Medical Out-of-Pocket Spending Among the Uninsured: Differential Spending & the Supplemental Poverty Measure*

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Abstract

This paper refines the treatment of Medical Out-of-Pocket (MOOP) spending among the uninsured in measuring poverty, and investigates its net effect on the Supplemental Poverty Measure (SPM). Unlike previous work, this research accounts for insurance coverage type in estimating counterfactual distributions of non-premium MOOP spending for the uninsured using predictive mean matching models. Additionally, this work considers an alternative counterfactual environment that accounts for the 2014 provisions of the Patient Protection and Affordable Care Act (PPACA) as it concerns premiums, premium subsidies, and the adult Medicaid expansion. Results show that the SPM poverty rates increase after implementing the spending adjustments for the uninsured compared to the "base" SPM, which incorporates only observed MOOP spending. The increase, however, is much lower in the case using the 2014 provisions of the PPACA.

Key Words: Medical Out-of-Pocket Spending, Predictive Mean Matching, Poverty, Supplemental Poverty Measure, Health Insurance, Uninsured, Medical Care.

1 Introduction

The uninsured, on average, utilize less medical services than their insured counterparts (e.g., Meer and Rosen, 2004).[1] Decreased utilization can take the form of preventative services (Hadley, 2003), or more general unmet health care needs (e.g., Carlson et al., 2006; Ayanian et al., 2000). And while uninsured individuals clearly spend less on premium Medical Out-of-Pocket (MOOP) expenses than the insured, they

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[1]There is an extensive literature on health insurance status, health service utilization, and health outcomes. The most extensive/convincing research comes from the RAND Health Insurance Experiment, which in part identified utilization as a decreasing function of copayment rate (e.g., Keeler, 1992). For an overview of the literature, including much more recent studies, see Hadley (2003), IOM (2009, 2002, 2001, 1998), and Freeman et al. (2008).

may also spend less than their insured counterparts on non-premium MOOP expenditures—especially if seriously ill where utilization increases to the rates of the insured (e.g., Johnson and Crystal, 2000).

These facts have implications for poverty measurement as recommended by the National Academy of Sciences Panel on Poverty and Family Assistance for the Supplemental Poverty Measure (SPM) (discussed in section II). Concerning MOOP spending, the panel recommended subtracting observed spending from income to determine poverty status in the SPM. However, because the uninsured have lower medical services utilization, and MOOP spending, their spending will reflect unmet needs relative to the insured's spending—resulting in downward pressure on the poverty rate in the SPM for the uninsured relative to the insured, *ceteris paribus*. Recognizing this aspect of the SPM, the Interagency Technical Working Group (ITWG) on Developing a Supplemental Poverty Measure recently suggested investigating the pros and cons of implementing an "adjustment" for the uninsured that accounts for such differential spending and its effect on poverty measurement (U.S. Census Bureau, 2010) (discussed in section II).

This research is a direct response to the ITWG and offers two distinct advances in how MOOP spending is incorporated into measuring poverty. First, it extends the method developed in Caswell and O'Hara (2010), which estimates counterfactual distributions of non-premium and premium MOOP spending for the uninsured, intended to reflect the correlation of spending of their insured counterparts. Specifically, this research is distinct in that it takes into account the type of insurance coverage—private coverage versus Medicaid/CHIP—of the donor (i.e., control) for predictive mean matching models of non-premium MOOP spending. Second, this work considers an additional counterfactual environment that incorporates key features of the Patient Protection and Affordable Care Act (PPACA), scheduled to be implemented in 2014, in assigning counterfactual premium values to hypothetical health insurance units (HIU) of the uninsured. These two counterfactual environments are therefore intended to represent levels of MOOP spending corresponding to satisfied medical care need of the uninsured, in terms of poverty measurement.

Using the two aforementioned uninsured MOOP spending adjustments, we investigate possible changes in SPM poverty rates. First we test whether the SPM incorporating the non-group uninsured adjustment is different from the "base" SPM that makes no adjustment for the uninsured. Second, we test whether the SPM estimates incorporating the uninsured adjustment reflecting key features of the PPACA is different from the base SPM. And finally, we test for differences in SPM poverty estimates over the two different uninsured adjustment methods. This work is intended to shed light on how SPM poverty rates change when it is assumed that the uninsured have met medical needs via the private non-group market, or alternatively in the health care reform environment in 2014. Results show that the poverty rates using both uninsured adjustments increase, compared to the "base" SPM (15.8 percent) which incorporates only observed MOOP spending: an increase of 2.6 percentage points in the first counterfactual versus a smaller increase of points 0.6 percentage points in the second.

2 Background

The Census Bureau has been conducting research on poverty measurement since the release of a 1995 report from the National Academy of Sciences (NAS) (Citro and Michael, 1995). That report recommended an improved measure of poverty for the United States that included many dimensions not accounted for in the official poverty measure, such as in-kind government benefits, taxes and tax credits, expenses related to work, and health care costs. They defined a poverty threshold that uses actual spending on basic needs, including food, clothing, shelter, and utilities, as reported in the Consumer Expenditure Survey (CE), to determine the level of resources below which a family or individual would be classified

as poor.[2]

The NAS panel recommended this method even though actual spending may not reflect amounts consumed nor the amount that society might agree to be the level needed. For example, families who own their home without a mortgage spend less than the amount of housing that they actually consume. This level of spending would not be a good measure of the amount of housing that the family might be considered to need. Another example would be a family that pays for substandard child care, because that is all they can afford to purchase while they go to work.

