NH = non-Hispanic; SPM = supplemental poverty measure. The light-gray portion of bar shows effects from group-specific logistic multivariable regressions of HIPM deep poverty on Medicaid expansion, adjusted (as appropriate to the group) for age, silver plan premium in rating area for a 27-year-old, racial identification and Hispanic ethnicity, education of the head, family structure, immigration/citizen status, whether the family includes someone receiving disability payments, the SPM threshold, and nonhealth resources. * $p < .05$.

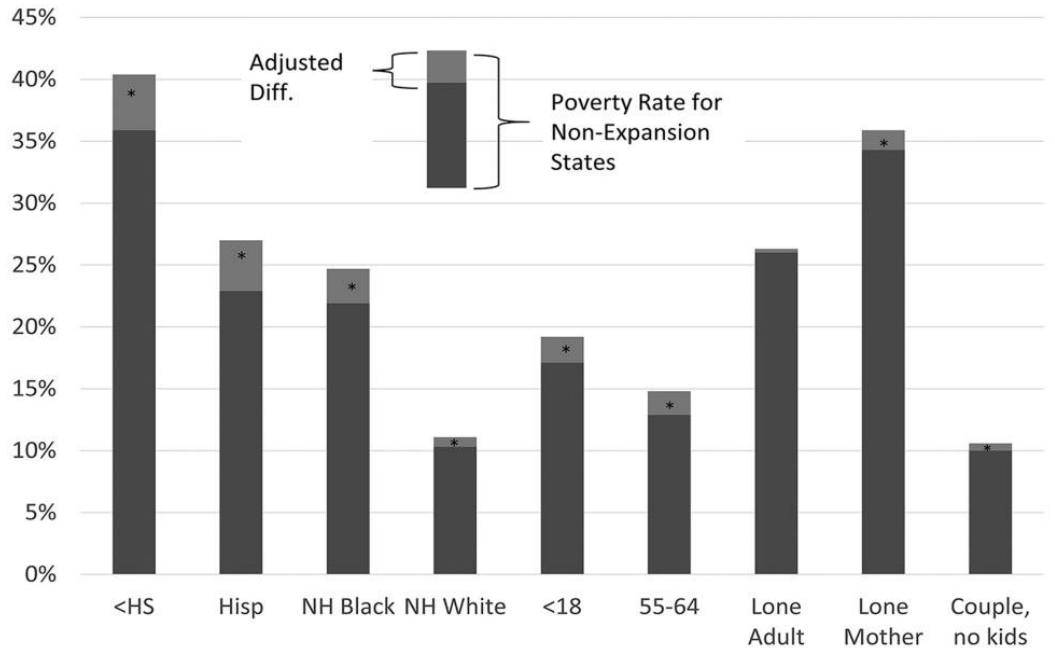

FIGURE 4. Adjusted differences (nonexpansion minus expansion) in health-inclusive poverty measure (HIPM) deep poverty for selected populations: Current Population Survey, United States, 2015. <HS = head of family had not completed high school; Hisp = Hispanic; NH = Non-Hispanic; SPM = supplemental poverty measure. The light-gray portion of bar shows effects from group-specific logistic multivariable regressions of HIPM poverty on Medicaid Expansion, adjusted (as appropriate to the group) for age, silver plan premium in rating area for a 27-year-old, racial identification and Hispanic ethnicity, education of the head, family structure, immigration/citizen status, whether the family includes someone receiving disability payments, SPM threshold, and nonhealth resources. *$p < .05$.

resources less than the SPM needs threshold, compared with 11.2 percent among all families (these figures are not shown in the tables).[18]

Similar results are found for HIPM deep poverty rates (fig. 4), although the effects appear proportionately larger. Medicaid expansion is associated with substantially lower HIPM deep poverty for individuals in families headed by less-educated persons, Hispanics, non-Hispanic blacks, children, couples with no children present, and persons ages 55–64. The small differential in deep poverty for lone adults is again puzzling, though it is likely attributable to their very low income; 13.2 percent of lone-adult families have nonhealth resources less than half the SPM needs threshold, compared with 3.9 percent among all families.[19]

DISCUSSION

Our results suggest that Medicaid expansion states had substantially lower rates of health-inclusive poverty and deep poverty than nonexpansion states, particularly among disadvantaged groups. In contrast, adjusted differences in SPM poverty between expansion and nonexpansion states were small and often not statistically significant. The SPM captures how Medicaid expansions reduce poverty by reducing out-of-pocket medical expenditures. But the HIPM also captures how Medicaid expansions reduce poverty by meeting health insurance needs, which the SPM misses (Moon 1993; Korenman and Remler 2016).

Many studies compare outcomes before and after Medicaid expansions in expansion states to changes in nonexpansion states over the same periods using difference-in-differences analyses (Courtemanche et al. 2017; Kaestner et al. 2017; Antonisse et al. 2018; Zewde and Wimer 2019). We do

18. In the non-Hispanic white subgroup, the model could not be estimated for one of the replicates. Therefore, the estimate comes from a logit model with standard errors clustered at the SPM unit; the standard errors are then inflated by the ratio of the standard error obtained using the svy logit to those of a clustered logit in a model with only socio-demographic controls.

19. In the non-Hispanic white, children (under age 18), and age 55–64 subgroups, the model could not be estimated for one of the replicates. In these cases the estimates come from a logit model with standard errors clustered at the SPM unit; the standard errors are inflated by the ratio of the standard error obtained using the svy logit to those of a clustered logit in a model with only sociodemographic controls.

not use this approach because, as explained above, we cannot estimate the HIPM for the United States during periods before the ACA's regulations of guaranteed issue and community rating took effect.[20] Our cross-sectional estimates adjust for many potential confounders, though expansion and nonexpansion states may differ in unmeasured ways related to poverty.

The effect of Medicaid expansions on health insurance coverage, however, has been demonstrated using difference-in-differences estimators (Courtemanche et al. 2017; Kaestner et al. 2017; Antonisse et al. 2018). Our regression-adjusted effects of Medicaid expansion on uninsurance rates are similar to estimates in this literature. Therefore, our regression-adjusted effect estimates, shown in table 4, demonstrate how the well-established effects of Medicaid expansion on health insurance benefits are associated with substantially lower health-inclusive poverty, especially deep poverty. In effect, our results isolate the effect of Medicaid expansions on health-inclusive poverty through the channel of health insurance. We also show descriptive differences in a comprehensive measure of poverty between expansion and nonexpansion states.

ALTERNATIVE HEALTH INSURANCE NEEDS

The HIPM's reliance on the benchmark silver plan as the particular need has advantages and disadvantages. We chose the benchmark silver plan as the basic health insurance need for several reasons. First, the political process effectively identified that plan as sufficient to meet basic health insurance needs because the ACA and its subsidies were designed to make that plan affordable. Second, our approach is practical for many reasons, including the availability of premium data. Third, because we know that everyone can purchase this plan, our approach is consistent with the federal statistical agencies' approach to poverty measurement: It is based on prices and the corresponding resources needed to attain an adequate standard of living.[21]

20. We have estimated effects of expansion using states that switched status—specifically, Pennsylvania and Indiana, which expanded at the beginning of 2015. However, the estimates were too noisy to be informative, due to small sample sizes and the small percentage of the population measured to take up benefits, especially in relevant income ranges.

21. The one exception is undocumented individuals who live in Vermont or Washington, DC, where it is impossible to purchase individual insurance outside of the ACA marketplace.

Of course, some will not agree that the benchmark silver plan meets basic health insurance needs. One objection is that health needs differ among people to a substantial degree, and some people require more care than a silver plan can provide. For example, a person with a severe disability might not be able to meet his or her health needs with a silver plan. However, this problem is not unique to health needs. The person with a disability also might not be able to make his or her housing accessible with income equal only to the SPM threshold.

