GOT HEALTH? ADVERTISING, MEDICAID AND CHILD HEALTH

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Of the ten million uninsured children in 1996, nearly half were eligible for the public health insurance program Medicaid but not enrolled. Little is known about the reasons low income families fail to use public programs or the consequences of failing to use them. Using detailed information on Medicaid outreach, enrollment and hospitalization rates in California, I find that 1) information and administrative costs are significant deterrents to program take-up, and 2) controlling for selection into Medicaid, enrolling children early in Medicaid leads to a more efficient allocation of health care resources by promoting primary ambulatory care over more expensive hospital based care resulting in fewer avoidable hospitalizations.

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I. Introduction

Despite large increases in the 1980's and early 1990's in eligibility for Medicaid, the public health insurance program for poor families, the share of children without health insurance grew by over ten percent between1987 and 1997 [Fronstin, 1998]. Further expansions in eligibility would likely have only a limited impact: of the ten million children in the US who lacked health insurance in 1996, an estimated 4.7 million were already eligible for Medicaid but not enrolled [Selden, Banthin and Cohen, 1998]. In response, the federal government has allocated up to $400 million annually to the states to increase enrollment among those eligible but not enrolled, though many states have thus far failed to use these funds.[1]

However, little is known about the reasons low income families fail to use public programs and the consequences of those decisions. Though much has been written about the possible causes of low take-up in public programs, in a review of existing literature on Medicaid take-up, Remler, Rachlin and Glied [2001] conclude that of the factors determining Medicaid participation "what little evidence about their effects exists is primarily qualitative and self-reported, based on focus groups and reports of officials. Their quantitative magnitude is entirely unknown."

Nor is there evidence that early enrollment in Medicaid leads to gains in efficiency or health. Currently, poor children who are eligible for Medicaid but who fail to enroll will be cared for (by law) should they become ill and require hospitalization. Not only will they be cared for, but also their care will likely be covered by Medicaid

[1] To this end, the federal government has allowed up to ten percent of the $4.27 billion total annual allocation for SCHIP (the public health insurance program established in 1997 to further expand public health insurance coverage) to be spent on administration and outreach to those eligible but not enrolled.

since eligible uninsured children are enrolled in Medicaid when they present at the hospital. The potential benefit of enrolling more children in Medicaid prior to their requiring hospitalization lies in its promotion of the efficient use of health care resources. Poor children with Medicaid coverage *prior to hospitalization* have greater financial access to regular well-child care than poor families without insurance. The receipt of regular primary care promotes overall health and may prevent, or at least moderate, certain medical conditions resulting in fewer hospitalizations, lower costs and better health. However, this has not yet been established empirically.

Thus the purpose of this research is two-fold: 1) to better understand the causes of low take-up in public programs, and 2) to estimate the benefit of increased early enrollment in terms of efficiency brought about by the prevention of unnecessary hospitalizations. To answer these questions I use a unique dataset that combines information on the timing and placement of Medicaid outreach efforts in California with administrative data on both Medicaid enrollment and hospitalization for the period 1996-2000 at a very fine level of detail (the zipcode and month). Identification follows from the exogenous variation in outreach efforts brought about by California's outreach campaign launched in mid 1998 which consists of a media campaign and the recruitment of community based organizations (CBOs) to serve as application assistants.

I find the most profound effects of outreach on those with the highest costs of enrolling: Hispanic and Asian children who have greater language and immigration concerns than other families. Proximity to two bilingual application assistants (the average number of assistants in areas that gain access) increases monthly new non

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This does not include an additional $500 million one-time allocation in 1997-1998 exclusively for

welfare-related Medicaid enrollment among Hispanics by 5.5 percent and among Asian children by thirteen percent. An additional week of English language advertising likewise increases new monthly enrollment by approximately four percent for all, and Spanish language advertisements increase new enrollment among Hispanic children by an additional five percent. While the positive impact of application assistance is found for children of all ages, the effect of advertising is limited primarily to infants, suggesting that information barriers are relevant for new families, while administrative barriers are significant for families with children of all ages. These results have important implications not only for improving Medicaid coverage among poor children, but for increasing take-up in other programs such as food stamps and the EITC.

To estimate the benefit of increased public health insurance coverage, I examine the effect of Medicaid enrollment (as a function of state outreach efforts) on avoidable, ambulatory care sensitive (ACS) hospitalizations in California in a two stage estimation process in which outreach efforts serve as excluded instruments. ACS conditions are defined as those "diagnoses for which timely and effective ambulatory care can help to reduce the risks of hospitalization by either preventing the onset of an illness or condition, controlling an acute episodic disease or condition."[2] If greater numbers of children are responding to local outreach efforts and enrolling in Medicaid prior to hospitalization, then we expect access to regular ambulatory care to improve and the rates of avoidable ACS hospitalizations to decline.

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outreach.

[2] Billings, John and Nina Teichholz [1990]. "Uninsured Patients in District of Columbia Hospitals," *Health Affairs*, 9, 158-165.

I find that increased take-up leads to more efficient use of medical resources. Because estimation of the impact of enrollment in Medicaid on health care utilization and child health is hindered by the endogeneity of the enrollment decision (children in greater need of medical care are more likely to enroll), OLS estimates of the impact of Medicaid enrollment on hospitalization rates are likely to be upward biased. When I use difference-in-differences and instrumental variable strategies, I find that early enrollment leads to lower hospitalization rates for those conditions that are avoidable if timely and effective ambulatory care is received: increasing the number of children with Medicaid by 50 percent results in a decline in the rate of Medicaid ambulatory care sensitive hospitalizations by 30 percent. A conservative estimate of the cost savings associated with such an increase in enrollment, considering only the costs of hospitalization and ignoring potential savings in terms or reduced emergency room visits and increased labor supply of parents, is roughly $22 million annually. These findings suggest that local efforts to increase take-up of Medicaid result in more efficient use of health care resources, fewer avoidable hospitalizations, and better health.

The rest of the paper is laid out as follows: section II surveys the existing literature on outreach and Medicaid take-up, access to primary care and factors affecting avoidable hospitalizations, section III provides background on California's outreach program, section IV presents implications of a model of Medicaid enrollment in the face of fixed enrollment costs, section V presents the empirical strategy and results of the analysis of the effect of outreach on enrollment, section VI the results of the analysis of the impact of increases in enrollment on hospitalizations, and section VII concludes.

II. Existing Literature

A. Medicaid Take-Up

Though Medicaid has no out of pocket costs and lowers the cost of medical care faced by low-income families, many still fail to enroll: nearly half of all uninsured children in California are eligible for Medicaid but not enrolled. As noted previously, what empirical work on Medicaid take-up exists consists largely of focus groups and case-studies, the results of which may not be generalizeable to the population of uninsured children. The three main reasons for low take-up, as hypothesized in the literature, are 1) lack of information (information costs), 2) administrative hassle associated with an application that requires considerable paper-work, verification of income and visits with caseworkers (process costs), and 3) and stigma associated with public programs (outcome costs). In addition, these costs vary by certain family characteristics: those with language barriers or immigration concerns likely face higher information and process costs and new families (those with infants) whose potential exposure to the Medicaid program may be shorter, may face higher information costs.

