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# THE HEALTH CARE SAFETY NET AND CROWD-OUT OF PRIVATE HEALTH INSURANCE

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## ABSTRACT

There is an extensive literature on the extent to which public health insurance coverage through Medicaid induces less private health insurance coverage. However, little is known about the effect of other components of the health care safety net in crowding out private coverage. We examine the effect of Medicaid and uncompensated care provided by clinics and hospitals on insurance coverage. We construct a long panel of metropolitan area and state-level data on hospital uncompensated care and free and reduced price care offered by Federally Qualified Health Centers. We match this information to individual level data on coverage from the Current Population Survey for two distinct groups: children aged 14 and under and single, childless adults aged 18 to 64. Our results provide mixed evidence on the extent of crowd-out. Hospital uncompensated care does not appear to crowd-out health insurance coverage and health center uncompensated care appears to crowd-out private coverage for adults and, in some specifications, children.

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## 1. Introduction

An issue that has attracted a great deal of attention in recent years is whether changes in Medicaid eligibility and the recent State Children's Health Insurance Program (SCHIP) expansions have crowded-out private employer-provided health insurance coverage.[1] Less well understood, however, is the role of the health care safety net in affecting low-income workers' decisions to accept employer-provided health insurance for themselves and their families. From the standpoint of low-income workers, a more dependable safety net may induce individuals to accept employment without health insurance or decline employer-provided coverage for themselves or their dependents, particularly in the face of rising health insurance premiums and rising cost-sharing that increasingly characterizes employer-sponsored health insurance (Gabel et al. 2004). A recent study by the Commonwealth Fund examining uninsured workers supports these contentions, suggesting that the uninsured often believe they can "get around insurance" by going to free clinics (Perry, Kennel, and Castillo 2000, p. 17).

From the standpoint of small employers, the availability of safety net health care services may induce firms, particularly smaller firms, firms hiring predominantly low-wage, low-skill workers, or firms in economically depressed areas, not to offer health insurance to workers. Data from the Medical Expenditure Panel Survey (MEPS) from the Agency for Healthcare Research and Quality (AHRQ) suggest that in 1998 only 54.7% of employees in low-wage establishments were offered insurance and only 29.9% of employees took up coverage in these firms (AHRQ, 2000). Further, data from a national employer survey indicate that among small firms (3-199 employees) only 35% of firms with a large fraction of low-wage employees offered health

[1] Publications on this topic include Cutler and Gruber 1996; Dubay and Kenney 1997; Blumberg, et al. 2000; Yazici and Kaestner 2000; and Lo Sasso and Buchmueller 2004.

insurance (Kaiser Family Foundation and HRET 2000). This occurred despite the fact that the offer rate among all small firms rose from 59% to 67% between 1996 and 2000. Moreover, evidence from the Survey of Income and Program Participation (SIPP) indicates that among persons who lose health insurance coverage, 60% reported that the reason for losing coverage is that insurance is too expensive and they cannot afford health insurance. Thus, it is clear that among low-income workers and small, low-wage firms, health insurance coverage decisions may respond strongly to financial conditions. It is these workers and firms for whom community safety net services may represent a viable alternative to traditional coverage options.

Data from the Census Bureau indicate that in 2004 there were 45.8 million people lacking health insurance. While many of these people may be eligible for public programs, this number represents the individuals most at risk of using safety net health care services should they become ill. Recent studies have suggested that the care provided by health care safety net providers has grown in recent years. For example, 41% of 8.3 million Federally Qualified Health Center (FQHC) patients in 1998 were uninsured, and between 1990 and 1998 FQHCs witnessed a 60% increase in the number of uninsured patients (Bureau of Primary Health Care 1998). In 2000 nearly $21 billion in uncompensated care was provided by short-term general non-federal hospitals.

Few studies have attempted to relate private insurance take-up to characteristics of local health care markets. The prior studies in this area suffer from notable shortcomings, including measurement problems that did not allow for precise measures of the safety net in a particular area, the inability to deal adequately with endogeneity concerns, and short time periods of analysis.

Our study uses data from March Current Population Survey (CPS) Annual Demographic File for the years 1991 to 2001 to measure health insurance coverage over the years 1990 to 2000. The CPS data are combined with detailed measures on local health care facilities to examine the link between safety net characteristics and private health insurance coverage. Our primary safety net measures include total hospital uncompensated care (UC) derived from the American Hospital Association's annual survey of hospitals and UC provided by FQHCs (both per population under age 65). We examine the robustness of our results to the potential presence of omitted variables that affect both insurance coverage and UC levels. We consider likely biases to our results in this situation, and propose several potential instrumental variables that we use in alternative estimates. Our results suggest that the impact of safety net care on health insurance coverage is small. Hospital uncompensated care does not appear to crowd-out health insurance coverage though health center uncompensated care appears to crowd-out private coverage for adults and, in some specifications, children.

## 2. Prior Literature

Rask and Rask (2000) conducted two separate analyses to examine the role of public hospitals and public programs in health insurance coverage decisions. First, they used the 1987 National Medical Expenditure Survey (NMES) data to examine how the presence of public hospitals affected health insurance coverage. They found that among individuals with income between 100 and 200 percent of the poverty line, the presence of a public hospital crowded out nearly 11 percent of persons who would otherwise be privately insured. Among middle-income individuals (income between 200 and 400 percent of the poverty line), public hospitals crowded out nearly 4 percent of persons who would otherwise be privately insured. The second

component of their study used data from the 1989 and 1992 National Health Interview Survey (NHIS) to measure the effects on health coverage of residing in a state with an uncompensated care funding pool and of AFDC and Medicaid program characteristics. The authors found that uncompensated care funds were associated with a higher rate of uninsurance and lower rates of Medicaid and private insurance.

Their analysis, while the first of its kind and innovative in many respects, is weak for several reasons. First, the authors did not have access to the geographic location of the NMES respondents. The authors were only able to match their data to a rough indicator for proximity to a public hospital. Moreover, without geographic identifiers the authors were unable to control for other state characteristics that can affect health insurance coverage; they were similarly unable to control for Medicaid eligibility. As a result, their findings regarding the impact of public hospitals on health insurance coverage call for more convincing evidence. Second, in their analysis using the NHIS, the presence of an uncompensated care reimbursement fund provides no information on the generosity of statewide support of safety net providers and safety net care in general. In addition, uncompensated care funds are present in only a handful of states and they differ sharply in their size. Finally, by covering the period 1987-1992, the study misses several key policy changes that have potentially had a dramatic effect on safety net providers. These include the dramatic increase in the Medicaid disproportionate share program, the SCHIP expansions, and welfare reform, all of which were likely to result in changes to provider, employer, and employee behavior.

Research by Herring (2005) uses data from the Community Tracking Study (CTS) to examine the effect of access to charity care on health insurance coverage. Herring finds that access to charity care is negatively associated with private health insurance coverage of low

income individuals. To measure "access" to local charity care services the author uses the market-level average (market refers to the 60 market areas surveyed in the CTS) among the uninsured for the question concerning whether the uninsured person had cost-related difficulty obtaining health care. While this measure of access to charity care does incorporate all potential sources of care individuals may receive (indeed it is positively correlated with hospital charity care provision and FQHC concentration), it does not present a readily interpretable policy "lever" and it is likely to incorporate a lot of other factors not related to safety net services, such as health status. The author argues that the market average of reported access to care reflects the "underlying altruism of people towards the uninsured" (Herring 2005, p. 239), but this argument is suspect because the difficulty that uninsured individuals face getting health care will depend on who the uninsured are and how many such individuals there are in the market. Despite using multiple years of data on individuals in each market, the author does not include fixed market effects leaving the reader to wonder whether unobserved factors are confounding the relationship between coverage and access to safety net care.

Chernew, Cutler, and Keenan (2005) study the relationship between health insurance premium increases and coverage and find that rising health insurance premiums in areas with greater availability of charity care, measured as public and teaching hospital beds per capita, is associated with larger declines in coverage. The result suggests that charity care is potentially used as a substitute for private health insurance coverage.

## 3. Theoretical Considerations

Hospitals and clinics provide uncompensated care because it is part of their mission and in certain circumstances they face statutory requirements to provide care. However, funding

from various sources—federal, state and local governments and foundations—can at the margin encourage hospitals and clinics to provide safety net care. These governmental levers are important tools in ensuring that care is provided for those without insurance. By making it less costly to provide uncompensated care, these government transfers are expected to induce greater provision of uncompensated care.

The provision of uncompensated care by health centers and hospitals then in turn affects individual and firm decisions. Safety net care can affect individual decisions to take up employer offered insurance as individuals weigh the attributes and costs of alternative health care arrangements. Employer provided health insurance is likely to have greater costs than Medicaid or safety net care both in terms of premiums and out of pocket costs such as deductibles and co-payments. However, it may have more favorable attributes such as shorter waiting times and more certain receipt of care. A more extensive safety net, provided by health clinics and hospitals, may induce individuals to conclude that the cost of employer provided coverage is too high.

The employer offer decision also depends on safety net care. Firms must aggregate the preferences of their workers. Firms must decide whether the health benefits they provide allow them to lower their offered wages enough to pay for the firm share of premiums, and decide how the tax advantages and lower group cost of providing health insurance affect the willingness of workers to accept lower wages. This willingness is affected by income and other determinants of employees demand for health care. Thus, the insurance offer rate and the rate of insurance coverage will depend on the characteristics of people in the geographic area from which the firms hire. The willingness of workers to accept lower wages in exchange for health insurance will also depend on the other health care options available to workers. Those other options

include safety net care at clinics and hospitals. The extent of this safety net will then likely affect the decision of firms to provide health insurance as well as the terms under which this insurance is offered.

## 4. Institutional Background

The health care safety net in the US can be characterized as a multitude of providers that are supported by a diverse and often haphazard array of funding mechanisms. The fraction of Americans without health insurance in 2004 is slightly higher at 15.7% from the 14.8% recorded in 1987. The uninsured, as well as many under-insured and Medicaid insured patients, often depend on safety net providers to meet their health care needs. During this period of change in the number of uninsured persons in the 1990s, health care industry restructuring and changes in the public financing of health care providers may have significantly affected safety net providers.

### *A. Safety Net Providers*

Defining what is encompassed by the health care safety net is a challenge. In a report issued by the Institute of Medicine (IOM) on the health care safety net (IOM 2000), the IOM committee used a general approach, defining the safety net as "providers that organize and deliver a significant level of health care and other related services to uninsured, Medicaid and other vulnerable patients." This definition, however, does not lend itself to the measurement of the extent of safety net care that is provided.

Urban public hospitals and academic medical centers (AHC) devote a large fraction of their health care provision to Medicaid and uninsured populations (Baxter and Mechanic 1997;

Mann et al. 1997).[2] While private not for profit (NFP) hospitals vary significantly in their roles as safety net providers, as a group these hospitals also form an important part of the safety net. In 1994, private NFPs (not including private AHCs) provided nearly 50% of all uncompensated hospital care and over 50% of all Medicaid hospital care. Given the large amount of uncompensated care that is provided throughout the hospital industry, it is clearly not appropriate to use arbitrary classifications of hospitals by public status or teaching status alone to determine safety net health care provision.[3]

FQHCs have a clear mission to serve the poor (Hawkins and Rosenbaum 1998). Based on year 2000 data, nearly 4 million of FQHCs' 9.6 million patients are uninsured (almost 10% of all uninsured), while another 3.2 million are Medicaid recipients (approximately 10% of all Medicaid recipients). Of the nearly 40 million patient encounters occurring at FQHCs, half are for primary care visits with an MD physician.

