 # 8232

Primary Household Language and Asthma Care among Latino Children

Luz Claudio, PhD
Jeanette A. Stingone, MPH

Abstract: To determine if language barriers affect the level of asthma management and quality of health care in Latino children, a cross-sectional, parent-report survey was conducted in 26 randomly selected public elementary schools in New York City. The overall response rate was 76.9%, yielding a sample of 1,847 Latino children. The prevalence of asthma among Latinos from Spanish-speaking households was 20.8%, compared with 25.8% among Latino children from English-speaking households. Although asthmatics from Spanish-speaking families were less likely to have symptoms than children from English-speaking families, they were twice as likely to be hospitalized for asthma (9.4% vs. 4.4%, $p<.02$). Asthmatics from Spanish-speaking households were more likely to have public health insurance and to use a community/hospital clinic for care. Spanish-speaking parents were less likely to report having access to care on weekends or to have communicated with their child's physician about recommended components of an asthma management plan.

Key words: Language, childhood asthma, Latinos, access to care.

According to the 2000 U.S. Census, more than 19% of the U.S. population ages 5 and older speaks a language other than English at home, an increase from the 13% reported in 1990.[1] Over half the non-English speakers, approximately 28 million Americans, reported Spanish as their primary language.[1] Currently, the Latino population is the largest minority group in the country, accounting for 15% of the population, and that figure is increasing.[2] As the Spanish-speaking Latino population grows, the role that language proficiency plays in these residents' ability to access and benefit from quality health care must be more thoroughly understood.

A number of studies have examined the role that language discordance can have as a perceived barrier to accessing health care, communicating with providers, and patient satisfaction.[3–16] A recent study found that a barrier commonly perceived by Latino adults was language differences impeding their ability to communicate with and trust their providers.[17] Another study showed that over one-quarter of Latino families cite language discordance as the greatest barrier to their children receiving health care.[18]

***DR. CLAUDIO** is an Associate Professor in the Department of Community Medicine at the Mount Sinai School of Medicine. **MS. STINGONE** is currently a doctoral student in the Department of Epidemiology at the University of North Carolina, Chapel Hill. Please address correspondence to Luz Claudio, PhD, Mount Sinai School of Medicine, 1 Gustave Levy Place, Box 1057, New York, NY 10029; (212) 241-7625; luz.claudio@mssm.edu.*

In addition to reporting such perceptions, researchers have investigated the effects of language discordance on health care utilization. Spanish-speaking Latinos are less likely than English-speaking Latinos to receive mammograms,[19] have a usual source of care,[10,11] and know the symptoms of a heart attack.[15] Additionally, children in families who needed Spanish interpretation services were more likely than other hospitalized children to experience a serious medical event.[13]

Effective patient-provider communication is key to successful health care, especially for chronic diseases that require vigilant disease management practices. Previous research has shown that provider-patient interactions are important in successful outcomes for adult diabetics,[20] and pediatric asthma patients using the emergency department.[21] As a chronic disease, asthma is a good model for studying the effects of language barriers on health, because its management requires ongoing communication between provider and patient or family.[22] Additionally, previous research has found significant disparities in asthma prevalence and health care utilization between Latino populations and non-Latino Whites.[23–25] Other studies have found differences in asthma diagnosis rates between Latino populations based on language proficiency.[26]

In order to disentangle the effects of language from those of other sociodemographic variables associated with access to and quality of health care received (such as ability to pay for care) we focused on Latino children in an urban environment. We hypothesized that language barriers to receiving asthma care would result in health outcomes for Latino children from Spanish-speaking households worse than the outcomes of their Latino counterparts from English-speaking households.

Methods

Data were collected as part of a cross-sectional study of asthma prevalence during the 2002–2003 school year.[27] The project was reviewed and approved by the Mount Sinai Institutional Review Board, the Mount Sinai Health Insurance Portability and Accountability Act (HIPAA) Office, and the New York City Dept. of Education's Division of Assessment and Accountability.

