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Access to and Use of Asthma Health Services Among Latino Children: The Rhode Island-Puerto Rico Asthma Center Study

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Abstract

This study determines asthma-related health care access and utilization patterns for Latino children of Puerto Rican and Dominican origin residing in Rhode Island (RI) and Latino children residing in Puerto Rico (Island). Data included 804 families of children with persistent asthma recruited from clinics. Island children were less likely to receive regular asthma care and care from a consistent provider and more likely to have been to the emergency department and hospitalized for asthma than RI children. Island children were 2.33 times more likely to have used the emergency department for asthma compared with RI non-Latino White (NLW) children. Latino children residing in both Island and RI were less likely to have used specialty care and more likely to have had a physician visit for asthma in the past year than RI NLW children. The differences might reflect the effects of the different delivery systems on pediatric health care utilization and asthma management.

Keywords

asthma; Hispanic Americans; Latino; children; health service accessibility; health care utilization; Puerto Rico

Childhood asthma continues to be an important clinical and public health problem in the United States. Data from the National Health Interview Survey show that approximately 8.5% of children have parent-reported asthma in the United States (Mannino et al., 2002). It has been estimated that among children, mainland Puerto Ricans have the highest prevalence of asthma (Carter-Pokras & Gergen, 1993; Lara, Akinbami, Flores, & Morgenstern, 2006) and asthma-related morbidity rates compared with Whites, Blacks, or other Latinos (Homa, Mannino, & Lara, 2000). For example, Lara et al. (2006) used 1997–2001 National Health Interview Survey data and reported that 26% of Puerto Rican children had parent-reported asthma compared with 13% for non-Latino White (NLW), 16% for non-Latino Black, 10% for Mexican, and 15% for both Cuban and Dominican children. Children in Puerto Rico (PR) have even higher parent-reported asthma prevalence rates than mainland Puerto Rican children, with studies showing lifetime rates as high as 30% to 40% (Ortega et al., 2003;

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Declaration of Conflicting Interests

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Ortega, Huertas, Canino, Ramirez, & Rubio-Stipec, 2002; Perez-Perdomo, Perez-Cardona, Disdier-Flores, & Cintron, 2003).

While researchers have posited that certain factors, mainly biological, environmental, and psychosocial, may be attributable to asthma-related burden in Puerto Rican children (Canino et al., 2006; Cohen & Celedon, 2006; Salari & Burchard, 2007), few studies have focused specifically on health care access and utilization among this group (Cabana, Lara, & Shannon, 2007; Cohen et al., 2006; Stingone & Claudio, 2006; Ortega, Huertas, et al., 2002). Additionally, studies have not investigated whether factors beyond ethnicity may account for any observed differences in health care access and utilization patterns in children from Latino and NLW backgrounds. For example, it may be that factors related to place of residence, poverty, or insurance coverage, independent of ethnicity, may be implicated in observed differences. A study using the 2000 Behavioral Risk Factor Surveillance System found that 33% of 4,206 adults interviewed in PR reported that they had a child with asthma. Of those children with parent-reported asthma, only 51% were currently in treatment for asthma, 52% made at least one visit to the emergency department (ED) in the past year, and 27% had at least one hospitalization in the past year (2% had 4 or more hospital admissions in the past year; Perez-Perdomo et al., 2003).

On the U.S. mainland, a cross-sectional study of 5,250 students in 26 New York City elementary schools found that 22.1% of Puerto Rican, 7.5% of Dominican, and 8.3% of White children had parent-reported current asthma. Indicators of asthma health care utilization were higher among the Latino groups. Fifty-five percent of Puerto Rican and 57% of Dominican children in the sample had an ED visit or hospitalization in the past 12 months compared with 21.5% of White children. Furthermore, compared with White children, Puerto Rican children were six times and Dominican children were three times more likely to have been to the ED or hospitalized than NLW children in the past 12 months (Stingone & Claudio, 2006). In an intervention study of publicly insured children with asthma in Connecticut, Puerto Rican children had more outpatient clinic visits and slightly more medication use than African American children, but they had fewer hospital days. No differences were observed in rates of ED visits or hospitalizations, after adjusting for asthma severity, medication use, and other confounding factors (Cohen et al., 2006). A separate study of children with asthma in Connecticut showed that Latino children, who were primarily Puerto Rican, had worse access to care, less use of health services, and poorer asthma management than NLW children (Ortega, Belanger, Paltiel, et al., 2001; Ortega, Gergen, et al., 2002).

