NBER WORKING PAPER SERIES

HOW DOES FAMILY HEALTH CARE USE RESPOND TO ECONOMIC SHOCKS? REALIZED AND ANTICIPATED EFFECTS

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Working Paper 20348
http://www.nber.org/papers/w20348

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
July 2014

We thank Pinar Karaca-Mandic and participants at the 5th Biennial Conference of the American Society of Health Economists, session on The Great Recession and Health, for helpful comments. The views expressed herein are those of the authors and do not necessarily reflect the views of the National Bureau of Economic Research.

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NBER Working Paper No. 20348
July 2014
JEL No. I12,I13,I18

ABSTRACT

Families in constrained economic circumstances resulting from economic shocks face difficult choices regarding how best to spend their diminished resources. As families strive to preserve their living standards, decisions regarding health care use and its allocation among family members may become more discretionary and complex. Using two-year panel data from the Medical Expenditure Panel Survey for 2004 to 2011, we examine how the intra-family allocation of health care spending responds to realized and anticipated changes in family economic status. We focus on the share of total family health care spending allocated to children, and measure realized economic shocks based on changes in the family's income, employment, and health insurance status. We account for anticipated economic shocks by differentiating families by whether they are observed prior to, at the onset of, or during the Great Recession, or in the post-recession period. Our findings suggest that both types of economic shocks affect the share of family health care spending allocated to children, with findings more pronounced for single-mother families. We also find that realized economic shocks have a greater impact on children's spending share than the anticipated change in economic status associated with the Great Recession and its recovery.

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I. Introduction

Families in constrained economic circumstances resulting from economic shocks – losses or reductions in employment, income, wealth, and health insurance – face difficult choices regarding how best to spend their diminished economic resources on critical necessities. As families strive to preserve their living standards by maintaining housing and adequate nourishment, decisions regarding health care use may become far more discretionary and complex. In particular, families experiencing an economic shock may, by necessity, be required to prioritize their health care spending among family members and specific health care services.

In such economic circumstances, the family's health care decision making confronts a number of compelling resource allocation decisions. For example, do families decide to share the burden of diminished economic resources by reducing health service use by all family members? Or do they prioritize health care spending on behalf of children and/or family members with specific health care needs or chronic health conditions? Do families forego certain types of services, such as preventive health care, prescription drugs, mental health care, and dental care, and are they more likely to obtain care at emergency rooms or hospital outpatient clinics? Such family decision making has implications not only for the private welfare of its members but for society more generally. For example, the inability of families to meet their health care needs can translate into delays in seeking health care, worsening of health conditions, and the use of health care in less appropriate setting, thereby contributing to greater health care spending over time.

In this paper, we consider how economic shocks affect family health security by examining the family's response to both *realized* and *anticipated* changes in their economic circumstances, focusing on the implication for family health care resource allocation between parents and children in single-mother and in two-parent families. We consider responses to a *realized* economic shock by examining how families respond to *observed* changes in their economic circumstances, focusing on losses in income, employment, and health insurance. Holding constant the changes in these observed attributes of family economic status, we also examine the impact of an *anticipated* economic shock on family health care use. We do so by using the period of the Great Recession (December 2007 to June 2009) as an exogenous change in macroeconomic circumstances which may have affected the family's expectations regarding its future economic prospects. [1] As we discuss below, survey data suggest that the Great Recession and its aftermath may have altered such expectations, and in response, families may have changed their spending patterns to accommodate precautionary savings motives. Moreover changes in unobserved factors such as family stress and anxiety during the Great Recession and its aftermath compared to pre-recessionary periods also may have changed expectations regarding longer term economic prospects, and such expectations may have altered resource allocation decisions by families (Hurd and Rohwedder, 2010; Pew Research Center, 2010)

We implement this analysis by exploiting a series of two-year panel data sets from the Medical Expenditure Panel Survey-Household Component (MEPS-HC). Use of these data to characterize family health care decision making represents a key contribution of our analysis as it enables us to examine within-family health care adjustments to realized economic shocks over a two-year period, and to the expectation of changes in economic status resulting from the Great

[1] We also make this distinction since actual economic shocks experienced by a family can occur in any time period and thus are not unique to the circumstances of the Great Recession.

Recession and its weak economic recovery. Our findings suggest that both types of economic shocks had an impact on the allocation of health care spending to children in single-parent households, with smaller and less consistent effects observed among two-parent families.

Our paper has particular policy salience. First, it speaks directly to the issue of the family's health care decision-making and welfare during a period when many American families have experienced meager economic progress, and in which economic conditions remain uncertain and unstable. Next, while the Patient Protection and Affordable Care Act (ACA) promises health care coverage that is "always there," and subsidies to defray the costs of coverage, the health care needs of some families experiencing economic shocks still will remain vulnerable. For example, since the ACA's cost-sharing subsidies phase out after 250% of poverty, families who exceed this income threshold but experience income losses during periods of economic distress may also be subject to high out-of-pocket (OOP) costs and make adjustments to their internal allocation of health care spending. In this regard, recent experience with state health reform in Massachusetts has revealed that national health reform may not be sufficient to alleviate substantial out-of-pocket costs for families with incomes below 400% of poverty, for those with increased health care needs, and for families with more children (Galbraith et al. 2013).

Other circumstances may put families at risk for high out-of-pocket costs and thus may affect the intra-family allocation of total health care spending. Families in states that fail to implement the ACA's Medicaid expansion and experience income losses that place them between their state's Medicaid thresholds and below 138% of poverty may face potentially high out-of-pocket expenses and may adjust their health care use accordingly. Additionally, should insured families suffer income losses in the post-ACA period, they may gravitate to less

generous essential health benefit plans and thereby face higher out-of-pocket costs that may necessitate changes in their decisions regarding family members' health care use and spending.

The plan of our paper is as follows. We begin with a brief description of the current economic environment and the impact Great Recession and discuss their implications for family economic and health security. Next, we describe prior research that is particularly relevant for our study followed by a description of the conceptual framework that motivates our analysis. We discuss the data used in our analysis and our conceptual and empirical frameworks, and then discuss our findings and conclusions. Our findings suggest that both realized and anticipated economic shocks may impact the intra-family health care spending allocation for children, with effects most pronounced for single-mother families.

II. Background:

Family Economic Security and the Economic Environment

Since the late 1990s, the US economy has been characterized by instability and sluggish economic growth, threatening the economic progress and security of many American families. This insecurity is reflected in stagnant or declining real incomes; increases in accumulated debt; difficulty in meeting rising health care and insurance costs; the threat of housing foreclosures; the tenuous nature of employment; and threats to the private safety net of pensions and retiree health benefits and to the traditional public safety net. As regards family incomes among work-age families, over the last decade, real median family income declined from $63,535 in 2000 to $55,640 in 2011 (Economic Policy Institute tabulations of real median family income, 2014b), and during the same period, the unemployment rate increased from 3.8% in April 2000 to 9.1% in April 2011 (Bureau of Labor Statistics). Consistent with this characterization, a report from

the Pew Research Center (2012) has labeled the decade beginning in 2000 as the "lost decade of the middle class" in which its size diminished, inflation-adjusted average family incomes declined for families in all income tiers, wealth declined for all families except those in the highest income tier, and in which respondents expressed significant pessimism over the future and with regard to the performance of major financial and government institutions. In addition, Leonhardt and Quealy (2014) report that compared to other developed countries, the economic stature of the U.S. middle class has fallen well behind.

