

# Does Public Health Insurance for Children Improve Single Mothers' Health Care Use?

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**Abstract** Public health insurance expansions for low- and middle-income children have improved private and social welfare by enhancing children's access to socially-valued health services and improving their health. In this paper, we considered another welfare implication from expanded public coverage for children: Whether the savings in private insurance premiums and/or out-of-pocket medical spending from enrolling children in public coverage freed up income that was used for mothers' own medical care. We used data from the 2001–2008 US Medical Expenditure Panel Survey and found that uninsured, low-income single mothers with children enrolled in public coverage used more preventive and other health care services than their counterparts who did not enroll their children in such coverage.

**Keywords** Single mothers · Children · Health insurance

## Introduction

In the US, public health insurance expansions for low- and middle-income families have included the Medicaid expansions of the late 1980s and the State Children's Health Insurance Program (SCHIP) beginning in 1997.

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These insurance expansions have improved health coverage and access to care for children, reduced the burden of medical spending borne by their families, and improved health outcomes for certain vulnerable groups (Banthin and Selden 2003; Currie et al. 2008; Currie and Gruber 1996a, b; Gruber 2003, among others). When such expansions have addressed the under-consumption of socially-valued medical care, such as the preventive services highlighted in the US Patient Protection and Affordable Care Act (ACA) of 2010, they also have enhanced both private and social welfare.<sup>1</sup>

Apart from such private and social benefits, the expansions have also yielded adverse social welfare effects, including possible reductions in family labor supply, disincentives toward savings, and changes in family structure (Gruber 2003). Perhaps the most frequently cited adverse consequence of the expansions has been the “crowding out” of enrollment in private, mostly employer-sponsored insurance (ESI) as families with children newly eligible for public coverage switched the latter's source of insurance from ESI to public coverage.<sup>2</sup> Such crowd out can reduce social welfare through the inefficient targeting of vulnerable populations that the expansions were intended to assist,

<sup>1</sup> Under the ACA, most private health insurers (except grandfathered health plans) and Medicare are required to cover preventive services designated “A” and “B” by the US Preventive Services Task Force. For a list of such services see: <http://www.uspreventiveservicestaskforce.org/uspstf/uspsabrecs.htm>.

<sup>2</sup> Although estimates and methodological approaches vary, the high end of such estimates found that crowd out—the increase in public coverage attributable to a decline in ESI—ranged from between a third to nearly 60 % (see Davidson et al. 2004; Gruber and Simon 2008 for reviews of the literature). In more recent work, Zimmer (2010) found that nearly a third of children enrolled in the State Children's Health Insurance Program were in families with two privately insured parents.

thus raising program costs and diverting resources from other productive uses.

In this paper, we investigated another welfare implication associated with expanded public coverage: whether children's enrollment in public insurance had consequences for their parents' use of health care. We focused on low-income families comprised of single mothers and their children as such families have been particularly vulnerable and, thus, may have been more inclined than other families to take advantage of the potential savings from enrolling their children in public insurance. Previous research has also found that single mothers were less likely to use socially valued preventive health care services compared to their married counterparts (Miller and Pylpchuk 2014).

In our analyses, we considered whether children's enrollment in public coverage improved the material well-being of families, much in the way that other means-tested welfare programs such as food stamps and publicly-provided education have improved family welfare (Leininger et al. 2010; Ver Ploeg 2009). In particular, we used data from the 2001–2008 US Medical Expenditure Panel Survey-Household Component to examine whether the lower out-of-pocket medical care spending and/or reduced premium costs for families enrolling children in public coverage, compared to other families, freed up income that could have been used for mothers' own medical care. To the extent that the income recovered from such reduced out-of-pocket costs enabled others in the household to achieve an optimal use of health services, the welfare loss from any ESI crowd out may have been partially offset. Alternatively, apart from crowd out, if the reduced out-of-pocket costs experienced by uninsured families enrolling children in public coverage yielded an increase in mothers' health care use, both private and social welfare would likely be enhanced. Below, we discuss this issue in the context of the growing prevalence of families with mixed insurance, and also consider the nature of these income transfers and their welfare consequences.

## Background

For well over two decades, families in the US have experienced profound changes in their health insurance choices and the prices they face for various types of coverage. As a consequence, there has been a noticeable shift in how families obtain coverage, including declines in dependent employer-sponsored insurance (ESI) and a greater prevalence of combinations of private and public coverage within families (Monheit and Vistnes 2005; Vistnes and Schone 2008). The changing composition of health insurance coverage within families has reflected a number of factors,

including rising out-of-pocket costs of health insurance, especially for family coverage, family incomes that have not kept pace with health insurance costs, and shifts in the perceived value of ESI coverage by households as cost-sharing for medical care has increased. The expansion of public coverage has also contributed to the changing nature of family health insurance. Previously uninsured children meeting eligibility criteria for public insurance now reside in households with uninsured parents, and the expansion of income-eligibility thresholds to encompass middle- and higher-income families has resulted in families in which parents have maintained ESI coverage while they have enrolled their children in public coverage. As we discuss next, in both cases, families may face strong incentives in the form of potential income gains that encourage the formation of such mixed-insurance status families.

