HCFE Data Brief

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AN EMPIRICAL METHOD FOR MEASURING THE RESTRICTIVENESS OF STATE MEDICAID PROGRAMS

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1.0 Overview

The proportion of the population enrolled in Medicaid varies nationally, across states and across time. This Data Brief explores possible reasons for this variation particularly the variation across states. The focus of our analysis is on the overall Medicaid population with an emphasis on the aged, blind and disabled,[1] and adult populations.[2] Among the socio-demographic and economic factors we consider as possible predictors of Medicaid enrollment are median family income, poverty rate for people ages 65 and over, and the percentage of people covered by employer sponsored insurance. We also consider factors that may vary as a result of individual state Medicaid policy. These include whether or not medically needy programs exist for nursing home care and home and community based services (HCBS) as well as what the income and asset thresholds are for these programs for both couples and individuals. These factors are indicative of the restrictiveness of individual states' Medicaid programs. We hypothesize that states with less generous income and asset levels will have lower levels of Medicaid enrollment. Lastly, we examine the effect of the federal matching rate on Medicaid enrollment levels. The federal matching rate is based on the ratio of each state's per capita income to the national average (1). States with lower ratios receive higher federal matching rates. We hypothesize that a higher federal matching rate will be associated with higher enrollment in Medicaid. This analysis will enable us to develop a model that predicts variations in the probability of an individual enrolling in Medicaid across states and years. We will then use the model to develop a method to measure the restrictiveness of state Medicaid programs.

2.0 Data and Methods

In order to conduct this analysis we collected data on Medicaid enrollment and eligibility requirements from a variety of sources including the HCFE State-Level Medicaid Dataset (2), archived files from the Kaiser Family Foundation (KFF) statehealthfacts.org project (3), and publicly available data summarized in tables in articles commissioned by AARP Policy Institute and the KFF foundation (4,5,6). Additional demographic and health insurance coverage variables were obtained from the KFF state health facts project (3). The data collected covered the years 1997 to 2002 for all 50 states and the District of Columbia (DC). In some instances data were available for all 6 years for all 50 states and DC. In other instances data were available only for a particular year or two during this time period. Where necessary we either interpolated or extrapolated data to fill in the missing data points.

Using the variables described below, we test four models that predict the probability of an individual enrolling in Medicaid. The first model predicts the probability of enrollment for the entire Medicaid population, the second for the aged, blind and disabled population and the third for the adult population. The fourth model

[1] Elderly includes all people age 65 and over. Blind and disabled includes younger people age 64 and under who are reported as eligible due to a disability.

[2] Adults are generally people ages 18-64, though in some states people age 18 may be classified as children for some purposes.

controls for three exogenous variables related to demand for services and then examines the residuals to gain an understanding of how the restrictiveness of individual states' Medicaid policies account for the variations in enrollment across states.

2.1 Dependent Variables

The dependent variable in all the models is the probability of an individual enrolling in Medicaid.

2.2 Independent Variables

The first set of variables included in the model are three state-level, exogenous, socio-demographic variables related to the demand for services. These are median family income, poverty rate for people ages 65 and over, and the percentage of people covered by employer sponsored insurance. We expect lower family income and higher poverty rates to be associated with a larger proportion of the population enrolled in Medicaid. Similarly, we expect a lower rate of employer health insurance coverage to be associated with greater Medicaid program enrollment.

The next several variables we include are Medicaid program variables that vary by state. These include the following seven variables: what the medically needy income threshold is as a percent of the federal poverty level for individuals; what the medically needy income threshold is a percent of the federal poverty level for couples; whether a medically needy option exists for nursing homes, whether a medically needy program option exists for home and community based services; what the nursing home income limit is as a percent of social security income; what the home and community based services income limit is as a percent of social security income; and what the nursing home asset maximum is for a particular state. For all these variables we posit that the lower the income or asset limit the more restrictive the program and therefore the lower the proportion of the state population enrolled in Medicaid. The last variable included in the model is the federal matching rate. We hypothesize that a higher federal matching rate will result in greater Medicaid enrollment.

