

## Inadequate Access to Care Among Children With Asthma From Spanish-Speaking Families

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*Abstract:* Despite substantial asthma prevalence and morbidity, children from Spanish-speaking families are at high risk of inadequate maintenance therapy. The reasons for this remain unclear. The objective of this study was to compare patterns of asthma morbidity and access to care of children with asthma from Spanish-speaking and English-speaking families. Cross-sectional data from a nationally representative sample of children with asthma 2–17 years of age were analyzed from the 1999 National Health Interview Survey, conducted in both English and Spanish, with the preferred language identified at the time of the interview. Among the 1,228 children with asthma (physician-diagnosed asthma by parent report), 66 (3%) were from Spanish-speaking families and 1,162 (97%) were from English-speaking families. In a logistic regression model adjusting for gender, insurance, poverty (above or below the federal poverty level, based on reported family income and the U.S. Poverty Threshold produced annually by the Census Bureau), and race/ethnicity, children with asthma from Spanish-speaking families were one-third less likely to have a usual health care provider (odds ratio [OR] 0.31, 95% confidence interval [CI] 0.1–0.8) than children with asthma from English-speaking families. Latino ethnicity was not independently associated with diminished continuity of care. These data indicate that children with asthma from Spanish-speaking families are less likely to experience continuity of health care than their counterparts from English-speaking families. Differences in continuity of care may contribute to inadequate asthma maintenance therapy among these children.

*Key words:* Childhood asthma, Latino children, asthma severity, access to care.

A significant proportion of the U.S. population is Latino, and demographic projections point to continued dramatic growth. Latino children in the U.S. number over 11.6 million, or about 16% of the population under 18 years old.<sup>1</sup> At the same time, there is no evidence of decline in asthma prevalence or morbidity

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despite advances in therapy.<sup>2-4</sup> Asthma has become the most common chronic illness affecting Latino children, with a disproportionately high prevalence reported in the Puerto Rican subgroup.<sup>5</sup>

Among all Latino and non-Latino children in the U.S., Puerto Ricans have been shown to have the highest point prevalence of asthma (11%), greater than that found among African Americans (6%) and non-Latino whites (3%). Asthma is present in only 3% of Mexican-American and 5% of Cuban-American children.<sup>6-9</sup> Asthma morbidity (the global impact of asthma, encompassing quality of life and disability incurred by the illness) among Latino children has not been studied in a national population-based sample. However, data from various clinical settings suggest significant morbidity among these children, and a recent study of asthma in Medicaid-insured children from five managed care organizations in California, Washington, and Massachusetts found that Latino children had worse asthma than white children within the same managed Medicaid populations.<sup>10,11</sup>

Despite substantial asthma prevalence and morbidity, children from Spanish-speaking families have been shown to be at high risk of inadequate maintenance asthma therapy. According to one study with findings from the National Health and Nutrition Examination Survey (NHANES) III, 99.8% of children from Spanish-speaking families with moderate to severe asthma did not receive appropriate maintenance medications.<sup>12</sup> This finding was confirmed by Lieu et al.,<sup>11</sup> who reported that Latino children were less likely to be using daily inhaled anti-inflammatory medications than white or black children. The reasons for this remain unclear. Possible reasons include differences in asthma severity,<sup>12</sup> linguistic or cultural barriers,<sup>13-17</sup> inadequate access to care,<sup>18-23</sup> and financial barriers, including cost and lack of insurance.<sup>15,24</sup> The objective of this study was to compare patterns of asthma morbidity and access to care between children from English- and Spanish-speaking families.

## Methods

**Population and sampling.** The source of data for these analyses was the Child Health Section of the 1999 National Health Interview Survey (NHIS), a continuing household health survey conducted annually by the National Center for Health Statistics. This survey provides information on the health of a nationally representative sample of the civilian noninstitutionalized population in the U.S., using a complex, multistage probability sampling design. The survey sampling frame is redesigned every 10 years to account for demographic changes. Both the black and Latino populations were oversampled in the 1995-2004 NHIS to represent these growing minority populations.

