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ORIGINAL PAPER

Nativity as a Determinant of Health Disparities Among Children

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Abstract Nativity is not often considered in the study of health disparities. We conducted a cross-sectional, parent-reported survey of demographics, socioeconomic characteristics, healthcare access, and health conditions in New York City schoolchildren (n = 9029). US-born children with US-born parents (US/US) had higher socioeconomic status, better access to healthcare, and reported higher rates of disease diagnoses compared to US-born children with immigrant parents and to immigrant children. Dental cavities were the only condition in which US/US children reported lower prevalence. US/US children had the best healthcare access, most favorable parent-reported health status and highest rate of satisfaction with healthcare. The magnitude of racial/ethnic disparities varied based on nativity of the children being compared. Factors such as the healthy immigrant effect and differential diagnosis rates may explain the results. In conclusion, nativity influences disease burdens and should be considered in health disparities studies.

Keywords Families · Healthcare access · Health outcomes · Immigrants · Minorities

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Introduction

Nativity is frequently overlooked in studies on health disparities [1–5]. Additionally, there are few studies on disparities in children [6]. Nativity may be an important determinant of disparities in healthcare access and health conditions among children [1–3, 7–12]. The influence of nativity on health disparities is a timely issue given the changing demographics of the United States (US) [13]. Importantly, 23% of children in the US live with at least one parent who is an immigrant [14].

US-born children or children with non-immigrant parents are more likely to have health insurance coverage [9, 15–17] and a usual source of care [8, 9, 11, 15, 17] compared to children who are immigrants or whose parents are immigrants. Nativity of children has been evaluated in studies on asthma [2, 3, 11, 17, 18], allergies [11, 18, 19], and obesity [20–22]. In general, US-born children are more likely than immigrant children to report asthma [2, 11, 19], food sensitization [19], sensitization to cat/dog allergens [11, 19], seasonal allergies [2, 19], wheezing [2, 11], and obesity [20, 23]. Data on the association of nativity with less prevalent health conditions are limited. Children with US-born parents had prevalences of attention deficit/hyperactivity disorder (ADHD), developmental delay, and learning disabilities 1.6–2.9 times that of children with immigrant parents [15]. The increasing prevalence of ADHD [24, 25], autism [24–26], and developmental delay [24] point to the importance of studying these conditions.

Studies of the relationship between nativity and health conditions frequently focus only on Hispanic/Latino populations [11, 18, 22, 27–30]. Immigrants from diverse racial/ethnic groups may be underrepresented even in studies where they are not excluded because data are obtained from surveys administered only in English and Spanish [7, 8, 31]

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and immigrants are geographically concentrated within certain areas of the US [32]. Data from previous studies suggest both child and parental nativity should be considered when assessing health measures among children [19, 20, 27, 30, 33], yet many consider only that of the child [1, 2, 11, 23, 34–36] or parent [3, 15, 17, 37]. This study examines the role of nativity on parent-reported health status in a racially and ethnically diverse population.

Methods

Participants

A cross-sectional survey was conducted in New York City public elementary schools during the 2009–2010 and 2010–2011 school years. Because the purpose of the study was to assess the role of nativity in health disparities among populations that are diverse in race, nativity and socioeconomic status, a multistage stratified random sampling was used to yield a study population representative of Black, White, and Hispanic children from households of varying income levels from all five boroughs. To accomplish this, population demographic data for children ages 5–14 obtained from the US Census were used to identify residential ZIP Codes where > 50% of the population was Black (n = 33), White (n = 39), or Hispanic (n = 35). ZIP Codes for each racial/ethnic group were categorized as high (> $50,000), medium ($35,000–$50,000), and low (< $35,000) using median income data. None of the ZIP Codes with a large Hispanic population were classified as high income. New York City Department of Education (NYCDOE) enrollment and population demographic data were used to randomly select 3 ZIP Codes from each stratum. The resulting 24 schools also included diverse Asian and White populations.

Data Collection

An interactive presentation was shown in each school. Students were given a questionnaire to be completed by their parent/guardian [38]. Children and teachers received nominal incentives (school supplies) to encourage participation. Questionnaires were provided in English, Spanish, Korean, Chinese, and Polish in order to include populations of diverse nativity in the sample. Hispanic/Latino populations were categorized as such, regardless of their race. The project was approved by the Mount Sinai Institutional Review Board, the Mount Sinai Health Insurance Portability and Accountability Act Privacy Office, and by the Proposal Review Committee of the NYCDOE Division of Assessment and Accountability.