Study design. Methodology for the selection of the study population has been reported in previous publications.[23,27,28] Briefly, the 176 residential New York City ZIP Codes were ranked and grouped according to their childhood asthma hospitalization rate by using data obtained from the New York State Statistics Planning and Area-wide Research Council (SPARCS) database. The ZIP codes with the highest, median, and lowest asthma hospitalization rates for children were selected, and the schools within each of the ZIP codes were enumerated. One public elementary school from each of 26 ZIP codes was randomly selected with probability proportional to size, eight schools each from the ZIP codes of highest and median asthma hospitalization rates, and 10 from areas of low asthma hospitalization rates (to compensate for expected lower prevalence).

Within each school, questionnaires were distributed in two randomly-selected classrooms per grade, kindergarten through 5th, and up to two self-contained, special-education classrooms, where available. Children were instructed to bring the questionnaire home to their parents/guardians and return the completed form within two

weeks. Children and teachers were given small incentives of books and school supplies to encourage participation.

Questionnaire content. Questionnaires were pilot-tested among native speakers and discussed in small focus groups to ensure clarity and cultural appropriateness. Questionnaires were distributed in both English and Spanish to all participants so parents/guardians could complete the questionnaire in whichever language they chose. Previous studies have assumed that the language of questionnaire completion or interview is the same as the primary household language,[16,17,29] and we have taken that approach here. Therefore, if a questionnaire was completed in Spanish, the household was considered to be primarily Spanish-speaking.

The survey instrument was adapted from a previous study of childhood asthma in a Latino population.[30] Questions included basic household demographic characteristics, asthma and allergy diagnoses, current symptoms, health care and medication utilization, and disease management practices. *Ever having asthma* was defined as having received an asthma diagnosis from a physician or other provider. Parents/guardians of asthmatics were prompted to answer questions on the frequency of symptoms.

In order to assess differences in the type and quality of health care that Latinos with different primary languages receive, asthmatics were also prompted to complete questions on access to care: insurance status, usual source of pediatric health care, having asthma management devices, and medication use. To determine differences in communication-dependant facets of care, parents were asked about their access to disease management advice on evenings/weekends and whether their physicians had discussed specific National Heart Lung Blood Institute (NHLBI) recommended components of their child's asthma plan.[22]

Participants. Of the 7,310 students who received a questionnaire, the weighted response rate was 76.9% (n=5,250). For the purposes of this study, analysis was focused on Latino children. Children's ethnicity was reported by the parent as one of the following: Asian, African American non-Latino, Dominican, Mexican, Puerto Rican, Other Latino, White non-Latino, and Other. Children were classified as Latino if any of the Latino subgroups was chosen or if the questionnaire was completed in Spanish. Approximately 39% of our sample was Latino (n=1,847), which corresponds exactly to the percentage of Latinos enrolled in New York City public elementary schools.[27]

Statistical analysis. Data were weighted to represent the number of children attending public elementary schools within their respective ZIP codes. All data analyses and comparisons were conducted using the Surveymeans and Surveyfreq procedures in SAS v9.1 (SAS Institute, Cary, NC, 2003). These methods account for clustering by school and stratification by neighborhood asthma hospitalization rate in the sampling design. Differences in demographic characteristics, asthma prevalence, access to care, and other disease management variables by language of questionnaire completion were compared, and corrected chi-squared statistics for categorical variables were calculated in SAS. To determine if the association between language and reporting an asthma hospitalization in the past 12 months would persist after adjusting for specific Latino ethnicity, a multivariable analysis was conducted. Variables related to access to care were determined to be causal intermediates, and thus, were not included in the multivariable analysis.

Results

Demographic characteristics of Spanish-speaking Latinos are significantly different from those of English-speaking Latinos. Over one-third (37.3%) of the Latino population in our sample completed the questionnaire in Spanish. Table 1 lists the demographic characteristics of Latinos by language of the completed questionnaire. Considerably more Spanish-speaking households were Mexican (37.5%), while the English-speaking households predominantly were Puerto Rican (45.7%).

