

ACA Implementation—Monitoring and Tracking

The Financial Burden of Medical Spending Among the Non-Elderly, 2010

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INTRODUCTION

Over the last decade, family spending on medical care (including health insurance premiums) as a share of income has generally increased. Likewise, the share of those facing “high” levels of medical spending relative to income has increased (Blumberg et al., 2012). Addressing this trend, the Affordable Care Act (ACA) includes several provisions to limit high spending, which begin in 2014. Nearly all individuals with family incomes up to 138 percent of the Federal Poverty Line (FPL) and who reside in a state choosing to expand its Medicaid program will have access to no-cost or low-cost insurance coverage.^{1,2} Premium subsidies will decrease the cost of exchange-based health insurance for those with incomes up to 400 percent of the FPL without access to affordable employer-sponsored insurance (ESI). Cost-sharing subsidies will decrease out-of-pocket medical costs for those with incomes below 250 percent of the FPL obtaining non-group coverage through exchanges. Restrictions on non-group and small group insurance policies that prohibit price discrimination based on health status are likely to lead to lower premiums for those with health problems. The otherwise uninsured, who obtain insurance under the ACA, will be less exposed to high spending levels in the event of illness or injury. In addition, an array of cost-containment strategies aim at increasing efficiency of the delivery of medical care and reducing the growth in medical expenditures for all households over time (Holahan et al., 2011).

However, there are aspects of the law that may increase medical spending with respect to income. Those previously uninsured who purchase coverage due to the individual mandate, or because it is more affordable, may experience increases in costs when beginning to contribute toward the cost of premiums, particularly if they had not utilized medical care in the past. Of course, health status changes over time, and even these individuals may experience future savings by being insured when medical needs arise, since health insurance plays a role in financial protection during the course of a lifetime, not just at a point in time. Similarly, the newly insured may consume more medical care than when uninsured, as their marginal cost of care generally decreases relative to being uninsured. While this increased spending has value and is incurred at the

choice of the individual, it may be observed as higher direct household medical costs post-reform. Thus, the net effect of reform on observed medical spending relative to income is difficult to predict, as we expect health care costs to increase for some households and decrease for others; however, we expect the share of households with high health care expenditures to decline as more households have financial protection from the costs of severe illness or injury with the increase in insurance coverage. The law’s provisions will undoubtedly have consequences on medical care utilization and spending, and tracking the proportion of individuals facing high spending levels as a proportion of their income (pre- and post-reform) is worthwhile.

This work provides estimates of the financial burden of medical spending among non-elderly individuals in 2010, where “burden” is generally defined as total family medical out-of-pocket spending on services, prescription drugs and equipment, over-the-counter items, and premiums as a percentage of family income (premium payments made by employers on behalf of their workers are not included). We focus significant attention on those with medical spending burdens exceeding a given threshold (10 percent, 15 percent or 20 percent). In doing so, we utilize a new data source on medical out-of-pocket spending, the Current Population Survey,³ that provides substantially larger sample sizes than has been used in most previous studies, which have often relied on the Medical Expenditure Panel Survey (MEPS). We seek to answer the question: Are higher levels of financial burden of medical spending largely due to higher levels of medical spending, lower levels of income, or some combination of the two? As part of this analysis, we also identify individual characteristics associated with “high” medical spending burden levels, such as age, health status and insurance coverage. In addition to providing direct estimates of these associations, this work extends the literature by estimating multivariate models of various burden thresholds and observable characteristics.⁴ This approach is important insofar as characteristics related with high burden levels are related to one another, leading to confounded estimates when studied in turn.

BACKGROUND

Previous studies investigate the proportion of the population that spends a given threshold of income on medical spending. Although similar in this regard, many differ in terms of the level of aggregation (e.g., individual, family), measurement of income (gross or net), measurement of medical spending (e.g., inclusion of employer premium contributions, exclusion of premiums all together), sample studied (e.g., non-elderly, non-poor and privately insured), methods (direct estimates or model-based estimates) and year of study. There is some variety of data sources (e.g., premiums taken from the MEPS household component (HC) or insurance component (IC) files); however most studies rely on the MEPS.

For example, Banthin and Bernard (2006) investigate the financial burden of medical spending among non-elderly individuals using the MEPS HC data. The authors define burden in this study as total out-of-pocket spending on health care services and premiums among all family members divided by net (after tax) family income. Each person within a given family shares the family's common burden level. These authors investigate changes in the proportion of the non-elderly individuals who faced burden levels greater than 10 and 20 percent, between 1996 and 2003. In 2003, 19.2 percent of the non-elderly faced burden levels greater than 10 percent compared with 15.8 percent of the 1996 population. Characteristics associated with "higher-than-average-risk" for these burden levels include low-income status, non-group health insurance and poor health (including limitations and chronic conditions).

Banthin et al. (2008) employ similar methods to investigate the trend in the financial burden of health care between 2001 and 2004 among the non-elderly using the MEPS. The authors show that a larger portion of the 2004 population faced burden levels greater than 10 percent (17.7 percent), compared with 2001 (15.9 percent). The largest increases were among those with private health insurance, particularly non-group insurance (39.0 percent in 2001 and 52.7 percent in 2004).

A more recent study by Cunningham (2010), largely using the same data and methods as the two studies above, investigates trends in the financial burden of health care between 2001 and 2006. Unlike the previous studies, he provides state-level results of financial burden for 29 states, and uses gross family income as the denominator of the burden measure. The state-level

estimates are averages for years 2004-06 and 2001-03. Using these data, the author identifies some state-level variation among those facing high burden levels, where variation in income is much larger than the variation in medical spending. The author also finds increases in burden levels among middle- and higher-income individuals with private insurance.

Blumberg et al. (2007) takes a different approach as they aim to define benchmarks for health care affordability, as opposed to identifying high burden levels across the population and over time. This is distinct insofar as the focus is not necessarily on high levels of spending with respect to income. This work is set in the context of health care reform in Massachusetts. As such, the authors focus on median family spending on health insurance premiums (as well as the mean, 75th and 95th percentiles), including employer contributions, and health care as a percentage of total family income, among particular subgroups. Using the MEPS HC data, the authors focus on non-poor individuals consistently insured (for 12 months) via a non-group insurance policy or ESI. Unlike the previous papers, the unit of analysis is the family, not individuals. Generally, the authors find that low-income families spend a much greater share of family income on medical care than higher-income families. In addition, families covered by non-group insurance pay relatively more than families with ESI. They conclude that affordability standards based on the median spending-income ratios of middle-income families (income of 300 to 499 percent of the FPL) to be most appropriate.

Blumberg et al. (2012) uses a similar approach to the paper above to study changes in the financial burdens associated with health care among the non-elderly between 2001 and 2009 using the MEPS HC and IC data. The study reveals an increasing trend in the proportion of family income (modified adjusted gross income) spent on premiums and medical care over this time. Increases were the largest for middle- and upper-income families, families with middle-aged adults and insured families. However, they find a decline in the proportion of income spent on medical care among low-income families over the last decade. They suggest that Medicaid and CHIP programs may have insulated this population from observed market trends. Additionally, they suggest that the low-income uninsured may have

faced increased constraints in their ability to access necessary care over the last decade.

Unlike the previous studies, Shen and McFeeters (2006) investigate medical spending burden while controlling for observable characteristics in a multivariate framework. They study insured adults ages 18 to 64, with consistent coverage for 12 months before the interview, using the 2002 National Survey of America's Families. Furthermore, it is a family-level analysis, as they select a random adult from the family for their final sample. Medical spending in their study excludes that on health insurance premiums and dental care. They estimate a multinomial logit model where the dependent variable identifies whether medical spending is less than 0.5 percent, 0.5 percent to 5.0 percent, or greater than 5.0 percent of family income. Independent variables of interest identify insurance status, and separate models are estimated by income category (less than 200 percent of the FPL and 200 or greater). Results show that those with non-group health insurance have the highest risk of falling into the highest burden category, regardless of income. On the other hand, those with public health insurance face much lower risk of facing high-burden levels.