Study Variables

Demographic variables included children's gender, birth year, and race/ethnicity, primary household language, parent's educational level, household income, whether the parent and child were US-born, and the length of time lived in the US. Parents selected race/ethnicity from one of the following categories: White/Caucasian ("White"), Black/African-American/Afro-Caribbean ("Black"), Asian, American Indian or Alaskan Native, Pacific Islander or Native Hawaiian, Hispanic/Latino, or Other. We present comparisons among White, Black, Asian, and Hispanic/Latino children. We defined three nativity categories: US-born children with US-born parents ("US/US" children), US-born children with immigrant parents ("US/IM" children), and immigrant children ("IM" children).

Healthcare access was assessed by questions regarding language barriers, being able to access healthcare for the child when needed, and access to preventive care. Results for parent satisfaction with healthcare quality are presented only for children who received care in the previous 12 months (92.9% of children). The parent's perception of the child's health status was assessed by the following question: "In general, how would you describe this child's health?" Response choices included excellent, very good, fair, and poor. The prevalence of most health conditions was assessed by the following question: "Have you ever been told by a doctor or other healthcare professional that this child has any of the following conditions?" For infectious conditions, diagnoses during the past 12 months were assessed. Asthma was assessed based on two questions: "Has this child ever been told by a doctor or nurse that he/she has asthma?" and "In the past 12 months, has this child had wheezing in the chest?" Children were classified as having "ever asthma" if the first question was answered "yes", and as having "current asthma" if both questions were answered "yes".

Statistical Analysis

For each school, data were weighted to represent the number of children attending public elementary schools within each selected ZIP Code, adjusting for absenteeism rates. Survey procedures were used to account for sampling by income and race/ethnicity and clustering among schools. Frequencies presented in tables represent the proportion of the total population of schoolchildren ("overall population"). Frequencies were compared using Rao-Scott χ^2 tests. For the analyses of health conditions as a function of nativity and race/ethnicity, only health conditions with a prevalence of > 5% were included: ever asthma, current asthma, allergies, food allergies, seasonal allergies, skin allergies, cavities, developmental delay, and strep throat. The modified Rao-Scott χ^2 test was used to test for associations between groups.

Multiple logistic regression models were developed to estimate odds ratios (ORs) and 95% confidence interval (95% CIs) for the association between nativity and each health condition. Either IM children or White children were used as the reference groups in the analyses. Models were developed only for conditions with a prevalence of > 5%. The complex sampling design was accounted for in the analyses. Based on the literature [1, 2, 7, 9, 19, 39–42], the following explanatory variables were included in the adjusted models: age, race/ethnicity, household income, parental education, ability to communicate with the child's healthcare provider in one's own language, health or dental insurance, and whether the child had a regular doctor/nurse. Associations with asthma were additionally adjusted for smoking in the home [43, 44].

We tested for statistical interaction between nativity and race/ethnicity, income, and health insurance, respectively, using likelihood ratio tests. We focused on the interaction between nativity and race/ethnicity since the interaction term was statistically significant ($P < 0.05$) for every health condition. Analyses were performed using SAS 9.3 (SAS Institute, Cary, NC).

Results

Population Characteristics

The response rate for the study adjusted for absenteeism was 75.6%. The majority of children and nearly half

Table 1 Demographic and socioeconomic characteristics of New York City school children as a function of nativity