Among both Spanish and English-speaking Latinos, the next largest ethnic category reported was *Other Latino*. Only 20% of Spanish-speaking Latinos who classified themselves as Other Latino listed a specific ethnicity (data not shown). The predominant ethnicities, among the 16 specified by Spanish-speaking Latinos, were Ecuadorian (3.6%), Colombian (3.4%), and a joint heritage of Dominican and Puerto Rican (3.3%). Conversely, approximately 70% of the Other Latinos from English-speaking households provided a specific ethnic subgroup. Respondents specified 54 distinct subgroups. The most common Other Latino ethnicity among English-speaking Latinos was joint-heritage of Dominican and Puerto Rican (14.5%), followed by Ecuadorian (12.3%) and Colombian (8.1%). All other ethnic groups constituted less than 5% of the English-speaking Latinos.

Spanish-speaking households were more likely than English-speaking households to be low-income and have lower educational attainment (Table 1). Because 26% of Spanish-speaking households and 12% of English-speaking households did not respond to the income question, we also examined educational attainment, another measure of socioeconomic status. Parents from Spanish-speaking households were much more likely than parents from English-speaking households to have less than a high-school education. Overall, these findings indicate that Spanish-speaking households had lower socioeconomic status (SES) than their English-speaking counterparts. Spanish-speaking households were also less likely to report exposure to tobacco smoke and had a significantly greater number of adults living in the household.

Children from Spanish-speaking households had a lower prevalence of asthma and fewer symptoms than children from English-speaking households. The prevalence of asthma diagnosis was significantly lower among Latino children from Spanish-speaking households than among children from English-speaking households (20.8% vs. 25.8%, $p<.001$) (Figure 1). The same relationship held for prevalence of asthma with current wheeze (11.5% vs. 14.8%, $p<.001$) and prevalence of diagnosed allergies (9.31% vs. 19.0%, $p<.001$). There was no difference in prevalence of potentially undiagnosed asthma, defined as asthma-like symptoms in children without diagnosis (2.25% vs. 2.76%), supporting the conclusion of a disparity in disease prevalence and not merely a difference in diagnosing patterns. A previous analysis of data from the reported on here,[27] examining both Latino and non-Latino participants, found that the prevalence of asthma with current wheeze in the general school-age population was 13.0%, roughly midway between the prevalence among Spanish-speaking Latinos (lower) and English-speaking Latinos (higher).

The prevalence in Latinos with asthma diagnosis of having current wheezing symptoms is similar in the two language-defined groups (55.2% and 57.5%, see Figure 2).

Table 1.

DEMOGRAPHICS AMONG LATINOS BY LANGUAGE OF QUESTIONNAIRE COMPLETION[a]

Characteristic	Total (n=1847) %	Language questionnaire completed in: English (N=1184) %	Spanish (N=663) %
Gender*			
Male	46.8	47.8	45.1
Age (years)	8.1	8.1	8.1
Ethnicity			
Dominican	16.8	14.1	21.2
Mexican	19.6	9.0	37.5
Puerto Rican	31.3	45.7	7.0
Other Latino	28.8	31.1	24.9
Other	1.5	—	2.1
Income ($)**			
20,000 or less	50.1	44.3	60.0
20,001–$39,999	22.6	28.9	12.0
40,000–$74,999	8.2	12.3	1.2
75,000 or more	1.9	2.8	0.4
Did not respond	17.2	11.8	26.2
Parental education**			
Less than high school	28.9	21.3	42.4
HS Diploma/GED	29.9	29.5	30.7
Some college	20.8	25.1	13.2
College degree	14.6	19.6	5.7
ETS exposure in home**	17.6	21.0	11.7
# of adults in household (mean)*	2.1	2.0	2.4
# of children in household (mean)	2.6	2.5	2.7

*$p<.05$
**$p<.001$
[a]Nonresponders were included in the denominators of all calculated percentages. Thus, some categories do not equal 100%.

However, the prevalence of recent attacks and frequency of sleep disturbance due to asthma, used as a marker of disease severity by the National Heart, Lung, and Blood Institute,[22] are significantly lower in children from Spanish-speaking households.