Four empirical but largely qualitative evaluations of Medicaid take-up in California suggest that process and information costs are the main concerns for this population. Stuber et al [2000] relying on survey data found individuals who perceive Medicaid enrollment forms as long and complicated or the Medicaid office hours inconvenient are 1.8 times less likely to enroll. The researchers did not find any significant negative effects with respect to stigma. A series of focus groups on Medicaid enrollment in California revealed that confusion over eligibility, language barriers, fears about immigration and an onerous enrollment process were considered important barriers

by eligibles [Perry, Stark and Valdez 1998; Perry 2001].[3] In addition, most families while knowing about the Medicaid program, did not have current information about the program, particularly with respect to the recent simplification of the enrollment process and the ability to apply outside of welfare offices. Findings from market research based on a sample of families eligible but not enrolled conclude that concerns over the enrollment process (long applications and waiting periods) are far more significant barriers to enrollment than concerns related to eligibility, coverage, benefits, costs, physician availability and documentation requirements [Medi-Cal Policy Institute, 2000].

Two conclusions can be drawn from this literature. First, information costs include a lack of knowledge of the current enrollment process, not simply awareness of the program. And second, process costs associated with enrollment in Medicaid are perceived to be high by California Medicaid eligibles, especially those with language barriers and/or immigration concerns.

B. Avoidable Child Hospitalizations

Children accounted for roughly nine percent of all acute care hospitalizations (excluding births) in California and a slightly larger percentage of total acute care hospital expenditures in 1999. Many of those hospitalizations were likely avoidable. Previous estimates suggest that eighteen to 28 percent of all child hospitalizations are avoidable or ambulatory care sensitive (ACS) compared with seven to twelve percent of adult, non-elderly hospitalizations [McConnochie et al, 1997]. There is strong evidence

[3] Immigration concerns consist of fears of deportation among those in the US without proper documentation and for those with documentation, fears of being considered a "public charge" which could lead to deportation.

that high ACS hospitalization rates do reflect inadequate ambulatory care. Parchman and Culler [1994] analyze hospital discharge data in Pennsylvania and find that areas with higher per capita rates of general practice physicians have lower rates of ACS hospitalizations, controlling for other environmental characteristics that might affect hospitalization rates. Research by Shi et al [1999] based on hospital discharges in South Carolina finds that those children without a primary care provider were nearly ten times more likely to be hospitalized for an ACS condition than those with a primary care provider. Gadmoski et al [1998] evaluated a Medicaid managed care program in Maryland that emphasized improved access to primary care and finds that those children who did use ambulatory care are less likely to be hospitalized, particularly for ACS conditions.[4]

Though the link between ACS hospitalizations and access to primary care is well-established, the link between ACS hospitalizations and insurance is more tenuous because of the presence of unobserved characteristics correlated with both the insurance decision and utilization that are more difficult to control for than are factors affecting access to primary care. For example, Weissman, Gastonis, and Epstein [1992] find that the relative risk of admission for ACS conditions increases for those with Medicaid or without insurance, relative to the privately insured, but note that higher rates of admission may result from an increased incidence or prevalence of disease among the uninsured or the Medicaid population as well as a host of other factors for which they cannot control.

[4] Other studies include Gill and Mainous [1998] who find that provider continuity is associated with fewer hospitalizations for chronic ACS conditions, but not acute ACS conditions among children in Delaware. Finally, Epstein [2001] finds that the availability of ambulatory clinics is associated with better access to primary care and a decline in ACS hospitalizations among low-income elderly populations in Virginia.

If underlying factors, such as initial health status, care-seeking behavior, or poverty, are associated with Medicaid enrollment and with rates of ACS hospitalizations, then Medicaid enrollment is endogenous, complicating estimation of its impact on ACS hospitalizations. Work by Dafny and Gruber [2000] represents one effort to control for these factors in estimates of the impact of Medicaid eligibility expansions on child hospitalization. The authors identify the effect of making more children eligible for Medicaid coverage using variation across states over time (as the Medicaid expansions were implemented at different times and different states.)[5] They find that expanding Medicaid eligibility to include previously ineligible children decreases the number of ACS hospitalizations though it increases the total number of hospitalizations.

The question raised and answered in this paper, however, differs in important ways from that of Dafny and Gruber [2000]. In this paper I estimate the impact not of expanding eligibility to additional children, but of program take-up among children already eligible. I also use considerably more detailed data (zipcode level versus state level), enabling me to control for many factors, observed and unobserved, that vary at a local level and may affect both Medicaid enrollment and child health.

III. Background on Medicaid and Outreach in California

A. Medicaid Eligibility

Children in California qualify for Medicaid through multiple channels. The most common channel (67 percent of all Medicaid covered children in 1996) is through the

[5] Their method relies on the inclusion of state and time fixed effects to control for unobservables correlated with Medicaid coverage and hospitalization rates. They also exploit some within state variation as the Medicaid expansions included children of some ages, and not others.

cash welfare program -- AFDC and now TANF. All children on welfare are automatically eligible for Medicaid and thus face zero costs of enrollment in Medicaid. The next most common means of Medicaid enrollment among children are through the Medicaid poverty expansion and medically needy programs, and, more recently, the federal section 1931(b) program. The outreach programs developed by the state target families eligible through these mechanisms.[6]

B. Trends in Child Medicaid Enrollment

Child Medicaid enrollment in California peaked in 1995 and then began to decline (Figure I). The driving force behind the decline in Medicaid enrollment has been drastically falling welfare rolls in California that have been partially offset by a rise in children enrolled through other non welfare-related channels that began in mid 1998. For Hispanic children, increased enrollment though other channels offsets the declines in welfare-related Medicaid enrollment to a greater extent than for the population as a whole, resulting in a net increase in total Hispanic Medicaid enrollment between 1998 and 2000.

As Figures I illustrates, the declines in Medicaid enrollment through the welfare program precede the increase in enrollment through other programs. Medicaid coverage through the welfare program begins to decline in 1995-1996, while the increased enrollment in non welfare-related programs does not begin until 1998, coincident with

[6] In California, the poverty expansions extend Medicaid eligibility to infants up to 200% of the federal poverty level (FPL), children under 6 up to 133%, children 6-15 up to 100% and children ages 15 and older up to 82% of the FPL. California's medically needy program is a relatively generous program, providing coverage to families with income roughly one third higher than current AFDC/TANF levels. The 1931(b) program stipulates that all families with income below 100 percent FPL are eligible for Medicaid.

the implementation of the state's outreach program in June of that year. This suggests that the rise in non welfare-related Medicaid enrollment does not simply reflect a transfer of enrollment from welfare-related enrollment as AFDC/TANF caseloads decline.

C. California's Uninsured and the Medicaid Outreach Campaign

A 1999 study of the uninsured in California estimated that of the 1.8 million uninsured children in the state, nearly 800,000 were eligible for Medicaid and among those eligible, 60 percent were Hispanic.[7] Such low rates of take-up among the Hispanic population are consistent with their facing greater costs of enrolling due to language barriers and/or immigration concerns.

California's outreach campaign was launched in June, 1998 coincident with the launching of the state's SCHIP program, entitled Healthy Families, which expanded coverage to children in families with income above Medicaid eligibility thresholds but below 250 percent of the federal poverty level through a separate, non-Medicaid program. The outreach campaign targets both the 800,000 uninsured children eligible for Medicaid but not enrolled and an additional 325,000 newly eligible for Healthy Families. The outreach campaign is comprised of two main components: community-based application assistants to reduce the process and outcome costs of enrolling, and a multi-million dollar media campaign to increase awareness of the program and reduce the information costs of enrolling, with roughly 40 and 60 percent of the $20 million annual outreach funds devoted to each component, respectively.[8] In addition, the state made

[7] This study was conducted by the UCLA Center for Health Policy and based on the 1998 March CPS.
[8] A third component, the granting of funds to community based organizations to conduct outreach, was initially small but has recently increased in size. In the first year of the campaign, roughly $7 million was

great efforts to simplify the enrollment process by developing a mail-in application that was considerably shorter in length than the previous application (reduced from 20 pages in June, 1998 to four by April,1999). The two main components are discussed in turn below.