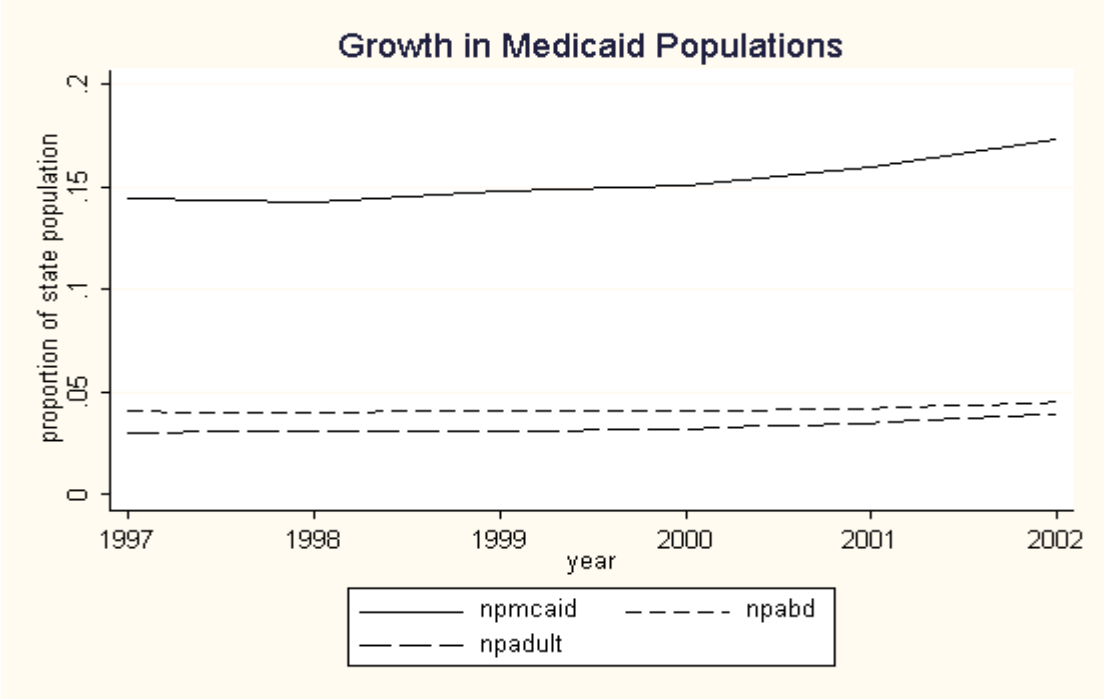
3.0 Results

This section summarizes the results of our analysis. Sections 3.1 and 3.2 describe the Medicaid population from 1997 to 2002. National trends are shown for the Medicaid population as a whole and individually for the aged, blind and disabled population and the adult population. Data is aggregated for states over this time period and the average proportion of the population in Medicaid is reported for individual states (Figures 3.2.1 and 3.2.2). Section 3.3 describes the results of the regression analyses.

3.1 Growth in Medicaid Population 1997-2002

The proportion of the population enrolled in Medicaid has grown in recent years, from 14.4% in 1997 to 17.4% in 2002. Roughly half of Medicaid enrollees have a basis of eligibility indicating that they are children. Children also account for about half the growth. The remaining half of Medicaid enrollees is composed of roughly equal parts "aged, blind, & disabled" and "adults". Figure 3.1 illustrates the growth in Medicaid enrollment as a proportion of the population from 1997 to 2002. The top line, labeled "npmcaid" is the overall proportion of the population enrolled in Medicaid; the line labeled "npabd" reflects the aged, blind, and disabled enrollees; and the line labeled "npadult" corresponds to adult enrollees. Although there is some variation from year to year and some growth overall, these populations look fairly stable over time.