## Families with Employer-Sponsored Health Insurance

Families with ESI coverage for adults and children eligible for public coverage face an incentive to enroll their children in such coverage since out-of-pocket insurance and medical care expenses are generally lower for public than for ESI coverage. As regards out-of-pocket premium costs, some families are able to shift to less expensive ESI when enrolling their children in public coverage (such as from family coverage to single coverage for adults or employee-plus-one coverage). Next, they may also face reduced out-of-pocket medical care spending should public coverage eliminate or lower cost-sharing for medical care services compared to ESI, or have richer benefits. Thus, compared to similarly situated families that enroll all members in private coverage, these "mixed insurance" families may face lower out-of-pocket costs.

Cutler and Gruber (1996a) first recognized that the possible monetary gain to the family from shifting covered children from ESI to public insurance was an inducement to such a coverage change. For 1987, they estimated that on average, a family could potentially recover \$1,262 in out-of-pocket premiums and medical spending (\$483 from the former and \$779 from the latter) as well as \$2,078 in increased wages due to the wage shifting associated with the elimination of employer health insurance contributions (all amounts presented are in US dollars). Since the latter represented 62 % of the total savings, Cutler and Gruber noted that the gain from altering the family's insurance status was largely dependent on the assumption of complete wage shifting by employers in response to reduced ESI coverage. They also focused specifically on families likely to experience crowd out of private insurance and estimated that such families received an income transfer of \$1,523 in 1987, equivalent to an 8 % increase in income (Cutler and Gruber 1996b, 1997).

More recently, Schaefer et al. (2011) examined the impact of Medicaid and SCHIP-related crowd out on out-of-pocket medical expenditures and private health insurance premiums for affected families. In contrast to the computations by Cutler and Gruber, these authors used out-of-pocket rather than total premium costs as a measure of the savings from foregoing ESI. They used data from the 1996 and 2001 panels of the Survey of Income and Program Participation and found a substantial crowd out of private insurance. The crowd out yielded a cash-equivalent income transfer of \$1,500 annually for families due to reduced out-of-pocket medical spending and premiums.

Finally, Leininger et al. (2010) also noted that private insurance crowd out improved family welfare due to reduced health insurance premium payments made on behalf of children and reductions in out-of-pocket payments for medical care, and that these reduced payments freed up resources for other consumption. They investigated the resulting change in household consumption using data from the Consumer Expenditure Survey and found that SCHIP eligibility was associated with a significant decline in out-of-pocket health care spending (for both insurance and medical care) amounting to approximately \$360 to \$441 per quarter. They also found a very significant increase of between \$3,200 and \$5,500 in total non-health consumption, representing more than 25 % of baseline total consumption, with significant spending increases for transportation and evidence of increased retirement savings. However, they noted that some of their estimated effects were imprecisely measured. Overall, their findings suggested that the SCHIP expansions substantially improved the material well-being of the low-income families it was intended to assist—including those who previously were paying for their own coverage.

In contrast to Leininger et al. (2010), we focused on the health care use of a particularly vulnerable group, mothers in low-income single-parent households. We noted that if the savings associated with enrolling children in public coverage were used by such single mothers to obtain their own health services, the associated increase in their utilization would be welfare enhancing from both private and social perspectives. This would have resulted because the increase in health care used by single mothers was due to an income effect rather than from the moral hazard associated with an insurance-induced decline in their own out-of-pocket price of medical care.<sup>3</sup> Put differently, single

<sup>3</sup> Apart from dropping dependent coverage, we assumed that parents did not change the nature of the health insurance they obtained (i.e., moving to coverage that is less generous) but only switched from family to employee-plus-one or single coverage. While not directly comparable, our analysis is consistent with the increased willingness to pay for health services (i.e., efficient moral hazard) and thus the enhanced private and social welfare that would result from the income

mothers would have used this savings on their own medical care when they could have used it to purchase other goods and services. As such, it would have represented an increased willingness to pay for medical care. Additionally, if the health care consumed in this way included socially-valued health services (such as the A and B preventive health services recommended by the US Preventive Services Task Force), then the increased health care use also would have enhanced social welfare.

#### Uninsured Families

Families with uninsured parents and with children enrolled in public coverage also could have obtained monetary savings if such coverage resulted in reduced out-of-pocket medical care spending. Since households with publicly insured children are typically low- or middle-income and thus likely to be income constrained in their use of health services (even among insured families), parents could have reduced their own health care use in favor of their children's health care needs. Consequently, the savings obtained from enrolling children in public coverage could provide a means to increase their own use of health care services, and such health care use could improve relative to similarly situated uninsured families who did not enroll their children in public coverage. Similar to mixed ESI/public coverage families, the savings used by uninsured single mothers to increase their own use of medical care would be welfare enhancing (reflecting their increased willingness to pay for medical care).

#### Estimates of the Monetary Savings from Enrolling Children in Public Coverage

To illustrate the potential savings in out-of-pocket costs from enrolling eligible children in public coverage, we estimated the difference in out-of-pocket spending for children's health care and family-level spending for health insurance between single-mother families fully-insured with ESI (all-ESI families) and single-mother families in which mothers had ESI coverage and eligible children were enrolled in public coverage (ESI/public families). We used data from the 2001–2008 US Medical Expenditure Panel Survey (described in detail below) for our analysis sample of single-mother families with incomes less than 300 % of the federal poverty line.<sup>4</sup> The estimates displayed in Table 1 revealed that the all-ESI families spent nearly twice as much out-of-pocket on premiums and health care

Footnote 3 continued  
transfers individuals in poor health received from other members in their insurance pool (Nyman 2002, 2004).