The analysis presented below is distinct from the previous studies in several dimensions. First, it utilizes an alternative data source, the Current Population Survey (CPS) Annual Social and Economic Supplement (ASEC), which recently began collecting information on medical spending. Benefits of this data source, compared with the MEPS, the data source used in most prior work, include its much larger sample size and more timely availability (see data section for survey details). Consequently, this analysis provides more recent estimates of the financial burden of medical spending than is possible using the

MEPS. One additional distinction is that the CPS ASEC also collects information on medical spending relevant to over-the-counter items (or "medical non-durables"), that are not included in the MEPS, which ensures that we captured the full array of medical spending in this study.

Also unlike previous work, this research emphasizes how medical spending and income vary relative to one another over the entire distribution of medical spending burden. This is useful as it illuminates the relative importance of income and medical spending over the spectrum of burden levels—low to high and everything in between. A more complete understanding of this relationship is essential to understanding how policies may affect the incidence of high burden levels. For example, would Medicaid coverage expansions, subsidies for health insurance, medical care, or income support be most effective in significantly decreasing the incidence of high burden levels among most individuals currently facing high burden levels? Previous studies often focus on spending and income at particular points of the burden distribution—the 50th and 75th percentiles, or burden levels greater than 10 or 20 percent, which, while useful, does not reveal the larger trend in the relative importance of each factor.

A final unique contribution of this work is to estimate the association of specific burden levels, which *include* health insurance premiums, with health, health insurance status, age, and other select characteristics, simultaneously. Most previous studies do not account for the correlation between health and insurance status and age, for example, when estimating the association of health and high burden levels. Without controlling for these factors, the association between a given characteristic and a particular burden level are likely overstated.

DATA AND METHODS

Data. This study uses the 2011 CPS ASEC data which are representative of the civilian, noninstitutionalized U.S. population. These data are a supplement to the monthly CPS, and are (mostly) collected in March, where the reference period for many of the questions used in this study correspond to the entire 2010 calendar year. The survey sample is based on approximately 100,000 addresses each year. It has a complex survey design, and all standard error estimates in this study are obtained using the survey's replicate weights.⁵ Information on annual medical spending is a recent addition to the CPS

ASEC, beginning with the 2010 survey. The CPS collects net medical out-of-pocket spending information from individuals over three categories: premiums; medical services, prescription drugs, and equipment; and over-the-counter items (medical non-durables).⁶ The survey questions instruct respondents to report spending after reimbursements, and therefore represent net spending (see U.S. Census Bureau, 2011, p. 257). These data compare well with similar data collected in other surveys, such as the MEPS and the Survey of Income and Program Participation (Caswell and O'Hara, 2010).

The primary unit of analysis in this paper is the individual. However, our measure of financial burden (defined below) is an aggregation over individuals in each health insurance unit. A health insurance unit (HIU) is a group of individuals who would normally be eligible to enroll on a common health insurance plan and includes adult children ages 18 to 22 that do not work the entire year, attend school and live with their parents. A HIU is similar to, yet more restrictive than, the CPS family definition, for example, which includes all related persons in the household. This analysis restricts the CPS ASEC data to the following sub-sample:

- *Individuals less than age 65, not in a HIU with anyone age 65 and older, and*
- *Individuals in a HIU with at least one adult age 18 to 64.*

Those 65 and older are more likely retired, receiving Social Security benefit income, and are nearly all covered by Medicare. As these individuals' access to health insurance, medical care, and source of income is much different from their younger counterparts, and their coverage is very unlikely to change as a result of the ACA, we exclude these individuals from the analysis. We further exclude a small number of individuals under age 65 living with older respondents such that the remaining units are more comparable. Our main results are not sensitive to this exclusion. Furthermore, in some instances there are no adults 18 years old or older in a HIU. This may occur as individuals age 15 to 17 are eligible for a complete interview even if they are the oldest in the household. We exclude these HIUs because they are very unlike the remaining units in that they have had little opportunity to attain education (e.g., high school/GED), skills, and work experience, compared with their slightly older counterparts.

The 2011 CPS ASEC contains 204,983 individual records, 19,524 of which are 65 years old or older, and 2,590 are under age 65 that reside in an HIU with someone aged 65 or older (restriction 1). There are 2,558 individuals that belong to an HIU without an adult aged 18 or older (restriction 2). Our final sub-sample includes 177,889 individual respondents. For ease of exposition we refer to this sub-sample as the “non-elderly.”⁷

Methods. Medical spending burden (or just “burden” for short) in this analysis is the sum of net medical spending over all individuals in a given HIU expressed as a percentage of gross HIU income.⁸ Medical spending includes spending on premiums; medical services,

prescription drugs and equipment; and over-the-counter items.⁹ Gross income is the summation of 16 distinct income categories collected in the CPS ASEC, including public assistance (e.g., TANF, AFDC) (U.S. Census Bureau, 2012).¹⁰ All individuals in a given unit face the unit's common level of medical spending burden. Note that in order to calculate the medical spending burden of HIUs who report zero income (and in some cases negative, or extremely low income) total gross HIU income is restricted to a minimum of \$100 (i.e., bottom coded).¹¹

One important contribution of this research is to shed more light on the relative importance of income, compared with medical spending, as burden levels increase across the entire distribution on medical spending burden (as defined above). To this end, this work presents estimates of income and medical spending among groups of individuals facing increasingly higher burden levels. To do this we first estimate the distribution of medical spending burden over all individuals in our sample (i.e., 10th percentile to 90th percentile, by 5 percentile intervals). We then estimate median medical spending and median income per person in the HIU among those individuals facing a burden level at or greater than a given percentile of the burden distribution.¹² For example, we estimate median income and median medical spending per person in the HIU, among those individuals in HIUs with a burden level at, or greater than, the non-elderly sample median burden level. We then estimate the same statistic for the smaller group of individuals whose burden level is at, or greater than, the 55th percentile of the burden distribution and so on to the 90th percentile.

Subsequent analysis investigates characteristics, other than income and medical spending, associated with burden levels at the right tail of the burden distribution. Focus is given to characteristics associated with medical spending greater than 10 percent, 15 percent and 20 percent of HIU income; namely, thresholds commonly studied in the literature, which are likely unsustainable for many individuals. The characteristics of the general non-elderly sample are compared with the sub-population of individuals facing the three burden thresholds. The individual-level characteristics we focus on include health status, health insurance coverage and age.

- **Health.** The health information in this study includes self-reported health status and whether the respondent reported one or more limitations related to Activities of Daily Living (ADL) or Instrumental Activities of Daily Living (IADL).¹³

Individuals in worse health are more likely to need medical attention, which may increase expenditures related to medical care and equipment, prescription drugs and over-the-counter items. Poor health may also associate with higher premium spending among individuals covered by non-group or small group insurance, whose premiums are higher due to their health. Additionally, working age adults in poor health may be less productive, earn lower wages, work less hours, or possibly not work at all, therefore decreasing earnings income. Poorer health will be associated with higher chances of facing a given burden threshold.

- *Health Insurance Coverage.* Our analysis includes the following hierarchy of health insurance status categories: large-group (50 employees or more or government) ESI; small-group ESI; directly-purchased insurance (non-group); public health insurance only (including Medicare and/or Medicaid); and uninsured. We categorize individuals reporting both ESI and directly purchased insurance as having ESI.

Individuals covered by private health insurance generally pay health insurance premiums, which increases their chances of facing a given burden level compared with the uninsured and (possibly) the publically insured.¹⁴ Individuals who purchase non-group insurance pay the full premium, compared with ESI, where the employer may contribute to employees' premiums. Compared with large-group ESI policies, small-group ESI policies generally have higher cost-sharing (Claxton et al., 2012). Finally, although the uninsured pay no premiums, they are exposed to higher risk of spending more in the event they purchase medical care. Although the uninsured likely consume and spend less on medical care because they face a relatively higher marginal cost.