Differences in insurance and usual source of health care may hinder access to asthma management and contribute to the higher asthma hospitalization rate for Spanish-speaking households. Although the percentage of asthmatics using the emer-

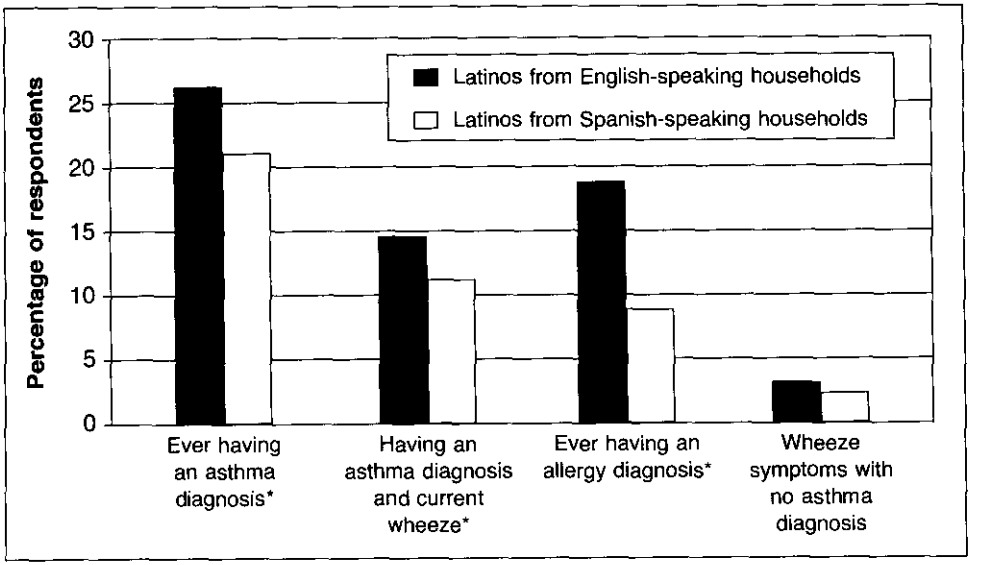

Figure 1. Comparison of prevalence of asthma and allergies among Latino children in English and Spanish speaking households (n=417; English-speaking = 282, Spanish-speaking = 135).

*p<.001

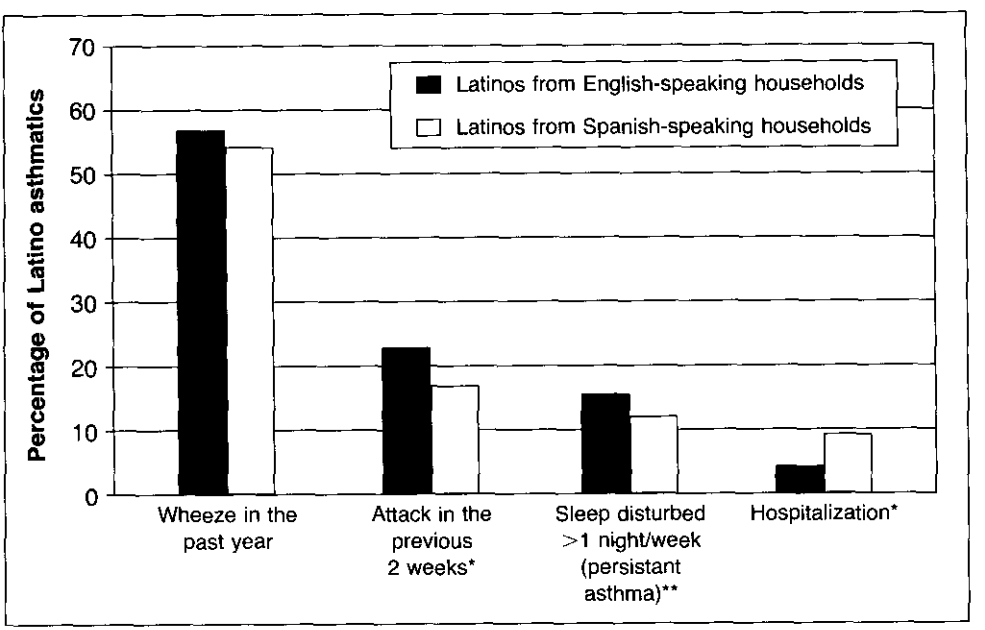

Figure 2. Disease characteristics of asthamatic Latino children in English and Spanish-speaking households (n=417; English-speaking = 282, Spanish-speaking = 135).

