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The Impact of Interpreters on Parents' Experiences with Ambulatory Care for Their Children

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Abstract

Health plan members who did not need an interpreter in the past 6 months were compared with those who needed one and always, usually, sometimes, or never got one. In multivariate analyses, Hispanic and Asian/Pacific Islanders (API) members who needed interpreters and usually, sometimes, or never used one reported significantly worse ($p < .05$) provider and office staff communication, access to care, and health plan customer service compared with members who did not need interpreters. Hispanic and API members who needed and always used an interpreter reported similar or significantly better ($p < .05$) provider and office staff communication, access to care, and health plan customer service than members that did not need interpreters. Use of interpreters reduced White-Hispanic disparities in reports of care by up to 28 percent and White-API disparities by as much as 21 percent. Increasing use of interpreters could reduce racial/ethnic disparities and improve health plan performance.

Keywords

Hispanic; Asian/Pacific Islander; disparities; interpreter; limited English language proficiency; CAHPS®

Language barriers present a significant problem for an increasing number of residents seeking medical care in the United States. According to U.S. Census Bureau (2000) statistics, approximately 45 million U.S. residents constituting nearly 18 percent of the U.S. population speak a language other than English at home. Patients with limited English language proficiency (LEP) must rely on interpreters to communicate with health care providers who do not speak their language or be subjected to impaired communication. Although federal guidelines issued by the Department of Health and Human Services Office for Civil Rights encourage federally funded entities to develop and implement plans for improving language

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access to care (Andrulis, Goodman, and Pryor 2002), professional medical interpreters are frequently unavailable for health care encounters, leaving clinicians and LEP patients to communicate with little or no common language or to rely on untrained family members, bilingual medical staff, or other ad hoc interpreters (Jacobs et al. 2003).

Previous research has shown that patients who do not speak English well receive less than optimal medical care. Language barriers can adversely affect processes of care including taking the patient's history (Marcos et al. 1973; Marcos 1979; Ebden et al. 1988; Vasquez and Javier 1991), comprehension of diagnosis and treatment (Baker et al. 1996), adherence to therapy (Manson 1988), and outcomes of care (Perez-Stable, Napoles-Springer, and Miramontes 1997). LEP patients are less likely to receive timely eye, dental, and physical examinations (Hu and Covell 1986), and LEP women are less likely to receive preventive services including mammograms, breast examinations, and Pap smears (Woloshin et al. 1997). Language barriers can also result in greater dissatisfaction with care. For example, compared with English-speaking patients, Spanish-speaking patients report more problems with their health care and are more dissatisfied with provider communication, access to care, timeliness of care, and health plan customer service (Baker et al. 1996; Morales et al. 1999; Morales et al. 2001; Carrasquillo et al. 1999; Weech-Maldonado et al. 2001, 2003, 2004).

NEW CONTRIBUTION

The use of trained interpreters is the recommended solution to language barriers faced by LEP patients (Woloshin et al. 1995). The majority of health care organizations, however, has either not implemented interpreter services or has implemented inadequate interpreter services that are not planned or staffed to provide timely access to interpreters (Jacobs et al. 2001). We undertook this study to assess the availability of interpreters to health plan members enrolled in the California State Children's Health Insurance Program who said they needed them, to evaluate the impact of the availability of interpreters on their reports of care, and to determine the extent of reductions in racial/ethnic disparities in reports of care that might be achieved by improving the availability to interpreters. Since its inception, the California State Children's Health Insurance Program has enrolled more than 1 million California residents. Based on reports from the U.S. Census Bureau, California is home to more foreign-born persons than any other state and has the highest percentage of LEP persons (Schmidley 2001; Shin 2003).

METHOD

CONCEPTUAL FRAMEWORK

We used Andersen's (1968 Andersen's (1995) behavioral model of health services use to guide our selection of explanatory variables for this study. In addition to analyses of health services utilization, previous studies have applied Andersen's behavioral model to analyses of access to care and to analyses of patient satisfaction (Snyder et al. 2000; Harada, Villa, and Andersen 2002).

Andersen's behavioral model posits that three types of factors independently influence the use of health services. These factors include predisposing, enabling, and need factors. Predisposing factors are generally conceptualized to be immutable characteristics of individuals such as age, gender, and education that predispose them to using health services. Researchers interested in disparities in care have added race and ethnicity to the list of predisposing factors. Other predisposing variables include health beliefs. Enabling factors are generally conceptualized as mutable characteristics of individuals that facilitate the use of health services and include variables such as income and insurance status, to which disparities researchers have added cultural and linguistic barriers. Finally, need factors are generally measured by indicators of health status such as indicators of chronic disease or measures of general health status.