New Contribution

What previous asthma services studies of Latino children fail to show are the following: (a) how do access and utilization patterns differ by site (e.g., island vs. mainland) and ethnic group (e.g., mainland Latino and NLW and island Latino) and (b) whether predisposing (e.g., age, English proficiency), enabling (e.g., family poverty level, insurance status), and need (e.g., parent-rated severity) factors (Andersen, 1995; Gelberg, Andersen, & Leake, 2000) account for any differences in health care use for Latinos on both the island and mainland. This investigation can further inform our understanding of asthma disparities among Latinos, thereby informing necessary intervention. Data from the Rhode Island-Puerto Rico Asthma Center study, a clinic-based study of children with asthma from Rhode Island (RI) and PR, offer the unique opportunity to examine the health care access and utilization patterns of Puerto Rican, Dominican, and NLW children. Rhode Island-Puerto Rico Asthma Center includes Dominican children because they have also demonstrated high rates of parent-reported asthma as well as high rates of ED and hospitalization use (Lara et al., 2006; Stingone & Claudio, 2006). Children with asthma of Dominican background

represent an understudied group; however, similar to Puerto Rican children, Dominican children with asthma are of Caribbean-origin and often face socioeconomic challenges that may impinge on their health status and access to care (Hernandez, 1997). Furthermore, inclusion of children both from the mainland as well as from PR may refine our understanding of the relative contribution of contextual versus individual factors associated with health care behavior and outcomes.

Conceptual Framework

The conceptual framework for this study is the behavioral model developed by Aday and Andersen (1974) and Andersen (1995). This model hypothesizes that health care access and utilization are determined by predisposing, enabling, and need factors. Our empirical analyses use this framework to guide model specification. Thus, predisposing factors in our models include characteristics such as child's gender and age, place of birth (island vs. mainland), and parent's English proficiency. Enabling factors include health insurance coverage, type of health insurance, and poverty threshold. Need is captured by parent-rated asthma severity.

Study Questions

In this study, we sought to determine (a) whether there were differences in asthma-related health care access and utilization between island Puerto Rican and mainland Puerto Rican and Dominican groups compared with mainland NLWs and (b) whether there were differences in health care access and utilization between island Puerto Ricans and mainland Puerto Ricans and Dominicans, after adjusting for predisposing, enabling, and need factors.

Data and Method

Study Design and Sampling

The sample was composed of 804 children aged between 7 and 15 years, with 405 from PR and 399 from RI. Among the children from RI, 112 were Puerto Rican, 136 were Dominican, and 151 were NLW. Participants in RI came primarily from convenience samples recruited at ambulatory pediatric clinics of a hospital and community primary care clinics. Children were also recruited from a hospital-based asthma educational program, health fairs and other community events, schools, and various grassroots sources (e.g., word of mouth, flyers, 13%). Participants recruited from medical versus nonmedical sources did not differ on health care variables being investigated in this current study. In PR, most of the children were recruited from four independent provider organizations and two ambulatory pediatric clinics from two hospitals, serving mostly medically indigent patients. To recruit middle to upper income children with asthma, 29.4% of the sample was recruited from 26 private practice pediatric offices. The study design was the same in both sites and for all the aims of the study: a cross-sectional, observational approach with repeated measurements (four sessions across a 4-month period) of selected variables.

Data Collection

Information was collected in face-to-face interviews with children and their primary caretakers. Questionnaires and verbal procedures used among the Spanish-speaking families were translated and adapted from English using multistage, state-of-the-art methods used previously by the Puerto Rican team of investigators (Canino et al., 2002; Matias-Carrelo et al., 2003).