Apart from this general lack of economic progress, the period encompassed by the Great Recession (December 2007 to June 2009) as well as its immediate aftermath has had a profound effect on family economic status and expectations for future wellbeing through its impact on labor, financial, and housing markets. The recession affected the economic status of many American families through income losses associated with lengthy or persistent unemployment, underemployment, losses of health insurance, as well as reductions in accumulated savings, wealth, and housing values. For example, during this period, the U.S. labor market lost 8.8 million jobs (Goodman and Mance 2011), the unemployment rate increased from 4.7% to 9.4%, and the long-term unemployed (more than six months unemployed) as a percent of the unemployed increased from 18.9% in November 2007 to 27% in May 2009 (Economic Policy Institute, 2014a). Finally, the economic recovery from the Great Recession has been exceedingly weak, with long-term unemployment long-term as a percent of the unemployment has increasing to 37.7% in December 2013 and, as noted above, real median family income for working-age families declining precipitously.

As Hurd and Rohwedder (2010) note in their analysis of the American Life Panel survey data, by April 2010, nearly 39% of households were in financial distress with either the

respondent or spouse having been unemployed, or the household had negative equity in their home, or had been in arrears in home payments. The authors also found that survey respondents' long-term expectations about stock market prices and housing prices were very pessimistic, and that workers' expectations of poor success in obtaining employment remained high. They conclude by noting that the data indicate that households are not optimistic about their economic future, suggesting that in this regard, the recession's impact may have significantly altered expectations.

What is especially relevant for our study is the authors' finding of efforts by households to economize on health care spending, specifically, a sharp decline in two components of health care spending (prescription drugs and health care services) which substantially exceeded the spending decline on the 25 other spending categories (health and non-health) surveyed. Finally, the authors also note that because of the protection health spending provides against future health declines, households economizing in this way are subject to potentially long-term negative consequences.

In sum, this review suggests that apart from realized economic shocks prior to and during the Great Recession, diminished family expectations about the state of the economy and future economic prospects were also prevalent. We consider both of these potential influences on the intra-family allocation of health spending in our analysis.

Prior research: Economic shocks and health security

Next, we highlight some very recent research that on health care responses to economic shocks. While there is a large literature that has examined the impact of economic swings on

health outcomes, we restrict our discussion to a few papers that are particularly salient for our analysis of family health care spending.[2]

Perhaps most relevant to our focus on intra-family health care decision making in response to an economic shock is the paper by Karaca-Mandic, Yoo, and Strong (2013). Noting that the Great Recession and its accompanying decreases in household income, savings, and increased risk both employment and health insurance loss were prominent factors in the decline in health care spending over this period, the authors consider OOP spending trends for children and adults. They use a sample of privately insured families with children (ages 0 to 17) and adults obtained from annual cross-sections of the Medical Expenditure Panel Survey to obtain annual spending estimates by each group between 2001 and 2009. The authors focus specifically on the issue of whose OOP health care spending – those of children or adults – was most affected by the recession.

Using generalized linear expenditure models (with a log-link) to estimate whether the period of the Great Recession had a differential effect on spending for these groups compared to other periods, they find little evidence that the recession affected such spending for most

[2] The impact of economic fluctuations on the health of individual family members is a complex process, and despite the large literature that has developed on this issue, remains unresolved. The complexity reflects the fact that on the one hand, the stress, uncertainty, and social dislocation associated with difficult economic times can result in reductions in the physical and mental health status of particular family members through harmful health behaviors, including smoking, drinking, drug abuse, and poor dietary practices, and that emotional distress and anxiety can lead to harmful physical health problems such as high blood pressure. Alternatively, the health status of some individuals will benefit from the decline in economic activity associated with the recession, as when individuals have more time to invest in their own health through recreation and physical activity, prepare meals at home rather than purchase prepared foods, when air pollution diminishes due to reduced industrial production, and when automobile mishaps are reduced as a consequence of declining economic activity, among other factors.

children. However, children with special health care needs had significantly lower spending levels, while adults, regardless of whether they were in families with or without special needs children, experienced a decline in their OOP spending. They note that the reduction in adult health care spending in families without special needs children also is suggestive of adults sacrificing their own health care use to maintain spending levels of children. Based on this divergence, the authors suggest that parents may reduce their own spending in difficult economic times to accommodate the health care needs of their children.

In a related paper Karaca-Mandic et al. (2014) take a family perspective on health care access and utilization by considering the relationship between the family's OOP health care burden and the health care needs of children. They use data from the MEPS-HC for the period of 2002 – 2009 which encompasses the period of the Great Recession and focus on measures of unmet health care needs for children, obtaining observations for each child for two years from the MEPS panel. The analysis includes OOP spending for children and for adults as explanatory variables and considers whether outcome measures were sensitive to the period of the recession. They fit linear probability models of the likelihood of unmet need/delayed care, and to address the potential endogeneity of OOP spending, the authors employ an instrumental variables technique. The authors found that children were more likely to have unmet needs or delayed care if other family members had high OOP spending, a finding that was consistent for children with our without special health care needs. Finally, the authors found that the period of the Great Recession was associated with reduced unmet needs of children, suggesting, as in their earlier study, that parents may have sacrificed their own use of medical care in response to difficult economic circumstances.

While these findings suggest an internal family resource allocation process that favors family members with specific health care needs (such as children), the analyses does not directly consider how a specific types of economic shocks affect may affect such decision making. The latter is particularly important since while the economic shocks of the Great Recession may have been especially profound for many families, families also experienced economic shocks in other periods and these also could have affected intra-family decision making. In our analysis, we directly consider this issue and by using the MEPS-HC two-year panels, consider how families adjust to actual and anticipated changes in their economic circumstances.

In an analysis that takes advantage of the two-year MEPS-HC panel, Schaller and Stevens (2014) consider the impact of involuntary employment loss on health, health care access, and health care utilization. They pool separate MEPS panels for the period 1996 to 2011 for individual between 21 and 65 that are employed in the first round of the survey, obtaining a sample of over 9800 individual job losses observed over this period. The authors find evidence that a job loss results in worse self-reported physical and mental health but is not associated with significant increases in chronic health conditions. Among all workers, they find that a job loss leads to reductions in insurance loss but little evidence reductions in health care use. However, if the lost job was the primary source of insurance, reductions in physician visits and prescription drug use are observed. While the authors' findings suggest that the health insurance loss associated with lost employment can be an important implications for health status of some workers, the analysis does not consider the implications for the health and health status for other family member, or how such insurance loss may lead to changes in family-level spending patterns. This can be an important shortcoming since the observed change in utilization for

individual workers is likely to be affected by the health care use and health status of other family members.

III. Conceptual Framework

To motivate our study of how the intra-family allocation of health care responds to economic shocks and to draw implications, we apply a simple model of family decision-making based on Becker's (1981) discussion of altruism in the family. In Becker's model, families allocate resources among members based upon the preferences of an altruistic family decision maker. Although Becker's model focuses on family resource allocation among spouses who pool income, his analysis has implications for the decision-maker's response to an economic shock.