	All (N = 9029)		Nativity category						
			IM (N = 1017)		US/IM (N = 3788)		US/US (N = 4103)		*P* value
	%	SE	%	SE	%	SE	%	SE	
All	–	–	11.0	0.9	40.4	1.9	47.0	2.6	
Sex									0.45
Male	48.5	0.4	48.8	2.0	49.6	0.8	47.6	1.0	
Female	50.7	0.4	50.5	1.8	49.5	0.8	52.0	1.1	
Age (mean ± standard deviation: 8.6 ± 0.1 years)									< 0.01
4–9	63.3	1.1	51.3	2.6	65.5	0.8	64.5	1.4	
10–15	34.3	1.1	46.3	2.5	32.6	0.8	33.2	1.2	
Race/ethnicity									< 0.01
White	17.5	2.5	18.3	2.7	12.3	2.0	22.2	4.0	
Black	32.6	5.4	23.1	6.3	30.1	6.4	37.1	4.9	
Asian	7.4	1.6	15.4	2.8	12.4	3.0	1.4	0.3	
Hispanic/Latino	32.4	3.8	37.9	4.1	39.1	5.1	25.1	3.5	
Other	8.1	0.6	4.5	0.6	4.5	0.4	12.3	1.1	
Household language(s)									< 0.01
English only	60.2	2.9	24.3	5.0	38.7	4.5	88.3	1.0	
English and 1 or more other languages	9.2	0.5	6.2	1.0	13.8	0.8	5.9	0.5	
No English, 1 or more other languages	28.8	2.6	66.8	4.9	45.8	4.3	5.0	0.6	
Parental education									< 0.01
Less than HS	18.4	1.7	25.9	1.3	22.7	2.4	12.6	1.7	
HS/GED	26.5	1.0	26.2	2.0	27.9	1.7	25.6	1.4	
Some college	23.7	1.7	15.8	2.1	20.7	1.7	28.5	2.2	
College/graduate/professional degree	26.6	2.2	26.7	1.9	24.0	2.9	29.3	2.4	
Household income ($)									< 0.01
< 25,000	45.1	2.4	58.3	2.4	49.8	2.4	38.3	3.6	
25,000–49,999	24.1	1.2	20.2	1.5	24.7	1.5	25.1	1.4	
50,000–75,000	9.4	0.9	5.2	0.8	8.3	0.8	11.6	1.4	
> 75,000	13.2	1.6	5.2	1.0	9.5	1.5	18.5	2.3	

GED general education development degree, *HS* high school, *SE* standard error, *IM* immigrant children, *US/IM* US-born children/Immigrant parents, *US/US* US-born children/US-born parents

of the parents in the population were US-born (88.1 and 47.6%, respectively). Less than one-third (28.6%) of IM children had lived in the US for more than 5 years. Most immigrant parents (88.0%) had lived in the US for more than 5 years. US/US children were most likely to live in a household where English was spoken, have a parent who had at least some college education, and to live in households with higher incomes, while IM children were least likely to demonstrate these characteristics (Table 1). In the overall population, 15.6% of children were exposed to smoking in the home. Nativity was significantly associated with smoking in the home ($P < 0.01$): US/US children (10.6%), US/IM children (19.9%), and IM children (15.9%). Nativity was significantly associated with every demographic and socioeconomic characteristic, except for gender.

US/US Children have the Best Healthcare Access and Their Parents are Most Satisfied with Quality of Healthcare

Parents of US/US children were least likely to encounter language barriers when communicating with providers, and their children were most likely to have insurance, regular interaction with healthcare providers, and access to healthcare (Table 2). Nativity was significantly associated with every measure of healthcare access, except for the usual source for care. US/US children were more than five times as likely to have dental insurance, and more than twice as likely to have private health insurance compared to IM children. The degree of healthcare access was concordant with parent satisfaction with the quality of healthcare. Most (75.6%) parents of US/US children were very satisfied with the quality of healthcare compared to 67.4 and 62.0% for parents of US/IM and IM children, respectively.

US/US Children Have the Highest Prevalence of Health Conditions, Yet Most Favorable Parent-Reported Children's Health Status

US/US children were most likely to report atopic disease, while IM children were least likely to report this diagnosis (Table 3). The prevalence of ever and current asthma, seasonal allergies, and skin allergies was more than twice as high for US/US children than for IM children. Food allergies were the only atopic disease that was not associated with nativity.

US/US children were most likely to have been diagnosed with a developmental disability, while IM children were least likely to report one. The prevalence of ADHD was four times higher for US/US children than for IM children. The prevalence of infectious conditions was similar for each group of children, except in the case of bronchitis. The prevalence of diabetes, elevated blood lead levels, autism, cancer, and pneumonia was low ($\leq 0.7\%$; data not shown). None of these conditions was significantly associated with nativity except for autism ($p < 0.01$). US/US children had the highest prevalence of autism (0.9%), followed by US/IM children (0.6%) and IM children (0.1%). Cavities were the only condition associated with nativity for which the prevalence was lower for US/US children than for US/IM and IM children.

The prevalence of children's health conditions was discordant with the parent-reported overall health status. The prevalence of most health conditions was highest for US/US children, but their parents were least likely to rate their health as fair/poor (8.4% vs. 13.4 and 14.7% for US/IM and IM children, respectively).

