

Health Shocks and Social Drift: Examining the Relationship Between Acute Illness and Family Wealth



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This paper analyzes the extent to which health shocks play a role in black-white wealth inequality. Deploying data from the Panel Study of Income Dynamics, we implement a first-differences identification strategy in estimating the effects of acute health events on changes in wealth for couples across waves of data from 1999 to 2011. We find that although such shocks affect both white and black families, they make black families more vulnerable financially as family heads near retirement. In comparison with their white counterparts, black families that experience an acute health shock are more likely to rely on social safety nets, such as food stamps and Social Security Disability Insurance. Findings hold implications across multiple policy arenas, including health-care and labor law.

Keywords: health, race, wealth inequality

The gap in wealth between black families and white families in the United States has been well documented since the 1990s (Oliver and Shapiro 1995; Conley 1999). In 1998, the median wealth of white families was six times that of black families. By 2013, this disparity had nearly doubled as assets and debts evolved in the wake of the Great Recession (Thompson and Suarez 2015; Wolff, this issue). A considerable literature notes the origins of this inequality and the roles of residential segregation, discrimination in mortgage markets, and returns on investments in either sustaining or widening the black-white wealth disparity over time (Oliver and Shapiro 1995; Conley 1999; Keister 2000; Keister and Moller 2000; Smith 2001; Krivo and Kaufman 2004). Absent from this literature, however, is an attempt to link disparities in family wealth with research on prevalent racial disparities in health. If racial disparities

in health exist at all levels of socioeconomic status (Williams et al. 2010) and the onset of poor health associates with drains in family wealth (Smith 1999, 2004; Wu 2003), health may be added to the list of factors contributing to the persistent black-white inequality in wealth.

The existing literature on the connections between health and socioeconomic status details the depletion of family wealth following the onset of severe illnesses for Americans older than fifty (Smith 1999; Wu 2003). The search for mechanisms behind this “asset cost of poor health” (Poterba, Venti, and Wise 2010) has pointed toward increased medical costs and changes in labor market participation as factors driving this relationship. Although prior studies detail the impact of health shocks on family wealth, most fail to examine this relationship in terms of racial inequality in the United States. To address this deficit,

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we analyze the extent to which health shocks for older men and women affect net worth for married and cohabitating couples. In doing so, we take careful note of the likelihood of experiencing an acute health shock, the consequent changes in labor market participation, and the resultant drain on family wealth as additional factors behind the black-white wealth disparity.

Deploying data from the Panel Study of Income Dynamics (PSID), we implement a first-differences identification strategy in estimating the effects of health events on changes in wealth for couples across waves of data from 1999 to 2011. Further, we apply this approach to both acute and chronic health conditions—the former where we expect the relationship from health to wealth to be more causal and the latter where we expect it to be more spurious. Lower levels of baseline wealth among black couples, in comparison with white couples, place them at an increased risk of financial hardship when facing health complications. Following the experience of an acute health shock, the drain on wealth for black families increases their likelihood of falling into total net debt and widens the black-white divide in total family wealth. The economic vulnerability of black families who experience a severe health event also increases their likelihood of reliance on social safety nets as couples near retirement. Findings from this study hold potential implications for multiple arenas of social policy, including health-care and labor legislation.

BACKGROUND

An extensive literature has documented a robust correlation between socioeconomic status (SES)—measured in a variety of ways—and health outcomes. Most studies favor a social causation hypothesis, in which the short- and long-term stressors of lower SES lead to a variety of health concerns over the life course (Ross and Wu 1995; Link and Phelan 1995; Adler and Ostrove 1999; Haas 2006). A significant body of literature also highlights persistent health inequality between blacks and whites: that black individuals at all age, education, and income levels experience higher mortality, earlier onset, and greater severity of

many diseases (Williams and Collins 1995; Bibbins-Domingo et al. 2009; Braveman et al. 2010; Williams et al. 2010).

Despite the weight of evidence in support of social causation hypotheses, associations between SES and health prove more complex than a unidirectional causal relationship. Literature on health selection reverses the direction of the SES-health relationship and details that poor health may spur “social drift,” in which the ill individual drains family resources (Adler and Ostrove 1999; Haas 2006) via diminished labor market participation (Smith 1999; Wu 2003) and increased debt (Himmelstein et al. 2005, 2009; Mohanan 2013). If black men and women are disproportionately likely to experience adverse health events at all levels of income, then the consequent social drift may further widen the black-white divide in SES, especially in terms of wealth.

Many existing analyses of health shocks and social drift use the Health and Retirement Study (HRS). Launched in 1992, the HRS has collected longitudinal data every two years on the income, assets, and health of individuals older than fifty in the first wave. The research produced using the HRS presents significant evidence in support of social drift in the aging population. Using the first three waves of the HRS, James Smith (1999) finds that those with cancers, heart conditions, strokes, and lung diseases experienced an estimated drain on wealth of \$16,846. In comparison, those reporting milder health conditions experienced a drain of only \$3,620 (Smith 1999, 154). James Poterba and his colleagues (2010) use the HRS and operationalize health by constructing an index variable from twenty-seven health-related questions. The authors find that couples in the top third of the health distribution in continuing two-person households (that is, those not experiencing widowhood or divorce) accumulated, on average, over 50 percent more assets than those in the lowest third.

Studies on the financial consequences of poor health also examine the pathways through which health shocks drain wealth. Findings show that poor health decreases labor market participation and increases the likelihood of retirement (Bound et al. 1999; Smith 2004; Wu 2003; Himmelstein et al. 2005; Conley and

Thompson 2013; Zajacova et al. 2015). Poor health also relates to decreased wealth via medical expenses (Smith 1999, 2004; Wu 2003; Himmelstein et al. 2005, 2009). David Himmelstein and his colleagues (2009) find that 57 percent of families filing for bankruptcy in early 2007 cited difficulty paying medical bills as a leading reason for their filing. Health-care burdens also affect wealth through the residential mobility needed to care for the ill individual (Choi et al. 2014). These changes in labor force participation and increased medical expenses are especially pronounced for more serious health shocks (Smith 1999).

Existing studies on health-related social drift motivate this analysis, but prior research largely ignores racial disparities in the impact of health on wealth and the potential for health shocks to drive wealth inequality. This dearth of research is startling in light of pronounced racial inequalities in wealth (Conley 1999), access to health care, and health outcomes (Williams and Collins 1995; Williams et al. 2010). The limited literature discussing racial disparities in social drift finds no significant differences between black and white individuals in the HRS (Wu 2003). However, given the prominence of race in analyses of social causation in health (Williams et al. 2010), these potential disparities require further attention.