Community Based Application Assistants (CBOs)

Community based application assistants (CBOs) are non-profit community organizations that are trained by the state in the completion of Medicaid applications. CBOs do not represent new organizations placed in the community for the purpose of conducting outreach and enrollment, but are pre-existing organizations. For all applications received and approved by the state, a $50 fee is granted to the application assistant. Nearly half of the 1,100 CBOs providing assistance in the first year of the program were health care providers and clinics (not including hospitals), 20 percent were community service organizations and 9 percent were schools.[9] Half of the CBOs have bilingual staff.

Over time, access to CBOs has increased. In 1998, 28 percent of all zipcodes had a CBO, increasing to 39 percent in 1999 and 46 percent by 2000. By March of 1999, ten months after the campaign was launched, half of all Medicaid applications received by the state were completed with the assistance of a community based organization and over $1million in application assistance fees had been paid to CBOs.

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allocated to advertising. For the community-based application assistants, $2.1 million was allocated for the payment of a $50 fee for each completed application, $1.9 million for training and $2.7 million for support.

[9] The remainder include insurance agents (5%), faith based organizations (3%), hospitals (3%) and tax-preparers (1%).

Figure II presents trends in non welfare-related Medicaid enrollment among Hispanics that gain access to one, two, three, four and five or more CBOs over this period. While differences in initial levels between these groups exist, they are relatively small. However, beginning in June 1998, the differences in non welfare-related Medicaid enrollment among these groups increased proportionately with the number of CBOs located in those areas. Hispanics living in areas that gain access to greater numbers of CBOs exhibited a greater increase in enrollment relative to Hispanics that gained access to fewer numbers of CBOs.[10] The non random placement of CBOs suggests possible selection on location which I address in Section V.

The State Advertising Campaign

The state advertising campaign consists primarily of television, and to a lesser extent radio and print advertisements that run in 48 of the state's 58 counties. The advertisements were developed in both English and Spanish languages. The advertising campaign was launched in June, 1998 and in the first 30 months of the program, television advertisements were aired in at least one county in all but seven months, with advertisements running from one to four weeks per month. All campaign materials consistently promote a toll-free number and in 1999, the state added banner copy to Spanish language ads that read "Call Now."[11]

[10] To determine whether CBOs are located in areas with greater declines in welfare-related Medicaid coverage that may affect the underlying demand for non welfare-related Medicaid coverage and thus bias the results, I examine trends in welfare-related Medicaid enrollment for the same groups. Bilingual CBOs are placed in poor areas that are characterized by higher initial levels of welfare use (among all groups, not just Hispanics), but the rates of decline appear similar for all groups.

[11] The toll-free line is staffed Monday – Friday 8am to 8pm by a team of operators proficient in ten languages who respond to requests for applications, assist with questions about the application, and provide referrals to CBOs.

The state largely considers the state-wide media campaign a success, based on the fact that calls to the toll-free hotline double in the weeks during which commercials have aired (from roughly 800calls/day to 1900 calls/day), and that 30 percent of callers identified advertising as their primary source of information about Medicaid. However, the state does not know what proportion of calls result in application and enrollment.

IV. A Simple Model of Medicaid Enrollment and Selection

I present here the two main implications of a simple economic model of enrollment in Medicaid (which lowers the cost of purchasing medical care but includes fixed costs of participation) that's included as an appendix. First, if the fixed costs of participation decrease (through, for example, an outreach campaign), families will be more likely to participate. Those for whom the cost decrease is greater as a result of outreach (Hispanic and Asian families with language barriers and new families with the least exposure to Medicaid), the probability of enrollment will likewise be greater. Second, given the likelihood of positive correlation between underlying (and unobserved) health and the insurance decision, as the costs of participation decrease, the average health of those enrolling will increase.

The presence of selection effects with respect to health insurance coverage in the presence of fixed enrollment costs has important implications for the results of the analysis of the impact of a decrease in the costs of health insurance on hospitalization. A simple regression of hospitalization on Medicaid coverage will result in positive, upward biased estimates of the impact of Medicaid coverage on hospitalization. My estimation strategy which involves instrumenting for Medicaid coverage using outreach as

instruments is designed to eliminate this selection bias, allowing identification of the impact of early Medicaid enrollment on preventative ambulatory care and avoidable hospitalizations.

V. The Effect of Outreach on Medicaid Enrollment

A. Data and Empirical Strategy

To assess the impact of outreach on the flow of Medicaid enrollment, data on CBO placement were linked with monthly data on new and total Medicaid enrollment by zipcode, age, race, and month for February 1996 to December 2000.[12] CBO availability or access is defined as the number of CBOs in one's zipcode as of the month of first enrollment. Because Medicaid coverage begins on the date of application, this is equivalent to access to CBOs as of the date of application.

To identify the effect of outreach on Medicaid enrollment, I employ multiple strategies to account for possible selection in the placement or timing of outreach efforts that may be based on demand for these services. First, zipcode and month fixed effects are included to control for the fact that areas with more intense outreach efforts may have higher numbers of low-income children, and more general trends in enrollment over this time period, respectively. Also included are other covariates that control for changes in the business cycle and in the underlying demographic composition of the state that may affect the demand for health insurance: the annual county employment to population ratio from BEA employer surveys (EMP/POP) and the number of births to women without a

[12] Information on the California outreach campaign was generously provided by the State Dept. of Health Services, Medi-Cal Eligibility Branch. The information includes the placement of television and radio advertisements by week and county and a database of all community based application assistants. The

college degree by race, zipcode and year from California birth certificate records (BIRTHS).

This basic equation has the following form:

$$(1a)\quad M_{arzt} = \beta_0 + \beta_1 ENGCBO_{zt} + \beta_2 SPCBO_{zt} + \beta_3 ASNCBO_{zt} + \beta_4 HISP*SPCBO_{zt} + \beta_5 ASIAN*ASNCBO_{zt} + \beta_6 RACE_r + \beta_7 AGE_a + \beta_8 BIRTHS_{rzt} + \beta_9 EMP/POP_{ct} + \beta_{10} MONTH_t + \beta_{11} ZIPCODE_z + v_{arzt}$$

M_{arzt} is the ratio of new Medicaid enrollment (flow) for age group a, race r at time t in zipcode z to the total number of children of the same age-race-zipcode.[13] New enrollment is defined as not having any Medicaid coverage in the month before. $ENGCBO_{zt}$ is the number of community based application assistants without bilingual staff in the zipcode in the month of enrollment, $SPCBO_{zt}$ is the number of CBOs with Spanish-speaking staff. Spanish-speaking CBOs are interacted with a dummy for Hispanic ($HISP*SPCBO_{zt}$ in the above equation), while Asian speaking CBOs are ($ASNCBO_{zt}$) interacted with a dummy for Asian, ($ASN*ASNCBO_{zt}$). In addition I include age (infant, preschooler) and race (white, black, Hispanic and Asian) indicators. All analyses are weighted by the size (population) of the cell.

In additional specifications, I include controls for the possibility of selective timing and placement of CBOs that may bias the results. First, I include zipcode*year fixed effects. This limits the identifying variation to changes in access to CBOs that occur within a relatively short period, thereby minimizing potential unobserved

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latter includes information on when the organization began participating in the program, the languages spoken by staff at the centers and the zipcode of the organization

[13] In calculating the rates of Medicaid enrollment and Medicaid hospitalizations, the denominator used is the total number of children in the given age, race and zipcode cell from the 2000 census. I attempted to create a denominator which included only low income individuals. However, income information by race is not available at the zipcode level and applying the total proportion of low income families in a zipcode to certain races (blacks and Hispanics) lead to Medicaid enrollment rates of greater than 1 in many cases.

underlying differences between those areas that quickly gained access to a CBO and those with delayed access. To control for potential selection in location, I also limit the sample to those zipcodes that ever gained access to a CBO. In addition, to control for the possibility that Hispanic and Asian families residing in areas that gain access to bilingual CBOs may differ from those who do not, I interact Hispanic and Asian children with an indicator for whether they ever gained access to a CBO: Hisp*EverSPCBO and Asian*EverASNCBO. Finally, I control for welfare caseloads and changes in welfare caseloads that differ in areas that gained access to a CBO.