PARTICIPANTS

We analyzed two independent cross-sectional samples of Consumer Assessment of Health Plans Survey (CAHPS[®]) data collected by the California State Children's Health Insurance Program (S-CHIP) in 2000 and 2001. The Managed Risk Medical Insurance Board (MRMIB) administers several programs designed to provide health care coverage to adults and children including the California S-CHIP. This program provides health coverage for uninsured children in families with incomes up to 250 percent of the federal poverty level and not eligible for Medicaid. MRMIB required California health plans participating in S-CHIP during 2000 and 2001 to survey parents/guardians of enrolled children using the pediatric version of the CAHPS[®] 2.0 surveys.

In total, 26,671 members of 26 health plans completed CAHPS[®] surveys. We excluded those who needed an interpreter and were white, black, or selected "other race" because there were so few. To accommodate the diversity of the health plan memberships, the surveys were administered in four languages other than English: Spanish, Cantonese, Korean, and Vietnamese. All translations were created using CAHPS[®] recommendations of separate forward and back translation with reconciliation (Weidmer, Brown, and Garcia 1999). The surveys were administered by mail and telephone by an independent survey vendor using the HEDIS protocol proscribed by the National Committee on Quality Assurance. The raw response rates of 60 percent and 58 percent were obtained in 2000 and 2001, respectively.

REGRESSION MODELS

We used multiple variable regression models to assess the independent association between use of interpreter and reports of care in three domains: communication with health care providers, access to care, and health plan customer service.

Dependent variables—The CAHPS[®] surveys include two types of consumer evaluations of care: ratings of care and reports of care. Ratings of care ask consumers to provide summary evaluations of care, whereas reports of care ask consumers about specific experiences of care in terms of what did or did not happen. Previous studies have suggested that ratings of care may be problematic for making group comparisons in culturally and linguistically diverse populations (Morales et al. 2001; Weech-Maldonado et al. 2001). To obviate these concerns, we only analyzed reports of care in this study.

Traditionally, the CAHPS[®] 2.0 reports of care have been summarized by five multiple-item composite measures that include access to care (four items), timeliness of care (four items), provider communication (four items), staff helpfulness (two items), and health plan customer service (three items). Recent research, however, suggests that the CAHPS[®] reports of care can be adequately summarized by a fewer number of composites. For this study, we summarized the CAHPS[®] reports of care with three composites (Bender and Garfinkel 2001) that included provider and office staff communication (six items), access to care (eight items), and health plan customer service (three items) (see Table 1).

Scores for each composite were computed in a two-step process: first, each item score was linearly transformed to a 0–100 possible range, then the composite score was computed by taking the mean of the item scores for each composite. The internal consistency reliability for each of the three composites was adequate for group comparisons: provider and office staff communication ($\alpha = .84$), access to care ($\alpha = .75$), and health plan customer service ($\alpha = .76$).

Primary explanatory variable—The primary explanatory variable for this study was constructed from two survey questions. The first question asked whether a respondent had needed an interpreter in the previous 6 months (response options: yes/no), and the second

question asked how frequently a respondent had used an interpreter in the previous 6 months (response options: never, sometimes, usually, and always). The first question was administered to all respondents, whereas the second question was only administered to respondents who indicated they had used an interpreter. On the basis of these two questions, we derived an explanatory variable with plan members assigned to one of four categories: plan members who did not need an interpreter (answered *no* to first question), members who needed an interpreter and *always* used one (answered *yes* to first question and *always* to second question), plan members who needed an interpreter and usually used one (answered *yes* to first question and *usually* to second question), and plan members who needed an interpreter and never or sometimes used one (answered *yes* to first question and *never* or *sometimes* to second question). Because of the small number of responses, we collapsed the *never* and *sometimes* categories in each of these categories.

Based on Andersen's behavioral model, the use of interpreters falls into the category of enabling factors. According to Andersen's model, interpreters reduce language barriers to care, and therefore, increases in the use of interpreters by patients who need them will result in more positive experiences of care, controlling for other enabling factors and predisposing and need factors.