- *Age.* We study the following age categories: 0-18, 19-44, 45-54 and 55-64.

Working adults near retirement age most likely have the highest earnings of their working lives, which significantly decreases their chances of facing higher burden levels compared with younger working-age adults. They may also have much higher interest income due to their longer lifetime in which they are able to accumulate savings. On the other hand, they may have more medical needs, resulting in higher spending on medical care, prescription drugs, and equipment than younger individuals, even if they are not in poor health. Young children are also likely to have more medical needs compared with young and middle-aged adults. Finally, children are also unlikely

to contribute to HIU earnings income compared with working-age adults.

In addition to the characteristics above, it is important to control for other observable characteristics related with medical spending burden. For example, we study the following mutually exclusive race and ethnicity categories: white, non-Hispanic; black, non-Hispanic; other, non-Hispanic; and Hispanic. This may be important insofar as groups have different attitudes towards seeking out medical care that influence utilization and related medical spending. Finally, we also include sex in our analysis, as men and women have different medical needs and related medical spending.

The composition of the HIU is also very important insofar as it may influence burden levels of individuals. For example, we include the number of adult workers and non-workers in the HIU. Workers contribute to the HIUs income, whereas non-workers do not. Therefore the additional number of workers (non-workers) in the HIU will decrease (increase) the chance that an individual faces higher burden levels. Similarly, we include the number of children younger than 18 years old in the HIU. Since children likely do not contribute to HIU earnings income yet may contribute to medical spending, they tend to increase the chances of facing higher burden levels. In addition, we include the additional number of people in the HIU with fair/poor health, or who report a limitation. These individuals are more likely to have higher medical spending and lower income, therefore increasing the chances of facing higher burden levels. Lastly, we incorporate education as the maximum attainment among all HIU members as following: less than high school (diploma or equivalent), high school up to an Associate's Degree, Bachelor's Degree, or Post Graduate Degree. HIUs with higher-educated members likely earn more and have better health.

Household-level geographic attributes may also influence burden levels. Individuals in non-metro areas, for example, may have less access to care than those in metro areas and consequently pay more for their care. Furthermore, there may simply be geographic variation in the price of medical treatment and incomes, reflecting differences in health insurance markets (affecting health insurance premium and non-premium spending) and labor markets (affecting wages). Consequently, our analysis identifies metro residence and nine census regions.

To study the relationship between the medical spending burden thresholds and the individual and family

characteristics discussed above, this work presents results from a series of multivariate linear probability models. Note that alternative specifications, such as logit and/or probit models, yield similar results. The unit of observation for these models is the individual, where the (binary) dependent variable identifies whether the individual faced medical spending burden above a given level (10 percent, 15, percent and 20 percent). Multivariate models allow us to measure the association between a given medical spending burden level with health status (for example) not confounded by age, insurance status, the composition of the HIU, or other observable characteristics.

Assumptions and Limitations. Although the measure of burden used in this study is common to the literature, it is important to emphasize a few of its attributes. First, the decision to focus on actual spending, as opposed to expected spending, makes this measure an ex post burden measure. That is, it does not take into account individuals' expectations about their perceived appropriate or necessary level of spending (e.g., at the beginning of the year). Rather it incorporates the level of spending observed by the unit over the calendar year given the unit's demand, preferences and resource constraints. As such, it does not take into account forgone medical care due to insufficient resources, for example. Nor does observed medical spending make any distinction between discretionary compared with non-discretionary medical spending. In addition, medical spending may not exactly equate to medical service utilization. Individuals who receive charity care, for example, may not pay anything (or significantly less) for their medical care.

In addition, current income may not be the only resource available to fund medical spending. Individuals may

spend accumulated wealth, borrow against their future income streams, or share resources across families. On the other hand, current or previous employers may provide in-kind health benefits that significantly decrease the cost of care. Alternatively, in-kind transfers from the government (e.g., food stamps), and/or other households, may free up income for alternative consumption. Indeed, in-kind transfers are one explanation for how the so-called zero-income households observed in household surveys cope (Zedlewski et al., 2003).¹⁵

Note that there are also limitations to our data regarding resource sharing. First, it is uncertain how individuals in a household share resources. Our more narrow focus on HIUs, compared with households or families, limits the income and medical spending components of our burden measure in some cases. We do this because the 2014 provisions of ACA are likely to have a more direct impact on HIUs. That is, studying the burden levels of HIUs before (and eventually after) the implementation of these provisions is important to understanding how they may affect individuals' well-being.

A second limitation regarding resource sharing concerns college students temporarily living away from home who are selected for an interview. In these cases, observed income may be misleading if they are dependent on their parents' resources.¹⁶ This is a concern even though the survey collects financial assistance from outside the household, since it likely does not reflect the total amount of income available to the student. However, the main results from our analysis are qualitatively unchanged after accounting for young-adult full-time students who do not live with their parents.

RESULTS

Medical spending burden: high spending, low income, or both? Exhibit 1 illustrates how income and medical spending vary with respect to one another as burden levels rise over the entire distribution.¹⁷ It plots median income and median medical spending per person in the HIU among those whose burden level is at, or greater than, a given percentile of the burden distribution. From the graph it is clear that income falls faster than spending rises as burden levels approach the right tail of the distribution (the highest burdens). For example, 90 percent of individuals (i.e., 10th percentile) reside in HIUs

where medical spending amounts to 0.1 percent of HIU gross income or more. Among these individuals, median income is \$20,000 per person, while median medical spending is \$742 per person.

Increasing the burden threshold from the 10th percentile to the median, medical spending increases to \$1,500 per person (a 102.2 percent increase relative to the 10th percentile). However, median income decreases from \$20,000 to \$17,500 per person (a 12.5 percent decrease relative to the 10th percentile).

Moving from the middle of the distribution to much higher levels of medical spending burden, however, clearly reveals that income falls much faster than medical spending rises. Between the 50th percentile and the 90th percentile, median medical spending per person increases from \$1,500 to \$2,000 per person (an 18.5 percent increase). Meanwhile, median income per person falls from \$17,500 to \$3,822 per person (a 78.2 percent decrease). Indeed, there is even a decrease in median medical spending between the 85th percentile and 90th percentile thresholds, thus emphasizing how low incomes are in this range of the burden distribution.

In short, these results show that higher burden levels are associated with higher medical spending. As we narrow our focus to individuals who face the highest burden levels, income falls much faster than medical spending rises. This general result is not sensitive to studying alternative points of the income and medical spending distributions (e.g., see appendix exhibit A1).

Additional characteristics associated with high medical spending burden. Here we focus on individual-level characteristics associated with high burden levels, namely those individuals in the right tail of exhibit 1, compared with the entire sample. This illustrates which individuals are overrepresented or underrepresented at the higher burden levels. Although not the focus of this work, we also include HIU- and household-level characteristics associated with these individuals that likely affect their high-burden status (see methods section). Attention is given to individuals in HIUs whose medical spending exceeds 10 percent, 15 percent, and 20 percent of HIU income. 20.7 percent of the sample face burden levels greater than 10 percent; 13.6 percent face burden levels greater than 15 percent; and 9.9 percent face levels greater than 20 percent.

Health. A larger proportion of less healthy individuals face high burden levels compared with the respective general population (exhibit 2). 2.4 percent of the entire non-elderly sample report “poor” health compared with 4.4 percent whose burden is greater than 10 percent and 5.7 percent of those whose burden is greater than 20 percent. Similarly, 6.2 percent of the non-elderly population aged 15 and older report a limitation in daily activities, compared with 10.0 percent who face burden levels greater than 10 percent, and 12.2 percent of those with burdens greater than 20 percent.¹⁸ Indeed, the proportion of respondents who reported a limitation or poor health and faced burden

levels greater than 20 percent is roughly double the rate of the full non-elderly sample.

Although a disproportionate fraction of less-healthy individuals face higher burden levels, the majority of those with high burdens are relatively healthy. For example, 60.5 percent of individuals who face a burden greater than 10 percent report “excellent” or “very good” health. Similarly, 90.0 percent (15 and older) of those with burdens of 10 percent or more did not report an activity limitation.