### *B. Safety Net Policies and Market Forces*

A number of policy and market factors have affected the environment in which safety net

[2] Approximately 70% of urban public hospital inpatient days in 1995 were for Medicaid or self pay patients. Public hospitals also provide a large volume of outpatient services to safety net populations. 77% of their outpatient and emergency room visits were for Medicaid (34%) and self-pay (43%) patients. Academic Health Centers (AHCs) also provide a large amount of care to safety net populations (Mann et al., 1997). In their markets, AHCs provide 37% of uncompensated (hospital) care and 31.5% of Medicaid (hospital) care, while only representing 7.3% of hospitals. For public AHCs (3.5% of hospitals) the corresponding figures are 26.2% of uncompensated care, 19.8% of Medicaid (Reuter and Gaskin 1997).

[3] In a study of how safety net hospitals fared between 1990 and 1997, Zuckerman et al. (2001) identified three groups of safety net hospitals based on whether they contribute a high fraction of the market's total uncompensated care or whether a high fraction of the hospital's costs are uncompensated or both. Hospitals displaying both attributes remained the most important providers of uncompensated care and, despite experiencing stagnant growth in admissions and losses in the number of births relative to non-safety net hospitals, virtually never closed. Hospitals with high market share continued their important role, but did reduce the share of the uncompensated care they provided relative to non-safety net hospitals. These facilities also appeared to be the most attractive merger partners, indicating that hospital involvement as a substantial market provider of indigent care is not a barrier to merger. Hospitals that had a high ratio of UC to costs were generally smaller and most at risk of closing.

providers operate. Medicaid disproportionate share payments to hospitals increased dramatically in the early 1990s from $1.4 billion in 1990 to $17.5 billion in 1992 (Coughlin, Ku, and Kim 2000). Since the late 1980s, private HMO market shares have risen from 19% to 35% in 2001 (Foster Higgins/Mercer 1998, 2003). Since 1994, Medicaid managed care has risen from 14% to 57% of beneficiaries. Welfare reform and the Balanced Budget Act (BBA) of 1997, which ushered in the SCHIP expansions, have transformed Medicaid eligibility and provider reimbursement policies.

Federal and state subsidy programs for health care providers are intended to make up the difference between payments safety net providers receive and the costs incurred through caring for the uninsured. Medicaid and to a lesser extent Medicare DSH payments are the primary method for the federal government and states to subsidize hospitals believed to be burdened by indigent care. States vary considerably in the extent to which they availed themselves of loopholes in the early law and subsequent reform efforts, and it is not at all clear that need has played a primary role in determining funding levels (Coughlin and Liska 1998).[4] States also vary dramatically in the fraction of federal DSH dollars that are actually provided to hospitals versus other state spending priorities (Ku and Coughlin 1995).[5]

[4] The history of the DSH program is long and complicated. Although the DSH program was enacted in the early 1980s, states were slow to capitalize on the program until the late 1980s when individual states began to develop creative methods to use the DSH program to increase their Medicaid funding (Fishman and Bentley 1997). Other states quickly copied the approaches of pioneers and DSH payments to states grew dramatically. The federal government passed reforms in 1991 and 1993 to attempt to control the growth in DSH payments. DSH payments leveled off after 1993 and subsequently fell after 1996 from around $18 billion to around $15 billion where they have remained since. However, state responses to the 1993 reforms varied considerably. Some states increased the number of types of providers to whom they made DSH payments, including mental health providers, for example. Other states were unable or unwilling to spend their full DSH allotments. For example, Colorado intentionally kept its DSH spending low to avoid the possible need to make up for lost federal DSH payments should the federal government cut DSH funding (Coughlin and Liska 1998). Michigan, by contrast, reduced DSH payments because prior to the 1993 reforms the state was retaining federal DSH revenues as general revenues instead of using them for safety net providers (GAO 1994).

[5] Closely related to state DSH programs are state uncompensated care pool systems, which are designed to

FQHCs have historically been financed through cost-based reimbursement from Medicaid, federal grants from the Bureau of Primary Health Care (BPHC), and in some cases state and local subsidies. Some evidence suggests that cost-based reimbursement has allowed FQHCs to expand their provision of health care to the uninsured through cost-shifting (Ku, Wade, and Dodds 1996). The BBA and its subsequent refinement, the Benefits Improvement and Protection Act (BIPA) of 2000, introduced the gradual phase-out of cost-based reimbursement. Federal grants to FQHCs have grown steadily throughout the 1990s from roughly $550 million in 1990 to $925 million in 1999 (National Association of Community Health Centers 1999).

State and local funding for the safety net is highly variable across the country (Meyer et al. 1999), and often can be used to make up for low federal subsidies (Norton and Lipson 1998). Local sources of non-operating revenues for hospitals and other safety net providers are widely variable, but can be aided by a few factors. One factor is ability of the county to have taxing authority and the willingness to use discretionary funds to support safety net providers (Meyer et al. 1999). The same is true for city-based public health departments. Many communities such as New York and Los Angeles have a long history of supporting safety net institutions, while others are less supportive (Baxter and Mechanic 1997).

Growing use of managed care in Medicaid heightens competition among providers over Medicaid patients, which represents a potential threat to safety net providers because Medicaid revenues often comprise an important portion of total revenues for safety net providers and have

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reimburse hospitals that provide a large fraction of care to the uninsured. During the 1990s, five states had UC pool systems (Massachusetts, New York, New Jersey, Maryland, and Virginia). The presence of a UC pool was used as an independent variable in the previously mentioned study by Rask and Rask (2000) and found to be significantly related to the provision of UC, at least cross-sectionally.

historically helped such providers cross-subsidize health care to the uninsured (Norton and Lipson 1998).[6] Similar to the Medicaid market, private purchasers of health care have aggressively pursued cost reductions through capitated managed care contracts. Studies have indicated that increasing private HMO penetration has been associated with increased price-based competition. Such competition potentially threatens the private pay patient base, which is frequently used to subsidize the cost of treating the uninsured (Norton and Lipson 1998). In addition, price competition in the private payer realm can make Medicaid reimbursement rates look relatively more attractive, which can heighten competition for Medicaid patients among safety net providers (Fishman and Bentley 1997). Studies have suggested that increased private HMO penetration have been associated with relatively greater reductions in patient volumes at hospitals serving predominantly safety net populations (Gaskin 1997).

## 5. Data and Methods

We combine information from four large datasets as well as several smaller datasets to produce our estimates. We focus on a long time period, the years 1990-2000, during which there were substantial changes in our key safety net measures. The study focuses on two distinct groups that could plausibly have their health insurance decisions affected by the health care safety net: children 14 and under and single, childless adults aged 18-64.[7]

[6] Although some studies have shown that some safety net providers fared better than anticipated after increases in Medicaid managed care (Hoag, Norton, and Rajan 2000), other studies have indicated mixed successes on the part of safety net providers in response to the Medicaid managed care pressures (North and Lipson 1998). Campbell and Ahern (1993) also found that California hospitals with greater Medicaid and Medicare contractual allowances (i.e., lower payment rates) provided less uncompensated care. Davidoff, et al. (2000) found that higher Medicaid managed care penetration was associated with lower UC for private NFP hospitals.

[7] One advantage of an analysis of children is that Cutler and Gruber (1996) found that fairly straightforward

### *A. Health Insurance Coverage Data*

We rely on the health insurance coverage data from the Current Population Survey because it is the only data source with comparable questions asked over the time period we analyze. The CPS also provides a very large sample with good geographic detail facilitating our analysis of local health care safety nets. In the March Annual Demographic File, the CPS reports responses to questions about coverage through various sources for the previous year. We use the files for survey years 1991-2001 to obtain data for the reference years 1990-2000. The data allow us to examine whether respondents had health insurance coverage of any type, as well as whether the coverage was public, or private, and whether private coverage was employer or union provided.

### *B. Geographic Unit of Analysis*

Only hospitals and clinics within a reasonable traveling distance from a family constitute the local health care safety net. Thus, an analysis of state data might be less appropriate because persons in one area of a state are unlikely to be affected by hospitals and clinics in another area of the state. On the other hand, an analysis of counties or metropolitan statistical areas (MSAs) could lead to mismeasured key variables as people are able to travel to neighboring counties, especially individuals who live near county borders, or because a smaller number of safety net institutions could exacerbate measurement errors in the data. Thus, we use MSAs as our primary unit of analysis and re-estimate our models using state-level data for a variety of measurement

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methods like those that we employ here yielded very similar estimates to their later approach that accounted for the Medicaid coverage of the entire family. We also estimated specifications for the child sample including family Medicaid eligibility and found little change in our uncompensated care coefficient estimates.

related reasons that will be clear as our key measures are described below.

MSAs are defined by commuting patterns and thus provide a sensible local geographic unit. In addition, using MSAs provides us with a large sample of independent observations. In all, 281 MSAs are identified over our sample period. The definition of some MSAs changed in the CPS, starting with the data for 1995.[8] When there is a substantial change in the definition, we take the redefined MSA to be a different geographic unit in the empirical analysis. Only MSAs that satisfy several additional criteria are included. Specifically, we only include MSAs defined by counties to facilitate matching[9], MSAs where the CPS sample frame is close to the MSA definition, and MSAs without suppressed hospital data. We end up with 1568 MSA-years of data. In order to match our various data sources together we rely on zip code and county information. Then, using files that link zip codes with counties and counties with MSAs, we are able to use either county or zip code information to link our data sources. In the cases where we use state level variables (usually in constructing instruments used in IV estimates) we combine state variables for multi-state MSAs using state shares of the population.

As mentioned, we provide a complementary set of analyses that use the state as the unit of analysis for the health care safety net. State policies have a strong influence on providers through a variety of mechanisms. Within federal guidelines, states set Medicaid eligibility and provider reimbursement rates for Medicaid services. State governments set DSH policies that can offset to varying degrees the impact of indigent care provision. States also provide the regulatory environment that can affect provider decisions regarding care provision.

[8] For the years 1990 to 1994 the 1983 OMB definition of MSAs is used, while from 1995 to 2000 the CPS uses the 1993 OMB definition.

[9] While elimination of MSAs not strictly defined by counties in unlikely to bias our estimates, it does necessitate eliminating a number of large northeastern MSAs, including Boston. Our state-level analyses do not require these exclusions.

Additionally, using state-level data eliminates concerns with the MSA-level analysis that only a subset of MSAs can be analyzed given the difficulties of linking data to MSAs not defined by counties, changes in MSA definitions over time, and AHA confidentiality restrictions which eliminate certain MSAs.

### *C. Hospital Safety Net Care*

Data on hospitals come from the American Hospital Association's Annual Survey of hospitals for the years 1990-2000. Because of the confidential nature of the financial measures, individual hospital values are aggregated to the MSA level using county codes. To preserve hospital confidentiality and to insure data integrity, MSAs with fewer than three hospitals or MSAs where more than 50 percent of hospitals had estimated values for uncompensated care (due to non-reporting) were not provided by the AHA. For the state-level data, these restrictions are not binding and we have a full set of aggregate state data for the 50 states (plus DC) for the years 1990-2000.

All short-term, general, non-federal hospitals are included in the state-level variables. We measure uncompensated care (UC) as the sum of bad debt, which is defined as, "the provision for actual or expected uncollectibles resulting from the extension of credit," and charity care, which is defined as, "health services that were never expected to result in cash inflows… [which] results from a provider's policy to provide health care services free of charge to individuals who meet certain financial criteria." Uncompensated care is reported on the basis of forgone revenue, at "list" price. Because of contractual arrangements, hospitals rarely receive the full charged price for services, thus list price does not reflect the true cost associated with

providing the services. To correct for this problem, we convert hospital UC values from charges to expenses by multiplying by a hospital specific ratio of costs to charges (RCC): [total expense – bad debt expense]/[Gross patient revenues + other operating revenues].[10] All of our dollar figures for safety net care and relevant instruments are in real terms and are per MSA/state resident under age 65.[11]

### *D. Community Health Centers*

We incorporate information on UC provided by FQHCs during the years 1990-2000. The primary data sources we use are the Bureau Common Reporting Requirements (BCRR) data (for the years 1990-1995) and the Uniform Data System (UDS) files (for the years 1996 to 2000). UDS and BCRR data are provided by grantees of several primary care system development programs administered by the Bureau of Primary Health Care. The program we are most interested in is the Community Health Center Program (Section 330 of the Public Health Service Act).[12] Centers report extensive information on the number and types of people who receive services at the center. The data also contain extensive financial information on types of expenditures and sources of revenue.