*p<.01
**p<.03

gency department in the previous 12 months was similar for both groups (Spanish-speaking: 37.7% vs. English-speaking: 37.2%) the asthma hospitalization rate among children from Spanish-speaking households is more than double that found among children from English-speaking households (9.42% vs. 4.37%, $p<.01$). The hospitalization rate for the overall sample was found to be 7.48% (data not shown). In unadjusted analysis, the odds of being hospitalized for asthma in the past 12 months among children in Spanish-speaking households was 2.43 times the odds of hospitalization among children in English-speaking households (1.09, 5.37 95% confidence interval (CI)). After adjusting for Latino ethnic sub-group, the odds ratio decreased to 1.81 with a 95% CI of 0.87 to 3.80.

Other health care factors were examined to determine if the difference in odds of asthma hospitalization were accompanied by differences in access to care. More than 90% of all Latino children indicated that they had some form of health insurance, although children from Spanish-speaking households were less likely to respond to the insurance question than children from English-speaking households (Table 2). Among those who did report what type of insurance they had, children living in Spanish-speaking households were more likely than children from English-speaking households to have publicly-funded health insurance (Table 2). Only 3.45% of Spanish-speaking households had private insurance. There were also significant differences in children's usual source of health care. Less than 5% of children from Spanish-speaking households used a private physician for their usual source of care, compared with almost 30% of children from English-speaking Latino households. Approximately half of Spanish-speaking households report community or hospital clinics as their usual source of health care.

In addition to differences in insurance and source of care, we observed significant disparities in access to and quality of communication-based indicators of asthma management among Latino children (Table 2). Parents/guardians from Spanish-speaking households were less likely to report being able to get advice and care for their child's asthma on evenings/weekends. Additionally, although there were similar rates of having arranged an asthma management plan with a physician in both language-defined groups, Spanish-speaking parents/guardians were less likely to report having received education on individual components of disease management plan. Specifically, these parents were less likely to have been taught what medications to administer during an asthma attack and when to visit the emergency room. They were also less likely to have received education on when to call the physician and which medications to administer regularly, although these results did not reach statistical significance.

We found no significant differences in other aspects of care between children from Spanish-speaking and English-speaking Latino households, including controller medication use (28.1% vs. 27.7%), undergoing allergy testing (39.4% vs. 36.9%), and having asthma management devices such as peak flow meter (19.6% vs. 20.9%) or spacer (43.7% vs. 40.7%).

Among Latinos, ethnic subgroups have differences in access to care and disease management characteristics. Because the Latino population in our sample was so heterogeneous, we sought to determine if the effect of language discordance on asthma

Table 2.

PREVALENCE OF DISEASE MANAGEMENT CHARACTERISTICS AMONG EVER ASTHMATICS BY LANGUAGE[a]

Characteristic	Total (n=417) %	Language questionnaire completed in: English (n=282) %	Spanish (n=135) %
Insurance*			
None	3.3	3.2	3.5
Medicaid	47.9	43.3	57.4
SCHIP	16.4	14.2	20.9
Private	18.5	25.7	3.5
Other/did not specify	4.6	6.8	0.0
Did not respond	9.3	6.7	14.8
Usual source of care*			
Community			
Clinic/hospital outpatient	41.7	37.8	49.8
Private doctor's office	21.6	29.8	4.5
Emergency department	20.0	17.2	25.9
Other/no one place	16.7	15.2	19.8
Access to evening or weekend advice**	52.0	56.9	41.7
Worked out an asthma plan with physician	65.4	66.2	63.8
Components of the asthma plan			
Medicines to be used during an attack***	46.2	50.4	37.4
When to go to the ED****	32.3	36.6	23.3
Medicines to be used regularly	38.2	39.5	35.6
When to call the doctor	27.4	29.4	23.3
How to remove triggers	35.5	35.1	36.3
Have a spacer	41.7	40.7	43.7
Have a peak flow meter	19.9	20.0	19.6
Underwent allergy testing	37.7	36.9	39.4