Others may regard the silver plan as too generous to represent the basic need for health care and insurance. They may feel that the need should correspond to a less generous plan because of the existence of free care. The omission of free care could result in overestimates of HIPM poverty rates and could affect estimates of differences between expansion and nonexpansion states in health-inclusive poverty rates. The solution, however, is not to change the need but rather to capture the value of free and uncompensated care in resources. We have taken this approach in other work on poverty in New York State by adding a de facto insurance value of free and uncompensated care specific to that state (Korenman, Remler, and Hyson 2018).

Some might argue that the health insurance need should be a more generous plan, one with less cost sharing—similar to a Medicaid plan. However, there is no consensus that everyone needs such a plan, and a national HIPM should be based on a national notion of health insurance need.[22]

Finally, HIPM results are not highly sensitive to the choice of health insurance need; this is because any change to the health insurance need results in an identical change to health insurance resources for most insured people. For those with employer- or government-provided insurance, health insurance resources (prior to deduction of premium payments) are exactly equal to the health insurance need. Consequently, any change to the health insurance need is exactly offset by a change to health insurance resources, resulting in no changes in HIPM poverty status.

For the individually insured eligible for premium subsidies (those with incomes under 400 percent of the federal poverty line), any change to the benchmark plan premium results in an identical change to premium

22. For a discussion of the practical barriers to using a Medicaid-like plan to define the health insurance need, see Korenman and Remler (2016, 33–34).

subsidies. Premium subsidies are calculated to ensure that those eligible can purchase the benchmark silver plan by spending at most a specific share of their income, with that share depending on income (e.g., in 2015, a household with an income at 150 percent of the federal poverty line was able to purchase the benchmark plan with at most 4.02 percent of their income). However, changes to health insurance needs and resources do not offset for those uninsured and individually insured who are not eligible for premium subsidies. Therefore, different assumptions about the health insurance need do affect the poverty status of such persons.

We performed calculations to test the sensitivity of HIPM poverty rates to a change of the basic health insurance need to 75 percent and to 125 percent of the benchmark plan. We performed these calculations in two ways. For the first calculation, we kept the dollar amount of premium subsidies constant when the silver plan premium changed. This approach keeps ACA rules in place but addresses the concerns of those who would argue that the health insurance need should be less than or greater than the silver plan premium. In this case, changes to the health insurance need potentially affect the poverty status of the uninsured and all the individually insured, including those who receive ACA premium subsidies. Changing the health insurance need to 75 or 125 percent of the benchmark plan changed the fully adjusted effect of Medicaid expansion from 1.7 percentage points to 1.3 and 2.1 percentage points, respectively. To the extent that such differences reflect real changes in what it costs to purchase a given form of health insurance, these changes represent actual effects on poverty of more or less expensive basic plan premiums.

For the second calculation, we assumed that ACA premium subsidies adjust when silver plan premiums change, according to ACA rules. This assumption captures changes to the benchmark silver plan, such as those that occur as a result of policy or market changes. In this case, changes to health insurance needs from changes in the premiums also change resources as subsidies adjust. In fact, these subsidy changes fully offset premium changes for those eligible for ACA premium subsidies. In this case, changing the need to 75 and 125 percent of the current benchmark silver plan changed the estimated effect of Medicaid expansions from 1.7 percentage points to 1.3 and 2.2 percentage points, respectively.

While the choice of a poverty threshold is always somewhat arbitrary and normative, our selection of the benchmark silver plan as the national health insurance need is practical, justified by the political process

determining national health insurance policy (the ACA) and consistent with long-standing approaches to poverty measurement in the United States, including the SPM approach.

HIPM DEPENDENCE ON HEALTH POLICY

The ability to calculate a valid HIPM depends on health policy. The estimates presented in this article are for calendar year 2015 and reflect policies in place at that time. However, policy changes that have taken place under the Trump administration or that might take place in the future could undermine the validity of the HIPM or the comparability of results over time. There are four basic types of challenges stemming from health policy changes. Certain policy changes that might appear to threaten the validity of the measure in fact do not. We conclude that, at worst, they raise some difficulties for comparability of the measure over time, something that, as we point out, is also a concern for the SPM.

First, policy changes could artificially increase the premium of the benchmark silver plan, so that, even though essentially everyone can purchase the plan, they can and will purchase cheaper plans that also meet basic health insurance needs. The main example of this threat is the administration's refusal to pay for the cost-sharing reduction (CSR) subsidies, resulting in so-called silver loading and silver switcheroo by state insurance regulators and insurers (Frakt 2017; Norris 2018*a*, 2018*b*). These policies artificially raise silver plan premiums in the marketplaces but do not raise other premiums. The result may be reduced comparability of HIPM poverty rates for 2018 and 2019 to those from earlier years.

Some health policy background is needed to understand the issue. CSR subsidies reduce patient cost sharing (e.g., deductibles and copayments) for those with incomes under 250 percent of the federal poverty line who purchase silver plans. The Trump administration stopped compensating insurance companies for these mandated subsidies in the last quarter of 2017 (Norris 2018*a*, 2018*b*). In 2018 and 2019, most state insurance regulators instructed insurers to raise premiums of silver plans only to cover these additional costs.

This silver-loading approach had several advantages for lower-income families. As described earlier, premium subsidies are calculated to ensure that lower-income families can afford the benchmark silver plan. Consequently, premium subsidies increase dollar for dollar to offset the increases

in benchmark silver plan premiums. Thus, those with subsidies are protected from silver loading.[23] However, silver loading penalizes silver plan purchasers who are not eligible for premium subsidies. Still, they can and often do purchase bronze or gold plans that, compared with silver-loaded plans, are cheaper, better, or both. In addition, some regulators and insurers implemented the silver-switcheroo approach, offering otherwise identical silver plans outside of the exchanges (marketplaces) at a lower premium (Frakt 2017; Norris 2018*b*).

Silver loading and silver switcheroo do, indeed, compromise the validity of the HIPM, but only for the uninsured and those individually insured persons who are not eligible for premium subsidies; it does not affect those covered by employer or other group insurance, public insurance programs such as Medicaid and Medicare, or the individually insured who are eligible for premium subsidies.

This validity challenge is mitigated in several ways. First, the magnitude is modest: after silver loading, silver premiums rose about 15 percent relative to gold and bronze premiums (Bipartisan Policy Center 2018). We showed above that our results were not very sensitive to a larger change in the silver premium, 25 percent.

Moreover, the silver-loading problem ended in 2019, as the Trump administration has banned silver loading for 2020 (Keith 2019). Once silver loading is banned, the HIPM will again accurately capture the cost of a basic plan (before subsidies). The problem is therefore largely one of lack of comparability of 2018–19 HIPM rates with other years. While this complicates interpretation of trends in the HIPM over this period, the SPM faces similar challenges (Meyer and Sullivan 2012) because the SPM threshold changes with changes in the 33rd percentile of consumption of food, clothing, shelter, and utilities and could fall in recessions as middle-class spending falls. Finally, additional research could investigate whether using alternative plans as the benchmark could improve comparability and validity.

A second category of policies that might challenge the validity of the HIPM are those that raise premiums more broadly—for example, by

23. Indeed, they are made better off because they can often purchase a bronze plan for no out-of-pocket premium or a gold plan for less than a silver plan (Norris 2018*b*). Silver loading raises costs for the federal government, and, in fact, many health-care benefit advocates have opposed government funding of CSR subsidies.

creating a sicker pool of individuals purchasing insurance. These policies include reducing the standard enrollment period, ending the individual mandate, and increasing the duration of non-ACA compliant short-term plans (Jost 2018). While these changes may seem to threaten validity, in fact they do not. They do increase the cost of meeting health needs for the uninsured and individually insured who are not eligible for premium subsidies. However, the HIPM accurately and appropriately reflects the higher poverty rates that result.

For those with employer- or government-provided insurance, the threshold may be artificially inflated, but HIPM poverty status (and hence the poverty rate) is unaffected and accurate because the same (or a similar) value is added to health insurance resources and needs. However, these policy changes could distort poverty gap calculations for these groups.