The protection of human subjects was approved by the institutional review boards of the University of Puerto Rico and Rhode Island Hospital. Informed consent and assent was obtained from both parents and children who participated.

Asthma Diagnosis

The diagnosis of asthma was determined at both sites by pediatric asthma specialists based on national (National Asthma Education and Prevention Program, 2007) and international (Global Initiative for Asthma, 2002) asthma guidelines. Study clinicians from both PR and RI participated in a series of telephone conference calls to calibrate assessments across and within sites.

Predictor Variables

We administered measures assessing predisposing, enabling, and need variables. The predisposing measures were child's gender and age, place of birth (island vs. mainland), and parent's English proficiency. Participants were asked to rate their ability to read, write, and speak in English on a 4-point Likert-type scale (e.g., 1 = *Not at all* to 4 = *Excellent*; Felix-Ortiz, Newcomb, & Meyer, 1994). The enabling measures were poverty threshold, an income-to-needs quotient determined by the yearly household family income by poverty threshold based on family size (Duncan & Brooks-Gunn, 1997; U.S. Department of Health and Human Services, 2005), insurance coverage in the past 12 months (yes, no), and type of insurance (private, public, both, neither). The measure of insurance coverage was dichotomized. Specifically, participants were asked "How much of the past 12 month was your child covered by any type of health insurance, including Medicaid?" Responses included "all year," "most months," "only a few months or weeks," and "never." Responses indicating insurance coverage for "most months" or more were categorized as "yes," and "only a few months or weeks" to "never" as "no." The need measures included parent-rated severity (very mild to mild, moderate, and severe to very severe). We included parent-rated severity as our indicator of need (vs. clinician-rated severity), because we believed it would be more closely related to parental decision making regarding health care utilization.

Access and Utilization

Access to primary care for asthma treatment is important. Effective outpatient management of asthma may prevent unnecessary ED visits or hospitalizations. For more complex cases, asthma specialty care may be necessary. Frequent use of emergency services suggests poorly controlled asthma. Asthma-related health care access and utilization questions used in the current study also have been used in previously published studies (Ortega, Belanger, Bracken, & Leaderer, 2001; Ortega, Belanger, Paltiel, et al., 2001; Ortega, Gergen, et al., 2002). The access to asthma care questions were the following: (a) does the child receive regular asthma care (yes, no); (b) if yes, where (e.g., private doctor's office); and (c) does the child receive asthma care from consistent provider (yes, no). The utilization measures were the following: (a) has the child had a primary care visit for asthma in the past 12 months (yes, no); (b) if yes, how many visits; (c) has the child had any asthma specialty care in the past 12 months (yes, no); (d) if yes, how many visits; (e) has the child ever been hospitalized for asthma (yes, no); (f) has the child been hospitalized for asthma in the past 12 months (yes, no); (g) has the child visited the ED for asthma in the past 12 months; and (h) if yes, how many visits.

Statistical Analyses

Chi-square and *F*-test analyses were used to compare island Puerto Ricans and Latino and NLWs from RI by the predisposing, enabling, and need factors. Next, we compared the island Puerto Ricans and mainland Latino and NLWs on access to care (e.g., having a

consistent asthma care provider) as well as on measures of health care utilization (e.g., number of ED visits for asthma in the past 12 months). Pairwise comparisons were conducted using Tukey's honestly significant difference test and chi-square tests for continuous and dichotomous data, respectively. Finally, we conducted multiple logistic regressions for dichotomous outcomes and ordinary least square regression for continuous outcomes to compare health care access and utilization across groups. Because of the limited power, only factors with the highest degree of theoretical relevance were controlled for and entered simultaneously into the multiple regression model. For analyses comparing health care access, we controlled for child age, child gender, poverty threshold, health insurance coverage, and parent-rated severity. Given group differences in access to regular asthma care and its potential impact on asthma care utilization patterns, we included this variable (i.e., "has a place for regular asthma-related care") in addition to the above variables for these analyses. Analyses were conducted first on the entire sample using mainland NLWs as the reference group and second within the Latino group using mainland Latinos as the reference group. Missing data ranged from 12 to 22 cases and 9 to 18 cases for analyses conducted on the entire sample and Latino groups, respectively. Sample sizes for subsequent analyses on the entire sample were 782 to 792; sample sizes for analyses including only Latinos from PR and RI ranged from 635 to 644.