Other explanatory variables—Guided by Andersen's behavioral model, we selected explanatory variables falling into the predisposing and need categories of variables. The predisposing variables we selected included parent age, parent education, child age, and child race/ethnicity, and the need variables included parent rating of child's health and an indicator for a child with a chronic condition. Parent age had four categories: 18–24 years, 25–34 years, 35–44 years, and 45 years or older. Parent education had four categories: 0–8 years, 9–11 years, 12 years, and 13 or more years. Child age had four categories: 0–5 years, 6–9 years, and 10–13 years. Although children up to 16 years of age were eligible for the study, there were no children older than 13 years. Child race/ethnicity (as indicated by the parent) had five categories including Hispanic, non-Hispanic White, non-Hispanic Black, non-Hispanic Asian/Pacific Islander and non-Hispanic Other. Child health status (as rated by the parent) had four categories: excellent, very good, good, and fair/poor. The *fair* and *poor* categories were combined because of the small numbers of respondents in these categories. Child health status was further assessed by a dichotomous variable indicating whether a child had a chronic medical condition, defined as a condition lasting 3 or more months.

We selected survey language for our analyses because previous studies have found survey language to be an important predictor of health status, access to care, satisfaction with care, and barriers to care among Hispanics (Kirkman-Liff and Mondragon 1991). Survey language had five categories including English, Spanish, Cantonese, Korean, and Vietnamese.

Multivariate analyses—A separate regression model was estimated for each dependent variable. To allow for differential effects of interpreters among Hispanics needing interpreters and Asian/Pacific Islanders needing interpreters, we included interactions of interpreter use with the indicator variable for Asian/Pacific Islander. In secondary analyses, we simulated the effect of always providing interpreters to health plan members who needed one to estimate the impact of increasing the availability of interpreters on composite scores and disparities. All multivariate analyses also included health plan fixed effects and survey year fixed effects.

All tests of statistical significance were based on robust standard errors adjusted for the clustering of respondents within health plans. In addition to tests of statistical significance for individual variables, we also conducted tests of joint significance on sets of related indicator variables (e.g., the set of indicator variables for age categories). All analyses were weighted to account for survey nonresponse. Using data from the health plans on all persons sampled for

the study, we derived survey nonresponse weights based on response rates within cells defined by survey language, child's age, health plan membership, and length of health plan enrollment. All analyses were conducted using Stata 7.0 (Stata Corp. 2001).

RESULTS

SAMPLE CHARACTERISTICS

Fifty percent of parents were less than 35 years of age (Table 2). Sixty-five percent of the parents had 12 years of education or less. Seventy-five percent of the children were less than 10 years of age. Sixty-three percent of the children were Hispanic, whereas 9 percent were white and 18 percent were Asian/Pacific Islander. Thirty-seven percent of the children had poor or fair health, and 10 percent had a chronic medical condition. Forty-seven percent of parents chose a Spanish survey, whereas 42 percent chose an English survey, and 11 percent chose a Cantonese, Korean, or Vietnamese survey.

THE AVAILABILITY OF INTERPRETERS

Overall, 15 percent of health plan members reported needing an interpreter in the last 6 months, of which 7 percent reported always having an interpreter, 4 percent reported usually having an interpreter, and 4 percent reported never or sometimes having had an interpreter. Among Hispanics, 19 percent reported needing an interpreter, of which 10 percent reported always having an interpreter. Among Asian/Pacific Islanders, 10 percent reported needing an interpreter, of which only 2 percent reported always having one.

Among the health plans in the study, the proportion of plan members who reported needing an interpreter ranged from 5 percent to 24 percent of members (Table 3). Among health plans, the proportion of plan members in need of interpreters who always had one ranged from 18 percent to 59 percent, whereas the proportion who never or sometimes had one ranged from 16 percent to 50 percent.

MEAN COMPOSITE SCORES BY THE AVAILABILITY OF INTERPRETERS

Mean scores for the provider and office staff communication composite, access-to-care composite, and health plan customer service composite were lowest for plan members who needed and never or sometimes had interpreters, followed by those who needed and usually had interpreters, and those who needed and always had interpreters (Table 4). Health plan members who needed and always had interpreters also had higher mean scores than plan members who did not need interpreters (scores range from 0 to 100).