Health Insurance Status. Individuals with directly purchased insurance or small-group ESI are overrepresented among the high-burden groups. For example, 4.5 percent of the sample reports having directly purchased insurance. However, among those with burden levels of 10 percent or more, 10.1 percent have directly purchased insurance. On the other hand, individuals covered by large-group ESI are underrepresented at the higher burden levels. For example, 48.1 percent of the entire sample report large-group ESI coverage, compared with 29.0 percent of those who faced a burden level greater than 20 percent.

Individuals covered only by public health insurance and the uninsured are less likely to experience burden levels greater than 10 percent compared with the overall sample. However, both groups are more likely to experience a burden level greater than 20 percent.

Age, Sex and Race and Ethnicity. Adults age 19 to 44 are consistently underrepresented at the higher burden levels, while adults 55 to 64 are consistently overrepresented, compared with the overall sample. Females are overrepresented among the high burden groups, as are black, non-Hispanics.

HIU Composition and Geography. Individuals facing higher burden levels, on average, reside in HIUs with fewer working adults and more non-working adults, compared with the general sample. Those with high burdens also reside in HIUs with (slightly) fewer children (15 percent and 20 percent thresholds only). High burden individuals are also more likely to reside in an HIU with other members that report a limitation or poor/fair health than the general respective population. Individuals who reside in non-metro areas and the Mountain and West South Central regions are consistently overrepresented in the higher burden groups. Finally, Mid-Atlantic and Northeast residents are consistently underrepresented among those with high burdens.

Linear Probability Models. Exhibit 3 graphs results relevant to health, health insurance status, and age from

three linear probability models. These three models estimate the association between burden levels greater than 10 percent, 15 percent, and 20 percent with the observable characteristics. (See appendix exhibit A2 for the complete results.) These graphs demonstrate the change in probability (i.e., marginal effect) of facing a given burden threshold associated with self-reported health, health insurance, and age, after controlling for all these characteristics, and others, simultaneously.¹⁹

Results for self-reported health status (top panel, exhibit 3) exhibit a clear gradient in health with respect to a given burden threshold. For example, compared with individuals who report “excellent” or “very good” health, those who report “good” health are 3.3 percentage points more likely to experience a burden level greater than 10 percent, which increases to 9.7 percent for those who report “fair” health, or 12.6 percent for those reporting “poor” health. The 15 percent and 20 percent threshold model results show a similar gradient, reinforcing this finding.

Results regarding health insurance status (middle panel, exhibit 3) also exhibit a clear relationship with the high burden levels. Compared with individuals covered by large-group ESI, the publicly insured and the uninsured are both less likely to experience a burden level greater than 10 percent (-14.4 and -7.3 percentage points, respectively). On the other hand, individuals covered by non-group insurance or small-group ESI are significantly more likely to face high burden levels than others. Individuals with non-group coverage are 24.9 percentage points more likely than those with large-group ESI to face a burden level greater than 10 percent. Similarly, people covered by small-group ESI are 5.9 percentage points more likely to face this burden level. That is, individuals

covered by non-group insurance are 4.2 times more likely than those covered by small-group ESI to face a burden level greater than 10 percent.

The sizable difference between the small-group ESI and direct purchase groups is largely a result of differences in premium spending. For example, median HIU premium spending per person among those who face burden levels greater than 10 percent is \$2,100 for those with directly purchased insurance and \$1,400 for those with small-group ESI.²⁰ Median non-premium spending per person is lower for the direct purchase group—\$750 compared with \$900 per person for those with small group insurance. The difference in median income per person across the two groups is not statistically different from zero. Note that the more general comparison between all non-elderly individuals and those with small-group ESI and directly purchased insurance is qualitatively different. Among the entire non-elderly sample, HIU non-premium *and* premium spending per person is higher for those covered by directly purchased insurance, while income per person is lower.²¹ This finding further emphasizes the contribution of relatively higher premium spending among those covered by directly purchased insurance to facing high burden levels.

After controlling for health, insurance status, and other factors, age (exhibit 3, bottom panel) has a significant association with high burden levels, but the greatest differences arise between children and adults. For example, children ages 0 to 18 are 3.5 percentage points more likely than those 19 to 44 to face a burden level greater than 10 percent. Older adults 55 to 64 are slightly less likely to face higher burden levels (15 percent and 20 percent thresholds only).

DISCUSSION

This work provides estimates of the financial burden of medical spending in 2010 among a non-elderly sample using an alternative data source than most previous studies. In doing so this work demonstrates how those with the highest burden levels (i.e., the right tail of the burden distribution) are associated with relatively low incomes compared to high medical spending. This implies that although medical spending is higher for individuals facing higher burden levels, the effect of low income on high burden status is dominant. Using these data, we estimate that approximately 21 percent of our non-elderly sample reside in families with medical spending levels that exceed 10 percent of gross income.

Almost 14 percent of the non-elderly sample face burden levels greater than 15 percent, and roughly 10 percent face levels greater than 20 percent.

Among our key findings is that that individuals covered by non-group policies are much more likely to face high burden levels, after controlling for health, age, work status, and other observable characteristics. This is generally a result of higher premium spending among those covered by non-group insurance. Our data, however, do not account for employer contributions to health insurance. That is, employer contributions would increase the income and medical spending components

of the burden measure used in this study. This is an important point insofar as workers accept lower wages in exchange for health benefits (e.g., Olson, 2002). Preliminary investigation of the 2009 MEPS HC and IC data, which include information on employer premium contributions, suggests that they may play an important role. Adjusting for premium contributions, we found a smaller gap in the proportion that faced a burden level greater than 10 percent between individuals covered by small-group ESI and directly purchased insurance. Although it is less important for the greater than 15 and 20 percent thresholds, which likely reflect lower incomes in this range.

In addition to those with low-incomes and non-group health insurance coverage, our multivariate analysis demonstrates that those covered by small-group ESI, the unhealthy, and children all have elevated risk of facing high burden levels. How will the 2014 provisions of the ACA likely affect these populations? It appears that the Medicaid expansions may have the largest impact insofar as many individuals with high burden levels have very low incomes, and public health insurance is significantly and negatively associated with higher burden levels (multivariate analysis). Of course, not all states have committed to expanding their program, and others indicate that they will not participate. This suggests that the ACA's ability to reduce the number of individuals with high medical financial burdens will vary considerably as a

function of states' decisions on whether to expand their Medicaid programs.

In 2014 subsidies for modest-income individuals that purchase non-group policies may significantly decrease the number of non-group enrollees with high burden levels. Subsidies will decrease the premium spending for comparable plans. However, non-group policies in 2014 will be in many cases more comprehensive than those sold today, complicating a direct comparison of premium spending. Relatedly, those with worse health will benefit from insurance market reforms that prohibit premium and enrollment discrimination by health status, the requirement of essential health benefit coverage, and minimum actuarial value requirements in the small group and non-group markets. For example, individuals with non-group coverage with condition exclusions in today's market will not face the same exclusions in 2014 if they purchase new policies. Consequently, the marginal cost of care related to previously excluded conditions will decrease for these individuals. The net effect on non-premium spending depends on what degree individuals currently forego needed care due to such exclusions. Finally, the ACA may influence the positive relationship between children and high burden levels insofar as new health insurance plans are required to provide recommended preventative care for children without cost-sharing. That is, since children are generally more healthy than adults, medical spending related to more commonly utilized medical care may decrease.

