Disparities in Primary Care by Race and Ethnicity among Medicaid Children in California

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Abstract

Racial and ethnic disparities in primary care for children have been well documented, but poorly understood. This study examines variation in preventable hospitalization rates of Medicaid children in California to extend our understanding of racial and ethnic disparity in primary care quality. I estimate a multivariate Poisson model from administrative data. The results show that primary care quality varies substantially by race and ethnicity even after controlling for beneficiaries' primary language. Moreover, the domain of primary care that minority children experience disadvantage varies by race and ethnicity. Compared to white children, African-American children lack continuity and comprehensiveness of care that is necessary for the management of chronic conditions. Hispanic children, on the other hand have inadequate first contact care. Asian children experience a better quality of care overall than white children. Independent of race, a primary language other than English has a protective effect on preventable hospitalization rates. The study finds no evidence of linguistic minorities' disadvantage in managed care.

Introduction

Racial and ethnic barriers in various aspects of health care have been extensively documented. Minority race has been linked to lower likelihood of having a regular source of care and fewer physician visits (Fiscella, Franks and Clancy 1998; Centers for Disease Control and Prevention 1998), receiving fewer routine preventive services (Gormick et. al 1996; Burns et. al 1996), and poorer quality of care (Ayanian et. al. 1999; Kahn et. al. 1994). While health disparities have been shown to exist for both adults and children on multiple domains of health care, the focus on primary care of children is particularly salient. Children's health care needs are mostly in the realm of preventive and acute care-- the hallmarks of primary care. Moreover, children, especially minority children are more likely to be covered by public health insurance programs such as Medicaid emphasizing the need for continuous assessment of their primary care to public health policy makers (Mills 2001).

Several studies have described disparities in primary care for children (Committee on Pediatric Research 2000; Stevens and Shi 2003). Only one study (Weech-Maldonado et al. 2001) has, however, examined it in the context of a public insurance program such as Medicaid. The study used subjective measures of perceptions of care as a measure of primary care quality raising concerns about the confounding effects of racial and ethnic variation in expectations of care with reports of care rating.

Preventable hospitalizations or hospitalization rates for ambulatory care sensitive conditions (ACSC), such as Asthma, Dehydration and Pneumonia that can be managed with timely and effective treatment in a primary care setting have been identified in the literature as an objective measure of primary care quality (Agency for Health Care

Research and Quality 2003). Hospital admissions for these conditions reflect a deterioration primary care access and quality (Bindman et. al 1995; Cassanova & Starfield 1995).

The aim of the present study is to analyze the variation in hospitalization rates for ACS conditions in a large Medicaid program to improve our understanding of racial and ethnic disparity in primary care among children. We also examine how race/ethnic disparity varies in the two domains of primary care. First contact care involves having access to a doctor for a new health problem. Care management includes primary care attributes such as longitudinality (or continuity of care), comprehensiveness and coordination of care (Starfield 1998). Finally, we explore if racial and ethnic minority groups are disadvantaged in managed care because of language barriers.

Data and Methods

This study used a specially created data file that linked annual files of the California discharge database (PDD) with eligibility records of the California Medicaid (Medi-Cal) beneficiaries for the period 1996-1999. The California hospital discharge record includes among other things, information on admission month and year, and diagnosis codes. Every discharge in the hospital was linked, using a combination of deterministic and probabilistic matching techniques to an individual Medi-Cal beneficiary in the monthly enrolment file maintained by the California Department of Health Services (Rains & Tagupa 2001). Detailed information on the enrollee's eligibility status, race/ethnicity, principle language spoken, county of residence, and health plan were appended to the

hospital discharge record. This provided a clear identification of the Medi-Cal patients in the hospital discharge data file.