Each time the NHIS is conducted, one sample adult and one sample child (if any children under age 18 reside in the home) are randomly selected, and information about each is collected by means of separate questionnaires. Data are collected through personal household interviews by interviewers from the U.S. Census Bureau. The interviewed sample for the Child Health Section of the 1999 NHIS, by proxy response from an adult in the family able to answer questions about the child's health, was 12,910 children 0-17 years old.

Information about child health status and access to care was gathered through the Child Health questionnaire. This questionnaire contains questions on a number of health conditions, including asthma, and examines the number of school days missed due to illness as reported during the 12 months prior to the interview, the number of acute health care visits for wheezing (office or emergency department visits), and the number of hospitalizations for asthma during the previous 12 months. In 1999, a series of detailed questions about asthma were administered to all sample children who were ever diagnosed with asthma. These included questions about sleep disturbance and limitation of usual activities. The Child Health Care Access section also includes questions about having a usual place for sick care and having a usual place for routine/preventive care.

**Definitions and measures.** Children with physician-diagnosed asthma 2–17 years of age were divided into two groups based on the language in which the interview was conducted. One group was composed of children from families who spoke only English during the interview and the other group included children from families who used Spanish or a combination of Spanish and English to answer the core Child Health questionnaire.

We compared these two groups of children on multiple measures of asthma morbidity and access to care. Measures of asthma morbidity included parental report of number of hospitalizations due to asthma and the number of acute care visits (doctor's office or hospital emergency room) for attacks of wheezing/whistling during the 12 months preceding the interview. We also included three other measures of asthma morbidity: the number of times the child's sleep was disturbed due to wheezing/whistling, the number of times the child's usual activities were limited due to wheezing/whistling, and the number of work/school days the child missed due to wheezing/whistling. Similar to the measures of asthma status used by Lieu et al.,<sup>11</sup> these measures were chosen to examine asthma morbidity, which encompasses quality of life and the disability caused by illness. As noted earlier, *morbidity* refers to the global impact of asthma; it takes into account more than asthma severity, the latter being an intrinsically physiologic characteristic of the individual. To compare access to care between the two groups, we analyzed responses to questions about having a usual source of sick care and having one health care provider for routine/preventive care, which represent two particular facets of access to care. In this paper, *access to care* designates the ability to obtain quality and appropriate health care, and *continuity of care* designates the extent to which a patient sees one health care provider for his or her health care, as this represents one of the dimensions of and ways to measure continuity.<sup>25–27</sup>

Independent variables included age, gender, maternal education (more or less than a high school diploma), poverty status (above or below the poverty level, based on reported family income and the U.S. Poverty Threshold produced annually by the Census Bureau), insurance status, geographic distribution/urbanicity (Metropolitan Statistical Area [MSA] sizes), geographic region of the country (Northeast, Midwest, South, West), and race/ethnicity (black, white, and Latino). These variables were chosen as they have been shown in the literature to influence patterns of access to care and asthma morbidity.<sup>28,29</sup>

**Analysis.** Bivariate analyses were conducted to identify significant differences ( $p < 0.05$ ) in asthma morbidity and access to care between children from English-speaking families and those from Spanish-speaking families. A summary logistic regression model included all variables listed. Ethnicity was included as an independent variable in this multivariate analysis to isolate the effects of ethnicity and language.

To account for the complex, multistaged sampling design of the NHIS, SUDAAN<sup>30</sup> software was used to obtain weighted frequencies, odds ratios (ORs), and 95% confidence intervals (CI). Chi-square tests were used to test for differences in proportions, and logistic regression was used for the multivariate analysis.

## Results

The sample included a total of 1,228 children with physician-diagnosed asthma: 66 (3%) were from Spanish-speaking families and 1,162 (97%) were from English-speaking families, as determined by the language used during the interview. Table 1 shows the demographic characteristics of these two groups. Children with asthma from Spanish-speaking families were more likely than children with asthma from English-speaking families to be poor (66% versus 19%), to have Medicaid or no insurance (70% versus 33%), and to have mothers with less than a high school diploma (63% versus 13%). There were differences in geographic distribution between the two groups, with more children from Spanish-speaking families than children from English-speaking families living in the western part of the United States (56%). More children from English-speaking families than from Spanish-speaking families lived in the Midwest (27%). Other variables, including age, gender, and MSA (the variable measuring urbanicity) did not differ between these two groups.