<sup>4</sup> Other sample restrictions are described below in the data section.

**Table 1** Spending by family insurance status: mean spending and spending at selected spending percentiles for family insurance premiums and out-of-pocket health care costs for children (standard errors are in parentheses)

	Total premiums + out-of-pocket spending	Spending on premiums	Out-of-pocket spending
A: All family members covered by ESI ( $N = 700$ )			
Mean spending	\$1,892 (74)	\$1,532 (64)	\$360 (32)
Spending at 25th percentile	675 (134)	432 (76)	23 (3)
Spending at 50th percentile	1,567 (76)	1,274 (95)	108 (11)
Spending at 75th percentile	2,563 (116)	2,277 (94)	350 (35)
Spending at 90th percentile	3,898 (211)	3,221 (79)	801 (66)
Spending at 95th percentile	4,773 (263)	3,845 (272)	1,290 (283)
B. Adults with ESI/children with public coverage ( $N = 197$ )			
Mean spending	\$1,000 (112)	\$893 (97)	\$107 (42)
Spending at 25th percentile	241 (75)	205 (109)	0 (0)
Spending at 50th percentile	796 (142)	717 (133)	2 (3)
Spending at 75th percentile	1,482 (144)	1,331 (123)	45 (18)
Spending at 90th percentile	2,160 (462)	1,954 (279)	133 (78)
Spending at 95th percentile	2,921 (158)	2,704 (301)	374 (299)

Source 2001–2008 MEPS-HC.  
All estimates are in 2008 dollars

services compared to the ESI/public coverage families (\$1,892 in Row 1 of Panel A vs. \$1,000 in Row 1 of Panel B, both expressed in 2008 dollars). As the table further revealed, we also found wide spending differences between these families at various points throughout the out-of-pocket spending distribution, as well as for components of this spending (out-of-pocket premiums and health expenditures considered separately).

While there also could have been spending differences between families in which single mothers were uninsured but their children had public coverage and single-mother families where all members were uninsured, we did not present spending comparisons for such families. Such unadjusted comparisons were problematic since publicly insured children could have used more medical care than uninsured children, and despite having public coverage, may have incurred higher out-of-pocket costs than uninsured children. Differences in utilization may also have affected our prior comparison of children with ESI to those with public coverage. However, apart from differences in demographic and other characteristics, such comparisons were less problematic since both categories of children had some form of coverage and were therefore more likely to have comparable levels of medical utilization.

## Data and Empirical Approach

Our sample of single mothers and their children for the US was obtained from the household component of the US Medical Expenditure Panel Survey (MEPS-HC), a nationally representative 2-year panel survey sponsored by the Agency for Healthcare Research and Quality (AHRQ).

MEPS provides national estimates of the civilian, non-institutionalized population's access to, use of, and expenditures for health care, their health and health insurance status, demographic characteristics, economic status, and employment characteristics. We pooled MEPS data for the years 2001 through 2008 and obtained an adequate sample of low-income single mothers and their families (the latter year represented the most currently available data at the initiation of our study). Since we wanted to examine mothers' use of medical services for a low-income population whose children were likely to be eligible for public coverage, we restricted our sample to single mothers ages 25–54 with incomes less than or equal to 300 % of the federal poverty line. We then limited our sample to single mothers whose family composition and health insurance status did not change over the course of the year. We also limited our sample to families where individuals only had one category of insurance (e.g., such as private or public) throughout the year. We defined such stable families as those with single mothers and children ages 0–18 in which the number of parents and children remained constant during the calendar year. In addition, we included the handful of single-mother families that were otherwise classified as stable, but where there was a death in the family or where someone entered a health care institution. This allowed us to capture families with high levels of medical expenditures.

Once we identified such stable families, we created health insurance eligibility units (HIEUs) to define family-level coverage status. In general, HIEUs were defined as consisting of single parents and dependent children ages 0–17, ages 18–23 if the child was a full-time student, or adult-children if they were disabled and living with their

parents. We also excluded a small number of women who gave birth during the year since their health care needs were substantially different from those of other women in the sample. In addition, we excluded a small number of cases with missing county-level data and a similarly small number with additional non-employment related private health coverage. We also excluded families where the children were reported to have public coverage but, according to state-level eligibility criteria and calculations using MEPS data, were not considered eligible for such coverage. We restricted the sample of ESI mothers to women who worked the entire year and subset the sample to wage-earners since self-employed women make insurance decisions for themselves as well as their workers.<sup>5</sup> Our sample consisted of 1,791 low-income single mothers, 897 with ESI and 894 who were uninsured. We used survey weights to produce estimates that were nationally representative, and adjusted standard errors for the complex survey design of the MEPS. Unless otherwise indicated, all findings reported in the text were statistically significant at least at the .05 level of statistical significance or better.

In Table 2, we present selected characteristics of the samples of low-income uninsured single mothers and low-income ESI single mothers and report statistically significant differences in these characteristics along a number of telling dimensions. First, we found that uninsured mothers were more likely than ESI mothers to have children enrolled in public coverage (66.8 % compared to 17.6 %, respectively). Next, we found that uninsured mothers were less likely than ESI mothers to reside in the Midwest (13.9 % compared to 25 %, respectively) and to work full-time (48.6 % compared to 91.2 %). We also found that uninsured mothers were more likely than mothers with ESI to have less than a high school education (30.3 % of the former compared to 9.7 % of the latter group), to be Hispanic (27.6 % compared to 10.2 %), to live in the South (52 % compared to 41.7 %), to report being in fair or poor health (28.9 % compared to 14.9 %), and to have more than two children (21.6 % compared to 12.9 %). The fact that uninsured mothers had lower educational attainment and were far less likely to work full-time compared to ESI mothers helped in explaining the latter group's greater access to ESI coverage.