That panel of experts wrestled with how to account for health care more than any other element in their recommended poverty measure. They proposed an approach that separates the measurement of economic poverty from the measurement of medical care needs and the adequacy of resources to meet those needs. Their proposal was to subtract actual out-of-pocket medical care (MOOP) expenses from the level of resources available to the family to meet other basic needs that included food, clothing, shelter and utilities, included in the thresholds. Doing this, they suggested, would not ignore the effects of the health care financing system, or people's health status, on economic poverty (Citro and Michael, 1995, 225).

Two reports on experimental poverty measures were released by the Census Bureau (Short et al., 1999; Short, 2001). Both of those reports presented estimates of MOOP expenses in the way that the NAS report recommended for in determining poverty status. Following the release of the first report, concern was raised that actual spending for medical care by individuals and families without medical insurance does not reflect the care needed. If income is low, needed medical care may be delayed or missed. Many studies have shown that individuals and families without health insurance forego needed care (see IOM, 2009). It was also suggested that health care should be considered to be a basic need and as such should be incorporated in the poverty threshold calculation with spending on food, clothing, shelter, and utilities (Bavier, 1998). In response, the second of these reports introduced a measure that included actual spending on health care in the threshold but added an adjustment for the uninsured. This method used expenditures reported by those purchasing private policies as a replacement for the spending reported by the uninsured (Bavier, 2000; Banthin et al., 2000; Short, 2001).

In March of 2010 the Census Bureau received suggestions from the Office of Management and Budget's ITWG on Developing a Supplemental Poverty Measure (U.S. Census Bureau, 2010). This document described in detail a poverty measure, referred to as "the SPM," that closely followed the NAS panel recommendations, including: calculating poverty thresholds based on spending as measured in the Consumer Expenditure Survey (CE), accounting for in-kind benefits on the resource side of the measure, and incorporating taxes and necessary expenses. In addition, the ITWG suggested 1) using the newly collected MOOP spending data in the CPS ASEC for measuring SPM poverty, conditional on collecting reliable data, and 2) to "investigate the pros and cons" of an "adjustment to MOOP [spending] ... for the uninsured, who may be spending less ... because they can not pay for health services" (U.S. Census Bureau, 2010, 7).

In response Caswell and O'Hara (2010) developed a method for an uninsured adjustment using the newly collected MOOP expenditure data in the Current Population Survey 2010 Annual Social and Economic Supplement (CPS ASEC). Consistent with the NAS panel recommendations, first the authors estimate poverty rates that subtract observed MOOP spending from family resources, all while using the conventional CPS family unit and official thresholds, as their "base" alternative estimates. The authors then estimate counterfactual distributions of non-premium MOOP spending for the non-elderly uninsured using both propensity score matching and predictive mean matching models. No distinction is made for the type of insurance of the control group. Finally, counterfactual premium estimates are

[2] See Bureau of Labor Statistics (2011) for detailed information on experimental poverty thresholds.

achieved via model-based imputations based on policyholders privately insured with non-group policies. This research extends the former in that 1) poverty estimates incorporate the full range of SPM modifications, such as (but not limited to) using the 'poverty unit' as the level of analysis versus the CPS family, 2) insurance type is accounted for in the predictive mean matching models, and 3) a second counterfactual environment that incorporates key features of the PPACA is considered as an alternative uninsured adjustment (discussed below).

3 Methods

3.1 Data

For the MOOP spending adjustment among the uninsured this work uses the newly collected MOOP spending data collected in the 2010 Current Population Survey, Annual Social and Economic Supplement (CPS ASEC). The CPS ASEC is representative of the civilian, non-institutionalized population, and is collected mostly in March 2010—although some data is collected in February and April. The corresponding reference period for the data collected in the CPS ASEC is the 2009 calendar year, January-December, and includes approximately 210,000 individual respondents. MOOP spending data is collected separately for premium and non-premium spending. Respondents are asked to report all non-premium expenditures on medical services and equipment. Premium spending, on the other hand, captures spending over all types of health insurance policies, except for Medicare Part B.[3]

Unlike in Caswell and O'Hara (2010), Medicare Part B premiums are simulated using two sources. The first is information from the CPS ASEC survey instrument that identifies that a respondent reported receiving Social Security Retirement Income net of Medicare Part B deductions, and how many months they received such payments over the 2009 calendar year. For these records the instrument automatically adds an estimate for Medicare Part B premiums to "net" Social Security Retirement (SSR) income to construct "gross" SSR income. In this calculation the instrument is programmed to assume that everyone who reports "net" SSR benefit income paid $96.40 per month. Therefore, to be consistent with what is added to the SSR income in these cases, the same amount is added to reported premium expenditures.[4]

