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Dimensions of Disadvantage: Normative and Empirical Analysis of the Effect of Public Insurance on Low-Income Children and Families

Abstract

This dissertation considers some challenges to delivering effective and equitable health care to disadvantaged children and families in the United States.

Chapter one examines whether expanded access to health insurance following the enactment of the Children’s Health Insurance Program (CHIP) in 1997 reduced the prevalence of economic hardships (food insecurity, problems affording housing) and postponed medical care. In difference-in-differences analysis, I find that relative to a comparison group of families that missed the eligibility cutoffs, families that gained eligibility under CHIP did not experience changes in food or housing problems, but were significantly less likely to postpone medical care. These findings suggest that while public insurance for families with children likely improves access to care, it does not significantly reduce other forms of hardship.

Chapter two provides an ethical argument for subsidizing health insurance for low-income families – a central component of the 2010 Affordable Care Act (ACA). I argue subsidies are a vehicle for promoting equality of opportunity: specifically, subsidies ensure access to specific “basic opportunities” (such as the ability to attend college) when out-of-pocket spending on insurance would have otherwise crowded out those opportunities. Subsidies thus make a modest, but important, contribution to mitigating the negative effect of health spending

on social mobility and financial security, even if they fall short of comprehensive income protection. I raise and respond to some potential concerns about inequities created by this system, and conclude with implications for evaluating the subsidies under the ACA.

Chapter three investigates whether diffusion of long-acting stimulants, a medication for Attention-Deficit/Hyperactivity Disorder (ADHD), narrowed racial/ethnic disparities among diagnosed children in the Florida Medicaid program. In longitudinal analysis, we found that minorities were substantially less likely than whites to use medications overall, but minority medication users were equally likely to switch to long-acting medications after market introduction. The increase in prescribed days was comparable for white and black medication users, but lower for Hispanics. Geography and provider setting helped explain overall medication utilization disparities, but adherence disparities were not explained by any of the covariates. We recommend targeting interventions to increase medication adherence to high-volume, minority-serving providers.

Acknowledgments

“You may ask yourself, ‘Well, how did I get here?’” –The Talking Heads, Once in a Lifetime

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Preface

In March 1997, Republican Senator Orrin Hatch joined with Democrat Senator Edward Kennedy to announce his support for national legislation to dramatically expand health insurance programs for low-income children. In explaining his support for a major new public program, Hatch asserted that “as a nation, as a society, we have a moral responsibility” to provide coverage for the most vulnerable children. Not having health insurance, Hatch explained, could have a scarring impact on children for “the rest of their lives” (Pear 1997). By that summer, Hatch and Kennedy had shaped a bill that authorized \$40 billion over ten years in block grants to states to design new health insurance programs. The Children’s Health Insurance Program (CHIP), as it is now known, eventually passed Congress and was signed into law by President Clinton in August 1997. Speaking again in favor of the new law after its passage, Hatch emphasized what he saw as a simple reality for many low-income families with children: “Parents should not have to decide whether to buy health insurance for their children or put food on the table” (Hatch 1997).

Senator Hatch may have been exceptional among conservatives for his early support of children’s health insurance programs, but he was not alone. Over the last twenty years, moderate conservatives repeatedly supported expansions of children’s health insurance programs, justifying the expenditures as necessary to protect children and their families against disease, disability, and out-of-pocket spending burden. Speaking in 1995, a Medicaid administrator of budget-cutting California Republican Governor Pete Wilson explained that the state was committed to, “fill in the cracks for kids—more benefits, larger numbers, higher income thresholds—and to do it with targeted, incremental programs” (Brown and Sparer 2001). This rhetoric was largely met with action. States embraced the expanded coverage options

under CHIP, and fought for the program's reauthorization in 2007 (Iglehart 2007). As a result, funding and eligibility for children's health insurance programs expanded in the late 1990s in many states even as other social welfare programs for low-income families, like cash assistance, decreased in generosity.

This dissertation examines the unique role that public health insurance plays in protecting vulnerable children and their families in the United States. This question has taken on a new importance in the current era in part because the role for public insurance has expanded. Medicaid and CHIP covered one in three children in 2009, compared to one in five in 1999 (United States Census Bureau 2011). Many of these children live in families with complex economic and social disadvantage. Understanding how public insurance meets these families' needs – and where it continues to fall short – can help to inform future policy discussions. For example, states are grappling with how to improve the quality of mental health treatment for children in regions where there are few specialist providers and large racial and ethnic disparities in access (McMorrow and Howell 2010). At the same time, the Affordable Care Act (ACA) promises to dramatically expand the size and scope of federal assistance to low-income families. Although conservative opponents of the ACA characterize the legislation as an unprecedented overreach of government authority, political centrists and conservatives once championed its core elements in the 1990s (Cooper 2012). Each of the three chapters in this dissertation addresses a normative or empirical question central to the future of public insurance for low-income families.

Chapter one focuses on the relationship between material hardships and public insurance eligibility. As Senator Hatch's comment underscores, many advocates of CHIP were concerned that the cost of health insurance might force families to choose between coverage and food. To investigate this question, I utilize data on over 100,000 children in the National Survey of American Families from 1997 to 2002. I examine whether the prevalence of food insecurity, problems paying bills, and postponed medical care changed for households that gained eligibility through CHIP and for households that were already eligible for Medicaid before 1997 (but were likely impacted by expanded program outreach).

Using difference-in-differences estimation and instrumental variables analysis, I compare these groups to households with children that were low-income (income less than 300 percent of poverty), but who missed the eligibility cutoffs in their states. I find that CHIP substantially reduced the prevalence of unmet need for medical care for newly eligible families, but I do not find evidence that CHIP reduced food insecurity or problems paying bills. This finding is consistent with a substitution effect: when families are uninsured they avoid spending money on health services in order to keep resources for food, housing, and clothing, and when they gain coverage they consume more health care.

Chapter two considers one of the most contentious issues in the debate over the ACA, *what is affordable health insurance, and why should society provide it?* I argue that to guide practical policymaking, a definition of affordable health insurance must be grounded in a normative principle of resource distribution. I focus on a principle of Fair Equality of Opportunity (FEO), which requires that all members of society are able to pursue the careers and other life plans suitable for their natural talents and skills. Subsidized health insurance helps to promote FEO in two ways. First, insurance provides access to health services that protect physical and mental health. Second, insurance protects family budgets from burdensome out-of-pocket spending that could also limit the development of opportunities. In a perfectly just society with a fair income distribution and strong welfare institutions, subsidies would neutralize the disadvantage of health spending burden on opportunity. I argue that in a society like our own, with large inequalities, subsidies can play a more modest role: they can promote access to specific “basic opportunities” such as the ability to save for a retirement, attend college, or open a small business where those opportunities would otherwise be crowded out by health insurance spending.

Chapter three (joint work with Catherine Fullerton and Thomas McGuire) examines whether long-acting stimulants, introduced in the late 1990s, narrowed racial and ethnic disparities in the treatment of Attention-Deficit/Hyperactivity Disorder (ADHD) in children. While medication use disparities overall have been well documented for ADHD, but it is unknown whether new innovations that simplified

medication use may have disproportionately benefited minorities. In an analysis of ten years of Florida Medicaid claims spanning the diffusion of new treatments, we find that black and Hispanic children with an ADHD diagnosis were consistently less likely to use any medication, but conditional on using medication, were as likely as whites to switch from short-acting to long-acting therapy. Gains in days of adherent medication treatment following long-acting introduction were comparable for blacks and whites, and lowest for Hispanics. We found that disparities in medication use were explained by geography and differences in treatment patterns at the level of individual providers. We recommend targeting interventions to improve medication use at high-volume, minority-serving providers.

One important theme running through these three chapters is that policymakers need to take a long-term view to improving various outcomes for children and their families. The FEO approach described in chapter two identifies a normative concern with how social and structural factors in childhood impact the development of individual skills and outcomes later in life. I specifically draw attention to how meeting health needs in childhood can impact social mobility and functioning across the life-course. The other two chapters in the dissertation examine outcomes that may shape these trajectories. In chapter one, I focus on material hardship (such as the inability to purchase enough food) measured at a point in time. In chapter three, I focus on processes of care for the treatment of ADHD (such as the duration of adherent medication use in the year). Each of these outcomes is important in its own right, but a social concern with these outcomes also stems from a widely held belief that these earlier outcomes predict future outcomes such as future schooling, employment, incarceration, health status, and substance abuse. To fully assess these outcomes, I suggest that these measures should be incorporated into well-designed longitudinal studies. Understanding how health insurance and access disparities in childhood impact trajectories in adolescence and adulthood can help policymakers develop targeted interventions. Moreover, such data can potentially bolster the case for more robust policies to support the complex needs of vulnerable families. Taken together, these three chapters argue for a more careful attention to the interaction of social context and the formal sphere of publicly financed health insurance programs.

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Chapter 1

Does Expanding Public Insurance Prevent Material Hardship for Families with Children?

1.1. Introduction

Over the last two decades state and federal governments have incrementally expanded public insurance income eligibility for low-income households. These expansions began in the 1980s as the Medicaid program raised its income eligibility for children to above the federal poverty level and extended coverage to pregnant women (Hill, Bartlett, and Brostrom 1993). Insurance for children was substantially expanded again in 1997 with the creation of the Children's Health Insurance Program (CHIP). Congress provided almost \$40 billion dollars over ten years to states for health insurance programs to cover children in low-income families (Peterson 2006). In recent years several states also have extended public insurance coverage to parents of children covered by Medicaid or CHIP, and in limited cases, to low-income childless adults (Long and Stockley 2011; Dubay and Kenney 2003). These efforts paved the way for unprecedented expansions of coverage for households through the 2010 Affordable Care Act (ACA), which is projected by the Congressional Budget Office to cover an additional 30 million individuals through a combination of expanded Medicaid coverage and subsidized insurance purchased through insurance exchanges. The federal cost of the coverage expansions under the ACA is estimated to be \$1.2 trillion over ten years, split almost evenly between the additional Medicaid costs and the health insurance subsidies (CBO 2012).

The impact of public insurance expansions on the financial wellbeing of low-income populations is a topic of considerable interest among policymakers. A growing proportion of U.S. households report that they have trouble paying medical bills, causing them to delay care or to cut back on essentials like food and housing (Doty et al. 2008). The destabilizing effect of medical spending on low- and moderate-income families also has been documented in studies of individuals filing for bankruptcy (Himmelstein et al. 2009) and undergoing home foreclosures (Pollack and Lynch 2009). Low-income families are especially susceptible to financial problems from health care because these households often live paycheck-to-paycheck and lack savings to withstand unexpected medical costs. Nearly half of all households in the bottom income quintile do not have a bank account, stocks, or pensions (Carasso and McKernan 2007).

Because many low-income families cannot afford comprehensive private insurance, public insurance could prevent low-income families from spiraling into debt and deep poverty if a family member had substantial medical costs. Public insurance limits the exposure of these families to out-of-pocket spending, including copayments, deductibles, and premiums. Several studies have used quasi-experimental methods to estimate the effect of public insurance eligibility on measures of financial wellbeing. The most comprehensive data come from a recent evaluation of the Oregon Health Insurance Experiment (Finkelstein et al. 2011). In 2008, Oregon provided poor, previously uninsured adults with the opportunity to enter a lottery for a limited number of new enrollee-slots in the state Medicaid program. Lottery “winners” who enrolled in Medicaid reported significantly lower levels of financial hardship related to health care expenses than did those who entered the lottery but did not win (the control group). After one year in the program, the winners were 20 percentage points less likely than the control group to report any out-of-pocket medical expenses, 18 points less likely to report currently owing money for

medical expenses, and 15 points less likely to have recently borrowed money or skipped other bills to pay medical bills. The study authors were also able to obtain the credit scores for most of the sample and found that while new enrollees and the control group had the same overall amount of outstanding debt, the enrollees had less medical debt.

The Oregon Health Insurance Experiment provides plausible evidence that extending public insurance to adults protects against financial strain, but the effect of expansions on the financial wellbeing of other populations – especially low-income families with children – is unclear. On the one hand, low-income families with children are among the most susceptible to material deprivations such as problems obtaining adequate food and paying bills overall (Beverly 2001). Families of children with disabilities are particularly at-risk for experiencing material hardships (Parish et al. 2008). Covering low-income children is thus likely to better target benefits to some of the most vulnerable households. On the other hand, compared to adults, children are much less likely to have costly chronic conditions (Anderson and Horvath 2004), so their expenses may be a smaller contributor to the economic hardships of their families. In 1996 (the year before CHIP was authorized) non-elderly, low-income adults had health care spending that was, on average, more than triple the health care spending of low-income children (\$3,049 versus \$891) (AHRQ 2011). Mean out-of-pocket spending was \$360 for the adults and \$87 for the children. It is important to note, however, that even if expenditures for children are low on average, some children may have hundreds or even thousands of dollars in costs that their families would be forced to pay out-of-pocket in the absence of public coverage (Newacheck and Kim 2005).

While access to subsidized insurance shifts costs from families (and employers) to state plans, public coverage also tends to enable greater use of medical care and to increase overall spending relative to no insurance coverage or private policies with high cost-sharing (Buchmueller et al. 2005; Freeman et al. 2008). In theory, subsidized insurance could also lead some households to increase their out-of-pocket medical spending, but this would only occur when the price elasticity of demand for health insurance was greater than 1 (i.e., the percentage increase in quantity exceeded the percentage fall in out-of-pocket price following access to public insurance). Most studies that estimate the price elasticity of demand for health care find that while households increase health care consumption when they receive subsidies, the proportional increase in health care quantity demanded is less than the increase in the subsidy (Liu and Chollet 2006), which would imply lower out-of-pocket spending when coverage is subsidized. Because cost-sharing tends to be minimal in public insurance it is especially unlikely that out-of-pocket spending would increase for this population. Indeed, decreased out-of-pocket spending has been observed for CHIP-enrolled populations, particularly children with poor health status (Shaefer, Grogan, and Pollack 2011; Davidoff and Kenney 2005).

Thus, CHIP (and Medicaid) reduces out-of-pocket spending on health care, freeing up disposable income that can be spent on non-health items or put toward paying off debts. Two recent studies examine the implications for financial wellbeing of CHIP and Medicaid. Leininger, Levy, and Schanzenbach (2010) found that changes in CHIP eligibility among low-income families were associated with decreased out-of-pocket spending on health insurance and an increase in non-health consumption, particularly spending on transportation and durable goods. Gross and Notowidigdo (2011) examined whether expanded Medicaid eligibility decreased individual bankruptcy rates at the state level, and found that a ten percentage point

increase in Medicaid eligibility between 1994 and 2004 decreased household bankruptcy rates in a state by 8.4 percent. They confirm the robustness of this result by showing that business bankruptcies were not affected by insurance eligibility changes. Although quite different in their outcome of interest, both studies identify the effect of eligibility expansions using an instrumental variable that simulates eligibility for a representative pool of children in each state and year (Currie and Gruber 1996).

In this paper, I build upon the previous literature by examining whether expanded eligibility and enrollment in public insurance decreased the prevalence of two kinds of material hardships: food insecurity and housing problems such as problems paying rent. I also examine whether expanding eligibility reduced the probability that any individuals in the child's household postponed medical care. I hypothesized that because public insurance reduces out-of-pocket spending burden for low-income families, families that gain eligibility will experience fewer material hardships and better access to care.

I draw upon data from the National Survey of American Families (NSAF), a cross-sectional survey fielded in three rounds (1997, 1999, and 2002) that spanned the early implementation of the CHIP program. The NSAF contains data on health care coverage, program participation, demographics, income and wellbeing of households in all states and the District of Columbia. It also over-sampled lower-income families. The NSAF data were combined with information on state CHIP eligibility standards, minimum wage thresholds, and monthly state-level unemployment rates in order to capture the effect of public insurance policies and other exogenous factors on the study outcomes.

1.1.1. Policy Background

CHIP was authorized as part of the Omnibus Budget Reconciliation Act of 1997 (Wooldridge et al. 2005). The program was designed to extend health insurance coverage to low-income children, especially those in families that earned too much to qualify for traditional Medicaid but did not have access to private health insurance. From its inception, CHIP was implemented as a block grant program, which gave states broad discretion in how high they set their income eligibility cutoffs and some flexibility in the design of the insurance benefit package. To obtain the CHIP funds, states were required to contribute funding as well, but in a deliberate move to encourage state participation in CHIP, the states' "matching rates" were substantially lower than their Medicaid matching rates (Kenney and Chang 2004). CHIP also provided funding for expanded outreach and streamlined eligibility determination (Williams and Rosenbach 2007; Kronebusch and Elbel 2004).