A third category of policies that could undermine the validity of the HIPM are those that appear to reduce the ability of persons with a silver plan to meet their health needs. This category includes policies such as narrowing the definition of essential benefits (health benefits that must be covered in order to make plans ACA compliant) and eroding the enforcement of regulations intended to ensure the adequacy of provider networks (Jost 2018). These policies lower the quality and range of care available to those purchasing the benchmark silver plan and also lower the price of that plan. While these policies might dilute the value of a basic plan, they do not undermine the HIPM's validity because our concept of health needs is one that is socially determined. If the political process reduces essential benefits, then it has implicitly redefined the basic health insurance need.

The fourth category comprises policies that undermine the ability of individuals to purchase health insurance irrespective of their health status (guaranteed issue) and at a price unrelated to their health status (community rating). For example, the ruling by a Texas court in 2018 that guaranteed issue and community rating are unconstitutional would invalidate the HIPM.[24] However, that ruling is expected to be overturned (Gostin 2018), and those features of the ACA have great political support. A similar threat arose in 2017, when it appeared that there would be no plans available to

24. Texas v. United States, 4:18-cv-00167 (N. D. Tex. 2018), https://affordablecareactlitigation.files.wordpress.com/2018/12/Texas-v.-US-partial-summary-judgment-decision.pdf.

purchase in some marketplaces. However, regulators and market forces responded, and the threat did not materialize (Lucia et al. 2017).

In summary, as long as community rating and guaranteed issue regulations remain in effect, and the ACA marketplaces function reasonably well, health policy changes do not appear to seriously threaten the validity of the HIPM. For example, Medicaid work requirements do not threaten the validity of the measure. Indeed, the HIPM may be uniquely capable of capturing the effects of such health policy changes on poverty.

IMPLICATIONS

Health-care policy in the United States is at a crossroads (Glied and Jackson 2017). Efforts continue to repeal the ACA in its entirety (Armour 2018; Center on Budget and Policy Priorities 2018), to repeal Medicaid expansions at both the federal and state levels (Milligan 2018; Rudowitz 2018), and to undermine ACA regulations through executive action (Bagley and Gluck 2018). Yet such efforts face vociferous opposition. In addition, efforts are underway to expand Medicaid in more states and to advance a variety of proposals for universal insurance, such as the New York Health Act (Liu et al. 2018). Accurate descriptions of the well-being of low-income families under these different policies would improve the policy debate. For those who see health care or insurance as a basic need, the HIPM is the appropriate measure to gauge the effect of these policy changes on poverty—on whether families have the resources to meet basic needs.

Our results illustrate the value of this measure. We show that Medicaid expansion is associated with substantially lower poverty and deep poverty. Indeed, when poverty thresholds are raised to include a health insurance need, the Medicaid expansion of eligibility to families with somewhat higher incomes should be viewed as an expansion of benefits not to those with income above the federal poverty level, but to the poor. Our results provide support for those who would frame Medicaid expansion as a means not only to improve public health but to reduce poverty as well. People can be poor because they have neither health insurance benefits nor the income to buy insurance. Even among those with health insurance benefits, people can be poor because they cannot afford their health insurance premiums, deductibles, or other forms of cost sharing.

The policy and political implications of recognizing health insurance as a need (i.e., of recognizing the poverty caused by uninsurance) are stark:

when Maine governor Paul LePage blocked the implementation of Medicaid approved by referendum (Bloch and Lee 2017; State of Maine, Office of the Secretary of State 2017), he risked keeping many of Maine's citizens not only uninsured but impoverished. Conversely, if additional states were to expand Medicaid or adopt universal policies such as the proposed New York State Health Act, they could lift many people out of poverty (Korenman et al. 2018).

NOTE

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APPENDIX A

TABLE A1. Descriptive Statistics by Medicaid Expansion Status, 2015

	Total	Nonexpansion States	Expansion States
Sociodemographics:			
Age (%):			
0–5	9.2	9.8	8.9*
6–17	19.4	19.8	19.1*
18–25	13.1	13.0	13.1
26–34	14.6	14.6	14.6
35–49	22.3	22.0	22.5
50–54	7.7	7.6	7.7
55–59	7.4	7.3	7.5
60–64	6.3	5.9	6.5*

TABLE A1 (*Continued*)

	Total	Nonexpansion States	Expansion States
Race/ethnicity (%):			
Non-Hispanic white	58.1	56.4	59.2*
Non-Hispanic black	12.6	17.4	9.6*
Hispanic	20.2	19.7	20.4
Non-Hispanic other	9.2	6.5	10.8*
Education of head (%):			
Less than high school	10.9	11.5	10.6*
High school graduate	25.3	26.0	24.9*
Some college	29.0	30.6	27.9*
College graduate (or more)	34.8	31.9	36.6*
Family structure (%):			
Lone female	4.6	4.5	4.6
Lone male	5.8	5.9	5.8
Lone mother with children	5.9	7.1	5.1*
Lone father with children	.9	1.0	.9
2 adults with no children	18.5	18.5	18.6
2 adults with children	36.3	36.8	36.0
≥3 adults with no children	12.2	11.0	12.9*
≥3 adults with children	15.8	15.3	16.1
Immigration status (%):			
Citizen by birth	85.9	87.6	84.7*
Naturalized citizen	5.9	4.6	6.7*
Noncitizen, not imputed undocumented	3.2	2.5	3.6*
Noncitizen, imputed undocumented	5.1	5.2	5.0
Premiums, thresholds, and non–health insurance resources ($):			
Annual premium second-cheapest silver plan for 27-year-old	2,876	2,784	2,935*
SPM threshold	24,725	22,551	25,380*
Non–health insurance resources	70,442	66,531	72,947*
HIPM threshold	35,831	33,778	37,147*
Health insurance needs	11,556	11,227	11,766*
Distribution of non–health insurance resources (%):			
<.5 SPM	3.9	4.2	3.8
.5 SPM to SPM	7.3	7.1	7.3
SPM to Midpoint SPM-HIPM	5.9	5.8	5.9
Midpoint SPM-HPM to HIPM	6.7	6.7	6.7
HIPM to 1.5 HIPM	21.8	22.2	21.5
>1.5 HIPM	54.5	54.0	54.9
n states	48	19	29
n unweighted, people	148,683	60,768	87,915
% analysis population (weighted)	100.0	39.1	60.9

Note.—SPM = supplemental poverty measure, HIPM = health-inclusive poverty measure. "Midpoint SPM-HIPM" is the midpoint between the SPM and HIPM threshold. Expansion states are states that expanded Medicaid by February 2015. We excluded Maine and Wisconsin because they incompletely expanded and Alaska because it expanded late in 2015.

* $p < .05$ for test of equality of means in expansion and nonexpansion states.