The key variables we extract are the dollar value of sliding payment scale adjustments (discounts) provided by a center and the dollar value of bad debt written-off by a center. These variables are then summed and calculated on a per capital basis for the MSA/state. The resulting

[10] As a check on this specification we also use an alternative formulation of the RCC: Net patient revenue/Total gross patient revenue and find comparable results.

[11] We constructed MSA-specific and state-specific medical price CPIs to adjust dollar values for inflation. Further details are available in the Data Appendix.

[12] The BCRR and UDS also include information about the Health Care Services for the Homeless Program and the Migrant Health Center Program. In addition, BCRR includes information about the Family Planning Program and the National Health Service Corps, while the UDS includes information about the Public Housing Primary Care Program.

variable, which we call center uncompensated care is the key clinic safety net variable that we use. All variables (except for number of centers) are also adjusted at the center level to exclude migrants, homeless, and users 65 or older.[13]

### *E. Medicaid and SCHIP*

We control for Medicaid/SCHIP eligibility for children in our analyses because eligibility for public insurance may affect private coverage through the same mechanisms described above for safety net care. There is an extensive literature examining the effect of public eligibility on private coverage. We are also interested in the effect of the safety net on coverage of any kind, and Medicaid/SCHIP is a key determinant of any coverage. Because our childless adult subsample is generally unlikely to be Medicaid eligible, we exclude public coverage as a dependent variable and Medicaid eligibility as an independent variable in the adult regressions.

We calculate an indicator variable for Medicaid/SCHIP eligibility using a detailed eligibility calculator that accounts for the Medicaid expansions, waivers, SCHIP provisions, and other features of that Medicaid and SCHIP eligibility. Following much of the literature (e.g. Cutler and Gruber 1996; Currie and Gruber 1996a, 1996b; Ham and Shore-Sheppard 2005), we are worried about the potential endogeneity of individual eligibility. Eligibility is a function of family income and family structure, which are likely to have independent effects on health insurance offers and take-up. Eligibility is also likely to be measured with error. Thus, we

[13] For each center, we have information on the proportion of all users who are migrants, homeless and older than 65. All variables of interest are multiplied by the proportion of users in a given center that are not migrants, homeless, or older than 65. In the BCRR data years (1990 to 1995) family planning information is sometimes included along with other program information in the financial data. Where possible, we proportionately reduce financial flows by the fraction of users who use family planning services. Financial information is reported at the center level, not the site level. In the small share of cases where sites are outside the MSA (or for the state-level data, in other states), we proportionately adjust the financial data.

instrument an individual's actual eligibility with a simulated eligibility measure.

We calculate two different simulated eligibility measures, one based on a national sample of family characteristics, and a second based on an MSA-specific sample of family characteristics. The first measure, which we call national simulated eligibility, is similar to that used in most past work. The second measure, which we call MSA-level simulated eligibility, uses a distribution of family characteristics (income in particular) that varies across states, but not over time, thus, should better reflect the wage and income distributions that are very different across states. For example, incomes are much higher in New York State than in Texas, and accounting for this difference can substantially affect the calculated fraction of a state's population affected by a Medicaid expansion. We construct a comparable measure using state-level distribution of characteristics for our state-level estimates. We also make some potential improvements over past simulated eligibility measures. In particular, we will account for the fact that it is uncommon for parents to receive the AFDC/TANF child care deduction.

For national simulated eligibility we use the family incomes (and other characteristics) for a random sample of 5000 children of a single year of age (0 to 14) from the entire urban U.S. and the entire sample period 1990-2000 (with dollar values indexed by the CPI-U). We then use our eligibility calculator to determine the Medicaid/SCHIP eligibility of each of these children as it would have been in each of the years 1990-2000 in each of the 51 states. The calculated mean eligibility for a given age, state and year is merged into our dataset and matched by age×state×year to individuals in the dataset.

For MSA-level (state-level) simulated eligibility we use the MSA (state) level distribution of income and other characteristics for all families with children under 18. We sample up to 500 children from the entire period 1990-2000 from each MSA (state). We then

use our eligibility calculator to determine what the Medicaid/SCHIP eligibility of each of these children would have been in that MSA (state) in each of the years 1990-2000 if the child were a given single year of age, 0 to 14. The calculated mean eligibility for a given age, MSA (state) and year is merged into our dataset and matched by age×MSA×year (age×state×year) to individuals in the dataset.

### *F. Other Individual Characteristics and Controls*

We control for a number of other individual and state characteristics in our regression estimates. These characteristics include age, race, education (of each parent for the children), work status (number of working parents for children), and whether the individual (or parent) works for a large firm. In addition for the child regressions we include type of family (only mother present, only father present) and family size.

We include as controls several characteristics of areas that vary by MSA and year including the MSA-level unemployment rate and per capita income. We also include the private HMO penetration rate and the state Medicaid managed care rate. For state-level analyses, unemployment, per capita income, and HMO penetration are all included measured at the state level. HMO and Medicaid managed care penetration are described in detail in the data appendix. We also tried specifications for children that included MSA-level family Medicaid eligibility, but the variable was not significant and did not appreciably affect the UC variable coefficients.

## 6. Econometric Estimates

We analyze a large repeated cross-section sample of children from the CPS over the 1990-2000 period. Our main specification relates coverage to Medicaid eligibility, safety net

variables, other state variables, demographic variables, and other characteristics and can be written as:

$$COVERAGE_{imt} = \alpha + \beta_1 CENTER\_UC_{mt} + \beta_2 HOSPITAL\_UC_{mt} + \beta_3 PUBLIC\_ELIGIBILITY_{imt} + \beta_4 MSA_m + \beta_5 YEAR_t + \beta_6 X_{imt} + \beta_7 Z_{mt} + \varepsilon_{imt} .$$

Here $COVERAGE_{imt}$ is an indicator variable for health insurance coverage of a given type for child $i$ in MSA $m$ and year $t$. Our main measures of coverage are private health insurance coverage and any health insurance coverage. $CENTER\_UC_{mt}$ is one of our measures of the health center safety net provided at the MSA level. In most cases, the measure is sliding discounts plus bad debt written-off per capita for the MSA and year. $HOSPITAL\_UC_{mt}$ is one of our measures of the hospital safety net care provided at the MSA level. In most cases this measure is charity care plus bad debt per capita, adjusted for the difference between hospital list and actual prices, for the MSA and year. $PUBLIC\_ELIG_{imt}$ is Medicaid or SCHIP eligibility. $X$ includes individual characteristics (and family characteristics for children). $Z$ includes the MSA and state by year level variables including unemployment rates and per capita income.

We will generally include MSA indicator variables when we use MSA simulated Medicaid eligibility, but report some estimates without them. We do not include MSA×year interactions because with them our safety net variables would not be identified. The results in Cutler and Gruber (1996, p. 406) and Lo Sasso and Buchmueller (2004, p. 1072) suggest that this identifying restriction is not too worrisome as they found that adding state×year interactions had little effect on their estimates. Our state-level regressions are structured in a similar fashion.

Like all of the previous work in this area, we use linear probability models. However,

we have explored the sensitivity of our estimates and examined how well the linearity assumption seems to approximate the data.[14] In addition, below we compare probit average derivatives to linear probability model coefficients for some of our key specifications. These estimates are reported in Table 10.

### *A. Descriptive Statistics*

Tables 1 through 3 report descriptive statistics for the data we use. Table 1 reports overall means for our MSA-level data sets for insurance coverage and policy variables over the 1990-2000 period, along with standard deviations and the range of the variables. (A comparable table for the state-level data set is contained in Appendix Table A.) We have over 182,000 children ages 14 or less in our child dataset and over 151,000 adults in our unmarried, childless adult dataset. Overall, just over 14 percent of children have no health insurance coverage and 65 percent have private coverage. Nearly 25 percent of children have public health insurance coverage, while 36 percent of children are eligible for Medicaid. For adults, nearly 28 percent of unmarried childless adults aged 18 to 64 have no insurance while roughly 64 percent have private coverage.

Hospital uncompensated care averages $90 annually per capita. Health center

[14] Ham and Shore-Sheppard (2005) found little difference between linear probability model estimates and logit derivatives when estimating similar, but simpler, models of insurance coverage. We have done some explorations of relaxing the linearity assumption. In particular, we have tried discretizing variables where it is sensible and adding squares of the remaining continuous variables. For the safety net variables and some other continuous variables we included (variable-overall mean)$^2$ so that the coefficient on the linear term retained its interpretation as the marginal effect at the means. We then added interactions of most of the discrete variables and many of the continuous variables. The interactions included interactions of components of X and Z with each other, Year×X, Year×Z, Age×X(except for age), Age×Z, Census region×X, Census region×Z. We examined how the fraction of out of unit interval predictions changed for our key estimates and how the coefficients on the safety net variables changed as we made the specification progressively less parametric. These explorations did not suggest that the simpler linear probability model estimates were badly biased.

uncompensated care is on average much lower, at nearly three dollars per capita, though it is above $30 dollars per capita in at least one MSA (Raleigh-Durham-Chapel Hill, NC). Sources of support for hospitals and clinics include state and local tax appropriations for hospitals, which on average is $22 per capita. Federal grant support for FQHCs is nearly $2.80 per capita, while state/local and private/other are smaller, averaging $0.92 and $0.31 per capita, respectively. State DSH spending is nearly $70 per capita and exceeded $400 per capita in one state (Louisiana in 1992). State UC pool spending is $10 per capita, but as mentioned earlier is non-zero in only five states.

Table 2 reports how the means of our key variables change over time. For convenience and to minimize sample composition changes over time in the MSA-level data, we display state-level means of the policy variables over time; MSA level means are generally quite comparable. The fraction of children without any health insurance coverage rises over time before falling at the end of the period. The fraction of children with private coverage has a less pronounced fall and more pronounced rise at the end. Some of the drop in uninsurance reported at the end of the period is likely due to the addition of an uninsurance verification question (see Nelson and Mills, 2001). Because we include year indicators in all of the regressions the effect of this questionnaire change should be minimal and should not influence parameters of interest. Over the period, Medicaid eligibility rises sharply from 27 percent of children ages 14 or under to nearly 50 percent. The fraction of unmarried, childless adults without health insurance remains relatively constant in the mid-to-high 20 percent range. Similarly, private health insurance for the adults dips during the 1990s but is virtually unchanged in 2000 relative to 1990 at 65 percent.

Hospital UC increases slightly in the early 1990s, but falls on average in the late 1990s. By contrast, FQHC UC increases throughout the 1990s by a total of roughly 50 percent. Our

simulated eligibility variables match trends in estimated eligibility for the sample of children. Both Medicaid managed care penetration and private HMO penetration increase sharply over the 1990s. Table 3 reports the mean and standard deviation for individual and family characteristics for our two samples. About one quarter of the sample of children is in single-mother families. Nearly ninety percent of the children live in families with at least one employed adult, and a bare majority have two employed adults in the family. Over 60 percent of children are in families with at least one family member working in a large firm, which is defined as 100 or more employees. Among the unmarried, childless adult sample, slightly over 60 percent work full-time with an additional 20 percent working part-time.