MULTIVARIATE RESULTS

Hispanic and Asian/Pacific Islander health plan members who needed interpreters and never or sometimes had one or usually had one had significantly lower composite scores than plan members who did not need interpreters on all three composites (Table 5). On the other hand, Hispanic and Asian/Pacific Islander members who needed interpreters and always had one had higher scores than plan members who did not need interpreters on the provider and staff communication composite. Hispanic members who needed interpreters and always had one also had higher scores on the access to care composite.

IMPACT OF PROVIDING INTERPRETERS ON REPORTS OF CARE AMONG HISPANICS AND ASIAN/PACIFIC ISLANDERS

By always providing interpreters to Hispanic plan members who need them, we estimate that the mean score for Hispanics on the provider and staff communication composite would increase by approximately 6 points, the mean score on the access-to-care composite would

increase by 4 points, and the mean score on the health plan customer service composite would increase by 2 points (Table 6). The impact of providing interpreters to Asian/Pacific Islanders is more dramatic. By always providing interpreters to Asian/Pacific Islanders who need them, the mean score for Asian/Pacific Islanders on the provider and staff communication composite would increase by approximately 15 points, the mean score on the access-to-care composite would increase by 8 points, and the mean score on the health plan services composite score would increase by 11 points.

IMPACT OF INCREASING THE AVAILABILITY OF INTERPRETERS ON DISPARITIES IN REPORTS OF CARE

The difference (disparity) in composite scores between whites and Hispanics ranged from -4.28 to 5.74, and the difference between whites and Asian/Pacific Islanders ranged from -9.57 to -4.96 (Table 7). By always providing interpreters to Hispanics who needed them, the disparity between whites and Hispanics would be reduced by 28 percent for the provider and office staff communication composite and by 19 percent for the access-to-care composite; the disparity in the health plan customer service composite, for which Hispanics reported higher scores, would increase by 5 percent. By always providing interpreters to Asian/Pacific Islanders who needed them, the difference in composite scores between whites and Asian/Pacific Islanders would be reduced by 8 percent to 21 percent.

DISCUSSION

Andersen's behavioral model predicts that greater use of interpreters by patients who need them would lead to improved reports of care, and indeed, our findings show a significant graded relationship between the use of interpreters by health plan members who need them and reports of care, across multiple domains of care. Specifically, we found significantly higher scores among health plan members who needed interpreters and always used one compared with health plan members who needed interpreters and usually, sometimes, or never used one. We also found higher scores among health plan members who needed interpreters and always used one compared with plan members who did not need interpreters. The latter finding suggests that interpreters may enhance experiences with care for plan members who need them in ways that go beyond the provision of language interpretation alone. As suggested by previous studies, it may be that interpreters also behave as cultural brokers or health systems way finders (Barrett et al. 1998) that result in higher scores.

Our results have two important implications for health plan administrators and providers of health care interested in quality of care improvement. First, our results show that the CAHPS® composite scores are sensitive to differences in the use of interpreters by health plan members who need them. This is demonstrated by the graded relationship between the use of interpreters and reports of care. Second, our results suggest that health plans could improve their performance on the CAHPS® surveys significantly by increasing the use of interpreters by LEP Hispanics and Asian/Pacific Islanders who need them. However, without a prospective randomized trial, we cannot be certain of the causal effects of providing interpreters to patients who need them on reports about care.

According to guidelines issued by the United States Department of Health and Human Services, entities receiving federal funds must make efforts to provide language assistance services to LEP patients (Andrulis, Goodman, and Pryor 2002). To ensure compliance with these guidelines, the California S-CHIP requires that participating health plans provide interpreters for all LEP health plan members who need them. Yet we still found that among the health plans participating in this study, the average proportion of plan members who needed and always used an interpreter was 47 percent, ranging from as low as 15 percent to a maximum of 57 percent. We also found that the average proportion of plan members who needed and never or

sometimes used an interpreter was 26 percent, ranging from a low of 16 percent to a maximum of 50 percent. These findings indicate that even though health plans may be contractually required to provide interpreter services (e.g., Language Line) by a payor like S-CHIP, health plan members who need interpreters frequently receive care without the benefit of interpreters.

In the Institute of Medicine (2002) report on unequal treatment, health services researchers were called on to identify the underlying causes and suggest interventions to ameliorate these disparities. In this study, we have clearly identified the inadequate use of interpreters as an important cause of disparities in care affecting Hispanics and Asian/Pacific Islanders. We estimate that providing optimal access to interpreters for LEP Hispanics and Asian/Pacific Islanders could diminish white-Hispanic disparities in reports of care by 19 percent to 28 percent and white-Asian/Pacific Islander disparities by 8 percent to 21 percent, depending on the domain of care.