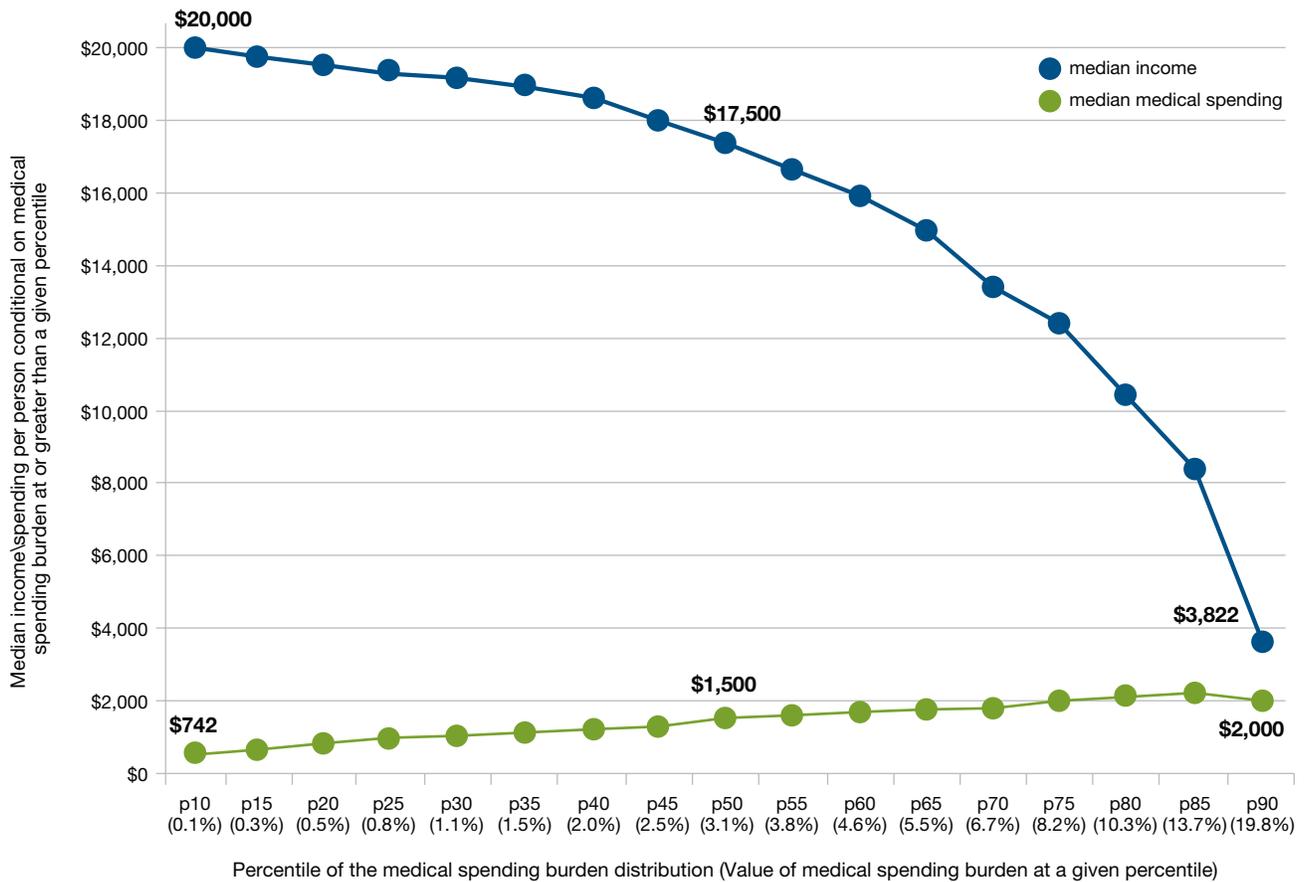
APPENDIX

Exhibit A1 includes data used to produce the graph in exhibit 1. In addition to median estimates of HIU income and medical spending per person at a given burden threshold, exhibit A1 reports the 25th and 75th percentiles, and their corresponding standard error estimates.

Exhibit A2 reports the linear probability models partially graphed in exhibit 2.

Exhibit A3 reports median medical out of pocket spending and income per person in the HIU among those covered by directly purchased insurance and small-group ESI.

EXHIBIT 1: Income and Medical Spending Per Non-Elderly Person By Increasing Thresholds of the Medical Spending Burden Distribution, 2010



Source: 2011 CPS ASEC (2010 reference year).

Notes: (1) The unit of analysis is the individual. Individuals 65 years old and older are omitted (see data section for exact sample definition). (2) Median income & medical spending per person in the HIU is calculated by dividing total HIU income (and medical spending) by the number of individuals in the HIU. Each person in the HIU has the same per person value. (3) Medical spending includes spending on premiums, medical services, prescription drugs and equipment, and over-the-counter items. Income is gross income. (4) Medical spending burden is defined as total HIU medical spending as a percentage of HIU income. Each person in the HIU has the same burden level. (5) Median income and medical spending per person in the HIU (vertical axis) are calculated conditional on burden being at or above a given percentile (horizontal axis). (6) See exhibit A1 for data and standard error estimates.

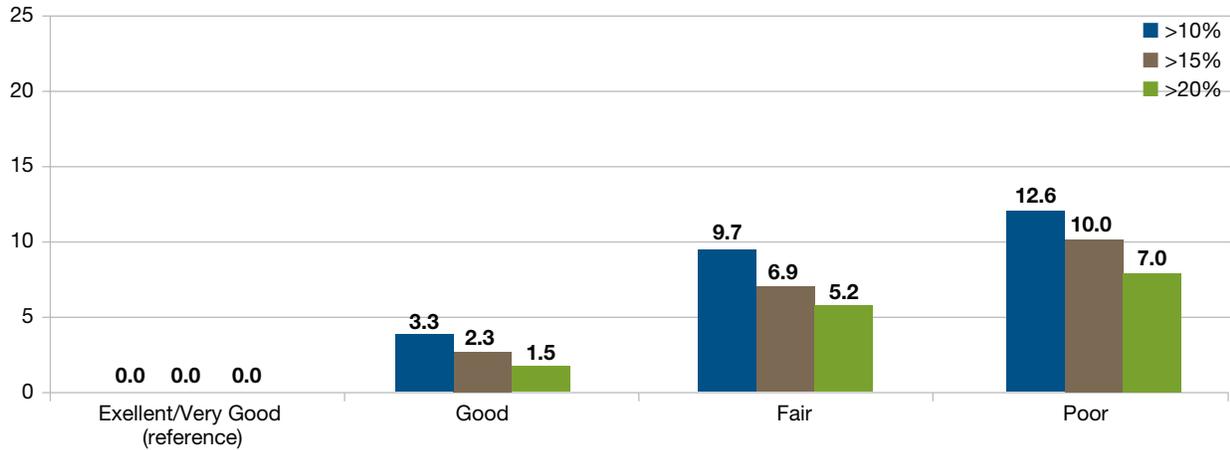
EXHIBIT 2: Summary Statistics for the Population Less Than 65 Years Old, and Among Those with Medical Spending Burden Greater Than 10 Percent, 15 Percent, and 20 Percent, 2010