### *B. Estimating the Impact of Uncompensated Care*

Table 4 reports our first set of regressions that show the determinants of uninsurance, any private coverage, and public coverage for children using the MSA-level data. Because we have strong beliefs about our Medicaid eligibility variable being endogenous (as it is a function of income and family status), we instrument for Medicaid eligibility for the child regressions. When we do not include MSA fixed effects in the specification, our simulated eligibility measure is national-level simulated eligibility. MSA-level simulated eligibility is a function of the state family composition and earnings distribution and thus is likely correlated with the error term unless MSA fixed effects are included. Medicaid eligibility has the expected impact on insurance coverage. A ten percentage point increase in Medicaid eligibility is estimated to increase public coverage by about one percentage point, similar to the magnitude found in Ham and Shore-Sheppard (2005) and Lo Sasso and Buchmueller (2004).

In the estimates without fixed effects the main source of identifying variation for the

uncompensated care variables is differences across MSAs in their usual level of uncompensated care. The estimates without fixed effects provide an important baseline. While we control for a number of important MSA and state level factors in our regression models, there are likely to be numerous unobserved factors, some of them the result of long-standing policies and industry make-up, that explain both coverage rates and UC levels. To the extent that these unobservables are positively correlated with both high UC and low coverage, the estimated impact of UC on coverage is likely to be too high. By including state/MSA fixed effects and examining the effect on the key safety net coefficients we can gauge the extent to which unmeasured area characteristics are confounding estimates. The results will also serve to highlight the potential biases in the previous cross-sectional research on the subject or other research that did not include fixed effects.

The estimates of the effect of hospital and center UC in Table 4 suggest crowd-out of both public and private coverage and an overall increase in uninsurance for children associated with hospital UC, but less consistent results for center UC. Focusing on the estimates in the first three columns, a fifty percent (approximately one standard deviation) increase in hospital UC is predicted to increase uninsurance by between .5 and 2 percentage points. We focus on the effect of a fifty percent increase in uncompensated care to provide an easily interpretable scaling of the coefficients. The estimated effect of hospital UC diminishes as more geographically specific fixed effects are added to the specification. The largest crowd-out effect in the private coverage estimates of column four suggests that a fifty percent increase in hospital uncompensated care would reduce private coverage by just over 1.5 percentage points, though with MSA fixed effects included the estimate falls to roughly one-quarter percentage point and is not statistically significant. Interestingly, the impact of hospital UC on public coverage is negative and

significant for children, suggesting that a fifty percent increase in UC is estimated to decrease public coverage of children by roughly half a percentage point.

The estimated effects associated with a fifty percent increase in health center provided uncompensated care are much smaller. A fifty percent increase in center uncompensated care is predicted to lead to a small increase in the likelihood of no insurance coverage. The 95 percent confidence interval for the effect of center uncompensated care in the estimates without fixed effects rules out a crowd-out effect of even two tenths of a percentage point. The upper end of the confidence interval for the estimates with MSA fixed effects is only slightly higher. The private coverage regression without fixed effects suggests that center UC may have a negative impact on private coverage. A fifty percent increase in center UC is predicted to decrease private coverage by nearly 3 tenths of a percentage point. With MSA fixed effects, the estimate is small and of the opposite sign. None of the coefficient estimates for family and demographic variables contain surprising results.

In Table 5 we present comparable regression estimates for the adult sample. Because public enrollment is quite rare for unmarried, childless adults between 18 and 64 years of age, we do not examine public coverage as an outcome variable. For obvious reasons we do not include Medicaid eligibility in the adult regressions. Hospital UC effects have a generally similar magnitude for adults relative to children and they exhibit the same general pattern: a fifty percent increase in hospital UC is predicted to increase uninsurance by .5 to 1.5 percentage points. In the case of the estimate with MSA fixed effects, a 95 percent confidence interval does not rule out a decrease in uninsurance or no effect. For private coverage, hospital UC has similarly sized effects on coverage, but in the opposite direction. As with the child regressions, center UC effects are less consistently statistically significant. The effect sizes for adults are comparable to

those for children: a fifty percent increase in center UC is predicted to increase uninsurance by 1 to 2 tenths of a percentage point and decrease private coverage by less than 1 tenth of a percentage point.

Table 6 displays summary results for child and adult regressions conducted using measures of UC that are aggregated to the state level. As mentioned earlier, the state-level measures of the safety net are less directly related to individual decision-making regarding health insurance coverage, thus making them cruder measures. However, aggregating to the state-level reduces the effect of measurement error in individual hospital and health center reporting on a year-by-year basis. We observe results that are qualitatively similar to our MSA-level findings. Some notable differences include the finding that hospital UC effects on children's public health insurance coverage are much larger than those observed with the MSA-level UC measures. In addition, health center UC has a more robust impact on adult health insurance coverage.

### *C. Instrumenting for Uncompensated Care*

The results presented thus far have assumed that UC is exogenous with respect to health insurance coverage. The exogeneity assumption would be invalid if 1) there was some degree of "reverse causality" between the UC measures and insurance coverage or 2) if unobserved characteristics affect both insurance coverage and UC levels. While it is unlikely to be the case that individuals can meaningfully affect the level of UC in a given MSA or state, we are concerned about the possibility that unmeasured factors might be correlated with both insurance coverage and UC. We expect that to some extent safety net care will be mechanically greater where fewer people are covered by insurance and thus fewer people have their care paid for by insurance. We also think that government entities supporting the safety net would feel that there

is greater need when there are more uncovered children. However, there are uncovered children in all MSAs, so it is not clear how powerful the latter effect will be. Additionally, it should be noted that in general the inclusion of MSA or state fixed effects is likely to control for many potential confounders. Nevertheless, because of the first mechanical relationship we expect that safety net care will be greater in areas with lower child coverage, all else equal. Thus, we expect that the estimates taking uncompensated care to be exogenous overstate the effect of safety net care in lowering overall insurance as well as lowering private insurance. We think it is reasonable to take the estimates provided in the previous section as an upper bound on the magnitude of potential adverse effects of the provision of safety net care on coverage.

For hospital UC, we use as instruments measures of financial support for safety net hospitals. The first variable is Medicaid Disproportionate Share dollars per capita for the state in which the hospital is located. The DSH program supported hospitals and clinics providing a disproportionate share of Medicaid and uncompensated care. The nature and history of the DSH program was described in more detail in Section 4. In addition, we use state and local tax appropriations. From the AHA Annual Survey we obtained annual tax appropriations received by hospitals within each MSA and state for the years 1990-2000. This measure reflects payment received by hospitals from state and local governments. In the year 2000 among short-term general non-federal hospitals, 59% of all public hospitals reported some tax appropriations, while roughly 22% of non-profit hospitals and 41% of for-profit hospitals received some tax appropriations. In 2000 hospitals reported a total of $2.8 billion in tax appropriations, of which over 90% was distributed to public hospitals. Public hospitals received in aggregate approximately $2.5 billion in tax appropriations, for an average of just over $14 million per hospital for the 178 public hospitals that reported some tax appropriations. By contrast, for-profit

hospitals received a total of $62 million in tax appropriations for an average of just over $320,000 per hospital for the 193 for-profit hospitals that reported some tax appropriations. Not-for-profit hospitals reported a total of $192 million in tax appropriations, for an average of $500,000 per hospital for the 385 not-for-profit hospitals that reported some tax appropriations.

As with hospital uncompensated care, we are concerned about the potential endogeneity of center uncompensated care. If fewer people are covered in an area, then a higher fraction of services provided by centers might go unpaid, and thus be classified as uncompensated care. Thus, we also consider variables that could be used as instruments for center safety net care. Our two instruments are: 1) federal grants provided to health centers, and 2) state, local and private grant support for centers. Both variables are obtained from the UDS and BCRR data.

We also construct a number of political economy measures intended for use as instruments in our regression models. These variables include the percentage of the MSA population voting Democratic in the presidential election (with linear time trends between presidential election years) and indicator variables for Democratic control of the governorship and the upper and lower houses of the state legislature. Finally, we include a measure of the state budget surplus per capita to control for the potential flexibility that states might have regarding funding safety net care.

Table 7 displays means over time of the instrumental variables. Hospital tax appropriations fall by nearly 50 percent over the period. There is a sharp rise in DSH spending apparent in the early 1990s followed by a gradual decline, while UC pool expenditures fall throughout the period. Federal grant support for FQHCs generally falls over the period, while state and local support for health centers rise more steadily. With the economic expansion of the second half of the 1990s, state budget surpluses increase and unemployment falls. The fraction

of the state population voting for Democratic presidential candidates increases somewhat over the period, but the overall fraction of the population living in states with Democratic state legislatures and governors falls.

Appendix Table C reports the first stage regressions for the child sample that show the determinants of the two types of uncompensated care and Medicaid eligibility. The UC first stage regressions are very similar for adults and children and are quite similar when measured at the state- or MSA-level, hence we only discuss the results presented in Appendix Table C. [Additional tables for the first stage regressions are available upon request of the authors.] Several results are worth highlighting. Medicaid eligibility has a negative and statistically significant effect on hospital UC (though not FQHC UC) suggesting that when Medicaid eligibility is higher it leads to less hospital uncompensated care. As suggested earlier, this result might be expected because when Medicaid eligibility is higher it is more likely a low-income patient will have their bills paid through Medicaid rather than have them end up as uncompensated care. The magnitude of the estimated effect is moderately sized, as a ten percentage point increase in eligibility is estimated to decrease hospital uncompensated care by roughly three percent. Tax appropriations are estimated to have a strong effect on hospital uncompensated care. For every dollar provided by states and localities, uncompensated care rises 31 cents.[15] Surprisingly, state-level DSH spending has no effect on hospital UC. This could be a result of measurement error associated with DSH dollars being measured at the state-level. Alternatively, prior work has suggested that a significant portion of total DSH dollars

[15] This result raises the question of where the other 69 cents goes, which is an interesting issue that we leave for future research.

might have been appropriated by the state and used for general revenues (Baicker and Staiger 2004, GAO 1994, Ku and Coughlin 1995).

Grant support for health centers is not associated with significantly more uncompensated care by hospitals, providing some suggestive evidence for the validity of it as an instrument. If grant support were capturing the unmeasured need for the safety net because coverage is low, we would expect health center grant support to predict hospital UC. Similarly, hospital tax appropriations do not contribute to higher center UC (column 6). Again, this evidence suggests that hospital tax appropriations do not capture the unmeasured need for the safety net, suggesting that it may be a valid instrument. Democratic control of the lower house of the state legislature is associated with higher hospital UC provision.

Turning to the FQHC UC regressions, a significant determinant of center uncompensated care is federal grant support, the coefficient of which indicates that 55 cents of every dollar of federal grant support is spent on UC. This result corresponds to some earlier suggestions that FQHCs were diverting federal grant dollars to pay for under paid Medicaid services (Hoag, et al. 2000). State and local support has the expected sign, but is not significantly different from zero. It is not clear how state and local grant support is spent, but our results do not suggest that these monies are used to subsidize the provision of UC to the uninsured. State DSH programs do not directly support health centers, thus the marginally statistically significant result is surprising. Also significant is Democratic control of the upper house of the state legislature.

One other result, or non-result, is worth mentioning. The unemployment rate and per capita income are not determinants of hospital and center safety net provision (with MSA fixed effects) even though they are associated with private coverage. This result suggests that need

(the private coverage rate) may not be the main determinant of safety net provision, but instead it is other factors such as local political leadership or local tastes for support for the safety net.

The determinants of Medicaid eligibility are mostly not surprising. The coefficients on simulated eligibility are close to one and are very precisely measured. Higher unemployment increases eligibility, which is expected given that the simulated eligibility calculation uses a distribution of income and other family characteristics that does not vary over time. Higher UC pool expenditures is associated with lower Medicaid eligibility, which could suggest that states with UC pools could be applying more resources to supporting the pool than to expanding eligibility, all else constant. Higher Medicaid managed care penetration is associated with higher Medicaid eligibility, which could suggest that states might have been willing to "trade" greater use of manage care for greater eligibility. Democratic control of the upper house of the state legislature is associated with higher Medicaid eligibility. The family structure and education variables have the expected signs and have strong and precisely estimated effects [not displayed].