Figure 3.1.1



3.2 Variations in the Proportion of the Population Enrolled in Medicaid Across States

Across states there is a very high level of variation in the proportion of the population enrolled in Medicaid. Figures 3.2.1 and 3.2.2 focus specifically on the levels of variation in the proportion of the population enrolled in Medicaid in the aged, blind, or disabled category and the adult category. For the aged, blind or disabled category, the average proportion of the population enrolled in Medicaid ranges from less than 2% in Utah to close to 8% in Mississippi, with the average proportion in most states between 2% and 4% (Figure 3.2.1). For the adult category, the average proportion of the population enrolled in Medicaid is generally lower than for the aged, blind and disabled

category with seven states enrolling less than 2% of those qualifying on the basis of adult eligibility in Medicaid (Figure 3.2.2).

Figure 3.2.1

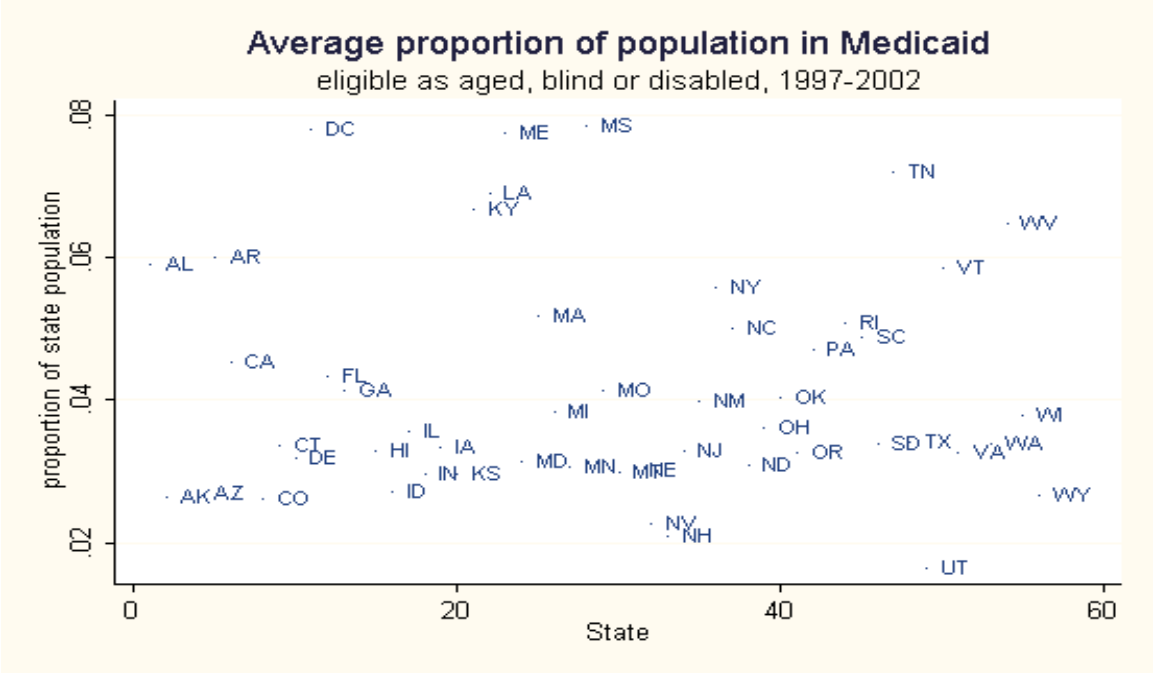
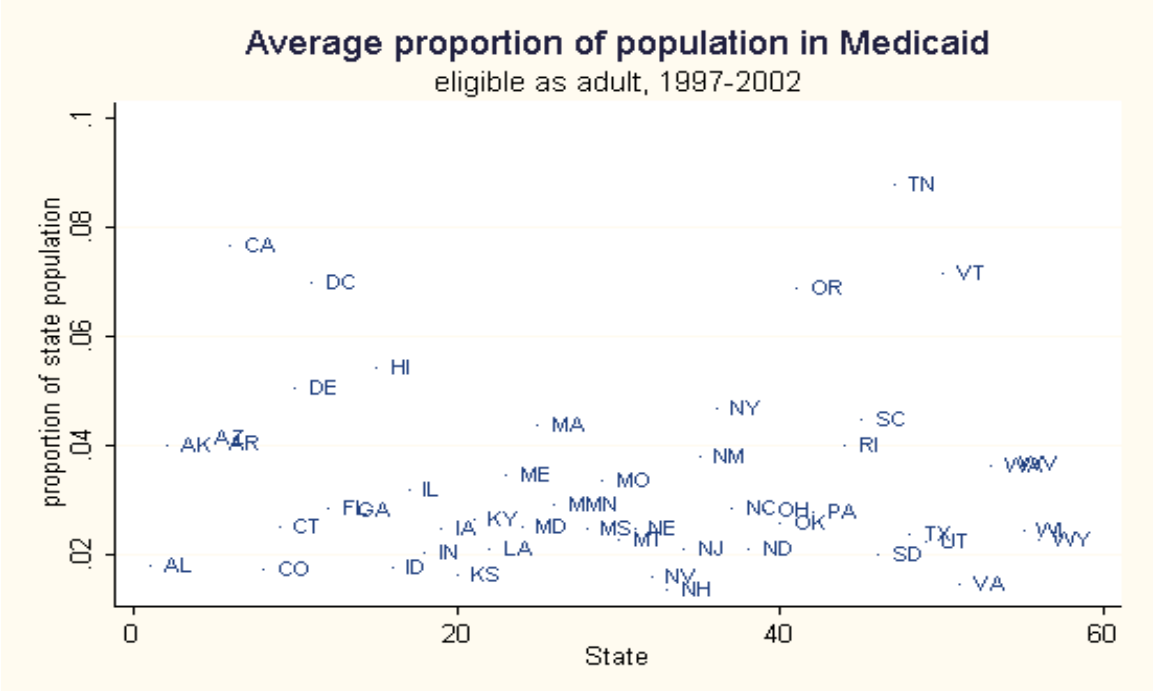