This study briefly touches on the trends in black wealth and white wealth from 1999 to 2011 before focusing on the drains in family wealth following the onset of an acute illness. In doing so, we draw attention to the oversight of these relationships across a wider range of the working-age population and persistent black-white disparities in health and wealth. Our first-differences regression models identify changes in health status from the previous wave. We expect this identification strategy to attenuate bias introduced by time-constant omitted variables. When an acute illness strikes the man or woman in a couple, we expect that to negatively influence net worth during the same period. We then analyze health-care costs and family dynamics in labor market participation following acute health shocks as mechanisms by which health affects wealth across race and gender. In conclusion, we provide descriptive evidence that the disproportionately

vulnerable economic position of black families who experience an acute illness relates with an increased likelihood of reliance on social safety nets.

DATA

The Panel Study of Income Dynamics is the world's longest-running longitudinal household survey, tracking family economic histories every year from 1968 through 1997 and biennially since. The initial study wave consists of a nationally representative sample of families in 1968 along with an oversample of low-income families, totaling approximately eighteen thousand individuals in five thousand families. Unique to the PSID, the survey follows children of sample members into adulthood as they form their own households. Partly because of extensive follow-up measures, the sample size has grown to nearly twenty-five thousand individuals in more than 8,500 families as of 2011. Important for the study of family dynamics in health and labor market decisions, the PSID codes information at both the family and individual levels.

To examine the relationship between health shocks and changes in wealth, we construct a panel of data collected biennially from 1999 to 2011 ($n = 7,422$ couple-years). Because the sample of nonblack racial minorities in the PSID is small, we include only those who are black or white. Further work is necessary to examine heterogeneity within and across a more comprehensive list of racial categories. Those eligible for analysis include married or cohabitating couples who remain in their relationship for at least two consecutive waves of data between 1999 and 2011. We restrict the sample to couples in which both individuals are ages forty-five to sixty-four to better gauge the effects of health shocks on wealth for a portion of the working-age population prior to eligibility for full Social Security benefits and typical retirement age.

To eliminate the confounding factor of asset reallocation in divorce or separation, we choose to limit our analyses to couples who continue in relationships across contiguous waves. It is likely that individuals without a partner face different constraints on assets and labor market decisions following the onset of

poor health. However, restricting analyses to single individuals in contiguous waves decreases the sample to a problematically small size for analysis. Additionally, the PSID does not code data on the deceased, precluding the ability to examine the impact of health shocks on wealth for families who experience the death of either member of the couple following the onset of an illness. In the discussion, we review the potential for these sources of bias to augment research findings.

The structure of the PSID between 1999 and 2011 is well suited for this analysis. First, from 1999 onward, the PSID codes a series of health events for family heads. Second, it also includes extensive data on family health-care costs and patterns of labor force participation for each partner. Finally, to examine the relationship between the onset of health conditions and short-term changes in family wealth, we need a window of time brief enough to attenuate potential bias due to unobserved variables and spurious correlation. The two-year spans between waves and the PSID variables coded since 1999 provide a viable data structure to address these issues.

The primary dependent variable in this analysis is total family wealth. In every survey year from 1999 onward, the PSID calculates wealth by summing the values of family business or farm, checking and savings, real estate other than main home, stocks and mutual funds, vehicles, bonds and life insurance policies, individual retirement accounts and annuities, and main home, minus any debts. This variable is standardized to 2011 dollars. Given the high skew of the wealth distribution, we log-transform these standardized values.¹ A primary concern of the log transformation is that the log of wealth does not permit analysis of negative values or total net debt. Therefore,

we also examine a dichotomous dependent variable equal to 1 if the family holds negative net wealth.² If we were concerned with aggregate wealth levels, then the selection of certain years would be critical to our estimations given their potential association with different points in the business cycle. However, because we are interested in comparing patterns of change across two periods rather than overall levels of wealth, we find cyclical concerns less troubling. As a precaution, we include survey year indicator variables to account for the potential presence of idiosyncrasies in any wave.

Our primary independent variables distinguish acute health shocks from the onset of chronic illnesses based on wave-to-wave changes in the incidence of nine physical health conditions coded in the PSID.³ We define an acute health shock as the occurrence of cancer, heart attack, heart disease, or a stroke between waves. We code the onset of a chronic illness as a new diagnosis of asthma, arthritis, diabetes, high blood pressure, or lung disease from one wave to the next. These distinctions subsume self-reported health and provide analyses of separate tiers of health complications. We code men and women as one in each wave the individual is diagnosed with a new acute or chronic illness. Research on the health and wealth connection varies in the terminology and criteria to distinguish between categories of health conditions. With few exceptions, our definition of acute shocks largely overlaps with severe and major illnesses in other studies (but see Wu 2003; Smith 1999, 2004; Coile and Milligan 2009). For a full discussion of our rationale for including each illness under its category, see the appendix.

Although all of these shocks may have developed over the course of years, they are

1. Analyses run using the inverse hyperbolic sine transformation of all monetary values increase standard errors but fail to significantly alter results. These results are available on request.
2. Unfortunately, the main interview of the PSID only codes the occurrence of bankruptcy in the 1996 interview, prior to the addition of survey questions regarding health histories. This precludes us from examining the relationship between acute health shocks and bankruptcy filings.
3. Although the onset of mental health conditions may adversely affect family wealth, we argue that the directionality of the relationship between health and wealth is more difficult to discern for a mental illness, such as depression, than it is with a physical illness, such as a stroke.

largely asymptomatic until an event affects an individual's behavior. We intend the terms acute and chronic to signal the severity of the illness and the degree of medical treatment that the illness necessitates. For instance, it is likely that an individual experiencing a heart attack will undergo initial treatment, including surgeries and hospital stays, within a short period following the health event. The subsequent complications of an acute shock will likely continue beyond the initial health event and result in changes to diet and medications. However, it is arguable that the primary impact of such a health event on wealth will occur relatively soon after the event and initial treatment. Given this rationale, we allow each member of a couple to experience more than one acute health shock during the study. For instance, if a family head experiences a stroke between 1999 and 2001 and then has a heart attack between 2007 and 2009, the individual would be coded as having an acute health shock twice between 1999 and 2011.

On the other hand, a disease such as diabetes will likely require more regular maintenance over a longer period following the diagnosis and result in effects on wealth that are not necessarily discernible in the short term. Because we feel that the effects of chronic health conditions on wealth will be less discernible in a span of two years, we permit the man or woman to be coded as having the onset of a chronic condition only once. It may be that the onset of an additional chronic illness may compound economic hardships for the family of the ill individual. We argue that this additional hardship remains difficult to measure in the span of two years. Alternate analyses that code each new incidence of a chronic illness for family heads fail to significantly alter results.

In our primary regression models, we include a series of control variables for changes in labor market participation. The PSID codes employment status history by month and con-

structs a variable representing the total number of weeks spent out of the labor force (unemployed and not looking for work) in a given year. We collapse these into dichotomous measures equal to 1 if the man or woman spent any time out of the labor force. To control for retirement decisions, we also include an indicator variable for each member of the couple noting if either retired between waves of data. In preliminary models, we included the change in log-transformed family income standardized to 2011 dollars. These models produced similar results. We omit this variable in our presented analyses to estimate the direct effect of health on wealth.