Nativity is Associated with Disparities in Socioeconomic Status, Healthcare Access, and Health Conditions

More than four times as many White IM children lived in a household with an income of <$25,000 compared with White US/US children to (39.8% versus 9.2%). The ratio for IM children compared to US/US children among minorities was ≤ 1.5: 58.0% versus 48.8% for Blacks, 68.1% versus 46.7% for Asian children, and 63.0% versus 49.9% for Hispanic/Latino children. Every measure of healthcare access (e.g., having a regular doctor or nurse and access to care to nights and weekends) was significantly associated with nativity among White children, but this was not the case for minority children. A significant association between nativity and satisfaction with quality of health care child received in past 12 months (very satisfied for 85.3%, 64.3%, and 56.0% of US/US, US/IM, and 56.0% IM children, respectively; $p < 0.0001$) and a sick child being able to see a doctor within 1 day (always/almost always for 91.3%, 82.9%, and 72.2% for US/US, US/IM, and IM children, respectively; $p < 0.0001$) was unique to White children. The proportion of parents reporting a fair/poor health status was consistently lower for each successive generation among White children (13.0%, 11.2%, and 2.6% for IM, US/IM, and US/US children, respectively; $p < 0.0001$), but not among minority children. Disparities between White children and minority children tended to be most pronounced among US/US children.

Associations Between Nativity and Health Conditions Vary Based on Race/Ethnicity

The results from the adjusted models revealed that nativity was least likely to be associated with a health condition among Black children (Table 4). Nativity was more

Table 2 Healthcare access for New York City school children as a function of nativity

	All (N = 9029)		Nativity category						*P* value
			IM (N = 1017)		US/IM (N = 3788)		US/US (N = 4103)		
	%	SE	%	SE	%	SE	%	SE	
Communicates with healthcare provider in their own language									< 0.01
Yes	91.9	0.7	82.3	2.0	89.6	1.1	96.7	0.4	
No	6.6	0.6	15.9	1.8	9.5	1.1	2.2	0.3	
Interpreter available									< 0.01
Always/usually	15.1	1.0	28.0	1.5	21.5	1.8	6.0	0.4	
Sometimes	9.9	0.7	20.2	1.4	14.3	1.2	3.4	0.4	
Never	10.9	0.9	15.2	1.3	10.6	0.9	10.1	1.4	
Speaks english, didn't need	58.4	1.9	30.0	2.5	47.4	2.8	75.5	1.6	
Insurance									< 0.01
Private	33.8	2.6	16.7	1.8	28.0	2.4	43.4	3.8	
Public	61.1	2.5	76.1	1.7	67.7	3.4	51.8	3.7	
None	2.8	0.2	4.9	0.6	2.4	0.3	2.7	0.3	
Dental insurance									< 0.01
Yes	83.1	0.9	16.3	1.2	82.3	0.7	86.5	1.2	
No	10.0	0.6	74.1	1.2	9.4	0.7	9.1	1.0	
Don't know	4.7	0.5	7.2	0.8	6.1	0.8	2.8	0.3	
Regular doctor or nurse									< 0.01
Yes	76.1	0.9	62.6	1.8	72.1	1.3	83.4	0.9	
No	17.3	0.7	29.8	1.8	19.9	1.0	12.0	0.7	
Usual source for care									0.13
Private doctor/HMO	63.2	3.0	58.0	2.6	61.0	3.3	66.7	3.4	
Community clinic/health center or School nurse/school-based health center	19.4	1.7	21.8	1.9	19.5	1.4	18.8	2.4	
Hospital outpatient department	7.9	0.8	9.3	2.9	9.2	1.0	6.6	0.7	
Other	0.6	0.1	0.5	0.2	0.5	0.1	0.7	0.2	
Hospital emergency room/No usual place	6.3	0.8	7.0	1.5	6.7	1.1	5.6	0.7	
Usual source for care/advice									0.075
Private doctor/HMO	63.2	3.0	58.0	2.6	61.0	3.3	66.7	3.4	
Other	27.9	2.3	31.7	2.2	29.2	2.3	26.1	3.0	
Hospital emergency room/No usual place	6.3	0.8	7.0	1.5	6.7	1.1	5.6	0.7	
If child is sick, can see a doctor within 1 day									< 0.01
Always/Almost always	69.9	1.3	60.9	1.0	67.4	1.4	74.6	1.6	
Often	7.0	0.4	8.3	0.9	7.4	0.5	6.3	0.4	
Sometimes	18.1	0.7	23.6	0.9	20.1	0.9	14.9	1.0	
Never	2.7	0.4	3.6	0.7	2.5	0.5	2.6	0.3	
Access to care on weekends/evenings									< 0.01
Always/Almost always	46.0	1.6	30.5	1.5	38.8	1.7	56.4	2.2	
Often	8.7	0.4	7.6	0.7	8.5	0.8	9.1	0.3	
Sometimes	27.0	0.7	33.3	1.3	29.5	0.8	22.9	1.3	
Never	14.9	1.0	22.4	2.4	19.1	1.3	9.6	0.9	