Applying this model to our context, a parent/family-decision maker's welfare or utility depends on the decision-maker's own resource consumption and on the welfare of other family members some of whom may require special consideration, such as children and those with vulnerable health status. We believe that the assumption of parental altruistic preferences has face validity for children, since parents are interested in child quality and also seek to avoid the costs associated with neglecting the health problems of children, and we assume similar sentiments are present with regard to other family members in vulnerable health.

In this context, we can perceive of each family member having their own health production function which depends on purchased medical care and time, and that the good health thus produced provides a source of utility for each family member. The altruist's utility function thus depends on her own health and on the utility she derives from the health of other family members who are the beneficiaries of the altruist's health care spending on their behalf. To simplify the discussion, we make the altruist's utility function depend upon her medical care use and that of her beneficiary, and assume that prices for medical care are the same for both. The

altruist will maximize her utility subject to a budget constraint in which her income is allocated to health care services across family members. Utility maximization by the altruist is obtained when the marginal utility of medical care for the altruist equals that of the beneficiaries (or the ratio of these marginal utilities equal unity), and thus determines the allocation of health spending within the family. Thus, the parent decision maker will allocate part of her income to support the health care consumption of other family members, thus sacrificing her own consumption of other health care and other commodities.

As Becker notes, an important implication of this model is that when the altruistic decision maker experiences an economic shock which reduces her income, the consumption by the altruistic decision maker will decline but by less than the full decline in income. More specifically, the altruist will in effect "reclaim" part of the income previously allocated to her beneficiaries to offset her potential consumption loss. Assuming health care to be a normal good, the model will predict that an economic shock will reduce the health care spending by both the altruist and her beneficiaries.

An implication of this behavior, not explicit in Becker's discussion, is the consequence for the share of total spending by the altruist and her beneficiaries. Since the altruist will reclaim expenditures made on behalf of beneficiaries prior to the economic shock, the beneficiaries' health care consumption will decline as the altruist either partially or fully restores her own spending. This will shift spending in favor of the altruist and away from the beneficiaries and thus increase her share of total spending. Thus, assuming altruistic parents, an economic shock could shift spending shares to parents and away from children.

As noted earlier, Becker's makes this point in the context of a two-person household (husband and wife) and with regard to a generic consumption commodity. While we have

extended this to the family's health care spending, allocation decisions regarding parents and children are likely to be more complex. In particular, the altruist may be willing to absorb a decline in her spending in response to an economic shock in order to preserve the health care spending of children and other vulnerable family members, especially if the altruist places greater value or utility on the health care use by vulnerable family members than on her own health care use. In this case, the share of spending by the altruistic parents will decline and that of her beneficiaries may increase. Thus, the consequence of an economic shock to the spending shares by the altruist and her beneficiary is ultimately an empirical question.

Alternatively, we can posit a more generic "common preference" parental utility function which depends on the welfare of the parents and dependent children (in our case based on medical care use). Should the indifference curves from this parental utility function exhibit a marginal rate of substitution (ratio of parents' marginal utility from children's medical care use to that of parents own medical care use) in excess of unity (i.e., the parents exhibit greater concern for children's welfare relative to their own welfare), parents will favor children in their initial intra-family resource allocation (Dickie and Messman 2004). These preferences will be reflected in the respective expenditure shares of the groups. Should the family experience an economic shock, the change in expenditure shares will depend on the behavior of the marginal rate of substitution between children's and parent's health care use (i.e., the shape of these indifference curves) as income declines. For preference functions that increasingly favor children as family economic status diminishes, then the intra-family health care resource allocation (and the expenditure share of children) will increase in response to the economic shock. Once again the response of the intra-family health spending allocation becomes an empirical issue.

In what follows, we empirically investigate the implications of both realized and anticipated economic shocks on family health care spending by first presenting descriptive estimates of changes in family health care spending allocated to children during the Great Recession and non-recessionary periods. For these analyses, we consider within-family changes over two-year periods captured by the MEPS panel data. We next apply econometric models that consider how expenditure shares and spending levels among parents and children respond to actual economic shocks and those anticipated by the Great Recession over two-year observation periods.

IV. Data and Empirical Approach

Data

The data for this analysis are from the Medical Expenditure Panel Survey-Household component (MEPS), a series of two-year panel data sets maintained by the Agency for Healthcare Research and Quality. The MEPS collects data from a nationally representative subsample of households that participated in the prior year's National Health Interview Survey (conducted by the National Center for Health Statistics). Respondents to the MEPS are surveyed five times over a period covering two calendar years regarding their demographic characteristics, health status, health care expenditures and utilization, health insurance coverage, income, and employment status. Our analytical data set includes pooled two-year panels from the MEPS covering the period 2004 through 2011.

Since the focus of our analysis is on intra-family resource allocation, we constructed family units and obtained family-level characteristics for each of the two panel years based on the characteristics of individual family members, family-level income, the insurance status of each family member, and parent's employment history. Our sample of families consists of those

with all members present for both years of the two-year panel and related by marriage or by birth. Our family definition also is consistent with the definition of a health insurance eligibility unit. We excluded families with individuals ages 65 years or older since such families typically have members covered by Medicare. Such families are less likely than families with non-elders to be affected by an economic shock that would compromise their health care spending or would require a spending reallocation away from the elderly family member. Moreover, such families may exhibit greater health care spending on average than families without elders. We also excluded families with births during the two-year period since such families may have experienced a one-time spike in their health care spending associated with pre-natal care and childbirth. Finally, we also excluded families with children ages 19 or older in an attempt to represent only nuclear families without children residing outside the household who may have access to other sources of medical care (such as care obtained through a college health plan), or who through their own employment obtained income and health insurance that were unlikely to be affected by an economic shock experienced by their parents.

These exclusions resulted in a sample size of 43,629 individuals representing 13,821 families. Additionally, since our analysis focuses on the intra-family health care allocation among adults and children, we restricted our analysis to married couples and single-parents (mothers) with children. These restrictions yielded samples of 6019 two-parent families with children and 2671 single-mother families for a total sample size of 8690 families. Finally, we constrained our analysis to families with positive health care spending in both years in order to assess the change in resource allocation for families who used health services in both periods. These restrictions yielded a sample of 2478 single-mother families and 5772 two-parent families for a total sample of 8250 families. For each family, we aggregated individual-level total health

care spending to obtain total family health care spending, and then using created variables accounting for the share of total spending allocated to parents and children. In contrast to work by Karaca-Mandic and colleagues, we focus on total health care spending for two reasons. First, compared to OOP spending, total health care spending represents a measure of the family's overall health care utilization, and next, because family decision-makers may be uncertain as to their OOPspending responsibility, and thus make their decisions based on total spending commitments. [3] We express total health care spending by the family in 2011 dollars. Thus, our key outcomes of interest are total expenditure shares for parents and children, and total spending for these groups.