In subsequent models, we deploy variables on total health expenses and labor market participation to analyze how changes in health may affect family wealth. First, we estimate total health expenses for families in which a man or woman experienced the onset of an acute or chronic illness. These expenses include costs associated with doctor's visits, outpatient surgery, prescription medication, hospitalization, and nursing home care; they are standardized to 2011 dollars for analysis. Next, we estimate the change in weeks worked, the change in weeks spent out of the labor force, and the likelihood of entering retirement to examine the severity of the impact of health shocks on labor supply. Finally, to examine policy-relevant outcomes of wealth depletion due to acute illness, we analyze descriptive statistics regarding receipt of food stamps and Social Security benefits.

All ordinary least squares regression models implement a first-differences identification strategy to factor out all unobserved, time-constant variables potentially related to changes in wealth.⁴ These include many of the behavioral measures, such as exercise and tobacco and alcohol use, so long as the individual does not change their behavior in a significant manner across waves.⁵ Key to our identification strategy is the hypothesis that the

4. A commonly used alternative to first-differences is a fixed-effects identification strategy. However, two separate tests show autocorrelation in our data, suggesting that the more efficient option is first-differences. Analyses implementing a fixed-effects approach yield similar results.

5. We included these behavioral measures in prior models with no significant changes in results, likely due to lack of variation for individuals and families across waves.

causal arrow in the health-wealth relationship will point from the experience of an acute health shock to consequent drains on family wealth in the short term and that this causality may be less clear when examining chronic conditions. Our first-differences approach decreases the likelihood of reverse causation because the short span of two years between waves reduces the time in which changes in wealth may affect health. It may be, for example, that changes in wealth relate to increased stress, higher blood pressure, and a greater likelihood of heart conditions. To test this hypothesis, we regress the onset of acute and chronic illnesses on the log of baseline wealth and the change in log-transformed wealth from $t-2$ to $t-1$ (see appendix). Results show that baseline wealth and changes in wealth do not predict acute health events in the short term. We therefore argue that it is more likely that the onset of acute illnesses leads to changes in wealth over a two-year period because unexpected health shocks cause changes in labor market participation and health-care expenses, among other wealth-draining phenomena.⁶

The general model to examine the effects of changes in health on changes in wealth takes the following form:

$$\begin{aligned} \Delta \log \text{wealth}_i = & \beta_0 + \beta_1 \text{acute man}_i \\ & + \beta_2 \text{acute woman}_i \\ & + \beta_3 \text{chronic man}_i \\ & + \beta_4 \text{chronic woman}_i \\ & + \beta_5 \Delta \text{controls}_i + \beta_6 \log \text{wealth}_{it-1} \\ & + \beta_6 X_i + \Delta \varepsilon_i \end{aligned}$$

where $\Delta \log \text{wealth}_i$ is the change in log-transformed total family wealth for family i

across two waves of the PSID. The subsequent four variables indicate the onset of an acute or chronic illness from the prior wave for each member of the couple. $\Delta \text{controls}_i$ is the wave-to-wave change in a vector of control variables for family i , including absence from the labor force and retirement for each member of the couple. Log-transformed wealth at $t-1$ controls for whether overall changes in logged family wealth are conditional on baseline wealth.⁷ Finally, X_i represents a vector of dummy variables for each wave of differenced data, the second wave being the suppressed category, and $\Delta \varepsilon_i$ represents the change in the idiosyncratic error. Further, we perform ordered logit regressions of entering into net debt on the onset of acute and chronic illnesses and the control variables. We run each model for black and white families with men and women ages forty-five to sixty-four. In models examining the pathways through which health affects wealth, we substitute the wave-to-wave changes in the log of family wealth with between-wave changes in weeks of work missed and weeks of work out of the labor force. Finally, we perform first-differences ordered logit regressions of a man or woman entering retirement on acute health shocks for each member of the couple.

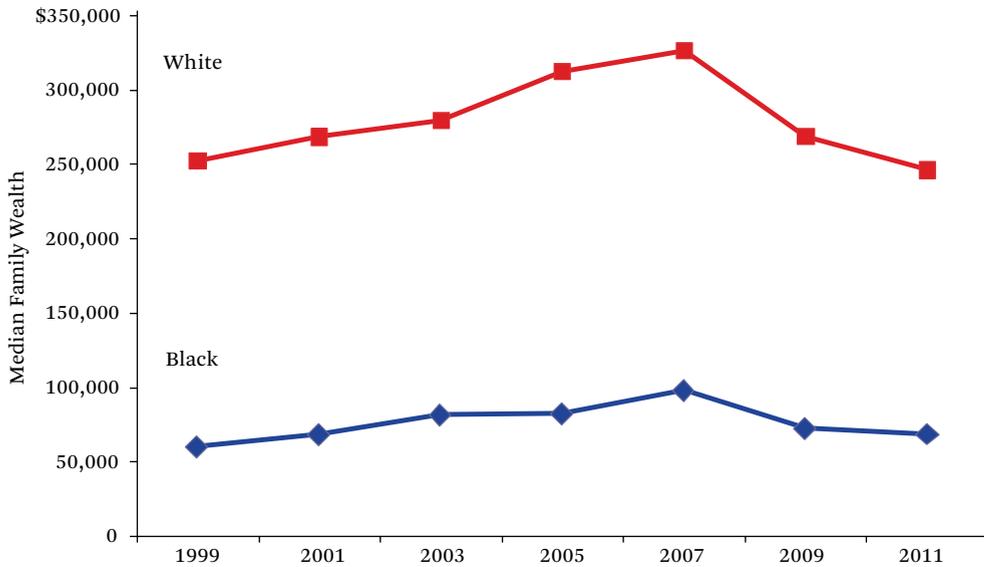
FINDINGS

Median levels of wealth in our sample follow the general trends outlined by Edward Wolff (this issue) and Jeffrey Thompson and Gustavo Suarez (2015).⁸ Median wealth for married and cohabitating couples between the ages of forty-five and sixty-four in the PSID rose steadily from 1999 to 2007 with an increase of 61.8 percent for black families and 28.6 percent for white families (figure 1). With the onset of the

6. Lagging the measure of health shocks by one wave would potentially address issues of temporal ordering, but doing so significantly reduces the number of cases we are able to analyze by depleting a full wave of family-years. Furthermore, if we were to lag the indicator for a health shock by a wave, we would be attempting to measure the change in wealth up to four years after the health event, leaving greater room for confounding influences in the health-wealth relationship.

7. Interaction terms between the log of baseline wealth and acute illness failed to prove significant.

8. The precise values of racial wealth disparities depend on the measurement of wealth and the sampling within the chosen set of data. As Fabian Pfeffer and Robert Schoeni note in this issue, data sets vary in the extent to which they include vehicle wealth in the calculation of total net assets. Furthermore, the calculation of family wealth in 2007 from a representative sample of families in 1968 (as is the case with the PSID) may provide dif-

Figure 1. Median Family Wealth

Source: Authors' calculation based on PSID.