Results

Table 1 summarizes the differences in predisposing, enabling, and need factors across the PR and RI Latino and NLW groups. In terms of the predisposing factors, there were more females among the RI Latinos than NLWs (48.0%, 35.1%). Children and caregivers reported higher levels of English proficiency among the RI Latinos compared with the island PR children. Results from the analyses examining enabling factors demonstrated that fewer Latino families (island PR 34.6%; RI Latino 40.7%) were above the poverty threshold in comparison to NLW families (85.4%). A higher percentage of RI NLW children had private insurance (61.7%) compared with island PR (40.0%) and RI Latino (8.9%) children. In terms of need factors, parent ratings of asthma severity indicated that island PR children had the highest percentage with severe to very severe asthma (37.6%) compared with RI NLW (5.4%) and RI Latino (23.4%) children.

Table 2 compares health care access and utilization across the sites and groups. A higher percentage of parents of children from RI reported having a regular place for "breathing problems" (RI NLW 98.7%; RI Latino 97.2%) than parents of island PR children (78.8%). Furthermore, RI NLW children were more likely to have their regular asthma care in a private physician office (75.8%) than island PR (44.4%) or RI Latino (54.9%) children. Island PR children were more likely to have their regular asthma care in the ED (52.3%) compared with RI NLW (32.9%) and RI Latino (34.6%) children. Finally, a lower percentage of island PR children had a consistent asthma provider (71.1%) than RI NLW (85.9%) and RI Latino (81.0%) children.

Table 2 also shows the results for the health care utilization measures. More Latino children had visited a physician in the past 12 months (Island PR 94.3%; RI Latino 92.3%) compared with RI NLW (81.1%) children. Island PR children had the most physician visits ($M = 5.11$) in the past 12 months compared with the other two groups (RI NLW $M = 2.82$; RI Latino $M = 4.00$). A higher percentage of RI NLW children had received asthma specialty care in the past 12 months (31.1%) compared with island PR (16.1%) and RI Latino (14.2%) children. A higher percentage of island PR children had ever been hospitalized for asthma (62.0%), followed by RI Latino children (42.3%), and RI NLW children (32.2%). Also, a greater percentage of island PR children had been hospitalized within the past year for asthma (23.7%) compared with RI NLW (7.3%) and RI Latino (8.9%) children. Finally, a higher percentage of island PR children had visited the ED for asthma in the past 12 months

(58.6%) compared with RI NLW (24.3%) and RI Latino (25.4%) children. Island PR children also had the most ED visits in the past year ($M = 1.77$; RI Latino $M = 0.49$; RI NLW $M = 0.42$).

Table 3 shows the multiple regression results for the health care access and utilization measures for both RI Latino and island PR children when compared with RI NLW children (reference group). Children living in PR were less likely to have an identified place for regular asthma related care (OR = .09; 95% confidence interval [CI] = 0.02, 0.39). RI Latino children were more likely to have had a physician visit (OR = 2.15; 95% CI = 1.06, 4.36) for asthma but were less likely to have used asthma specialty care in the past 12 months (OR = 0.39; 95% CI = 0.22, 0.68) than RI NLW children. Island PR children were more likely to have had a physician visit for asthma (OR = 2.63; 95% CI = 1.29, 5.35), had a higher mean number of visits ($\beta = .17, p < .01$), and were less likely to have used asthma specialty care (OR = .50; 95% CI = 0.30, 0.84) in the past 12 months than RI NLW children. Island PR children were also more likely to have visited the ED (OR = 2.33; 95% CI = 1.43, 3.79) for asthma and had a higher mean number of ED visits in the past 12 months than RI NLW children ($\beta = .17, p < .01$).