Data on the size of the "at risk population" for the calculation of the hospitalization rates by age, gender, race/ethnicity, language, and health plan type for each month of the period 1996-1999, were obtained from DHS' Medi-Cal Monthly Eligibility File (MMEF). Because ambulatory care sensitive hospitalization rate is an indicator of health care quality at the out-patient setting, that is before arriving at the hospital, only beneficiaries who were enrolled in Medi-Cal the month before hospitalization were considered to be in the risk pool. This way I eliminated any misclassification of uninsured children who may have gained coverage because of the hospitalization as Medi-Cal insured.

Commonly accepted lists of conditions (table 1) defined with diagnostic codes were used to calculate the number of hospitalizations for ambulatory care sensitive conditions (Agency for Health Care Research and Quality 2003). These codes generally rely on the primary diagnosis.

Table 1 about here

Using the multivariate Poisson regression analysis I modeled the monthly ambulatory care sensitive condition admission rate as a function of race/ethnicity(African American, Asian and Pacific Islander, Hispanic, Non Hispanic White, and Other), controlling for the principal language spoken (English, Spanish, Asian, and Other), Medi-Cal delivery model (fee-for-service, and managed care) admission month, admission year, child's age (0-1, 2-5,6-10,11-15,16-18 years), sex, and county of residence. The

Pearson scale factor corrected any remaining over-dispersion in the model (McCullagh and Nelder 1989).

Structural considerations and previous literature guided the choice of independent variables. Disparities in primary care arising from language ability, which are amenable to change and can be addressed relatively easily by providing linguistic services, are very different from disparities by race or ethnicity. Because many minority members also have lack adequate English language ability, disentangling the effects of language, in addition to race/ethnicity is very important and provides insight into the mechanism that generates racial disparity. The empirical evidence on the effect of race and ethnicity in the presence and absence of English language ability is not clear. Some report that controlling for English language ability eliminates the disparities between Asian, Hispanic and white children (Weinick and Krauss, 2000; Weech-Maldonado et al, 2003). While other studies (Seid et. al. 2003; Stevens and Shi 2002) found that controlling for language reduced, but did not eliminate reported racial and ethnic disparities.

Another factor to be disentangled is potential access to care. Following Andersen and Davidson, potential access is defined as "structural indicators such as characteristics of health care delivery system and enabling resources that influence potential care seekers use of health services (p17; Anderson and Davidson 1996). These are variables such as having health insurance or having a regular care provider which are necessary for primary care access, but do not determine the actual use of care or quality of that care. By focusing on Medicaid children, and further by including a variable for managed care, this study broadly controls for potential access factors. As opposed to Medi-Cal fee-for-

service, Medi-Cal managed care requires beneficiaries to have a regular source of primary care.

During 1994-1999, California expanded Medi-Cal managed care statewide by implementing mandatory managed care programs for most children. As a result the percentage of beneficiaries less than 18 years of age in HMO increased from 35 to 79 percent. Because the mandatory managed care program was implemented on a county by county basis over time, I introduced controls for year and county of residence. This eliminated differences in primary care attributable to Medi-Cal policy and also any secular changes in practice pattern that may affect hospitalization rates for ACSC. Some of the ACSCs such as Pneumonia and Asthma are seasonal. The variable for month of admission was included to control for the seasonality in ACSC hospitalization.

The independent variables were captured for each admission, and then aggregated to obtain the number of ambulatory care sensitive condition hospitalizations for groups with each combination of characteristics. Such an approach can accommodate changes in individual characteristics over time, such as type of health plan held by a beneficiary. However, since the patient discharge and enrollment files were linked to the discharge year, I could not accurately determine Medicaid enrollment status and health plan at the time of admission for hospital admissions that resulted in discharges in a different calendar year. Less than 1% of admissions had discharges in a subsequent year and these were excluded from the analysis. I also had to exclude January discharges as it could not be determined if the patient was enrolled in Medicaid in the month prior to the hospitalization.

I conducted separate analysis for acute and chronic conditions, as these reflect different attributes of primary care. For example, hospitalization for acute ACSC conditions such as dehydration and pneumonia reflects deficiency in first-contact care, which involves being accessible so that patients have a designated doctor for a new health problem (Starfield 1998). Hospitalizations for chronic ACS condition such as Asthma, on the other hand may indicate a lacking in continuity or comprehensiveness of care.