*$p<.001$
**$p<.01$
***$p<.02$
****$p<.05$
[a]Nonresponders were included in the denominators of all calculated percentages. Thus, some categories do not equal 100%.
ED = emergency department

management practices varied by ethnic subgroup. Although examining interaction between language and Latino ethnicity caused the numbers to be too small to conduct meaningful statistical comparisons, we observed that Spanish-speaking households appeared less likely to report the majority of access to care indicators than English-speaking households of the same ethnic subgroup (Table 3). *Other Latinos* were the exception, with Spanish-speaking households reporting the majority of indicators more often. Additionally, differences in reporting access to care indicators were observed between the different ethnic subgroups, with the same household language. For example, more than half of Spanish-speaking Puerto Ricans reported access to evening/weekend advice compared with one-third of Spanish-speaking Dominicans. However, none of the comparisons achieved statistical significance at the .05 level.

Table 3.

PREVALENCE OF DISEASE MANAGEMENT CHARACTERISTICS OF LATINOS BY ETHNIC SUBGROUP AND HOUSEHOLD LANGUAGE

	Dominican		Mexican		Puerto Rican		Other Latino	
Language	**S %**	**E %**	**S %**	**E %**	**S %**	**E %**	**S %**	**E %**
Access to evening or weekend advice	33.8	62.5	38.1	74.5	52.9	60.1	58.4	43.2
Worked out an asthma plan	61.0	61.7	65.5	81.2	53.1	67.2	72.7	63.3
Components of the asthma plan								
Medicines to be used during an attack	41.1	51.9	43.8	43.6	27.7	53.0	42.3	43.8
When to go to the Emergency dept.	26.0	43.8	45.1	41.9	25.9	37.0	22.5	31.7
Medicines to be used regularly	22.0	56.1	48.4	41.9	33.1	37.3	42.5	37.8
When to call the doctor	20.0	41.1	38.6	41.9	27.3	26.4	19.1	30.5
Have a spacer tube for medication	32.4	36.5	54.1	64.5	53.8	41.7	45.2	36.9
Have a peak flow meter	21.8	10.5	19.4	36.7	21.1	21.5	23.1	21.5
Currently taking controller medicine	15.2	27.8	30.3	34.6	36.0	27.0	34.4	28.7
Underwent allergy testing	44.0	43.2	49.1	70.7	45.7	40.5	45.1	41.6

E = English
S = Spanish

Discussion

The findings support our hypothesis that children from Spanish-speaking households face barriers to asthma management. Differences in asthma management between children from English-speaking and Spanish-speaking Latino households were in facets of care that are largely communication-dependent, while other aspects of care largely remained similar between the two groups. An analysis of 1996–2000 Medical Expenditure Panel Survey (MEPS) found that Latino children from families with limited English proficiency had significant barriers to care, including lack of access to weekend/evening advice.[17] More recent research in the inner city has found that Latinos with limited English-proficiency had greater asthma morbidity.[31] Previous research also suggests that Latino parents express greater concerns about medication side-effects than Black or White parents.[32] If parents are unable to discuss these concerns with their children's health care providers, it could present yet another barrier to proper asthma management. Additionally, our data show that parents whose primary language is Spanish were less likely than others to discuss key components of the disease management plan, including when to use the emergency department and when to administer medications for an attack. This supports our conclusion that Spanish-speaking Latinos have significant barriers to quality asthma care related to language discordance with health care providers.

Similar to our findings, findings from other research showed that Spanish-speaking Latinos were less likely than Latinos from English-speaking homes to have a written asthma plan or to utilize peak-flow monitoring, and had lower quality of life scores.[12,33] Our study further examined the ethnic subgroup of Latinos and found interesting differences. For example, children of Mexican ethnicity living in Spanish-speaking households were less likely to have weekend access to care than Puerto Rican children from Spanish-speaking households. Yet both groups were less likely to report these characteristics of care than their English-speaking counterparts. Weinick and colleagues also found that health care utilization varied among different Latino ethnic groups.[34] Koinis-Mitchell et al. found that the majority of differences between Latino ethnic groups were related to asthma treatment and practices, and not the causes or symptoms.[35] Our findings, in conjunction with previous research,[34–36] highlight the need for more research examining the interaction between language and culture in the different ethnic Latino subgroups.