Island Puerto Ricans Versus Mainland Latinos

Table 4 shows regression analyses comparing island PR children with RI Latino children (reference group) on the health care access and utilization measures. Island PR children were found to differ from RI Latino children on both access measures. They were less likely to have an identified place for regular care (OR = 0.11; 95% CI = 0.05–0.24) and a consistent care provider (OR = 0.64; 95% CI = 0.43–0.95) for asthma. Island PR children had more visits to a physician for asthma ($\beta = .08, p < .05$) than RI Latino children. In addition, island PR children were more likely to have been to the ED (OR = 3.74; 95% CI = 2.55, 5.49), had more ED visits ($\beta = .23, p < .001$), and were more likely to have been hospitalized (OR = 2.73; 95% CI = 1.60, 4.67) for asthma in the past 12 months than RI Latino children.

Discussion

Poor asthma-related health care access and utilization for Latinos of Puerto Rican and Dominican descent have been documented (Canino et al., 2006; Cohen et al., 2006; Ortega & Calderon, 2000; Ortega, Gergen, 2002; Stingone & Claudio, 2006). The current study is a preliminary investigation of factors that may contribute to the ethnic differences in health care access and utilization. Thus, the current study sought not only to document health care disparities between ethnic groups (i.e., Latinos vs. NLWs) but also investigate how these differences vary based on place of residence (e.g., mainland United States vs. island). Furthermore, we examined whether differences in health care access and utilization patterns would persist after controlling for predisposing, enabling, and need factors.

Asthma is a complex illness, and its presentation is multidetermined and may vary according to both contextual and individual factors. Understanding mechanisms driving differences in health care access and utilization is important in informing targeted interventions, particularly in our attempts to reduce health disparities. This question is a difficult one to answer given that individual and contextual factors are often confounded. It is impossible to completely disentangle the role of various factors, given the complex nature of factors contributing to asthma's presentation even within groups of similar backgrounds. Examining groups of individuals who are similar on the basis of some characteristics (e.g., ethnicity) but vary with respect to others (e.g., health care context), however, may refine this understanding.

Overall, the findings of this study support that there are health care access and utilization disparities, both *across* ethnic groups and *within* ethnic groups, depending on place of residence, supporting the potential role of both individual and contextual factors. Differences in health care access and utilization patterns persisted even after controlling for predisposing, enabling, and need factors. Specifically, Latinos residing in PR were less likely to report either having an identified place for regular care (compared with both RI NLW and Latinos residing in RI) or a consistent provider for asthma (compared with Latinos residing in RI). Latinos residing in both PR and RI were more likely to receive asthma care from a primary care physician and less likely to receive care from a specialist compared with NLWs. Latinos residing in PR demonstrated higher utilization, in terms of asthma-related physician and ED visits, than both Latinos and NLWs residing in RI; these high utilization rates were observed after accounting for multiple confounding factors. They were also significantly more likely to receive asthma care from the ED than both the other groups, and compared with RI Latinos, they were more likely to be hospitalized. These findings were particularly interesting given that in our clinic sample of island Puerto Rican children, 40% had private insurance and 52% had public insurance compared with 77% of RI Latino children having public insurance and 9% having private insurance. However, it is possible that island participants may have overreported private insurance because Medicaid is managed by independent practice groups.

An interesting consideration related to individual factors is the role of parent's perceptions of their child's asthma severity in making decisions regarding health care utilization. Parents' perceptions of their children's levels of severity may contribute to utilization behaviors, particularly for ED and primary care use. For example, if a parent does not perceive her child to have moderate or severe asthma, then she may be less assertive in making a primary care appointment for asthma. Alternatively, if a parent perceives her child to have very severe asthma, she may be more inclined to use the ED. Differences in parental perception and asthma beliefs may partially explain higher utilization patterns among Latino families. It should be noted, however, that reported differences in hospitalization rates reflect physician, as opposed to parental, decision making. Thus, an interesting area for future inquiry is to explore the associations between parental and clinician ratings, with the use of objective measures, and to determine their influences in health care seeking decisions. In addition, understanding the determinants of parental severity estimation, such as parental worry, fear and disease knowledge, and parent-child communication regarding symptoms, would be useful in understanding the motivators for health care utilization.