To assess the influence of advertisements on the rate of new Medicaid enrollment, data on the timing of advertisements was linked to Medicaid enrollment at the county (not zipcode) level because advertisements are generally aired at the county level. The following equation was estimated:

$$(1b) \quad M_{arct} = \beta_0 + \beta_1 ENGADVT_{ct} + \beta_2 SPADVT_{ct} + \beta_3 HISP*SPADVT_{ct} + \beta_4 RACE_r + \beta_5 AGE_a + \beta_6 BIRTHS_{rct} + \beta_7 EMP/POP_{ct} + \beta_8 MONTH_t + \beta_9 COUNTY_c + \varepsilon_{arct}$$

M_{arct} is the ratio of new Medicaid enrollees to the total number of children in the county. $ADVT_{ct}$ is a dummy variable equal to the number of weeks of television advertising in the month of enrollment, $SPADVT_{ct}$ is a measure of bilingual (English and Spanish language) television advertising in the month of enrollment. The analysis sample for estimating the impact of advertisements on new enrollment is limited to the months after July 1998 (when the advertising campaign was launched) and excludes the ten counties in which advertisements were never aired as they are substantially different (mostly rural) counties. Identification of the impact of advertisements is more straight-forward than the impact of CBOs because selection is less of an issue once we eliminate those counties

that do not ever air an advertisement: monthly differences in the number of weeks of advertisements are determined by an advertisement schedule set at the beginning of the year and changes little from year to year.

Because outreach should affect Medicaid enrollment through non welfare-related programs only but not enrollment through the AFDC or TANF programs, I estimate the impact of outreach on non welfare-related and welfare-related enrollment separately and include both sets of estimates in the tables.

B. Results: The Impact of Outreach on Medicaid Enrollment

i. Basic Specification

Community Based Application Assistance (CBOs)

The first three columns of Table I contain estimates of the impact of CBOs on enrollment with zipcode and month fixed effects for the period February 1996-December 2000 (equation 1a). The first column contains estimates of the impact of CBOs on new monthly, non welfare-related Medicaid enrollment, the second column of the impact of CBOs on welfare-related Medicaid enrollment (for which we expect no effect) and the third on total new monthly Medicaid enrollment. English-only CBOs have a positive and significant effect on non welfare-related enrollment, as do the interactions between bilingual CBOs and Hispanic and Asian children. The coefficient of .188 on English only CBOs implies a five percent marginal increase in new non welfare-related Medicaid enrollment each month with every additional CBO. The coefficients on the two interaction terms (.167 and .250) imply a marginal increase in new monthly non welfare-related Medicaid enrollment of 2.1 percent for Hispanics with access to a CBO with

Spanish-speaking staff and 17 percent for Asians with access to a CBO with Asian language speaking staff. These interaction effects are negative (though close to zero) in regressions of welfare-related enrollment.

Interestingly, the main effects of bilingual CBOs are negative and significant with respect to non welfare-related enrollment but positive and significant with respect to new welfare-related enrollment, suggesting potential selection effects in the timing and/or location of outreach efforts, which I address through alternative specifications presented in the next section.

Advertisements

The next three columns of Table I contain estimates of the impact of advertisement (equation 1b) for the whole sample. The only significant effect of advertising on new Medicaid enrollment appears for Hispanic families exposed to Spanish language advertisements. New non welfare-related Medicaid enrollment increases 4.7 percent with an additional week of advertisement. It is interesting to note that this effect is found only for advertising in the month of enrollment. In alternative specifications not presented here I found neither advertisements in the month before nor the total number of weeks of advertising in the three months prior (regressions not presented here) to have any significant impact on enrollment. This suggests that any impact of advertising is immediate, with no cumulative or lagged effects.

ii. Alternative Specifications

Community Based Application Assistance (CBOs)

Table II contains estimates of the effect of CBOs on the alternative, more

restrictive specifications that attempt to account for potential selection effects in the timing and placement of CBOs. The first three columns of Table II contain estimates of the impact of CBOs on new enrollment including zipcode*year fixed effects. The inclusion of the zipcode*year effects has very little impact on the size or significance of the effects of bilingual CBOs on Hispanic and Asians, but does diminish the main effects of the CBOs which are in some cases no longer significant.

To further control for potential selection of CBOs that may be driving the findings, I restrict the sample to those zipcodes that ever received a CBO (columns 4-6). This is designed to control for inherent differences in those areas (zipcodes) where CBOs are located. The estimated effect of bilingual CBOs on enrollment of Hispanic and Asian children is not diminished by this restriction. Columns 7-9 of Table II contain estimates from regressions that include controls for Hispanic and Asian children who ever gained access to bilingual CBOs. Again, the estimated effect of bilingual CBOs on enrollment of Hispanic and Asian children remain. Finally, in column 10 of Table II, I present estimates of the impact of CBOs on total new Medicaid enrollment controlling for the stock of welfare-related enrollment. While the interaction effects do not change, the main effects are further eroded and the effects of both English CBOs and Spanish CBOs become positive, though still insignificant.

To assess the importance of close geographic proximity to CBOs, I redefine the measure of CBO availability as the number of CBOs available in a slightly larger geographic area – the minor civil division or MCD which is a political boundary, such as a township, borough or municipality. In California, there are roughly 1700 zipcodes, 58 counties and 371 MCDs. Table III contains results of regressions in which CBO

availability is measured at the MCD level and including MCD and month fixed effects. The same general pattern emerges: CBOs have a positive and significant impact on non welfare-related enrollment but not welfare-related enrollment. As expected, the size of the impact is considerably smaller. For Hispanics, the impact of an additional bilingual CBO in one's MCD is roughly one tenth as great an additional CBO in one's zipcode, for Asians the impact is roughly one fifth as great.

Advertisements

Results in Table IV illustrate the impact of advertisements on new monthly Medicaid enrollment for infants (months 0-12) only. All infants born to a mother with Medicaid are automatically enrolled in Medicaid for six months so I control for all Medicaid births (by race and county) six months prior. Columns one and two contain results based on regressions that include county and month fixed effects. An additional week of English advertisements increases new monthly enrollment among infants by 4.4 percent. An additional week of Spanish advertisements increases new enrollment among Hispanic infants by 5 percent.[14] As a specification check, I include advertisements in the month after enrollment (columns 3-4). The leads, while positive, are not significantly different from zero and their inclusion does not affect estimates of the impact of advertisements in the month of enrollment (F test =0.86 p-value=0.46). In a separate regressions, (not included here), of the impact of advertisements on enrollment of non-infant children, considerably smaller and insignificant effects are found. That the impact of advertisements on infant enrollment is considerably greater relative to older children suggests that information barriers are most important for new children.

[14] These regressions control for the total number of new births to women without a college degree by race,

These findings support our predictions. First, community based applications assistants that lower process costs by addressing concerns regarding the cumbersome and confusing enrollment process are particularly effective for those with language barriers as evidenced by the large interactive effects between Hispanic and Asian children and bilingual application assistants. And second, outreach in the form of advertisements has a greater impact on infants relative to older children, suggesting that information costs may be greater for new families who may have had less exposure to Medicaid for children and no experience enrolling their children in Medicaid (since the hospital had previously done it on their behalf).