Second, for the remaining respondents that report Medicare status, Medicare Part B premiums are simulated using the rules for income and tax filing status in 2009 (Medicare.gov, 2009).[5] As the CPS ASEC does not collect information on tax filing status, the simplifying assumption is made that married respondents with their spouse present file married joint. For these cases the combined reported income of both spouses is used to determine the appropriate Part B premium. Finally, it is assumed that the following two groups pay zero Part B premiums: 1) dual-eligible respondents (i.e., Medicare and Medicaid), and 2) those with a family income less than 135 percent of the Federal Poverty Level. The latter assumption is a rough estimate for eligibility and participation in at least one of the following programs: Qualified Medicare Beneficiary (QMB), Specified Low-Income Medicare Beneficiary (SLMB), or Qualified Individual - 1 (QI-1).[6]

[3] Although respondents are asked not to report Medicare Part B premiums, there is concern that they indeed report Part B premiums. This is a topic for future research.

[4] In these cases it is important to assign an amount for Medicare Part B premiums that is equal to what is added to the resource side, i.e., SSR income, of the poverty calculation. Note that the instrument calculation is done irrespective of Medicaid status, and therefore dual-enrollees who report "net" SSR income receive an estimate for Medicare Part B that is added to reported premiums.

[5] The CPS ASEC does not collect the number of months that a person was on Medicare; therefore we make the simplifying assumption that respondents were insured for the entire year. Given this data limitation, this assumption is appropriate as most all individuals on Medicare do not transition out of Medicare.

[6] We abstract from the possibility of (state-specific) asset requirements.

3.2 Case 1: the Uninsured & the Non-Group Market

Counterfactual estimates of non-premium and premium MOOP expenditures are estimated for the uninsured (ages 0-64). Uninsured adults in the counterfactual are considered insured via the non-group market; as are children whose family income as a percent of the FPL exceeds the state-specific CHIP threshold (Kaiser Family Foundation, 2010b). Children whose family income falls at or below the state threshold are considered covered by CHIP in the counterfactual. This exercise is similar to that in Caswell and O'Hara (2010), yet extends it insofar as it accounts for insurance type—private versus Medicaid/CHIP instead of just insured versus uninsured—in the non-premium adjustment (discussed below).

3.2.1 Non-premium MOOP Expenditures

Counterfactual distributions of non-premium MOOP spending are estimated using predictive mean matching (PMM) models. Non-premium MOOP spending models are estimated separately by age and insurance category: 1) privately insured non-elderly adults (ages 19-64); 2) privately insured children (ages 0-18); and 3) Medicaid/CHIP insured children. Specifically, a one-part Generalized Linear Model (GLM) with a log-link and assumed Poisson error term is estimated conditional on being insured, for each of the three categories above. For example, the model for privately insured adults takes the following form:

$$\ln(E[\mathbf{s}|\text{ Privately Insured=1; Age 19 to 64}]) = \boldsymbol{\beta}'\mathbf{x}, \tag{1}$$

where $\mathbf{s}$ the vector of non-premium MOOP spending in 2009 U.S. dollars, $\hat{\boldsymbol{\beta}}$ is a vector of parameters to be estimated, and $\mathbf{x}$ is a matrix of demographic controls correlated with non-premium MOOP spending.[7] Slightly different model specifications are estimated for privately insured children, and children only insured by Medicaid/CHIP.[8]

Using parameter estimates from the three different model specifications—$\hat{\boldsymbol{\beta}}_A^{PI}$, $\hat{\boldsymbol{\beta}}_C^{PI}$, $\hat{\boldsymbol{\beta}}_C^{MCD}$, where superscripts "PI" is for Privately Insured, "MCD" is for Medicaid/CHIP; and subscripts "A" is for Adult and "C" for child—predicted values are estimated for both the insured (in-sample) and uninsured (out-of-sample) records. For example, parameter estimates for privately insured adults, $\hat{\boldsymbol{\beta}}_A^{PI}$, are used to obtain the in-sample predicted values, $\hat{\mathbf{s}}_A^{PI}$, as well as the out-of-sample predicted values for uninsured adults, $\hat{\mathbf{s}}_A^{U}$. In other words, the uninsured individuals' predicted values are obtained using the estimated correlation between spending and the demographic characteristics of the privately insured. The predicted values of the privately insured adults, $\hat{\mathbf{s}}_A^{PI}$, are then matched with the uninsured adults, $\hat{\mathbf{s}}_A^{U}$, using the SAS-user-written algorithm Greedy Match (Mayo Clinic, 2003).[9] Similarly, matches are made for the remaining two groups: privately insured children, and children only insured by Medicaid/CHIP. Finally, the *reported* non-premium spending values from the matched insured records (controls) are donated to the corresponding uninsured records (cases) to achieve the counterfactual distributions of non-premium spending.

3.2.2 Premium MOOP Expenditures

Uninsured adults, and children with sufficiently high family income (discussed above), are grouped into Health Insurance Units (HIU), and counterfactual premiums are estimated via model-based imputations using the models presented in Caswell and O'Hara (2010). Non-group premium spending models are

[7] See Appendix A, table A.1, for the complete list of covariates included in the matrix $\mathbf{x}$.