Great Recession, wealth dropped precipitously, with black and white median wealth retreating to 2001 levels within the subsequent two years. Figure 1 portrays this unique span of time for wealth accumulation and volatility in the United States. Although this study bridges a distinct era in the early 2000s, our findings regarding the impact of acute health shocks on wealth are not sensitive to the general trends of boom or bust from 1999 to 2011.⁹ This is not to say that individual family dynamics in response to health shocks do not differ during periods of prosperity and economic recession. However, it appears with the data at hand that the drain on wealth following an acute health shock does not differ between an era of general economic growth and one of economic decline.

Table 1 shows weighted descriptive statistics of our sample separated by race. As a point of comparison, we also include descriptive statistics for married and cohabitating couples between the ages of thirty and forty-four. As expected, a gap in mean and median wealth between black and white couples is clear. It also increases in magnitude across the life course. The mean wealth for white couples is more than three times that of black couples among those age thirty to forty-four. This disparity increases to four to one later in adulthood; the pattern is similar when measuring median wealth. Older men and women in our sample are significantly more likely to experience an acute health shock or the onset of a chronic illness later in life than between the

ferent values than a calculation rendered from a representative cross-section in the year 2007, such as the Survey of Consumer Finances (SCF). Despite these potential discrepancies, the trends in wealth from 1999 to 2011 for black and white families in our sample are similar to those detailed by Jeffrey Thompson and Gustavo Suarez (2015) using waves of SCF data from 1998 to 2013.

9. Interaction terms between the wave of data and the onset of acute and chronic illnesses were insignificant, suggesting that our findings are not an artifact of a unique downturn in the economy (results available on request). This null finding may be attributed to a variety of factors, including the types of assets families draw upon in times of economic crisis and bankruptcy exemptions for home equity. Future research should address the health-wealth connection in the recovery from the Great Recession with additional data regarding the continued evolution of assets beyond 2011.

Table 1. Descriptive Statistics

	Ages Thirty to Forty-Four		Ages Forty-Five to Sixty-Four	
	Black	White	Black	White
Mean family wealth	\$83,409 (\$210,384)	\$269,850 (\$755,654)	\$179,854 (\$290,142)	\$711,481 (\$1,996,052)
Median family wealth	\$31,904	\$94,019	\$68,831	\$271,873
Mean family income	\$81,294 (\$44,349)	\$114,207 (\$101,509)	\$83,262 (\$42,275)	\$132,408 (\$167,621)
Man acute health shock	0.022 (0.146)	0.040 (0.196)	0.219 (0.414)	0.194 (0.395)
Woman acute health shock	0.068 (0.252)	0.063 (0.244)	0.161 (0.368)	0.150 (0.357)
Man chronic illness	0.220 (0.415)	0.250 (0.433)	0.445 (0.497)	0.469 (0.499)
Woman chronic illness	0.302 (0.459)	0.221 (0.415)	0.526 (0.500)	0.442 (0.497)
N	606	1,724	514	1,608

Source: Authors' compilation based on PSID.

Note: Statistics weighted by mean family survey weight across all waves of valid data. Monetary values standardized to 2011 dollars.

ages of thirty and forty-four. This discrepancy is most prominent for the experience of acute health shocks among black men. The incidence among partnered black men between forty-five and sixty-four is ten times that among their younger married and cohabitating counterparts (21.9 percent to 2.2 percent). Among partnered older white men, the incidence increases fivefold, from 4 percent to 19.4 percent. Older black and white women also experience an elevated incidence of acute health shocks in comparison with their younger counterparts, but the differences are not as stark, with a 2.4 times increased risk. We call attention to the increased incidence of severe health events and growing wealth disparity later in the life course to highlight the potential role of acute

health shocks in the widening black-white wealth gap among older couples.

Likely because so few younger couples experience acute illnesses, regressions of change in the log of family wealth on acute health shocks produce null findings for those ages thirty to forty-four.¹⁰ However, in table 2 we see a significant drain on the log of family wealth following acute health shocks for couples between forty-five and sixty-four. In black families, an acute health shock for a man relates with a 60 percent decrease in family wealth. In white families, an acute health shock for a man does not associate with a significant change in the log of family wealth, but for a woman corresponds with a 25 percent drop.¹¹ These significant decreases in family wealth following

10. Analyses available on request.

11. We argue that the marginal significance of these coefficients is likely due to the small sample size, given the mean of 233 black families per wave and 827 white families per wave. Unfortunately, widening the age span of respondents eligible for this study is untenable, as the incidence of acute illnesses drops significantly with age. It is likely that heterogeneous effects of health on wealth exist across the types of illnesses categorized as acute in this study. In results not shown, we perform separate regressions of change in the log of family wealth on each acute illness (cancers, heart attacks, heart diseases, and strokes). Unfortunately, disaggregating acute health shocks into the component illnesses increases the standard errors for the estimates of the effect of illness on wealth, rendering the coefficients for most illnesses insignificant. For black families, heart diseases and strokes significantly predict drops in the log of wealth for men and women, respectively. In white families, the onset of

Table 2. First-Differences OLS Regressions of Log Total Family Wealth on Couples' Health

	Black	White
Man acute illness	-0.596+ (0.354)	-0.166 (0.125)
Woman acute illness	-0.619 (0.390)	-0.247+ (0.139)
Man chronic illness	-0.178 (0.285)	-0.055 (0.088)
Woman chronic illness	-0.300 (0.231)	-0.090 (0.096)
Observations	1,631	5,791
R ²	0.240	0.130

Source: Authors' compilation based on PSID.

Note: Robust standard errors clustered by family in parentheses. Models include controls for log family wealth at t-1, changes in employment status, and dummy variables for each wave of data. Monetary values standardized to 2011 dollars.

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

acute health shocks contrast with the null associations between the onsets of chronic conditions and changes in wealth. For black and white men and women, diagnosis of a chronic illness does not significantly reduce log-transformed family wealth.

Although the coefficients for acute health shocks do not differ across race by a statistically significant margin, the magnitude of this difference is compelling. To place these elasticities in context, refer to the median family wealth for black and white couples age forty-five to sixty-four. Following an acute health shock for a man, a black family at the median level of wealth would drop from \$68,831 to \$27,808 in total assets. In contrast, a white family at the median level of wealth with a woman experiencing an acute health shock would see their wealth change from \$271,873 to \$204,720. Given the baseline racial wealth disparity, white families would see a larger drop in terms of dollar amount (\$67,153 versus \$41,023). However, the white to black ratio of wealth actually

Table 3. First-Differences Ordered Logit Regressions of Net Debt on Couples' Health

	Black	White
Man acute illness	0.700* (0.354)	0.485+ (0.288)
Woman acute illness	0.745+ (0.444)	0.486 (0.330)
Man chronic illness	0.517 (0.331)	0.251 (0.238)
Woman chronic illness	0.263 (0.268)	0.190 (0.263)
Observations	1,631	5,791

Source: Authors' compilation based on PSID.