Figure 3.2.2



3.3 Factors Determining Population Enrolled in Medicaid in 1998-2002

To gain a preliminary understanding of predictors that might determine the probability of enrolling in Medicaid we ran a simple regression using the set of state and program characteristics described above, some time-varying and some held constant at 1998 values.

Table 1 shows the coefficient estimates for the independent variables. Coefficients starred are significant at the $p < 0.05$ level. In this model, which covers the entire Medicaid population, only four variables are significant. As expected, as employer sponsored coverage increases, an individual's probability of enrolling in Medicaid decreases. Similarly, as the poverty rate increases for those 65+, an individual's probability of enrolling in Medicaid increases. The other two significant factors in this model are the HCBS income limit as a percentage of SSI and the maximum assets allowed for nursing homes. These factors, however, do not act in the expected direction. As income limits and assets increase, the percentage of the population enrolled decreases. Why this relationship occurs is unclear. The next two models focus more specifically on populations more likely to enroll in these programs and may clarify this for us.

Table 1: Factors Predicting Medicaid Enrollment, 1998-2002, All Groups

Dependent Variable		
Probability of an individual enrolling in Medicaid		N = 255 $R^{2=}$ 0.51
Independent Variables	**Coefficient**	**Std. Error**
Family income	-.0012614	.0007673
% w/ employer-sponsored coverage	-.2948672*	.0545899
Poverty rate 65+	.5575105*	.0718785
Medically needy threshold as %FPL, individual	.0449761	.0329862
MN threshold as % FPL, couple	.0091248	.0369116
MN program for NH	-.013098	.0081645
MN program for HCBS	.0035814	.0073502
NH income limit as %SSI	.0053306	.0034978
HCBS income limit as %SSI	-.0075968*	.0033538
NH asset max	-.0136319*	.0034927
Federal match rate	-.0259421	.041631

*p < 0.05

3.3.1 Factors Determining Population Enrolled in Medicaid in 1998-2002 - Aged, Blind and Disabled

The second model limits the population analyzed to the aged, blind and disabled category. Limiting the analysis in this way results in many more variables being significant (Table 2). Higher incomes and more employer-sponsored insurance seem to lead to lower Medicaid enrollments and higher poverty seems to lead to higher enrollment. Higher medically needy thresholds for individuals are associated with higher enrollment as are having a medically needy program for HCBS and higher

income limits for nursing homes. In contrast, higher income limits for HCBS and higher asset limits for nursing homes are associated with lower enrollment. This latter finding is somewhat counterintuitive. A possible explanation may be that higher income and asset limits stem from relatively low enrollment instead of the other way around.