VI. The effect of Outreach and Enrollment on Avoidable Hospitalizations

A. Data and Empirical Strategy

To estimate the impact of increased enrollment in Medicaid through outreach on access to primary, preventative care, I estimate the impact of outreach on child hospitalization rates using both difference-in-difference and instrumental variable methods. For this analysis, data on Medicaid enrollment in January, April, July, and October of each year (1996-2000) were matched to all hospital admissions occurring in the following quarter by zipcode, race and age group.[15] Hospital admissions are classified as either *ambulatory care sensitive* (ACS), defined as those "diagnoses for which timely and effective ambulatory care can help to reduce the risks of hospitalization by either preventing the onset of an illness or condition, controlling an acute episodic

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county and month and thus do not simply reflect new births.

disease or conditions" [Billings, 1993], or as *marker* conditions which include acute appendicitis, congenital heart disease, and certain forms of cancer which should not be affected by access to primary care. [16]

The difference-in-differences estimates reflect a comparison of differences in hospitalization rates over time for treatment and control groups. The treatment group consists of Asian and Hispanic children who reside in zipcodes that gain access to a CBO with bilingual staff over this period. The treatment is the presence of bilingual application assistants (SPCBOs and ASNCBOs). The analysis sample is limited to all children that gain access to CBOs over this time period. As such, the control group consists of other (non Asian or Hispanic) children residing in the same zipcodes. This method enables one to control for any changes in geographic access to primary care services over this period.

The equation estimated follows the general form:

$$(2) \quad H_{arqz} = \alpha_1 \text{ Asian*EverASNCBO} + \alpha_2 \text{ Hispanic*EverSPCBO} + \beta_1 \text{ASNCBOs} + \beta_2 \text{SPCBOs} + \delta_1 \text{ Asian* ASNCBOs} + \delta_2 \text{ Hispanic* SPCBOs} + \beta_2 \text{Age}_a + \beta_3 \text{Race}_r + \beta_4 \text{Quarter}_q + \beta_5 \text{AdultAdm}_{rzq} + \beta_6 \text{ AFDC/TANF}_{arzq} + \beta_7 \text{Zipcode}_z + \varepsilon_{arzq}$$

H_{arzq} represents the rates of hospitalizations for a given age, race, zipcode and quarter. The terms Asian*EverASNCBO and Hispanic*EverSPCBO are indicators for the treatment group: Asian children residing in a zipcode that gains access to a CBO with Asian language speaking staff and Hispanic children in zipcodes that gain access to

[15] Data on all hospital admissions for California came from the hospital discharge database maintained by OSHPD which includes the diagnoses, payment source, age and race of the patient, and zipcode of residence.

[16] ACS conditions include asthma, bronchitis, bacterial pneumonia, dehydration , cellulitis and ear infections.

Spanish speaking staff, respectively. The treatment itself (the number of bilingual CBOs) is represented by ASNCBOs and SPCBOs. The coefficients on Asian* ASNCBOs and Hispanic* SPCBOs, δ_1 and δ_2, represent the difference-in-difference estimates: the difference in hospitalization rates upon gaining access to a bilingual CBO for the treatment group relative to the difference for the control. Other covariates include: vectors of age and race dummies, (Age and Race), AdultAdm which represents the rate of adult hospitalizations for a give race (to control for general differences or trends in disease prevalence), zipcode and quarter dummies. To account for the fact that welfare caseloads (and thus welfare-related Medicaid enrollment) are dropping over this period which may result in an overall decline in Medicaid hospitalizations, independent of the effect of outreach, I control for welfare caseloads in these regressions (AFDC/TANF).

IV regression estimates of the impact of Medicaid enrollment on ACS hospitalization rates are presented in Table VI. Outreach efforts (CBOs) serve as instruments for Medicaid enrollment in the first stage (included in appendix Table II). As noted previously, because children in need of hospitalization are more likely to enroll in Medicaid, we would expect a positive effect of Medicaid enrollment on hospitalization rates in a simple OLS regression. In contrast, the IV estimation is designed to purge the estimates of this selection bias and reflect the impact of early enrollment and improved access to ambulatory care on ACS hospitalization rates. The equation estimated has the following form:

$$(3) \qquad H_{arzq} = \beta_1 Medicaid_{arzq} + \beta_2 Age_a + \beta_3 Race_r + \beta_4 Quarter_q + \beta_5 AdultAdm_{rzq} + \beta_6 AFDC/TANF_{arzq} + \beta_7 Zipcode_z + \varepsilon_{arzq}$$

Where Medicaid represents the rate of non welfare-related Medicaid enrollment and for which I instrument using outreach as instruments in the first stage.

B. Results: The Impact of Increased Take-up on Access to Primary Care as Measured by ACS Hospitalization Rates

Table V contains the results of difference-in-differences analyses of the impact of outreach on child Medicaid hospitalization rates. The estimates suggest that the difference in ACS hospitalization rates for Hispanic children with access to a bilingual CBO relative to non-Hispanic children is –0.017/1000, which corresponds to a 1.5 percent decrease. For Asian children, the relative decline is –0.031/1000 which corresponds to a 6 percent decrease. In contrast, outreach appears to have no impact on hospitalization rates for marker conditions among Hispanic children, as expected (Table V, column 2). For Asian children, the effect of outreach on hospitalization for marker conditions is greater, but still less than it is for ACS hospitalizations and insignificant at traditional levels.

These difference-in-differences estimates capture "intent to treat" effects. They do not isolate the effect of outreach on those who enroll in Medicaid and likely underestimate the impact of Medicaid outreach on hospitalization rates. In contrast, the IV estimates are designed to isolate the effect of Medicaid outreach on hospitalization rates among those with Medicaid and thus one would expect them to be larger than the difference-in-differences estimates. Recall that we expect the OLS estimates of the impact of Medicaid enrollment on hospitalization rates to be positive as those children in worse health and therefore greater need of hospitalization will be the ones most likely to enroll in the face of high costs of enrolling. In contrast, we expect the IV estimates,

which are designed to purge the estimates of this negative selection effect and thereby isolate the impact of insurance on access to primary care, to be negative.

Table VI contains the OLS and IV estimates of the impact of Medicaid enrollment on Medicaid hospitalization rates for ACS and marker conditions, separately. The OLS estimates of the impact of Medicaid enrollment rates on ACS hospitalization rates is positive and significant. In contrast, the IV estimates are negative and significant and suggest that an increase in the (non welfare) Medicaid enrollment rate of 50 people per thousand would result in a decrease in Medicaid ACS hospitalization rates of 0.23 per 1000, for a savings of roughly $22 million annually.[17] In contrast, the IV estimate of the impact of Medicaid enrollment on marker conditions is positive and relatively small in size.[18]

However, it is not clear based on these results whether automatically enrolling all eligible children in Medicaid would lead to similar declines in ACS hospitalizations. If families learn of the advantages of primary preventative care through the process of enrolling in Medicaid, then automatic enrollment may have only a limited impact. In an effort to test this, I estimate the same equation but in the first stage include as instruments only those CBOs that are medical providers (mostly primary care clinics).[19] If medical providers are more likely to educate families about the benefits of primary preventative care and the impact of increased Medicaid enrollment on ACS hospitalizations is operating largely through increased education about primary care, then we would expect

[17] This amount was calculated by adding all gross charges for child ACS hospitalizations in 1996 and multiplying the amount ($230 million in 1996) by the average ratio of gross charges to net charges for Medicaid admissions in 1996. Net charges reflect the actual "negotiated" rate paid by Medicaid after hospital deductions are considered.
[18] A test of overidentifying restrictions yields a chi-squared test statistic of 3.2 (p-value=0.60).
[19] The first stage is presented in the second column of appendix Table II.

the estimated impact of enrollment on hospitalization rates (instrumented using only providers) to be greater. The results are presented in columns 5-8 of Table VI and are very similar to those based on all CBOs, not just providers, suggesting that learning about primary preventative care through the Medicaid enrollment process is not driving the declines in ACS hospitalizations.