Empirical Approach

To assess the impact of anticipated and actual and realized economic shocks of the intra-family health care spending allocation, we estimate several econometric models using the family as the unit of analysis, and with the following general specification:

$$O_{it} = \emptyset(X_{it}\beta + A_{it}\gamma + P_{rt}\delta_r + \tau_i + \epsilon_{it})$$

In this specification O_{it} represents the outcome of interest for family *i* in time *t*, $\emptyset$ represents a statistical operator which varies across model types, X_{it} represents a vector of family-specific characteristics with coefficient vector β , A_{it} represents a vector of actual economic shocks experienced by the family with coefficient vector γ, and P_{rt} is a vector of designated r=3

[3] While research demonstrates that health care decision making is responsive to parameters of insurance policies, it is also well known that individuals are not well informed regarding the specific payment provisions of such policies. We also created similar variables for total family out-of-pocket spending and the share of such spending for parents and children, and plan to examine behavior with regard to outcomes based on this measure of spending.

recessionary and non-recessionary time periods and δ_r the coefficient vector. Finally, τ_i is a family-specific error term, with ϵ_{it} representing a general stochastic error term.

In these models, the share of total health care spending allocated to children represents the outcomes of interest. We control for various family characteristics including family size, mother's age and education, the health status of children and parents, mother's race/ethnicity, and the region in which the family resides. As described next, we include family income, employment status, and insurance status to capture actual economic shocks over each two-year observation period in our data, and identify families as to whether their two-year observation periods encompass the pre-recession, recession, or post-recession time periods.

The econometric models include an pooled ordinary least squares model (OLS) that provides estimates of the impact of the realized economic shocks on the outcomes of interest *averaged within and across families*, and estimates of the impact of anticipated economic shocks *averaged across families* for families observed in specific years of the pre-recession, recession, and post-recession periods (since time periods do not vary across the two-year observation periods for specific families). This model serves as a comparison for two alternative family fixed-effects models for estimates of children's expenditure shares. These models provide estimates of the impact of the *within-family change* in actual economic status on children's health care spending shares over two-year time periods (relative to designated reference groups for each component of economic status which do not change), and the *within-family change* in spending allocation over each of the two-year designated recession/non-recessionary time periods.

In the first linear fixed-effects model (as in the OLS model), we do not constrain expenditure shares predictions to fall in the zero/one bound. Recognizing that these models can

predict outside this constraint, we follow work by Mullahy (2011), Papke and Wooldridge (2008), and Wooldridge (2010) and estimate a fractional response model for children's expenditure shares. This model is essentially a generalized linear model (GLM) with proportions as output and a probit function as the designated link function. Following Papke and Wooldridge (2008) and Wooldridge (2010), this model also includes the two-year average values of our explanatory variables which control for any correlation between our explanatory variables and unobserved family effects yielding coefficient estimates that are equivalent to a family fixed-effects estimator.

Variables capturing realized economic changes

As noted earlier, we draw a distinction between realized and anticipated economic shocks that can affect the family's allocation of health care spending. To assess the impact of realized changes in economic status over the two-year observation periods, we fit the above models using measures of economic status within each MEPS panel year, focusing on family income, employment status, and health insurance status. With regard to income changes, we include dummy variable indicating family income relative to the federal poverty line (FPL), specifically, whether the family is classified as poor or near-poor (less than 125% of the FPL), low income (125% to less than 200% of the FPL), middle income (200% to less than 400% of the FPL), with high income families (400% of the FPL or more) as the reference group.[4] We also characterize

[4] Although we fit models with continuous income inflated to 2011 dollars, we focus on the poverty level measures for the following reasons. First these measures capture any non-linearity in the income/expenditure share relationship. Also, movement across these categories over time represents significant income shifts. For example, moving from the income threshold of four times the FPL in 2011for a family of four to the threshold for three times the FPL represents an income loss of over $20,000 ($89,400 to $67,050). Such a dramatic shift is not likely to be captured using a continuous measure of income which most accurately provides marginal changes in income. The disadvantage in using the FPL measure is that we can miss some significant changes *within* FPL classes.

the family's employment status during each year of the two-year panel with a set of dummy variables. For single-mother families, these variables indicate whether the mother was continuously without employment during the year or lost employment during the year (full-year employment is the reference group). For the two-parent families, similar variables were constructed for mothers and fathers. In each case, the reference group indicates whether the parent was continuously employed over the year or had acquired a job. Finally, we also account for changes in the family's health insurance status over each year in the two-year panel. We do this with dummy variable indicating whether all family members were uninsured during the year; whether at least one family member lost coverage during the year; and whether at least one family member (but not all) was uninsured all year. We combined variables indicating full-year coverage for all family members or the acquisition of coverage during the year as our reference group. In our models that account for time-invariant family effects (our linear fixed-effects and fractional response models), the coefficients of each set of these economic status dummy variables convey *the within-family time-varying change in economic circumstances* over the two-year panel observation period (i.e., from one-year to the next) relative to reference groups whose status does not change over the two-year observation period.

Variables capturing anticipated economic changes

To assess the impact of anticipated economic shocks associated with the Great Recession, we created several dummy variables indicating the two-year time periods in which families in specific MEPS panels were observed. Families whose two-year observation period occurred primarily prior to the recession (the years 2004-2005, 2005-2006, or 2006-2007) were designated with the dummy variable PRE; families in panels whose two-year observation periods spanned the onset and duration of the recession (either 2007 -2008 or 2008-2009) were designated with

the dummy variable REC; and families in panels whose two-year observation periods fell primarily in the post-recession period (2009- 2010 or 2010- 2011) were designated with the dummy variable POST. For each of our estimated models, we report our findings in a consistent manner as the *change* in the outcomes of interest over each of the designated two-year observation period.. As discussed next, the specification of these variables differed across our alternative models. In each case, the variables were defined to capture the change in outcomes for families observed between the first and second years of each designated economic time period.

As noted above, we use three different estimating models: a pooled OLS model; a linear fixed-effects model; and a fractional response model. The pooled OLS model provides a basis for comparison with the linear fixed-effects and fractional models of children's expenditure shares. To accommodate the OLS model, we created a set of dummy variables indicating whether a family is observed in the first or second year of each designated economic period (i.e., PRE1, PRE2; REC1, REC2; and POST1, POST2, respectively), with PRE1 serving as the reference group. The difference in the estimated year-specific coefficients in this model (e.g., POST2 – POST1) represents the *across-family change* in our outcome of interest due to an anticipated change in economic circumstances.

The linear fixed-effects and fractional response models employ different specifications for these time-period effects. In the linear fixed-effects model, each designated time-period dummy variable is defined for a second year of the designated economic period (e.g., PRE2, REC2, and POST2). These variables capture the *within-family change* in outcomes between the first and second years of these time periods. This specification also permits us to examine whether the within-family differences in family health care spending over the two-years of the

recession differed from the effects observed over the two years specific to the other designated time periods. Finally, in the fractional response models, we obtain similar comparisons of the changes over the two-year periods based on the use of the full set of time-specific dummy variables as defined for the OLS model. As noted below, we used differences in time period predictions based on specific time period coefficients such as the coefficients of ONSET2 and ONSET1) to estimate changes in outcomes over relevant time periods.[5]

In what follows, we present descriptive findings describing the change in family health care expenditure shares by family type and number of children over the different time periods noted above (selected characteristics of single-mother and two-parent families are displayed in appendix Table A). In our econometric work, we report on findings for each of the models noted above, focusing on specifications that include *both* realized changes in economic status and anticipated changes associated with the recession and its aftermath. Unless otherwise indicated, all estimates are weighted by a MEPS family-level weight, standard errors are adjusted for the MEPS complex survey design in our descriptive findings (while our econometric work employs robust standard errors), and reported estimates and marginal effects are statistically significant at the 0.05 level or greater.[6]

[5] The specification of the time-specific dummy variables vary between these models since the family fixed-effects model is derived from an explicit within-family estimation, while the fractional response model obtains within-family effects after controlling for the two-year family averages in the explanatory variables. The latter variables, in effect, control for across-family effects.