	(1)		(2)		(3)		(4)		(5)	(6)	(7)	(8)	(9)	(10)
	All	s.e.	>10%	s.e.	>15%	s.e.	>20%	s.e.	(2)-(1)	(3)-(2)	(4)-(3)	(4)-(2)	(3)-(1)	(4)-(1)
Health Status (%)														
Excellent	35.7	0.2	30.5	0.4	29.0	0.5	27.9	0.6	**	*		**	**	**
Very Good	32.7	0.2	30.0	0.4	28.8	0.5	28.4	0.6	**	+		*	**	**
Good	22.8	0.2	24.9	0.4	25.7	0.4	25.9	0.5	**			+	**	**
Fair	6.4	0.1	10.1	0.2	11.2	0.3	12.1	0.4	**	**	+	**	**	**
Poor	2.4	0.1	4.4	0.1	5.2	0.2	5.7	0.2	**	**		**	**	**
	100%		100%		100%		100%							
No limitation†	93.8	0.1	90.0	0.3	88.7	0.4	87.8	0.4	**	**		**	**	**
1+ limitation(s): doing errands, concentrating, dressing, or walking†	6.2	0.1	10.0	0.3	11.3	0.4	12.2	0.4	**	**		**	**	**
	100%		100%		100%		100%							
Health Insurance Status (%)														
ESI, large group	48.1	0.2	41.8	0.5	34.5	0.6	29.0	0.7	**	**	**	**	**	**
ESI, small group	12.6	0.2	16.7	0.4	16.6	0.5	15.5	0.5	**		+	+	**	**
Directly purchased insurance (non-group)	4.5	0.1	10.1	0.3	11.1	0.4	11.4	0.4	**	*		**	**	**
Public health insurance (no private)	16.4	0.2	14.7	0.3	16.9	0.5	19.0	0.6	**	**	**	**	**	**
Uninsured	18.4	0.2	16.7	0.4	20.9	0.5	25.1	0.6	**	**	**	**	**	**
	100%		100%		100%		100%							
Age (%)														
0-18	29.1	0.0	30.2	0.3	29.2	0.3	28.3	0.4	**	*	+	**		**
19-44	41.1	0.0	37.5	0.3	39.0	0.3	40.4	0.4	**	**	**	**	**	**
45-54	16.8	0.0	17.0	0.2	16.4	0.3	16.1	0.4				*		**
55-64	13.0	0.0	15.2	0.3	15.4	0.4	15.3	0.4	**				**	**
	100%		100%		100%		100%							
Sex (%)														
Male	50.5	0.0	48.6	0.2	48.7	0.3	48.7	0.4	**				**	**
Female	49.5	0.0	51.4	0.2	51.3	0.3	51.3	0.4	**				**	**
	100%		100%		100%		100%							
Race & Ethnicity (%)														
White, non-Hispanic	62.4	0.0	63.2	0.4	61.2	0.6	58.5	0.7	+	**	**	**	*	**
Black, non-Hispanic	12.6	0.0	13.1	0.3	14.5	0.4	15.6	0.5	+	**	+	**	**	**
Other, non-Hispanic	7.3	0.0	7.2	0.2	7.4	0.3	7.6	0.3						
Hispanic	17.7	0.0	16.4	0.4	17.0	0.5	18.3	0.5	**		+	**		
	100%		100%		100%		100%							
Composition of HIU (Average)														
Number of adult workers	1.3	0.0	1.0	0.0	0.9	0.0	0.7	0.0	**	**	**	**	**	**
Number of adult non-workers	0.4	0.0	0.6	0.0	0.7	0.0	0.8	0.0	**	**	**	**	**	**
Number of children (less than 18)	1.1	0.0	1.1	0.0	1.1	0.0	1.0	0.0	**	*	**	**	**	**
Health Status of Other HIU Members (Average)														
Additional number of people with fair/poor health	0.1	0.0	0.2	0.0	0.2	0.0	0.2	0.0	**				**	**
Additional number of people with limitation	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.0	**				**	**
Highest Educational Achievement Among HIU Members (%)														
Less than High School	9.1	0.2	10.8	0.3	13.5	0.4	15.8	0.5	**	**	**	**	**	**
High School up to Associate's Degree	54.4	0.2	60.2	0.5	61.1	0.6	62.1	0.7	**			*	**	**
Bachelor's Degree	22.0	0.2	19.1	0.4	17.2	0.5	15.2	0.5	**	**	**	**	**	**
Post Graduate Degree	14.5	0.2	10.0	0.3	8.2	0.3	6.9	0.4	**	**	**	**	**	**
	100%		100%		100%		100%							
Geography (%)														
Metro area	84.7	0.5	82.1	0.7	82.2	0.7	82.5	0.7	**				**	*
Non-metro area	15.3	0.5	17.9	0.7	17.8	0.7	17.5	0.7	**				**	*
	100%		100%		100%		100%							
Mid-Atlantic	13.1	0.1	11.2	0.3	11.8	0.4	12.2	0.4	**			+	**	*
Northeast	4.6	0.0	4.4	0.1	4.2	0.2	4.1	0.2	*				*	**
South Atlantic	19.0	0.1	19.2	0.4	19.4	0.5	19.5	0.5						
East South Central	5.9	0.0	6.9	0.2	6.6	0.3	6.2	0.3	**			+	*	
West South Central	12.0	0.1	12.6	0.3	13.6	0.4	13.6	0.5	+	+		+	**	**
East North Central	15.0	0.1	15.2	0.3	14.1	0.4	14.5	0.4		*			*	
West North Central	6.6	0.0	6.8	0.2	6.3	0.2	5.7	0.2		*	+	**		**
Mountain	7.4	0.0	8.6	0.2	8.4	0.3	8.5	0.3	**				**	**
Pacific	16.4	0.1	15.2	0.3	15.6	0.4	15.7	0.5	**				+	
	100%		100%		100%		100%							
N	177,889		37,584		23,858		17,128							
†N (limited to individuals ages 15+)	131,068		27,402		17,637		12,807							

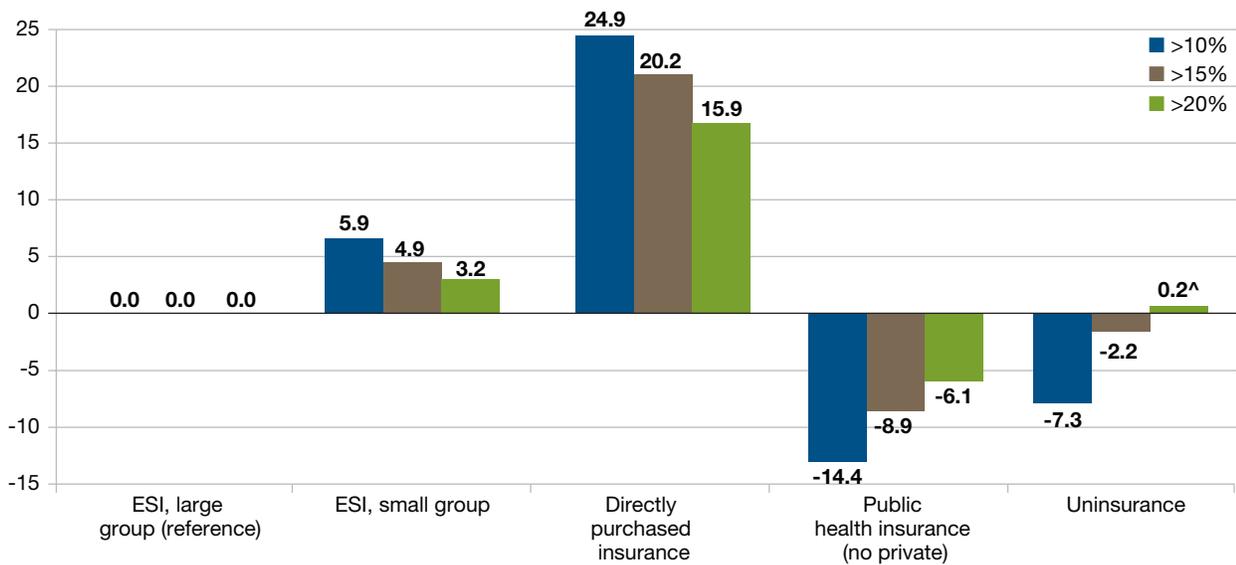
Notes: Standard error estimates calculated using replicate weights (Fay's method). Columns (5) through (10) summarize the results from two-tailed significance tests for the null hypothesis that the difference in estimates over the indicated columns is equal to zero. ** p<0.01, * p<0.05, + p<0.1 See data section for details on sample definition.

Source: Authors' calculations using the 2011 CPS ASEC (2010 reference year).