### Empirical Approach

Our analyses provided an indirect assessment of the impact of the savings in out-of-pocket spending obtained from enrolling children in public coverage on single mothers'

<sup>5</sup> The restrictions on our samples resulted in the exclusion of 3.7 % of the sample for uninsured mothers and 9.6 % of the sample for ESI mothers.

health care use. We estimated econometric models of health care use and expenditures to analyze the differences in these outcomes between single mothers with children enrolled in public coverage and single mothers with no children enrolled in public coverage. Our key independent variable in the model for mothers with ESI was the total out-of-pocket premium paid on behalf of all family members.<sup>6</sup> We focused on this component of savings rather than premiums plus out-of-pocket medical spending for children since the latter measure was associated with medical care utilization of children and was likely to reflect mothers' unobserved tastes and preferences for medical care and therefore would be considered endogenous. As shown in Table 1, the mean premium for families entirely covered by ESI was \$1,532 compared to \$893 for families with a mixture of ESI and public coverage (in 2008 dollars). We used this information in our ESI models to evaluate the effects of savings on the health care use of single mothers.

In our models for uninsured mothers, we compared the health care use of uninsured single mothers with children enrolled in public coverage to outcomes for uninsured single mothers whose children were also uninsured. In these models, the key independent variable was a dummy variable for whether the children had public coverage. The coefficient on this variable captured the net benefit to the single mother of enrolling her children in public coverage, and reflected the savings in out-of-pocket medical care costs for children with public coverage less any required public premium payments.<sup>7</sup>

We tested the hypotheses that the savings from enrolling children in public coverage increased mothers' use of medical services. To do so, we estimated a series of econometric models of health care spending and utilization.<sup>8</sup> First, we estimated separate models of the likelihood of positive medical expenditures, mental health drug expenditures, office-based visit expenditures, and prescription drug expenditures. We then estimated conditional models of levels of positive total health care spending, spending for office-based health care visits and for

<sup>6</sup> The private out-of-pocket premiums were collected directly in the MEPS questionnaire. The public premiums for children enrolled in public coverage were estimated based on state-level data on eligibility criteria and required premiums.

<sup>7</sup> We did not include a direct measure of out-of-pocket spending on children's health care in our models for uninsured mothers. As noted above, children on public coverage were likely to use more medical services than uninsured children. As a result, comparing their out-of-pocket spending would not appropriately reflect the savings a mother would expect when enrolling her children on public coverage.

<sup>8</sup> In both descriptive and econometric analyses, our estimates were weighted to yield population estimates of use and so that regression coefficients reflected the behavior of the population under consideration. We also adjusted standard errors for the complex survey design of the MEPS.



**Table 2** Selected characteristics of low-income single mothers: mothers with ESI and uninsured mothers (standard errors are in parentheses)

	Mothers with ESI	Uninsured Mothers
Percent with children with public coverage	17.6 (1.9)	66.8*** (2.4)
Percent of mothers ages 25–34	35.9 (2.3)	43.5* (2.4)
Percent of mothers ages 35–44	44.3 (2.2)	38.7 <sup>†</sup> (2.3)
Percent of mothers ages 45–54	19.8 (2.1)	17.9 (1.7)
Percent of mothers with less than 12 years of education	9.7 (1.3)	30.3*** (2.2)
Percent of mothers with 12 years of education	43.2 (2.5)	41.4 (2.5)
Percent of mothers with 13–15 years of education	31.8 (2.1)	22.7** (2.1)
Percent of mothers with 16 years of education	12.4 (1.8)	3.9*** (1.0)
Percent of mothers with more than 16 years of education	2.8 (0.7)	1.7 (0.7)
Percent of mothers who are white	39.8 (2.7)	34.6 (2.5)
Percent of mothers who are Hispanic	10.2 (1.2)	27.6*** (2.5)
Percent of mothers who are black	32.6 (2.9)	26.9 (2.2)
Percent of mothers of other race/ethnicity	17.4 (1.8)	10.8** (1.3)
Percent of mothers residing in the Northeast	16.3 (2.0)	10.8* (1.6)
Percent of mothers residing in the Midwest	25.0 (2.3)	13.9*** (1.7)
Percent of mothers residing in the West	17.0 (2.2)	23.3 <sup>†</sup> (2.7)
Percent of mothers residing in the South	41.7 (3.0)	52.0* (2.8)
Percent of mothers in fair/poor health	14.9 (1.6)	28.9*** (2.0)
Percent of mothers working full-time	91.2 (1.5)	48.6*** (2.4)
Percent of mothers with one child	59.1 (2.4)	48.2** (2.4)
Percent of mothers with two children	27.9 (2.1)	30.2 (2.1)
Percent of mothers with more than two children	12.9 (1.4)	21.6*** (1.9)
Number of Observations	897	894

Source 2001–2008 MEPS-HC

Pairwise differences in characteristics significant at

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ , <sup>†</sup>  $p < .10$

physician visits, and spending for all prescription drugs (in 2008 dollars).<sup>9</sup> We also considered the number of visits for office-based care and for office-based physician care. Finally, we considered whether the savings in out-of-pocket costs from enrolling children in public coverage was associated with greater use of preventive services by single mothers. In doing so, we used MEPS data consistent with preventive services rated A or B by the US Preventive Services Task Force. These services included blood pressure screening and cholesterol checks within the last year, Pap tests as part of cervical cancer screening, and mammograms as part of breast cancer screening for women age 40 or over.