Findings from the current study also indicate the potential role of contextual factors in health care access and utilization patterns. Island children were found to have lower access to regular asthma care and higher rates of ED use, even after controlling for individual factors, such as parent-rated asthma severity and socioeconomic status, than both groups of mainland children. The health care systems between PR and RI are different, in terms of delivery, accessibility, and financial arrangements, especially for those children receiving public insurance. For example, in PR, individuals of low socioeconomic status are covered under an island-wide program partly funded by Medicaid in which families are not required to pay for covered medication. There is a disproportionate high enrollment of Puerto Rican children in public health plans, since approximately 42% of families live below the poverty level (Guzman, 2001), which makes them eligible for the island-wide Puerto Rican Public Health Plan. Under this system, the government contracts with managed care organizations (MCOs) by a negotiated capitation payment. The MCOs then contract with provider groups (e.g., independent provider associations), and many of these subcontracts pass financial risk for treatment cost down to primary care provider groups. Under the current policy, primary care providers are directly financially responsible for medication costs and referrals to specialists.

While such arrangements are sometimes observed in the states (e.g., MCO MediCal subcontracts to physician groups in California), the capitation levels in PR are much lower so that passing the financial risk down to providers constitutes a major barrier to use of expensive medication. As a result, financial incentives to primary care providers in PR may discourage them from prescribing inhaled steroids or other expensive controller therapy. It is possible that the observed low use of controller medication is attributable to the high use of ED care, where physicians are focused on treating acute symptoms and not necessarily chronic disease management. Furthermore, in PR, patients receive free medication in the ED. In addition, none of the outpatient clinics operate outside of regular office hours and very few are open on the weekends, forcing many working poor island Puerto Ricans to use the ED to avoid missing work. In contrast, in RI, the public health plans operate more similarly to private health plans, in which physicians bill for office visits, and the plans tend to cover most or all of the medication costs. Additionally, community health centers have more flexible hours, including evening and weekend appointments.

Thus, the differences observed between island children and mainland Latino children may be related to differences in the health care delivery systems between sites. While we controlled for important predisposing and enabling factors, the relatively lower utilization rates among RI Latinos, in terms of number of physician visits for asthma, also may be a result of system, policy, economic, and geographic barriers that were not accounted for in this study. It is important to note, however, that RI Latinos were more likely to receive care in private physicians' offices, and they were more likely to identify a regular location for receiving asthma care, and to have a consistent provider compared with island Puerto Ricans. These may be indicators of good health care quality and partly explain the lower utilization and ED rates in RI. Conversely, the health care utilization patterns in PR characterized by higher ED and lower specialty care utilization rates may be indicative of less optimal management and care of asthma.

As in any observational study, especially those using clinical samples, there are limitations in our findings. First, because of health care/clinic differences between RI and PR, we were not able to apply equivalent recruitment strategies across sites. The RI site used a broader range of recruitment sources (e.g., grassroots, educational programs) that may have introduced some unknown selection biases. Moreover, as our study participants in both sites were recruited from clinics and because we did not use a probability sampling design, generalization to target populations should be interpreted in the context of these sampling strategies. We may not have accessed children who were not receiving any care at all for their asthma. These factors suggest caution in generalizing our findings to the overall population of children with asthma, particularly those with the lowest levels of health care access. Finally, there may be additional factors not directly assessed in this study (e.g., beliefs about asthma, knowledge of health care or environmental exacerbation triggers such as tobacco smoke and pet dander) that may affect access and utilization patterns among the groups examined in this study. Despite these limitations, however, and given the dearth of health services data on PR and Dominican children with asthma, groups that have demonstrated high risk, our findings lend some insight into potential health care disparities experienced by these populations.

Conclusion

Very little research has focused on asthma-related health care access and utilization patterns for PR and Dominican children, especially for children living in PR. This study demonstrates that after controlling for predisposing, enabling, and need factors, island PR children have high health care consumption patterns and are more likely to receive care in nonprivate settings than Latino and NLW children from RI. Future research should focus on

how the organization of the Puerto Rican primary care system contributes to high rates of health care utilization and ED use for childhood asthma.