One articulated goal of Medi-Cal's managed care policy is to improve beneficiaries' access to primary care. As opposed to Medi-Cal fee-for-service, Medi-Cal managed care requires beneficiaries to have a regular source of primary care and relies heavily on health maintenance (primary prevention). However, racial/ethnic minority members who speak a language other than English may not have access to health education that promotes primary prevention. Moreover, patients' inability to comprehend physician instruction can lead to poor compliance and under use of physician services (Derose and Baker 2000). In order to examine if language barriers undermine some of the benefits of Medicaid insurance/managed care among low income children, I compared the differences in ACSC hospitalization rates among English, Spanish and Asian language speaking beneficiaries with managed care and fee-for-service plans.

Results

Table 2 shows the key demographic characteristics of the Medicaid children in California during 1996-1999. We see that about 90% of white children and 98% of African-American children in Medi-Cal speak primarily English at home. The corresponding numbers for Hispanic and Asian children are 49% and 28% respectively. Fifty one

percent Hispanic children and 69% Asian children report speaking Spanish and Asian language at home respectively. Children of minority racial and ethnic groups are more likely to be in managed care compared to white children ($p<.001$).

Table 2 about here

There is substantial variation in preventable hospitalization rates by race/ethnic group. The average unadjusted ACSC hospitalization rate for white children in Medi-Cal during 1996-1999 was 7.7 per 10,000 person-months (std. error .08), while those for African-American and Hispanic children were 9.6 (std. error .14) and 9.2 (std. error .31) respectively. Asian children had a lowest unadjusted ACSC hospitalization rate (4.6 per 10,000 person-months; std. error .25).

Table 3 shows the effects of race/ethnicity, language and health care delivery on hospitalization rates for ambulatory care sensitive conditions among Medi-Cal Children. We find that African American and Hispanics children in Medicaid have a 21% ($e^{.19}=1.21$; $p<.001$) and 13% ($e^{.12}=.13$; $p<.001$) higher rate of preventable hospitalization rates compared to white children indicating that minority children have barriers to good quality primary care even with Medicaid insurance. However, Hispanic children whose primary language is Spanish overcome most of the disadvantage ($e^{.12-.10}= 1.02$; $p=.11$). Asian children on the other hand experience better quality of primary care than white ($e^{-17}=.85$; $p<.001$) and other children. In addition, speaking an Asian language further lowered hospitalization rates for preventable conditions by about 21% ($e^{-24}=.79$; $p<.001$).

Table 3 about here

When we examine racial and ethnic differences separately for hospitalization for acute and chronic preventable conditions, we find that the Hispanic disadvantage remains

strong in the case of acute conditions ($e^{.18}$ = .84; p<.001), and the beneficial effect of Spanish language largely vanishes. On the other hand, in case of chronic ACS conditions, the Hispanic disadvantage largely disappears, but the Spanish language advantage becomes even stronger ($e^{-.30}$ = .74; p<.001). This suggests that Hispanic children lack quick access to primary care, but enjoy better continuity and co-ordination of care for chronic conditions like Asthma. Further, speaking Spanish at home is associated with a better care management. It could also indicator a lower prevalence of chronic conditions among Spanish speaking Hispanic children.

In contrast to Hispanic children, the opposite seems to be true for African-American children. Because African-American children have a 13% ($e^{-.14}$=.87; p<.001) lower rate of hospitalization for acute ACS conditions than white children they most likely have adequate first contact care. However, these children have a 72% ($e^{.54}$=1.72; p<.001) higher hospitalization rates for chronic ACS conditions than white children indicating that their primary care is deficient in care management practices to control flare-ups in chronic conditions.