HMO Health Maintenance Organization, *SE* standard error, *IM* immigrant children, *US/IM* US-born children/immigrant parents, *US/US* US-born children/US-born parents

Table 3 The prevalence of health conditions as a function of nativity among New York City school children

	All (N = 9029)		Nativity category						
			IM (N = 1017)		US/IM (N = 3788)		US/US (N = 4103)		*P* value
	%	SE	%	SE	%	SE	%	SE	
Ever asthma									< 0.01
Yes	20.8	1.1	11.5	1.1	17.9	0.9	25.4	1.6	
No	77.0	1.1	85.8	1.1	79.9	1.0	73.0	1.5	
Current asthma									< 0.01
Yes	12.8	0.8	6.6	0.8	9.8	0.7	16.6	1.0	
No	85.1	0.8	90.6	0.8	88.0	0.7	81.9	1.0	
Allergies									< 0.01
Yes	19.5	0.6	13.5	0.6	16.2	0.9	24.1	1.2	
No	80.5	0.6	86.5	0.6	83.8	0.9	75.9	1.2	
Food allergies									0.81
Yes	5.2	0.3	4.8	0.3	5.2	0.4	5.4	0.4	
No	94.8	0.3	95.2	0.3	94.8	0.4	94.6	0.4	
Seasonal allergies									< 0.01
Yes	10.2	0.7	5.9	0.7	7.5	0.7	13.9	1.0	
No	89.8	0.7	94.1	0.7	92.5	0.7	86.1	1.0	
Skin allergies									< 0.01
Yes	8.9	0.4	5.6	0.9	6.7	0.4	11.7	0.8	
No	91.1	0.4	94.4	0.9	93.3	0.4	88.3	0.8	
Cavities									< 0.05
Yes	13.4	0.8	16.7	1.9	13.9	1.2	12.2	0.7	
No	86.6	0.8	83.3	1.9	86.1	1.2	87.8	0.7	
Learning disability									< 0.01
Yes	2.4	0.2	2.4	0.2	1.1	0.2	3.5	0.3	
No	97.6	0.2	97.6	0.2	98.9	0.2	96.5	0.3	
ADHD									< 0.01
Yes	3.3	0.3	1.1	0.3	2.7	0.2	4.4	0.6	
No	96.7	0.3	98.9	0.3	97.3	0.2	95.6	0.6	
Developmental delay									< 0.01
Yes	5.1	0.4	2.8	0.7	4.5	0.5	6.2	0.4	
No	94.9	0.4	97.2	0.7	95.5	0.5	93.8	0.4	
Strep throat									0.49
Yes	11.7	1.3	13.9	1.3	10.9	1.6	12.1	1.6	

Table 3 (continued)

	All (N = 9029)		Nativity category						*P* value
			IM (N = 1017)		US/IM (N = 3788)		US/US (N = 4103)		
	%	SE	%	SE	%	SE	%	SE	
No	88.3	1.3	86.1	1.3	89.1	1.6	87.9	1.6	
Bronchitis									< 0.01
Yes	3.7	0.2	2.2	0.2	2.7	0.3	4.9	0.5	
No	96.3	0.2	97.8	0.2	97.3	0.3	95.1	0.5	
Ear infections									0.36
Yes	2.9	0.2	2.2	0.5	3.1	0.3	2.7	0.2	
No	97.1	0.17	97.8	0.5	96.9	0.3	97.3	0.2	
Conjunctivitis									0.30
Yes	2.8	0.2	2.3	0.5	2.5	0.3	3.1	0.3	
No	97.2	0.2	97.7	0.5	97.5	0.3	96.9	0.3	

ADHD attention deficit/hyperactivity disorder, *SE* standard error, *IM* immigrant children, *US/IM* US-born children/immigrant parents, *US/US* US-born children/US-born parents

likely to be associated with atopic diseases among White and Asian children than among Black and Hispanic/Latino children. Despite the heterogeneity among racial/ethnic groups for most health conditions, we noted some consistent findings for asthma. US/US children of every racial/ethnic group had a higher odds of ever asthma and current asthma compared to US/IM and IM children. Few associations between nativity and non-atopic diseases were significant. For White and Black children, respectively, US/US children had twice the odds of reporting a developmental delay relative to IM children. A unique finding among Hispanic/Latino children was that nativity was significantly associated with cavities and strep throat. US/US children had the lowest prevalence for both conditions.