Note: Robust standard errors clustered by family in parentheses. Models include controls for log family wealth at t-1, changes in employment status, and dummy variables for each wave of data. Monetary values standardized to 2011 dollars.

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

increases from 3.95 to 7.36 following the onset of an acute illness in a white and a black family at their respective levels of median wealth. Additionally, a white couple at the median level of wealth who experienced an acute health shock would maintain nearly three times the median wealth of black families who did not (\$204,720 versus \$68,831).

The effects of acute illnesses on wealth also appear in an examination of the likelihood of falling into negative net worth, or net debt. Table 3 shows results of first-differences ordered logit regressions of holding negative net worth on the onset of health conditions and changes in control variables. Following an acute health shock, black couples are twice as likely to develop net debt than those unaffected by such illness [$\exp(0.700)$ for black men and $\exp(0.745)$ for black women]. Although black families are at an increased risk of negative net worth regardless of who experiences the health shock, white families face a greater likelihood of net debt only if a man experiences a severe illness.

cancers for men relates with decreased family wealth. However, the differences between coefficients for each acute illness are not significant and, with few exceptions, the relationship between each acute illness and change in wealth is in the same direction. These results are available on request.

Table 4. First-Differences OLS Regressions of Labor Force Participation on Change in Couples' Health

	Black		White	
	Man	Woman	Man	Woman
	Weeks Worked			
Acute illness	-9.131*** (1.931)	-1.964 (1.529)	-4.510*** (0.855)	-0.565 (1.064)
Observations	1,631	1,631	5,791	5,791
	Weeks out of Labor Force			
Acute illness	6.692*** (1.816)	-0.973 (2.410)	0.467 (0.938)	-0.640 (1.265)
Observations	1,631	1,631	5,791	5,791

Source: Authors' compilation based on PSID.

Note: Robust standard errors clustered by family in parentheses. Models include a control for onset of a chronic illness and dummy variables for each wave of data.

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5. First-Differences Ordered Logit Regressions of Retirement on Change in Couples' Health

	Black		White	
	Man	Woman	Man	Woman
Acute illness	1.613*** (0.269)	1.333** (0.403)	0.707*** (0.194)	0.135 (0.314)
Observations	1,631	1,631	5,791	5,791

Source: Authors' compilation based on PSID.

Note: Robust standard errors clustered by family in parentheses. Models include a control for onset of a chronic illness, log family wealth at $t-1$, and dummy variables for each wave of data. Monetary values standardized to 2011 dollars.

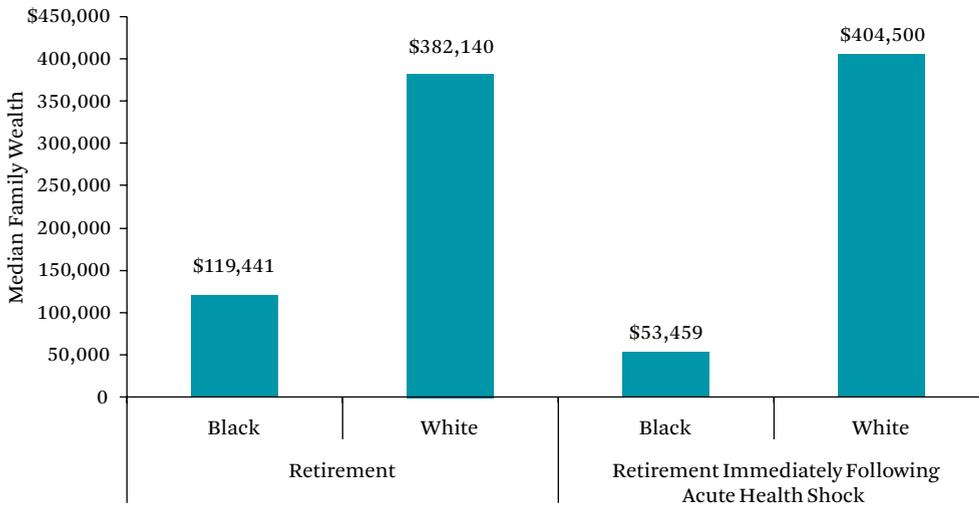
+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

A white family is 1.6 times [$\exp(0.485)$] more likely to find itself in net debt following an acute health shock for a man.

In line with the literature, the drains on wealth following acute health shocks in our sample far outweigh the costs incurred from medical expenses (Smith 1999; see also the appendix). To examine the ways in which acute illness may affect wealth, we present the predicted change in weeks of work per year following an acute health shock for either member of a couple (table 4). The changes in weeks worked in the same wave as experiencing an acute illness are significant for black and white men but not for women of either race. Married and cohabitating black men lose an additional nine weeks of work after an acute health event,

whereas married and cohabitating white men lose four and a half weeks. The difference between these two coefficients is significant at the $p < 0.05$ level. Furthermore, only black men show an increase in weeks out of the labor force following an acute health shock. Black men spend an average of 6.7 more weeks out of the labor force following an acute health event. At the same time, black women, white men, and white women see no significant change.

Another strong black-white disparity in labor market participation following an acute health shock is evident in retirement decisions. In table 5, we present results of first-differences ordered logit regressions of retirement on acute and chronic illnesses. As a

Figure 2. Median Family Wealth at Retirement of First Member of Couple

Source: Authors' compilation based on PSID.

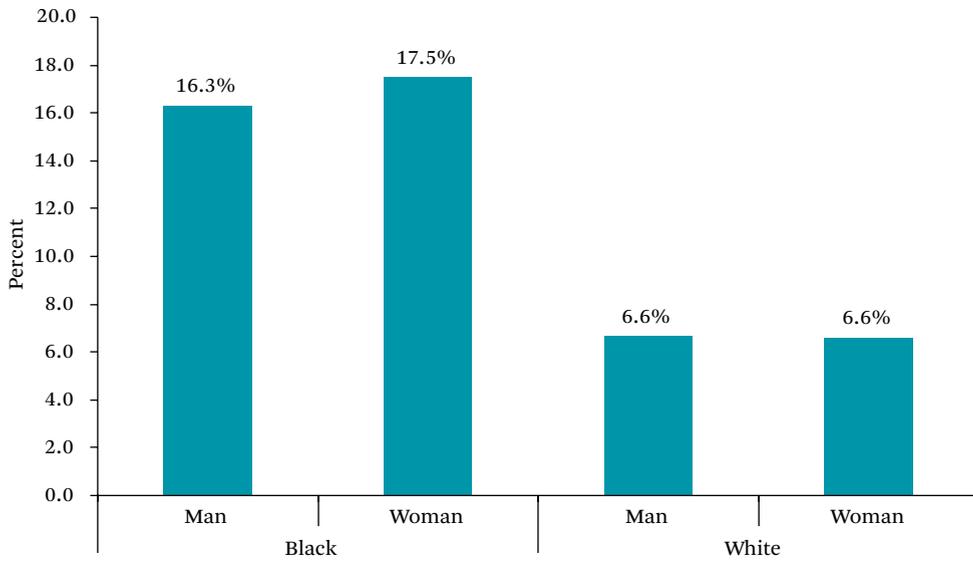
reminder, these retirements would be considered early in the sense that our sample is restricted to individuals younger than the age at which they would be eligible for full Social Security benefits in retirement. Acute illnesses significantly predict retirement for black men, black women, and white men. In all, retirement following acute health shocks is more prevalent among married and cohabitating black couples. Black men are significantly more likely than white men [$\exp(1.613) = 5.02$ for black men and $\exp(0.707) = 2.03$ for white men] to retire in the same wave in which they experience a severe illness. For white women, an acute illness is not a significant predictor of retirement. However, black women are 3.8 times [$\exp(1.333)$] more likely to retire in the same wave in which they experience an acute health shock.