By 2000, all states and the District of Columbia had joined the CHIP program. The immediate effect of this rapid implementation was that eligibility for public coverage for children over the age of six expanded from around 125 percent of the Federal Poverty Line (FPL) in 1997 to around 200 percent. The lowest income eligibility cutoffs were in North Dakota and South Dakota (140 percent of the FPL) and the highest was in New Jersey (350 percent of the FPL) (Lo Sasso and Buchmueller 2004). Following the CHIP expansions, there were substantial increases in the number of children enrolled in health insurance, and decreases in the number of uninsured children. One recent analysis estimates that CHIP led to an increase in public coverage of between 14 and 20 percentage points, and that more than half of the newly enrolled children were uninsured prior to implementation (Dubay and Kenney 2009).

1.2. Empirical Strategy

Following other studies that have tracked the impact of CHIP on health services utilization and access (Lo Sasso and Buchmueller 2004; Gruber and Simon 2008; Dubay and Kenney 2009), I treat expanded eligibility under CHIP as a quasi-natural experiment in access to subsidized health insurance. Specifically, the causal effect of CHIP is identified through changes in the income eligibility cutoffs for public insurance across age groups of U.S.-born children within states and across years. A key challenge is controlling for other time-varying exogenous factors such as the economic climate and demographic changes that simultaneously affect coverage rates and material hardship. During the study period (1997-2002) there were substantial reforms to federal welfare programs, rising workforce participation among low-income single mothers, and an economic boom followed by a small recession after 2001 (Blank 2002). All of these could have impacted both insurance coverage and the prevalence of material hardship.

1.2.1. Difference-in-Differences Estimation

The first set of analyses estimate the effect of expanded eligibility using a difference-in-differences (DD) approach. The DD analyses answer the question of how much, on average, changes in insurance eligibility changed the probabilities of both material hardship and postponed medical care for different types of low-income families. All else equal, one would expect that most of the benefits of eligibility expansion would accrue to those households that opted to enroll a child in public coverage. The implications for those families that had an eligible child whom they did not enroll are less clear. These families might still have accrued some indirect financial benefits because expanded funding that goes to health care providers who serve low-income children reduces the cost of treatment or free up more of the providers' resources for

provision of uncompensated care (IOM 2009). On the other hand, if the supply of provider services remains fixed, newly covered children may bid coverage away from uninsured children. The DD estimates average across these two populations, but the instrumental variable analysis (described below) focuses only on those that take up CHIP coverage.

I separately examine two groups of children that were likely to have been most directly affected by the CHIP expansions, and a control group of demographically similar children living in households that did not qualify for public coverage during the study period because of the income cutoffs in their states. Concurrent trends in the economic and policy environment that affected both the treatment and control groups are addressed using state, year, and group fixed effects. Covariates for household and child characteristics are also included to address other observable differences between groups that may have varied over time.

The treatment groups for the DD analysis are defined using the same methodology in each of the time periods. *Originally eligible children* were children in any of the three survey rounds who had family incomes below the income eligibility cutoffs for their state and age group under the 1997 criteria. Because the income eligibility cutoffs for public insurance were lower in all states in 1997 than in 2002, the group of originally eligible children is primarily comprised of children living in households with incomes below the poverty line. Although the CHIP expansions were not primarily directed at these children since they were eligible for Medicaid, studies have suggested that they increased their enrollment in Medicaid after CHIP because of increased program outreach and eligibility simplification (Banthin and Selden 2003; Kronebusch and Elbel 2004). *CHIP eligible children* were children in any of the survey rounds that lived in families with incomes above the 1997 Medicaid cutoffs, but who would have met the CHIP

income eligibility cutoffs for their state and age group that were in place in 2002. By definition, children in this group should not have been eligible for public insurance in 1997. The comparison group is *near eligible children*, those U.S.-born children living in households with incomes that were below 300 percent of the FPL, but too high to qualify for CHIP coverage under the 2002 criteria for their age in their state. Notably, many children in the comparison group lived in states with lower income cutoffs and would have been eligible for coverage in other states during each of the survey rounds. Also, many children who missed the eligibility cutoff in their state would have been eligible if they were younger.

I estimated a linear probability model of the following form:

$$(1) \quad Y_{ijst} = \beta_0 + \beta_1 Year_{ijs} + \beta_2 Orig_Elig_{ijst} + \beta_3 CHIP_Elig_{ijst} + \beta_4 Year_{ijs} * Orig_Elig_{ijst} + \beta_5 Year_{ijs} * CHIP_Elig_{ijst} + \beta_6 Demo_{ijst} + \beta_7 Family_{jst} + \beta_8 Minimum_{st} + \beta_9 Unemp_{st} + \beta_{10} State_{ijt} + \varepsilon_{ijst}$$

Y denotes the probability of experiencing any of the three study outcomes for child i , in family j , state s , and year t . Indicators for $Year$ are included, eligibility group $Orig_Elig$ (originally eligible) and $CHIP_Elig$ (CHIP eligible), and β_4 and β_5 represent the main parameters of interest, the interactions between year and eligibility group. I also include a vector for child demographics ($Demo$) and family characteristics ($Family$), minimum wage ($Minimum$), unemployment rates ($Unemp$), and state fixed effects ($State$). ε_{ijst} represents an error term.

1.2.2. Instrumental Variables Estimation

The second set of analyses I conducted use instrumental variables (IV) estimation to capture the effect of public insurance enrollment on the outcomes. The treatment effect estimated in the IV analyses differs from the DD analyses because the IV analyses focus only on the effect

of insurance expansion among those families that take up health insurance in response to changing eligibility cutoffs. A critical identifying assumption for the IV analysis is that the models isolate the variation in public insurance enrollment that is driven by variation in eligibility rules across states and years apart from other factors that are likely to simultaneously affect the selection into public insurance coverage.

I used a version of the now-common simulated eligibility instrument constructed by Gruber and Simon (2008), which was provided by those authors. The instrument is computed by applying the age-specific income eligibility cutoffs for each state to the same nationally representative, random sample of children in the Survey of Income and Program Participation in each year and then deriving a predicted proportion of children in each age interval from the national sample who would be eligible for Medicaid or CHIP insurance in the survey year. Because the eligibility rules are applied to a national sample, the simulated proportion of eligible children in each state should reflect only the generosity of the eligibility cutoffs in that state, and not variation in income stemming either from the state's economic climate or from a strategic response among families that keep their incomes below the state cutoffs in order to qualify for public coverage.

With the simulated eligibility instrumental variable, I estimated a two stage least squares regression model. The first stage yielded the predicted probability of public insurance take-up (\widehat{Public}) within the sample by regressing the instrument on public insurance enrollment status while controlling for a set of individual and family covariates, and state and year fixed effects. In the second stage, I regressed the marginal effect of public insurance take-up on each of the

outcomes controlling for the same set of covariates. The second stage equation can be expressed as follows:

$$(2) \quad Y_{ijst} = \beta_0 + \beta_1 Year_{ijs} + \beta_2 \widehat{Public} + \beta_3 Demo_{ijst} + \beta_4 Family_{jst} + \beta_5 Minimum_{st} + \beta_6 Unemp_{st} + \beta_7 State_{ijt} + \varepsilon_{ijst}$$

Where \widehat{Public} represents the predicted probability of public insurance take-up as modeled in the first stage, and the other parameters represent the same set of variables as in equation (1).

1.3. Data

I used data from National Survey of American Families (NSAF), a cross-sectional survey that was administered in three rounds: 1997, 1999, and 2002. Each round interviewed roughly 40,000 households, collecting information on over 100,000 individuals. Details of the complex, multi-stage sampling design have been published elsewhere (Kenney, Scheuren, and Wang 1997). In households with children present, up to two children were randomly selected for the survey, and information about the health and wellbeing of these children was reported by a knowledgeable adult. I refer to this adult as the parent, although in some cases this adult was some other family member. After adjusting for differential sampling, undercoverage of households without telephones, and non-response the NSAF can provide estimates that are representative of non-institutionalized households in the United States (Brick et al. 2003). The sample is restricted to the 61,622 U.S.-born children residing in households with income below 300 percent of the Federal Poverty Level (FPL). All of the analyses are weighted to the

household level and standard errors were clustered at the household level to account for the nested sampling structure of the data.

1.3.1. Dependent Variables

Three outcomes were examined: food problems, housing problems, and postponed medical care. Households were classified as having food problems if the adult said that in the last 12 months “the food that we bought just didn't last, and we didn't have money to get any more,” or if the respondent replied *often* or *always* to the statement “we worried whether our food would run out before we got money to buy more” in the last 12 months. Housing problems were determined either if the respondent reported that there was a time when he or she was unable to pay the mortgage, rent, or utility bill in full because of lack of money in the last 12 months, or the respondent affirmed that during the last 12 months “you or your children moved in with other people even for a little while because you could not afford to pay your mortgage, rent or utility bills.” Households were classified as having any postponed medical care if anyone in the household in the last 12 months “did not get or postponed getting medical care or surgery when they needed it.”

1.3.2. Public Insurance Coverage and Eligibility

The current insurance status of children at the time of the survey and the predicted eligibility status for public insurance (whether or not the child was enrolled) were assessed. Current coverage was classified by a four-level hierarchy so that children are placed in only one of the following groups (in rank order): employer-sponsored coverage, public insurance, non-group private, and uninsured. Public insurance was defined as either enrollment in the CHIP or

Medicaid program in the respondent's state. Medicaid and CHIP were combined because many parents would not have known the specific eligibility category of their child.

For the DD analyses, eligibility was simulated for the two treatment groups by applying the 1997 and 2002 eligibility rules to each child in the sample to predict whether the child would meet the income eligibility cutoffs for the child's age under each set of rules. To do this, I constructed the eligibility income for each household in the year, defined as the combined pretax income reported in the NSAF after applying earned income and child care disregards defined by the state in the survey year (earned income was reported separately in the NSAF as was use of paid child care). I then divided the eligibility income by the poverty thresholds for the size of the household used by federal programs. Both the income eligibility criteria and the relevant income disregards were obtained from the Transfer Income Model 3 (TRIM3), a publicly available database of state program rules.

1.3.3. Child and Family Covariates

The child's age in years was used for simulating eligibility, and the regression models also included a covariate for the child's age in three categories: 0-6 years, 7-12 years, and 13-18 years of age. Race/ethnicity of the child was classified in three mutually exclusive categories: Hispanic, non-Hispanic black, and non-Hispanic white/other. Several measures of the child's health status were included in the model: an indicator for the presence of a parent-reported physical, learning, or mental health condition that limited the child's ability to participate in normal activities; an indicator for whether the child had a negative mental health score based on a parent-rated scale; an indicator for whether the child's behavior was aggravating to the parent;

and the child's health status as rated by the parent on a five-point scale was included as a continuous measure.

I also included covariates for characteristics of parents and families: whether the household was headed by a single parent (rather than two parents or some other arrangement), whether there were more than four individuals in the child's family, including the child. Parental age was entered as a continuous measure. Parental education was classified in four groups: less than high school, high school or equivalency, some college, and college graduate. I included an indicator for whether the parent rated his or her health as fair or poor. Models also included an indicator for whether there was at least one full time worker in the household.

1.3.4. Program Participation and Income

Indicators were included in the models for participation by the child's household in some of the most common national public assistance programs: the Temporary Assistance for Needy Families (TANF) program, food stamps, the Women, Infants, and Children Program (WIC), and Social Security Income (SSI). An indicator for whether the child's family lived in subsidized or government housing was also included. I use imputation-adjusted income categories for family income expressed as a proportion of the FPL that were created by NSAF analysts: less than 50 percent, 51-100 percent, 101-150 percent, 151-200 percent, and 201-300 percent of the FPL.

1.3.5. State Covariates

For each sampled household, models include a linked measure of the average monthly seasonally adjusted unemployment rate in the state and year of the survey. Models also include an indicator for the highest minimum wage available in the state and year. The federal minimum

wage sets the minimum wage floor; the federal value was imputed if a state did not maintain a higher minimum wage.

1.4. Results

Table 1.1 provides descriptive statistics for children and their families in the NSAF sample by year as well as the average values of the state-level covariates in each year. There was relatively little change in the prevalence of food problems and housing problems across years. Although the percentage of households experiencing food problems declined from 36 to 33 percent between 1997 and 1999, the percentage increased to 35 in 2002. Housing problems remained relatively unchanged at around one quarter of all households over the study period. Approximately 12 percent of all households reported that someone in the household postponed medical care in 1997, a percentage that remained constant throughout the study period.

There were notable changes in the reported insurance coverage during this time: the proportion with employer coverage declined from 51 to 46 percent, while Medicaid/CHIP increased from 28 to 38 percent. Meanwhile, there was a corresponding decline in the uninsured rate from 17 to 12 percent of the sample. Other forms of private coverage remained low (declining from 4 to 3 percent in the sample). For parents, there was relatively little change in coverage during this period, with around 55 percent covered by employer-sponsored insurance, 17 percent covered by public insurance, 5 percent covered by other coverage, and just under a quarter uninsured.

Most of the other demographic characteristics for children and families remained relatively constant during the study period. In terms of race/ethnicity, there was a notable

increase in the share of low-income children who were Hispanic (increasing from 19 to 24 percent); the proportion of children who were black remained constant at around 20 percent, and the largest group, comprised of non-Hispanic white and other race children, declined from 62 to 56 percent of the sample. Notably, the percent of foreign-born parents nearly doubled from 9 to 17 percent of the sample during the study period (by restriction, children in the sample were U.S.-born). Almost half of the children in the sample were under six years old and were slightly more likely to be female.

Approximately 13 percent of children in the sample in 1997 had a reported physical, learning, or mental health condition that limited their ability to participate in normal activities. This trended up to 16 percent by 2002. The proportion of children with reported fair or poor physical health remained around 6 percent in all years. Approximately 17 percent of all children had low mental health scores, indicating that they experienced symptoms of depression, anxiety or other psychological distress. Roughly 12 percent of all parents reported high levels of aggravation, a binary measure that indicated whether it was particularly difficult to care for the child.

More than one third of all low-income children lived in a household headed by a single parent. Average parental educational attainment was low in all years: more than 40 percent of all parents did not complete high school, and 22 percent had a high school diploma or equivalency as their highest degree. Around 57 percent of children in the 1997 sample lived in households with one or more workers, which increased to 61 percent in 1999, but declined again in 2002. The average age of parents in the sample was around 37 years at each time point. Approximately 12 percent of the adults in the sample had reported fair or poor health.

Table 1.1. Descriptive Statistics for All U.S. Born Children Below 300% FPL in NSAF by Survey Round

	1997		1999		2002	
	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Dependent Variables						
Food Problems	36.3	0.7	33.2	0.5	35.4	0.7
Housing Problems	24.8	0.7	24.3	0.6	25.8	0.6
Delayed Anyone's Medical Care	11.6	0.4	11.7	0.4	11.9	0.4
Child's Insurance Coverage						
Employer	51.2	0.8	52.1	0.9	46.3	0.7
Medicaid/CHIP	27.6	0.7	27	0.7	38.4	0.7
Other	4.2	0.3	4.1	0.3	3.4	0.2
Uninsured	17	0.5	16.8	0.6	11.9	0.5
Parental Coverage						
Employer	54.8	0.8	57.7	0.8	54.6	0.7
Medicaid/CHIP	16.7	0.6	13.2	0.4	16.2	0.5
Other	4.5	0.3	4.7	0.3	4.5	0.2
Uninsured	24.1	0.6	24.5	0.6	24.7	0.7
Family and Child Demographics						
Child Under 6 Years Old	46.1	0.4	45.8	0.7	45.1	0.5
6-12 Years Old	31.4	0.5	31.2	0.6	31.5	0.5
13-18 Years Old	22.5	0.5	23	0.6	23.4	0.5
Male	48.7	0.5	49.3	0.5	48.9	0.6
Female	51.3	0.5	50.7	0.5	51.1	0.6
Hispanic	19.2	0.4	21.1	0.6	24	0.5
Black Non-Hispanic	19.1	0.7	20	0.6	20.4	0.6
White/Other	61.7	0.7	58.9	0.7	55.6	0.7
Family>Four People	36.5	0.7	37.7	0.8	39.8	0.8
Child Has Activity Limitation	13.3	0.4	14.6	0.4	15.5	0.3
Child Fair/Poor Health	6.2	0.3	6	0.3	6.3	0.3

Table 1.1. (Continued).