The Extent of Racial/Ethnic Disparities in Health Conditions Varies with Children's Nativity

The extent of racial/ethnic disparities in health conditions between White and minority children varied widely based on nativity category (Table 5). For example, Black children had more than twice the odds of being diagnosed with developmental delay relative to White children among US/IM children, but were as likely as White children to report developmental delay compared to US/US and IM children, respectively. Despite this heterogeneity, there were some common findings for disparities between racial/ethnic groups. White children tended to have lower odds of ever asthma and current asthma compared to minority children irrespective of the nativity category.

There was no noticeable pattern in health disparities for allergic conditions, except that minority US/IM children were more likely than White US/IM children to have allergies. For every generation, Black children had the lowest odds of reporting cavities and Hispanic/Latino children had the highest odds of having a developmental delay, although not all estimates were significant. White children tended to have higher odds of strep throat than minority children. Black and Asian children had lower odds of strep throat relative to White children, irrespective of the nativity category.

Discussion

This study demonstrates that US/US children have the highest socioeconomic status and best healthcare access, while IM children have the lowest socioeconomic status and poorest healthcare access. US/US children reported the highest prevalence of most diseases, while IM children were least likely to report health conditions. An exception to the pattern of higher prevalences of health conditions among US/US children was observed for dental cavities.

Table 4 Associations between nativity and health conditions for each racial/ethnic group among New York City school children using immigrant children as the reference group

Health condition	Nativity category	Race/ethnicity							
		White		Black		Asian		Hispanic/Latino	
		OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
Ever asthma	US/US	2.09	(1.29, 3.39)**	1.79	(1.32, 2.43)**	3.87	(1.70, 8.82)**	3.30	(2.09, 5.22)**
	US/IM	1.21	(0.85, 1.73)	1.27	(0.86, 1.86)	2.10	(1.03, 4.26)*	1.76	(1.19, 2.60)**
Current asthma	US/US	6.12	(3.09, 12.12)**	2.12	(1.09, 4.09)*	2.93	(1.02, 8.48)*	2.01	(1.29, 3.14)**
	US/IM	2.38	(1.34, 4.21)**	1.34	(0.57, 3.14)	2.39	(1.08, 5.30)*	1.18	(0.87, 1.61)
Allergies	US/US	1.65	(1.05, 2.61)*	1.43	(0.88, 2.34)	2.01	(1.23, 3.29)**	1.59	(0.81, 3.11)
	US/IM	0.67	(0.47, 0.96)*	0.90	(0.60, 1.35)	1.76	(1.21, 2.56)**	1.45	(0.67, 3.14)
Food allergies	US/US	0.40	(0.28, 0.58)**	4.33	(0.47, 40.20)	2.77	(1.18, 6.51)*	0.95	(0.41, 2.21)
	US/IM	0.31	(0.17, 0.56)**	6.63	(0.58, 75.22)	1.64	(0.77, 3.50)	1.17	(0.43, 3.18)
Seasonal allergies	US/US	2.87	(1.62, 5.08)**	1.90	(0.77, 4.67)	1.60	(0.82, 3.11)	1.72	(0.89, 3.33)
	US/IM	0.89	(0.57, 1.38)	0.85	(0.33, 2.23)	1.50	(0.75, 3.02)	1.55	(0.70, 3.42)
Skin allergies	US/US	1.21	(0.65, 2.27)	0.90	(0.34, 2.40)	12.08	(4.45, 32.82)**	2.87	(1.17, 7.06)*
	US/IM	0.56	(0.33, 0.96)*	0.46	(0.15, 1.42)	7.33	(3.46, 15.53)**	1.74	(0.74, 4.13)
Cavities[a]	US/US	0.93	(0.62, 1.39)	1.64	(0.95, 2.84)	1.04	(0.68, 1.60)	0.44	(0.34, 0.58)**
	US/IM	0.86	(0.49, 1.51)	1.47	(0.84, 2.60)	1.39	(0.79, 2.45)	0.61	(0.41, 0.89)*
Developmental delay[b]	US/US	2.21	(1.13, 4.33)*	2.85	(1.02, 7.98)*			1.45	(0.51, 4.15)
	US/IM	0.70	(0.40, 1.23)	2.09	(0.76, 5.76)	1.84	(0.65, 5.25)	1.31	(0.42, 4.09)
Strep throat	US/US	1.18	(0.94, 1.48)	1.90	(0.52, 6.94)	1.96	(0.86, 4.43)	0.47	(0.29, 0.75)**
	US/IM	0.87	(0.72, 1.05)	0.74	(0.23, 2.42)	1.24	(0.79, 1.95)	0.75	(0.59, 0.94)*