TABLE A2. Poverty Measure Concepts: Official, Supplemental, and Health Inclusive

	OPM	SPM	HIPM
Measurement units	Families or unrelated individuals	Families, including any co-resident unrelated children who are cared for by the family and any cohabiters and their relatives, or unrelated, noncohabiting individuals	Same as SPM[a]
Nonhealth needs	Three times cost of minimum food diet in 1963[b]	The mean of expenditures on FCSU over all two-child consumer units in the 30th to 36th percentile expenditure range, multiplied by 1.2	Same as SPM measure of nonhealth needs
Adjustments to nonhealth needs	Vary by family size, composition, and age of householder	Geographic adjustments for differences in housing costs by owner/renter status and a three-parameter equivalence scale for family size and composition	Same as SPM
Updating nonhealth needs	Consumer Price Index: all items	5-year moving average of expenditures on FCSU	Same as SPM
Health insurance needs	Small amount implicit in the 3× multiplier	Explicitly: none. However, implicitly, all out-of-pocket expenditures on insurance premiums (premium MOOP), because they are deducted from resources as "nondiscretionary" expenses	Unsubsidized Premium of Basic Health Insurance Plan
Cost-sharing and uncovered health care needs	Small amount implicit in the 3× multiplier	Explicitly: none. However, implicitly all out-of-pocket expenditures on care and/or cost-sharing (non-premium MOOP), because they are deducted from resources as "nondiscretionary" expenses	Explicitly: none. However, implicitly, *capped* out-of-pocket expenditures on care (nonpremium MOOP, up to the available cap depending on health insurance type) because they are deducted from resources as "nondiscretionary" expenses
Resources:			
Nonhealth	Gross before-tax cash income	Sum of cash income, plus noncash benefits that families can use to meet their FCSU needs, *minus* taxes (or plus tax credits), *minus* work expenses and child support paid to another household *minus* out-of-pocket medical care and insurance and over-the-counter expenses (MOOP)	SPM Resource Measure but without the MOOP subtraction
Health insurance	None	None	For those who get private or public health insurance benefits: Unsubsidized premium of Basic Plan minus actual premium MOOP (limited to premium MOOP necessary to obtain Basic Plan). For those eligible for premium subsidies: subsidy value.

Source.—Korenman and Remler (2016, table 1). The OPM and SPM descriptions are partly based on Short (2013, 3).

Note.—OPM = official poverty measure; SPM = supplemental poverty measure; HIPM = health inclusive poverty measure; FCSU = food, clothing, shelter, and utilities.

[a] However, health insurance needs and resources are determined for health insurance units, subunits of the SPM unit, then aggregated to SPM unit.

[b] A small amount of out-of-pocket expenditures for health insurance and care is captured by the OPM needs threshold.

TABLE A3. Unadjusted and Regression-Adjusted Differentials in HIPM Poverty and Deep Poverty Rates between Medicaid Expansion and Nonexpansion States, Early vs. ACA-Era Medicaid Expansions, 2015

	HIPM Poverty		HIPM Deep Poverty	
	AOR [95% CI]	AME [95% CI]	AOR [95% CI]	AME [95% CI]
Expanded pre-ACA (before January 2014)	.42 [.35, .51]	−2.3 [−2.8, −1.8]	.39 [.30, .50]	−1.3 [−1.6, −1.0]
ACA expansion (January 2014 or later)	.62 [.53, −.73]	−1.30 [−1.7, −.80]	.65 [.53, .79]	−.60 [−.90, −.30]
Mean of outcome in nonexpansion states (%)	16.9		7.0	

Note.—All $p < .05$. HIPM = health-inclusive poverty measure. AOR = adjusted odds ratio from multivariable logistic regressions; AME = average marginal effect; CI = confidence interval; ACA = Affordable Care Act. The model specification in this table corresponds to model 3 of table 4 and is adjusted for sociodemographics, silver plan premium, supplemental poverty measure threshold, and non–health insurance resources. Socio-demographics: age, racial identification and Hispanic ethnicity, education level of the head of the family, family structure, and immigration or citizenship status. Silver plan premium is for a 27-year-old in the ACA rating area of residence. AME = average marginal effect, the average predicted probability of HIPM poverty if the entire sample resided in an expansion state minus the average predicted probability of HIPM poverty if the entire sample resided in a non-expansion state, with all other variables set to their observed values. Expansion states = states that expanded Medicaid by February 1, 2015. We excluded Maine and Wisconsin because they incompletely expanded and Alaska because it expanded late in 2015. Analysis sample size is 148,683.

APPENDIX B

COMPLETE LOGIT MODEL ESTIMATES

TABLE B1. Complete Model Results for Supplemental Poverty Results in Table 4 (Outcomes: SPM Poverty and SPM Deep Poverty)

	SPM Poverty		SPM Deep Poverty	
	OR	95% CI	OR	95% CI
Medicaid expansion state	1.05	[.97, 1.12]	.93	[.84, 1.03]
Hispanics	1.39*	[1.27, 1.51]	1.04	[.91, 1.2]
NH black	1.74*	[1.58, 1.93]	1.40*	[1.23, 1.6]
Race other than Hispanic, NH black, and NH white	1.49*	[1.33, 1.67]	1.58*	[1.36, 1.84]
Age 5 or younger	1.45*	[1.35, 1.55]	1.53*	[1.35, 1.73]
Age 6–17	1.19*	[1.11, 1.29]	1.28*	[1.14, 1.43]
Age 18–25	1.66*	[1.53, 1.82]	1.92*	[1.69, 2.19]
Age 35–49	.90*	[.83, .98]	.93	[.82, 1.04]
Age 50–54	.91+	[.82, 1.01]	1.05	[.89, 1.22]
Age 55–59	.89*	[.81, .99]	1.07	[.93, 1.23]
Age 60–64	1.05	[.94, 1.18]	1.27*	[1.08, 1.5]
Household head is high school graduate	.51*	[.46, .57]	.56*	[.48, .65]
Household head attended college, no degree	.37*	[.33, .41]	.44*	[.38, .51]
Household head has college degree	.17*	[.15, .19]	.25*	[.21, .29]
Household is 2 adults, no children	.95	[.86, 1.05]	1.41*	[1.2, 1.66]
Single male household	2.88*	[2.62, 3.16]	5.61*	[4.9, 6.44]
Single female household	3.78*	[3.42, 4.17]	6.80*	[5.88, 7.87]
Single mother with children	3.35*	[3, 3.75]	3.70*	[3.09, 4.42]
Household has members over and under age 65	1.23*	[1.09, 1.39]	1.18	[.97, 1.44]
Naturalized US citizen	1.24*	[1.12, 1.36]	1.14	[.97, 1.34]
Not a US citizen	1.63*	[1.44, 1.83]	1.23*	[1.01, 1.51]
Household has undocumented indiv. (imputed)	1.78*	[1.61, 1.96]	1.84*	[1.57, 2.16]
Household has indiv. receiving disability payments	1.46*	[1.3, 1.65]	1.02	[.8, 1.3]
Constant	.20*	[.18, .23]	.05*	[.04, .06]

Note.—SPM = supplemental poverty measure; OR = odds ratio; CI = confidence interval; NH = non-Hispanic. For additional notes, see table 4.

* $p \leq .05$.

\+ $.05 < p \leq .10$.

TABLE B2. Complete Model Results for HIPM Results in Table 4 (Outcomes: HIPM Poverty and HIPM Deep Poverty)