High Parental Aggravation	8.9	0.3	9.2	0.3	9.8	0.3
Child Negative Mental Health	16.8	0.4	16	0.4	16.7	0.4
Parent in Fair/Poor Health	12.1	0.4	12.9	0.4	12.3	0.3
Parent Age (Mean)	36.8	0.1	37.1	0.1	37.6	0.1
Lives in Single Parent Household	37.7	0.8	36.1	0.7	37.7	0.7
Parent<High School Education	40.8	0.7	35.4	0.8	40.8	0.6
Parent High School Graduate	22	0.7	24.8	0.6	21.7	0.5
Parent Some College	22.1	0.7	21	0.7	20.7	0.5
Parent College Graduate	15.2	0.6	18.8	0.6	16.9	0.4
Parent Foreign Born	9.1	0.3	14.2	0.5	17	0.4
Work and Welfare Programs						
At Least One Full Time Worker	56.6	0.7	60.8	0.7	58.2	0.7
Family Receives TANF	10.7	0.6	7	0.4	6.2	0.3
Family Receives Food Stamps	19.7	0.6	15.4	0.6	16.4	0.5
Family Receives WIC	23	0.7	22.2	0.7	25.5	0.6
Family Receives SSI	6.2	0.4	6.3	0.3	8.1	0.3
Family Lives in Subsidized Housing	8.1	0.6	6	0.4	6.4	0.4
Income<50% FPL	14.8	0.6	11.6	0.4	11.2	0.4
Income 51-100% FPL	17.6	0.6	16.3	0.5	16.1	0.6
Income 101-150% FPL	17.4	0.6	18.5	0.6	18	0.5
Income 151-200% FPL	18.4	0.6	19.6	0.5	19.1	0.5
Income 201-300% FPL	31.9	0.8	33.9	0.8	35.7	0.7
State-Covariates (Means)						
Unemployment	5		4.3		5.8	
State Minimum Wage	4.8		5.2		5.4	

Note: Estimates are weighted using household-level survey weights created by NSAF analysts.

Participation in in the Temporary Assistance for Needy Families (TANF) program decreased from 11 to 6 percent between 1997 and 2002. This was likely a consequence of the

1996 federal welfare reform laws. Food stamp participation also decreased from 20 to 16 percent between 1997 and 2002. Participation in the Women Infant's and Children's Program, on the other hand, increased slightly from 23 to 26 percent of the sample. Other programs, including Supplemental Security Income (SSI) and subsidized housing were less common. There was a notable upward shift in the income distribution during the study period: in 1997 approximately 15 percent of households had reported income below half of the federal poverty line (FPL) and 32 percent had incomes between 200 and 300 percent of the FPL. By 2002, only 11 percent of households had incomes below 50 percent of the FPL and 36 percent had incomes in the highest bracket.

1.4.1. Difference-in-Differences Results

Table 1.2 presents the coefficients and standard errors for the preferred specification of the DD model for each study outcome. The interactions between treatment group and year (shown in bold) provide estimates of the average treatment effects at each time point compared to the baseline year, 1997. Because of the potential endogeneity with program eligibility status, I do not include direct measures of income or welfare program participation in the preferred specification, but including these covariates did not substantially change the impact estimates (not shown).

I found evidence for an effect of insurance expansions on the probability of reporting food problems in only one of the treatment groups: families of originally eligible children experienced a 4 percentage point reduction in the probability of food problems in 2002 relative to the comparison group (borderline statistical significance, $p=.064$). The 1999 estimate was also

negative for originally eligible children, but not significant. Neither of the year by group coefficients were close to statistical significance for the CHIP eligible children.

I also did not find evidence of an average effect of insurance expansion on the prevalence of housing hardship in either of the treatment groups. Housing hardship was estimated to have slightly increased in the originally eligible group relative to the treatment group in 1999, and to have decreased in 2002, but neither of these effects was close to statistically significant. The effect was zero for the CHIP eligible group in 1999, and negative but not significant in 2002.

There was stronger evidence that insurance expansions lowered the probability of postponed care for both treatment groups. For the originally eligible group I estimated a reduction in the prevalence of postponed care of 2 percentage points in 2002 and 4 points in 1999 relative to the control group. Only the 1999 estimate was statistically significant ($p=.012$). The estimates were similar for the CHIP eligible group: again a 2 percentage point decrease in 2002, and 4 point decrease in 1999 relative to the control group. The 2002 estimate was not significant, but the 1999 estimate was significant ($p=.024$).

Table 1.2 Difference-in-Differences Estimates for Full NSAF Sample

	Food Problems			Housing Problems			Postponed Care		
	<i>Estimate</i>	<i>S.E.</i>	<i>P>Z</i>	<i>Estimate</i>	<i>S.E.</i>	<i>P>Z</i>	<i>Estimate</i>	<i>S.E.</i>	<i>P>Z</i>
2002	-0.012	0.020	0.550	0.032	0.019	0.085	0.020	0.015	0.197
1999	0.002	0.019	0.907	0.014	0.016	0.374	0.030	0.016	0.057
Originally Eligible	0.164	0.017	<.0001	0.094	0.015	<.0001	0.014	0.013	0.254
CHIP Eligible	0.055	0.017	0.002	0.073	0.016	<.0001	0.025	0.013	0.054
Orig.*2002	-0.038	0.021	0.064	-0.012	0.019	0.517	-0.021	0.016	0.190
Orig.*1999	-0.032	0.022	0.135	0.022	0.019	0.246	-0.042	0.017	0.012
CHIP*2002	0.023	0.022	0.304	-0.027	0.021	0.200	-0.020	0.016	0.226
CHIP*1999	0.015	0.023	0.518	0.001	0.021	0.946	-0.040	0.018	0.024
Family and Child Demographics									
Child Under 6 Years Old	-0.027	0.008	0.001	-0.022	0.008	0.005	-0.006	0.006	0.326
6-12 Years Old	-0.015	0.009	0.085	-0.005	0.008	0.565	0.003	0.006	0.670
Male	0.005	0.006	0.384	0.000	0.006	0.978	0.003	0.004	0.506
Black	-0.034	0.014	0.013	-0.018	0.013	0.165	0.014	0.009	0.144
White/Other	-0.059	0.011	<.0001	-0.016	0.011	0.119	0.061	0.008	<.0001
Family>Four People	0.025	0.008	0.002	0.026	0.008	0.001	-0.007	0.006	0.238
Child Has Activity Limitation	0.050	0.011	<.0001	0.033	0.010	0.002	0.033	0.008	<.0001
Perceived Child Health (5 Point Scale)	0.025	0.004	<.0001	0.011	0.004	0.006	0.016	0.003	<.0001
High Parental Aggravation	0.060	0.012	<.0001	0.012	0.012	0.297	0.013	0.009	0.160
Child Negative Mental Health	0.255	0.010	<.0001	0.205	0.010	<.0001	0.080	0.008	<.0001
Parent in Fair/Poor Health	-0.090	0.011	<.0001	-0.062	0.011	<.0001	-0.089	0.009	<.0001
Parent Age	-0.002	0.000	<.0001	-0.002	0.000	<.0001	-0.001	0.000	<.0001
Lives in Single Parent Household	0.078	0.008	<.0001	0.033	0.008	<.0001	0.016	0.006	0.007
Parent H.S. Grad	0.064	0.010	<.0001	0.035	0.009	0.000	-0.040	0.008	<.0001
Some College	0.048	0.011	<.0001	0.069	0.010	<.0001	0.026	0.009	0.003
College Grad	0.036	0.011	0.001	0.041	0.010	<.0001	-0.017	0.008	0.039
Parent Foreign Born	0.034	0.012	0.006	-0.030	0.011	0.009	-0.046	0.008	<.0001
At Least One Full Time Worker	-0.038	0.008	<.0001	-0.044	0.008	<.0001	-0.029	0.006	<.0001
State Characteristics									
Unemployment	0.021	0.010	0.036	0.016	0.009	0.093	-0.002	0.007	0.772
State Minimum Wage	-0.005	0.013	0.690	-0.023	0.012	0.047	0.009	0.009	0.313
Intercept	0.316	0.186	0.090	0.251	0.113	0.026	0.179	0.075	0.017
N	59791			60375			60674		
R-squared	0.1776			0.1008			0.0604		

1.4.2. Two Stage Least Squares Results

Table 3 displays statistics from the first stage of the IV analysis, and the coefficients, standard errors, and p-values for the second-stage IV estimates. The preferred specification of the IV model included the set of demographic covariates, year, and state fixed effects. Conditioning on these covariates substantially changed the point estimates for the effect of public insurance enrollment on the study outcomes and limited the precision of the estimates, an issue I return to in the discussion.

Neither of the measures of material hardship was close to statistical significance, and both were in the opposite direction of what had been the expected association: public insurance take-up was estimated to increase the risk of food problems by 28 percentage points ($p=.233$) and housing problems by 7 percentage points ($p=.748$). I did find limited evidence suggesting public insurance take-up reduces postponed care. This effect was estimated to be large (24 percentage point reduction), but it was not statistically significant in the preferred specification ($p=.164$). The same, or larger, estimates were obtained in alternate specifications that omitted state fixed effects and included measures of household income. However, sensitivity of the estimates to model form suggests that considerable caution should be taken when considering the IV estimates.

Table 1.3. Instrumental Variables Estimates for Full NSAF Sample

Second Stage Estimates	Food Problems			Housing Problems			Postponed Care		
	<i>Estimate</i>	<i>S.E.</i>	<i>P>Z</i>	<i>Estimate</i>	<i>S.E.</i>	<i>P>Z</i>	<i>Estimate</i>	<i>S.E.</i>	<i>P>Z</i>
Predicted Public Insurance	0.281	0.235	0.233	0.072	0.224	0.748	-0.245	0.178	0.167
1997	0.071	0.037	0.057	-0.003	0.035	0.922	-0.037	0.028	0.179
1999	0.053	0.033	0.102	0.019	0.030	0.526	-0.029	0.025	0.254
Child and Family Demographics									
Male	-0.003	0.006	0.592	0.001	0.006	0.901	-0.004	0.005	0.396
Child Under 6 Years Old	-0.025	0.027	0.348	-0.005	0.026	0.843	0.027	0.020	0.176
6-12 Years Old	-0.018	0.014	0.210	0.001	0.013	0.947	0.017	0.010	0.100
Black	0.019	0.018	0.307	0.011	0.017	0.530	-0.004	0.013	0.745
White/Other	-0.015	0.023	0.509	-0.004	0.022	0.871	0.024	0.018	0.169
Family>Four People	0.020	0.012	0.095	0.025	0.012	0.033	0.003	0.009	0.780
Child Has Activity Limitation	0.032	0.020	0.104	0.029	0.019	0.126	0.051	0.016	0.001
Perceived Child Health (5 Pt. Scale)	0.022	0.005	0.000	0.010	0.005	0.030	0.018	0.004	0.000
High Parental Aggravation	0.053	0.014	0.000	0.010	0.013	0.447	0.018	0.010	0.066
Child Negative Mental Health	0.249	0.014	0.000	0.206	0.014	0.000	0.089	0.011	0.000
Parent in Fair/Poor Health	-0.074	0.019	0.000	-0.056	0.019	0.003	-0.102	0.015	0.000
One Parent Family	0.066	0.028	0.018	0.037	0.027	0.176	0.046	0.022	0.034
Parent H.S. Grad	-0.024	0.015	0.109	0.004	0.014	0.768	0.013	0.011	0.236
Some College	-0.005	0.024	0.828	0.031	0.023	0.185	0.043	0.019	0.023
College Grad	-0.047	0.035	0.173	-0.042	0.032	0.193	0.004	0.026	0.864
At Least One Worker	0.003	0.067	0.965	-0.047	0.063	0.451	-0.096	0.050	0.055
Adult U.S. Born	0.040	0.013	0.002	-0.026	0.011	0.022	-0.046	0.008	0.000
Constant	0.116	0.230	0.614	0.426	0.214	0.047	0.282	0.157	0.073
State Variables									
Minimum Wage	0.002	0.015	0.877	-0.022	0.013	0.095	0.002	0.010	0.828
Unemployment Rate	0.024	0.010	0.018	0.017	0.009	0.066	-0.002	0.008	0.839
Year Fixed Effects	Yes			Yes			Yes		
First Stage Regression Statistics									
R-Squared	0.247			0.249			0.249		
F Statistic	19.586			20.643			20.856		

1.5. Discussion

I examined whether the expansions of public insurance eligibility under CHIP decreased the probability of two kinds of material hardships – food insecurity and housing problems – as well as the probability of postponed medical care. In DD analyses, I found that expanding eligibility for CHIP reduced the probability of postponed care by as much as 4 percentage points for both originally eligible and CHIP eligible children. I found only moderate evidence of an impact of expanded eligibility on food problems for originally eligible children, and I did not find evidence of an effect for CHIP eligible children. I also did not find an impact on housing problems for either group. The IV analyses examined the impact of public insurance enrollment affected by changing eligibility rules. I found that enrolling in public coverage was not significantly associated with a change in the probability of either food insecurity or housing problems. The estimated decrease in postponed care was substantively large, but not significant in the preferred specification.

My findings related to postponed care are consistent with other quasi-experimental studies that show that CHIP eligibility led to reduced unmet need (Kenney 2007; Shone et al. 2008). Another study using the NSAF found that families impacted by CHIP greatly increased their rates of doctor visits, and well-child visits specifically (Li and Baughman 2010). These studies provide strong support to the claims made by program advocates that extending public insurance to low-income families helps to ensure access to the health care system for vulnerable children.

By comparison, results related to food insecurity and housing problems suggest that expanded public insurance did not relieve material hardship for families with children. As I noted in the introduction, while out-of-pocket medical spending causes material hardship for families with children in poor health, most children are healthy, so health spending is not a substantial contributor to the material hardships experienced by their families. This would explain why expanding coverage may reduce out-of-pocket spending on average, but not have a noticeable effect on material hardship.

It is also worth considering three additional issues. First, it is possible that public insurance is insufficient on its own to provide financial protection from health care expenses, particularly for those households with children in poor health. As has been documented in previous studies, families of children with chronic conditions must contend with a range of non-medical expenses such as reduced parental work time (Chen and Newacheck 2006) or additional child care expenses that are not covered by public insurance. Providing more generous public insurance addresses one important issue (out-of-pocket health spending risk) but leaves many families vulnerable to expenses stemming from non-medical services needed for chronically ill children.

Second, expanding public insurance could conceivably improve financial wellbeing without affecting material hardship. Unlike continuous measures of household resources such as income, material hardship describes a point below which resources are not adequate to meet basic needs. Moving families above this point of adequacy may not be possible if the family has a very low income or very complex material needs. For example, the marginal \$100 of reduced out-of-pocket spending on medical care could be a large financial benefit for a family and yet it

still might not make it possible to provide enough food for the month. Conversely, some moderate income families may have incomes that place them above the threshold, even if they pay out-of-pocket for health insurance. Gaining coverage would still benefit these families, but not change their risk of material hardship.

Third, there also are likely to be major substitution effects between health and non-health consumption in the absence of public insurance. Rather than cutting back on non-health goods, some families may opt to forego health care. These families may not experience non-health material hardships, but a lack of health coverage would still prevent them from meeting their health-related needs. The presence of such substitution effects might be one reason why there was a significant decline in the probability of postponed care in the DD analyses, but not a decline in material hardship. In the case of children it may be easier to postpone medical care, because the majority of children are relatively healthy, and even children with chronic health needs may be able to receive some care through the emergency room or community clinics. The implications of delayed or avoided medical care for children may therefore not be immediately apparent, but could contribute to poor health in adolescence and adulthood. It would be illuminating to separately examine the impact of CHIP eligibility and enrollment on children in the sample with health limitations and fair or poor health status, but the sample for this study lacked the statistical power to obtain reliable estimates for this subgroup.

Some additional study limitations should be noted. First, because the study draws upon repeated cross-sections I was only able to control for observable household characteristics at a point in time; I could not compare changes within households over time. Panel data would provide a greater ability to control for endogenous shifts in income and to measure take-up

versus continuation of public insurance. Unfortunately, there are no large panel datasets spanning the time period of CHIP implementation that include repeated measures related to material hardship and health insurance. Second, as with all household surveys, measures in the NSAF related to health insurance coverage and income are subject to measurement error. Specific to the DD estimates, there is likely to be some misclassification of income eligibility, and therefore incorrect assignment to the treatment or control groups. I attempt to mitigate this issue using both the imputation-adjusted income data in the NSAF, and applying eligibility determination disregards that have been shown to affect simulated eligibility (Dubay and Kenney 2000). Third, because the IV estimates were highly sensitive to specification, reported IV point estimates should be interpreted with caution. The estimates for postponed care were consistently negative, but the estimated magnitude of the effect varied across different specifications. Finally, the three study outcomes shed light on discrete changes in the presence of self-reported deprivations, but do not allow me to consider how changes in eligibility and enrollment may have shifted lower-intensity forms of hardship (for example, the nutritional value of the family's diet versus access to sufficient food of any kind). It is therefore an open question whether expanding public insurance might have an impact on other less severe forms of material hardship.

1.6. Conclusions

This study has important implications for research and policy. First, it suggests a need to better understand the complex interaction between health care spending risk and poverty, especially for families with children. Investments in children's health insurance programs are often framed as an investment in the long-term health of poor children because public insurance provides access to preventative medical services that poor families might otherwise not be able

to (or choose to) consume. As I discussed, in the short term, subsidized insurance could therefore be more effective in reducing postponed medical care than in changing balance sheets of low-income families. The longer-term effects are more uncertain. Some studies suggest that public insurance expansions lowered mortality and improved health, (Howell et al. 2010; Currie 1995) but it is unknown how much these programs also reduced family poverty. If there are longer-term positive effects of public insurance on economic wellbeing, then analyses that only focus on the period following implementation (such as this study) might understate the true benefits of the programs. Studying these effects is an important objective for future research.