The 66 children with asthma from Spanish-speaking families were 3% white, 0% black, 10% Puerto Rican, 63% Mexican, and 24% other Latino (including heritage in Central and South America, the Dominican Republic, and Spain). The 1,162 children from English-speaking families were 65% white, 19% black, 4% Puerto Rican, 5% Mexican, 3% other Latino, and 4% of other non-Latino origin.

Comparison of these two groups on the basis of asthma morbidity is shown in Table 2. No statistically significant differences in any of the measures of asthma morbidity were found between the two groups, although for school absences and limitation in activity, the trend was for children from Spanish-speaking families to have greater asthma morbidity.

Comparison of access to care between the two groups of children is shown in Table 3. Children with asthma from Spanish-speaking families were less likely than children with asthma from English-speaking families to have a usual source of sick care (86% versus 97%,  $p = 0.04$ ) and to have a usual health care provider (53% versus 83%,  $p = 0.002$ ). An additional subgroup analysis including only Latino children revealed similar findings: Latino children with asthma whose parents speak Spanish were less likely than Latino children with asthma whose parents speak English to have a usual health care provider (53% versus 77%,  $p = 0.02$ ), although no differences were found between these two groups in usual source of sick care (86% versus 94%).

**Table 1.****DEMOGRAPHIC CHARACTERISTICS OF CHILDREN WITH ASTHMA, BY HOUSEHOLD LANGUAGE, NHIS 1999**

|                                  | Total<br>(N = 1,228) | Children with<br>asthma from<br>English-speaking<br>families (n = 1,162) | Children with<br>asthma from<br>Spanish-speaking<br>families (n = 66) | p*     |
|----------------------------------|----------------------|--|---|--------|
| Age (y)                          |                      |  |   |        |
| 2-5                              | 20%                  | 20%  | 15%   | 0.34   |
| 6-17                             | 80%                  | 80%  | 85%   |        |
| Gender                           |                      |  |   |        |
| Male                             | 61%                  | 61%  | 61%   | 0.99   |
| Female                           | 39%                  | 39%  | 39%   |        |
| Maternal education               |                      |  |   |        |
| Less than high school<br>diploma | 15%                  | 13%  | 63%   | <0.001 |
| High school diploma              | 31%                  | 31%  | 22%   |        |
| More than high school<br>diploma | 54%                  | 56%  | 15%   |        |
| Poverty status                   |                      |  |   |        |
| Below poverty                    | 20%                  | 19%  | 66%   | 0.005  |
| At or above poverty              | 80%                  | 81%  | 34%   |        |
| Urban versus rural               |                      |  |   |        |
| MSA                              | 78%                  | 77%  | 80%   | 0.79   |
| Non-MSA                          | 22%                  | 23%  | 20%   |        |
| Insurance type                   |                      |  |   |        |
| Private                          | 66%                  | 67%  | 30%   | 0.001  |
| Medicaid                         | 26%                  | 26%  | 40%   |        |
| No insurance                     | 8%                   | 7%   | 30%   |        |
| Geography                        |                      |  |   |        |
| Northeast                        | 19%                  | 19%  | 15%   | 0.0001 |
| Midwest                          | 26%                  | 27%  | 4%  |        |
| South                            | 34%                  | 35%  | 25%   |        |
| West                             | 20%                  | 19%  | 56%   |        |

\* All *p* values refer to comparisons of children with asthma from Spanish-speaking families and children with asthma from English-speaking families.