Models adjusted for health insurance, race/ethnicity, nativity x race/ethnicity, income, language spoken with healthcare provider, education, age, regular doctor/nurse. For current and ever asthma smoking in the home was additionally included as an explanatory variable

CI confidence interval, *OR* odds ratio, *IM* immigrant children, *US/IM* US-born children/immigrant parents, *US/US* US-born children/US-born parents

*P value < 0.05; **P value < 0.01

[a]For this condition, dental insurance replaced health insurance as an explanatory variable

[b]None of the US/US Asian children had this condition

The differences in socioeconomic status and healthcare access observed between nativity categories are consistent with previous reports [1, 12, 19, 27, 30, 33, 45, 46], as are our findings that US-born children have a higher asthma prevalence [2, 11, 19, 35, 47] and prevalence of developmental disabilities [15] compared to IM children. Also consistent are results from oral health studies that have shown that US-born children are less likely than IM children to have cavities [48] or decayed and filled primary teeth [49].

We found that parents of US/US children were most likely to report a favorable health status for their children despite reporting a higher prevalence of most health conditions compared to IM children. Other studies have found similar results [1, 17, 27, 30, 45]. The discordance between parent-reported health status and the low prevalence of health conditions among immigrant children may be explained by undiagnosed/untreated health conditions in US/IM and IM children due to poorer healthcare access and more frequent diagnoses in US/US children due to better healthcare access. Additionally, US-born parents are less likely than immigrant parents to report unmet expectations and communication barriers when interacting with healthcare providers [15, 50]. However, better healthcare access does not fully explain higher prevalences since nativity was significantly associated with health conditions despite adjusting for having a regular doctor/nurse and insurance coverage.

Our finding that US-born children report health conditions more frequently than IM children is consistent with the "healthy immigrant effect" [51]. One potential explanation is that people who migrate are healthier than those who are unable to do so ("positive health selection"). The extent of positive health selection may vary based on country of origin [52]. Prevalence differences may also reflect various risk factors to which children may be exposed to or the timing and duration of these exposures [19, 47].

Differences in nativity may explain the persistence of many health disparities among racial/ethnic groups after

Table 5 Associations between health conditions for minority children relative to white children as a function of nativity among New York City school children