It is also important to note that children's health insurance operates as one of several strands in a fragile safety net that support low-income families. As Janet Currie (2008) suggests, safety net programs: "act together, providing a broad-reaching and comprehensive net that especially protects young children in low-income families... Pulling on one thread—say, the funding of one part of one program—is liable to start the unraveling of the whole tenuous system, unless we recognize the reality that these programs create something greater, in much the same way that a net is greater than the sum of its individual ropes" (p. 3). This observation is particularly salient given the changing context of American in-kind assistance programs. If those families that depend most heavily on public health insurance also depend on other forms of public assistance, then cuts to programs such as food stamps or child care subsidies could both directly strain family budgets and also limit the marginal effectiveness of health insurance coverage in preventing economic hardship.

In the current environment, non-health safety net programs are under considerable strain. Pressure is rising in state and federal government to cut spending, and at the same time, demand

is growing for assistance among families experiencing unemployment and other disruptions (Nichols and Zedlewski 2011). Even if the economy improves in the near future, it is quite likely that low-income families will find themselves with fewer programs and services supporting employment, housing, and other needs. Health services, including public programs for children, are also facing some funding cuts, but are still projected to grow both in total spending and in number of individuals covered (Holahan et al. 2011). From the perspective of protecting vulnerable families from material hardships, it is therefore important to consider whether spending limited resources on public insurance is an effective tool for protecting low-income families against poverty relative to investments in other programs, independent of its beneficial impacts on health. The results in this paper suggest that, at least for families with children, public insurance may not be sufficient to prevent two of the most common forms of material hardship. Within an environment of strained financial resources, future expansions to public insurance might focus on targeting resources such as childcare, food assistance, and social service referrals to families with children that have complex health needs and require services in multiple systems.

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Chapter 2

Less than Ideal: An Ethical Argument for Protecting Affordable Health Insurance in an Unequal Society

2.1. Introduction

What is affordable health insurance, and on what basis should the government subsidize affordable coverage? These questions have been the subjects of an intense debate focused on the 2010 Affordable Care Act (ACA). When fully implemented in 2014, the ACA will expand Medicaid for non-elderly adults with incomes below 138 percent of the poverty line, and provide subsidies to purchase insurance for individuals with household incomes between 138 and 400 percent of the poverty level. The ACA also provides premium subsidies to small employers that sponsor health insurance for their employees and pay at least half of the premium. In addition, the ACA includes new regulations of private insurance plans and new mandates on large employers and individuals (KFF 2011a). Taken together, these measures are projected by the Congressional Budget Office to extend coverage to an additional 30 million individuals at an estimated cost of over one trillion dollars over ten years (from 2012 to 2021). Subsidies on the exchanges alone will cost an estimated \$681 billion during this period (CBO 2012).

The ultimate target of health insurance subsidies in the ACA is to redistribute the cost of *health care* spending, since health insurance is a prerequisite for gaining quality health care. Broadly construed, then, affordable health insurance encompasses the direct costs of health insurance in the form of premiums, deductibles, and copayments, and also out-of-pocket

spending that could in principle be financed through an insurance scheme. To collectively pay for society's health care costs, subsidies take money from people who pay taxes and redistribute it to poorer households as in-kind vouchers. This problem is particularly pressing in the United States, as health care spending now accounts for about 16 percent of gross domestic product, or roughly \$7,500 per capita in 2008 (KFF 2011b). Health expenditures are currently borne by a patchwork of different payers: the federal government directly pays for almost half of all spending through programs for specific populations like the elderly, poor children, and the disabled, and provides an additional tax subsidy to employers that insure their workers.

Although the majority of families with working adults receive coverage in this manner, there still remains an "excluded middle" – households that do not meet the eligibility requirements for public insurance, but cannot obtain employer sponsored coverage. Many such families go without insurance or pay for expensive plans in the individual market. Subsidies under the ACA would help these families to get needed medical care and lower the risk of burdensome out-of-pocket spending. In turn, these families would be required to contribute some amount of money toward their coverage, or face a penalty. This so-called "individual mandate" remains one of the most controversial aspects of the ACA, and is currently the centerpiece of a challenge to the law in the United States Supreme Court (Oberlander 2011).

This essay provides an ethical argument for subsidizing health insurance for low- and moderate-income households, and a criterion to evaluate insurance affordability. I argue that subsidized insurance helps to advance an important social priority: it better enables people to pursue the range of careers and life plans for which their natural talents equip them. Ensuring that people are able to develop their abilities, within the resource limits of their society, is the main implication of the principle of Fair Equality of Opportunity (FEO). As John Rawls (1971)

famously argued, a principle of FEO is one necessary condition of a society that allows each person to reap the rewards of social cooperation. Reducing the impact of health insurance spending on the budget of families with limited means makes a tangible difference to their ability to improve their economic position (for example by investing in job training or education) and to gain financial security (by saving for retirement or building housing equity). It also improves access to essential health services such as immunizations, screenings, and medications.

There is currently a lack of agreement about how much of a household's budget should be dedicated to spending on comprehensive health insurance in comparison to other goods such as food, clothing, entertainment, and savings. I argue that an approach focused on FEO would require policymakers to consider how different levels of spending would impact the ability of households to purchase specific goods that protect opportunity, and then provide subsidies for health insurance (defined as premium spending as well as cost-sharing) up to the point that such spending would not result in the loss of these opportunities. One important question is what opportunities should be protected under an affordability policy. The general answer is that the kind of opportunities that would be protected depends on the broader social and economic background of the society. Affordable coverage can safeguard a much wider array of opportunities in a society in which households are also protected by a robust welfare state, and a fair principle of income distribution. In a society with fragmented social assistance programs and large income inequalities, health insurance subsidies have a more limited reach.

I will thus need to distinguish between a "comprehensive" conception of opportunity and a more "basic" set of opportunities. Comprehensive opportunity is what would be attainable in an ideally just society with a fair income distribution. In such a society, rampant economic inequality would likely be constrained by robust social insurance and collective bargaining for

labor. Strengthening these institutions, which are weak in the United States, would go a long way toward improving the economic resources of low- and moderate-income households, even before more targeted redistribution through health insurance subsidies. Although the most and the least disadvantaged members of society would not have equal incomes, at least in such a society income inequality would not prevent disadvantaged individuals from pursuing the same opportunities as equally talented counterparts in better off households. In a society with large inequalities, like our own, subsidies still impact outcomes like the ability to save for a retirement, pay for childcare, or attend college. These are examples of basic opportunities, which include factors linked to social mobility and financial security for working families in our society. Although I present the intuition behind basic opportunities and some illuminating examples, I do not attempt to provide a complete definition in this essay.

An approach focused on basic opportunities does not do everything possible to equalize the burden of health insurance spending between rich and poor and between healthy and sick. A point of comparison is provided by many continental European societies. These societies are governed by a principle of social solidarity – a comprehensive social norm focused on “‘shared responsibility’ and commitment to the common good” (Meulen et al. 2002, p. 1). Under this principle, those that are sick pay the same as those that are healthy, and all health spending is progressively financed. Even if these countries permit other inequalities outside of the health insurance system, they come very close to neutralizing any inequalities in access to a tier of comprehensive coverage (many such countries also permit another tier of private coverage that serves the affluent, however). A system fully governed by such a principle would be one method for protecting opportunities that might otherwise be compromised by health inequalities, but

such a system presupposes the presence of certain social norms that are arguably weak in the United States.

The account I offer represents more of a compromise. It does not go as far as a European-style system in equalizing the burden of covering a population, but it provides a principled alternative to setting affordability based narrowly on what consumers are willing to pay or on a reference budget pegged to a basket of goods that only covers necessities like food and shelter. I argue that a basic opportunity approach is plausible insofar as it provides the greatest amount of subsidization to protect opportunities that are causally connected to health care spending, without making other households worse off. The proviso that other households are not made worse off is important because it provides a minimal constraint on subsidies, ensuring that they do not crowd out the promotion of other non-health opportunity.

In the next section (Section 2.2), I provide a brief overview of the concept of health insurance affordability in both ordinary discourse and policymaking, and then critique some leading attempts to define the concept. In Section 2.3, I develop the FEO approach to affordability and subsidies. I begin by showing what a commitment to FEO would mean under a comprehensive approach. In Section 2.4, I argue that this account would need to be circumscribed outside of ideal theory, and present the basic opportunity approach as a plausible alternative. I consider two objections related to the scope of the basic opportunity principle. Section 2.5 concludes with some implications for evaluating the ACA, and suggestions for further inquiry.

2.2. Defining Affordable Health Insurance

In American political discourse, “affordable health insurance” has achieved the status of policy platitude – a phrase so malleable that it has been used for the rhetorical purposes of both liberals in support of health reform and conservatives opposing the same policies.¹ In practice, policy analysts operationalize the meaning of health insurance affordability in quite different ways, leading to different assessments of whether health insurance coverage is in fact affordable in different scenarios. For instance, experts from different disciplines and political ideologies were recently asked to define affordability in the context of hypothetical vignettes about household spending. The experts disagreed widely in their ratings of affordability and in the substantive criteria they employed. As the study authors noted, few of the experts explicitly provided a normative model justifying their choices (Muennig et al. 2011). In this section I argue that definitions of affordable health insurance should be grounded upon explicit normative principles. I review some recent approaches to defining affordability, and argue that they lack a principled basis for separating out those who can, and cannot, afford to pay for health insurance.

2.2.1. The Concept of Affordability

Statements about affordability express a relationship between the cost of a good and the resources available to purchase that good for some household (or more broadly, for an organization, or for society as a whole). In ordinary usage, when we say that good *X* is affordable for person *Y* we are making a descriptive claim about how people with different incomes and

¹ The word “affordable” appears in numerous policy speeches from the Democratic leadership, and in the Affordable Care Act itself. Just to provide a couple of illustrative examples of how Republicans use the term: Representative Joe Pitts (R-PA) told reporters in January 2012 that a “free-market alternative” to the ACA is “is much better as far as making health insurance affordable and available to everyone” (Haberhorn 2012) and Senator Charles Grassley (R-IA) wrote, “There's also widespread support for health insurance exchanges and for ending discrimination based on preexisting conditions to make coverage more affordable and accessible.” (Grassley 2009)

needs generally spend their income. For practical purposes, what we mean is that X is the kind of good that a person with Y 's budget could purchase without interfering with the income share that a person in that position would need to purchase a typical basket of goods over the long term (that is, would leave them with some discretionary income).² For instance, very few people would be inclined to say that I could afford a Cadillac Escalade (retail price \$63,170) even though it would literally be possible for me to purchase one if I were to withdraw all of my personal savings and liquidate all my possessions. If I liquidate my assets, I will not be able reliably to obtain a bundle of goods typical for someone in my position.

These colloquial statements about affordability do not imply any judgments about whether X is objectively worth having, let alone whether there is a social prerogative to ensure an equitable distribution of X . Although these statements are sometimes accompanied by value judgments, the two are distinct. For instance, some people may feel that they have good reasons to purchase goods that they cannot afford, even by their own definitions. Sometimes these reasons correspond to widely recognized needs. When a close family member requires emergency heart surgery, I may feel that I have good reason to scrape together all my savings in order to pay for the surgery. Other times these reasons may correspond to idiosyncratic preferences. The oenophile may decide that it is foolish for him to purchase a vintage bottle of Bordeaux since it will threaten his budget for other necessities, but decide nevertheless to make the purchase even if doing so forces him to sacrifice a balanced and satisfying diet. He is willing to scrape by on peanut butter because the pleasure he derives from drinking the wine is so great.

² Typicality judgments can apply to general categories of goods (rather than to specific goods). For example, a person may have an atypical kind of leisure like collecting vintage coins, but as long as she does not spend more on leisure overall compared to what is typical for her income, that expenditure would not be deemed unaffordable.

2.2.2. *Classical Approaches to Affordability*

Judgments about affordability in the policymaking arena are different. When policymakers assert that some good should be affordable for households, they are implying some value judgment about how society should distribute that good for households, or alternatively, a view about what burdens households should bear to obtain it. Within modern welfare economics, one of the clearest statements of this ideal comes from Richard Musgrave's *Theory of Public Finance* where he identified a class of goods that are, "considered so meritorious that their satisfaction is provided for through the public budget, over and above what is provided for through the market and paid for by private buyers" (1959, p. 13). Satisfying these "merit wants" of others may produce a positive social externality, but the main motivation in Musgrave's view is to provide others with goods that in some respect improve the wellbeing of those receiving the goods. Educating others is good for society, for example, but is also an "an essential part of democracy" and civic identity (ibid, p. 14). In some cases providing for "merit wants" may involve some interference with sovereign preferences, but this paternalism can be justified, Musgrave argues, if people lack a clear understanding of what is truly in their best interests.

The desire to see others receive goods that they would not otherwise purchase may also stem from a social aversion to certain forms of inequality. James Tobin expressed the view that: "the social conscience is more offended by severe inequality in nutrition and basic shelter, or in access to medical care or to legal assistance, than by inequality in automobiles, books, clothes, furniture, boats" (1970, p. 265). In essence, Tobin made the case for a limited form of egalitarianism that could warrant additional redistribution outside of the system of taxation and income transfers. Why are some goods worthy of specific egalitarian concern? According to

Tobin these are “necessities of life and health,” as contrasted with “luxuries and amenities” which might serve as prizes for people’s hard work and ambition (p. 266). Tobin was particularly concerned that in a market society, the better off could use their purchasing power to snatch up limited quantities of scarce resources, such as medical care, leaving only inferior goods for disadvantaged populations. He argues that under a ration-voucher system “everyone would be compelled to have the same medical insurance policy, and no one could obtain medical care except on the terms prescribed in the common policy” (p. 273).

Both Musgrave’s idea of “merit wants” and Tobin’s “specific egalitarianism” argue in favor of policies that protect access to health insurance, but their theories are difficult to adapt to current debates over affordability.³ Tobin’s own preferred policy prescription is a compulsory, single-payer health insurance system, which would arguably entail much broader reform than what is laid out within the ACA framework. Musgrave does not lay out any single policy, but his view may not require any policy other than what people might be inclined to provide as a matter of altruism. Tobin’s goals are very broad and ambitious, but it is unclear which ethical principles ultimately justify his view. As noted, the clearest principle that Tobin articulates is that society should protect those goods that are “necessities,” a category which covers food, housing, and medical care. But how extensively should we define necessities – he clearly is thinking of something broader than subsistence, but how much broader? A second, related, challenge is determining what we can ask people to give up for necessities. Does Tobin’s framework forbid

³ It is worth noting that both Musgrave and Tobin shared a concern with integrating fairness and efficiency in the same welfare economics frameworks. These frameworks included a theory of public goods, utilities, externalities and so forth. There is less interest in developing a unified framework in the field today; efficiency and equity are measured on their own. I thank Tom McGuire for pointing this out.

imposing cost-sharing on non-poor families with some disposable income? Determining how to fairly share the cost burden for this group is central in the current debate.

2.2.3. Current Approaches to Affordability

The last few years have seen several proposals to define affordable health insurance. One approach is to designate health insurance as one component of a “socially acceptable” minimum package of goods, a term which in practice is more limited than Musgrave and Tobin’s conception of merit goods. Bundorf and Pauly (2006) used nationally representative survey data from the 2000 Medical Expenditure Panel Survey and insurance premiums quotes from brokers to simulate the fraction of people that were currently uninsured that could pay for the premiums while obtaining a minimally adequate bundle of goods. They illustrated that if we take the federal poverty line as a proxy for a minimally adequate bundle of goods,⁴ then a large majority of people that are currently uninsured could in principle purchase insurance coverage on that budget. But once we raise the minimal budget to two or three times the federal poverty level, a much smaller fraction of the uninsured can afford health insurance. In a similar vein, Jonathan Gruber and David Seif (2009) used data from the Consumer Expenditure Survey to estimate how much “room” different households have in their budgets for health care spending. The reference budget was based on goods deemed essentials including childcare, food, housing, taxes, and transportation. The authors did not provide any justification for why only those goods are essentials, or why only “essential” goods should be protected from health spending.

⁴ The current federal poverty line is, in fact, based on the “thrifty budget,” a formula based on 1960s prices for housing and food, plus an allowance for other goods, that was created by Mollie Orshansky, an economist working for the US Department of Agriculture (Fisher 2008).

One common objection to these minimal budgets is that they are too demanding – they withhold subsidies from families until those families have spent down their income to a level just above subsistence. This position is widely seen as inadequate, but there is no consensus among analysts about what the “correct” reference budget should be. In the recent study reported by Muennig and coauthors (2011), the policy experts could not come to an agreement on what kinds of expenditures should be protected for the purpose of affordability policies. According to Katherine Swartz (one of the experts involved in the process), rating the affordability of hypothetical vignettes required making many imperfect assumptions about the spending needs and resources of different households. Swartz (2011) reflects that in the face of uncertainty about which families would need special exemptions, she and other experts believed that it would be more straightforward and fairer to apply a simple percentage-of-income rule:

“The percent-of-income rule does not give preference to some types of expenses or life circumstances and not others. We might all agree that the cost of child care or the amount of income given to help support aging parents deserves to be deducted from a person’s income before deciding what the health insurance assessment should be. But then the problem becomes deciding on a maximum amount that can be deducted for child care or income support or any other exception item” (p. 856).