	HIPM Poverty				HIPM Deep Poverty			
	Model 2		Model 3		Model 2		Model 3	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Medicaid expansion state	.96	[.9, 1.04]	.53*	[.46, .61]	.85*	[.77, .94]	.54*	[.45, .64]
Non–health insurance resources			1.00*	[1, 1]			1.00*	[1, 1]
SPM threshold			1.00*	[1, 1]			1.00*	[1, 1]
Silver Plan premium for 27-year-old in rating area			1.00*	[1, 1]			1.00*	[1, 1]
Hispanic	1.55*	[1.42, 1.69]	.73*	[.61, .88]	1.25*	[1.1, 1.43]	.76*	[.59, .98]
NH Black	1.82*	[1.66, 2]	.67*	[.56, .79]	1.57*	[1.38, 1.78]	.77*	[.61, .98]
Race other than Hispanic, NH black, and NH white	1.58*	[1.4, 1.77]	.84	[.65, 1.1]	1.70*	[1.48, 1.95]	.92	[.67, 1.25]
Age 5 or younger	1.43*	[1.34, 1.53]	.79*	[.69, .9]	1.43*	[1.28, 1.6]	.81+	[.66, 1]
Age 6–17	1.17*	[1.09, 1.26]	.84	[.74, .97]	1.17*	[1.05, 1.29]	.87	[.72, 1.06]
Age 18–25	1.63*	[1.5, 1.77]	.89	[.76, 1.03]	1.78*	[1.58, 2]	.83+	[.68, 1]
Age 35–49	.91*	[.84, .98]	1.21*	[1.06, 1.39]	.90+	[.81, 1.01]	1.07	[.89, 1.3]
Age 50–54	.92	[.83, 1.02]	1.75*	[1.46, 2.1]	1.06	[.92, 1.22]	2.02*	[1.55, 2.61]
Age 55–59	.92+	[.84, 1.01]	2.40*	[1.97, 2.92]	1.16*	[1.01, 1.33]	3.09*	[2.36, 4.04]
Age 60–64	1.08	[.97, 1.2]	1.91*	[1.55, 2.37]	1.47*	[1.28, 1.7]	3.37*	[2.55, 4.45]
Household head is high school graduate	.49*	[.44, .54]	.85	[.7, 1.04]	.55*	[.49, .63]	1.21	[.95, 1.53]
Household head attended college, no degree	.34*	[.31, .38]	.87	[.72, 1.05]	.38*	[.34, .44]	1.03	[.81, 1.31]
Household head has college degree	.14*	[.13, .16]	1.17	[.92, 1.48]	.21*	[.18, .24]	1.70*	[1.26, 2.31]
Household is 2 adults, no children	.96	[.88, 1.04]	1.03	[.82, 1.29]	1.40*	[1.21, 1.61]	1.02	[.71, 1.47]
Single male household	2.74*	[2.52, 2.99]	.45*	[.35, .58]	4.93*	[4.36, 5.58]	.52*	[.33, .82]
Single female household	3.63*	[3.31, 3.98]	.44*	[.34, .58]	6.35*	[5.56, 7.25]	.58*	[.37, .92]
Single mother with children	3.21*	[2.87, 3.6]	.39*	[.32, .48]	3.28*	[2.78, 3.86]	.36*	[.27, .48]
Household has members over and under age 65	1.10	[.98, 1.25]	1.16	[.89, 1.51]	1.26*	[1.03, 1.53]	1.40	[.91, 2.14]
Naturalized US citizen	1.30*	[1.18, 1.42]	.86	[.69, 1.06]	1.08	[.93, 1.25]	.70*	[.52, .95]
Not a US citizen	1.61*	[1.43, 1.82]	.54*	[.44, .67]	1.25*	[1.06, 1.48]	.41*	[.29, .57]
Household has undocumented indiv. (imputed)	2.27*	[2.05, 2.51]	2.27*	[1.81, 2.86]	2.23*	[1.94, 2.55]	2.63*	[1.96, 3.53]
Household has indiv. receiving disability payments	1.34*	[1.19, 1.51]	.72*	[.57, .92]	.96	[.77, 1.21]	.55*	[.38, .79]
Constant	.25*	[.22, .28]	2.13*	[1.27, 3.59]	.07*	[.06, .08]	.72	[.32, 1.63]

Note.—HIPM = health-inclusive poverty measure; OR = odds ratio; CI = confidence interval; SPM = supplemental poverty measure; NH = non-Hispanic. For additional notes, see table 4.

* $p \leq .05$.

\+ $.05 < p \leq .10$.

TABLE B3. Complete Model Results for HIPM Results in Table 5 (Outcomes: HIPM Poverty and HIPM Deep Poverty)

	HIPM Poverty		HIPM Deep Poverty	
	OR	95% CI	OR	95% CI
Medicaid expansion state	.52*	[.45, .6]	.50*	[.41, .62]
Non–health insurance resources	1.00*	[1, 1]	1.00*	[1, 1]
SPM threshold	1.00*	[1, 1]	1.00*	[1, 1]
Silver Plan premium for 27-year-old in rating area	1.00*	[1, 1]	1.00*	[1, 1]
Hispanics	.76*	[.64, .91]	.77+	[.58, 1.02]
NH black	.63*	[.52, .75]	.82	[.61, 1.09]
Race other than Hispanic, NH black, and NH white	.85	[.65, 1.12]	.88	[.63, 1.22]
Age 5 or younger	.76*	[.67, .88]	.80*	[.65, .99]
Age 6–17	.83*	[.72, .95]	.82+	[.66, 1]
Age 18–25	.80*	[.68, .94]	.74*	[.59, .93]
Age 35–49	1.19*	[1.03, 1.37]	1.07	[.86, 1.33]
Age 50–54	1.75*	[1.45, 2.1]	1.94*	[1.45, 2.59]
Age 55–59	2.44*	[2.02, 2.94]	3.08*	[2.3, 4.13]
Age 60–64	1.94*	[1.56, 2.41]	3.28*	[2.45, 4.39]
Household head is high school graduate	.88	[.71, 1.09]	1.25*	[1.01, 1.55]
Household head attended college, no degree	.89	[.72, 1.08]	1.02	[.79, 1.32]
Household head has college degree	1.14	[.89, 1.46]	1.76*	[1.23, 2.52]
Household is 2 adults, no children	1.05	[.84, 1.31]	1.01	[.7, 1.48]
Single male household	.39*	[.3, .51]	.43*	[.27, .67]
Single female household	.35*	[.26, .47]	.54*	[.34, .84]
Single mother with children	.33*	[.26, .42]	.34*	[.24, .48]
Household has members over and under age 65	1.15	[.9, 1.47]	1.33	[.91, 1.96]
Naturalized US citizen	.83+	[.67, 1.03]	.69*	[.5, .95]
Not a US citizen	.51*	[.41, .64]	.40*	[.28, .55]
Household has undocumented individual (imputed)	2.26*	[1.83, 2.8]	2.55*	[1.95, 3.33]
Household has indiv. receiving disability payments	.68*	[.52, .89]	.61*	[.42, .87]
Constant	1.03	[.61, 1.72]	.35*	[.17, .71]

Note.—HIPM = health-inclusive poverty measure; OR = odds ratio; CI = confidence interval; SPM = supplemental poverty measure; NH = non-Hispanic. For additional notes, see table 5.

* $p \leq .05$.

\+ $.05 < p \leq .10$.

TABLE B4. Complete Model Results for Table 6 (Outcomes: Has Health Insurance Benefits and Uninsured)