Table 2: Factors Predicting Medicaid Enrollment 1998-2002, Aged, Blind and Disabled

Dependent Variable		
Probability of an aged, blind and disabled individual enrolling in Medicaid		N = 254 $R^{2=}$ 0.55
Independent Variables	**Coefficient**	**Std. Error**
Family income	-.0005456*	.0002589
% w/ employer-sponsored coverage	-.0359315*	.0183854
Poverty rate 65+	.2081579*	.0241988
Medically needy threshold as %FPL, individual	.0229069*	.011111
MN threshold as % FPL, couple	-.0148911	.0124572
MN program for NH	.0028138	.0027593
MN program for HCBS	.005699*	.0024745
NH income limit as %SSI	.0071075*	.0011776
HCBS income limit as %SSI	-.0049411*	.0011291
NH asset max	-.0029838*	.001176
Federal match rate	.0093181	.014121

*p < 0.05

3.3.2 Factors Determining Population Enrolled in Medicaid in 1998-2002 - Adults

The third model limits the population analyzed to the adult category. In contrast to the aged, blind and disabled model, the model for adults has lower power overall and fewer statistically significant coefficients (Table 3). Employer-sponsored insurance and poverty rates have the expected effects, as does the medically needy threshold for couples. Interestingly, having a medically needy program for nursing home residents is strongly associated with lower enrollment of adults, as are higher nursing home asset limits. This could be because a Medicaid program that is generous to nursing home residents has less available for adult (non-disabled) enrollees. Finally, the federal matching rate is negatively associated with adult enrollment, probably serving as a proxy for having a small tax base.

Table 3: Factors Predicting Medicaid Enrollment 1998-2002, Adults

Dependent Variable		
Probability of an adult individual enrolling in Medicaid		N = 254 $R^{2=}$ 0.38
Independent Variables	**Coefficient**	**Std. Error**
Family income	-.0003588	.0003303
% w/ employer-sponsored coverage	-.1088561*	.0234579
Poverty rate 65+	.1265986*	.0308751
Medically needy threshold as %FPL, individual	.0123186	.0141764
MN threshold as % FPL, couple	.0290268	.015894
MN program for NH	-.020151*	.0035206
MN program for HCBS	.0031967	.0031573
NH income limit as %SSI	-.0012878	.0015025
HCBS income limit as %SSI	-.0003981	.0014407
NH asset max	-.0057036*	.0015005
Federal match rate	.0546884*	.018017

*p < 0.05

3.3 Characterizing the Relative Restrictiveness of State Enrollment Policies

One way to use these models to characterize the restrictiveness of each state's Medicaid program is to look at the both the contribution of the independent variables and the residuals in explaining the probability of an individual enrolling in Medicaid. For example, take a simple model based on the three exogenous variables related to demand for services: median family income, the percentage of people covered by employer sponsored insurance and poverty rate for people ages 65 and over. An R-squared of 0.42 indicates that these variables explain less than half the variation in Medicaid enrollment. By definition, the residuals account for the remaining variation. We are assuming that the residuals measure individual state Medicaid policies that restrict eligibility and subsequently enrollment. In Table 5 the average residuals from this model are calculated by state. The mean residual for each state indicates the difference in the observed versus the predicted proportion of the population enrolled in Medicaid. In this model, a positive residual can be interpreted to mean that the a particular state's Medicaid policy is less restrictive and therefore results in greater enrollment than expected; a negative residual can be interpreted to mean that a particular state's Medicaid policy is more restrictive and therefore results in lesser enrollment than expected. According to this model, the most generous states are Vermont, Tennessee, California, the District of Columbia, Maine and Arkansas. The least generous states are Nevada, North Dakota, Texas, Virginia, Montana and New Jersey.