Asian children in Medi-Cal are hospitalized for acute ACSCs at about the same rate as non-Hispanic white children ($e^{-.08}$=.92; p=.08). For chronic conditions, the hospitalization rates of Asian children is 27% ($e^{-.32}$=.73; p<.001) lower than white non-Hispanic children. Speaking an Asian language at home is associated with lower hospitalization rates for both acute and chronic conditions. Indeed, Asian children who speak an Asian language at home have a hospitalization rate for chronic ACS conditions that is only 50% ($e^{(-.32-.38)}$ = .50; p<.001) of the rate for English speaking non-Hispanic

white patients. However, some of this may be attributable to lower prevalence of chronic conditions in Asian American children.

As compared to fee-for-service health care delivery mechanism, Managed care is associated with significant declines in hospitalization rates in both, acute and chronic conditions. The effect of managed care in reducing preventable hospitalization is more in the case of acute conditions than chronic conditions ($e^{-.44}$=.64 vs. $e^{-.15}$=.86; p for difference <.01). This implies that the assignment of a primary care physician as a usual source of care is effective in improving timeliness of primary care and reducing preventable hospitalization.

Table 4 about here

Table 4 shows the estimated preventable hospitalization rates under fee-for-service and managed care health plans for children speaking English, Spanish and Asian language controlling for age, gender, race/ethnicity, year, month and county of residence. Column 1 gives an estimate of disparity in primary care for linguistic minorities under the fee-for-service plan. Column 2 gives the same estimate of disparity among beneficiaries in managed care plans. We notice that as compared to English speakers, those whose primary language is Spanish experience greater improvements in primary care in managed care plans, while those who speak an Asian language experience similar improvements in primary care as English speakers.

Discussion and Conclusion

Medi-Cal, California's Medicaid program is the largest state Medicaid program in the country. Medi-Cal provides health insurance to roughly 2.2 million children 75% of who

belong to a minority race and 66% speak a language other than English at home. In this study I examined the effect of race/ethnicity and primary language spoken at home on primary care quality among Med-Cal children using a large administrative database and an objective measure of quality of primary care. This study confirms that racial and ethnic disparity in primary care quality, as measured by preventable hospitalization rate exist even after Medicaid has ensured financial access. African-American and Hispanic children in this population have significantly worse quality of primary care than white children. Black race and Hispanic ethnicity have been known to be associated with higher preventable hospitalization rates (Friedman & Basu 2001) and worse primary care for children (Newacheck et. al 1996; Liu et. al 1993). However, some studies have shown that ethnic disparity is eliminated once language is controlled, particularly for Hispanic children (Weech-Maldonado et al 2001; Weinick and Krauss 2000). In this study we see that disparities persist for African American and Hispanic children even after controlling for language. This difference in finding can be attributed to several methodological differences between the studies.

First, these studies used subjective ratings of care (Weech-Maldonado et al 2001) or focused only on a single aspect of access to primary care --the presence of a regular source of care (Weinick and Krauss 2000) as a measure of primary care quality. By including a variable for managed care in the multivariate analysis, my study in fact, controls for the presence of a usual source of care, since Medicaid managed care requires beneficiaries to sign up with a primary care physician. Studies that use objective measures of access, find that controlling for language and potential access to care reduces, but does not eliminate racial and ethnic differences (Seid et al. 2003). Other

studies that use detailed characteristics of primary care, such as physician contact or waiting time at clinics and receipt of preventive care, also show that racial disparities persist regardless of language (Stevens and Shi 2002).

We find that Asian children experience better quality of primary care and lower hospitalization rates for preventable conditions than white children. This finding is consistent with previous studies on adults (Bindman et. al 2005) and infants (Cohen & Christakis 2006) in Medicaid, but varies from studies based on the general population (Weech-Maldonado et al 2001; Stevens and Shi 2002).

Speaking a language other than English does not result in worse primary care among Medicaid children in California. Studies that have used subjective ratings of access and satisfaction show people with limited English proficiency, particularly Asians report barriers to care (Weech-Maldonado et. al 2003; Seid et al. 2003; Snyder et. al. 2000; Merendith & Siu 1995; Murray-Gracia et. al. 2000). Subjective ratings of care are inherently problematic as they often capture cultural expectations and perceptions of care, and may be subject to recall and reporting bias. This study overcomes that problem by using a validated objective measure of primary care quality.