[6] We derived family weights for our two-year panel file by taking the family weights from the full-year file corresponding to the second year of each longitudinal file and adjusting these weights for our specific sample. We did this by multiplying by the ratio of the sum of family weights in this second-year file to sum of family weights for families who remained in the two-year panel in the full-year file. We thank Steven Hill of AHRQ for his advice on this weighting issue.

V. Findings

Descriptive results

In Table 1, we present estimates of children's share of total health care spending by family type, number of children in the family, and time period. We focus on these descriptive estimates since they capture both actual and anticipated shocks and are more straightforward and economical to discuss compared to the full set of realized economic effect variables. For specific family types, these unadjusted estimates generally reveal a constancy of children's expenditure shares over each two-year period but with some noteworthy differences, particularly for single-mother families in the recession and post-recession periods. For these families with one child, we observe a decline in the child's total expenditure share in the post-recession period from 40.5% to 35%. In data not presented, this decline does not represent a strict reallocation from child to mother. Both mother and child experience a decline in total health spending, but the mother's decline of $322 (from $4083 to $3761; data not shown) is considerably smaller than the $626 decline for the child (mean total spending decline from $2376 to $1750). We also observe declines in the recession and post-recession periods for children's expenditure shares in single-mother families with two children (57.9% to 50.7% in the recession period, $p < 0.10$; 62.5% to 55.1% in the post- recession period, $p < 0.10$). In the former case, spending on both children and mothers actually increase, but the spending increase for mothers exceeds that for children by over $200. In the latter case, however, we observe nearly a $1500 decline in average spending for children while mother's spending declines by only $210 on average, suggesting a more substantive reallocation of spending toward mothers. We observe no statistically significant changes in children's expenditure shares in the pre-recession period for these families, suggesting that the observed changes in the recession and post-recession periods represent real

shifts in spending shares (albeit somewhat imprecisely estimated for families with two children) compared to the earlier period.

In two-parent families with one child in the post-recession period, we observe a small decline in children's expenditure share from 28% to 24.6% ($p < 0.10$) (from $2202 to $1713, or by nearly $500).This also represents a real reallocation to parents (notwithstanding the marginal statistical significance), specifically to mothers (her share increased from 41.4% to 45.1%) while father's expenditure share remained roughly constant at just over 30% (data not shown). We find no changes in children's expenditure share in the pre-recession period for these family types. By contrast, the only other change we observe is for two-parent, two-child families in the pre-recession period. This is a relatively small decline in children's expenditure share in these families (from 44.4% to 42.3% $p < 0.10$) and is obtained at the expense of a decline in spending allocated to mothers. Thus for two-parent families, we fail to observe any systematic change in these unadjusted expenditure shares estimates related to specific time periods.

Econometric results

Children's expenditure shares

In Tables 2 and 3, we present estimates of the impact of the actual and anticipated economic shocks on children's expenditure shares. These estimates represent marginal effects on expenditure shares presented in terms of percentage point changes, with estimates for the obtained directly from the model coefficients for the pooled OLS and linear fixed-effects models. For the fractional response models, we estimated marginal effects as the difference in average partial effects estimated for each set of variables. We obtained these average partial effects for a standard population of families (either single-mother families or two-parent families) by first predicting the expenditure share from our model by setting the relevant dummy variable equal to

one and obtaining predictions for each family, next setting this dummy variable equal to zero and also obtaining predictions for each family, computing the difference in these predictions for each family and then averaging. Standard errors were obtained using a bootstrapping procedure specified by Wooldridge (2010) based on at least 100 sample draws.

In Table 2, we present marginal (percentage point) effects for single-mother families. The pooled OLS model (column 1) provides some evidence of both actual and anticipated economic effects *across families*, revealing that children's expenditure shares increase for families classified as poor/near poor (compared to those with high incomes) and for families with some or all members uninsured (compared to those with full-year coverage or who acquired coverage). We find that families in which the single mother is not employed shift spending away from children to mothers (a decline in children's expenditure share of 3.43 percentage points), and that families in the post-recession period also shift spending away from children to mothers.

Both the family-fixed effects (column 2) and fractional response models (column 3) provide strong evidence of within-family responses to economic shocks, with effects of comparable magnitudes across these models. We find that families that become poor/near poor over the two-year observation period (compared to families whose economic status remained unchanged) shift spending toward children (increasing their spending share by13.1percentage points in the fixed effects model and by 12.8 percentage points in the fractional response model, respectively). Children also appear to obtain priority when some family members lose coverage as their expenditure shares increase (by 8.66 and 8.57 percentage points respectively across these two models). By contrast, children's expenditure shares decline when single mothers' employment status changed to not employed over the two-year period (by 5.25 and 5.31 percentage points across the models, $p < 0.10$). While such a shift could reflect a health-related

reason for the change in mother's employment status, as we note below, we account for changes in mother's health insurance status in these models. Finally, we find some impact of the anticipated change in economic status over the post-recession period, with children's expenditure share declining by roughly 4.69 percentage points in both the fixed-effects and fractional response models. This finding may reflect a response by families to their diminished expectations regarding future economic prospects. Thus, the consistent finding from both of these models is that both realized and anticipated economic shocks affect the intra-family resource allocation but in different ways, and the magnitude of the former exceeds the impact of the latter effect.

By contrast, estimated marginal effects for two-parent families (Table 3) are strikingly different. The across-family effects of the pooled OLS model dominate the within-family effects of the linear fixed-effects and fractional response models (columns 2 and 3), as we observe little in the way of within-family effects for both the realized or anticipated economic shock variables. While we observe no time-period effects across families in the pooled OLS findings of column 1, we do observe average (across and within) family effects that are consistent with the actual economic shocks observed in the same model for single-mother families.

In sum, our findings reveal different within-family changes in children's expenditure shares over two-year observation periods single-mother as compared to two-parent families, and these differences may reflect the more precarious economic conditions faced by single-parent families compared to those with two-parents.

An aside: family health effects on children's expenditure share

Since our models control for changes in family health status, it is instructive to see how such changes affect children's expenditure shares, both to provide another perspective on the

intra-family allocation of health care resources, and also to help validate our conceptual framework. As regards the latter, our perspective on household behavior suggests that family decision makers who weigh the welfare of family members such as children more heavily than their own welfare would favor a resource allocation toward such family members so that we would expect the health expenditure share to increase for children with vulnerable health status. For this preliminary examination, we consider the response of spending shares to respondent reports of being in fair/poor health relative to a reference group in excellent, very good, or good health.

We present these findings in Table 4 and find results consistent with expectations. For single-mother families (top panel), and focusing on our within-family models (columns 2 and 3), a change in a child's health status changes to fair/poor health has a positive impact on children's expenditure shares, and while the t-statistics exceed unity, these results are not statistically significant. By contrast, any decline in mother's health status over our two-year period (either a change to fair/poor health, or a reported decline in health status) results in a shift in spending away from children and toward the single parent, findings that are quite consistent in both linear fixed-effects and fractional response models. We also find that a shift away from spending on children to mothers when mothers report an improvement in health, a finding possibly reflect the use of medical care services to attain such improved health over our observation period.