Table 4: Simple Model to Predict Medicaid Enrollment 1998-2002, All groups

Dependent Variable		
Probability of an individual enrolling in Medicaid		N = 255 $R^{2=}$ 0.42
Independent Variables	**Coefficient**	**Std. Error**
Family income	-.0009503	.0006898
% w/ employer-sponsored coverage	-.261231*	.0544687
Poverty rate 65+	.2679824*	.0350634

*p < 0.05

Table 5 Summary of Residuals

State	Mean	Std. Dev.	State	Mean	Std. Dev.
AK	.04221907	.03021727	MT	-.04627265	.01105002
AL	-.02522439	.02089533	NC	-.02209173	.00390397
AR	-.01036542	.02501303	ND	-.05302678	.00851856
AZ	-.01372074	.03263494	NE	-.00624403	.01922862
CA	.06079554	.02419687	NH	-.02135185	.00887445
CO	-.02253862	.00750235	NJ	-.04051016	.02019904
CT	.00581701	.01468682	NM	.00589263	.01255475
DC	.05841736	.04759585	NV	-.05430801	.00811443
DE	.02954969	.04091311	NY	.00344934	.01722911
FL	-.02756655	.00379347	OH	.00486936	.02000815
GA	-.00604375	.01311456	OK	-.00039623	.01341318
HI	.01081881	.01753289	OR	.03045789	.00716888
IA	-.00409959	.00250497	PA	.0107736	.00587546
ID	-.01872958	.02103665	RI	.02043306	.01624764
IL	.01000133	.0109423	SC	.01325656	.01801008
IN	-.00321043	.01632411	SD	-.02067441	.02441404
KS	-.03098469	.00791144	TN	.08156342	.01923406
KY	.00530919	.01707428	TX	-.05195691	.01342067
LA	-.01417623	.02886555	UT	-.03458007	.00884727
MA	.02189397	.00967764	VA	-.04695426	.011267
MD	-.01537507	.02097729	VT	.0871746	.00817936
ME	.04695167	.03782614	WA	.02075865	.01753407
MI	.01482352	.00283716	WI	-.00124249	.01703346
MN	.00121073	.02468103	WV	.02157063	.015897
MO	.0307447	.03314432	WY	-.03321717	.01975024
MS	-.01389055	.01067643	Total	2.032e-11	.03680942

4.0 Discussion

This Data Brief focuses specifically on factors that determine the probability of an individual enrolling in the Medicaid program. Because Medicaid program eligibility requirements differ substantially from state to state we are particularly interested in measuring Medicaid program variables that might explain differences in enrollment in Medicaid across states.

We found that several variables exogenous to the Medicaid program consistently and significantly predicted Medicaid enrollment. In all four models, poverty rate of persons aged 65 and over and the percent of the population with employer sponsored insurance predicted Medicaid enrollment in the expected direction. Family income was significant in the model for the aged, blind and disabled only.

Medicaid program variables that were significant varied from model to model with a greater number of program variables becoming significant as the population studied was narrowed to more specific groups of individuals. Associations were not always in the expected direction. Even in the more refined models higher income limits for HCBS and higher asset limits for nursing homes were associated with lower enrollment leading us to believe that an endogeneity problem may exist.

Lastly, in the fourth model, by analyzing residuals, we developed a method for characterizing the relative restrictiveness of state enrollment policies by comparing the actual proportion of the state population enrolled in Medicaid with a predicted proportion.

There are several improvements to make as we further refine these models. First in both the models for adults and the aged, blind and disabled, denominators more specific to each of those populations would improve the dependent variable. Second, the model for adults could be improved by using a poverty rate for adults under age 65.

5.0 References

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