We estimated our two-part expenditure models with a first-stage probit model for the likelihood of incurring an expenditure and second-stage conditional expenditure estimating equation based on a generalized linear model (GLM). The GLM model was characterized by a logarithmic link function and variance function proportional to the mean squared (a gamma distribution). For number of visits, we estimated a negative binomial “count” model,

and for preventive care, we estimated probit models of the likelihood of use.

All estimating equations included a rich set of control variables including the single mother’s age, race/ethnicity, region of residence, and whether she resided in a metropolitan statistical area. The latter two variables partially controlled for geographic differences in health care costs. Other control variables included income in relation to the federal poverty line (FPL) and a squared term for FPL, total asset levels (in 2008 dollars), education, an indicator of whether the MEPS interview was conducted in English and indicators for the number of children (one, two, or more than two children). Additionally, we controlled for the single mother’s health status including whether the mother was in fair or poor physical and mental health, the presence of chronic health conditions, and the presence of any limitations in work, housework or school. We also included a measure of the number of children in fair or poor health. In addition, we included a set of variables to capture the single mother’s tastes—attitudes toward medical care and risky behavior. We included the characteristics of the mother’s job, such as the employer’s size and whether the worker was a union member, in the models for single mothers with ESI to control for generosity of coverage. We also included measures of sick leave and

<sup>9</sup> We did not estimate a conditional expenditure equation for mental health prescription drugs due to small sample sizes.

whether the mother worked full-time (35 or more hours per week) to control for difficulties in seeing a doctor due to time constraints in the mother's schedule.<sup>10</sup> Finally, we included county characteristics that were merged onto the MEPS from the Area Resource File. These characteristics included the county unemployment rate, per capita income, the number of active doctors, and the population size of the county.

#### Econometric Issue: Causality or Association?

A key challenge for our analysis was whether we could assign a causal interpretation to the relationship between family type or premiums and single mothers' health care use, or whether our approach was more limited and capable only of discerning an interesting association. The econometric issue in our models was whether mothers who decided to enroll their children in public coverage and used the resulting savings to enhance their own health care use were more responsible, in general, or predisposed to use health care services. This could have been due to either unmeasured severity of health conditions or because of a strong commitment to preventive care. If this was the case, then we could not generalize from the experience of these mothers, since their decision to enroll their children would be correlated with unobserved strong preferences for health care, risk-avoiding behavior, or unmeasured health status. As a result, our estimated impact of family type on uninsured parents' use of care could have been biased upward since these unobservable or omitted factors would have been positively correlated with enrollment in public coverage and with our outcomes of interest.

We first attempted an instrumental variables (IV) strategy to address this issue and employed several variables to serve as instruments for out-of-pocket premium costs (for mothers with ESI) and for uninsured mothers' family type. These included average premiums for single and family coverage that we calculated from employer data in the MEPS-Insurance Component by state and employer size, and a state-level measure of the generosity of public coverage.<sup>11</sup> This state-specific measure was defined as the eligibility rate of a nationally representative population of children for Medicaid or SCHIP, had they lived in each state and year. Measures of this nature have been widely used in the literature on Medicaid/SCHIP, starting with Currie and Gruber (1996a) and Cutler and Gruber (1996b). The measure was calculated by taking a nationally

representative sample of children from the Current Population Survey and measuring the fraction that would be considered eligible for Medicaid/SCHIP in a certain state and year as determined by the eligibility rules in that state. Unfortunately, these instruments failed conventional tests for robust instruments in the first stage equations.

As an alternative to an IV approach, we employed a strategy that tested the sensitivity of our findings to the inclusion of a number of variables in the MEPS that characterized an individual's attitudes toward medical care and risk-taking behavior. Our models included attitudinal measures based on responses to questions on whether the respondent could overcome illness without the medical care system; was more likely to take risks than the average person; regularly used seat belts; reported being physically active; and was a smoker. We included these variables as well as health status measures in our full specification. We did so to purge some of the potential correlation between such unobserved "tastes" for medical care, for imprudent behavior and for unobserved health problems that might otherwise create a correlation between the error term in our regression models and the key family type/premium variables of interest. By comparing estimates that excluded and then included these variables, we observed the extent to which any remaining omitted variables in our full specification might have biased our results (see Hill 2012; Monheit and Vistnes 2005 for examples of similar sensitivity tests). Below, we report our findings with respect to these sensitivity tests.

#### Findings

We present results from our econometric analyses of single mothers' health care use in Tables 3 and 4 (full model estimates are available from the authors upon request). Tables 3 and 4 present changes in our outcome measures as the family's health insurance status changed from either all ESI coverage to ESI/public coverage (Table 3) or from all uninsured to uninsured/public coverage (Table 4). Since our key independent variable in the ESI models (Table 3) measured total private and public premiums paid, we evaluated the change in coverage for ESI mothers by changing the level of total premiums from the mean for all ESI coverage to the mean for ESI/public coverage (\$1,532 to \$893 in 2008 dollars). In Table 4, we evaluated changes in the outcome measures as the dummy variable for coverage changed from "all uninsured" to "uninsured/public coverage." The first column of each table presents results from our full specification while the remaining columns present results from our sensitivity tests (discussed below). The standard errors for these estimates were calculated using balanced repeated replicates.