[8] See Appendix A, table A.2, for the complete list of covariates included in the children spending models.

[9] Greedy Match performs case-control one-to-one matching, which is an application of nearest-neighbor matching. See Bergstralh and Kosanke (1995) for more details.

estimated on observed HIUs insured via non-group policies (only) using the 2010 CPS ASEC data, by policy type (family versus single policy).[10]

3.3 Case 2: the Uninsured & the PPACA, 2014

Counterfactual distributions of non-premium and premium MOOP expenditures are estimated for the uninsured to reflect the distributions of their insured counterparts, and key features of the Patient Protection and Affordable Care Act (PPACA) *to be* implemented in 2014. Specifically, Medicaid and CHIP eligibility, state exchanges, and premium tax credits are considered (discussed below).[11] For an overview of the 2014 provisions, see Kaiser Family Foundation (2010c).

Medicaid & CHIP Eligibility. Individuals less than 65 years old with family income less than or equal to 133 percent of the Federal Poverty Level (FPL) will be eligible for Medicaid, and states are to reduce countable income by five percentage points (Stone et al., 2010, p. 11).[12] This effectively makes the threshold 138 percent of the FPL. Additionally, states are to maintain FPL eligibility levels for the Children's Health Insurance Program (CHIP) (Stone et al., 2010, p. 2). In this exercise all uninsured adults and children meeting the aforementioned FPL requirement are considered insured through Medicaid/CHIP, where the state-specific CHIP eligibility FPL thresholds are taken from Kaiser Family Foundation (2010b).[13]

State Exchanges. Individuals may be able to purchase health insurance through a state-level "Exchange," conditional on being a U.S. citizen/lawful resident, residing in the same state as the exchange, and if their employer does not offer a sufficient plan (Chaikind et al., 2010). Exchange health insurance policies will be regulated in terms of price and actuarial value, and eligible respondents will receive a premium tax credit (discussed below). Premiums prices will be restricted, and will vary by age, restricted by a band of a three-to-one ratio (Chaikind et al., 2010, p.12).

Premium Tax Credits. Among those purchasing insurance in the exchanges, premium tax credits will be offered on a sliding schedule as follows:

Family Income as a % of the FPL	Max. Premium Expenditure as a % of Family Income
138*-150	3.00-4.00
150-200	4.00-6.30
200-250	6.30-8.05
250-300	8.05-9.50
300-400	9.50

Source: Kaiser Family Foundation (2010c)
*The 5% reduction in countable income has been accounted for here.

3.3.1 Non-premium MOOP Expenditures

Counterfactual distributions of non-premium spending are derived in a similar way as described in section 3.2.1, yet it is expanded to include Medicaid eligible adults. That is, GLM log-link models for non-premium MOOP spending taking the form of equation (1) are estimated for the three groups discussed

[10] See Caswell and O'Hara (2010) for more details on the model specifications and parameter estimates.

[11] Cost-sharing subsidies are not incorporated; namely, a topic to be considered for future research. Nonetheless, results in Caswell and O'Hara (2010) suggest that the MOOP premium component of the spending adjustment is the driving force in its effect on poverty status.

[12] The law excludes pregnant individuals, however due to data limitations this work does not account for this dimension.

[13] Due to data limitations, undocumented residents are not excluded in this analysis.

above, as well as non-elderly adults insured by Medicaid; who are then matched with uninsured non-elderly adults with family income up to 138 percent of the FPL.[14] Given that the number of uninsured non-elderly adults is greater than the number of non-elderly adult Medicaid enrollees, we replicate the distribution of non-elderly Medicaid adults to be matched with the uninsured fourfold.[15]

3.3.2 Premium MOOP Expenditures

Uninsured individuals under age 65 not eligible for Medicaid/CHIP under the 2014 PPACA legislation requirements are grouped into hypothetical HIUs to determine the composition of each unit, and the appropriate counterfactual premium assignment. Premium estimates are taken from Kaiser Family Foundation (2010a), which are in turn taken from Congressional Budget Office (2009, table 2) for a single/family reference plan based on a policyholder 40 years old. As done in Kaiser Family Foundation (2010a), premiums are deflated using inflation projections (Congressional Budget Office, 2009), in this case from projected 2014 U.S. dollars to 2010 U.S. dollars, and then to 2009 U.S. dollars using the CPI all items series, CUUR0000AA0 (Bureau of Labor Statistics, 2010):[16] $4,315 (single reference policy, age 40), and $11,632 (family reference policy with policyholder age 40). Premiums for a given HIU are scaled by the age of policyholder (constrained by a three-to-one ratio), and adjusted using the aforementioned sliding-scale-premium-tax-credit schedule, which is a function of family income as a percentage of the FPL.