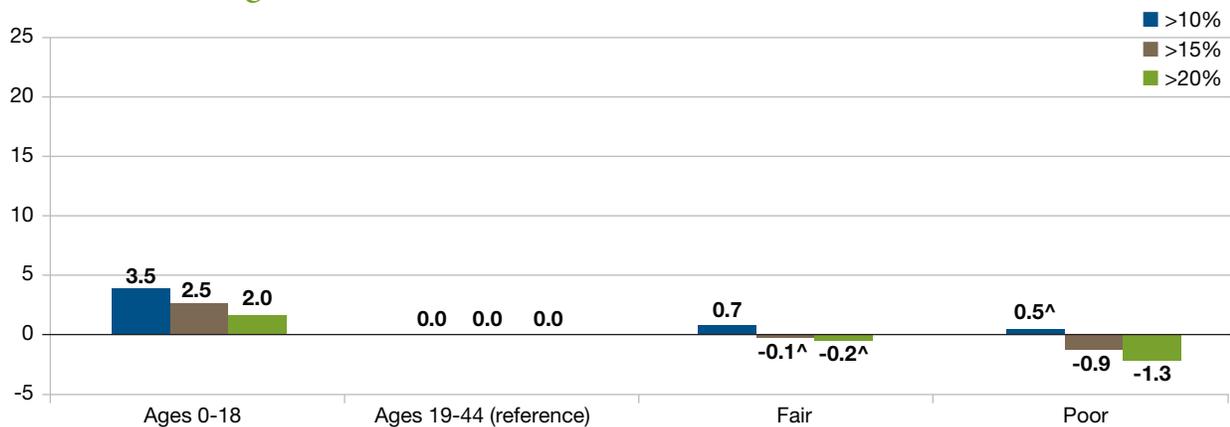
EXHIBIT 3: Change in Probability of Facing Medical Spending Burden (>10%, >15%, and >20%) Associated with Health Status†



Change Probability of Facing Medical Spending Burden (>10%, >15%, and >20%) Associated with Health Insurance Status†



Change in Probability of Facing Medical Spending Burden (>10%, >15%, and >20%) Associated with Age†



†Results are estimated marginal effects (i.e., change in probability) from linear probability models associated with a given dummy variable (change from 0 to 1). Additional covariates not reported include: ADL/IADL limitation, sex, race & ethnicity, health insurance eligibility unit composition (number of working & non-working adults, and additional children, in the unit), health status of other members, highest educational attainment of all members, and geography (metro status & census region) among individuals aged less than 65.

[^] Estimate not statistically different from 0.0.

Source: Authors' calculations using the 2011 CPS ASEC (2010 reference year).

EXHIBIT A1: Income and Medical Spending Per Non-Elderly Person By Increasing Thresholds of the Medical Spending Burden Distribution, 2010

Percentile of Medical Spending Burden Distribution	(1)	(2)	(3)	(4)	(5)	(6)
(Percentile Value)	p75 Income (s.e.)	Median Income (s.e.)	p25 Income (s.e.)	p75 Medical Spending (s.e.)	Median Medical Spending (s.e.)	p25 Medical Spending (s.e.)
p10 (0.1%)	\$35,502 (225)	\$20,000 (97)	\$9,340 (91)	\$1,780 (12)	\$742 (8)	\$193 (4)
p15 (0.3%)	\$35,123 (132)	\$19,669 (163)	\$9,200 (90)	\$1,870 (13)	\$825 (11)	\$242 (4)
p20 (0.5%)	\$35,000 (94)	\$19,502 (165)	\$9,140 (77)	\$1,973 (15)	\$925 (12)	\$300 (3)
p25 (0.8%)	\$35,000 (144)	\$19,403 (166)	\$9,078 (73)	\$2,063 (17)	\$1,020 (10)	\$380 (6)
p30 (1.1%)	\$34,467 (250)	\$19,251 (145)	\$9,000 (92)	\$2,175 (15)	\$1,117 (10)	\$460 (6)
p35 (1.5%)	\$33,857 (224)	\$19,000 (145)	\$8,980 (113)	\$2,285 (17)	\$1,215 (8)	\$535 (8)
p40 (2.0%)	\$32,861 (188)	\$18,577 (169)	\$8,747 (133)	\$2,429 (20)	\$1,300 (9)	\$602 (5)
p45 (2.5%)	\$31,667 (206)	\$18,018 (122)	\$8,425 (125)	\$2,567 (18)	\$1,400 (11)	\$676 (11)
p50 (3.1%)	\$30,240 (178)	\$17,500 (178)	\$8,050 (102)	\$2,704 (19)	\$1,500 (11)	\$748 (11)
p55 (3.8%)	\$29,213 (218)	\$16,673 (139)	\$7,609 (150)	\$2,865 (21)	\$1,600 (12)	\$800 (10)
p60 (4.6%)	\$27,683 (160)	\$15,906 (114)	\$7,004 (146)	\$3,040 (23)	\$1,705 (13)	\$850 (13)
p65 (5.5%)	\$26,124 (193)	\$15,000 (101)	\$6,266 (156)	\$3,225 (29)	\$1,810 (17)	\$903 (16)
p70 (6.7%)	\$24,667 (198)	\$13,720 (161)	\$5,324 (156)	\$3,450 (25)	\$1,938 (21)	\$950 (21)
p75 (8.2%)	\$22,479 (202)	\$12,314 (127)	\$4,000 (170)	\$3,676 (33)	\$2,035 (20)	\$948 (27)
p80 (10.3%)	\$20,000 (152)	\$10,800 (183)	\$2,460 (190)	\$3,950 (36)	\$2,138 (29)	\$904 (31)
p85 (13.7%)	\$16,900 (252)	\$8,136 (196)	\$450 (113)	\$4,213 (57)	\$2,190 (39)	\$676 (35)
p90 (19.8%)	\$12,357 (209)	\$3,822 (235)	\$0 --	\$4,432 (72)	\$2,000 (55)	\$300 (22)

Standard error estimates calculated using replicate weights (Francisco and Fuller, 1991). See notes and source from exhibit 1.

EXHIBIT A2: Linear Probability Models of Medical Spending Burden (>10%, >15%, and >20%) Among the Non-Elderly on Health, Insurance Status, Age, Sex, Race & Ethnicity, HIU Composition, and Geography

	(1)		(2)		(3)		(4)	(5)	(6)
	DV: Spending >10% gross income		DV: Spending >15% gross income		DV: Spending >20% gross income		(2)-(1)	(3)-(2)	(3)-(1)
	Est.	s.e.	Est.	s.e.	Est.	s.e.			
Health Status									
Excellent/Very Good (reference)									
Good	0.033**	0.004	0.023**	0.003	0.015**	0.003	**	**	**
Fair	0.097**	0.006	0.069**	0.005	0.052**	0.005	**	**	**
Poor	0.126**	0.010	0.100**	0.010	0.070**	0.009	**	**	**
No limitations (reference)									
1+ limitation(s): doing errands, concentrating, dressing, or walking	0.027**	0.008	0.014 ⁺	0.008	0.007	0.007	**	*	**
Health Insurance Status (mutually exclusive)									
ESI, large group (reference)									
ESI, small group	0.059**	0.006	0.049**	0.005	0.032**	0.004	**	**	**
Directly purchased insurance (non-group)	0.249**	0.009	0.202**	0.008	0.159**	0.008	**	**	**
Public health insurance (no private)	-0.144**	0.006	-0.089**	0.005	-0.061**	0.005	**	**	**
Uninsured	-0.073**	0.005	-0.022**	0.004	0.002	0.004	**	**	**
Age									
0-18	0.035**	0.002	0.025**	0.002	0.020**	0.002	**	**	**
19-44 (reference)									
45-54	0.007*	0.003	-0.001	0.003	-0.002	0.003	**	**	
55-64	0.005	0.005	-0.009*	0.004	-0.013**	0.003	**	*	**
Sex									
Male (reference)									
Female	0.015**	0.002	0.010**	0.002	0.008**	0.001	**	*	**
Race & Ethnicity									
White, non-Hispanic (reference)									
Black, non-Hispanic	-0.012*	0.006	-0.007	0.005	-0.003	0.005	*	*	**
Other, non-Hispanic	-0.001	0.006	-0.002	0.005	0.002	0.004		*	
Hispanic	-0.022**	0.006	-0.026**	0.005	-0.018**	0.004	*	**	
Composition of HIU									
Number of adult workers	-0.079**	0.003	-0.084**	0.003	-0.084**	0.002	**	**	**
Number of adult non-workers	0.052**	0.004	0.045**	0.004	0.039**	0.003	**	**	**
Number of children	0.010**	0.002	0.003*	0.001	-0.001	0.001	**	**	**
Health Status of Other HIU Members									
Number of additional people with fair/poor health	0.061**	0.006	0.045**	0.006	0.031**	0.005	**	**	**
Number of additional people with limitation	0.023*	0.010	0.011	0.009	-0.004	0.007	**	**	**
Highest Educational Achievement Among HIU Members									
Less than High School	0.015*	0.006	0.031**	0.006	0.033**	0.006	**	**	
High School up to Associate's Degree (reference)									
Bachelor's Degree	-0.045**	0.005	-0.030**	0.004	-0.024**	0.003	**	**	**
Post Graduate Degree	-0.079**	0.005	-0.051**	0.004	-0.034**	0.003	**	**	**
Geography									
Metro area (reference)									
Non-metro area	0.024**	0.005	0.017**	0.004	0.013**	0.004	**	**	**
Mid-Atlantic (reference)									
Northeast	0.031**	0.008	0.018**	0.006	0.012*	0.006	**	*	**
South Atlantic	0.029**	0.006	0.013*	0.006	0.006	0.005	**	**	**
East South Central	0.040**	0.009	0.010	0.007	-0.003	0.006	**	**	**
West South Central	0.034**	0.007	0.025**	0.006	0.012*	0.005	**	**	**
East North Central	0.026**	0.006	0.002	0.005	0.003	0.004	**	**	
West North Central	0.033**	0.007	0.010 ⁺	0.006	0.001	0.005	**	**	**
Mountain	0.055**	0.008	0.029**	0.006	0.020**	0.005	**	**	**
Pacific	0.007	0.007	0.001	0.006	-0.004	0.005	*	**	**
Constant	0.247**	0.007	0.200**	0.006	0.175**	0.005			
Observations	177,889		177,889		177,889				
R-squared	0.087		0.093		0.098				