	Has Health Insurance Benefits				Uninsured			
	Model 2		Model 3		Model 2		Model 3	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Medicaid expansion state	1.51*	[1.43, 1.59]	1.47*	[1.39, 1.55]	.52*	[.49, .55]	.55*	[.52, .58]
Non–health insurance resources			1.00*	[1, 1]			1.00*	[1, 1]
SPM threshold			1.00*	[1, 1]			1.00*	[1, 1]
Silver Plan premium for 27-year-old in rating area			1.00	[1, 1]			1.00*	[1, 1]
Hispanics	.84*	[.79, .9]	.84*	[.78, .9]	1.48*	[1.38, 1.59]	1.43	[1.33, 1.54]
NH black	.93*	[.86, 1]	.95	[.88, 1.02]	1.28*	[1.19, 1.39]	1.20*	[1.11, 1.3]
Race other than Hispanic, NH black, and NH white	.85*	[.77, .94]	.84*	[.76, .93]	1.12+	[1, 1.26]	1.11+	[.99, 1.24]
Age 5 or younger	2.72*	[2.46, 3]	2.76*	[2.5, 3.04]	.31*	[.27, .34]	.29*	[.26, .33]
Age 6–17	2.91*	[2.71, 3.13]	2.89*	[2.69, 3.1]	.24*	[.22, .26]	.24*	[.22, .26]
Age 18–25	1.18*	[1.1, 1.26]	1.17*	[1.09, 1.24]	.73*	[.67, .79]	.73*	[.67, .79]
Age 35–49	1.27*	[1.2, 1.35]	1.25*	[1.18, 1.33]	.78*	[.73, .84]	.81*	[.75, .87]
Age 50–54	1.40*	[1.3, 1.51]	1.35*	[1.26, 1.46]	.60*	[.54, .66]	.64*	[.58, .71]
Age 55–59	1.46*	[1.35, 1.57]	1.41*	[1.3, 1.52]	.56*	[.51, .62]	.61*	[.55, .67]
Age 60–64	1.45*	[1.32, 1.58]	1.43*	[1.31, 1.57]	.52*	[.47, .58]	.54*	[.48, .6]
Household head is high school graduate	1.41*	[1.31, 1.52]	1.37*	[1.27, 1.48]	.69*	[.63, .75]	.75*	[.69, .81]
Household head attended college, no degree	1.81*	[1.68, 1.95]	1.71*	[1.59, 1.84]	.48*	[.44, .52]	.55*	[.51, .6]
Household head has college degree	2.38*	[2.18, 2.6]	2.06*	[1.88, 2.26]	.27*	[.24, .3]	.37*	[.33, .42]
Household is 2 adults, no children	.75*	[.71, .8]	.85*	[.78, .92]	1.35*	[1.26, 1.46]	1.13*	[1.03, 1.25]
Single male household	.51*	[.47, .55]	.66*	[.6, .74]	2.07*	[1.9, 2.26]	1.31*	[1.16, 1.48]
Single female household	.58*	[.54, .63]	.77*	[.69, .86]	1.84*	[1.66, 2.04]	1.11	[.96, 1.27]
Single mother with children	.97	[.87, 1.09]	1.14*	[1.02, 1.28]	1.11+	[.98, 1.25]	.81*	[.71, .92]
Household has members over and under age 65	.63*	[.58, .69]	.63*	[.58, .68]	1.60*	[1.44, 1.77]	1.63*	[1.48, 1.81]
Naturalized US citizen	.96	[.88, 1.05]	.95	[.87, 1.03]	.90*	[.81, .99]	.92+	[.83, 1.01]
Not a US citizen	1.22*	[1.09, 1.36]	1.23*	[1.1, 1.38]	.80*	[.71, .9]	.77*	[.68, .86]
Household has undocumented indiv. (imputed)	.37*	[.34, .4]	.37*	[.34, .4]	2.53*	[2.31, 2.76]	2.49*	[2.28, 2.73]
Household has indiv. receiving disability payments	.93	[.84, 1.02]	.93	[.84, 1.02]	1.18*	[1.07, 1.3]	1.17*	[1.06, 1.29]
Constant	2.17*	[1.99, 2.38]	1.60*	[1.31, 1.95]	.37*	[.33, .41]	.83+	[.67, 1.03]

Note.—OR = odds ratio; CI = confidence interval; SPM = supplemental poverty measure; NH = non-Hispanic. For additional notes, see table 6.

* $p \leq .05$.

\+ $.05 < p \leq .10$.

TABLE B5. Complete Model Results for Figure 3, Selected Populations (Outcome: HIPM Poverty; Education, Age, and Household)

	Education of Household Head Less Than HS Degree		Children Ages ≤18		Adults Ages 55–64		Single Adult		Adult Couple		Single Mother and Children	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Medicaid expansion state	.44*	[.32, .6]	.51*	[.43, .62]	.47*	[.36, .61]	.84	[.62, 1.13]	.71*	[.5, 1]	.67+	[.45, 1]
Non–health insurance resources	1.00*	[1, 1]	1.00*	[1, 1]	1.00*	[1, 1]	1.00*	[1, 1]	1.00*	[1, 1]	1.00*	[1, 1]
SPM threshold	1.00*	[1, 1]	1.00*	[1, 1]	1.00*	[1, 1]	1.00*	[1, 1]	1.00*	[1, 1]	1.00*	[1, 1]
Silver Plan premium for 27-year-old in rating area	1.00*	[1, 1]	1.00*	[1, 1]	1.00	[1, 1]	1.00*	[1, 1]	1.00+	[1, 1]	1.00	[1, 1]
Hispanic	.94	[.63, 1.39]	.67*	[.52, .86]	.83	[.55, 1.23]	1.14	[.75, 1.73]	1.17	[.73, 1.88]	.60+	[.33, 1.07]
NH black	.89	[.59, 1.34]	.63	[.49, .8]	.68*	[.52, .91]	.89	[.61, 1.3]	.89	[.55, 1.42]	.57*	[.34, .95]
Race other than Hispanic, NH black, and NH white	1.04	[.53, 2.04]	.68+	[.45, 1.01]	.94	[.54, 1.63]	1.18	[.63, 2.2]	1.12	[.63, 1.98]	.27*	[.12, .61]
Age 5 or younger	.70*	[.53, .92]									.89	[.61, 1.3]
Age 6–17	.88	[.67, 1.16]									1.08	[.83, 1.42]
Age 18–25	.87	[.63, 1.2]					.45*	[.31, .65]	.67*	[.46, .97]	.51*	[.28, .94]
Age 35–49	1.29+	[1, 1.67]					1.67*	[1.03, 2.7]	1.52*	[1.04, 2.22]	1.08	[.69, 1.71]
Age 50–54	2.34*	[1.69, 3.24]					2.18*	[1.23, 3.89]	2.20*	[1.32, 3.69]	4.06*	[1.47, 11.27]
Age 55–59	3.18*	[2.02, 5.02]					3.24*	[1.91, 5.51]	2.95*	[1.78, 4.87]		
Age 60–64	2.01*	[1.19, 3.4]			.88	[.71, 1.09]	3.38*	[1.89, 6.04]	1.56	[.89, 2.72]		
Household head is HS graduate			.92	[.71, 1.2]	.78	[.56, 1.1]	1.15	[.71, 1.86]	1.01	[.63, 1.63]	.83	[.46, 1.49]
Household head attended college, no degree			.87	[.68, 1.12]	.68*	[.47, .99]	.73	[.45, 1.21]	1.02	[.65, 1.59]	.73	[.42, 1.26]
Household head has college degree			1.49*	[1.05, 2.12]	.72	[.48, 1.09]	1.18*	[.68, 2.05]	1.76+	[.96, 3.25]	.81	[.37, 1.78]
Household is 2 adults, no children	.74	[.43, 1.27]	.40*	[.33, .5]	.52*	[.33, .83]						
Single male household	.35*	[.19, .66]	1.25	[.84, 1.85]	1.00	[.63, 1.59]						
Single female household	.37*	[.19, .71]	.63	[.24, 1.66]	.95	[.59, 1.53]						
Single mother with children	.37*	[.24, .56]	.51+	[.24, 1.11]	.79	[.52, 1.21]						
Household has members over and under age 65	1.59*	[1.03, 2.46]	2.14*	[1.6, 2.86]	.52*	[.33, .81]						
Naturalized US citizen	1.13	[.79, 1.63]	.64*	[.47, .87]	2.05*	[1.15, 3.64]	.82	[.4, 1.68]	.70	[.39, 1.28]	2.19+	[.87, 5.46]
Not a US citizen	.47*	[.33, .66]	2.51*	[1.3, 4.86]	.72	[.44, 1.18]	.55	[.22, 1.36]	.58*	[.34, .99]	.33*	[.15, .74]
Household has undocumented indiv. (imputed)	2.22*	[1.56, 3.16]	.92	[.71, 1.2]	4.97*	[2, 12.4]	2.17*	[1.39, 3.41]	1.73+	[.99, 3.01]	1.83+	[.93, 3.57]
Household has indiv. receiving disability payments	.69	[.42, 1.13]	.87	[.68, 1.12]	.88	[.71, 1.09]	1.00*	[0, 0]	.48*	[.32, .73]	.31*	[.19, .52]
Constant	1.39	[.43, 4.47]	1.49*	[1.05, 2.12]	.78	[.56, 1.1]	3.01+	[.85, 10.7]	4.29*	[1.07, 17.23]	8.91*	[2.04, 38.97]
Sample size	16,875		51,468		17,482		12,255		19,604		9,514	

Note.—HIPM = health-inclusive poverty measure; HS = high school; OR = odds ratio; CI = confidence interval; SPM = supplemental poverty measure; NH = non-Hispanic. For additional notes, see fig. 3.