4 Results[17]

4.1 Uninsured MOOP Spending Adjustment: the Non-Group Market

Table 1 presents MOOP spending summary statistics among the uninsured before (panels 1 and 3) and after (panels 2 and 4) the non-group insurance/CHIP spending adjustment. Starting in panel 1, total MOOP spending per non-elderly uninsured person-excluding uninsured children with family income above the state CHIP threshold—is $539, where 61.4 percent of the distribution reports an amount equal to $0. After the premium and non-premium spending adjustment, panel 2 reports total spending per person for this group at $3,273, and only 4.8 percent of the distribution with zero spending. In other words, total spending per person increases by $2,734 per person for this group, and the percentage of zeros in the distribution decreases by 56.6 percentage points. Similarly, total premium spending per uninsured non-elderly adult increases by $2,588, and average total non-premium spending per non-elderly person increases by $267.[18] Panels 3 and 4 (table 1) illustrate how the Medicaid/CHIP adjustment changes the distribution of non-premium spending among children whose family income falls below the state-level CHIP threshold. These uninsured children—before the adjustment, shown in panel 3—are associated with non-premium spending of $179 per child, where 70.4 percent of the distribution report $0 spending. After the adjustment, shown in panel 4, non-premium spending per child is only $72, where

[14] See Appendix A, table A.2, for the complete list of covariates included in the adult Medicaid spending model.

[15] The choice of fourfold was determined to produce a ratio of controls to cases (3.603) that is close to the remaining three matching models.

[16] The All Items series is used to be consistent with the inflation projection series in Congressional Budget Office (2009). Inflation projections are not available for the Medical Care component of the CPI.

[17] The estimates in this paper (which may be shown in the text, figures, and tables) are based on responses from samples of the population and may be different from actual values because of sampling variability or other factors. As a result, apparent differences between the estimates for two or more groups may not be statistically significant. All comparative statements have undergone statistical testing and are significant at the 90 percent confidence interval unless otherwise noted. Standard errors were calculated using replicate weights (U.S. Census Bureau, 2009).

[18] Among uninsured non-elderly adults, 4.85 percent report an amount for total premium spending greater than zero.

Table 1: MOOP spending among the non-elderly uninsured before/after the non-group/CHIP spending adjustment

	Uninsured Aged 0-64 Before/After Private Insurance Adjustment								
	(1) Before			(2) After					
	Avg	s.e.†	p50	Avg	s.e.†	p50	N§	Δ Avg†	
Total MOOP Spending									
2009 $	539	20	0	3,273	18	2,500	28,273	2,734	**
=$0 (% for Avg)	61.4	0.5	1	4.8	0.1	0	28,273	-56.6	**
Premium Spending (Ages>18)									
2009 $	99	5	0	2,687	9	1,670	26,365	2,588	**
=$0 (% for Avg)	95.2	0.2	1	12.7	0.2	0	26,365	-82.5	**
Non-Premium Spending									
2009 $	446	19	0	713	14	200	28,273	267	**
=$0 (% for Avg)	63.7	0.5	1	30.6	0.3	0	28,273	-33.1	**
	Uninsured Aged 0-18 Before/After CHIP Adjustment								
	(3) Before			(4) After					
	Avg	s.e.†	p50	Avg	s.e.†	p50	N§	Δ Avg†	
Non-Premium Spending									
2009 $	179	14	0	72	10	0	4,309	-108	**
=$0 (% for Avg)	70.4	1.1	1	83.6	0.7	1	4,309	13.3	**

†s.e. obtained using replicate weights (Fay's Method)
** p<0.01, * p<0.05, + p<0.1 (two-tailed test)
§Not weighted
Notes: All statistics are reported at the individual level.
Source: Authors' calculations using the 2010 CPS-ASEC (internal files).

83.6 percent of these records are equal to $0. In other words, non-premium spending decreases by $108 per child, wherein the proportion of zeros increases by 13.3 percentage points.

4.2 Uninsured MOOP Spending Adjustment: PPACA, 2014

Table 2 reports MOOP statistics that illustrate how the adjustment, which incorporates key features of the PPACA, changes the distribution of spending among the non-elderly uninsured. Panels 1 and 2 report MOOP statistics among those assumed to achieve health insurance via an exchange. Before the adjustment, panel 1, total spending per non-elderly uninsured person is $566, and 59.2 percent of this distribution is composed of values equal to $0. After the adjustment, panel 2, total spending increases to $3,804 per person in this group, and only 5.5 percent of the distribution have values equal to $0. That is, total spending per person in this group increases by $3,238, and the proportion of $0 spending decreases by 53.7 percentage points. This large increase in spending is largely due to the large increase in premium spending, $3,163 per non-elderly adult; although non-premium spending also increases by $258 per non-elderly person. Among the non-elderly uninsured who receive an adjustment for Medicaid/CHIP status, non-premium MOOP spending decreases. Before the adjustment, panel 3 of table 2, average non-premium spending per uninsured non-elderly person in this group is $343, where 68.3 percent of the distribution reports zero spending. After the adjustment, panel 4, average non-premium spending per person decreases to $176 per person—a decrease of $168.