There could be several possible explanations for lower preventable hospitalizations among people whose primary language is not English. First, persons who do not speak their native language at home may be more embedded in the ethnic community, which offers a protection for adverse health outcomes such as ACSC hospitalization, especially for chronic conditions. Primary language in this case is possibly measuring social network effect. Persons who do not speak English at home are more likely to be recent immigrants and the lower preventable hospitalization rates

associated with such persons could be a reflection of the "migration selection effect" and lower prevalence of chronic conditions such as Asthma, which accounts for over 92% of preventable hospitalizations for chronic conditions in this population (table 1). There is a growing literature that documents declining health status of immigrants as they assimilate in the US (DeLia 2003). Data from the California Health Interview Survey also show that the prevalence of Asthma is lower among those who primarily speak a language other than English at home than those who speak English.

The effect of race/ethnicity and language differ by condition. Preventable hospitalizations for chronic and acute conditions reflect different facets of primary care. Acute conditions reflect deficiency in "first contact" care, whereas admissions for chronic ACS conditions reflect deficiencies in care management. Our results suggest that Hispanic children lack immediate access to primary care, whereas African-American children suffer from poor care management. Only Asian-American children and particularly Asian-American children who speak an Asian language at home experience better quality in both domains of primary care than Non- Hispanic white English speaking children. The lower rates of hospitalization for persons with a non-English primary language are also seen in chronic care management. This seems reasonable if non-English primary language is tapping into the beneficial impact of social network.

In addition to demographic variables, health care delivery model accounts for large differences in the quality of primary care received by children in Medi-Cal. Managed care is associated with a lower rate of preventable hospitalization. This keeps with earlier findings on managed care and preventable hospitalization rates on adults (Bindman et al 2005). In addition, managed care depresses the hospitalization rates for

both acute and chronic conditions indicating that managed care improves access to first contact care, as well as long-term aspects of primary care such as care management, continuity of care and comprehensiveness of primary care. However, the association of managed care is stronger in improving first access to physician than in care management, indicating that the mechanism by which managed care reduces preventable hospitalization is likely through the establishment of a usual source of care.

We do not find any evidence that language barriers undermine any of the gains derived from managed care among Spanish speaking Hispanic children and Asian children speaking an Asian language. Studies (Kominski et al 2006; Wilson et al 2005; Weech-Maldonado et. al 2003) that report trouble in interpretation and communication of linguistic minorities at the health care setting do not factor in social and individual resources patients may be using to overcome these difficulties. Because non-English language has an independent negative impact on preventable hospitalization rates for chronic conditions, it is likely that persons with a primary language other than English use personal and social resources outside of the health care system to overcome language problems.

The study represents several improvements on previous studies. First, by using statewide administrative data, we are able to study Asian children as a separate group. Much of previous research on language proficiency and health care disparity examined the Hispanic population only. Secondly, ambulatory care sensitive hospitalization rate represents an objective measure of primary health care quality, as opposed to patient/parent perceptions, which are influenced by respondent expectations. Third, this analysis enables the estimation of language proficiency and race/ethnicity effects

independent of structural factors such as health insurance and health care delivery model. Fourth, we get an insight into the mechanism and the aspect of primary care that is associated with health care disparity among racial, ethnic and linguistic groups.

The study also has several limitations. This analysis is confined to Medicaid children in California. This focus on a homogeneous population reduces the risk of errors arising from inaccurate measures of income, wealth and socioeconomic status, but also affects the generalizability of the results to other populations. The results also depend on how language barriers are measured (Flores et al 2005).