A multivariate analysis was performed to assess the independent association among children with asthma of language spoken at home and having a usual source of sick care and having one health care provider for routine/preventive care (Table 4). All variables that were significant for both outcomes from the bivariate analyses (maternal education, insurance type, poverty status, geography) were included in the model. To assess the independent effects of ethnicity and language, race/ethnicity

**Table 2.****ASTHMA MORBIDITY IN U.S. CHILDREN, BY HOUSEHOLD LANGUAGE, NHIS 1999 (N = 1,228)**

|                             | English-speaking | Spanish-speaking | <i>p</i> |
|-----------------------------|------------------|------------------|----------|
| Hospitalizations            | 2%               | 5%               | 0.27     |
| Emergency department visits | 34%              | 37%              | 0.66     |
| Nighttime symptoms          | 30%              | 41%              | 0.22     |
| Limitation of activity      | 31%              | 44%              | 0.12     |
| School absences             | 19%              | 32%              | 0.08     |

**Table 3.****ACCESS TO CARE IN CHILDREN WITH ASTHMA, BY HOUSEHOLD LANGUAGE, NHIS 1999**

|  | English-speaking | Spanish-speaking | <i>p</i> |
|--|------------------|------------------|----------|
| Having usual source of sick care                           | 97%              | 86%              | 0.04     |
| ER/no place  | 4%               | 14%              |          |
| Clinic/MD office/hospital OPD                              | 96%              | 86%              |          |
| Having one healthcare provider for routine/preventive care | 83%              | 53%              | 0.002    |

(reported as either black, white, or Latino) was added to this model as an independent variable. Whereas Latino ethnicity was not significant in this model, children with asthma from Spanish-speaking families were one-third less likely to have a usual health care provider than children with asthma from English-speaking families (OR 0.31, 95% CI 0.1–0.8). Black race was associated with a decreased likelihood of having a usual health care provider (OR 0.59, 95% CI 0.4–1.0). Children with asthma and Medicaid (0.016) or no insurance (0.03) were less likely to have a usual source of sick care than those with private insurance. All the results from the multivariate analysis are included in Table 4.

**Discussion**

These analyses indicate that children with asthma from Spanish-speaking families are less likely than Latino or non-Latino children with asthma from English-speaking families to have a usual health care provider. Although we found no statistically significant differences between these two groups in any of the measures of asthma morbidity, prior studies indicate that Latino children in the U.S. overall have worse asthma than white children.<sup>10,11</sup> Clearly, these children, like all children, would benefit

**Table 4.****MULTIVARIATE ANALYSIS: PREDICTORS OF ACCESS TO CARE FOR CHILDREN WITH ASTHMA, 1999 NHIS**

|                      | Usual source of sick care OR (95% CI) | Having one provider for routine/preventive care OR (95% CI) |
|----------------------|---------------------------------------|---|
| Language             |                                       |   |
| Spanish speaking     | 1.07 (0.2–5.7)                        | 0.31 (0.1–0.8)*   |
| English speaking     | 1                                     | 1   |
| Race/ethnicity       |                                       |   |
| White                | 1                                     | 1   |
| Black                | 1.20 (0.5–3.1)                        | 0.59 (0.4–1.0)*   |
| Latino               | 1.13 (0.3–3.8)                        | 0.76 (0.4–1.4)  |
| Gender               |                                       |   |
| Male                 | 0.46 (0.2–1.1)                        | 1.0 (0.7–1.6)   |
| Female               | 1                                     | 1   |
| Education            |                                       |   |
| <High school diploma | 1.04 (0.3–3.5)                        | 0.68 (0.4–1.3)  |
| High school diploma  | 1                                     | 1   |
| >High school diploma | 1.16 (0.4–3.1)                        | 1.36 (0.9–2.2)  |
| Poverty status       |                                       |   |
| Below poverty        | 1.12 (0.4–4.0)                        | 0.93 (0.6–1.6)  |
| At or above poverty  | 1                                     | 1   |
| Urban versus rural   |                                       |   |
| MSA                  | 0.58 (0.2–2.0)                        | 0.63 (0.3–1.1)  |
| Non-MSA              | 1                                     | 1   |
| Insurance type       |                                       |   |
| Private              | 1                                     | 1   |
| Medicaid             | 0.16 (0.0–0.7)*                       | 1.09 (0.6–2.1)  |
| No insurance         | 0.03 (0.01–0.1)*                      | 0.53 (0.2–1.2)  |
| Geography            |                                       |   |
| Northeast            | 1                                     | 1   |
| Midwest              | 0.66 (0.1–6.0)                        | 0.66 (0.3–1.3)  |
| South                | 0.68 (0.1–5.5)                        | 0.69 (0.4–1.3)  |
| West                 | 0.28 (0.04–1.8)                       | 0.61 (0.3–1.2)  |

\*p value &lt; 0.05.

from having a usual health care provider, yet only about half of such children have one. Previous research has shown that children with asthma from Spanish-speaking families are at high risk of inadequate maintenance asthma therapy.<sup>12</sup> The data from this study suggest that poor access to care contributes to this state of affairs.