Table 2: MOOP spending among the non-elderly uninsured before/after the PPACA rules spending adjustment

	Uninsured Aged 0-64 Before/After Private Insurance Adjustment								
	(1) Before			(2) After					
	Avg	s.e.†	p50	Avg	s.e.†	p50	N§	Δ Avg†	
Total MOOP Spending									
2009 $	566	25	0	3,804	35	3,236	18,027	3,238	**
=$0 (% for Avg)	59.2	0.6	1	5.5	0.2	0	18,027	-53.7	**
Premium Spending (Ages > 18)									
2009 $	105	8	0	3,268	32	3,101	16,119	3,163	**
=$0 (% for Avg)	95.0	0.2	1	13.5	0.2	0	16,119	-81.5	**
Non-Premium Spending									
2009 $	470	24	0	728	18	200	18,027	258	**
=$0 (% for Avg)	61.5	0.5	1	29.8	0.4	0	18,027	-31.7	**
	Uninsured Aged 0-64 Before/After Medicaid/CHIP Adjustment								
	(3) Before			(4) After					
	Avg	s.e.†	p50	Avg	s.e.†	p50	N§	Δ Avg†	
Non-Premium Spending									
2009 $	343	21	0	176	15	0	14,555	-168	**
=$0 (% for Avg)	68.3	0.7	1	74.9	0.4	1	14,555	6.7	**

†s.e. obtained using replicate weights (Fay's Method)
** p<0.01, * p<0.05, + p<0.1 (two-tailed test)
§Not weighted
Notes: All statistics are reported at the individual level.
Source: Authors' calculations using the 2010 CPS-ASEC (internal files).

4.3 The Supplemental Poverty Measure & the Uninsured Adjustments

Table 3 shows individual-level poverty rates for the three measures—all of which incorporate the full range of SPM modifications—by a variety of characteristics. The first measure reflects reports of MOOP spending without any adjustment for the uninsured (column 1), all while taking into account all the dimensions of the SPM. The estimated population poverty rate in this "base" scenario is 15.8 percent. Differences in the base SPM estimates from the official measure by subgroup—not presented here—are described in detail in Short (2011), but generally result in higher poverty rates for all groups except for children, African Americans, people residing in non-metropolitan areas, and those covered by public health insurance.

The second SPM estimates include the adjustment for the uninsured, where premiums are estimated via non-group market prices (column 2). Including this adjustment increases the poverty rate significantly to 18.4 percent. Poverty rates rise significantly for all subgroups listed in the table with this adjustment (column 4), compared to the SPM without any adjustment. The largest increase is observed for the non-elderly uninsured (11.1 percentage points), which is expected as this is the target group for the adjustment. Recall, however, that even individuals who themselves are insured may reside with others that are uninsured, and thus their shared resources decrease to account for the uninsured individual's adjustment. Therefore it is possible for an insured person to be reclassified from non-poor to poor after this adjustment. It is also observed that the SPM increase is large for non-elderly Hispanics (6.1 percentage points; column 4), largely because they constitute one of the largest uninsured groups in the population. The estimated increase is considerably less for the remaining subgroups—ranging from 1.8 to 4.0 percentage points (column 4).

Table 3: Poverty rates (%) by select groups and non-elderly uninsured adjustment

	(1)		(2)		(3)		(4)		(5)		(6)	
	SPM		SPM w/ Non-Grp/ CHIP Adj.		SPM w/ PACCA Adj.		(2)-(1)§		(3)-(1)§		(3)-(2)§	
	Est.	s.e.†	Est.	s.e.†	Est.	s.e.†	Δ Est.†		Δ Est.†		Δ Est.†	
Total Population	15.8	0.2	18.4	0.2	16.4	0.2	2.6	**	0.6	**	-2.0	**
Ages 0-18	17.9	0.3	20.6	0.3	18.3	0.3	2.7	**	0.4	**	-2.3	**
Ages 19-64	14.9	0.2	17.9	0.2	15.8	0.2	3.0	**	0.8	**	-2.1	**
Ages 0-64	15.8	0.2	18.7	0.2	16.5	0.2	2.9	**	0.7	**	-2.2	**
White, Non-Hispanic	10.3	0.2	12.1	0.2	10.6	0.2	1.8	**	0.3	**	-1.5	**
Black, Non-Hispanic	23.8	0.6	27.8	0.6	24.5	0.6	4.0	**	0.7	**	-3.3	**
Other, Non-Hispanic	17.9	0.7	20.6	0.7	18.7	0.7	2.7	**	0.8	**	-1.9	**
Hispanic	28.7	0.6	34.8	0.7	30.9	0.7	6.1	**	2.2	**	-3.9	**
Uninsured	31.2	0.5	42.3	0.5	33.9	0.5	11.1	**	2.7	**	-8.4	**

** p<0.01, * p<0.05, + p<0.1 (two-tailed test)
†s.e. obtained using replicate weights (Fay's Method)
§Difference estimates reported in columns (4) through (6) may differ from subtracting estimates reported in columns (1) through (3) due to rounding.
Source: Authors' calculations. Weighted Statistics from the 2010 CPS-ASEC (internal files).