Of course, such an approach might not be sufficiently sensitive to differences in needs across households, which requires further modifications to the rules. Swartz imagines this might be addressed using some additional appeals process. Ultimately, implementing such a process requires that we develop a clear concept of what a reasonable burden would be for any household. Although experts expressed opinions about goods that people should have access to as a matter of principle (for example a car or some savings), “attempts to bridge the gap by

formulating general principles that might guide the definition and application of affordability were surprisingly tentative” (Muennig et al. 2011, p. 839).

One of the few recent scholars to articulate a principled basis for affordability is Carla Saenz (2009). Saenz’s basic proposal is to define a set of goods that should be protected from health insurance spending burden because those goods are of comparable moral importance to health insurance. She argues that agents could deliberate about which goods are fair to ask households to sacrifice in order to purchase health insurance from an impartial perspective. To model this, she suggests using a Rawlsian veil of ignorance (making a choice without knowledge of one’s particular social position or preferences). From such a standpoint, Saenz argues that there would be wide societal agreement that comparable goods would include education, housing, nutrition, employment or engagement in a productive meaningful activity, safety, and affiliation. These are all goods that “make it possible to sustain oneself and develop oneself intellectually and emotionally, regardless of one’s plan of life” (p. 408). This argument has a particular relevance to situations such as an individual mandate under which some low-income families will be required to dig into their own pockets to pay more for their own health insurance than they would elect to spend in the absence of a mandate. Families can reasonably complain about these demands, according to Saenz, only if they are asked to sacrifice some of the protected goods (of course, families might also need some time to adjust to the new burden of health spending if previously they had not been spending anything on insurance).

Saenz’s argument provides a sounder basis for policy than other accounts because it links policy deliberations to a compelling interest of social policy: namely, ensuring that households can pursue different goals and projects that are of high value to them. Norman Daniels and I argued that this motivation is consistent with the ideal of FEO, especially if opportunity is

interpreted to broadly encompass the ability to pursue a reasonable plan of life (Saloner and Daniels 2011). Although Saenz suggests that health insurance is one of several goods that have a fundamental value for many different life plans, she does not articulate what the intrinsic importance of insurance might be. This leaves a substantial gap in her otherwise plausible argument. *In what way does social protection of health insurance costs make society fairer overall?* Knowing the answer to this question would clarify the scope of a societal obligation to protect affordability, even in a world in which purchasing insurance is not mandated. Section 2.3 shows how to develop the theoretical foundation for such an argument on a broad principle of FEO, and Section IV illustrates how we can assess its partial realization in the non-ideal case.

2.3. Affordable Health Insurance within an Ideal Theory of Justice

In this section I lay out what I believe is the most plausible theoretical argument for subsidizing health insurance. The normative principles underlying this argument can be traced back to a social contract theory of justice, particularly Rawls' theory of justice as fairness. Rawls was concerned with deriving principles of justice to govern "the basic structure," the major economic and political institutions. He argues that these are the principles that rational people would pick to govern their society from an ideally fair standpoint (the original position). As I describe shortly, Norman Daniels extended Rawls' argument by showing how a theory of justice could address inequalities caused by disease and disability (departures from normal functioning). While modifying one idealizing assumption – that everyone is in perfect health – this argument still was presented against the backdrop of an ideal theory of justice. In a recent essay, Norman Daniels and I argued that such a theory of justice for health could be extended to encompass a

concern not only with the impact of health insurance status on physical and mental health, but also the impact of out-of-pocket spending on financial security (Saloner and Daniels 2011). I extend and refine that view in this section, still operating within the framework of an ideal theory. In Section 2.4, I sketch out how this theory could be adapted to a non-ideal setting, such as the contemporary United States in which welfare institution states are much weaker, and inequalities much larger, than would be permitted under Rawls' principles.

2.3.1. Rawlsian “Justice as Fairness”

Rawls argues that political and economic institutions should be constructed on terms that fairly recognize the contribution of different members of the society. In particular, he argues that we should imagine a hypothetical choice situation in which members of society chose principles of justice from a standpoint that represented one another as free and equal citizens, interested in seeking terms that would be fair to each person. This ideal was implicit in a *Theory of Justice*, but was most clearly articulated in the *Restatement*: “the rules of background institutions required by the two principles of justice (including the difference principle) are designed to achieve the aims and purposes of fair social cooperation over time” (2001, p. 52). How do the two principles of justice realize the aim of fair social cooperation?

The principle of FEO is intended to constrain the adverse effect that disadvantages in the social and economic background have on the development of natural talents and abilities. In order to allow equally talented people to compete and cooperate on equal terms, it is necessary to raise their skills up to a level where they can fully exercise their natural talents and abilities.

Rawls states: “those who are at the same level of talent and ability, and have the same willingness to use them, should have the same prospects of success regardless of their initial place in the social system” (1971, p. 63).⁵ The public provision of different resources, such as preschool, safe housing, and universal primary and secondary school are widely recognized as advancing the goals of FEO. By providing children with literacy and critical thinking skills it is more possible (but not guaranteed) that disadvantaged children can pursue a broad set of careers and positions.⁶

Although comprehensive FEO would substantially narrow the opportunities between equally talented disadvantaged and advantaged households, a principle of justice would also need to mitigate the effect that differences in natural talents (and other morally arbitrary differences) would have on differences in income and wealth that would occur between more and less talented individuals. The principle of FEO is thus supplemented by the Difference Principle (DP). The DP acts as a constraint on inequalities and wealth in a fair society, requiring all social and economic inequalities be arranged in order to maximally benefit those in the worst off societal group.⁷ The presence of a DP is important in an ideal theory because it raises the share

⁵ The intended contrast is with a principle of *formal equality of opportunity*, which merely requires that institutions do not discriminate among qualified candidates (by preventing entry among, say, women and minorities). According to Rawls (1971), formal equality of opportunity is one requirement of justice, but it is not by itself sufficient to meet the societal obligation to level the playing field between people from disadvantaged and advantaged backgrounds.

⁶ Rawls acknowledges that even in the ideal theory a principle of FEO will be limited by inequalities stemming from the kinds of peers and family influences to which children are exposed. He says, “the extent to which natural capacities develop and reach fruition is affected by all kinds of social conditions and class attitudes. Even the willingness to make an effort, to try, and so to be deserving in the ordinary sense is itself dependent upon happy family and social circumstances” (1971, p. 64).

⁷“Luck egalitarians” might wish to go even further than a difference principle. They believe that people should be insured against only those misfortunes that stem from a bad draw in the natural lottery. On this basis, they could argue for policies that completely equalize the wealth of those that were born with good fortune and those that have unchosen misfortunes (such as a lack of natural talents), even if doing so does not maximally benefit the untalented. A leading example of health care luck egalitarianism is Segall (2009).

of resources available to those in lower-income groups beyond what they could secure on the basis of FEO alone, ensuring that economic institutions are structured to provide the largest possible share for those at the bottom.

2.3.2. Extending FEO to Health Care

There is no discussion about health care or public health institutions in Rawls' early work on justice. To simplify matters, Rawls initially abstracted away from the impact of ill health on the opportunity of individuals by supposing that all members of society were healthy across the lifespan. In reality, poor health and disability have a significant, and unequal, impact on the functioning of individuals. In several seminal papers, Norman Daniels argued that health care has a special moral importance because of its role in addressing objectively important needs. Specifically, impairments of functioning caused by diseases reduce the access that individuals have to the normal opportunity range (NOR) in a society, "the array of life plans reasonable persons in it are likely to construct for themselves" (1985, p. 33). The content of the NOR itself is defined by other fair distributive principles of justice within the limit of societal resources and development. For example, in some industrialized societies, the chance to pursue a career in nuclear physics is part of the NOR, but not in less developed societies. An individual's fair share of the NOR are those life plans for which he or she would be qualified to pursue were the individual healthy.

Daniels broadens the Rawlsian conception of FEO in two important ways. First, Rawls originally described FEO as a principle targeting economic and political positions such as access to higher education, careers, and political offices. Daniels takes the concept of FEO, as it applies to competition for careers and offices and generalizes it to the ability to pursue a reasonable plan

of life. A reasonable plan of life often includes career goals, but also extends beyond the labor market and working years to encompass pursuits such as raising a family or enjoying a healthy retirement. Second, because of the strategically important role of health care in protecting FEO, health care programs are added to institutions such as education that have a special claim to be delivered to everyone regardless of their social status or earning abilities. This contrasts with other primary social goods, such as income, which (as noted) might be distributed unequally under the DP in order to provide maximum benefit to those in the least well off position. Health care services (and by extension health insurance) should be designed so as to restore for people their fair share of the NOR through prevention, treatment, and rehabilitation. They do not eliminate differences in life prospects between people, but they are charged with restoring normal functioning to the extent possible,⁸ that is, “they act to minimize departures from the normality assumption” (Daniels 2008, p. 62).

2.3.3. Further Extending the FEO Argument to Health Insurance Affordability

In my recent essay with Norman Daniels, we argued that a general principle of FEO could be further broadened to account for the financial impact of health insurance on opportunity above and beyond its impact on physiological health (Saloner and Daniels 2011). A key premise in this argument is that even where the physiological effects of a health condition on opportunity are modest, the impact of medical expenses on family finances can seriously impede the ability

⁸ The limits of medical interventions depend in part upon what treatments are available through an adequate benefit package in a health insurance scheme. Daniels (2008) argues that setting the content of this benefit package requires making fine-grained judgments where a principle of FEO is indeterminate and another fair deliberative process may be required.

of household members to pursue opportunities such as saving for retirement (Cook et al. 2010). Moreover, the financial impact of poor health on opportunity often extends from a sick person to other members of the household that are providing care for the person, such as the parents of a child with a chronic health need (Shattuck and Parish 2008). This point was not explicitly made in Daniels' earlier writings, but it is consistent with a concern for the negative effects of poor health on the range of opportunities that individuals are able to pursue.

How should we address the impact that health needs have on financial opportunities above and beyond the impact that they have on normal physical and mental health functioning? We should treat the unequal distribution of health care spending as a departure from FEO, which by itself acts a barrier to an individual's fair share of the NOR. To correct for this unequal burden, we should design health insurance institutions that minimize the impact of health spending on opportunity. Within an ideal theory, this would mean ensuring that health care costs are pooled across all groups so that those with larger health needs are not hampered by health care costs in the pursuit of their life plans. Pooling costs between the sick and the healthy – community rating – achieves part of this goal, but does not address the unequal impact of spending on premiums across the income distribution. The European principle of social solidarity, mentioned in the introduction, would be one framework for realizing the broader goal since progressively financed, state-run health insurance uses the tax system as a way of fairly sharing the burden of health spending. Copayments at the point of service can also be incorporated into this system, but only if the burden of such payments does not take away money from a household's budget that they would use to purchase goods connected to opportunity.

The same principle can be applied to a system that relies on a regulated private insurance market rather than a single-payer public model. Such a system would need to incorporate various

implicit and explicit subsidies to neutralize not only the unequal costs of health spending for different groups, but also the unequal impact that those costs would have on opportunity for households across the income distribution. In other words, we would need to consider health spending in relation to those goods that are used to secure opportunity. The question of how much to subsidize would thus reduce to how much money would be required to ensure that a household could purchase the total set of goods required to protect access to their fair share of the NOR. I call each of these goods an “opportunity good” and the cost of purchasing the entire set of goods (“the opportunity set”) that protects the fair share of a household’s NOR is the “opportunity budget” (OB). The OB simply represents one way of ensuring that people can obtain a basket of goods that protect FEO using private markets rather than state-run institutions.

For the sake of illustration let us assume that the Smiths, a disadvantaged household, only have a claim to three opportunity goods: education, food, and health insurance. The complete bundle of those goods – the OB – costs \$30,000 per year (\$10,000 for each good). The Smiths have an income of \$20,000 per year, and pay no income taxes. If the state opts to let the market provide each of these three goods, then the Smiths would need an additional \$10,000 to purchase their opportunity goods. There are multiple ways in which this subsidy could be allocated: as a \$10,000 lump sum payment, as two separate vouchers of \$5,000 each for education and health insurance, and so forth. Alternatively, the state could directly provide universal primary and secondary education, which would wipe this expense off the balance sheet of the Smith family, leaving them with enough income to purchase the other two goods. The general point is that the amount of subsidization required for a specific good depends not only on the total cost of attaining the goods in the OB, but also on the degree to which the state is subsidizing other opportunity goods. In a country like Sweden where the state directly provides many opportunity

goods such as preschool and college education, less income is needed in order to attain the remaining goods in the market. Of course, taxation matters: if the Smiths are now taxed \$5,000 per year to pay for welfare state programs, they will need an offsetting voucher at the point of purchase.

As one might surmise, many other factors could change the size of the Smith family's entitlement to a subsidy under an ideal theory: a change in their economic resources, a change in their needs, a change in the prices of opportunity goods in the market, or (most unusually) a change in their innate talents and skills. If, for example, a member of the Smith household unexpectedly requires an additional \$20,000 of cancer treatments not covered under their health insurance, but the family's income remains fixed, they will require an additional \$20,000 in subsidies. What is essential is that households with equal talents and skills receive equal consideration to pursue their chosen plan of life. The fact that all components of an OB derive from a common goal of promoting FEO provides a much more coherent and principled way of establishing a reference budget than other approaches described earlier. In considering the justification for each subsidy, policymakers could ask whether providing the subsidy is likely to foster the development of talents and skills and prepare individuals to face socioeconomic challenges at each stage in the life-course.

How does the FEO respond to challenges at each stage in the life-course? One potential concern might be that the account is optimally designed to aid younger adults and children – whose opportunities are “ahead of them” – but does not provide a rationale for subsidizing the insurance of older adults who arguably have already developed their talents and skills. This concern can be allayed, however, by recognizing that the ability to pursue a reasonable plan of life encompasses long-term plans such as a financially secure retirement. Older adults continue

to maintain an interest in remaining active, engaging with family, and in some cases may desire some continued employment. The ability to exercise choice over these options requires the financial security provided by health insurance. This framework reaches far beyond a “social minimum” budget (like Gruber and Seif), by providing goods such as post-secondary education that *both* protect against deprivation and promote personal development and mobility.

To briefly summarize, in this section I developed a criterion for allocating subsidies for health insurance in an ideal theory of justice: subsidies should neutralize the unequal impact that health insurance spending would have on an individual’s fair share of the NOR. A FEO account does not preclude the use of private markets as a means to deliver opportunity goods, but it does require that households receive vouchers equal to what they would have received in financial protection from a single-payer system. These payments supplement what households would already be entitled to under the DP, and so it is plausible to believe that a voucher subsidy system could achieve the objective of comprehensive FEO between equally talented individuals, regardless of their household income. This assumption is not plausible in non-ideal settings, but the basic framework still applies, as I illustrate in the next section.

2.4. Affordable Health Insurance in a Non-Ideal Setting

The ACA represents one of the most redistributive social policies since the war on poverty of the 1960s (Leonhardt 2010). However, outside of health insurance, many social welfare programs have stagnated, and some programs that serve families close to the poverty line have actually contracted in recent decades. A prominent example is cash assistance for low-income women and children which became time-limited and difficult to acquire after 1996 (Garfinkel et

al. 2010). This dramatically reduced the number of households claiming benefits. At the same time, social inequalities have grown in many different domains including income inequalities and racial and ethnic inequalities in educational attainment, incarceration, and political participation (Western 2006; Duncan and Murnane 2011; Bartels 2010). The result is that families are moving farther apart in social and economic opportunity, and the welfare state is providing increasingly fewer resources to buffer the impact of socioeconomic polarization. Within this highly unequal environment, health insurance subsidies can have an important impact on access to certain opportunities, but cannot ensure total access to a household's share of the NOR.

Norman Daniels and I acknowledged this reality, but did not define a scaled-down target for subsidy policies under a principle of FEO. Here, my general suggestion is that the target should be access to the "basic opportunities" that a household would have enjoyed in the absence of out-of-pocket spending burden. As noted in the introduction, this account does not equalize all costs. Rather, it restricts redistribution only to those factors that are causally connected to a principle of FEO. Basic opportunities encompass factors connected to financial security or social development in our society. Often, but not always, these factors are linked to upward mobility for lower-income households, or alternatively, reduce the risk that a middle-income or poor household will experience downward mobility. This includes some post-secondary education, assets (including retirement savings), and stable employment. The burgeoning literature on the intergenerational transmission of socioeconomic status suggests that these factors are all significant in determining whether poverty is passed from parents to their children (Isaacs et al. 2008). The chance to move from poverty into the middle class is only one aspect of FEO.

Arguably, however, the chance to experience upward mobility would be realized in a society where individuals in all groups were able to develop their talents and skills.