Our results for the impact of such changes in family health status on children's expenditure shares are also obtained for two-parent families (lower panel of Table 4) with a few differences. Focusing again on the linear fixed-effects and fractional response model, we observe a strong shift to spending on children when a child's reported health status changes to fair/poor health (in excess of a ten percentage point change for both models). For parents we find that an

observed health decline for mothers over the two-year period reduces spending on children (by just over four percentage points). For fathers, a shift in reported health status to fair/poor health yields a nearly seven percentage point decline in children's health spending share, while a reported decline in health yields just over a four percentage point decline in children's share.

Impact on Children's and Mother's Health Care Spending

As a final analysis, we consider the impact of actual and anticipated economic shocks on the amount of health care spending of children and mothers in single-mother families (data not shown). We do so to provide some insight as to how the family allocated actual spending in response to these factors. We focus on these families since our earlier results indicate that such households were primarily affected by economic shocks.

We summarize results based on a GLM model of total spending for children and for mothers using the basic model specification we developed for the expenditure share analyses. The GLM model is estimated with logarithmic link and a gamma variance function, and estimates are derived based on the MEPS family weight described earlier and using robust standard errors. As in our fractional response model, we include two-year averages of our independent variables to control for any correlation between these time-invariant observed family characteristics and unobserved time-invariant family effects, and thus to obtain within family effects. We obtain marginal effects as described in our discussion of the fractional response model and obtain boot-strapped standard errors. Our findings thus can be considered within-family responses to the actual and anticipated economic shocks.

Many of our finding from this model are imprecisely estimated, suggesting use of our basic model requires some re-specification. In general, we find realized income shocks shift spending levels toward children and away from single-mothers, while employment shocks and

changes in family insurance status tend to shift spending toward children. We also find that within-family spending in the post-recession period declines for both children and single mothers, but that children's spending declines by over $700 over the two-year period compared to a spending decline of over $400 for mothers. Our findings, albeit very preliminary in nature, suggest that these spending shifts in response to economic shocks may not be trivial, but d clearly more work is necessary to add precision to these estimates.

VI. Conclusion

The Great Recession and much of its aftermath have witnessed a general decline in consumption by families that has resulted in weak economic growth and impeded a robust recovery. Such a decline in consumption can be a response to realized economic shocks experienced by the family as well as cut-backs in spending and changes in spending patterns induced by expectations of poor future economic prospects. In this paper, we focus on how both types of economic shocks affect one important component of family consumption – health care spending – focusing on the intra-family allocation of health care resources. Using data from the Medical Expenditure Panel Survey's Household Component and models which estimate the intra-family changes in health care spending over a two-year observation periods, we find evidence that the share of the family's health care spending allocated to children is sensitive to both realized and anticipated economic shocks, with results most pronounced for single-mother families.

Our empirical results suggest that in these single-mother families, mothers appear to behave altruistically to children in the sense that they weight children's welfare more than their own welfare when the family experiences an actual economic shock and in response, increase

children's share of total health care spending. We find evidence of such an increased spending allocation to children when the family's economic status declines to income classified as poor or near poor or to low income compared to families whose economic status remains intact over the two-year observation periods. We also find evidence of such an allocation when a family member (typically the mother) experiences a loss of coverage or experiences a year-long spell without health insurance. By contrast, we find that when mothers are not employed (a shift to this employment status from a prior status of at least some employment), children's health care spending share is reduced (a finding which might reflect an unobserved change in health status that led to the change in employment status). As for anticipated economic shocks, we find that over the two-year period encompassing the post-recession period, children's share of total health care spending declines, suggesting that such spending was sensitive to the weak economic recovery from the Great Recession as well as diminished expectations regarding family economic status. Thus our findings suggest that both realized and anticipated economic shocks play a role as the family determines how to allocate its health care spending among various members, that these shocks have somewhat different impacts, and that the magnitude of a realized shock exceeds that of an anticipated economic shock.

Finally, we acknowledge the preliminary and exploratory nature of our investigation, and that fact that much more work needs to be done to understand the various dimensions through which family health spending responds to economic changes. As noted in our introduction, issues of spending allocations among family members with specific health attributes and across specific health services pose interesting and compelling investigations that we hope to pursue.

References

Becker, Gary S. 1981. *A Treatise on the Family*. Cambridge MA: Harvard University Press.

Bureau of Labor Statistics. 2014 "Monthly Unemployment Rates, 2000 to 2011." Available at http://data.bls.gov/pdq/SurveyOutputServlet. Last accessed June 3, 2014.

Dickie, Mark and Victoria L. Messman. 2004. "Parental Altruism and the Value of Avoiding Acute Illness: Are Kids Worth More than Parents?" *Journal of Environmental Economics and Management* 48: 1146-74.

Economic Policy Institute. 2014a."The Share of the Unemployed who have been Jobless for Six Months or More, 1948 – 2014." Available at http://www.stateofworkingamerica.org/charts/long-term-unemployment/ (last accessed 5/31/2004).

Economic Policy Institute. 2014b. *The State of Working America: Real Median Household Income.* Available at http://stateofworkingamerica.org/charts/real-median-household-income/last accessed June 3, 2014.

Galbraith, A., A. Sinaiko, S. Soumerai, D. Ross-Dugan, M. Dutta-Linn, and T. Lieu. "Some Families who Purchased Coverage Through The Massachusetts Connector Wound Up with High Financial Burdens." *Health Affairs* 32:5: 974-983.

Goodman, Christopher J. and Steven M. Mance. 2011. "Employment Los and the 2007-09 Recession: An Overview. *Monthly Labor Review*, April, 3-12.

Hurd, M.D., and S. Rohwedder. 2010. "Effects of the Financial Crisis and Great Recession on American Households." Cambridge, MA: National Bureau of Research Working Paper 16407, September.

Karac-Mandic, P., S. Choi Yoo, and B. Sommers. 2013. "Recession Led to a Decline in Health Care Spending for Children with Special Health Care Needs." *Health Affair* 32:6: 1054-1061.

Karaca-Mandic, Pinar; Sung Choi Yoo; Jinhyung Lee,; Peter Scal. " Family Out-of-Pocket Health Care Burden and Children's Unmet Needs or Delayed Health Care." Academic Pediatrics (in press).

Leonhardt, David and Kevin Quealy. 2014. "U.S. Middle Class is No Longer World's Richest." *New York Times*, April 23, A1.

Mullahy, John. 2011. "Multivariate Fractional Regression Estimation of Econometric Share Models." University College Dublin Geary Institute Discussion Paper Series (Geary WP 2011/33) November.

Papke, Leslie E. and Jeffrey M. Wooldridge. 2008. “Panel Date Methods for Fractional Response Rates with an Application to Test Pass Rates.” *Journal of Econometrics* 145:121-133.

Pew Research Center. 2010. How the Great Recession has Changed Life in America.” June 30.

Schaller J. and A. Huff Stevens. 2014. “Short-Run Effects of Job Loss on Health Conditions, Health Insurance, and Health Care Utilization.” National Bureau of Economic Research Working Paper 19884. February.