Early retirement decisions have significant consequences for families as they begin to rely on accrued assets for consumption in later stages of the life course. In figure 2, we show the median family wealth for black and white couples in our sample as the first member of the couple enters retirement. The median of black couples with a retiree following an acute health shock is less than half that of their counterparts with a healthy retiree (\$53,459 versus \$119,441). In contrast, the median wealth for white families varies only slightly (\$382,140

versus \$404,500). Whereas white families may opt into retirement at relatively the same economic standing regardless of health status, black families enter illness-induced retirement with increased financial strain. Indeed, black families with an early retiree following an acute health shock have one-third less median wealth than the mean annual income of black couples in our sample: \$53,459 (figure 2) versus \$83,262 (table 1). Furthermore, the white to black ratio of median wealth on retirement increases dramatically among families with an ill retiree. The median wealth of a white couple with an early retiree is more than three times that of a black couple with at least one member entering retirement (\$382,140 versus \$119,441). This ratio more than doubles, from 3.2 to 1 up to 7.6 to 1, among families with a retiree who experienced an acute illness within the two years before retirement.

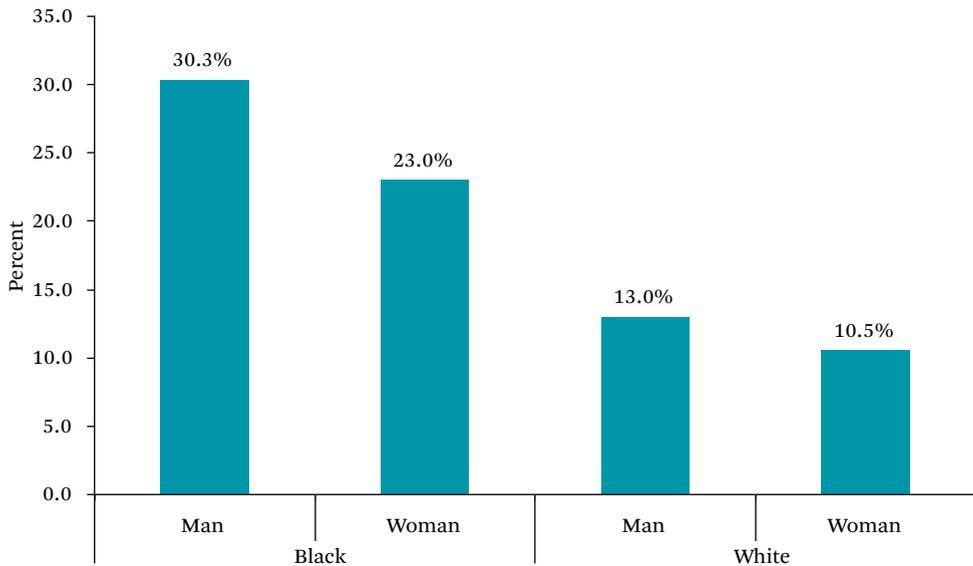
This impact of health on wealth has implications for families' future reliance on social safety nets. With smaller nest eggs than white families, black families are more likely to rely on social safety nets following an acute health shock. After an acute illness, seventeen percent of black families in our sample received government assistance via food stamps for the first time, whereas only 7 percent of white families did so (figure 3). This racial disparity is

Figure 3. Receiving Food Stamps for First Time Following Acute Health Shock



Source: Authors' compilation based on PSID.

Figure 4. Receiving SSDI Following Acute Health Shock



Source: Authors' compilation based on PSID.

also seen among families receiving Social Security Disability Insurance (SSDI) following an acute health shock of either the man or the woman (figure 4). Conditional on not already receiving SSDI, black men and women who experience a severe illness are significantly more

likely to consequently rely on SSDI (30.3 percent versus 13.0 percent for men and 23.0 percent versus 10.5 percent for women). In all, drains on wealth are seen for black and white families who experience an acute health shock, black families being disproportionately vulner-

able to net debt and reliance on social safety nets following time off of work, time out of the labor force, and early retirement.

DISCUSSION

Our findings show significant depletions of family wealth following acute health shocks for black and white couples. Given the baseline racial disparities in wealth, the percentage drain on total assets is greater for black families in the wake of severe illnesses for a man. Furthermore, acute health shocks for men and women predict net debt for black couples. Although white couples do lose a significant percentage of their net worth after a health shock, the median wealth of white families with an acutely ill man or woman is multiple times that of black families who did not experience a severe health event. In this paper, we highlight differential patterns of labor market participation as a way black families become financially more vulnerable and more likely to rely on social safety nets following health shocks.

As addressed in the literature (Smith 1999), it appears as though the brunt of the impact of health on wealth occurs through changes in labor market participation, rather than increased health-care expenses (Smith 1999, 2004; Wu 2003). Receipt of SSDI or Old-Age and Survivors Insurance (OASI) potentially plays an important role in the connections between health shocks, wealth depletion, and retirement decisions. It may be that the greater likelihood of entering retirement following an acute health shock for a black family is associated with the greater SSDI and OASI replacement rate among lower earners. Greater replacement rates among the lowest earning men and women (and, likely the families with the least wealth) may allow families with less wealth to retire following an acute health shock without experiencing a dramatic loss of annual income in retirement. However, the lower annual Social Security income among these families would likely fail to safeguard them in the event of future health complications. Compounding this issue, families with fewer economic resources are less likely to also hold additional retirement wealth in a defined contribution retirement fund (Devlin-Foltz, Henriques, and Sa-

belhause, this issue) to serve as an additional buffer against further financial hardship.