Our estimates that take uncompensated care to endogenous are reported in Table 8, for children and adults using MSA-level measures of UC. As before, we consider estimates that rely mostly on the differences in the safety net across states for their identifying variation. We then estimate our models with state fixed effects. Finally we include MSA fixed effects. The estimates that do not include fixed effects use national-level simulated eligibility as an instrument for Medicaid eligibility. Because the MSA earnings distribution is incorporated in MSA-level simulated eligibility measure, we believe that it is important to control for MSA fixed effects with this instrument. We contrast results with and without fixed effects (but with controls for unemployment, per capita income, and managed care penetration). The estimates without fixed effects suggest that a fifty percent increase in hospital uncompensated care would increase

uninsurance for children by 2.5 percentage points, decrease private coverage by 2 percentage, and decrease public coverage by 6 tenths of a percentage point. For health center UC the uninsurance regression suggests no crowd-out, but the private coverage regression suggests that a fifty percent increase in center UC is associated with a decrease in private coverage of between one and two tenths of a percentage point. The public coverage regression shows a somewhat surprising positive effect of center UC on public coverage.

When we control for state fixed effects the identifying variation in the estimation comes from changes in uncompensated care within states over time. In this case, the uninsurance effect is roughly halved to an increase of 1.2 percentage point associated with a 50% rise in hospital UC; for private coverage the effect is a drop of 9 tenths of a percentage point; while for public coverage the effect is a drop of 6 tenths of a percentage point. For health center UC the uninsurance regression suggests an increase in uninsurance of 2 tenths of a percentage point and a decrease in private coverage of nearly 4 tenths of a percentage point with a fifty percent rise in center UC. The public coverage regression again shows a surprising positive effect of center UC on public coverage.

Controlling for MSA fixed effects restricts the identifying variation to changes in UC within MSAs over time. Using 2SLS and including MSA fixed effects leads the standard errors on the hospital uncompensated care measures to rise substantially. While the hospital uncompensated care coefficient in the children's uninsurance regression now has a negative sign suggesting no crowd-out, the standard error on the coefficient is nearly four times larger than it was with state fixed effects. Similarly in the private coverage regression the hospital UC coefficient is large and positive, and in this case statistically significant. A fifty percent increase in center UC is associated with an increase in uninsurance of 3 tenths of a percentage point and a

(statistically insignificant) drop in private coverage of 2 tenths of a percentage point. The public coverage regression now suggests higher center UC is associated with a drop in public coverage, but the coefficient is not significant.

The adult regressions treating UC as endogenous are displayed in the bottom panel of Table 8. The hospital and center UC effects are qualitatively similar to those observed for children, though they are generally smaller in magnitude.

Table 9 displays the complementary analyses using state-level measures of UC. For children the results are qualitatively similar to the results observed using MSA-level measures. In the bottom panel we see that the center UC coefficients in the fixed effects regressions suggest that a fifty percent increase in center UC is associated with a nearly 1.3 percentage point increase in uninsurance among single, childless adults with a comparable decrease in private coverage. The effect size is two to three times higher than previous estimates observed, but nonetheless implies an elasticity of private coverage relative to center UC of roughly –0.1, which is comparatively small.

Table 10 displays estimates of the main specifications displayed in Tables 8 and 9 for childless adults using residual added probit regressions. Under the assumption that the first stage regressions for the endogenous variables have normally distributed errors, Rivers and Vuong (1988) show that including the first stage residuals as additional probit regressors gives consistent estimates. There are two things about these results worth noting. First, the computed marginal effects for the probit results rarely deviate from the linear probability model results seen earlier by more than 15% and frequently are considerably closer. The specifications where there are larger differences are generally those with small coefficients and large standard errors to begin with. The results lend support to the use of linear probability models for this research.

A second point is that the residual added terms in the regression are frequently significant in the specifications that do not include fixed effects, but, with the exception of the state-level uninsurance regression, when fixed effects are included the residual added terms are no longer significant. However, the insignificance of the hospital UC first stage residuals is in large part due to substantial standard errors rather than small coefficients. Because the residual added terms can be used as a test of endogeneity the results suggest that the inclusion of fixed effects is successful in removing the endogenous component of safety net care from the regression, at least for center UC.

## 7. Discussion and Conclusions

There is an extensive literature on the extent to which public health insurance coverage through Medicaid induces less private health insurance coverage. However, little is known about the effect of other components of the health care safety net in crowding out private coverage. We examine the effect of Medicaid and uncompensated care provided by clinics and hospitals on insurance coverage. We construct a long panel of state- and MSA-level data on hospital uncompensated care and free and reduced price care offered by Federally Qualified Health Centers. We match this information to individual level data on coverage from the Current Population Survey. Our results provide mixed evidence on the extent of crowd-out. Hospital UC does not appear to have crowded-out health insurance coverage for children, but the degree of precision in the estimates is lacking in our best controlled regression specification. However, FQHC UC does appear to crowd-out private coverage for single, childless adults and, in some specifications, for children.

Less crowd-out for hospital uncompensated care may be plausible given that most

hospital uncompensated care pays for big ticket items rather than more routine care that individuals may think of when making coverage decisions. Most of the arguments about the exogeneity of our uncompensated care measures suggest that our estimates should overstate the extent of crowd-out. Similarly, the likely potential endogeneity concerns about our instruments would also suggest that we should overstate the extent of crowd-out. That we do not find strong evidence of crowd-out suggests that the effects may be small if present. Further study of the determinants of uncompensated care provision is called for, and would shed light on the validity of potential instruments for uncompensated care.

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## Data Appendix

**Summary of the MSA Selection Criteria:**

We start with the 281 MSAs ever identified in the CPS between 1990 and 2000. We lose 27 of these because the MSAs are defined by a city, a parish or part of a county and thus cannot be identified solely through the use of county codes. We dropped an additional 29 because they are reported in the CPS in such a way (for nondisclosure reasons) that the reported geographic unit differs from the county based true MSA definition by more than ten percent of the population (not identified, not in sample). Of these MSAs, 13 are only identified for either 1990-1994 or 1995-2000, but not both. In addition, for 17 of these MSAs the definition changes are large enough to affect more than ten percent of the population. In this case, we include separate MSA dummy variables for the two periods, i.e. we treat them as different MSAs in the two periods. In summary, after exclusions, we are left with 139 stable MSAs over the entire period and an additional 63 MSAs available for the period 1990-1994 and an additional 53 available for the period 1995-2000.

**Family characteristic variables used in simulated eligibility calculations:**

The family characteristics that we take from the sample used to simulate eligibility are number of parents in family, number of children under 18, family income minus welfare income (this is equal to earned plus unearned income minus public assistance income), family earnings, and an indicator for whether either spouse in a two parent family worked more than 1200 hours in previous year (which is used to calculate eligibility for AFDC-UP).

**Sources of other explanatory variables:**

We obtain several state level variables by aggregating county level data from the Area Resource File (ARF). We use the ARF to obtain the population under 65, the unemployment rate, and per capita income.

**Private and Medicaid HMO Penetration:**

The private HMO penetration rate by county for the years 1990-2000 is provided by InterStudy Publications. Interstudy conducts primary survey research, surveying all full-service HMOs twice each year. The survey instrument, known as the InterStudy National HMO Census, collects data on key personnel, enrollment by product type, plan name and address, provider contract information, and many other topics. The methodology to derive county-level estimates of HMO enrollment is described in detail in Wholey et al. (1995). We aggregate the county information to the state level.

The state Medicaid managed care rate is derived using administrative data from the Centers for Medicare and Medicaid Services (CMS). Using enrollment data in managed care plans and total Medicaid enrollment, we can calculate average Medicaid managed care penetration from 1990 to 2000.

**State-Specific Medical Price CPI**

We used the regional medical CPI collected by the Bureau of Labor Statistics, but benchmarked it to allow for state differences with the Geographic Practice Cost Index (GPCI).

**Table 1: Descriptive Statistics, Insurance Coverage and Policy Variables 1990-2000, MSA-Level Data Set**

| | Mean | Standard Deviation | Range |
|---|---|---|---|
| ***Insurance Variables*** | | | |
| No health insurance coverage-Children | 0.143 | | |
| Private health insurance coverage-Children | 0.652 | | |
| Public health insurance coverage-Children | 0.248 | | |
| Medicaid eligibility-Children | 0.359 | | |
| No health insurance coverage-Adults | 0.277 | | |
| Private health insurance coverage-Adults | 0.637 | | |
| Simulated Medicaid eligibility (MSA)-Children | 0.355 | 0.143 | 0.027 – 1 |
| Simulated Medicaid eligibility (National)-Children | 0.343 | 0.117 | 0.086 – 0.99 |
| | | | |
| ***Safety Net and Policy Variables†*** | | | |
| Real MSA level hospital UC per capita | 90.526 | 46.650 | 13.56 – 811.23 |
| Real MSA level FQHC UC per capita | 2.155 | 3.352 | 0 – 32.35 |
| Real MSA level hospital tax appropriations per capita | 22.122 | 34.604 | 0 – 1013.5 |
| Real MSA level FQHC federal revenue per capita | 2.785 | 3.223 | 0 – 67.35 |
| Real MSA level FQHC state and local revenue per capita | 0.923 | 1.692 | 0 – 24.72 |
| Real MSA level FQHC other revenue per capita | 0.312 | 0596 | 0 – 19.96 |
| Real DSH spending per capita | 66.266 | 58.955 | 0 – 439.48 |
| State Medicaid managed care penetration | 0.287 | 0.268 | 0 – 1 |
| Real state budget surplus per capita ($1000) | 379.880 | 265.922 | –199.58 – 2618.64 |
| Real UC pool expense per capita | 9.794 | 25.285 | 0 – 185.09 |
| Fraction voting Democratic in MSA | 0.557 | 0.103 | 0.143 – 0.774 |
| Democratic control of upper house legislature | 0.400 | | |
| Democratic control of lower house legislature | 0.627 | | |
| Democratic governor | 0.364 | | |
| Unemployment rate | 5.690 | 2.220 | 1.367 – 19.798 |
| Real per capita income ($1000) | 24.491 | 4.475 | 10.04 – 41.09 |
| Private HMO penetration rate | 0.268 | 0.139 | 0 – 0.884 |

Sample size is 182,152 for the children and 151,779 for the adults. Data for children aged 14 or less and unmarried, childless adults aged 18-64 from 1991-2001 CPS March Annual Demographic File representing insurance coverage years 1990-2000. All per capita variables constructed using MSA population under 65 years of age.

† Descriptive statistics displayed for adult sample; child sample means of policy variables are similar.

**Table 2: Descriptive Statistics for Policy and Coverage Variables Over Time, State-Level Data Set**

| Variable† | 1990 | 1992 | 1994 | 1996 | 1998 | 2000 |
|---|---|---|---|---|---|---|
| No health insurance coverage-child | 0.132 | 0.127 | 0.139 | 0.147 | 0.159 | 0.123 |
| Private health insurance coverage-child | 0.711 | 0.686 | 0.651 | 0.652 | 0.665 | 0.682 |
| Public health insurance coverage-child | 0.154 | 0.172 | 0.238 | 0.229 | 0.203 | 0.222 |
| Medicaid eligibility-child | 0.268 | 0.322 | 0.345 | 0.357 | 0.400 | 0.488 |
| No health insurance coverage-adult | 0.261 | 0.276 | 0.270 | 0.272 | 0.280 | 0.254 |
| Private health insurance coverage-adult | 0.655 | 0.631 | 0.637 | 0.627 | 0.630 | 0.654 |
| Real state level hospital UC per capita | 87.416 | 90.275 | 92.520 | 89.605 | 87.247 | 85.625 |
| Real state level FQHC UC per capita | 2.042 | 1.959 | 2.078 | 2.333 | 2.639 | 2.974 |
| Simulated Medicaid eligibility (state) | 0.276 | 0.326 | 0.345 | 0.357 | 0.425 | 0.474 |
| Simulated Medicaid eligibility (National) | 0.277 | 0.322 | 0.340 | 0.351 | 0.429 | 0.475 |
| Medicaid managed care penetration | 0.067 | 0.132 | 0.202 | 0.377 | 0.501 | 0.538 |
| Private HMO penetration rate | 0.175 | 0.184 | 0.224 | 0.294 | 0.309 | 0.307 |
| Unemployment rate | 5.609 | 7.512 | 6.110 | 5.479 | 4.641 | 4.053 |
| Real per capita income ($1000) | 32.353 | 29.699 | 28.590 | 28.465 | 29.649 | 30.429 |

Sample sizes are 363,622 for children, 293,350 for adults. Data are from 1991-2001 CPS March Annual Demographic File representing insurance coverage years 1990-2000. All dollar values in real terms. All per capita variables constructed using state population under 65 years of age.