* $p \leq .05$.

\+ $.05 < p \leq .10$.

TABLE B6. Complete Model Results for Figure 3, Selected Populations (Outcome: HIPM Poverty; Race)

	Hispanic		NH Black		NH White	
	OR	95% CI	OR	95% CI	OR	95% CI
Medicaid expansion state	.40*	[.3, .52]	.40*	[.3, .53]	.68*	[.56, .82]
Non–health insurance resources	1.00*	[1, 1]	1.00*	[1, 1]	1.00*	[1, 1]
SPM threshold	1.00*	[1, 1]	1.00*	[1, 1]	1.00*	[1, 1]
Silver Plan premium for 27-year-old in rating area	1.00*	[1, 1]	1.00	[1, 1]	1.00*	[1, 1]
Hispanic						
NH black						
Race other than Hispanic, NH black, and NH white						
Age 5 or younger	.81+	[.65, 1.02]	.63*	[.44, .89]	.82+	[.67, 1.02]
Age 6–17	.85+	[.7, 1.03]	.91	[.67, 1.22]	.73*	[.58, .92]
Age 18–25	.91	[.71, 1.17]	.72+	[.49, 1.06]	.91	[.72, 1.14]
Age 35–49	1.24*	[1, 1.54]	1.19	[.81, 1.74]	1.24*	[1.01, 1.53]
Age 50–54	1.83*	[1.35, 2.47]	1.15	[.66, 1.99]	2.17*	[1.65, 2.85]
Age 55–59	2.79*	[1.92, 4.04]	1.77*	[1.07, 2.93]	2.46*	[1.84, 3.3]
Age 60–64	1.74*	[1.11, 2.73]	2.49*	[1.44, 4.32]	2.30*	[1.68, 3.15]
Household head is high school graduate	.82	[.61, 1.1]	.62	[.39, .98]	.99	[.71, 1.39]
Household head attended college, no degree	1.05	[.75, 1.46]	.68+	[.44, 1.06]	.88	[.62, 1.23]
Household head has college degree	1.04	[.65, 1.66]	.88	[.47, 1.64]	1.17	[.8, 1.71]
Household is 2 adults, no children	1.27	[.84, 1.94]	1.34	[.74, 2.42]	1.14	[.83, 1.56]
Single male household	.56*	[.35, .87]	.49*	[.25, .97]	.55*	[.4, .77]
Single female household	.59*	[.37, .95]	. . .		. . .	
Single mother with children	.42*	[.3, .58]	.34*	[.22, 52]	. . .	
Household has members over and under age 65	1.70	[1.04, 2.79]	. . .		. . .	
Naturalized US citizen	.96	[.73, 1.27]	.75	[.42, 1.33]	.58	[.27, 1.24]
Not a US citizen	.52*	[.42, .66]	.93	[.48, 1.81]	.27*	[.11, .64]
Household has undocumented indiv. (imputed)	2.39*	[1.78, 3.19]	3.52*	[1.5, 8.28]	2.09*	[1.08, 4.07]
Household has indiv. receiving disability payments	.75	[.47, 1.2]	.64+	[.39, 1.07]	.70*	[.49, .99]
Constant	1.31	[.55, 3.11]	3.83+	[.89, 16.55]	.83	[.36, 1.88]
Sample size	32,168		17,046		85,273	

Note.—In the models for non-Hispanic Blacks and non-Hispanic Whites, single male households and single female households were combined due to small sample size. The estimate reported on the line for single male households is the estimate for single adults of both sexes. HIPM = health-inclusive poverty measure; OR = odds ratio; CI = confidence interval; SPM = supplemental poverty measure; NH = non-Hispanic. For additional notes, see fig. 3.

* $p \leq .05$.

\+ $.05 < p \leq .10$.

TABLE B7. Complete Model Results for Figure 4, Selected Populations (Outcome: HIPM Deep Poverty; Education, Age, and Household)

	Education of Household Head Less Than HS Degree		Children Ages ≤18		Adults Ages 55–64		Single Adult		Adult Couple		Single Mother and Children	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Medicaid expansion state	.58*	[.41, .82]	.63*	[.47, .83]	.44*	[.33, .6]	.73+	[.51, 1.04]	.35*	[.23, .53]	.69	[.4, 1.19]
Non–health insurance resources	1.00*	[1, 1]	1.00*	[1, 1]	1.00*	[1, 1]	1.00*	[1, 1]	1.00*	[1, 1]	1.00*	[1, 1]
SPM threshold	1.00*	[1, 1]	1.00*	[1, 1]	1.00*	[1, 1]	1.00*	[1, 1]	1.00*	[1, 1]	1.00*	[1, 1]
Silver Plan premium for 27-year-old in rating area	1.00+	[1, 1]	1.00*	[1, 1]	1.00*	[1, 1]	1.00*	[1, 1]	1.00*	[1, 1]	1.00	[1, 1]
Hispanic	.58+	[.33, 1.01]	.63*	[.45, .96]	.83	[.51, 1.35]	.90	[.6, 1.35]	.82	[.48, 1.41]	1.05	[.43, 2.61]
NH black	.59+	[.34, 1.03]	1.00*	[.49, 1.1]	.72+	[.49, 1.05]	.67+	[.43, 1.06]	.81	[.45, 1.46]	.67	[.29, 1.55]
Race other than Hispanic, NH black, and NH white	.65	[.25, 1.69]	1.00*	[.58, 1.5]	.58+	[.31, 1.08]	1.14	[.62, 2.12]	.67	[.33, 1.37]	.60	[.21, 1.7]
Age 5 or younger	.95	[.65, 1.4]									.65	[.35, 1.22]
Age 6–17	.80	[.58, 1.11]									.80	[.5, 1.29]
Age 18–25	.76	[.51, 1.13]					.43*	[.26, .71]			.57	[.21, 1.57]
Age 35–49	1.02	[.71, 1.48]					1.07	[.65, 1.76]	1.42	[.92, 2.18]	.79	[.38, 1.64]
Age 50–54	1.45	[.86, 2.46]					2.26*	[1.19, 4.29]	2.04*	[1.17, 3.55]	8.38*	[2.34, 29.99]
Age 55–59	3.72*	[2.05, 6.78]					5.20*	[2.66, 10.18]	3.24*	[1.84, 5.71]		
Age 60–64	2.98*	[1.68, 5.3]			1.15	[.88, 1.51]	12.12*	[5.72, 25.64]	4.36*	[2.58, 7.38]		
Household head is HS graduate			1.08	[.78, 1.5]	1.04	[.67, 1.6]	.97	[.58, 1.62]	2.02*	[1.08, 3.77]	1.74	[.78, 3.85]
Household head attended college, no degree			.96	[.66, 1.4]	.79	[.5, 1.23]	.81	[.49, 1.32]	1.40	[.76, 2.57]	2.22*	[1.02, 4.85]
Household head has college degree			2.23*	[1.33, 3.72]	1.53	[.92, 2.54]	1.14	[.65, 2.02]	2.09+	[.94, 4.66]	4.89*	[1.46, 16.37]
Household is 2 adults, no children	.71	[.36, 1.38]	.41*	[.31, .55]	.30*	[.16, .56]						
Single male household	.61	[.27, 1.4]	2.10*	[1.06, 4.18]	.60+	[.35, 1.04]						
Single female household	.53	[.23, 1.22]	.64	[.17, 2.48]	.56+	[.3, 1.06]						
Single mother with children	.35*	[.2, .61]	1.58	[.3, 8.46]	.92	[.58, 1.47]						
Household has members over and under age 65	2.54*	[1.08, 5.93]	2.83*	[1.91, 4.2]	.54+	[.27, 1.08]						
Naturalized US citizen	.58+	[.31, 1.09]	.61+	[.37, 1]	2.59*	[1.24, 5.44]	.99	[.4, 2.44]	.55	[.24, 1.25]	.17	[.02, 1.74]
Not a US citizen	.39*	[.23, .68]	.50	[.21, 1.22]	.32*	[.17, .6]	.49	[.18, 1.34]	.55	[.26, 1.16]	.35	[.08, 1.66]
Household has undocumented indiv. (imputed)	3.22*	[1.91, 5.42]	1.08	[.78, 1.5]	6.19*	[1.86, 20.6]	1.71*	[1.06, 2.75]	2.66*	[1.26, 5.63]	4.35*	[1.2, 15.81]
Household has indiv. receiving disability payments	.52*	[.28, .96]	.96	[.66, 1.4]	1.15	[.88, 1.51]	1.00*	[0, 0]	.32*	[.19, .51]	.43*	[.21, .85]
Constant	1.41	[.43, 4.65]	2.23*	[1.33, 3.72]	1.04	[.67, 1.6]	2.28	[.52, 10.1]	3.30	[.67, 16.3]	2.10	[.17, 25.36]
Sample size	16,875		51,468		17,482		12,255		19,604		9,514	