Language barriers contribute to increased cost of asthma care. Despite having fewer symptoms than children from English-speaking households and emergency department use similar to that of such children, children from Spanish-speaking homes had double the asthma hospitalization rate. Although this relationship was attenuated after adjusting for specific ethnic subgroup, the odds ratio was still elevated, even though the confidence interval included the null value of 1.0. Because the rates of emergency department visits are similar between the two groups, it does not seem likely that the difference in hospitalization rate is due to excess utilization of urgent care. Children of lower SES are more likely to be hospitalized for asthma because they experience more severe attacks, in part because of a lack of preventive care.[37] Our results are consistent with this hypothesis as Spanish-speaking Latinos were more likely to be of low-SES

and to experience barriers to quality asthma management, such as access to care on evenings/weekends and having an asthma plan.

The majority of Spanish-speaking Latinos have publicly-funded health insurance. Previous work by Todd and colleagues found that non-White/Latino children on public insurance had higher hospitalization rates than non-Latino Whites on public insurance and non-Latino Whites with private insurance.[38] They estimated a nationwide savings of $5.3 billion in hospital charges if the hospitalization rate disparity between children on public and private insurance were eliminated.[38] It is unclear what specific factors associated with language barriers and/or type of insurance drive the observed increased use of the hospital for care in our study. However, our findings suggest that language barriers do not just contribute to poor health outcomes for individuals, but also increase the cost of their health care.

Community/hospital clinics are common sources of care for the Spanish-speaking population. Another notable finding of our study was that over half of the Spanish-speaking population sought care in community or hospital-based clinics, rather than in private physicians' offices. This is consistent with findings from previous studies.[39] Greek and colleagues hypothesized that this was due to the increased availability of interpreters in these settings.[17] Vandervort and Melkus examined linguistic services in community and hospital-supported clinics and found that the majority of these clinics employed bilingual nurses as interpreters.[39] A recent study in California found that more than one-fourth of private physicians spoke Spanish, but that many did not accept public health insurance, severely limiting the ability of many Latinos to find private physicians, despite the apparent availability of language-appropriate services.[40]

It seems plausible that a combination of language concordance, insurance accessibility, and geographic availability contribute to the frequent use of community and hospital-based clinics by this population. Our previous research among both Latino and non-Latino children found no significant difference in odds of emergency department use or hospitalization between children who used a clinic for their usual source of care and children who visited a private physician's office.[23] Thus, community clinics seem to be a natural route of intervention to improve care among the Spanish-speaking population.

Limitations. In this study, as in others,[29] the measure of primary household language was the language in which the parent-report questionnaire was completed. It has not been determined whether this method is an accurate proxy for level of English-proficiency in the Spanish-speaking families. It is possible that some families have oral English proficiency, but are not comfortable with written English, and thus chose to complete the questionnaire in Spanish. However, this potential misclassification bias would be non-differential, and because both exposure and outcome are binary, would tend to diminish any effects observed between the English and Spanish-speaking households in our sample. Because of this, we remain confident in our findings of differences in access to care between the two language-defined groups.

As reported in a previous publication,[23] there was a significant correlation between overall parent-reported asthma hospitalization rate for each school in our sample and the childhood asthma hospitalization rate of the surrounding ZIP code, as reported in the SPARCS database. This supports the validity of the self-reported difference in

hospitalization rates by household primary language. Additionally, the demographics of our sample were very similar to those of the residents of the surrounding ZIP codes from which the schools were selected, as well as to the overall elementary school population in New York City. Parents also had the option of submitting the questionnaire anonymously, reducing the likelihood of purposeful submission of false data.

Conclusion. In this study of a representative sample of urban Latino children, children from Spanish-speaking households had twice the asthma hospitalization rate, compared with Latino children from English-speaking households, despite having fewer symptoms and lower prevalence of asthma. Our study found that Spanish-speaking households had less access to weekend/evening care and lower rates of discussing key elements of an asthma management plan with their health care providers. Half of the asthmatic Spanish-speaking population sought care in a community-based clinic, suggesting that these health care institutions provide an likely venue for improving asthma care for this high-risk population.

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Notes

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