The OB in the non-ideal setting becomes the amount of money required to secure access to the set of basic opportunities. It is quite difficult to define all the elements in the basic opportunity set; they vary in relation to the specific needs of a household and to changing social and economic context (for example, computer literacy is a component of the opportunity set today, but was not thirty years ago). For the purposes of setting health insurance subsidies, we are most interested in those elements of the OB that are causally connected to health insurance spending risk. That is, to fully implement the OB approach we need to have a clearer sense of what opportunity goods would be likely to be crowded out of a household's budget by health insurance spending. I will not attempt to stipulate all of these goods here. Instead, I take it for granted that we could at least specify some of the most important candidates (childcare, job training, access to postsecondary education, safe housing, transportation, saving for retirement, access to credit to start a small business, and so forth), and focus more on what a subsidy policy should do by way of these basic opportunities (whatever they are).

Once we have a clearer sense of what basic opportunities are at risk we can identify how much of a subsidy a household will require. Subsidies should be set in such a manner that a household can purchase a comprehensive health insurance package without losing any basic opportunities that they would have otherwise enjoyed. In many cases, this will entail one hundred percent subsidization of health insurance, since some poor households make direct tradeoffs between health insurance spending and basic opportunities. On the other hand, this does not mean that health insurance has to be provided free of charge to everyone. As income increases households have more room in their budgets to purchase goods that increase their

utility such as entertainment, but do not increase any basic opportunities.⁹ Some moderate-income households can pay for at least some of their coverage if it means giving up certain amenities. In other cases, some households may need to transition from consuming higher to lower quality goods (such as moving to a less expensive apartment or purchasing cheaper foods). Both giving up luxuries and giving up higher quality goods represent sacrifices to the quality of life for these families, but it is justifiable provided the family does not give up basic opportunities and if the households have adequate transition time to adjust their budgets.¹⁰

The benefits of subsidies will vary across a population of disadvantaged people. The most obvious beneficiaries of such a policy are households that would have spent much of their income out-of-pocket on health services before such a policy; this group includes uninsured people that pay providers directly and households that scrape together money to pay for insurance in the individual market. Receiving a subsidy would be a major windfall for these households, allowing them to use money spent on essential health services on other basic opportunities. Indeed, a subsidy may not alter the health services use patterns of these families (technically, they have a price elasticity of demand close to zero), but they would experience substantial non-health gains because of the additional resources to purchase other opportunity goods. Alternatively, some uninsured households may completely avoid using medical services without a subsidy. These households, too, would benefit from subsidization if they had been delaying preventative or urgent medical treatments (to say nothing of the increased peace of

⁹ When they make their own choices, these households may still opt not to purchase health insurance, in which case there may be grounds for imposing a mandate to ensure that they contribute to their own care and to the care of others. This is a complicated issue, which I cannot fully explore in this essay.

¹⁰ Katherine Swartz (2011) argues those households may need a transition period with higher subsidization in order to adapt to the new demands on family budgets imposed by cost-sharing.

mind that comes with being insured against unpredictable losses). The primary benefit in these cases would come from reductions in future disease and disability, even if they do not experience any improvement in their access to non-health opportunity goods. Even young, healthy individuals who have no current health needs receive protection against unexpected accidents.

2.4.1. Objection: Subsidies Do Not Provide Equal Benefits to the Needy

Although virtually everyone benefits from subsidized insurance, it might be seen as unfair that some households stand to benefit *much more* from health insurance than others that are equally needy. Consider the following example: the Johnsons and the Wilsons are both two-parent families with a single child who is a high school senior earning good grades. Both families earn around \$50,000 per year, and do not qualify for any major means-tested programs in their state, both lack health insurance. The child in both families has been accepted to one college, which costs \$20,000 per year. Both families are confronting obstacles that would prevent them from sending their child to college if the obstacle is not resolved. The Johnsons inherited a college fund for their child of \$80,000. However, the mother was just diagnosed with Stage III breast cancer, and the treatment costs \$80,000 over four years to be paid out-of-pocket. Effectively treating the cancer would eliminate the college nest egg. The Wilsons have no savings, but they also have no pressing medical needs. In their case, the inability to send their child to college reflects their lack of savings and an income that is too low to finance affordable loans.

From the standpoint of FEO, these families are in parallel situations. In each case, the child is prevented from gaining access to a basic opportunity because of family disadvantage. In both

cases, an additional \$20,000 of income per year would make the difference between attending and not attending college. The only difference is that the Johnson family had a stroke of good fortune (inheriting college money) that was offset by a stroke of bad fortune (developing a costly illness). As a matter of overall fairness, there is no reason for aiding one family and not the other. Yet, if opportunity-protecting health insurance subsidies were implemented without simultaneously improving other social policies, only the Johnson family would receive a chance to pursue the opportunity to send a child to college. *Does the Wilson family have a legitimate objection against this system? Are they not entitled to a different system, in which all shortfalls of opportunity receive equal consideration?*

My response is that this outcome is indisputably unfair, but the unfairness is not necessarily caused by the presence of a health insurance subsidy. Rather, the unfairness arises from a societal failure to mitigate non-health barriers to success as much as they mitigate those that stem from health problems. Put differently, what is objectionable is not the inequality between the two families that results from the subsidy. The world would not be fairer if *neither* family were helped. The only grounds that the Wilsons would have for complaining about the Johnsons receiving a subsidy would be if that subsidy actually made the Wilsons worse off. That is, if aiding the Johnsons came at the expense of aiding the Wilsons. This could be true if society was pressed up against an immovable resource constraint. This could be a financial resource constraint: where it is feasible to raise funds to address non-health needs or to raise funds for health insurance subsidies, but not both. Or it could be a political resource constraint: where it is only possible to marshal political support for health insurance or for other kinds of social programs, but not for addressing both issues. Were either of these conditions to be true then it

would be open to those that did not receive protection to complain that their opportunities were crowded out.

So, is a failure to adequately protect other non-health opportunities in the United States a consequence of overly generous health insurance policies? Some pieces of evidence might support this claim. For example, health care programs comprise the fastest growing portion of the federal budget, and at current rates, the Medicare and Medicaid programs will overtake all other federal non-entitlement spending (CBO 2011). It is claimed that without slowing the growth of health entitlement programs in the long term, there will not be adequate funds for other kinds of domestic spending such as infrastructure development and human services (White House Fiscal Commission 2010). At the state level, Medicaid spending is the largest item in many budgets, and legislatures have cut back on education, public safety, and infrastructure in order to meet their health care spending obligations (NGA 2011). That said, it is not necessarily true that if the government spent less on health care, that it would spend more on other programs. Savings from cutting health care for low-income populations might instead go toward tax cuts for the wealthy. Moreover, it may be possible to increase the efficiency of health care delivery, such as limiting the use of wasteful or redundant procedures. These issues exceed the scope of this paper. My only point is that the burden of proof is on those that object to the Johnsons receiving a subsidy in the current system to show that their receipt of the subsidy is the underlying reason why some other deserving group is not aided. This is a high burden of proof.

2.4.2. Objection: We Might Be Able to Do Better, Even in Non-Ideal Settings

I close this section by considering a different kind of objection against the basic opportunity framework. To recap, I argued that subsidization policies under the basic opportunity approach should meet two conditions. First, subsidies should be sufficient to ensure that households can purchase health insurance while still obtaining those basic opportunity goods that they would have otherwise enjoyed, and second, the overall distribution of subsidies should leave no household worse off with respect to basic opportunities. The common connection between these two principles is that no household is forced to sacrifice basic opportunities in the name of purchasing health insurance. For example, I argued that the hypothetical Johnson family should receive an insurance subsidy large enough to cover their cancer care and protect their child's college fund, provided that subsidies under such a program would not leave the Wilsons (and others like them) in a worse off position.

One might object that non-ideal theory should expand redistribution beyond what would be provided under a principle of basic opportunity. If, as I argued, the status quo is profoundly unfair, why not use subsidies to the greatest possible extent to redistribute resources to the poor and the sick in order to realize the fairest distribution of resources under current constraints? In particular, why not increase subsidies to low-income families that would otherwise be required to give up goods that are outside of their opportunity budgets, such as entertainment or nicer quality clothing, food, and cars in order to purchase health insurance? After all, one might argue that under a fairer income distribution these are the kinds of goods that many low-income families would be able to obtain while still having money left over for basic opportunity goods.

This is ultimately a question of scope. One view, rooted in welfare economics, is that subsidies are simply one of several policy levers that could bring about the fairest possible distribution of resources. On this view, we can rank different possible states of distribution

according to some principles of justice that correspond to a social welfare function. Once we have identified the most equitable social welfare function, subsidies can be used to bring about an allocation of goods that is incrementally closer to this outcome (even if the most fair outcome is ultimately not attainable). If an additional dollar subsidy to a disadvantaged household is both feasible and would lead to a fairer income distribution, then there would be strong grounds to provide that additional dollar.

In response, I would argue that even if we could identify the fairest possible distribution under a non-ideal theory (which would itself be difficult to show), there may be strong grounds for maintaining a conceptual separation between redistribution in the name of FEO and redistribution in the name of the Difference Principle (or whatever other principle one thinks should govern residual inequality). On the Rawlsian view, protecting goods like health insurance that determine FEO holds a greater importance than providing goods that increase wellbeing or social position independent of opportunity. The distribution of resources through public programs can of course contribute to the secondary goal of income redistribution, but such redistribution should be justified on its own terms, not tacked onto a framework focused on equality of opportunity.

To the extent that we might want to “stretch” the basic opportunity framework in a non-ideal setting, it might be to broaden the set of opportunities available to households beyond basic opportunities. That is, if we could identify some goods that were connected to comprehensive opportunity, but beyond the limits of basic opportunity, it would be consistent with the FEO framework to subsidize those more expansive opportunities if there were available resources to achieve this objective. It is not clear how great the mismatch would be between basic and more comprehensive opportunity, however. Both of these opportunity ranges are defined in relation to

other institutional realities – the basic opportunity range depends, among other things, upon certain facts about economic mobility and the labor market in an unequal society; the normal opportunity range in an ideal society depends upon the state of that society’s institutional development (such as what kinds of careers are possible). I have not attempted the very ambitious task of trying to define either of these opportunity ranges, so I cannot say with certainty how much further it might possible be to use subsidies to move beyond basic opportunities in the name of FEO. For now, the basic opportunity approach is the most internally consistent and realistic objective for subsidization policies.

2.5. Conclusion

In this essay, I tried to pin down the elusive concept of health insurance affordability, and to develop a normative criterion to ground subsidy policies. I criticized existing efforts to define health insurance affordability that are not tethered to an explicit normative foundation, since these definitions do not provide a principled and consistent method for allocating subsidies across different households. As an alternative, I developed an argument for establishing subsidies on the basis of FEO. I argued that under an ideal theory, subsidies should be set in such a way that they ensure access to a household’s fair share of the NOR. In non-ideal theory, this account would be modified to focus on ensuring that subsidies protect specific basic opportunities that would otherwise be crowded out by health insurance spending.

My account pushes the discussion forward in two important ways. First, it moves us beyond the “cross sectional” view of health policies, where we simply ask how much a policy changes the set of resources that a household is able to use at a point in time. Instead, the account

I offer prompts us to ask how a set of resources that are protected by a policy would be used to promote future opportunities. The OB concept enables us to focus on a causal chain that begins with health insurance spending and culminates with a reduced set of opportunities, impacting people's development and choices over the life course. For example, rather than judging the adequacy of a household's budget based on some arbitrary cutoff (such as the ratio of health spending to income) we can ask whether a particular level of health insurance spending is likely to impact the ability of a household to secure an important opportunity good such as a college education, which in turn would impact the prospect that the child would experience social mobility.

Second, and relatedly, my account provides an integrated perspective for simultaneously considering different ways in which health policies impact equality of opportunities, taking into account their role in both promoting physical and mental health and reducing financial burden. Both of these issues factor into policy justifications, but their common link is rarely articulated. The reasonable tradeoff argument from Carla Saenz, which I described briefly in Section 2.2., moves closer to this objective by focusing on the opportunity cost of health care (specifically, the loss of goods such as education, nutrition, and social affiliation deemed to be of comparable moral importance to health care). This account does not, however, attempt to connect these diverse interests that people share to an overarching theory of justice. Saenz is more interested in exploring under what conditions households should contribute to their health care than exploring why health care is a good with special moral importance or how subsidies increase fairness overall. One of the objectives of policy analysis should be to help us to understand how much different initiatives are moving us toward a fairer society, even in a highly unequal context.

Based on the criterion that I sketched in Section 2.4., we can draw some preliminary conclusions about the fairness of the subsidies under the ACA. First, the ACA makes substantial progress toward both protecting affordability and promoting physical and mental health. The exchange subsidies clearly improve the status quo, but some obvious gaps remain. For example, the phasing out of subsidies at 400 percent of the poverty level can be criticized. A family of three earning the equivalent of \$75,000 would not be eligible for any subsidies, and might well struggle to pay the full cost of insurance premiums and out-of-pocket spending, even in a regulated insurance market. Another example is the affordability standard for employer-sponsored coverage. According to the legislation, households can only opt out of employer coverage to purchase coverage on the exchanges if the employer premiums cost more than ten percent of their household income (KFF 2011a). For households with lower incomes, this can represent a substantial sacrifice (especially relative to the exchanges). Future legislation might create greater parity by offering some additional tax credits to households purchasing employer coverage. Other policy reforms for households purchasing coverage on the exchanges might include creating “income disregards” for specific investments connected to basic opportunities, such as college savings so that money put aside toward promoting those opportunities would be protected from health spending.

To establish how far the ACA would have to be tweaked in order to meet the goal of protecting basic opportunities we should measure how the legislation shifts access to different opportunity goods. Currently, the answer to this question is unknown. We know, in a general way, that exposure to health care spending leads to negative financial consequences ranging from unpaid bills all the way to bankruptcy (Himmelstein et al. 2009; Finkelstein et al. 2011). We do not, however, have reliable estimates of how large these negative outcomes will be reduced by

subsidized coverage for the population that would receive subsidies in the ACA. This is an unresolved task for research. Part of the evaluation of the ACA going forward will be to collect data from well-designed studies. It is important to gather repeated measurements of household income, investments, and consumption on the same populations before and after the expansions goes into effect, and to identify comparison groups in order to understand how family finances change with and without subsidies on the exchanges. Using this information, policymakers can assess the extent to which the ACA bridges the affordability gap for various households that are struggling to pay bills.

These incremental steps represent the “art of the possible,” potential reforms that could improve the fairness of our policies within a political framework that is generally hostile to expanded redistribution. This hostility comes from many directions. Even if the ACA survives the current challenge in the U.S. Supreme Court, augmenting the legislation will be difficult in the next few years. The current Congress has shown no enthusiasm for increasing revenue (for example by raising taxes on high income earners or closing tax loopholes), nor for reforms to slow the growth of low value medical spending (including reducing use of costly medical technologies and procedures that produce limited health gains) (Baily 2012). At the same time, the states are reducing aid to low-income families. For example, many states are now increasing tuition and reducing aid substantially at publicly funded four-year colleges (Webley 2012). The burden of these reforms will fall most heavily on lower and moderate-income families. Within this constrained set of possibilities, it may be that there is currently little room to maneuver toward fairer policies. Nevertheless, the realm of possibilities need not remain fixed. Broad-based policies create momentum toward reform, which can lead to greater advocacy and support on the part of those that benefit from the policies (Campbell 2003). As designed, the ACA would

begin enrolling millions of uninsured individuals into subsidized coverage in January 2014.

Increasing the visibility of such policies may strengthen the moral argument for health reform, and increase future support for policies that promote social and economic mobility.

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Chapter 3

The Impact of Long-Acting Medications on Attention-Deficit/Hyperactivity Disorder Treatment Disparities*

3.1. Introduction

Long-acting formulations of stimulant medications have been the fastest growing pharmacotherapy among children diagnosed with Attention-Deficit/Hyperactivity Disorder (ADHD) since the late 1990s (Fullerton et al. 2012). These medications have displaced shorter-acting treatments that require two or more daily administrations (Stein 2004). Simplifying medication treatment makes it easier to establish a treatment routine, leading to more habitual and automatic use (Chacko et al. 2010). Long-acting medication users have shown increased adherence compared to short-acting users (Adler and Nierenberg 2010). While long-acting medications offer broad benefits to all children diagnosed with ADHD, their impact on racial/ethnic disparities is unknown. Black and Hispanic children with an ADHD diagnosis are less likely to utilize stimulant medications than non-Hispanic whites (Chen et al. 2009; Winterstein et al. 2007), and those that initiate treatment are more likely to discontinue treatment (Marcus et al. 2005).