Health condition	Race/ethnicity	Nativity category					
		IM		US/IM		US/US	
		OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
Ever asthma	Black	2.45	(1.42, 4.22)**	2.56	(2.09, 3.14)**	2.10	(1.71, 2.58)**
	Asian	1.01	(0.42, 2.41)	1.74	(1.20, 2.54)**	1.87	(1.22, 2.86)**
	Hispanic/Latino	1.92	(1.32, 2.79)**	2.78	(2.20, 3.52)**	3.03	(2.38, 3.85)**
Current asthma	Black	5.16	(1.97, 13.53)**	2.90	(2.15, 3.91)**	1.78	(1.46, 2.18)**
	Asian	1.82	(0.83, 4.00)	1.83	(1.01, 3.33)*	0.87	(0.49, 1.55)
	Hispanic/latino	6.57	(3.37, 12.81)**	3.27	(2.41, 4.42)**	2.16	(1.69, 2.76)**
Allergies	Black	2.60	(1.91, 3.53)**	1.32	(1.09, 1.59)**	0.85	(0.65, 1.11)
	Asian	0.98	(0.59, 1.64)	1.97	(1.45, 2.68)**	0.92	(0.50, 1.69)
	Hispanic/latino	0.75	(0.39, 1.45)	1.57	(1.11, 2.23)*	0.70	(0.53, 0.93)*
Food allergies	Black	0.73	(0.41, 1.29)	1.23	(0.74, 2.05)	0.61	(0.44, 0.86)**
	Asian	0.06	(0.01, 0.43)**	1.30	(0.80, 2.13)	1.68	(1.05, 2.69)*
	Hispanic/latino	0.24	(0.15, 0.39)**	1.40	(0.84, 2.32)	0.88	(0.66, 1.17)
Seasonal allergies	Black	0.99	(0.36, 2.75)	0.95	(0.74, 1.22)	0.66	(0.51, 0.85)**
	Asian	1.34	(0.49, 3.63)	2.26	(1.59, 3.22)**	0.75	(0.38, 1.46)
	Hispanic/latino	0.82	(0.46, 1.46)	1.42	(0.93, 2.17)	0.49	(0.35, 0.68)**
Skin allergies	Black	1.71	(0.64, 4.61)	1.41	(0.90, 2.22)	1.27	(0.93, 1.75)
	Asian	0.15	(0.06, 0.37)**	1.95	(1.35, 2.81)**	1.49	(0.95, 2.32)
	Hispanic/latino	0.51	(0.22, 1.16)	1.57	(1.11, 2.22)*	1.20	(0.84, 1.70)
Cavities[a]	Black	0.39	(0.20, 0.76)**	0.67	(0.39, 1.18)	0.70	(0.51, 0.95)**
	Asian	0.91	(0.48, 1.72)	1.48	(1.08, 2.02)*	1.02	(0.64, 1.62)
	Hispanic/latino	1.95	(1.40, 2.73)**	1.38	(0.89, 2.15)	0.94	(0.74, 1.20)
Developmental delay[b]	Black	0.73	(0.22, 2.39)	2.17	(1.33, 3.56)**	0.94	(0.66, 1.36)
	Asian	0.52	(0.20, 1.36)	1.35	(0.60, 3.02)		
	Hispanic/latino	1.79	(0.51, 6.31)	3.32	(1.92, 5.75)**	1.17	(0.81, 1.70)
Strep throat	Black	0.10	(0.02, 0.55)**	0.08	(0.03, 0.21)**	0.16	(0.11, 0.25)**
	Asian	0.19	(0.12, 0.31)**	0.28	(0.20, 0.39)**	0.32	(0.15, 0.67)**
	Hispanic/latino	0.94	(0.59, 1.52)	0.81	(0.57, 1.17)	0.38	(0.27, 0.51)**

Models adjusted for health insurance, race/ethnicity, nativity x race/ethnicity, income, language spoken with healthcare provider, education, age, regular doctor/nurse. For current and ever asthma smoking in the home was additionally included as an adjustment variable

CI confidence interval, *OR* odds ratio, *IM* immigrant children, *US/IM* US-born children/immigrant parents, *US/US* US-born children/US-born parents

*P value < 0.05; **P value < 0.01

[a]For this condition, dental insurance replaced health insurance in all models that included insurance as an explanatory variable

[b]None of the Asian US/US children had this condition

accounting for socioeconomic factors [53, 54] and the heterogeneity in health measures within racial/ethnic groups [4, 31, 55–58]. Our study demonstrates that in addition to ethnicity, nativity is a source of diversity for White populations and is associated with health disparities. This finding is supported by a study that showed that US-born, non-Hispanic White children and adolescents are three times as likely as immigrant, non-Hispanic White children to have asthma [2]. Our results suggest the importance of considering nativity when designing interventions to reduce health disparities. For instance, strategies to improve health measures for Black children may differ in effectiveness among US/US and IM children because barriers to healthcare access for each group differ in type and extent. Additionally, healthcare providers should be aware that immigrant parents may need additional assistance in coordinating care, more detailed information, and translators to better navigate the health care system and obtain appropriate care for their children [15, 50].

Our study has several limitations. The survey assessed parent report of provider-diagnosed conditions and may underestimate the prevalence of health conditions in children with less healthcare access. Parent-reported health conditions may be over-reported or under-reported due to the parent's education level and ethnicity [59], English language proficiency [9, 60] and legal status [7, 32, 61, 62]. Study strengths include the large study population, racial/ethnic diversity of the children, the administration of the survey in five languages, and inclusion of less prevalent health conditions.

Conclusion

This study demonstrates the importance of accounting for nativity in the assessment of health disparities among children. The need for a more comprehensive approach to health disparities in which socioeconomic status is considered in combination with nativity and other determinants has been advocated in the US [2, 63, 64] and abroad [65]. Expanding our view to include nativity may enhance the effectiveness of policies and programs designed to improve the health status of children.

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