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

Notes: Standard error estimates calculated using replicate weights (Fay's Method). Columns (4) through (6) summarize results from seemingly unrelated regressions (SUR) and subsequent two-tailed significance tests for the null hypothesis that the difference in parameter estimates over the indicated columns is equal to zero.

Source: Authors' calculations using the 2011 CPS ASEC (2010 reference year).

EXHIBIT A3: Median Medical Spending & Median Income Per Person in the HIU Among Non-Elderly Individuals Covered By Direct Purchase Insurance And Small-Group ESI

	(1)		(2)		(3)	
	Premium Spending		Medical Services, Equipment, Prescription Drugs, and Over-the-Counter Items		Income	
	Median	s.e.	Median	s.e.	Median	s.e.
Non-Elderly Sample						
Directly purchased insurance	\$1,200	\$30	\$425	\$13	\$20,000	\$396
Small group ESI	\$323	\$19	\$343	\$7	\$23,628	\$305
Difference	\$877	\$36	\$82	\$14	-\$3,628	\$499
Null Hypothesis: Difference = \$0	**		**		**	
Conditional on Burden >10%						
Directly purchased insurance	\$2,100	\$63	\$750	\$35	\$14,173	\$450
Small group ESI	\$1,400	\$50	\$900	\$50	\$13,967	\$379
Difference	\$700	\$80	-\$150	\$61	\$207	\$588
Null Hypothesis: Difference = \$0	**		**			

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

Source: Authors' calculations using the 2011 CPS ASEC (2010 reference year).

About the Authors and Acknowledgements

Kyle J. Caswell is a research associate, and Timothy Waidmann and Linda J. Blumberg are senior fellows, in the Health Policy Center at The Urban Institute. The authors thank Sharon Long for helpful comments on a previous version of this manuscript.

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ENDNOTES

1 The U.S. Supreme court decision, *National Federation of Independent Business v. Sebelius*, 567 U.S. ____ (2012), preserved the ACA's Medicaid expansion provision, but ruled states' participation in the expansions voluntary.

2 Low-income undocumented, and some documented, immigrants will not have access to Medicaid coverage in states that expand their program. Low-income documented immigrants without access to affordable employer-sponsored insurance and who are not eligible for Medicaid due to being in the country for fewer than 5 years will, however, be eligible for subsidized coverage through the health insurance exchanges.

3 Although certainly not a new survey, it is a new source to investigate issues related to medical spending since new questions were added in the 2010 March supplement (see the data section).

4 Shen and McFeeters (2006) is one exception. However, their study does not include spending on health insurance premiums, nor does it include uninsured population.

5 Fay's method is used for all proportion and average standard error estimates (see Judkins, 1990), and the Woodruff method is used for percentiles (see Francisco and Fuller, 1991).

6 The 2010 CPS ASEC did not collect information on over-the-counter items. This question was added to the 2011 survey.

7 We exclude 2.7 percent of the unweighted non-elderly population via the restrictions described above.

8 As an alternative to gross income, we investigated using HIU net income as the denominator, where federal and state taxes were simulated using the program TAXSIM. Our main results, however, were not qualitatively different; therefore, we decided to use gross income as the denominator.

9 This analysis focuses on the aggregation of these medical spending components (i.e., total spending). It is possible to disaggregate these data by category, which we do in one comparison.

10 Income categories, collected from respondents 15 years old and older, include: earnings, unemployment compensation, workers' compensation, social security, supplemental security income, public assistance, veterans' payments, survivor benefits, disability benefits, pension or retirement income, interest, dividends, rents, royalties, and estates and trusts, educational assistance, alimony, child support, financial assistance from outside of the household, and other income.

11 This affected seven percent of HIUs, corresponding to four percent of individuals (unweighted). Among this seven percent of HIUs, 33 percent report zero medical spending and therefore have a burden value equal to zero. One percent report negative income and positive medical spending; 63 percent report zero income and positive medical spending. The remaining three percent report positive income less than \$100 and positive medical spending.

12 HIU gross income and medical spending per person equals HIU income/spending divided by the number of individuals in a given HIU. HIU income (medical spending) per person, in this case, is equal for every member of the HIU. This is clearly only one means of many to adjust for differences in HIU size. Alternative uses of this information, however, yield similar results (e.g., HIU income as a percentage of the Federal Poverty Guidelines in lieu of HIU income per person). Additional percentile estimates (e.g., 25th and 75th) corroborate the median results.

13 ADLs include dressing or bathing, walking or climbing stairs, concentrating or remembering or making decisions. IADLs include difficulty doing errands, such as shopping. Note that these questions are only relevant to individuals aged 15 and older. For simplicity, in the multivariate analysis individuals less than 15 are coded as not reporting an ADL/IADL.

14 Medicare Part B premiums are not included in our measure of premium spending.

15 Although a limitation, we did investigate how including estimates of the market value of housing assistance and SNAP for CPS respondents, produced by the Census Bureau, affect our results on the relative importance of income and medical spending at higher burden thresholds. We found that including this information did not qualitatively change the observed trend reported in this analysis (exhibits 1 and A1). Although a smaller portion of the population faced the 10 percent, 15 percent, and 20 percent burden thresholds used in this paper.

16 Married full-time students living in university-owned housing units (e.g., dormitories) are interviewed if sampled, while non-married full-time students are not. Parents sampled, whose non-married full-time student children are temporarily away from home, include these children on the household roster (U.S. Census Bureau, 2006). Therefore, the most concerning cases where full-time students are sampled and parental resources are not observed include 1) married, full-time students, and 2) full-time students living in non-university-owned housing.

17 Data used to produce this figure, including standard error estimates, are available in the appendix, exhibit A1.

18 Only individuals aged 15 and older are asked ADL and IADL questions.

19 Controls included but not reported in exhibit 2 are ADL/IADL limitation, work status, sex, race and ethnicity, composition and health status of other HIU members, educational attainment (maximum of HIU), and geography (metropolitan residence and Census region).

20 Results reported in appendix exhibit A3.

21 Results reported in appendix exhibit A3.