Note.—HIPM = health-inclusive poverty measure; HS = high school; OR = odds ratio; CI = confidence interval; SPM = supplemental poverty measure; NH = non-Hispanic. For additional notes, see fig. 4.

* $p \leq .05$.

\+ $.05 < p \leq .10$.

TABLE B8. Complete Model Results for Figure 4, Selected Populations (Outcome: HIPM Deep Poverty, Race)

	Hispanic		NH Black		NH White	
	OR	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**
Medicaid expansion state	.48*	[.34, .66]	.47*	[.29, .75]	.57*	[.45, .73]
Non–health insurance resources	1.00*	[1, 1]	1.00*	[1, 1]	1.00*	[1, 1]
SPM threshold	1.00*	[1, 1]	1.00*	[1, 1]	1.00*	[1, 1]
Silver Plan premium for 27-year-old in rating area	1.00*	[1, 1]	1.00	[1, 1]	1.00*	[1, 1]
Hispanic						
NH black						
Race other than Hispanic, NH black, and NH white						
Age 5 or younger	.72^{+}	[.5, 1.03]	.89	[.57, 1.38]	.69^{+}	[.46, 1.03]
Age 6–17	.82	[.6, 1.12]	.75	[.49, 1.15]	.81	[.57, 1.14]
Age 18–25	1.00	[.72, 1.39]	.69	[.42, 1.13]	.82	[.61, 1.11]
Age 35–49	1.20	[.84, 1.7]	.90	[.57, 1.43]	1.03	[.76, 1.41]
Age 50–54	2.08*	[1.22, 3.54]	2.10*	[1.1, 4.01]	2.16*	[1.43, 3.26]
Age 55–59	3.71*	[2, 6.89]	2.61*	[1.42, 4.82]	3.33*	[2.3, 4.84]
Age 60–64	4.14*	[2.44, 7.05]	3.26*	[1.63, 6.49]	4.06*	[2.75, 6.01]
Household head is high school graduate	1.53*	[1.08, 2.15]	1.18	[.66, 2.11]	.92	[.62, 1.37]
Household head attended college, no degree	1.23	[.82, 1.85]	1.16	[.68, 1.98]	.80	[.55, 1.16]
Household head has college degree	1.31	[.7, 2.44]	3.78*	[1.49, 9.64]	1.17	[.76, 1.82]
Household is 2 adults, no children	.95	[.52, 1.72]	.90	[.39, 2.1]	1.57^{+}	[.99, 2.5]
Single male household	.63	[.31, 1.29]	.41	[.13, 1.28]	.83	[.46, 1.5]
Single female household	.63	[.29, 1.38]	.20*	[.11, .38]	1.05	[.51, 2.16]
Single mother with children	.59*	[.36, .96]	.30*	[.1, .88]	.27*	[.11, .67]
Household has members over and under age 65	2.38*	[1.19, 4.78]	.11*	[.03, .34]	2.01^{+}	[.89, 4.52]
Naturalized US citizen	.73	[.47, 1.14]	2.06	[.78, 5.42]	.48*	[.29, .8]
Not a US citizen	.50*	[.33, .76]	.61	[.22, 1.64]	.37	[.1, 1.44]
Household has undocumented indiv. (imputed)	3.43*	[2.34, 5.02]	1.82	[.2, 16.63]	.69^{+}	[.46, 1.03]
Household has indiv. receiving disability payments	.51*	[.3, .89]	.89	[.57, 1.38]	.81	[.57, 1.14]
Constant	.27^{+}	[.07, 1.03]	.75	[.49, 1.15]	.82	[.61, 1.11]
N	32,168		17,046		85,273	

Note.—HIPM = health-inclusive poverty measure; OR = odds ratio; CI = confidence interval; SPM = supplemental poverty measure; NH = non-Hispanic. For additional notes, see fig. 4.

* $p \leq .05$.

$^{+}$ $.05 < p \leq .10$.

TABLE B9. Complete Model Results for Appendix Table A3 (Outcomes: HIPM Poverty and HIPM Deep Poverty)

	HIPM Poverty		HIPM Deep Poverty	
	OR	95% CI	OR	95% CI
Pre-ACA Medicaid expansion	.42*	[.35, .51]	.39*	[.3, .5]
ACA Medicaid expansion	.62*	[.53, .73]	.65*	[.53, .79]
Non–health insurance resources	1.00*	[1, 1]	1.00*	[1, 1]
SPM threshold	1.00*	[1, 1]	1.00*	[1, 1]
Silver Plan premium for 27-year-old in rating area	1.00*	[1, 1]	1.00*	[1, 1]
Hispanic	.78*	[.65, .94]	.80+	[.61, 1.04]
NH black	.67*	[.56, .79]	.70*	[.53, .92]
Race other than Hispanic, NH black, and NH white	.89	[.68, 1.16]	.99	[.74, 1.33]
Age 5 or younger	.77*	[.68, .88]	.68*	[.55, .83]
Age 6–17	.84*	[.73, .96]	.72*	[.59, .87]
Age 18–25	.89	[.76, 1.03]	.88	[.72, 1.07]
Age 35–49	1.21*	[1.06, 1.39]	1.10	[.9, 1.35]
Age 50–54	1.79*	[1.5, 2.15]	2.26*	[1.72, 2.97]
Age 55–59	2.43*	[2, 2.97]	3.35*	[2.52, 4.46]
Age 60–64	1.95*	[1.57, 2.4]	3.85*	[2.88, 5.14]
Household head is high school graduate	.85	[.69, 1.04]	1.16	[.94, 1.43]
Household head has some college	.87	[.72, 1.1]	.98	[.79, 1.24]
Household head has college degree	1.19	[.94, 1.51]	1.66*	[1.18, 2.34]
Household is 2 adults, no children	1.00	[.79, 1.28]	1.40+	[1.00, 1.96]
Single adult, no children	.46*	[.35, .61]	.90	[.62, 1.31]
Single mother with children	.40*	[.33, .48]	...[a]	
Household has members over and under age 65	1.16	[.89, 1.51]	...[a]	
Naturalized US citizen	.87	[.7, 1.07]	.72*	[.52, .98]
Not a US citizen	.56*	[.45, .69]	.42*	[.31, .57]
Household has undocumented indiv. (imputed)	2.27*	[1.81, 2.85]	2.67*	[2.05, 3.49]
Household has indiv. receiving disability payments	.73*	[.57, .93]	.58*	[.4, .82]
Constant	1.54	[.88, 2.7]	.25*	[.1, .5]

Note.—HIPM = health-inclusive poverty measure; OR = odds ratio; CI = confidence interval; SPM = supplemental poverty measure; NH = non-Hispanic. For additional notes, see table A3.

[a] Three family-structure categories were combined for estimation of logistic regression models using replicate weights for the deep poverty outcome.

* $p \leq .05$.

\+ $.05 < p \leq .10$.

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