When viewed from the perspective of health plan members who need interpreters, the potential reductions in disparities are even more striking. Specifically, increasing the use of interpreters by health plan members who need them could potentially result in a 6-point (9 percent) improvement in the communication domain for Hispanics and a 15-point (23 percent) improvement in the communication domain for Asian/Pacific Islanders. Health plans interested in reducing racial and ethnic disparities and improving their performance on the CAHPS[®] surveys should implement interventions to increase the utilization of interpreters to LEP health plan members who need them.

This study has limitations. First, this is an observational study, and therefore, we cannot conclude with certainty that the provision of interpreters is causally related to the scores we observed on CAHPS[®] surveys. As with any observational study, we have carefully controlled for potentially confounding factors in the analyses, but unaccounted-for confounding may still exist.

Second, limitations in the data prevented us from differentiating among different types of interpreters used by health plan members. Some plan members may have considered ad hoc interpreters such as family, while others considered only trained interpreters when answering the survey question about access to interpreters. Previous studies have shown that LEP patients prefer professional interpreters to ad hoc interpreters (Lee et al. 2002). Future studies should attempt to differentiate among interpreters by level of training and experience.

Finally, it is possible that the observed differences in reports of care among racial/ethnic and linguistic groups were due to reporting bias rather than real differences in the experiences of care. Although there is some evidence of culturally mediated biases accounting for observed racial/ethnic differences on self-reported measures (Hayes and Baker 1998), there is other research showing the existing bias is not significant (Morales, Reise, and Hays 2000). In addition, research has found that the Spanish and English CAHPS[®] 2.0 survey instruments have adequate psychometric properties (Morales, Reise, and Hays 2003).

Interventions to increase the use of interpreters by LEP patients might include increasing awareness among patients and providers of the availability of interpreter services and improving the timeliness and accessibility of interpreters. In one of the few studies conducted comparing different modes of interpretation, Hornberger et al. (1996) showed that LEP patients and providers preferred remote simultaneous interpretation to face-to-face interpretation. With ongoing improvements in telecommunication capabilities (e.g., wireless telephones), the accessibility and timeliness of interpretation could be greatly increased through the further development of remote simultaneous interpretation services. Other strategies for increasing the use of interpreters might include training or hiring more bilingual staff, teaching other

languages to monolingual English-speaking health care professionals, and training or hiring qualified medical interpreters.

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TABLE 1
CAHPS[®] Reports of Care: Summary of Item Content and Response Options

<i>Summary of Item Content</i>	<i>Response Options</i>
Access-to-care composite (eight items)	
How much of a problem, if any, was it to get a personal doctor or nurse you are happy with?	A big problem
How much of a problem, if any, was it to get a referral to a specialist that you needed to see?	A small problem
How much of a problem, if any, was it to get the care you or a doctor believed necessary?	Not a problem
How much of a problem, if any, were delays in health care while you waited for approval from your health plan?	
When you called during regular office hours, how often did you get the help or advice you needed?	Never
How often did you get an appointment for regular or routine health care as soon as you wanted?	Sometimes
When you needed care right away for an illness or injury, how often did you get care as soon as you wanted?	Usually Always
How often did you wait in the doctor's office or clinic more than 15 minutes past your appointment time to see the person you went to see?	
Provider and office staff communication composite (six items)	
How often did doctors or other health providers listen carefully to you?	Never
How often did doctors or other health providers explain things in a way you could understand?	Sometimes
How often did doctors or other health providers show respect for what you had to say?	Usually Always
How often did doctors or other health providers spend enough time with you?	
How often did office staff treat you and your child with respect?	
How often was office staff as helpful as they should be?	
Health plan customer service composite (three items)	
Problems finding or understanding health plan information	A big problem
Problems getting help	A small problem
Problems with paperwork	Not a problem

Note: CAHPS[®] = Consumer Assessment of Health Plans.