VII. Conclusions

The empirical results presented here represent some of the first to shed light on the causes and consequences of low take-up rates in the public program Medicaid. Using a unique data set with local area detail I am able to exploit exogenous variation in factors influencing take-up to identify the reasons why families may fail to take-up benefits that involve no out of pocket costs. These findings suggest that language barriers and immigration concerns increase the costs of take-up among Hispanic and Asian children and that new families (those with infants) also face significant information costs. Furthermore, my findings suggest that increased enrollment as a result of outreach improves access to primary care as evidenced by a reduction in ambulatory care sensitive hospitalizations. Thus, outreach designed to address the concerns of low income families such as bilingual application assistance and a media campaign to increase awareness effectively increases take-up, enhances the efficiency of health care delivery and improves outcomes.

Appendix: A Simple Model of Medicaid Enrollment and Selection in the Presence of Fixed Enrollment Costs

The decision-making agent is the child's mother who derives utility (U) from a consumption good (C), and from child health or quality (H). Child health is subject to a child health production function. The main input of the production function is investment in health, which primarily consists of ambulatory medical care (doctor visits) not hospitalization. Investments in health are included in the model and denoted I, with the error term including unobservable factors such as underlying health stock.

The benefit of enrolling in public health insurance programs is that it lowers the marginal cost of health investments. However, there are fixed costs (k) associated with enrollment: the information, process and outcome costs discussed earlier. In addition, these costs differ among families: those with language barriers face higher enrollment costs (both information and process costs) and new families may face higher information costs as they've had less time to learn about the Medicaid program.

The decision to enroll involves solving for the optimal levels of consumption and investment conditional on Medicaid enrollment (C*, I* and C_m*, I_m*) and choosing to enroll in Medicaid if enrollment yields higher utility relative to not enrolling. Thus the utility maximization problem conditional on public health insurance enrollment (and for which the agent must maximize with respect to C and I) is:

$$U = U(C, H; X, \nu)$$

Subject to the constraints:

$$H = f(I; \varepsilon) \text{ and}$$

$$C + P_m * I + k = W$$

Where X is a vector of family characteristics and P_m the price of medical care with

Medicaid. The utility maximization problem conditional on non-enrollment is identical with the exception of the budget constraint

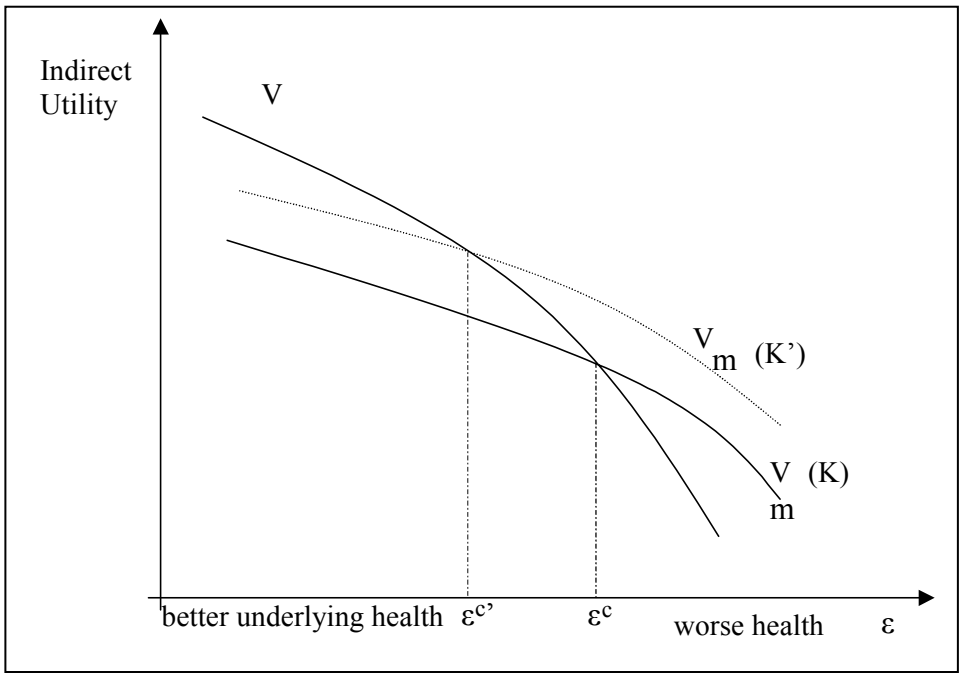
$$C + P*I = W$$

Where $P>P_m$ and $k >=0$ denotes fixed costs of enrolling.

The consumer solves for C_m*, I_m*, $C*$, $I*$, which characterize her indirect utility associated with enrollment (V_m) and non-enrollment (V), respectively. She will enroll her child in Medicaid if:

$$V_m (P_m, W, k; X, \varepsilon) > V (P, W; X, \varepsilon)$$

The main implications of the model are as follows. First, if the costs of participation (k) decrease, families will be more likely to participate. Those for whom the cost decrease is greater as a result of outreach (Hispanic and Asian families with language barriers and new families with the least exposure to Medicaid), the probability of enrollment will likewise be greater. Second, given the likelihood of correlation between the error term in the child health production, investment (I) and the insurance decision, as the costs of participation decrease, the average health of those enrolling will, under certain assumptions, increase. The following figure serves to illustrate this point.



In the above figure, V represents indirect utility with no health insurance and V_m indirect utility with health insurance. There exists a critical value (ε^c) below which the utility of no insurance exceeds the utility of insurance.[20] Therefore, those with better underlying health ($\varepsilon < \varepsilon^c$) will choose no insurance, while those with worse underlying health ($\varepsilon > \varepsilon^c$) will choose insurance. V_m is a function of k and as k decreases to K', $V_m(k)$ shifts up to $V_m(k')$. As a result, the critical value ε^c shifts down to $\varepsilon^{c'}$. This in turn results in an improvement in the average underlying health of those who obtain health insurance.

[20] While I do not present here conditions under which such a critical value exists, it can be shown that at such a point of intersection, the slope of the indirect utility function with no insurance is steeper than that of indirect utility with insurance if the higher the investment in health, the lower the impact of changes in underlying health (ε) on health.