Wooldridge, Jeffrey M. 2010. “Correlated Random Effects Models with Unbalanced Panels.” Unpublished manuscript. May.

Table 1. Children's Share of Family Total Health Care Spending, Year 1 and Year 2.									
				Children's Share of Health Spending, Year 1			Children's Share of Health Spending, Year 2		
			N	Mean	Standard Error	Median	Mean	Standard Error	Median
Family Type	Number of Children in Family	Time Period							
Single Mother Family	1 Child	Pre-Recession	440	38.5	1.8	32.6	38.2	1.7	30.2
		Onset and Recession	312	38.1	2.4	30.5	37.8	2.4	30.5
		Post-Recession	329	40.5	2.1	29.7	35.0	1.9	26.2
	2 Children	Pre-Recession	366	49.9	2.1	48.2	51.6	2.2	51.8
		Onset and Recession	231	57.9	2.8	64.5	50.7	2.5	55.2
		Post-Recession	217	62.5	2.5	72.7	55.1	2.8	62.1
	3 or more Children	Pre-Recession	265	61.6	2.5	72.6	61.6	3.1	73.2
		Onset and Recession	169	62.2	3.4	67.9	63.0	3.0	70.1
		Post-Recession	149	67.8	3.0	77.1	65.1	3.3	75.9
Two Parent Family	1 Child	Pre-Recession	769	27.4	1.2	18.3	26.7	1.2	16.2
		Onset and Recession	441	30.1	1.7	21.0	28.0	1.7	18.6
		Post-Recession	427	28.0	1.4	20.3	24.6	1.5	15.6
	2 Children	Pre-Recession	1148	44.4	1.0	41.9	42.3	1.0	38.4
		Onset and Recession	719	43.0	1.2	39.3	42.3	1.2	41.7
		Post-Recession	639	44.2	1.4	41.9	42.1	1.4	38.9
	3 or more Children	Pre-Recession	755	56.5	1.3	57.2	54.4	1.2	55.7
		Onset and Recession	456	51.7	1.6	52.5	53.7	1.6	61.0
		Post-Recession	418	55.9	1.8	56.9	55.6	1.6	57.3
All (unique families)			8250	43.1	0.4	39.5	41.6	0.4	36.8

Table 2. Marginal Effects for Actual and Anticipated Impact of Economic Shocks on Children's Share of Family Health Care Spending: Single-Mother Families

Models	Pooled OLS (1)	Fixed Effects (2)	Fractional Response (3)
	Percentage point change (standard errors in parentheses)		
Actual economic shocks:			
Change in income:			
Poor/near poor	4.19* (2.41)	13.1*** (4.46)	12.8*** (4.30)
Low income	-0.65 (2.32)	7.40* (4.18)	7.12* (4.02)
Middle income	0.45 (2.16)	3.99 (3.28)	3.83 (3.09)
Change in employment:			
Lost employment	-0.02 (1.52)	-1.33 (3.26)	-1.27 (3.35)
Not employed	-3.43** (1.52)	-5.26* (2.80)	-5.31* (2.74)
Change in health insurance:			
At least one member (but not all) lost coverage during year	6.66*** (1.88)	8.66*** (2.37)	8.57*** (2.34)
All members uninsured all year	2.41 (3.79)	-3.69 (8.19)	-3.97 (7.96)
One member, but not all, uninsured all year	15.23*** (1.64)	-8.63*** (3.11)	8.54*** (3.02)
Anticipated economic shock			
Pre-recession effect	0.41 (0.24)	-0.71 (1.51)	-0.77 (1.62)
Onset/recessionary effect	-1.05 (0.50)	-0.90 (1.84)	-0.88 (1.80)
Post-recession effect	-5.36** (2.62)	-4.69*** (1.65)	-4.68*** (1.64)
Number of observations: 2478 unique families.			

Source: Authors' estimates from MEPS-HC longitudinal files, 2004 to 2011. * Statistically significant at $p < 0.10$; ** at $p < 0.05$; *** at $p < 0.01$.

Model specifications include the following set of family characteristics: family size, mother's age and education, the health status of children and parents, mother's race/ethnicity, and the region in

which the family resides. Actual economic shocks are captured by income as a percent of the federal poverty line, mother and father's employment status, and family insurance status, and the change in these variables over the two-year observation periods. Dummy variables indicate whether the family is observed in the first or second year of each designated economic period: In the pre-recession (PRE1 or PRE2), recession (REC1 or REC2), or post-recession (POST1 or POST2) time periods. In the OLS model, we include these dummy variable with PRE1 serving as the reference group. In this model, the impact of an anticipated economic shock on children's expenditure share over the family's two-year observation period is measured as the difference in relevant OLS regression coefficients (i.e., POST2 – POST1). In the linear fixed-effects model, we include the variables for second year of the designated economic period (e.g., PRE2, REC2, and POST2) with the first year as the reference period, and the impact of an anticipated economic shock is obtained directly from the time-period regression coefficient. In the fractional response models, we use of the full set of these time-specific dummy variables as defined for the OLS model and obtain marginal effects as described on pages 22 and 23 above.

Table 3. Marginal Effects for Actual and Anticipated Impact of Economic Shocks on Children's Share of Family Health Care Spending: Two-parent Families

Models	Pooled OLS (1)	Fixed Effects (2)	Fractional Response (3)
	Percentage point change (standard errors in parentheses)		
Actual economic shocks			
Change in income:			
Poor/near poor	3.88***	2.72	2.78
	(1.34)	(2.18)	(2.20)
Low income	0.17	0.07	0.04
	(1.17)	(1.84)	(1.87)
Middle income	-0.38	1.39	1.39
	(0.74)	(1.33)	(1.27)
Change in employment:			
Mother lost employment	0.95	0.23	-0.19
	(1.72)	(2.15)	(1.95)
Mother not employed	-1.23*	-1.48	-1.49
	(0.75)	(1.99)	(2.39)
Father lost employment	-3.70*	-2.00	-2.08
	(1.93)	(2.27)	(2.59)
Father not employed	-6.67***	-1.27	-1.32
	(1.54)	(2.80)	(3.19)
Change in health insurance:			
At least one member (but not all) lost coverage during year	3.82**	0.79	0.80
	(1.63)	(2.32)	(2.24)
All members uninsured all year	0.66	-7.54	-7.45
	(2.14)	(5.03)	(4.81)
One member, but not all, uninsured all year	9.24***	3.81	3.79
	(1.16)	(2.83)	(2.95)
Anticipated economic shock			
Pre-recession effect	-1.45	1.34*	1.34*
	(0.89)	(0.76)	(0.73)
Onset/recessionary effect	-0.35	-0.33	-0.34
	(0.30)	(1.05)	(1.03)
Post-recession effect	-1.49	-1.38	-1.40
	(1.22)	(1.02)	(1.09)
Number of observations: 5772 unique families.			