Although we uncover significant disparities between black and white families, data limitations may underestimate the drains on wealth for both black and white families, along with the racial disparity in wealth depletion following acute health events. First, the examination of changes in wealth in a two-year window of time is intended to reduce the impact of confounding factors in the health-wealth relationship and narrow in on a causal estimate of health shocks on family wealth. It is likely that health-care costs and lost labor may linger beyond two years in the case of illnesses such as cancers, severe heart conditions, and strokes. Supplemental analyses of changes in family wealth over multiple waves of data (four-plus years) following acute health shocks show that drains in wealth possibly persist beyond this two-year window. However, diminished sample sizes in these analyses and increased standard errors render the point estimates insignificant. Given larger sample sizes over a longer span, the total loss of wealth may surpass that estimated with the data at hand.

Second, the limitation of our sample to continuing married and cohabitating couples also likely underestimates the impact of health shocks on family wealth by ignoring couples who divorce or separate between two waves of data. Alicia Eads and Laura Tach, elsewhere in this issue, detail the connection between economic hardship and marital strain. If the link between financial hardship and likelihood for the dissolution of a relationship is similar for those experiencing health complications, our findings would underestimate the impact of health on wealth for families reallocating assets as well as losing wealth from health-care expenses and diminished labor market participation. Less than 2 percent of individuals in our sample who experience an acute health shock also divorce within the same wave of data. Although this sequence of events is possible, the frequency at which it occurs is minimal and presents too small of a sample to properly estimate changes in wealth following such a sequence.

Finally, the coding of the PSID precludes the

ability to measure mortality in the same wave as the onset of severe health conditions. It is likely that mortality following acute health shocks would increase drains on wealth and potentially increase the black-white disparity in wealth. The loss of a partner would increase health-related costs associated with acute illnesses via funeral expenses. Additionally, loss of life ensures that the partner cannot return to a job or reenter the labor force after an absence. Therefore, families would continue to drain wealth throughout the remaining time between waves of data, rather than level out as the once-ill partner returns to work. Furthermore, if black individuals face a greater risk of mortality due to cancers, severe heart conditions, and strokes (Williams and Jackson 2005; Siegel, Naishadham, and Jemal 2012), then including families experiencing the death of an ill partner may increase the growing black-white disparity in wealth following acute health shocks.

Despite these limitations, our findings offer directions for future research and empirical data for policy discussions. From a health-care policy perspective, our findings do not depend on health insurance status. This is not to say, however, that health-care coverage plays no role in the relationship between acute health events and family wealth. If insurance coverage increases the likelihood of seeking preventive medicine and leads to a reduction in the onset of acute illnesses later in the life course (Hadley 2003), then expanded coverage would indeed play a role in reducing the impact of severe health events on family wealth. Implementation of the Affordable Care Act presents the opportunity to examine the impact of a new health-care regime on medical care and how this might dampen the effects of health on wealth.

Beyond future research agendas analyzing expanded health-care and health outcomes, further work toward labor policy may also address the role of health in wealth accumulation, along with the existing black-white disparities. Our findings corroborate prior literature in that the majority of the impact of health on wealth stems from a decrease in labor market participation and leaving the labor force altogether. Our findings show that an

acute illness decreases the number of weeks worked for black and white men. This may be an unfortunate but necessary step for recovery from cancers, heart conditions, and strokes. However, at least among black families, acute illnesses also predict an increase in weeks spent out of the labor force. Although policy may not be able to address the severity of acute health shocks via work missed because of illness, legislation may soften the blow of health on wealth for those forced out of the labor market on the basis of acute health conditions. Revisions to current policy, such as the Family and Medical Leave Act, may expand coverage for the most vulnerable, underemployed workers so that jobs are held for the individuals while they recover. This might cut down on the amount of time families go without a paycheck, because families would not be forced to combine a job search with the time necessary to recover from an illness.

CONCLUSION

It is likely that health is both “a cause and a consequence of larger processes of stratification” (Haas 2006, 349). In this vein, those at the lower end of the socioeconomic spectrum may be more likely to experience adverse health outcomes leading to further diminished socioeconomic status. We test this hypothesis to determine the impact of acute health shocks on wealth for black and white families. Black families experience a significant drain in wealth and are at an increased risk of net debt following an acute health shock. Although health affects wealth in white families, the existing wealth disparities are such that the ratio of median white wealth to median black wealth among married and cohabitating couples increases among families experiencing acute health shocks. Strikingly, median wealth of white couples following an acute health shock remains three times greater than that of healthy black couples.

The results from this study have implications for our understanding of family dynamics in response to health crises and shed light on factors contributing to economic security and insecurity in adulthood. Loss of labor market participation and reliance on stored economic resources following acute health shocks

inhibit families' ability to accumulate assets in the future (Poterba, Venti, and Wise 2010). This lost opportunity for asset accumulation places families in vulnerable economic positions as heads of the household age. Furthermore, this loss of family wealth at a point in the life course when couples are nearing retirement places black families in a particularly insecure position as they end their working careers. Our findings link health shocks and family wealth on the micro level with macro-level issues of inequality and social policy, because wealth depletion can lead to a greater burden on social safety nets.

Because full implementation of the Affordable Care Act is under way, this micro-macro connection may indeed evolve. Expanding health-care coverage may relate to better preventive care, higher quality treatment, and positive health outcomes (for a review, see Hadley 2003). Better health may then relate to better economic security as individuals face fewer medical costs (Smith 1999) and are able to avoid illness-induced retirement and work later into the life course (Bound et al. 1999). As more recent data become available, research should examine whether the relationship between health shocks and family wealth also evolves throughout the recovery from the Great Recession and the implementation of quasi-universal health care in the United States.

APPENDIX

Coding of Chronic and Acute Illnesses

We categorize an illness as acute if it meets at least one of two criteria. First, as discussed in the main text, the illnesses defined as acute for this study are likely more severe in terms of initial treatment following the onset of the adverse health condition. Second, although the socioeconomic status-health gradient is noted for many of the illnesses operationalized as acute and chronic in this study (for a review, see Lang et al. 2012), we sought to minimize the likelihood for endogeneity in the relationship between acute illnesses and family wealth. Therefore, a second criterion is satisfied if the illness is not strongly related with baseline wealth for families in our sample.

Each illness we define as acute in this study

satisfies both criteria, with the exception of heart attacks and strokes for white women. This may upwardly bias the estimate of the drain on family wealth following a diagnosis for white women in our sample, because less money would represent a larger change in the percentage of family net worth when analyzing log-transformed wealth. Despite this potential bias, we classify heart attacks and strokes as acute illnesses for two reasons. First, they meet the first criterion regarding the severity of the initial treatment following the onset of the illness. Second, any upward bias in estimating drains on family wealth for white families would result in underestimating the black-white wealth disparity following acute health shocks, which is the key contribution of this paper. We feel that the potential for this bias is less troubling, given findings on the null associations involving baseline wealth, changes in wealth, and the onset of acute health shocks.