† Except where indicated, descriptive statistics displayed for adult sample; child sample means of policy variables are similar.

**Table 3: Descriptive Statistics, Socio-Demographic Characteristics, Child and Childless, Unmarried Adult Samples, 1990-2000, MSA-Level Data Set**

| ***Variable*** | *Child Sample* | *Adult Sample* |
|---|---|---|
| Female | 0.491 | 0.448 |
| Non-white | 0.202 | 0.365 |
| Age | 6.873 | 32.800 |
| | (4.267) | (13.034) |
| Mother only present | 0.241 | --- |
| Father only present | 0.038 | --- |
| One worker in household | 0.386 | --- |
| Two workers in household | 0.505 | --- |
| Full-time worker | --- | 0.629 |
| Part-time worker | --- | 0.183 |
| At least one person in household works for large (100+ employees) firm | 0.609 | 0.470 |
| High school graduate | --- | 0.291 |
| Some college | --- | 0.316 |
| College graduate | --- | 0.210 |
| Mother's education: high school graduate | 0.329 | --- |
| Mother's education: some college | 0.255 | --- |
| Mother's education: college graduate | 0.191 | --- |
| Father's education: high school graduate | 0.234 | --- |
| Father's education: some college | 0.182 | --- |
| Father's education: college graduate | 0.215 | --- |
| Sample size | 182,152 | 151,779 |

Data for children aged 14 or less and unmarried, childless adults aged 18-64 from 1991-2001 CPS March Annual Demographic File representing insurance coverage years 1990-2000. Standard deviations in parentheses.

**Table 4: Child Sample, Uninsurance, private coverage, and public coverage MSA-Level 2SLS regressions**

| | Uninsurance | | | Private Coverage | | | Public Coverage | | |
|---|---|---|---|---|---|---|---|---|---|
| | **No FE** | **State FE** | **MSA FE** | **No FE** | **State FE** | **MSA FE** | **No FE** | **State FE** | **MSA FE** |
| Medicaid eligible | –0.093*** | –0.026 | –0.060*** | 0.007 | 0.013 | –0.009 | 0.145*** | 0.037 | 0.093*** |
| | (0.022) | (0.017) | (0.017) | (0.023) | (0.024) | (0.021) | (0.026) | (0.024) | (0.022) |
| Hospital UC/pop | 0.439*** | 0.271*** | 0.103 | –0.361*** | –0.247*** | –0.064 | –0.125*** | –0.114** | –0.110 |
| ($1000) | (0.043) | (0.049) | (0.079) | (0.047) | (0.053) | (0.075) | (0.042) | (0.050) | (0.082) |
| FQHC UC/pop | 0.0008* | 0.0015*** | 0.0008 | –0.0024*** | –0.0026*** | 0.0007 | 0.0016*** | 0.0011 | –0.0011 |
| | (0.0005) | (0.0006) | (0.0009) | (0.0005) | (0.0006) | (0.0009) | (0.0006) | (0.0007) | (0.0010) |
| MMC penetration | –0.019* | –0.020* | –0.014 | 0.010 | 0.009 | 0.010 | 0.011 | 0.028** | 0.017 |
| Rate | (0.010) | (0.011) | (0.011) | (0.011) | (0.014) | (0.014) | (0.011) | (0.014) | (0.014) |
| HMO penetration rate | 0.025 | –0.030** | –0.019 | –0.048*** | 0.013 | –0.015 | –0.006 | –0.017 | 0.022 |
| | (0.018) | (0.013) | (0.019) | (0.016) | (0.017) | (0.024) | (0.016) | (0.020) | (0.025) |
| Per capita income | –0.003*** | 0.000 | 0.002 | 0.006*** | 0.003*** | 0.002 | –0.005*** | –0.006*** | –0.004** |
| ($1000s) | (0.001) | (0.001) | (0.002) | (0.001) | (0.001) | (0.002) | (0.001) | (0.001) | (0.002) |
| Unemployment rate | 0.001 | –0.001 | 0.000 | –0.008*** | –0.006*** | –0.007** | 0.004*** | 0.005*** | 0.002 |
| (%) | (0.001) | (0.001) | (0.002) | (0.001) | (0.001) | (0.003) | (0.001) | (0.001) | (0.002) |
| Female child | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | –0.004** | –0.004** | –0.004** |
| | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) |
| Nonwhite race | 0.027*** | 0.029*** | 0.031*** | –0.093*** | –0.098*** | –0.095*** | 0.093*** | 0.098*** | 0.092*** |
| | (0.004) | (0.004) | (0.004) | (0.005) | (0.006) | (0.006) | (0.006) | (0.007) | (0.006) |
| Dad only present | –0.001 | 0.013 | 0.014 | 0.099*** | 0.096*** | 0.090*** | –0.122*** | –0.137*** | –0.132*** |
| | (0.010) | (0.009) | (0.009) | (0.010) | (0.010) | (0.009) | (0.009) | (0.009) | (0.009) |
| Mom only present | –0.104*** | –0.101*** | –0.095*** | –0.021*** | –0.027*** | –0.026*** | 0.096*** | 0.101*** | 0.095*** |
| | (0.006) | (0.006) | (0.006) | (0.007) | (0.007) | (0.007) | (0.007) | (0.007) | (0.007) |
| Dad high school | –0.131*** | –0.111*** | –0.114*** | 0.176*** | 0.170*** | 0.165*** | –0.023*** | –0.042*** | –0.034*** |
| Graduate | (0.007) | (0.006) | (0.006) | (0.007) | (0.007) | (0.007) | (0.007) | (0.007) | (0.007) |
| Dad some college | –0.171*** | –0.151*** | –0.155*** | 0.223*** | 0.220*** | 0.214*** | –0.025*** | –0.049*** | –0.039*** |
| Education | (0.008) | (0.007) | (0.007) | (0.008) | (0.008) | (0.008) | (0.008) | (0.008) | (0.008) |
| Dad college | –0.191*** | –0.168*** | –0.174*** | 0.260*** | 0.256*** | 0.249*** | –0.053*** | –0.080*** | –0.067*** |
| Education | (0.008) | (0.007) | (0.007) | (0.008) | (0.009) | (0.008) | (0.009) | (0.009) | (0.008) |

(continues)

**Table 4: Child Sample, Uninsurance, private coverage, and public coverage MSA-Level 2SLS regressions (continued)**

| | Uninsurance | | | Private Coverage | | | Public Coverage | | |
|---|---|---|---|---|---|---|---|---|---|
| | **No FE** | **State FE** | **MSA FE** | **No FE** | **State FE** | **MSA FE** | **No FE** | **State FE** | **MSA FE** |
| Mom high school | –0.083*** | –0.066*** | –0.067*** | 0.176*** | 0.169*** | 0.164*** | –0.085*** | –0.101*** | –0.094*** |
| Graduate | (0.007) | (0.006) | (0.006) | (0.007) | (0.007) | (0.006) | (0.006) | (0.006) | (0.006) |
| Mom some college | –0.112*** | –0.093*** | –0.096*** | 0.234*** | 0.230*** | 0.224*** | –0.115*** | –0.137*** | –0.128*** |
| Education | (0.008) | (0.006) | (0.007) | (0.008) | (0.007) | (0.007) | (0.007) | (0.007) | (0.007) |
| Mom college | –0.133*** | –0.108*** | –0.113*** | 0.280*** | 0.273*** | 0.268*** | –0.155*** | –0.182*** | –0.170*** |
| Education | (0.009) | (0.007) | (0.007) | (0.008) | (0.008) | (0.007) | (0.009) | (0.008) | (0.008) |
| 1 working parent | 0.113*** | 0.125*** | 0.116*** | 0.201*** | 0.206*** | 0.198*** | –0.305*** | –0.333*** | –0.314*** |
| | (0.011) | (0.010) | (0.010) | (0.010) | (0.010) | (0.009) | (0.012) | (0.012) | (0.011) |
| 2 working parents | 0.099*** | 0.124*** | 0.109*** | 0.252*** | 0.258*** | 0.245*** | –0.345*** | –0.391*** | –0.363*** |
| | (0.015) | (0.012) | (0.012) | (0.013) | (0.013) | (0.012) | (0.015) | (0.015) | (0.014) |
| Parent(s) work for | –0.126*** | –0.118*** | –0.120*** | 0.178*** | 0.177*** | 0.174*** | –0.022*** | –0.034*** | –0.029*** |
| large firm (100+) | (0.005) | (0.005) | (0.005) | (0.005) | (0.006) | (0.006) | (0.005) | (0.005) | (0.004) |

Regressions also include age dummies, year dummies, and state fixed effects (where indicated). Regressions treat Medicaid eligibility as endogenous instrumenting with national-level simulated eligibility for the no state-FE regressions and. N=363,622; coverage years 1990-2000 for children 14 and under. Regressions control for state-year clustering. Huber-White standard errors in parentheses. *** indicates $p<0.01$, ** indicates $0.05<p<0.01$, * indicates $0.10<p<0.05$.

**Table 5: Single Childless Adult Sample, Uninsurance and private coverage, MSA-Level OLS regressions**

| | Uninsurance | | | Private Insurance | | |
|---|---|---|---|---|---|---|
| | **No FE** | **State FE** | **MSA FE** | **No FE** | **State FE** | **MSA FE** |
| Hospital UC/pop | 0.343*** | 0.158*** | 0.096 | –0.302*** | –0.145*** | –0.068 |
| ($1000s) | (0.046) | (0.045) | (0.065) | (0.043) | (0.042) | (0.063) |
| FQHC UC/pop | 0.0007 | 0.0012** | 0.0016** | –0.0008* | –0.0006 | –0.0006 |
| | (0.0005) | (0.0005) | (0.0007) | (0.0005) | (0.0005) | (0.0006) |
| MMC penetration Rate | –0.028*** | –0.032*** | –0.040*** | 0.016 | 0.022** | 0.028*** |
| | (0.011) | (0.011) | (0.010) | (0.011) | (0.011) | (0.010) |
| HMO penetration rate | 0.043** | –0.031** | 0.003 | –0.042*** | 0.023 | –0.036* |
| | (0.017) | (0.014) | (0.019) | (0.015) | (0.016) | (0.021) |
| Per capita income | 0.000*** | 0.000 | 0.000 | 0.000*** | 0.000 | 0.000 |
| ($1000s) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Unemployment rate | 0.008*** | 0.006*** | 0.000 | –0.008*** | –0.007*** | –0.003** |
| (%) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.002) |
| Nonwhite race | 0.116*** | 0.109*** | 0.106*** | –0.140*** | –0.136*** | –0.134*** |
| | (0.004) | (0.003) | (0.003) | (0.004) | (0.003) | (0.003) |
| High school graduate | –0.077*** | –0.073*** | –0.072*** | 0.137*** | 0.134*** | 0.133*** |
| | (0.005) | (0.005) | (0.005) | (0.004) | (0.004) | (0.004) |
| Some college education | –0.162*** | –0.162*** | –0.162*** | 0.255*** | 0.255*** | 0.255*** |
| | (0.006) | (0.006) | (0.006) | (0.005) | (0.005) | (0.005) |
| College education | –0.222*** | –0.222*** | –0.222*** | 0.335*** | 0.333*** | 0.333*** |
| | (0.006) | (0.006) | (0.006) | (0.005) | (0.005) | (0.005) |
| Female | –0.041*** | –0.041*** | –0.041*** | 0.033*** | 0.032*** | 0.032*** |
| | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) |
| Works full-time | 0.027*** | 0.023*** | 0.023*** | 0.251*** | 0.252*** | 0.252*** |
| | (0.005) | (0.005) | (0.005) | (0.005) | (0.005) | (0.005) |
| Works part-time | 0.105*** | 0.102*** | 0.102*** | 0.102*** | 0.103*** | 0.102*** |
| | (0.005) | (0.004) | (0.004) | (0.005) | (0.005) | (0.005) |
| Works for large firm | –0.165*** | –0.163*** | –0.162*** | 0.163*** | 0.162*** | 0.162*** |
| (100+) | (0.004) | (0.004) | (0.004) | (0.003) | (0.003) | (0.003) |

Regressions also include age dummies, year dummies, and state or MSA fixed effects (where indicated). N=293,350; coverage years 1990-2000 for unmarried, childless adults aged 18-64. Regressions control for state-year clustering. Huber-White standard errors in parentheses. *** indicates p<0.01, ** indicates 0.05<p<0.01, * indicates 0.10<p<0.05.