The third category of SPM estimates include the MOOP spending adjustment which incorporates key features of the PPACA (column 3). Under this scenario the poverty rate for the entire population is estimated at 16.4 percent, which is an increase of 0.6 percentage points (column 5) over the "base" SPM that does not include an adjustment for the uninsured (column 1). As discussed above, this result is in part because the non-elderly uninsured individuals, who previously did not pay a premium and spent little for health care, would now have greater total MOOP spending, which decreases resources of the poverty unit accordingly. All sub-groups in the table show statistically significant increases in poverty rates from the "base" SPM (column 5), and the increase is the largest for the non-elderly uninsured (2.7 percentage points) and the non-elderly Hispanic (2.2 percentage points). The increase for the remaining reported subgroups is about, or less than, one percentage point.

Comparing SPM poverty rates over the two uninsured adjustments attempted in this research (column 6) it is clear that the estimates decrease for the adjustment reflecting key features of the PPACA versus the alternative adjustment. For example, the total population poverty rate decreases from 18.4 percent (column 2) to 16.4 percent (column 3), a significant decrease of two percentage points (column 6). Estimated decreases are statistically significant for all subgroups reported, and as expected they are the largest for the non-elderly uninsured (-8.4 percentage points).

5 Discussion

Using the newly collected MOOP spending data in the 2010 CPS ASEC, this research provides new poverty estimates that incorporate the full range of SPM modifications, and two different adjustments for the uninsured intended to reflect met medical need. In doing so, this work offers two main results. The first is that SPM poverty estimates increase across the entire population for both uninsured adjustments relative to the "base" SPM which makes no adjustment for the uninsured. In the first case, non-elderly adults are assumed insured via the private (non-group) market, and children either in the private market or

via Medicaid/CHIP if family income is sufficiently low. In this counterfactual the estimated population poverty rate increased by 2.6 percentage points compared to the base SPM (from 15.8 to 18.4 percent). Alternatively, the second scenario attempts to incorporate key features of the PPACA as scheduled to be implemented in 2014. In this counterfactual we estimate an increase in the poverty rate of only 0.6 percentage points compared to the base SPM (from 15.8 to 16.4 percent).

The second main result, which follows from the first, is that although the PPACA's key provisions for 2014 are intended to limit MOOP spending for low-income individuals, we find that limited increases in spending may result in an increase in poverty as measured by the SPM. Nonetheless, the SPM estimates for the PPACA counterfactual are significantly less than those for the alternative uninsured adjustment. For example, the population poverty rate for the PPACA counterfactual is 16.4 percent versus 18.4 percent for the non-group uninsured adjustment. In short, an SPM that attempts to account for unmet medical care needs may result in a decrease in measured economic wellbeing. This result may hold even in the case where low-income individuals are insulated from high MOOP spending when insured.

One limitation of our study is that it does not model economic behavior—partial or general equilibrium effects. That is, our poverty estimates which incorporate adjustments for the uninsured are done using statistical estimates of spending for the insured, which are then imposed on the uninsured. Alternatively, although the CBO premium estimates used for the PPACA counterfactual do incorporate economic behavior, they are preliminary estimates. To date the state "exchanges" are not yet up and running, and premiums charged by the exchanges in 2014 may be much different. Differences in premium prices could influence the poverty estimates, even though there are "bands" in the legislation that limit total spending as a percentage of family income. Although the bands which limit exposure to high spending as a percent of family income significantly constrain how this channel can affect the SPM poverty rates.

A final aspect of economic behavior that we abstract from is health insurance take-up on behalf of the uninsured. Nonetheless, our assumption of 100 percent take-up is consistent with the aim of this paper: to create a medical spending adjustment for the uninsured that reflects met medical need. In other words, it is not necessary that the uninsured actually purchase insurance and spend as the insured do on medical services. Rather our uninsured adjustments are simply intended to represent a level of spending that reflects met medical need, where we assume the insured have met medical need versus the uninsured. To this end it is clearly not our objective that actual economic behavior of the uninsured—to take-up or not take-up insurance—reflects their actual economic behavior. Nonetheless, recent research by Krueger and Kuziemko (2011) suggests that take-up of health insurance on behalf of the *uninsured* under the 2014 PPACA provisions may be much higher than previous research suggests—as high as 77 percent.

A final aspect of this work that may be a limitation is that we make no effort to implement caps on non-premium MOOP spending in the PPACA counterfactual uninsured adjustment. This omission may exert upward pressure on the poverty rates estimated in this counterfactual. However, as the results in Caswell and O'Hara (2010) suggest, it is the premium adjustment that is the first order of importance in how it exerts upward pressure on the poverty rate. Incorporating these caps is an area of consideration for future research.

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Appendix A

GLM log-link model parameter estimates used to derive the counterfactual non-premium MOOP spending distributions are reported in tables A.1 and A.2. Note that all four models in tables A.1 and A.2 are used for the PPACA counterfactual non-premium spending distributions (see Section 3.2.1). In the alternative counterfactual, however, only the Private insurance model in table A.1 is used, along with both spending models for children reported in A.2 (see Section 3.3.1).