Based on these criteria, we depart from prior literature in coding lung diseases and diabetes. Stephen Wu (2003) and James Smith (1999, 2004) use the Health and Retirement Survey and include lung diseases (such as chronic bronchitis and emphysema) as severe illnesses. We argue that this category may gloss over significant variation between types of noncancerous lung diseases that differ substantially in terms of their impact on labor market participation and, consequently, family wealth. Furthermore, we define lung disease as a chronic illness given that log-transformed baseline wealth significantly predicts the onset of such diseases for black women, white men, and white women (table A1). Stephen Wu also includes the diagnosis of diabetes as a "health shock" (2003). In our study, diabetes is included as a chronic illness for the same theoretical and empirical reasons as lung disease. Log baseline family wealth significantly predicts the onset of diabetes for black women, white men, and white women in our sample (table A1). Our definitions of acute and chronic illnesses most closely align with those that Courtney Coile and Kevin Milligan outline (2009), with the exception of our inclusion of heart disease as an acute illness, which satisfies our criteria for severity of treatment and

Table A1. Logit Regressions of Diabetes, Lung Disease, and Heart Disease on Log Family Wealth

	Diabetes		Lung Disease		Heart Disease	
	Man	Woman	Man	Woman	Man	Woman
	Black Couples					
Log family wealth at time t-1	0.005 (0.034)	-0.051+ (0.028)	-0.061 (0.040)	-0.118*** (0.033)	0.000 (0.046)	-0.050 (0.046)
Observations	1,631	1,631	1,631	1,631	1,631	1,631
	White Couples					
Log family wealth at time t-1	-0.090*** (0.023)	-0.110*** (0.027)	-0.104*** (0.027)	-0.112*** (0.023)	-0.039 (0.028)	-0.049 (0.036)
Observations	5,791	5,791	5,791	5,791	5,791	5,791

Source: Authors' compilation based on PSID.

Note: Robust standard errors clustered by family in parentheses. Models include dummy variables for each wave of data. Monetary values standardized to 2011 dollars.

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A2. Logit Regressions of Chronic and Acute Illnesses on Log Family Wealth

	Black		White	
	Man	Woman	Man	Woman
	Onset of Chronic Illness			
Log family wealth at time t-1	-0.038+ (0.020)	-0.016 (0.021)	-0.036** (0.014)	-0.025 (0.015)
Observations	1,631	1,631	5,791	5,791
	Onset of Acute Illness			
Log family wealth at time t-1	-0.012 (0.029)	-0.013 (0.030)	0.005 (0.022)	-0.028 (0.023)
Observations	1,631	1,631	5,791	5,791

Source: Authors' compilation based on PSID

Note: Robust standard errors clustered by family in parentheses. Models include dummy variables for each wave of data. Monetary values standardized to 2011 dollars.

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

lack of association with baseline family wealth in our sample.

Directionality in the Health-Wealth Relationship

Tables A2 and A3 test the extent to which the onset of chronic illnesses and acute health shocks are related with baseline family wealth and prior changes in family wealth. In table A2, we regress the experience of either type of health event on the log of family wealth at time t-1. Results show that baseline family wealth

predicts the onset of chronic illnesses for men but fails to predict acute health shocks for men and women in our sample. Table A3 assesses whether changes in family wealth may spur the onset of chronic conditions and acute health events. Although an increase in the log of family wealth from t-2 to t-1 predicts the onset of chronic illnesses between t-1 and t, we see that prior changes in the log of family wealth are not related with the experience of an acute health shock for married and cohabitating men and women.

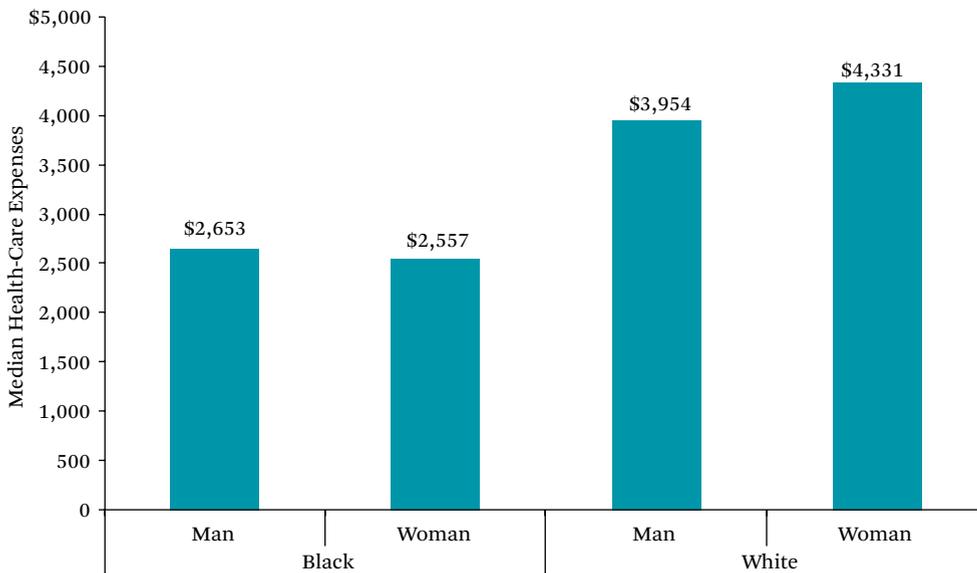
Table A3. Logit Regressions of Chronic and Acute Illnesses on Changes in Log Family Wealth

	Black		White	
	Man	Woman	Man	Woman
Onset of Chronic Illness				
Change in log family wealth from time t-2 to t-1	-0.008 (0.030)	0.025 (0.030)	0.046+ (0.027)	0.007 (0.025)
Observations	1,369	1,369	4,870	4,870
Onset of Acute Illness				
Change in log family wealth from time t-2 to t-1	0.037 (0.036)	0.054 (0.041)	0.031 (0.029)	0.043 (0.040)
Observations	1,369	1,369	4,870	4,870

Source: Authors' compilation based on PSID.

Note: Robust standard errors clustered by family in parentheses. Models include dummy variables for each wave of data. Monetary values standardized to 2011 dollars.

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Figure A1. Median Health-Care Expenses Following Acute Health Shock

Source: Authors' compilation based on PSID.

Health-Care Expenses Following Acute Health Shocks

Prior literature highlights health-care costs as a way in which acute health shocks may affect family wealth (Smith 1999; Wu 2003). However, the health-care costs shown in figure A1 are relatively small in comparison with the total drain in family wealth. Following acute health

shocks, the median health-care expenditure for black families is nearly \$2,600, whereas that for white families is between \$4,000 and \$4,300. In contrast, a black family with median wealth after an acute health shock would lose approximately \$40,000 and a white family more than \$65,000. These findings corroborate earlier studies suggesting that the drain on wealth fol-

lowing the experience of a severe illness far outweighs the costs incurred from medical expenses (Poterba, Venti, and Wise 2010).

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