Source: Authors' estimates from MEPS-HC longitudinal files, 2004 to 2011. * Statistically significant at $p < 0.10$; ** at $p < 0.05$; *** at $p < 0.01$

Model specifications include the following set of family characteristics: family size, mother's age and education, the health status of children, mothers, and fathers, mother's race/ethnicity, and the region in which the family resides. Actual economic shocks are captured by income as a percent of the federal poverty line, mother and father's employment status, and family insurance status, and the change in these variables over the two-year observation periods. Dummy variables indicate whether the family is observed in the first or second year of each designated economic period: In the pre-recession (PRE1 or PRE2), recession (REC1 or REC2), or post-recession (POST1 or POST2) time periods. In the OLS model, we include these dummy variable with PRE1 serving as the reference group. In this model, the impact of an anticipated economic shock on children's expenditure share over the family's two-year observation period is measured as the difference in relevant OLS regression coefficients (i.e., POST2 – POST1). In the linear fixed-effects model, we include the variables for second year of the designated economic period (e.g., PRE2, REC2, and POST2) with the first year as the reference period, and the impact of an anticipated economic shock is obtained directly from the time-period regression coefficient. In the fractional response models, we use of the full set of these time-specific dummy variables as defined for the OLS model and obtain marginal effects as described on pages 22 and 23 above.

Table 4. Family Health Status and Children's Health Expenditure Share: Marginal Effects			
Models	Pooled OLS (1)	Fixed Effects (2)	Fractional Response (3)
Percentage point change (standard errors in parentheses)			
Single-mother families			
Any child in fair/poor health	15.42*** (1.66)	3.98 (2.71)	3.99 (2.62)
Mother in fair/poor health	-29.90*** (1.92)	-9.67*** (3.72)	-9.41** (0.04)
Mother's health declines	-11.75** (2.23)	-7.68*** (2.99)	-7.56*** (2.78)
Mother's health improves	-16.32*** (1.94)	-9.42*** (3.55)	-9.35*** (3.60)
Number of observations: 4,956			
Two-parent families			
Any child in fair/poor health	17.44*** (1.35)	10.11*** (1.92)	10.20*** (1.68)
Mother in fair/poor health	-12.32*** (1.60)	-2.05 (2.39)	-2.15 (2.49)
Mother's health declines	-9.81*** (1.48)	-4.13** (1.94)	-4.23** (2.04)
Mother's health improves	-7.32*** (1.51)	-1.55 (1.86)	-1.56 (2.01)
Father in fair/poor health	-16.51*** (1.47)	-6.98*** (2.67)	-7.55*** (2.75)
Father's health declines	-8.87*** (1.63)	-4.04* (2.22)	-4.15* (2.21)
Father's health improves	-8.81*** (1.38)	-2.21 (1.80)	-2.19 (1.74)
Number of observations: 11,544			

Source: Authors' estimates from MEPS-HC longitudinal files, 2004 to 2011. * Statistically significant at $p < 0.10$; ** at $p < 0.05$; *** at $p < 0.01$

These marginal effects are derived from models for single-mother families. These models include the following set of family characteristics: family size, mother's age and education, the health status of children and parents, mother's race/ethnicity, and the region in which the family resides. Actual economic shocks are captured by income as a percent of the federal poverty line, mother and father's employment status, and family insurance status, and the change in these variables over the two-year observation periods. Dummy variables indicate whether the two-year observation periods for families encompass the pre-recession, recession, or post-recession time periods.

Appendix Table A1: Selected sample characteristics , averages for 2004-2001				
	Single-Mother Families		Two-Parent Families	
	Mean	Standard error	Mean	Standard error
Share of family spending on children	46.7	0.7	41.0	0.4
% families with poor/near poor income	39.1	1.1	9.7	0.4
% families with low income	21.5	0.8	11.8	0.4
% families with middle income	27.2	1.0	35.6	0.7
% families with high income	12.2	1.0	42.9	0.8
% of families, Pre-recession year 1	21.9	0.7	21.7	0.5
% of families, Pre-recession year 2	21.9	0.7	21.7	0.5
% of families, Recession year 1	14.2	0.6	14.5	0.4
% of families, Recession year 2	14.2	0.6	14.5	0.4
% of families, Post-recession year 1	13.9	0.6	13.9	0.4
% of families, Post-recession year	13.9	0.6	13.9	0.4
% mothers who are White	47.6	1.5	71.2	0.8

Appendix Table A1 continued: Selected sample characteristics , averages for 2004-2001

	Single-Mother Families		Two-Parent Families	
	Mean	Standard error	Mean	Standard error
% mothers who are Black	32.0	1.4	6.6	0.4
% mothers who are Hispanic	16.1	1.0	15.1	0.7
% mothers of other race/ethnicity	4.3	0.5	7.1	0.4
% of mothers with < 12 years schooling	15.8	0.8	10.1	0.4
% of mothers with12 years of schooling	35.2	1.2	25.6	0.8
% mothers with 13 -15 years of schooling	30.1	1.1	25.3	0.7
% mothers with 16 or more years of schooling	18.8	1.0	38.6	1.0
% mothers, no education data	0.1	0.1	0.3	0.1
Mother's age	37.0	0.227	39.2	0.117
west	18.3	1.1	23.3	0.9
south	41.1	1.5	36.0	1.1
northeast	18.2	1.2	17.9	0.9
% families, everyone insured all year	58.1	1.2	73.2	0.7
% families, everyone uninsured all year	3.1	0.3	3.4	0.3
% families, one member (but not all) uninsured all	17.2	0.9	13.2	0.6

Appendix Table A1 continued: Selected sample characteristics , averages for 2004-2001				
	Single-Mother Families		Two-Parent Families	
	Mean	Standard error	Mean	Standard error
% families one member (but not all) lost insurance	9.0	0.5	4.2	0.2
% families one member (but not all) gained insurance	7.9	0.5	3.7	0.2
% families with at least one member with unstable insurance coverage	4.5	0.4	1.9	0.2
% families with missing insurance data	0.3	0.1	0.5	0.1
% families with at least one child in fair/poor health	10.5	0.6	5.8	0.3
Family income	$33,968	814	$91,877	1189
% of mothers employed	64.4	1.1	61.0	0.7
% mothers not employed	18.6	0.9	26.0	0.6
% of mothers who lost employment	5.3	0.5	3.5	0.2
% of mothers who acquired employment	10.2	0.5	8.8	0.3
% of mothers with unstable employment	1.5	0.2	0.6	0.1
% of fathers employed			84.2	0.4

Appendix Table A1 continued: Selected sample characteristics , averages for 2004-2001				
	Single-Mother Families		Two-Parent Families	
	Mean	Standard error	Mean	Standard error
% of fathers not employed			4.5	0.3
% of fathers who lost employment			2.3	0.2
% of fathers who acquired employment			8.4	0.3
% of fathers with unstable employment			0.5	0.1
% of mothers in fair/poor health	7.9	0.6	3.3	0.2
% of mothers in good/very good/excellent health	75.9	1.0	86.8	0.4
% of mothers whose health improved	7.5	0.6	4.3	0.2
% of mothers whose health declined	6.1	0.4	3.9	0.2
% of mothers with unstable health	2.6	0.2	1.7	0.1
% of mothers with missing health data	0.1	0.0	0.1	0.0
% of fathers in fair/poor health			3.1	0.2
% of fathers in good/very good/excellent health			86.9	0.4
% of fathers whose health improved			4.8	0.2

Appendix Table A1 continued: Selected sample characteristics , averages for 2004-2001				
	Single-Mother Families		Two-Parent Families	
	Mean	Standard error	Mean	Standard error
% of fathers whose health declined			3.8	0.2
% of fathers with unstable health			1.3	0.1
% of fathers with missing health data			0.2	0.0