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Table 1

Demographics and Characteristics of Sample

Total Sample (<i>N</i> = 804) ^a	Rhode Island			Overall <i>p</i> Value ^b	Pairwise Comparisons
	Puerto Rico (A; <i>n</i> = 405)	Latino (B; <i>n</i> = 248)	NLW (C; <i>n</i> = 151)		
Predisposing factors					
Female	44.0%	48.0%	35.1%	.04	B > C *
Child age (<i>SD</i>)	10.68 (2.51)	10.63 (2.47)	10.52 (2.59)	.81	<i>ns</i>
Child ethnicity				<.01	
White	0%	0%	100%		A, B < C ****
Puerto Rican	100%	45.2%	0%		A > B > C ****
Dominican	0%	54.8%	0%		A, C < B ****
U.S. mainland born					
Child	—	78.6%	99.3%		B < C ****
Caregiver	10.1%	19.0%	95.4%	<.01	A < B < C ****
English proficiency					
Child (<i>SD</i>)	2.13 (0.72)	3.40 (0.55)	—	<.01	A < B ****
Parent (<i>SD</i>)	2.01 (0.81)	2.24 (0.96)	—	<.01	A < B **
Enabling factors					
Above poverty threshold	34.6%	40.7%	85.4%	<.01	A, B < C ****
Insurance coverage majority of past 12 months	96.0%	97.6%	98.7%	.23	<i>ns</i>
Type of insurance					
Private only	40.0%	8.9%	61.7%	<.01	C > A > B ****
Public only	52.1%	77.3%	30.2%	<.01	C < A < B ****
Both	3.2%	10.9%	6.7%	<.01	A < B ****
Neither	4.7%	2.8%	1.3%	.13	<i>ns</i>
Need factors					
Parent-rated asthma severity				<.01	A > B > C **
Very mild to mild	19.3%	25.4%	49.3%		

	Rhode Island			Overall <i>p</i> Value ^b	Pairwise Comparisons
	Puerto Rico (A; <i>n</i> = 405)	Latino (B; <i>n</i> = 248)	NLW (C; <i>n</i> = 151)		
Total Sample (<i>N</i> = 804) ^a					
Moderate	43.1%	51.2%	45.3%		
Severe to very severe	37.6%	23.4%	5.4%		

Note: NLW = non-Latino White; *SD* = standard deviation.

^a. There was a total of 804 participants; because of missing data, some variables had fewer than 804 participants.

^b. χ^2 or *F* test.

* *p* < .05.

** *p* < .01.

*** *p* < .001.

Table 2

Health Care Access and Utilization for Asthma

	Puerto Rico (A)	Rhode Island		Overall <i>p</i> Value ^a	Pairwise Comparisons
		Latino (B)	NLW (C)		
Health care access					
Has a place for regular asthma-related care	78.8%	97.2%	98.7%	<.01	A < B, C***
Location of usual asthma-related care					
Private physician's office	44.0%	54.9%	75.8%	<.01	A < B < C**
Emergency department	52.3%	34.6%	32.9%	<.01	A > B, C***
Community health clinic	14.8%	18.3%	7.5%	.01	A, B > C*
Hospital clinic/walk-in clinic/urgent care center	33.6%	35.4%	24.5%	.07	<i>ns</i>
Receives asthma care from consistent provider	71.1%	81.0%	85.9%	<.01	A < B, C**
Health care utilization					
Physician visit, past 12 months	94.3%	92.3%	81.1%	<.01	A, B > C***
Number of physician visits, past 12 months (<i>SD</i>)	5.11 (5.26)	4.00 (6.71)	2.82 (2.83)	<.01	A > B, C*
Asthma specialty care, past 12 months	16.1%	14.2%	31.1%	<.01	A, B < C***
Number of visits for asthma specialty care, past 12 months (<i>SD</i>)	0.51 (1.58)	0.92 (5.35)	0.93 (1.93)	.21	<i>ns</i>
Ever hospitalized	62.0%	42.3%	32.2%	<.01	A > B > C*
Hospitalized, past 12 months	23.7%	8.9%	7.3%	<.01	A > B, C***
Visited ED, past 12 months (<i>SD</i>)	58.6%	25.4%	24.3%	<.01	A > B, C***
Number of ED visits, past 12 months (<i>SD</i>)	1.77 (2.62)	0.49 (1.19)	0.42 (1.38)	<.01	A > B, C***

Note: NLW = non-Latino White; *SD* = standard deviation; ED = Emergency department.