TABLE 2

Sample Characteristics

<i>Variable</i>	<i>n (unweighted)</i>	<i>% (weighted)</i>
Respondent age		
< 25 years	1,908	7
25–34 years	11,340	43
35–44 years	10,596	41
≥ 45 years	2,180	8
Respondent education		
Grades 0–8	5,128	20
Grades 9–11	3,896	15
Grade 12	7,745	30
Grade > 12	9,044	35
Child age		
0–5 years	8,894	34
6–9 years	10,829	41
10–13 years	6,693	25
Child race/ethnicity		
White	2,598	9
African American	465	2
Asian/Pacific Islander	4,639	18
Hispanic	16,729	63
Other	1,985	7
Child health status		
Excellent	1,774	7
Very good	6,198	24
Good	8,333	32
Fair/poor	9,625	37
Child with chronic condition	2,470	10
Survey language		
English	11,171	42
Spanish	12,278	47
Cantonese	1,365	5
Korean	975	4
Vietnamese	627	2

TABLE 3
Availability of Interpreters Among 26 Participating Health Plans

	<i>Mean</i>	<i>Minimum</i>	<i>Median</i>	<i>Maximum</i>
Percentage patients who need interpreters (among 26 health plans and 26,298 patients)	15	5	14	24
Availability of interpreters to patients who needed interpreters (26 health plans and 3,671 patients)				
Percentage who always had an interpreter	47	18	47	59
Percentage who usually had an interpreter	27	19	25	52
Percentage who sometimes/never had an interpreter	26	16	17	50

TABLE 4

Composite Scores by the Availability of Interpreters

	<i>Provider/Office Staff Communication</i>		<i>Access to Health Care</i>		<i>Health Plan Customer Service</i>	
	M	SE	M	SE	M	SE
Availability of interpreters						
Needed and sometimes/never had an interpreter	62.72	0.85**	66.47	0.80**	77.70	1.23**
Usually	69.11	0.57	70.52	0.61	82.29	1.15
Always	81.38	0.44	78.81	0.43	88.50	0.78
Did not need interpreter	79.16	0.16	77.68	0.15	83.56	0.83

Note: Weighted means. Scores range from 0 to 100.

** $p < .01$ for test of null hypothesis that the mean values are equal.

TABLE 5

Multivariate Results

	<i>Provider and Office Staff Communication</i>	<i>Access to Health Care</i>	<i>Health Plan Customer Service</i>
Interpreter services for Hispanics ^a			
Need/never-sometimes	-12.89**	-7.68**	-4.60**
Need/usually	-6.53**	-4.10**	-0.32
Need/always	3.80**	1.80**	0.80
Interpreter services for Asians ^b			
Need/never-sometimes	-13.10**	-16.00**	-16.69**
Need/usually	-4.65**	-4.21**	-11.75**
Need/always	9.94**	-0.28	0.70
<i>R</i> ²	.14	.11	.09
Composite mean score	78.12	76.96	83.54

Note: Models include controls for parent age, parent education, survey language, child age and child health status, health plan, race/ethnicity, and survey year.

^aReference group consists of survey respondents who did not need interpreters in the past 6 months.

^bReference group consists of survey respondents who did not need interpreters in the past 6 months.

**
p < .01 for test of null hypothesis that the odds regression coefficient is 0.

Impact of Providing Interpreters on Reports of Care for Hispanics and Asian/Pacific Islanders Who Need Interpreters

TABLE 6

	<i>Adjusted Scores</i>					
	<i>Hispanics</i>			<i>Asian/Pacific Islanders</i>		
	<i>Need Interpreters</i>	<i>Simulated to Have Interpreters Always Provided</i>	<i>Change in Score</i>	<i>Need Interpreters</i>	<i>Simulated to Have Interpreters Always Provided</i>	<i>Change in Score</i>
Provider and office staff communication	74.7	81.1	6.4	64.4	79.3	14.9
Access to health care	75.5	79.2	3.7	58.8	66.4	7.6
Health plan customer service	88.0	89.5	1.5	58.2	68.9	10.7

TABLE 7
 Simulated Impact of Providing Interpreters on Racial/Ethnic Disparities in Reports of Care

	White-Hispanic Disparity	Disparity Reduction Resulting from Providing Interpreters	Percentage Reduction in Disparity	White-Asian/ Pacific Islander Disparity	Disparity Reduction Resulting from Providing Interpreters	Percentage Reduction in Disparity
Provider and office staff communication	-4.28**	1.21	28	-9.57**	1.47	15
Access to health care	-3.75**	0.69	19	-9.55**	0.75	8
Health plan customer service	5.74**	0.29	5	-4.96**	1.06	21

** $p < .01$ for test of null hypothesis that the Hispanic/Asian regression coefficient is not equal to the White regression coefficient.