In a multivariate analysis, Spanish language use, but not Latino ethnicity, predicts a decreased likelihood of having a usual health care provider. This is consistent

with the findings of another recent study that found that poor access to care among Latino children was largely attributable to language.<sup>20</sup> Although the finding of inadequate access to care among children from non-English-speaking families overall has been reported previously in the literature, this study focuses specifically on children with asthma, for whom access to care is especially important. Limited English proficiency has also been found to be associated with an increased risk for medical errors, inadequate analgesia, fewer prescriptions, and use of harmful remedies; in at least one other study, Latino parents cited language barriers as the single greatest barrier to health care access.<sup>13,14,19</sup>

In this study, black children with asthma were also less likely than others to have a usual health care provider and those children with Medicaid or no insurance were less likely than children with private insurance to have a usual source of sick care. Previous studies have shown that black race<sup>31-34</sup> and Medicaid/no insurance<sup>31,29</sup> are associated with a decreased likelihood of having a usual source of health care.

Continuity of care has long been regarded as essential to good patient care,<sup>35</sup> and there is a growing body of evidence to support the view that consistent contact with a single physician improves outcomes.<sup>36</sup> Several observational studies have reported that continuity of care is associated with decreased emergency department use and hospitalization in both children and adults.<sup>37,38</sup> A recent study by Christakis et al.<sup>39</sup> found that decreased continuity of care is associated with increased risks of hospitalization and emergency department use among children receiving care at a health maintenance organization.

Continuity of care also has been shown to play an important role in the care of children with other chronic conditions such as epilepsy<sup>40</sup> and type I diabetes mellitus, with low continuity of care identified in one study as a risk factor for diabetic ketoacidosis.<sup>41</sup> Asthma is the most common chronic condition in children, and continuity of care can affect its management in a number of ways. First, adherence to medication regimens has been shown to be affected by how well patients know their prescribing clinicians.<sup>42</sup> Better adherence with medication regimens could protect children with asthma from avoidable morbidity. Second, an individualized asthma management plan may be complex and evolves over time in a stepwise fashion as the patient-clinician partnership grows. Education is ongoing, as is feedback from patient to clinician and vice versa. Third, having a regular primary care provider may increase the likelihood that parents will bring their child to see that particular clinician for acute care.<sup>39</sup> Such care is likely to be of higher quality and better coordinated with outpatient treatment goals than that provided by emergency room physicians who are often unsure of follow-up.

Children with asthma from Spanish-speaking families may be less likely to have a usual source of care because of cultural and linguistic barriers. For these families, the availability of health care providers and office staff who speak Spanish and understand the family's cultural beliefs may be vital to ensuring adequate access to health care.<sup>20</sup> For this reason, linguistic and cultural barriers must be identified to pave the way for more effective patient-clinician partnerships providing quality asthma care for these children.

This study has several limitations that must be acknowledged. All measures of asthma morbidity and access to care were based on parental report. Like other



studies, our analyses were limited by the lack of a universally accepted definition of asthma.<sup>43</sup> To enhance diagnostic specificity, we included only those children with physician-diagnosed asthma older than 2 years of age, because the diagnosis of asthma is uncertain before the age of 2. Further, the sample size of children from Spanish-speaking families ( $n = 66$ ) was small compared with the sample size of children from English-speaking families ( $n = 1,162$ ) and may have affected our ability to detect significant differences between the two groups, particularly regarding asthma morbidity. This was, however, a national dataset and represents our best effort to generate a large representative sample.

The data in this paper point to the need to identify and implement ways to improve continuity of care for children with asthma from Spanish-speaking families. Patients with chronic conditions must be assured of regular follow-up by a consistent health care provider. Ensuring continuity of care for Latino children with asthma may lessen morbidity and improve adherence with maintenance medications used to control asthma.

## Notes

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