In theory, new technologies that simplify treatment could disproportionately benefit minorities and reduce disparities in outcomes (Goldman and Lakdawalla 2005). Factors that

* This chapter comes from a paper coauthored with Catherine Fullerton and Thomas McGuire

contribute to low medication adherence, such as dysfunctional schools, irregular parental work schedules, and lower social support, are prevalent among minority children with ADHD (Bussing et al. 2003; Guevara 2005). Literature on ADHD medication use among minorities emphasizes cultural norms that contribute to lower medication adoption (dosReis et al 2006; Eiraldi et al. 2006), yet it is also likely that that some minority families are willing to start a child on medication but fail to continue treatment because of difficulty adhering to the treatment regimen. By simplifying dosing schedules, new treatments can reduce the social and environmental stressors that lead to non-adherence.

On the other hand, treatment innovations could increase disparities. Because of better access to care, whites often adopt new medications before blacks and Hispanics for many conditions (Lleras-Muney and Lichtenberg 2002). This could be explained by numerous factors. Minority children are more likely to reside in medically underserved communities and to receive treatment from community clinics (Galbraith et al. 2010). Providers serving minority children with ADHD have reported that they were overburdened and not able to keep abreast of the latest developments in treatment (Guevara et al. 2005). Geographic segregation may reinforce disparities since mental health treatments diffuse through peer groups of providers (Gotham 2004). In addition, exposure to direct-to-consumer pharmaceutical advertising is higher among whites than minorities (Avery et al. 2008), which could lead to greater demand for new medications.

In this study we use Medicaid claims from fiscal years (FYs) 1996 to 2005 to examine disparities in medication utilization and adherence following the introduction of long-acting medications among a diverse population of children in Florida. We address three questions. First,

were minorities initially less likely than whites to receive long-acting medications, and if so, did the gap narrow with time? Second, can we explain the racial/ethnic utilization gap by adjusting for demographic, geographic, and provider-level factors? Finally, what were the implications of long-acting medication diffusion for adherence? We test two hypotheses: that minorities would be slower to adopt long-acting medications than whites due to geographic and provider-level barriers, and that minorities that adopted long-acting medications would increase adherence even more than whites because the medications address barriers to adherence common among minorities.

3.2. Methods

Using the Medicaid claims, we created cross-sectional cohorts of children between the ages of 3 and 17 who had two or more claims with an ADHD diagnosis (ICD-9: 314xx) during each year. We excluded children enrolled in a health maintenance organization because we would not have access to their complete utilization data. We also excluded children who had pervasive developmental disorders, mental retardation, or schizophrenia. Our total sample included 142,625 children. During this period, the program was primarily fee-for-service, and ADHD medication prescriptions were not subject to prior authorization.

3.2.1. Outcome Variables

Our two main outcomes were utilization of ADHD medication treatment and medication adherence. We counted children as utilizing an ADHD medication if they filled at least one prescription for either long-acting ADHD medication (stimulants or atomoxetine) or short-acting stimulants. Children with filled prescriptions for both types were placed in the long-acting group.

We divided the remaining children into individuals with prescriptions for other psychotropics (such as atypical antipsychotics, alpha agonists, and antidepressants) and individuals without prescriptions for psychotropics.

We measured adherence as the total number of days in the year after the first prescription with a filled ADHD medication prescription. We summarize adherence with the continuous measure “annualized prescribed days” (APDs), calculated by dividing the days with prescribed medications by total days after the first prescription and then multiplying by 365.

3.2.2. Independent Variable

Using a combined measure of race/ethnicity created by the Florida Medicaid program, we divided the study population into white, black, and Hispanic groups. The latter group combines children classified in the Hispanic category with the “other/missing” category because the Hispanic category was only adopted after 1999 in the Supplemental Security Insurance (SSI) program and we therefore cannot accurately identify Hispanic children that enrolled through SSI in earlier years.

3.2.3. Individual Covariates

We grouped children into age categories and included an indicator for sex. We included an indicator for the eligibility category of each child: income-eligible children under now-outdated Aid to Families with Dependent Children (AFDC) standards, children with disabilities eligible through SSI, and “other” eligibility. Using ICD-9 codes, we identified the presence of mental and physical health comorbidities.

3.2.4. Treatment Providers

Approximately 92 percent of children with diagnosed ADHD in the sample had a claim for ADHD treatment from a prescriber (the remainder only visited non-prescribing therapists or school counselors). Using a specialty code, we classified prescribers as psychiatrists and primary care physicians (PCPs). We assigned children to a primary PCP, a primary psychiatrist, or both, defined as the psychiatrist (or PCP) that had the most number of visits with the child for ADHD treatment (or the greatest dollar amount in claims where two providers had an equal number of visits).

3.2.5. Region

The Florida Medicaid program divides the administration of the state program into 11 regions, consisting of between one large urban county (Broward County) and 12 adjoining rural counties. These divisions correspond to distinct regions or metropolitan areas.

3.2.6. Descriptive Analysis

We present unadjusted descriptive statistics separately for whites, blacks, and Hispanics in two-year cross-sections at the beginning and the end of the study period: Fiscal Years (FYs) 1996-1997 and 2004-2005 (an intervening cross-section, FYs 2000-2001, is included in regression analyses). We display demographic characteristics stratified by race/ethnicity and time point, as well as the unadjusted percentages of children utilizing ADHD medications, and measures of adherence (APD). We calculated χ^2 statistics for pairwise white-black and white-Hispanic differences, and for differences between the first and third periods.

To study ADHD medication utilization differences at the level of individual providers, we also calculated the percentage of children in each group filling prescriptions at each of the 200 highest-volume providers. We display these results in scatterplots overlaid with the percentage of whites at each provider receiving medications on the x-axis and the percentage of black (or Hispanic) children receiving medications on the y-axis. The size of each dot is proportional to the number of minority children visiting the practice. We overlay a weighted line of correlation.

3.2.7. Regression Analysis

Using the complete pooled data, we estimated staged ordinary least squares regression models for three study outcomes: (1) the probability of utilizing any ADHD medication, (2) the probability of utilizing long-acting medications specifically, and (3) number of APDs. In our first model we included indicators for racial/ethnic group, time period, and their interaction. We then sequentially added covariates for clinical and demographic characteristics, region, and treatment setting to see whether these variables explained racial/ethnic disparities. In our final specification, we included a fixed effect for primary psychiatrist, PCP (where there was no psychiatrist), or an indicator for no provider for the small group without prescriber visits. By controlling directly for prescribers we could evaluate whether differences between whites and minorities were explained by within-provider prescription utilization patterns. Specifically, if patients of all race/ethnicity filled prescriptions at the same rate conditional on provider, we would expect the race/ethnicity coefficients to remain unchanged, but any attenuation of the race/ethnicity coefficient would indicate within-prescriber prescription fill differences.

3.3. Results

3.3.1. Demographic Trends by Race/Ethnicity

Table 3.1 provides descriptive statistics of the ADHD cohort for the first time period (FYs 1996-1997) and the final period (FYs 2004-2005) stratified by race/ethnicity. The number of children diagnosed with ADHD in Florida Medicaid increased rapidly during the ten-year period, especially for Hispanics, among whom the number of diagnosed children more than tripled.

There were considerable variations in demographics characteristics and health conditions between whites and minorities at each time period, especially when comparing white and Hispanic children. Hispanic children were significantly more likely to be male and to be in the youngest age group (especially in period 1). Over time, however, the age distribution for all groups of diagnosed children shifted toward older children, and females became a slightly higher proportion of the diagnosed population, which remained more than 70 percent male in all groups.

White diagnosed children were most likely to be eligible for Medicaid through the AFDC category at both periods, followed by blacks, and finally Hispanics. Conversely, at period 1, almost half of the Hispanics enrolled through the SSI category; this contrasts with one quarter of whites and one third of blacks. The proportion of SSI-category children declined over time for whites and blacks, but not Hispanics. Notably, this time period coincides with an expansion of income eligibility for Medicaid for children, as well as a phasing out of ADHD as an SSI-qualified disability (Mayes et al. 2009).

There were some significant differences by race in diagnosed comorbidities at both time periods. Externalizing disorders were the most common psychiatric comorbidity, especially among blacks. Whites were more likely to have diagnosed bipolar disorder, depression, and adjustment disorder. Hispanics had double the rate of diagnosed asthma of white children in the initial period. The diagnosed prevalence of comorbidities such as bipolar disorder, asthma, and obesity increased in all groups over time.

Finally, most children were likely to have received care from a psychiatrist, either exclusively, or in combination with some care from a PCP. White children were much more likely to receive care exclusively from a PCP compared to minority children. The proportion of children treated exclusively by a PCP also increased over time, especially for white children, which went from about 29 percent to 44 percent.

Table 3.1. Demographics of ADHD Cohorts by Race and Time Period

	FYs 1996-1997			FYs 2004-2005		
	White	Black	Hispanic	White	Black	Hispanic
Age (Total)	<i>N</i> (%) 16008	<i>N</i> (%) 10242	<i>N</i> (%) 6849	<i>N</i> (%) 25193	<i>N</i> (%) 15080	<i>N</i> (%) 23003
3 to 8	5669 (35.4%)	3872 (37.8%) ^a	3514 (51.3%) ^a	8041 (31.9%) ^b	4772 (31.6%) ^{a,b}	7893 (34.3%) ^{a,b}
9 to 13	8202 (51.2%)	5285 (51.6%)	2712 (39.6%)	11488 (45.6%)	7169 (47.5%)	11034 (48%)
14 to 17	2137 (13.4%)	1085 (10.6%)	623 (9.1%)	5664 (22.5%)	3139 (20.8%)	4076 (17.7%)
Sex						
Male	12503(78.1%)	7788 (76%) ^a	5556 (81.1%) ^a	18011 (71.5%) ^b	10793 (71.6%) ^b	17678 (76.9%) ^{a,b}
Medicaid Eligibility						
AFDC	11904(74.4%)	6813 (66.5%) ^a	3448 (50.3%) ^a	22805 (90.5%) ^b	11144 (73.9%) ^{a,b}	11804 (51.3%) ^a
SSI	4019 (25.1%)	3413 (33.3%)	3387 (49.5%)	2289 (9.1%)	3919 (26%)	11125 (48.4%)
Other	85 (0.5%)	16 (0.2%)	14 (0.2%)	99 (0.4%)	17 (0.1%)	74 (0.3%)
MH Comorbidities						
No MH comorbidity	10116(63.2%)	6725 (65.7%) ^a	4519 (66%) ^a	13457 (53.4%) ^b	8222 (54.5%) ^{a,b}	12741 (55.4%) ^{a,b}
Bipolar Disorder	470 (2.9%)	171 (1.7%)	165 (2.4%)	2109 (8.4%)	577 (3.8%)	1319 (5.7%)
Externalizing Disorder	2299 (14.4%)	1838 (18%)	915 (13.4%)	3782 (15%)	3029 (20.1%)	3268 (14.2%)
Depression	907 (5.7%)	513 (5%)	360 (5.3%)	1218 (4.8%)	730 (4.8%)	1049 (4.6%)
Adjustment Disorder	1349 (8.4%)	589 (5.8%)	301 (4.4%)	1910 (7.6%)	1049 (7%)	914 (4%)
Other Diagnosis	867 (5.4%)	406 (4%)	589 (8.6%)	2717 (10.8%)	1473 (9.8%)	3712 (16.1%)
Physical Comorbidities						
Asthma	855 (5.3%)	428 (4.2%)	720 (10.5%) ^a	2398 (9.5%) ^b	1372 (9.1%) ^b	3131 (13.6%) ^{a,b}
Diabetes	38 (0.2%)	19 (0.2%)	23 (0.3%)	98 (0.4%)	38 (0.3%)	106 (0.5%)
Obesity	41 (0.3%)	30 (0.3%)	40 (0.6%)	279 (1.1%)	187 (1.2%)	413 (1.8%)
ADHD Treatment						
Psychiatrist Only	7838 (49%)	6425 (62.7%) ^a	3757 (54.9%) ^a	8145 (32.3%) ^b	7425 (49.2%) ^{a,b}	10351 (45%) ^{a,b}
PCP Only	4705 (29.4%)	2096 (20.5%)	1628 (23.8%)	11095 (44%)	3660 (24.3%)	6011 (26.1%)
PCP and Psychiatrist	3214 (20.1%)	1504 (14.7%)	1286 (18.8%)	3187 (12.7%)	1825 (12.1%)	3793 (16.5%)
Non-Prescriber Only	251 (1.6%)	217 (2.1%)	178 (2.6%)	2766 (11%)	2170 (14.4%)	2848 (12.4%)

^asignificantly different than whites in time period at p<.0001, ^bsignificantly different for race/ethnicity compared to 1996-1997 at p<.0001

3.3.2. Medication Utilization and Adherence Trends by Race/Ethnicity

Table 3.2 displays the rates of medication use and mean APDs stratified by race/ethnicity and time period. Black children were twice as likely as white children to not receive medication at each time point, and Hispanic children were 1.75 times as likely. The proportion of children that remained unmedicated decreased in all groups between periods 1 and 3, but the decline was not significant for Hispanics. There was more than a sixfold increase in the share of children in each group using long-acting medications and a commensurate decline in the share using other medications. For example, whereas 11 percent of white children used long-acting medications in period 1, the proportion increased to 71 percent by period 3. White children were more likely than minorities to adopt long-acting medications overall, but there was no gap in adoption when considering only those children that used Medication in each time period.

The bottom portion of Table 3.2 displays mean APDs for ADHD medication users only, and then subdivides this into long- and short-acting medication users. The table also displays APDs averaged across all children in each group, calculated by imputing a value of zero treatment days for children without any filled prescriptions and then averaging between treated and untreated children. When considering the broadest measure of APDs averaged across all children, APDs were highest for whites at baseline (141 days) and lowest for blacks (87 days) followed by Hispanics (106 days). Over the study period, average gains in APDs across all children were much greater for whites (43 days, compared to 34 days for blacks and 27 days for Hispanics), a finding explained by the lower use of medications among minority children in both periods. This pattern persisted when considering only children with ADHD medications. All groups of children with ADHD medication substantially increased APDs over the study period,

and the gains were roughly comparable for whites and blacks (40 and 43 days, respectively) but substantially lower for Hispanics (27 days). Finally, considering only those children using long-acting medications, we found that these children had the highest unadjusted APDs in all groups, and again, mean APDs were highest for whites in both time periods.

Table 3.2. Medication Use Rates and Average Annualized Prescribed Days (APDs) by Race and Time Period

Medication Use Rates	FYs 1996-1997			FYs 2004-2005		
	White	Black	Hispanic	White	Black	Hispanic
<i>Full Sample</i>	<i>N (%)</i>	<i>N (%)</i>	<i>N (%)</i>	<i>N (%)</i>	<i>N (%)</i>	<i>N (%)</i>
Long-Acting Medications	1747 (10.9%)	569 (5.6%) ^a	540 (7.9%) ^a	17779 (70.6%) ^b	7894 (52.4%) ^{a,b}	13047 (56.7%) ^{a,b}
Short-Acting Medications	9249 (57.8%)	4551 (44.4%) ^a	3242 (47.3%) ^a	1096 (4.4%) ^b	489 (3.2%) ^{a,b}	911 (4%) ^b
Other Psychotropics Only*	1423 (8.9%)	651 (6.4%) ^a	624 (9.1%)	1343 (5.3%) ^b	599 (4%) ^{a,b}	1088 (4.7%) ^b
No Psychotropics	3589 (22.4%)	4471 (43.7%) ^a	2443 (35.7%) ^a	4975 (19.8%) ^b	6098 (40.4%) ^{a,b}	7957 (34.6%) ^a
<i>Medication Users Only</i>						
Long-Acting Medications	1747 (14.1%)	569 (9.9%) ^a	540 (12.3%)	17779 (87.9%) ^b	7894 (87.9%) ^b	13047 (86.7%) ^b
Short-Acting Medications	9249 (74.5%)	4551 (78.9%) ^a	3242 (73.6%)	1096 (5.4%) ^b	489 (5.4%) ^b	911 (6.1%) ^b
Other Psychotropics Only	1423 (11.5%)	651 (11.3%)	624 (14.2%) ^a	1343 (6.7%) ^b	599 (6.7%) ^b	1088 (7.2%) ^b
Mean ADHD Medication Annualized Prescribed Days (APDs)	FYs 1996-1997			FYs 2004-2005		
	White	Black	Hispanic	White	Black	Hispanic
Full Sample	141.2	87.3 ^a	105.8 ^a	183.9 ^b	121 ^{a,b}	133.1 ^{a,b}
ADHD Med Users Only	205.5	174.7 ^a	191.6 ^a	245.4 ^b	217.7 ^{a,b}	219.2 ^{a,b}
Short-Acting Med Users Only	202.5	172.2 ^a	188.1 ^a	213.6	181.5 ^a	191.6 ^a
Long-Acting Med Users Only	221.7	194.4 ^a	213 ^a	247.4 ^b	219.9 ^{a,b}	221.2 ^a

^asignificantly different than whites in time period at p<.0001, ^bsignificantly different for race/ethnicity compared to 1996-1997 at p<.0001

*Other psychotropics are non-stimulant medications such as alpha agonists, antidepressants, and atypical antipsychotics. The one exception is atomoxetine which is classified with long-acting medications.