Finally, variation in preventable hospitalization rates may also be attributed to differences in disease prevalence and differential admission thresholds among racial, ethnic and linguistic groups. This analysis does not fully account for these sources of variation. The bias associated with these sources of errors is however expected to be small. Almost two thirds of the conditions in this study are acute conditions. Secondly, studies have not found any race or language based differentials in admission criteria in Emergency room, which is the source of most hospital admissions for ACS conditions (Oster & Bindman 2003; Rogers et al 2004). Nevertheless, these factors may be operating in California and underlie our finding of lower ACS hospitalization rates for persons who do not speak English as a primary language. Future research should address whether lower hospitalization rate of linguistic minorities is a reflection of decreased access to hospital care or superior social resources.

Table 1: Distribution of Ambulatory Care Sensitive Condition Hospitalizations Among Medicaid Children in California 1996-1999

Condition	No. of discharges	Percentage
ACUTE		
Dehydration	16788	13.8
Gastroenteritis	17359	14.3
UTI	11877	9.8
Pneumonia	35907	29.6
Ruptured Appendix	322	0.3
CHRONIC		
Asthma	34865	28.7
Diabetes	3422	2.8
COPD	27	0.0
CHF	556	0.5
Hypertension	198	0.2
Angina	1	0.0
Amputation	6	0.0

Table 2: Charecteretics of the Medicaid Children in California by Race and Ethnicity 1996-1999

	Percentage of Children				
	African American	Asian	Hispanic	Other[1]	White
Age					
0-1	9	5	9	9	8
	(1278663)	(463246)	(3125273)	(82318)	(1529913)
2-5	27	20	31	25	26
	3932616	1684104	10414764	220394	4841413
6-10	32	29	32	31	32
	4569406	2461518	10658281	276777	5812763
11-15	22	31	20	25	24
	3179275	2688056	6672667	223893	4417896
16-18	9	15	8	10	10
	1348408	1321223	2797347	88408	1800978
Gender					
Male	49	51	50	51	50
	7047721	4377644	16890227	452796	9260335
Female	51	49	50	49	50
	7260647	4240503	16778105	438994	9142628
Primary Language Spoken at Home					
Asian	0	69	0	1	1
	11225	5913840	24410	8958	193922
English	98	28	49	76	90
	13984050	2381059	16550533	682115	16644182
Spanish	0	1	51	2	0
	32766	46881	17014159	20345	60350
Other[1]	2	3	0	20	8
	280327	276367	79230	180372	1504509
Health Care Delivery					
HMO	66	62	57	38	48
	9503078	5358941	19244362	339233	8773703
FFS	34	38	43	62	52
	4805290	3259206	14423970	552557	9629260

Notes: [1] Includes missing values
Figures in parenthesis represents total person months of observations

Table 3: Effect of Race/Ethnicity, and Primary language on Ambulatory Care Sensitive Condition Hospitalization Rates Among Medicaid Children In California 1996-1999

Variables	All ACSC	Acute Conditions	Chronic Conditions
Race/Ethnicity (refence category - White)			
African-American	0.19***	-0.14***	0.54***
Asian	-0.17***	-0.08	-0.32***
Hispanic	0.12***	0.18***	-0.01
Primary Language Spoken at Home (reference category - English)			
Asian	-0.24***	-0.13**	-0.38***
Spanish	-0.10***	-0.01	-0.30***
Health Care Delivery (reference category - Fee-for-Service)			
Managed Care	-0.32***	-0.44***	-0.15***

Note: Adjusted for year, month, age, sex and county of residence
*** p<.001
**p=.01

Table 4:Estiamted Difference[1] in Risk Ratios for Preventable Hospitalization by Primary Language Spoken Among Fee-For-Service and Managed Care Medicaid Beneficiaries in California 1996-1999

	Risk Ratio					
Health care delivery model	English	Spanish	Difference	English	Asian	Difference
FFS	REF	0.99	0.01	REF	0.86	0.14***
Managed care	0.74	0.6	0.14***	0.74	0.63	0.11**
Difference in disparity			-0.13***			0.03

[1] adjusted for age, sex, race/ethnicity, county of residence, year and month of admission
*** p<.001
** p<.01
REF: Reference group

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