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Table I: Impact of Application Assistance and Advertisements on New Monthly Medicaid Enrollment

	Application Assistance			Advertisements		
	Non welfare	**Welfare**	**Total**	**Non Welfare**	**Welfare**	**total**
Application Assisitance (CBOs)						
Spanish CBOs*Hispanic	0.167	-0.014	0.153			
	[0.014]	[0.014]	[0.013]			
Asian CBOs*Asian	0.25	-0.074	0.176			
	[0.035]	[0.035]	[0.033]			
Spanish CBOs	-0.138	0.053	-0.085			
	[0.015]	[0.015]	[0.014]			
Asian Language CBOs	-0.15	0.122	-0.029			
	[0.022]	[0.022]	[0.020]			
English Only CBOs	0.188	-0.188	-0.001			
	[0.049]	[0.048]	[0.045]			
TV Advertising						
Weeks of English TV in month of application				0.226	-0.121	0.105
				[0.166]	[0.123]	[0.209]
Weeks of Spanish TV in month of application				0.004	-0.037	-0.033
				[0.218]	[0.162]	[0.275]
Weeks of Spanish TV in month of application*Hispanic				0.149	0.029	0.178
				[0.074]	[0.055]	[0.093]
Child Characteristics						
Black	-2.107	13.676	11.569	-2.328	12.727	10.399
	[0.064]	[0.063]	[0.058]	[0.231]	[0.171]	[0.291]
White	0.581	8.751	9.333	0.581	4.082	4.663
	[0.050]	[0.049]	[0.046]	[0.113]	[0.084]	[0.143]
Hispanic	7.647	5.938	13.585	7.644	4.693	12.337
	[0.040]	[0.039]	[0.037]	[0.120]	[0.089]	[0.152]
Asian	1.448	4.023	5.471	1.44	2.136	3.576
	[0.070]	[0.069]	[0.065]	[0.153]	[0.114]	[0.193]
Infant	23.574	17.34	40.914	22.151	11.68	33.83
	[0.057]	[0.057]	[0.053]	[0.148]	[0.110]	[0.186]
Preschool aged	1.374	4.544	5.918	1.7	3.37	5.071
	[0.032]	[0.032]	[0.030]	[0.083]	[0.061]	[0.104]
Observations	933477	933477	933477	21123	21123	21123
R-squared	0.24	0.2	0.5	0.63	0.58	0.7

Robust standard errors adjusted for grouping within zipcodes in brackets
Regressions of the impact of CBOs on enrollment include zipcode and month fixed effects for 2/1996 -12/2000
Regressions of the impact of advt on enrollment include county and month fixed effects for 8/1998 - 12/2000
Regressions also include zipcode and month fixed effects, number of births and annual county ratio of employment to population.

Table II: Impact of CBOs on New Monthly Medicaid Enrollment, Alternative Specifications

	zipcode*year FE			zipcode*year FE (control for CBOs)			Control for Welfare
	non Welfare	Welfare	Total	non Welfare	Welfare	Total	Total
Spanish CBOs*Hispanic	0.179	-0.018	0.161	0.134	-0.022	0.112	0.159
	[0.014]	[0.014]	[0.013]	[0.015]	[0.015]	[0.013]	[0.013]
Asian CBOs*Asian	0.245	-0.047	0.198	0.227	-0.039	0.188	0.176
	[0.036]	[0.036]	[0.033]	[0.039]	[0.038]	[0.035]	[0.032]
Spanish CBOs	-0.06	0.011	-0.049	-0.035	0.013	-0.022	0.003
	[0.032]	[0.032]	[0.029]	[0.032]	[0.032]	[0.029]	[0.029]
Asian Language CBOs	-0.116	0.031	-0.085	-0.116	0.029	-0.087	-0.067
	[0.066]	[0.065]	[0.059]	[0.066]	[0.065]	[0.059]	[0.058]
English Only CBOs	-0.05	0.037	-0.014	-0.052	0.037	-0.016	0.105
	[0.124]	[0.123]	[0.112]	[0.124]	[0.123]	[0.112]	[0.110]
Hispanic*Ever Spanish CBO				0.978	0.084	1.061	
				[0.080]	[0.079]	[0.072]	
Asian*Ever Asian CBO				0.197	-0.086	0.111	
				[0.132]	[0.130]	[0.119]	
Welfare Caseload/1000							0.016
							[0.000]
black	-2.109	13.677	11.568	-2.125	13.676	11.551	3.588
	[0.063]	[0.063]	[0.057]	[0.063]	[0.063]	[0.057]	[0.071]
white	0.577	8.753	9.33	0.523	8.75	9.272	5.006
	[0.049]	[0.049]	[0.045]	[0.050]	[0.049]	[0.045]	[0.050]
hisp	7.632	5.944	13.576	6.863	5.879	12.742	10.365
	[0.040]	[0.039]	[0.036]	[0.074]	[0.073]	[0.067]	[0.039]
asian	1.449	4.009	5.457	1.331	4.042	5.373	0.391
	[0.070]	[0.069]	[0.063]	[0.090]	[0.089]	[0.081]	[0.068]
infant	23.574	17.34	40.915	23.575	17.34	40.916	40.398
	[0.057]	[0.056]	[0.052]	[0.057]	[0.056]	[0.052]	[0.051]
preschool	1.374	4.544	5.918	1.374	4.544	5.918	3.943
	[0.032]	[0.032]	[0.029]	[0.032]	[0.032]	[0.029]	[0.030]
Observations	933477	933477	933477	933477	933477	933477	933477
R-squared	0.25	0.21	0.53	0.25	0.21	0.53	0.54

Robust standard errors adjusted for grouping within zipcodes in brackets

Regressions also include number of births and annual county ratio of employment to population.

Table III: Impact of CBOs on New Monthly Medicaid Enrollment, MCD-Level

	zipcode & month FE		
	non Welfar	**Welfare**	**Total**
Spanish CBOs*Hispanic	0.014	0.002	0.016
	[0.001]	[0.001]	[0.001]
Asian CBOs*Asian	0.042	-0.012	0.03
	[0.005]	[0.004]	[0.007]
Spanish CBOs	-0.005	-0.007	-0.012
	[0.002]	[0.001]	[0.002]
Asian Language CBOs	-0.021	0.004	-0.017
	[0.004]	[0.003]	[0.005]
English Only CBOs	-0.005	0.057	0.053
	[0.009]	[0.007]	[0.011]
Black	-1.809	12.341	10.532
	[0.073]	[0.061]	[0.095]
White	0.54	5.306	5.846
	[0.049]	[0.041]	[0.063]
Hispanic	6.988	5.024	12.012
	[0.046]	[0.039]	[0.060]
Asian	0.96	2.662	3.623
	[0.076]	[0.063]	[0.097]
Infant	21.121	14.646	35.767
	[0.065]	[0.054]	[0.083]
Preschool	1.32	3.896	5.216
	[0.036]	[0.030]	[0.047]
Observations	273853	273853	273853
R-squared	0.42	0.42	0.53

Robust standard errors adjusted for grouping within zipcodes in brackets

Regressions also include month and zipcode fixed effects,
number of births and annual county ratio of employment to population.

Table IV: Impact of Advertisements on Medcaid Enrollment, Infants Only

	Non-Welfare	**Welfare**	**Total**	**Non-Welfare**
English TV in month of enrollment	1.000	0.077	1.077	1.043
	[0.462]	[0.356]	[0.594]	[0.472]
Bilingual TV in month of enrollment	0.742	0.265	1.007	0.769
	[0.607]	[0.468]	[0.780]	[0.616]
Bilingual TV in month of enrollment*Hispanic	2.216	0.244	2.460	2.291
	[0.201]	[0.155]	[0.258]	[0.207]
English TV in month after enrollment				0.679
				[0.494]
Bilingual TV in month after enrollment				0.431
				[0.618]
Bilingual TV in month after enrollment*Hispanic				0.194
				[0.249]
Observations	6921	6921	6921	6686
R-squared	0.85	0.8	0.8	0.85

Robust standard errors adjusted for grouping within counties in brackets

These regressions also include county and month fixed effects, race indicators, the number of births in the county to mothers without a college degree and the employment/population ratio

Table V: Difference-in-Differences Estimate of the Impact of CBOs on ACS Hospitalizations