3.3.3. Provider-Level Analysis

Figure 3.1 depicts white-black average rates of ADHD medication utilization between- and within-providers for the 200 largest providers over the study period. These providers collectively saw 66 percent of ADHD children with visits to a prescriber. Figure 3.2 illustrates white-Hispanic rates of ADHD medication utilization for the same 200 providers. The sizes of the bubbles in the figures indicate the relative size of each provider's minority caseload. The figures show that the providers with the largest minority caseloads tended to have the lowest utilization rates for all children. For example, fewer than half of the white and Hispanic children at the largest Hispanic-serving provider filled prescriptions during the study period.

Figure 3.1. Black-White Rates of Medication Use at Provider-Level (All Years)

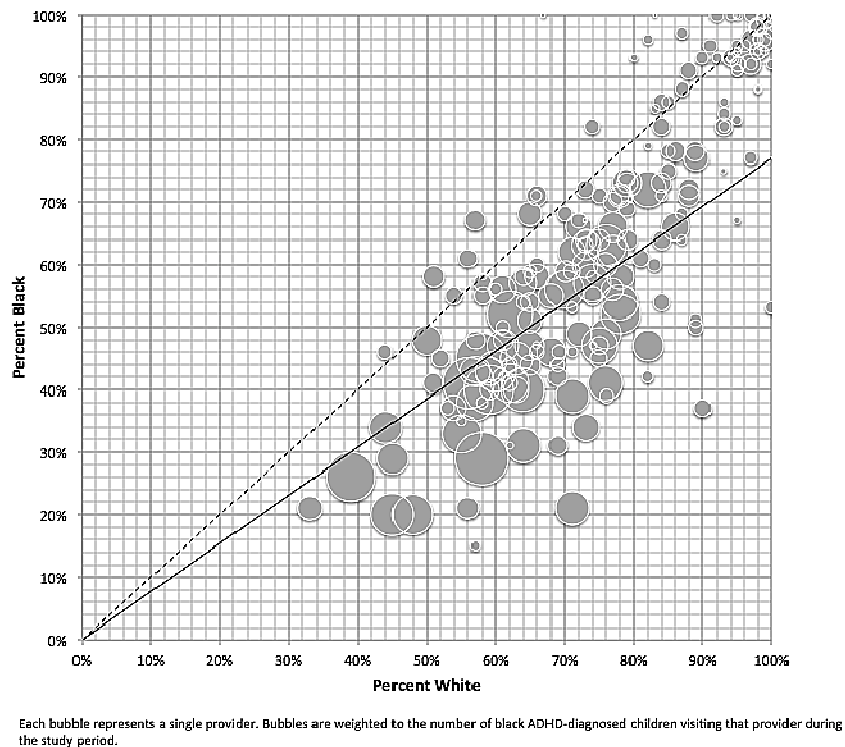
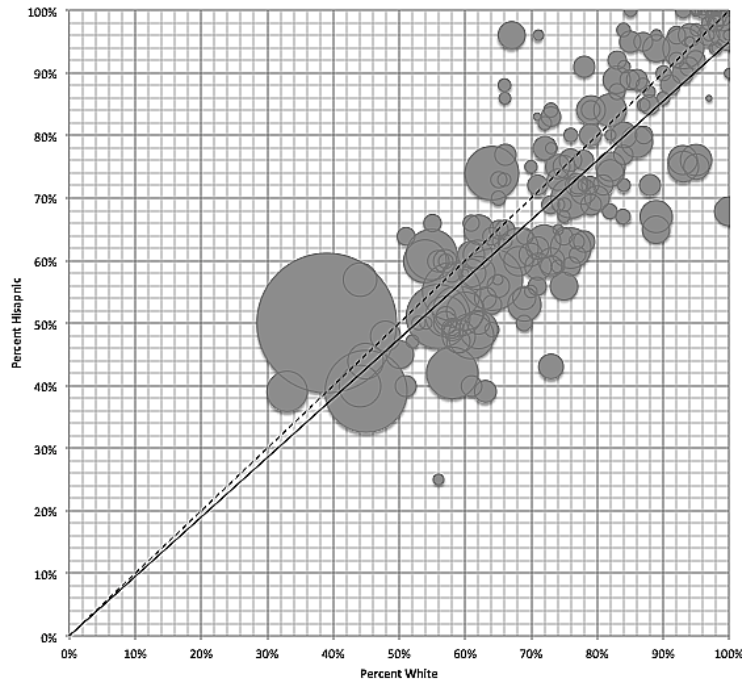


Figure 3.2 Hispanic-White Rates of Medication Use at the Provider Level (All Years)



Each bubble represents a single provider. Bubbles are weighted to the number of Hispanic ADHD-diagnosed children visiting that provider during the study period.

The white-black correlation line lies substantially below the 45-degree line, indicating large differences in average filled prescription rates between blacks and whites seeing the same provider (Figure 3.1). The white-Hispanic correlation line (Figure 3.2) lies close to the 45-degree line (the 95% confidence interval almost includes the 45-degree line), suggesting that although there were large unadjusted differences between providers, whites and Hispanics were filling prescriptions at similar rates conditional on seeing the same providers.

3.3.4. Regression Models

Table 3.3 presents the estimated black-white and Hispanic-white disparities in each period for three outcomes: probability of using any ADHD medication, probability of using long-

acting medications specifically, and average APDs. These estimates were derived from linear regression models that pooled together all three cross-sections and included main effects for race and time, race by time interactions, and covariates. The coefficients in the table represent the average black-white and Hispanic-white differences after adjusting for other covariates. We indicate whether the estimated gap at baseline, and the change in the gap between baseline and periods 2 or 3 were statistically significant ($p < .001$).

Table 3.3 Disparities Estimates for ADHD Medication Use, Long-Acting Use, and Mean APDs by Time Period

Outcome	Disparity	Period(FY)	Model 1		Model 2		Model 3		Model 4		Model 5	
			Unadjusted		Individual-Level (Comorbidities, Age, Sex)		Individual-Level and Region		Individual-Level, Region, Service Setting*		Individual, Region, Service Setting, Provider Fixed Effects	
			Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Any ADHD Medication Use	Black- White	1996-97	-0.187 ^a	0.006	-0.191 ^a	0.006	-0.148 ^a	0.006	-0.108 ^a	0.005	-0.080 ^a	0.006
		2000-01	-0.220 ^b	0.008	-0.228 ^b	0.008	-0.173	0.008	-0.127	0.007	-0.099	0.007
		2004-05	-0.193	0.008	-0.202	0.008	-0.144	0.008	-0.083 ^b	0.007	-0.059	0.007
	Hispanic- White	1996-97	-0.135 ^a	0.007	-0.154 ^a	0.007	-0.058 ^a	0.007	-0.048 ^a	0.006	-0.023 ^a	0.007
		2000-01	-0.160	0.009	-0.192 ^b	0.009	-0.094 ^b	0.008	-0.062	0.008	-0.042	0.008
		2004-05	-0.142	0.009	-0.174 ^b	0.009	-0.072 ^b	0.008	-0.040	0.008	-0.024	0.008
Long- Acting ADHD Med Use	Black- White	1996-97	-0.054 ^a	0.006	-0.055 ^a	0.006	-0.026 ^a	0.006	0.000	0.005	0.008	0.006
		2000-01	-0.137 ^b	0.008	-0.141 ^b	0.007	-0.105 ^b	0.007	-0.078 ^b	0.007	-0.062 ^b	0.007
		2004-05	-0.182 ^b	0.007	-0.186 ^b	0.007	-0.147 ^b	0.007	-0.107 ^b	0.007	-0.076 ^b	0.007
	Hispanic- White	1996-97	-0.030 ^a	0.006	-0.039 ^a	0.006	0.019	0.007	0.027 ^a	0.006	0.032 ^a	0.006
		2000-01	-0.092 ^b	0.008	-0.110 ^b	0.008	-0.048 ^b	0.008	-0.029 ^b	0.008	-0.016 ^b	0.008
		2004-05	-0.138 ^b	0.008	-0.157 ^b	0.008	-0.090 ^b	0.008	-0.070 ^b	0.008	-0.046 ^b	0.008
Mean Annualized Prescribed Days (Among ADHD Med Users)	Black- White	1996-97	-30.80 ^a	1.59	-32.38 ^a	1.58	-29.03 ^a	1.58	-26.75 ^a	1.57	-24.58 ^a	1.66
		2000-01	-30.33	2.12	-32.05	2.10	-28.60	2.09	-27.43	2.07	-25.54	2.15
		2004-05	-27.73	2.01	-29.68	2.00	-25.77	1.99	-25.21	1.97	-23.04	2.08
	Hispanic- White	1996-97	-13.88 ^a	1.77	-19.53 ^a	1.78	-12.35 ^a	1.81	-11.18 ^a	1.80	-10.51 ^a	1.91
		2000-01	-19.13	2.19	-26.60	2.18	-19.31	2.17	-18.71 ^b	2.15	-14.99	2.26
		2004-05	-26.17	2.19	-32.22	2.18	-23.77	2.17	-23.48 ^b	2.15	-18.17	2.26

^a Disparity in baseline period (FY 1996-1997) significant p<.001 ^b Change in disparity significantly different than baseline (FY 1996-1997) p<.001
 Individual-level: sex, age, eligibility group, mental and physical health comorbidities; 11 Medicaid regions in Florida; service setting: PCP only,
 psychiatrist only, PCP and psychiatrist, and no prescriber *Also includes a term for long-acting medication use for the Annualized Prescribed Days models

Disparities in Use of Any ADHD Medications

The unadjusted black-white disparity in any ADHD medication use was about 19 percentage points in period 1 (Model 1). This gap widened slightly to 22 points in period 2, but narrowed again by period 3. Adjustment for individual-level factors (Model 2) did not explain any of the gap, but controlling for region (Model 3), service setting (Model 4), and provider fixed-effects (Model 5) each substantially explained a portion of the utilization disparities in each of the treatment years. For example, adjusting for all of these factors reduced the period 1 gap to 8 percentage points (almost 2/3 of the unadjusted estimate). The Hispanic-white disparity in any ADHD medication use was substantial in period 1 (14 percentage points), and widened slightly in period 2 (16 points) before narrowing in period 3 (back to 14 points). As with whites, adjusting for individual-level factors did not attenuate the gap, but geography and providers accounted for more than three-quarters of the gap. Adjusting for geography narrowed the period 1 gap to 6 points, and full adjustment further reduced the gap to 2 percentage points. Hispanics were disproportionately concentrated in south Florida where medication use rates were lowest on average for all groups.

Disparities in Use of Long-Acting Medications

The next set of models examined disparities in the use of long-acting medications overall in the population. The unadjusted overall gap in use of long-acting medications widened over time: the black-white gap increased from 5 to 18 percentage points. It is important to remember that these estimates reflect unconditional differences in the diagnosed population, as was illustrated in Table 3.2, there was only a modest gap in the in the probability of adopting long-acting medications *conditional on using any ADHD medications*. Adjustment for individual-level

factors (Model 2) did not help explain the black-white gap in use of long-acting medications. However, adjustment for geography, treatment setting, and provider fixed effects jointly reduced the black-white gap by more than one-half in all periods. The basic pattern was similar for the Hispanic-white gap. After full adjustment the Hispanic-white gap was actually reversed in the baseline period, and reduced by almost two-thirds for FYs 2004-2005 (decreasing the gap from 14 percentage points to 5 percentage points). The large attenuating effect of geography and provider setting suggest that segregation in where children are living, and which providers they visit, are important contributors to medication use differences.

Disparities in APDs

Finally, when focusing on the black-white gap in mean APDs, we find substantial average unadjusted disparities (around 30 days) in period 1 that remained fairly constant across the study periods. Adjustment for individual-level factors and region did not explain much of the gap. In Model 4, we adjusted for provider setting, and also included an indicator for whether the child was using a long-acting medication. This further adjustment only very slightly attenuated the estimated black-white gap (by about 2 days). Including provider fixed effects in Model 5 slightly reduced the black-white gap. The baseline Hispanic-white gap was smaller (14 days), but increased to 26 days by period 3. Adjusting for the same set of factors substantially explained the gap only for the final period. In period 3, the provider fixed effect explained one quarter of the difference, suggesting that Hispanic children were shifting to settings where APDs were lower on average.

3.4. Discussion

This study examined changes in utilization of long-acting medications for ADHD and medication adherence among a diverse population of children in the Florida Medicaid program. We found that black and Hispanic children had much lower initial prescription fill rates than white children, and the gap did not narrow. Use of long-acting medications increased more than sixfold in all groups. Minority children had a lower probability of utilizing long-acting medications in every time period, but conditional on using an ADHD medication, white and minority children were equally likely to switch to long-acting medications. A combination of geographic and provider-level factors largely explained the lower utilization of ADHD medications among minorities.

One striking finding was that most of the children with ADHD in the Florida Medicaid program received their care primarily from a few providers with very large panels of Medicaid children. The 200 highest-volume providers were the primary providers for 66 percent of all ADHD-diagnosed children, and the children receiving care from these providers were disproportionately Hispanic and black. Although our data do not include measures of visit length or patient satisfaction, the sheer volume of children being seen by a small group of providers raises questions about the ability of these providers to have meaningful office visits with their ADHD-diagnosed patients and their families. If minorities receive fewer follow-up visits and less information about ADHD medication, they may be more reluctant to fill prescriptions. Studies have highlighted that minority children with ADHD are less likely to receive care in a medical home (Toomey et al. 2010), and that poor communication with providers is a specific concern among families of minority children with ADHD (Olaniyan et al. 2007).

In terms of adherence, we identified large and persistent racial/ethnic gaps in average prescribed days (APDs) at baseline. Although APDs increased among medication users in all three groups over the study period, black-white disparities did not narrow and Hispanic-white disparities widened. We could not explain any of this difference in terms of observable individual-level or provider-level factors. Exploring these differences is an important topic for future research. We speculate that it may partially be attributable to worse access to providers and pharmacies for minorities and culturally specific norms about medication use. It is also worth understanding how medication continuity and adherence may be influenced by use of non-medication therapies and behavioral interventions in the school setting. We did not specifically examine use of other types of treatment, which may be used either as complements or as alternatives to medication therapy.

Some study limitations should be noted. First, the sample was restricted to children with paid claims for ADHD treatment, which excludes children that met the diagnostic criteria but were not adequately evaluated. If minority children were less likely than white children with similar symptoms to be diagnosed, this could understate disparities in treatment. In a national survey, however, minority children with ADHD symptoms were as likely as white children to have been diagnosed (Froehlich et al. 2007). Another concern is that ADHD-diagnosed cohorts in earlier periods may be comprised of children with higher severity since the diagnosis rate has expanded over time to cover more children. Higher severity of symptoms is associated with higher rates of ADHD medication utilization (Visser et al. 2007), so cohort effects would tend to understate the increase in medication utilization. We attempt to address this by adjusting for comorbidities, but we lack direct measures of ADHD impairment. Second, our measure of race/ethnicity was defined using administrative records, which have been shown to have higher

sensitivity for categorizing whites and blacks than Hispanic ethnicity (Arday et al. 2000). Also, as already noted, we were not able to consistently identify Hispanic children among the children in the “other/missing” category, so this category included a small number of non-Hispanic children of other races. Other races comprised a small share of Florida’s population during the study period: just two percent of the population in Florida reported Asian, Native American, or Pacific Islander as their race in the 2000 Census (U.S. Census Bureau 2007). Finally, our results may not generalize to a national sample of ADHD-diagnosed Medicaid-enrolled children. For example, we found that minority children were less likely to receive ADHD treatment in primary care than white children, but this pattern may not hold in other states.

3.5. *Conclusions*

Our study illustrates the persistence of medication treatment gaps between white and minority children, even in the context of a public insurance program with no copayments or prior authorization for medication. In our data we observed widely varying medication use patterns that are unlikely to be justified by underlying differences in clinical need or preferences for treatment. Geography and provider setting are important factors that we found explain utilization of ADHD medications. The large concentration of children receiving care in a few high-volume providers suggests that effectively targeted interventions could have a large impact on the quality of care of many children with ADHD, especially racial/ethnic minorities. There are several approaches that can be used to improve quality and increase consistency of prescribing and medication use. One approach is to focus on prescribing patterns among providers. There are now promising results from primary care interventions for pediatric ADHD targeted at

improving adherence to clinical guidelines and coordinating care between PCPs, specialists, and educators (Kelleher 2009).

Beyond emphasizing consistent prescribing, another approach is to focus on communication between providers, patients, and their families. Helping providers to recognize how cultural and social context influences specific concerns and preferences for different groups can enable them to better tailor guidance to these families. More in-depth communication can also be supported through higher reimbursement for consultation. Providers have cited low reimbursement for consultation from Medicaid as a barrier to the delivery of high quality, patient-centered ADHD care (Pfefferle 2007). Empowering patients and their families to discuss their concerns, and providing support and follow-up over the long-term could improve medication continuity, and contribute to the elimination of disparities.

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