<sup>10</sup> The job characteristics included in these models reflected the last job in the calendar year. In the models estimated on uninsured mothers, we included controls for women who worked the whole year, part-of-the year, or not at all.

<sup>11</sup> We are grateful to Kosali Simon for providing us with the latter measure.

**Table 3** Change in outcomes due to reduced premium outlays: models for single mothers with ESI (*t*-statistics are in parentheses)

	Full specification (1)	Drop preferences only (2)	Drop health status measures only (3)
<b>A. Percentage point change in the likelihood of preventive services</b>			
Blood pressure ( <i>N</i> = 886)	0.1 (0.25)	0.4 (0.66)	0.1 (0.22)
Cholesterol ( <i>N</i> = 865)	−0.1 (0.16)	0.0 (0.01)	−0.1 (0.12)
Pap test ( <i>N</i> = 878)	1.7 <sup>†</sup> (1.91)	1.8* (2.19)	1.5 <sup>†</sup> (1.77)
Mammogram ( <i>N</i> = 356)	0.9 (0.51)	1.6 (0.94)	0.8 (0.49)
<b>B. Percentage point change in the likelihood of an expenditure</b>			
Any expenditure ( <i>N</i> = 897)	0.9* (2.04)	0.9 <sup>†</sup> (1.91)	1.0* (2.34)
Any mental health drug expenditure ( <i>N</i> = 897)	−0.8* (2.05)	−0.8 <sup>†</sup> (1.88)	−1.0* (2.35)
Any officebased visit expenditure ( <i>N</i> = 897)	0.2 (0.31)	0.3 (0.36)	0.3 (0.34)
Any drug expenditure ( <i>N</i> = 897)	1.2 <sup>†</sup> (1.72)	1.1 (1.63)	1.3 <sup>†</sup> (1.86)
<b>C. Change in conditional expenditures for selected services (in dollars)</b>			
Total expenditure ( <i>N</i> = 796)	8.764 (0.11)	−15.63 (0.20)	−88.71 (0.94)
Office-based visit Expenditure ( <i>N</i> = 657)	−22.01 (0.69)	−24.99 (.76)	−49.48 (1.42)
Drug expenditure ( <i>N</i> = 643)	−12.82 (0.58)	−13.27 (0.60)	−40.82 (1.51)
<b>D. Change in number of visits</b>			
Office-based doctor visits ( <i>N</i> = 897)	−0.078 (0.92)	−0.097 (1.11)	−.133 (1.41)
Office-based total visits ( <i>N</i> = 897)	−0.118 (0.76)	−0.162 (1.04)	−.206 (1.21)

Source 2001–2008 MEPS-HC. The changes reported in the table reflect comparisons of single ESI mothers with children with public coverage to those with children with ESI. More specifically, we evaluate the change in coverage for ESI mothers by changing the level of out-of-pocket premiums from the mean for all ESI coverage to the mean for ESI/public coverage (\$1,532 to \$893 in 2008 dollars)

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ , <sup>†</sup>  $p < .10$

The model in Column 2 excludes the following variables from the full model: whether the respondent can overcome illness without the medical care system, is more likely to take risks than the average person, regularly uses seat belts, reports being physically active, and is a smoker

The model in Column 3 excludes the following variables from the full model: indicators that the mother is in fair or poor self-reported health and mental health, an indicator that the mother has a chronic condition, and a variable measuring the number of children that are reported to be in fair or poor health

We did not find much evidence that ESI mothers increased their health care use as a result of the savings they experienced by enrolling children in public coverage (Table 3). We found three positive effects of between 1 and 2 percentage points in our models of the likelihood of obtaining a Pap test, the likelihood of having any expenditure, and the likelihood of any prescription drug expenditure. However, these results were not statistically significant at conventional levels, attaining significance only at  $p < .10$ . Finally, we also found an unexpected negative effect for the likelihood of any mental health drug expenditure.

By contrast, we found more widespread, positive effects of children's public coverage on mother's use of services in our analyses of uninsured single mothers (Table 4). Mothers in uninsured/public coverage families were more likely to obtain preventive services than their counterparts in all uninsured families, with changes in these outcomes that ranged from 7.6 to 10.7 percentage points for cholesterol screenings and mammograms, respectively. Outcomes for blood pressure screenings and Pap tests increased by roughly 8 percentage points but the increases were not statistically significant at conventional levels

(only at  $p < .10$  for both). We found effects of similar magnitudes in our models of the likelihood of any expenditure, any mental health prescription drug expenditure, and any office-based visit expenditure when we compared uninsured mothers with children with and without public coverage. We also found an increase in office-based visits and prescription drug conditional expenditures for mothers in uninsured/public coverage families compared to those in all uninsured families, but these increases were only significant at the  $p < .10$  level. Finally, our negative binomial models revealed that mothers in uninsured/public coverage families had 0.527 additional office-based doctor visits and 1.3 additional office-based total visits than their counterparts in families where all members were uninsured.