	ACS	Marker
Spanish CBOs*Hispanic	-0.017	-0.001
	[0.011]	[0.002]
Asian CBOs*Asian	-0.031	-0.005
	[0.013]	[0.003]
Spanish CBOs	-0.012	-0.001
	[0.008]	[0.002]
Asian Language CBOs	0.003	0.003
	[0.007]	[0.002]
English Only CBOs	0.014	0
	[0.013]	[0.004]
Ever Spanish CBO*Hispanic	0.072	0.013
	[0.048]	[0.010]
Ever Asian CBO*Asian	-0.166	-0.008
	[0.053]	[0.017]
White	-0.19	-0.006
	[0.045]	[0.008]
Black	0.25	-0.058
	[0.061]	[0.010]
Hispanic	-0.35	-0.037
	[0.054]	[0.011]
Asian	-0.337	-0.026
	[0.045]	[0.013]
Infant	6.004	0.032
	[0.103]	[0.006]
preschool	0.803	-0.017
	[0.021]	[0.004]
Observations	207605	207605
R-squared	0.23	0.02

Robust standard errors adjusted for grouping within zipcodes in brackets
also included are welfare caseload, emp/pop, births, zipcode and month fixed effects

Table VI: OLS and IV Estimates of the Impact of Medicaid Enrollment Rates on Medicaid Hospitalization Rates

	All CBOs used in first stage				Only medical providers in first stage			
	ACS		Marker		ACS		Marker	
	OLS	IV	OLS	IV	OLS	IV	OLS	IV
Medicaid Enrollees/1000	3.972	-4.757	-0.088	0.448	3.993	-4.719	-0.087	0.047
	[0.083]	[1.091]	[0.017]	[0.216]	[0.084]	[1.078]	[0.017]	[0.213]
Hispanic	-0.783	0.267	-0.014	-0.079	-0.785	0.262	-0.015	-0.031
	[0.027]	[0.134]	[0.005]	[0.026]	[0.027]	[0.132]	[0.005]	[0.026]
White	-0.401	-0.058	-0.008	-0.03	-0.401	-0.06	-0.008	-0.013
	[0.028]	[0.051]	[0.006]	[0.010]	[0.028]	[0.051]	[0.006]	[0.010]
Asian	-0.471	-0.478	-0.037	-0.037	-0.471	-0.478	-0.037	-0.037
	[0.033]	[0.033]	[0.007]	[0.007]	[0.033]	[0.033]	[0.007]	[0.007]
Black	0.062	0.343	-0.063	-0.081	0.062	0.342	-0.064	-0.068
	[0.037]	[0.051]	[0.007]	[0.010]	[0.037]	[0.051]	[0.007]	[0.010]
Infant	5.233	6.607	0.045	-0.039	5.23	6.601	0.045	0.024
	[0.029]	[0.174]	[0.006]	[0.034]	[0.029]	[0.172]	[0.006]	[0.034]
Preschool aged	0.422	1.174	-0.011	-0.057	0.42	1.17	-0.011	-0.023
	[0.017]	[0.095]	[0.003]	[0.019]	[0.017]	[0.094]	[0.003]	[0.019]
Observations	324331	324331	324331	324331	324284	324284	324284	324284
R-squared	0.2	0.19	0.02	0.02	0.2	0.19	0.02	0.02

Robust standard errors adjusted for grouping within zipcodes in brackets
also included are welfare caseload, emp/pop, births, zipcode and month fixed effects

Appendix Table I: Sample Means

	All	Hispanic	Asian
New Monthly Medicaid Enrollment (flow) per 1000			
Total	7.8	13.4	3.4
	(0.02)	(0.04)	(0.03)
non Welfare-related	3.3	7.9	1.3
	(0.01)	(0.03)	(0.02)
Welfare-related	4.5	5.5	2.1
	(0.01)	(0.02)	(0.02)
Monthly Medicaid Enrollment (stock) per 1000			
Total	246.4	349.4	223
	(0.3)	(0.6)	(0.7)
non Welfare-related	103	180	49.7
	(0.1)	(0.3)	(0.2)
Welfare-related	143	169.5	173.3
	(0.2)	(0.3)	(0.7)
Medicaid Hospialization Rates per 1000			
All	2.35	2.34	1.58
	(0.02)	(0.024)	(0.037)
ACS	0.721	0.771	0.44
	(0.006)	(0.012)	(0.017)
Marker	0.103	0.096	0.075
	(.001)	(0.002)	(0.004)
Total Hospitalization Rates per 1000			
All	4.948	3.904	4.101
	(0.023)	(0.035)	(0.021)
ACS	1.33	1.171	1.091
	(0.010)	(0.016)	(0.048)
Marker	0.256	0.193	0.258
	(0.002)	(0.003)	(0.007)

Standard errors below means in parentheses

Appendix Table II: First Stage Regressions, Impact of CBOs on Medicaid Enrollment Rates

	(1)	(2)
Spanish CBOs*Hispanic	5.11	7.807
	[0.142]	[0.211]
Asian CBOs*Asian	3.247	10.622
	[0.337]	[0.715]
Spanish CBOs	-1.489	-2.184
	[0.143]	[0.203]
Asian Language CBOs	1.544	2.374
	[0.208]	[0.381]
English Only CBOs	1.473	4.258
	[0.460]	[1.467]
Hispanic	117.755	119.654
	[0.530]	[0.526]
White	39.084	39.165
	[0.589]	[0.589]
Asian	-2.48	-3.124
	[0.720]	[0.715]
Black	31.877	32.201
	[0.778]	[0.778]
Infant	157.383	157.386
	[0.536]	[0.536]
preschool	86.161	86.18
	[0.321]	[0.321]
Observations	324284	324284
R-squared	0.7	0.7
F statistic (instruments)	341.34	392.22
p value	0.0000	0.0000

Robust standard errors adjusted for grouping within zipcodes in brackets
Also included are annual births and county employment to population ratio as well as welfare caseloads
Sample includes all monthly enrollment for January, April, July, and October of 1996-2000

Figure I
Child Medicaid Enrollment

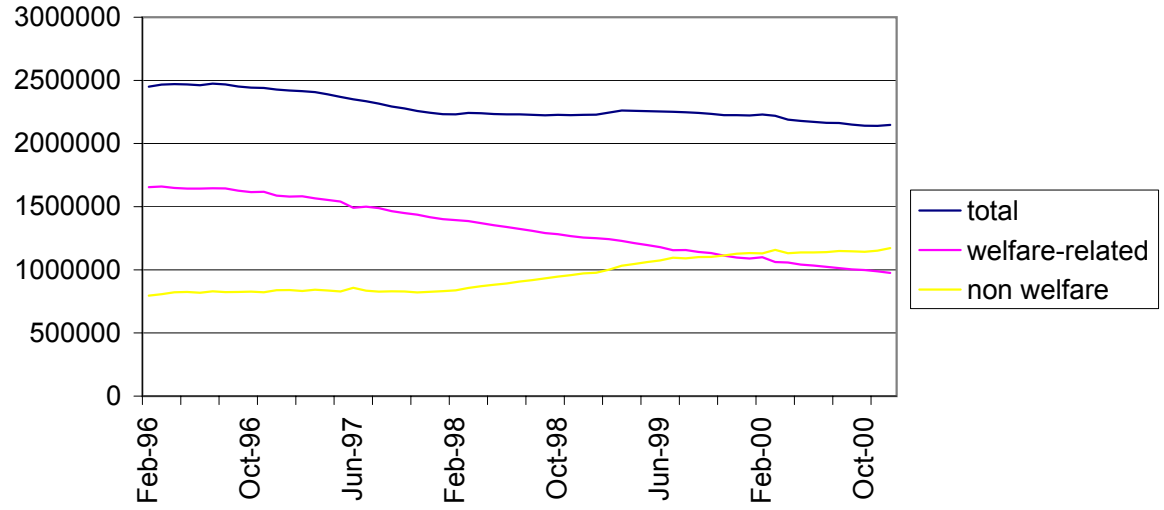

Figure II
Hispanic Non Welfare Medicaid Enrollment by Number of Bilingual CBOs