**Table 6: Child and Adult Samples, Uninsurance, private coverage, and public coverage State-Level 2SLS and OLS regressions**

| | Uninsurance | | Private Coverage | | Public Coverage | |
|---|---|---|---|---|---|---|
| | **No FE** | **State FE** | **No FE** | **State FE** | **No FE** | **State FE** |
| ***Child Estimates*** | | | | | | |
| Medicaid eligible | –0.090*** | –0.048*** | 0.027* | 0.021 | 0.083*** | 0.034** |
| | (0.018) | (0.014) | (0.016) | (0.014) | (0.022) | (0.013) |
| Hospital UC/pop | 0.393*** | 0.243** | –0.229*** | –0.005 | –0.254*** | –0.314*** |
| ($1000) | (0.060) | (0.098) | (0.065) | (0.094) | (0.048) | (0.095) |
| FQHC UC/pop | 0.0011 | –0.0014 | –0.0022*** | –0.0007 | 0.0009 | 0.0025 |
| | (0.0007) | (0.0014) | (0.0008) | (0.0017) | (0.0009) | (0.0018) |
| ***Adult Estimates*** | | | | | | |
| Hospital UC/pop | 0.119** | 0.064 | –0.019 | 0.017 | --- | --- |
| ($1000) | (0.059) | (0.101) | (0.054) | (0.098) | | |
| FQHC UC/pop | 0.0030*** | 0.0033** | –0.0041*** | –0.0036*** | --- | --- |
| | (0.0007) | (0.0014) | (0.0006) | (0.0013) | | |

Regressions also include demographic variables, area characteristics, age dummies, year dummies, and state and MSA fixed effects (where indicated). Regressions treat Medicaid eligibility as endogenous for the child regressions instrumenting with national-level simulated eligibility for the no FE regressions and state-level simulated eligibility for the state-FE regressions. Coverage years 1990-2000. N=182,152 for children 14 and under; N=151,779 for unmarried, childless adults aged 18-64. Regressions control for state-year clustering. Huber-White standard errors in parentheses. *** indicates $p<0.01$, ** indicates $0.05<p<0.01$, * indicates $0.10<p<0.05$.

**Table 7: Descriptive Statistics for Instrumental Variables Over Time, State-Level Data Set**

| Variable† | 1990 | 1992 | 1994 | 1996 | 1998 | 2000 |
|---|---|---|---|---|---|---|
| Real state level hospital tax appropriations per capita | 23.159 | 17.832 | 19.370 | 17.720 | 15.126 | 12.310 |
| Real state DSH per capita | 5.714 | 105.279 | 91.765 | 71.107 | 63.446 | 54.336 |
| Real UC pool expense per capita | 17.115 | 14.411 | 10.327 | 7.806 | 7.267 | 6.415 |
| Real state level FQHC federal grants per capita | 4.130 | 3.494 | 3.561 | 3.848 | 3.037 | 3.428 |
| Real state level FQHC state and local grants per capita | 1.002 | 0.959 | 1.221 | 1.393 | 1.371 | 1.410 |
| Real state level FQHC other grants per capita | 0.309 | 0.406 | 0.522 | 0.201 | 0.230 | 0.421 |
| Real state budget surplus per capita ($1000) | 374.564 | 258.555 | 392.710 | 577.076 | 827.966 | 809.790 |
| Fraction voting Democratic in state | 0.447 | 0.433 | 0.466 | 0.496 | 0.489 | 0.484 |
| Democratic control of upper house legislature | 0.651 | 0.523 | 0.462 | 0.440 | 0.413 | 0.415 |
| Democratic control of lower house legislature | 0.830 | 0.768 | 0.448 | 0.438 | 0.586 | 0.565 |
| Democratic governor | 0.552 | 0.519 | 0.523 | 0.282 | 0.266 | 0.325 |

Sample size 293,350 (for adults). All dollar values in real terms. All per capita variables constructed using state population under 65 years of age.

† Descriptive statistics displayed for adult sample; child sample means of policy variables are similar.

**Table 8: Child and Adult Samples, Uninsurance, private coverage, and public coverage 2SLS regressions, MSA-Level Sample, Instrumenting for UC**

| | Uninsurance | | | Private Coverage | | | Public Coverage | | |
|---|---|---|---|---|---|---|---|---|---|
| | **No FE** | **State FE** | **MSA FE** | **No FE** | **State FE** | **MSA FE** | **No FE** | **State FE** | **MSA FE** |
| ***Child Estimates*** | | | | | | | | | |
| Medicaid eligible | –0.080*** | –0.021 | –0.072*** | –0.008 | 0.005 | 0.005 | 0.149*** | 0.038 | 0.101*** |
| | (0.024) | (0.018) | (0.018) | (0.024) | (0.024) | (0.023) | (0.027) | (0.024) | (0.023) |
| Hospital UC/pop | 0.558*** | 0.258*** | –0.468* | –0.444*** | –0.208*** | 0.627** | –0.143** | –0.129* | 0.173 |
| ($1000) | (0.089) | (0.080) | (0.282) | (0.083) | (0.076) | (0.316) | (0.060) | (0.067) | (0.312) |
| FQHC UC/pop | –0.0011 | 0.0019*** | 0.0029** | –0.0014** | –0.0037*** | –0.0018 | 0.0027*** | 0.0017** | –0.0025 |
| | (0.0008) | (0.0006) | (0.0014) | (0.0007) | (0.0008) | (0.0017) | (0.0007) | (0.0008) | (0.0016) |
| ***Adult Estimates*** | | | | | | | | | |
| Hospital UC/pop | 0.402*** | 0.157** | –0.265 | –0.321*** | –0.166** | 0.188 | --- | --- | --- |
| ($1000) | (0.084) | (0.072) | (0.249) | (0.070) | (0.065) | (0.250) | | | |
| FQHC UC/pop | –0.0012* | 0.0013** | 0.0016 | 0.0002 | –0.0009 | –0.0013 | --- | --- | --- |
| | (0.0007) | (0.0006) | (0.0012) | (0.0006) | (0.0006) | (0.0012) | | | |

Regressions also include demographic variables, area characteristics, age dummies, year dummies, and State and MSA fixed effects (where indicated). Regressions treat Medicaid eligibility as endogenous instrumenting with national-level simulated eligibility for the no FE and state-FE regressions and MSA-level simulated eligibility for the MSA-FE regressions. 2SLS models instrument UC with real state hospital tax appropriations per capita, real state DSH dollars per capita, real federal grant dollars for FQHCs per capita, real state/local grant dollars for FQHCs per capita, real other grant dollars for FQHCs per capita, real state budget surplus per capita, fraction voting Democratic in state, Democratic party control indicators for governor and upper and lower houses of state legislature, and real UC pool dollars per capita. Coverage years 1990-2000. N=182,152 for children 14 and under; N=151,779 for unmarried, childless adults aged 18-64. Regressions control for MSA-year clustering. Huber-White standard errors in parentheses. *** indicates $p<0.01$, ** indicates $0.05<p<0.01$, * indicates $0.10<p<0.05$.

**Table 9: Child and Adult Samples, Uninsurance, private coverage, and public coverage 2SLS regressions, State-Level Sample, Instrumenting for UC**

| | Uninsurance | | Private Coverage | | Public Coverage | |
|---|---|---|---|---|---|---|
| | **No FE** | **State FE** | **No FE** | **State FE** | **No FE** | **State FE** |
| ***Child Estimates*** | | | | | | |
| Medicaid eligible | –0.076*** | –0.056*** | 0.016 | 0.029* | 0.084*** | 0.037** |
| | (0.018) | (0.016) | (0.017) | (0.016) | (0.022) | (0.015) |
| Hospital UC/pop | 0.475*** | –0.333 | –0.343*** | 0.631 | –0.178*** | –0.189 |
| ($1000) | (0.090) | (0.479) | (0.104) | (0.503) | (0.059) | (0.359) |
| FQHC UC/pop | –0.0006 | 0.0038 | 0.0006 | –0.0062 | 0.0007 | 0.0027 |
| | (0.0011) | (0.0038) | (0.0014) | (0.0041) | (0.0010) | (0.0039) |
| ***Adult Estimates*** | | | | | | |
| Hospital UC/pop | 0.054 | -0.290 | 0.012 | –0.035 | --- | --- |
| ($1000) | (0.074) | (0.325) | (0.065) | (0.226) | | |
| FQHC UC/pop | 0.0016 | 0.0091** | –0.0026** | –0.0065* | --- | --- |
| | (0.0011) | (0.0044) | (0.0011) | (0.0036) | | |

Regressions also include demographic variables, area characteristics, age dummies, year dummies, and state fixed effects (where indicated). Regressions treat Medicaid eligibility as endogenous instrumenting with national-level simulated eligibility for the no state-FE regressions and state-level simulated eligibility for the state-FE regressions. 2SLS models instrument UC with real state hospital tax appropriations per capita, real state DSH dollars per capita, real federal grant dollars for FQHCs per capita, real state/local grant dollars for FQHCs per capita, real other grant dollars for FQHCs per capita, real state budget surplus per capita, fraction voting Democratic in state, Democratic party control indicators for governor and upper and lower houses of state legislature, and real UC pool dollars per capita. Coverage years 1990-2000. N=363,622 for children 14 and under; N=293,350 for unmarried, childless adults aged 18-64. Regressions control for state-year clustering. Huber-White standard errors in parentheses. *** indicates $p<0.01$, ** indicates $0.05<p<0.01$, * indicates $0.10<p<0.05$.