^a. χ^2 or *F* test.

* *p* < .05.

** *p* < .01.

*** *p* < .001.

Table 3**Regressions Predicting Health Care Access and Utilization for Asthma**

Variable	Model	Rhode Island NLW	Rhode Island Latino	Puerto Rico
Health care access ^a				
Has a place for regular asthma-related care	Logistic (OR) ^b	Reference	0.83 (0.17–4.18)	0.09 (0.02–0.39)
Receives asthma care from consistent provider	Logistic (OR) ^b	Reference	1.07 (0.58–1.95)	0.67 (0.38–1.19)
Health care utilization ^c				
Physician visit, past 12 months	Logistic (OR) ^b	Reference	2.15 (1.06–4.36)	2.63 (1.29–5.35)
Number of visits	OLS (coefficient) ^d	Reference	0.07 ($p = .17$)	0.17 ($p < .01$)
Asthma specialty care, past 12 months	Logistic (OR) ^b	Reference	0.39 (0.22–0.68)	0.50 (0.30–0.84)
Number of visits	OLS (coefficient) ^d	Reference	0.00 ($p = 1.0$)	−.06 ($p = .28$)
Hospitalized, past 12 months	Logistic (OR) ^b	Reference	0.72 (0.32–1.63)	1.96 (0.94–4.09)
Visited ED, past 12 months	Logistic (OR) ^b	Reference	0.62 (0.37–1.05)	2.33 (1.43–3.79)
Number of visits	OLS (coefficient) ^d	Reference	−.08 ($p = .11$)	0.17 ($p < .01$)

Note: NLW = non-Latino white; OR = odds ratio; OLS = ordinary least squares; ED = emergency department.

^a. Adjusted for child age, child gender, poverty threshold, health insurance coverage, and parent-rated severity.

^b. 95% confidence intervals are presented for odds ratios.

^c. Adjusted for child age, child gender, poverty threshold, health insurance coverage, parent-rated severity, and access to a place for regular asthma-related care.

^d. Regression weights are standardized coefficients.

Table 4

Regressions Predicting Health Care Access and Utilization for Asthma for Mainland Versus Island Latinos

Variable	Model	Rhode Island Latino	Puerto Rico
Health care access ^a			
Has a place for regular asthma-related care	Logistic (OR) ^b	Reference	0.11 (0.05–0.24)
Receives asthma care from consistent provider	Logistic (OR) ^b	Reference	0.64 (0.43–0.95)
Health care utilization ^c			
Physician visit, past 12 months	Logistic (OR) ^b	Reference	1.27 (0.64–2.50)
Number of visits	OLS (coefficient) ^d	Reference	0.08 ($p < .05$)
Asthma specialty care, past 12 months	Logistic (OR) ^b	Reference	1.25 (0.77–2.02)
Number of visits	OLS (coefficient) ^d	Reference	-.05 ($p = .20$)
Hospitalized in past 12 months	Logistic (OR) ^b	Reference	2.73 (1.60–4.67)
ED visit in past 12 months	Logistic (OR) ^b	Reference	3.74 (2.55–5.49)
Number of visits	OLS (coefficient) ^d	Reference	.23 ($p < .001$)

Note: NLW = non-Latino white; OR = odds ratio; OLS = ordinary least squares; ED = emergency department.

^a. Adjusted for child age, child gender, poverty threshold, health insurance coverage, and parent-rated severity.

^b. 95% confidence intervals are presented for odds ratios.

^c. Adjusted for child age, child gender, poverty threshold, health insurance coverage, parent-rated severity, and access to a place for regular asthma-related care.

^d. Regression weights are standardized coefficients.