#### Sensitivity Tests

As noted above, our empirical models included variables capturing parents' tastes for medical care and attitudes toward risk, as well as measures of health status. These variables controlled for the possibility that the decision of some mothers to enroll their children in public coverage



**Table 4** Change in outcomes from enrolling children in public coverage: models for uninsured single mothers (*t*-statistics are in parentheses)

	Full specification (1)	Drop preferences only (2)	Drop health status and any limitation measure only (3)
<b>A. Percentage point change in the likelihood of preventive services</b>			
Blood pressure ( <i>N</i> = 878)	8.8 <sup>†</sup> (1.84)	8.3 <sup>†</sup> (1.77)	9.1 <sup>†</sup> (1.90)
Cholesterol ( <i>N</i> = 857)	7.6* (2.15)	7.7* (2.09)	6.6 <sup>†</sup> (1.82)
Pap test ( <i>N</i> = 863)	8.1 <sup>†</sup> (1.85)	7.8 <sup>†</sup> (1.81)	8.2 <sup>†</sup> (1.89)
Mammogram ( <i>N</i> = 331)	10.7* (2.32)	9.8* (2.25)	9.0 <sup>†</sup> (1.83)
<b>B. Percentage point change in the likelihood of any expenditure</b>			
Any expenditure ( <i>N</i> = 894)	9.0* (2.06)	8.4 <sup>†</sup> (1.93)	9.8* (2.11)
Any mental health drug expenditure ( <i>N</i> = 894)	7.1** (2.86)	6.9** (2.76)	6.3** (2.70)
Any office-based visit expenditure ( <i>N</i> = 894)	10.3* (2.08)	10.2* (2.04)	10.9* (2.12)
Any drug expenditure ( <i>N</i> = 894)	0.5 (0.09)	0.2 (0.04)	0.1 (0.02)
<b>C. Change in conditional expenditures for selected services (in dollars)</b>			
Total expenditure ( <i>N</i> = 573)	−75.97 (0.39)	−67.28 (0.32)	−12.74 (0.07)
Office-based visit expenditure ( <i>N</i> = 394)	136.00 <sup>†</sup> (1.85)	160.44 <sup>†</sup> (1.89)	121.66 (1.62)
Drug expenditure ( <i>N</i> = 401)	151.67 <sup>†</sup> (1.77)	130.39 (1.51)	183.19* (2.15)
<b>D. Change in number of visits</b>			
Office-based doctor visits ( <i>N</i> = 894)	0.527** (2.90)	0.520** (2.89)	.516** (2.77)
Office-based total visits ( <i>N</i> = 894)	1.258*** (3.37)	1.230*** (3.36)	1.171** (3.22)

*Source* 2001–2008 MEPS-HC. The changes reported in the table reflect comparisons of single uninsured mothers with children with public coverage to those with uninsured children. The model in Column 2 excludes the following variables from the full model: whether the respondent can overcome illness without the medical care system, is more likely to take risks than the average person, regularly uses seat belts, reports being physically active, and is a smoker

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ , <sup>†</sup>  $p < .10$

The model in Column 3 excludes the following variables from the full model: indicators that the mother is in fair or poor self-reported health and mental health, an indicator that the mother has a chronic condition, and a variable measuring the number of children that are reported to be in fair or poor health and an indicator of whether the mother faces any limitations in work, housework or school

may have been endogenous, reflecting the behavior by those parents who were more responsible and/or were concerned about their health status and medical care use more generally, and thus were predisposed to use health services. If this were the case, we would have obtained estimates of the impact of family type in our uninsured mothers’ models that were biased upward. Similarly, we would have obtained estimated changes in outcomes in our analysis of ESI mothers that were biased upward. We included such variables to reduce any potential bias due to correlation between the regression error term and our variables of interest. We assessed the impact of this strategy and explored whether our estimates might be biased upward due to any remaining correlation with unobserved measures of parental responsibility, health status and predisposition to health care use. To do so, we compared our findings with and without the attitudinal and health status variables (Columns 1 versus Columns 2 and 3 in Tables 3, 4).

First, we note that estimates in the different columns in Tables 3 and 4 were not statistically different from each other so that we cannot draw strong conclusions from this

exercise in either the ESI or uninsured mother models. With that caveat in mind, we found that our ESI specifications were generally not sensitive to the inclusion of these sets of variables (Table 3). In our uninsured models (Table 4), we found that of the eleven models with statistically significant effects in our full model for uninsured mothers (Column 1), only two showed larger estimates of change after the taste and attitude variables were excluded (our cholesterol check and office-based visit conditional expenditure models). All other models in Table 4 showed changes in the opposite direction. This provided some evidence that in the majority of our specifications in the uninsured models, our estimates of the changes in our outcomes from enrolling children in public coverage were not biased upward.

Next, we explored the sensitivity of our results to excluding our health status measures in both our uninsured and ESI models (comparing Columns 1 and 3 in Tables 3 and 4). Again, keeping in mind that none of these comparisons were statistically significant, in five of our specifications for uninsured mothers (blood pressure, Pap test, any expenditure, any office based visit expenditure and

conditional drug expenditures), we observed larger changes in these outcomes when health status measures were excluded from the specification (Table 4). In our conditional prescription drug expenditure model, the statistical significance of the estimated change in outcome increased to the  $p < .05$  level when all health status measures were eliminated. In our ESI specifications (Table 3), we found larger estimates in the “any expenditure” and “any drug expenditure” models when we excluded health status measures. By contrast, the change in the likelihood of obtaining a Pap test was smaller when we dropped health status from our models. These sensitivity tests provided some indirect evidence that controlling for health status helped to mitigate the possible bias from unobserved health problems. It also suggested that our results may have been biased upwards due to any remaining omitted measures of health status.