**Table 10: Adult Sample, Uninsurance and Private Coverage, Residual Added Probit Regressions Controlling for UC Endogeneity, MSA- and State-Level Samples**

| | Uninsurance | | Private Coverage | |
|---|---|---|---|---|
| | **No FE** | **FE** | **No FE** | **FE** |
| ***MSA Level*** | | | | |
| Hospital UC/pop | 0.410*** | –0.256 | –0.370*** | 0.217 |
| ($1000) | (0.041) | (0.210) | (0.041) | (0.224) |
| FQHC UC/pop | –0.0015*** | 0.0015 | 0.0003 | –0.0015 |
| | (0.0004) | (0.0013) | (0.0004) | (0.0013) |
| 1st Stage Residual, | -0.120 | 1.211 | -0.020 | -0.897 |
| Hospital UC | (0.181) | (0.765) | (0.179) | (0.793) |
| 1st Stage Residual, | 0.016*** | 0.001 | -0.008*** | 0.003 |
| FQHC UC | (0.002) | (0.005) | (0.002) | (0.003) |
| ***State-Level Estimates*** | | | | |
| Hospital UC/pop | 0.060** | -0.300** | 0.019 | 0.012 |
| ($1000) | (0.026) | (0.152) | (0.026) | (0.156) |
| FQHC UC/pop | 0.0016*** | 0.0101*** | –0.0029*** | –0.0084*** |
| | (0.0005) | (0.0021) | (0.0006) | (0.0023) |
| 1st Stage Residual, | 0.812*** | 1.355** | -0.462*** | 0.008 |
| Hospital UC | (0.143) | (0.529) | (0.144) | (0.516) |
| 1st StageResidual, | 0.014*** | -0.025*** | -0.014*** | 0.013 |
| FQHC UC | (0.003) | (0.008) | (0.003) | (0.009) |

Mean marginal effects displayed for probit coefficients of uncompensated care variables. Regressions also include demographic variables, area characteristics, age dummies, year dummies, and MSA or state fixed effects (where indicated). Probit regressions include predicted residuals from first stage OLS models of UC controlling for above mentioned variables plus excluded instruments: real state hospital tax appropriations per capita, real state DSH dollars per capita, real federal grant dollars for FQHCs per capita, real state/local grant dollars for FQHCs per capita, real other grant dollars for FQHCs per capita, real state budget surplus per capita, fraction voting Democratic in state, Democratic party control indicators for governor and upper and lower houses of state legislature, and real UC pool dollars per capita. Coverage years 1990-2000. N=151,779 for MSA sample of unmarried, childless adults aged 18-64; N=293,350 for state sample of unmarried, childless adults aged 18-64. Standard errors (in parentheses) bootstrapped from 500 repetitions. *** indicates $p<0.01$, ** indicates $0.05<p<0.01$, * indicates $0.10<p<0.05$.

**Appendix Table A: Descriptive Statistics, Insurance Coverage and Policy Variables 1990-2000, State-Level Data**

| | Mean | Standard Deviation | Range |
|---|---|---|---|
| ***Endogenous Variables*** | | | |
| No insurance coverage-Children | 0.139 | | |
| Private health insurance coverage-Children | 0.673 | | |
| Public health insurance coverage-Children | 0.203 | | |
| Medicaid eligibility-Children | 0.359 | | |
| No insurance coverage-Adult | 0.271 | | |
| Private health insurance coverage-Adult | 0.637 | | |
| | | | |
| Real state level hospital UC per capita | 89.563 | 44.399 | 25.93 – 464.99 |
| Real state level FQHC UC per capita | 2.834 | 2.431 | 0 – 23.13 |
| | | | |
| ***Policy Variables†*** | | | |
| Real state level hospital tax appropriations per capita | 17.981 | 25.561 | 0 – 260.61 |
| Real state level FQHC federal grants per capita | 4.446 | 2.601 | 0 – 16.34 |
| Real state level FQHC state and local grants per capita | 1.824 | 1.770 | 0 – 14.08 |
| Real state level FQHC other revenue per capita | 0.473 | 0.480 | 0 – 5.80 |
| Real DSH spending per capita | 68.240 | 69.783 | 0 – 593.19 |
| Real UC pool expense per capita | 10.355 | 30.311 | 0 – 226.79 |
| Simulated Medicaid eligibility (State) | 0.361 | 0.129 | 0.09 – 1.0 |
| Simulated Medicaid eligibility (National) | 0.358 | 0.128 | 0.09 – 1.0 |
| State Medicaid managed care penetration | 0.301 | 0.280 | 0 – 1 |
| Private HMO penetration rate | 0.239 | 0.148 | 0 – 0.653 |
| Real state budget surplus per capita ($1000) | 429.472 | 523.956 | –801.94 – 7284.44 |
| Fraction voting Democratic in state | 0.468 | 0.082 | 0.263 – 0.852 |
| Democratic control of upper house legislature | 0.499 | | |
| Democratic control of lower house legislature | 0.635 | | |
| Democratic governor | 0.411 | | |
| Unemployment rate | 5.696 | 1.617 | 2.2 – 11.4 |
| Real per capita income ($1000) | 23.785 | 4.545 | 13.16 – 41.45 |

Sample sizes are 363,622 for children, 293,350 for adults. Data are from 1991-2001 CPS March Annual Demographic File representing insurance coverage years 1990-2000. All per capita variables constructed using state population under 65 years of age.

† Except for simulated eligibility, descriptive statistics displayed for adult sample; child sample means of policy variables are similar.

**Appendix Table B: Descriptive Statistics, Socio-Demographic Characteristics, Child and Childless, Unmarried Adult Samples, 1990-2000, State-Level Data Set**

| ***Variable*** | *Child Sample* | *Adult Sample* |
|---|---|---|
| Female | 0.491 | 0.442 |
| Non-white | 0.185 | 0.308 |
| Age | 6.672 | 33.147 |
| | (4.275) | (13.324) |
| Mother only present | 0.230 | --- |
| Father only present | 0.041 | --- |
| One worker in household | 0.370 | --- |
| Two workers in household | 0.534 | --- |
| Full-time worker | --- | 0.625 |
| Part-time worker | --- | 0.190 |
| At least one person in household works for large (100+ employees) firm | 0.612 | 0.460 |
| High school graduate | --- | 0.305 |
| Some college | --- | 0.311 |
| College graduate | --- | 0.197 |
| Mother's education: high school graduate | 0.341 | --- |
| Mother's education: some college | 0.265 | --- |
| Mother's education: college graduate | 0.185 | --- |
| Father's education: high school graduate | 0.257 | --- |
| Father's education: some college | 0.191 | --- |
| Father's education: college graduate | 0.201 | --- |
| Sample size | 363,622 | 293,350 |

Data for children aged 14 or less and unmarried, childless adults aged 18-64 from 1991-2001 CPS March Annual Demographic File representing insurance coverage years 1990-2000. Standard deviations in parentheses.

**Appendix Table C: Child Sample, First stage MSA-Level OLS regressions of determinants of UC and Eligibility**

| | Hospital UC | | | FQHC UC | | | Medicaid Eligibility | | |
|---|---|---|---|---|---|---|---|---|---|
| | **No FE** | **State FE** | **MSA FE** | **No FE** | **State FE** | **MSA FE** | **No FE** | **State FE** | **MSA FE** |
| Simulated eligibility | –79.394*** | –22.761*** | –25.418*** | –1.522** | 0.225 | 0.178 | 0.936*** | 0.964*** | 1.024*** |
| | (10.226) | (6.746) | (6.170) | (0.659) | (0.445) | (0.359) | (0.026) | (0.032) | (0.019) |
| Hospital tax appropriation | 0.730*** | 0.679*** | 0.311*** | 0.0056*** | 0.0028 | 0.0027 | –0.00006 | –0.00005 | –0.00011 |
| per capita | (0.387) | (0.033) | (0.0565) | (0.0017) | (0.0021) | (0.0034) | (0.00004) | (0.00004) | (0.00009) |
| State DSH per capita | 0.069*** | 0.015 | –0.003 | 0.003*** | 0.001 | 0.002* | 0.000 | 0.000 | 0.000 |
| | (0.027) | (0.042) | (0.036) | (0.001) | (0.002) | (0.001) | (0.000) | (0.000) | (0.000) |
| UC Pool expense per capita | 0.311*** | 0.252*** | 0.091 | –0.005 | 0.003 | –0.002 | 0.000 | 0.000 | 0.000** |
| | (0.066) | (0.095) | (0.098) | (0.003) | (0.003) | (0.003) | (0.000) | (0.000) | (0.000) |
| FQHC federal grants | 2.229*** | 0.142 | 0.020 | 0.744*** | 0.717*** | 0.549*** | 0.002*** | 0.001 | 0.001 |
| per capita | (0.438) | (0.303) | (0.330) | (0.038) | (0.037) | (0.054) | (0.000) | (0.000) | (0.001) |
| FQHC state/local grants | 0.541 | 1.041 | 0.783 | 0.078 | 0.076 | 0.095 | 0.000 | 0.000 | 0.000 |
| per capita | (0.700) | (0.707) | (0.852) | (0.096) | (0.061) | (0.068) | (0.001) | (0.001) | (0.001) |
| FQHC other grants per | –3.173* | 0.890 | –0.373 | 0.296 | –0.121 | 0.053 | 0.002 | 0.002 | –0.003 |
| Capita | (1.825) | (1.530) | (1.014) | (0.306) | (0.191) | (0.173) | (0.003) | (0.003) | (0.003) |
| State surplus per capita | –8.332** | 2.630 | 6.031 | 0.739*** | 0.067 | 0.050 | 0.009 | 0.014 | 0.010 |
| ($1000s) | (4.226) | (5.068) | (3.751) | (0.267) | (0.257) | (0.202) | (0.009) | (0.010) | (0.008) |
| Democratic upper house | 10.668*** | –0.761 | 1.286 | –0.269*** | 0.161 | 0.274** | 0.009** | 0.002 | 0.013** |
| | (2.401) | (3.710) | (2.173) | (0.088) | (0.142) | (0.126) | (0.004) | (0.006) | (0.006) |
| Democratic lower house | 9.779*** | 4.747* | 5.117*** | –0.169 | 0.142 | 0.124 | 0.002 | 0.004 | 0.001 |
| | (2.901) | (2.810) | (1.919) | (0.156) | (0.123) | (0.102) | (0.004) | (0.005) | (0.004) |
| Democratic governor | 0.910 | –5.539** | –2.877 | 0.307* | –0.284** | –0.318*** | –0.003 | –0.002 | –0.006 |
| | (2.578) | (2.782) | (1.874) | (0.169) | (0.117) | (0.105) | (0.003) | (0.004) | (0.004) |
| Fraction voting Democratic | 60.201*** | 117.647*** | –57.032 | 0.005 | 1.245* | 1.998 | 0.003 | 0.037 | 0.039 |
| for president (state) | (12.194) | (12.231) | (42.637) | (0.662) | (0.637) | (2.792) | (0.022) | (0.024) | (0.071) |
| Medicaid managed care | –10.354* | –23.007*** | –18.702*** | 2.105*** | 1.272*** | 0.697* | 0.035*** | 0.015 | 0.027** |
| Penetration | (5.478) | (6.654) | (5.706) | (0.366) | (0.366) | (0.406) | (0.010) | (0.013) | (0.012) |
| HMO penetration rate | –54.099*** | –14.950* | 3.379 | –1.344** | –1.825*** | –0.333 | –0.034*** | –0.042*** | –0.014 |
| | (8.716) | (7.728) | (7.840) | (0.540) | (0.442) | (0.512) | (0.012) | (0.016) | (0.019) |
| Per capita income ($1000s) | 0.053 | 1.359*** | –0.241 | 0.066** | –0.024 | 0.078 | –0.005*** | –0.004*** | –0.004** |
| | (0.353) | (0.370) | (0.887) | (0.031) | (0.019) | (0.057) | (0.001) | (0.001) | (0.002) |
| Unemployment rate (%) | –1.678*** | 1.651** | 0.546 | 0.206*** | 0.187*** | 0.087 | 0.006*** | 0.007*** | 0.006*** |
| | (0.561) | (0.660) | (0.917) | (0.037) | (0.037) | (0.062) | (0.001) | (0.001) | (0.002) |
| Joint F-stat for instruments | 60.56 | 61.14 | 5.88 | 47.43 | 41.74 | 11.85 | 125.46 | 88.63 | 104.60 |

Regressions also include demographic variables, age dummies, year dummies, and state/MSA fixed effects (where indicated). N=182,152; coverage years 1990-2000 for children 14 and under. Regressions control for MSA-year clustering. Robust standard errors in parentheses. *** indicates p<0.01, ** indicates 0.05<p<0.01, * indicates 0.10<p<0.05.