Table A.1: GLM log-link non-premium MOOP spending models, adults (19-64) by insurance coverage

	Private			Medicaid (Only)		
	Coefficient	**s.e.†**		**Coefficient**	**s.e.†**	
Natural Log of Family Income	0.084	0.018	**	0.132	0.040	**
Number of Family Members (per age group)						
age≤18	0.011	0.016		-0.026	0.050	
19≤ age≤64	-0.031	0.018	+	-0.146	0.067	*
age≥65	-0.043	0.048		-0.053	0.178	
Marital Status (Married=1)	-0.027	0.035		0.638	0.125	**
Education (reference = less than H.S. Equivalent)						
H.S. Equivalent/Associate's Degree	0.122	0.059	*	0.039	0.193	
Bachelor's Degree	0.277	0.062	**	-0.263	0.202	
Master's/Professional Degree/Ph.D.	0.387	0.063	**	0.62	0.378	
Health Status (reference = Excellent)						
Very Good	0.084	0.034	*			
Good	0.557	0.064	**	0.510	0.153	**
Fair	0.927	0.058	**	1.038	0.208	**
Poor	1.114	0.109	**	1.260	0.210	**
Disability	0.213	0.059	**	0.271	0.179	
Age in Years				0.007	0.006	
Age (reference = 19-24)						
25-29	0.212	0.121	+			
30-34	0.398	0.111	**			
35-39	0.371	0.122	**			
40-44	0.374	0.122	**			
45-49	0.396	0.122	**			
50-54	0.624	0.120	**			
55-59	0.733	0.123	**			
60-64	0.742	0.119	**			
Male	-0.144	0.021	**	0.003	0.120	
Race & Ethnicity (reference = White, Non-Hispanic)						
Black, Non-Hispanic family member	-0.353	0.044	**	-0.336	0.235	
Hispanic family member	-0.369	0.041	**	-0.717	0.166	**
Other, Non-Hispanic family member	-0.360	0.063	**	-0.327	0.381	
Residence (reference = South)						
Northeast	-0.368	0.043	**	-0.519	0.148	**
Midwest	-0.159	0.052	**	-0.004	0.225	
West	-0.041	0.048		-0.144	0.163	
Employment Status (reference = unemployed)						
Employed (Excluding self-employed)	0.185	0.138		0.847	0.558	
Not in labor force	0.136	0.056	*	-0.182	0.249	
Full Time Student	-0.027	0.137		0.224	0.762	
Self-employed	0.271	0.062	**	0.131	0.281	
Employer Number of Employees						
<25 workers	-0.142	0.136		-0.904	0.541	+
25-99 workers	-0.187	0.137		-0.752	0.569	
100-499 workers	-0.190	0.138		-1.008	0.597	+
500+ workers	-0.181	0.132		-1.056	0.532	*
Industry: Wholesale & Retail Trade	0.011	0.046		-0.403	0.245	
Intercept	5.127	0.205	**	3.728	0.518	**
N (not weighted)	83,422			9,220		

** p<0.01, * p<0.05, + p<0.1

†s.e. obtained using replicate weights (Fay's Method)

Notes: GLM log-link models are estimated only on insured non-elderly adults aged 19-64, by group as indicated.
Source: Authors' calculations using the 2010 CPS-ASEC (internal files).

Table A.2: GLM log-link non-premium MOOP spending models, children (0-18) by insurance coverage

	Private			Medicaid/CHIP (Only)		
	Coefficient	**s.e.†**		**Coefficient**	**s.e.†**	
Natural Log of Family Income	0.127	0.054	*	0.200	0.064	**
Number of Family Members (per age group)						
age≤18	-0.070	0.020	**	-0.119	0.094	
19≤age≤64	-0.161	0.031	**	-0.121	0.095	
age≥65	-0.145	0.074	+	-0.196	0.195	
Max Education Family Members						
(reference = less than H.S. Equivalent)						
H.S. Equivalent/Associate's Degree	0.058	0.163		0.337	0.247	
Bachelor's Degree	0.264	0.155	+	0.483	0.279	+
Master's/Professional Degree/Ph.D.	0.351	0.154	*	0.459	0.358	
Health Status						
(reference = Excellent; Excellent, Very Good & Good)						
Very Good	0.126	0.042	**			
Good	0.681	0.076	**			
Fair	1.725	0.168	**	1.499	0.334	**
Poor	1.888	0.241	**	2.330	0.421	**
Age (reference = 1-13 years old)						
infant	0.302	0.083	**	-0.854	0.207	**
14-18	0.244	0.049	**	0.568	0.201	**
Race & Ethnicity (reference = White, Non-Hispanic)						
Black, Non-Hispanic family member	-0.427	0.076	**	-0.847	0.200	**
Hispanic family member	-0.123	0.094		-0.364	0.187	+
Other, Non-Hispanic family member	-0.205	0.075	**	-0.483	0.285	+
Residence (reference = South)						
Northeast	-0.207	0.071	**	-0.003	0.225	
Midwest	-0.105	0.052	*	0.206	0.234	
West	-0.069	0.056		-0.084	0.190	
Intercept	4.613	0.672	**	2.334	0.673	**
N (not weighted)	40,038			16,632		

** p<0.01, * p<0.05, + p<0.1

†s.e. obtained using replicate weights (Fay's Method)

Notes: GLM log-link models are estimated only on insured children aged 0-18, by category as indicated.

Source: Authors' calculations using the 2010 CPS-ASEC (internal files).