Finally, it is also important to re-consider our strong findings for preventive service use by mothers in families with uninsured parents/publicly insured children. Recall that our findings indicated a strong increase in the use of these services relative to families in which all members were uninsured. A key issue for consideration was whether this difference reflected the impact of the income transfer received by the former families or whether this reflected contact with providers as these parents obtained health care for their publicly insured children. In the event that the effect operated mainly through the latter pathway, this would not have represented a bias in our findings, but a different interpretation of the ways in which public coverage for children may have increased mothers’ use of health services.

## Conclusion

In this paper, we used data from the 2001–2008 MEPS and investigated the impact of public coverage for children on the health care use of single mothers. We focused on this issue for the following reason: While prior research has identified the gains to children from public insurance expansions and the inefficiencies associated with private insurance crowd out, analyses have generally neglected the potential health care benefits that may accrue to other family members. If public coverage expansions, such as those for children, free up resources that can be used by other family members, particularly for medical care that has recognized social benefits (such as certain preventive services and mental health care), then the inefficiencies associated with such coverage expansions may be overstated and the value of the expansion understated. As we discuss below, our findings have particular relevance for US health care policy in light of the fact that as of this

September 2014 writing, about half of the states are not participating in the ACA’s Medicaid expansion, leaving many low-income mothers in these states uninsured.

Our findings revealed that uninsured single mothers who enrolled their children in public coverage used more medical care services than their counterparts in families where all members were uninsured. We noted that our models included a variety of attitudinal and health status variables to control for any upward biases that might have resulted from the predisposition of uninsured mothers with publicly enrolled children to use health services. Our findings were consistent with the hypothesis that the income transfer associated with reduced out-of-pocket spending for children was used to consume health services. However, we could not rule out an alternative pathway where mothers had additional contact with physicians from taking their publicly insured children to more doctor visits than mothers with uninsured children. Under either pathway, our results suggested that the public coverage expansions for children may have exerted a positive spillover effect on single mothers’ use of health services that increased their private welfare as well as social welfare. The social welfare gain appeared, in part, from the single mothers’ increased use of preventive health care services and prescription drug use for mental health problems.

Contrary to expectations, we found little such evidence for parents with ESI who were likely to receive larger income transfers from enrolling their children in public coverage compared to uninsured parents. This finding may have reflected the fact that such parents already had coverage which met their health care needs, and therefore, used any income transfer for other goods and services. Such a finding may be consistent with that of Leininger et al. (2010) who found that households eligible for SCHIP experienced reduced out-of-pocket spending on medical care, increased spending on transportation, and also had increased retirement savings.

Our findings regarding the benefits to low-income uninsured single mothers with children enrolled in public coverage remain relevant even as the ACA expands Medicaid coverage in 2014 to low-income adults. Under this provision, individuals with incomes up to 138 % of the federal poverty line are eligible for the expansion, but the US Supreme Court has ruled that state participation cannot be required by the federal government and is strictly voluntary. Presently, existing eligibility income levels for working parents’ in a majority of states exclude many low-income parents and are well below the ACA’s eligibility threshold (Snyder et al. 2012). As noted above, about half of the states have indicated that they will not participate in this public coverage expansion. Uninsured low-income single mothers in those states will therefore still face the incentives we have identified to enroll their children in

public coverage in order to capture the associated savings. In this regard, our study yielded important implications for assessing health care use by low-income uninsured single mothers in the non-expansion states by demonstrating the importance of taking into account the entire family's health insurance composition. For policymakers, it also highlighted an additional benefit to families from enrolling children in public coverage. For researchers evaluating the impact of the ACA's Medicaid expansions, our findings demonstrate the importance of controlling for children's health care coverage when comparing the health care use of newly insured mothers in expansion states to that of uninsured mothers in non-expansion states.

Finally, although our analysis provided insights as to how public insurance expansions targeted at children could impact the health care use of low-income single mothers, we must acknowledge two important limitations of our study. First, our study focused on the importance of the potential savings in private insurance premiums and out-of-pocket medical care costs as a key incentive for families to enroll children in public coverage and in providing resources that can be used for mothers' health care. However, we were unable to estimate the savings in out-of-pocket medical care costs if an uninsured child was enrolled in public coverage. This limitation reflects the fact that such an estimate requires a comparison of out-of-pocket costs between those on public insurance and those uninsured. Since the former would be more likely to use medical care, they could have incurred greater out-of-pocket spending despite being on public coverage. As a result, any estimate of this component of cost savings could be overstated.

Next, our study findings may reflect the influence of unobserved or omitted factors that are correlated with decisions to enroll children in public coverage and with a mother's own propensity to use health care services. Such unobserved heterogeneity among mothers could yield an upward bias on our estimates of the impact of insurance expansions on mothers' health care use. As noted, our efforts to address this potential source of bias through instrumental variables were unsuccessful. While we employed MEPS data on mothers' attitudes toward health insurance and health care as an alternative strategy to control for unobserved tastes, it remains to be seen whether this approach completely addressed the potential for bias in our findings.

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