Social determinants of emergency department visits in mild compared to moderate/severe asthma

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INTRODUCTION/BACKGROUND

- Asthma is the most common chronic lung disease among children, **affecting nearly 9% of children in the United States.**
- The lack of access to preventive measures leads to **increase of emergency department (ED) visits for asthma exacerbation.**
- **Prior studies** do not consider the possibility that **social determinants of health** could matter more for children with **moderate/severe asthma opposed to children with mild asthma.**

MATERIALS & METHODS

- We used data from the **2016-2019 National Survey of Children's Health (NSCH),** a nationally representative cross-sectional survey collecting data on the physical and emotional health of US children age 0-17 years.
- The primary outcome was the **number of all-cause ED visits in the past 12 months**, classified as none, one, or two or more.
- The primary independent variable was caregiver-reported **asthma severity (mild vs. moderate or severe).**
- Measures of SDOH included **parental educational attainment** (highest of either parent), **type of insurance** (any private, public only, or none).
- Covariates included the **child's age, sex, race/ethnicity, exposure to tobacco smoke**, and whether the child has a usual. **source of health care that was not the ED**

RESULTS

Table 1. Emergency department visits and patient characteristics by caregiver-rated asthma severity (N=9,937).

Variable	Children with mild asthma (N=7041)	Children with moderate/severe asthma (N=2896)	P
	Weighted mean or proportion (95% CI)	Weighted mean or proportion (95% CI)	
ED visits in last 12 months			
0	0.70 (0.68, 0.73)	0.52 (0.47, 0.56)	<0.001
1	0.21 (0.19, 0.23)	0.26 (0.22, 0.31)	0.022
2 or more	0.09 (0.07, 0.10)	0.22 (0.18, 0.26)	<0.001
Age (years)	10.4 (10.2, 10.6)	10.2 (9.8, 10.5)	0.31
Sex			
Male	0.57 (0.55, 0.60)	0.54 (0.50, 0.58)	0.22
Female	0.43 (0.40, 0.45)	0.46 (0.42, 0.50)	0.22
Race/ethnicity			
Non-Hispanic White	0.47 (0.45, 0.50)	0.37 (0.33, 0.40)	<0.001
Non-Hispanic Black	0.19 (0.17, 0.21)	0.27 (0.24, 0.31)	<0.001
Hispanic/Latino	0.22 (0.20, 0.25)	0.29 (0.24, 0.34)	0.014
Other	0.11 (0.10, 0.13)	0.07 (0.06, 0.09)	<0.001
Insurance type			
Private	0.61 (0.59, 0.64)	0.44 (0.40, 0.48)	<0.001
Public only	0.34 (0.32, 0.37)	0.50 (0.46, 0.55)	<0.001
None	0.04 (0.03, 0.06)	0.06 (0.04, 0.07)	0.20
Parental educational attainment			
High school or less	0.23 (0.20, 0.25)	0.30 (0.27, 0.35)	0.001
Some college	0.32 (0.30, 0.34)	0.35 (0.31, 0.39)	0.26
Bachelor's degree	0.22 (0.21, 0.24)	0.19 (0.17, 0.22)	0.059
Graduate/professional degree	0.23 (0.21, 0.25)	0.15 (0.13, 0.18)	<0.001
Tobacco exposure	0.19 (0.17, 0.21)	0.20 (0.17, 0.23)	0.63
Has usual source of care	0.80 (0.78, 0.82)	0.20 (0.17, 0.23)	0.07

CI, confidence interval; ED, emergency department

Table 2. Multivariable ordinal logistic regression of emergency department visits (N=9,937).

Variable	OR	95% CI	P
Asthma severity			
Mild	Ref.		
Moderate/severe	2.13	1.73, 2.63	<0.001
Age (years)	0.912	0.89, 0.93	<0.001
Sex			
Male	Ref.		
Female	0.909	0.74, 1.11	0.35
Race/ethnicity			
Non-Hispanic White	Ref.		
Non-Hispanic Black	1.49	1.17, 1.90	0.001
Hispanic/Latino	1.09	0.81, 1.46	0.59
Other	1.14	0.86, 1.50	0.36
Insurance type			
Private	Ref.		
Public only	1.60	1.25, 2.05	<0.001
None	1.60	1.04, 2.47	0.034
Parental educational attainment			
High school or less	Ref.		
Some college	0.80	0.60, 1.07	0.14
Bachelor's degree	0.58	0.42, 0.79	0.001
Graduate/professional degree	0.59	0.41, 0.85	0.004
Tobacco exposure	1.20	0.94, 1.54	0.14
Has usual source of care	0.77	0.59, 1.00	0.054

CI, confidence interval; OR, odds ratio; Ref. reference

Appendix Table 1. Unadjusted ordinal logistic regression models of emergency department visits, interacting each characteristic with asthma severity (N=9,937).

Variable	Children with mild asthma			Children with moderate/severe asthma			P-value for difference in ORs
	OR	95% CI	P	OR	95% CI	P	
Age (years)	0.92	0.90, 0.94	<0.001	0.89	0.86, 0.93	<0.001	0.167
Sex							
Male	Ref.			Ref.			
Female	0.85	0.68, 1.06	0.16	0.87	0.61, 1.22	0.41	0.944
Race/ethnicity							
Non-Hispanic White	Ref.			Ref.			
Non-Hispanic Black	1.72	1.31, 2.27	<0.001	2.03	1.37, 2.99	<0.001	0.502
Hispanic/Latino	1.33	0.97, 1.85	0.081	1.55	0.98, 2.45	0.062	0.607
Other	1.37	0.96, 1.95	0.080	0.90	0.54, 1.48	0.673	0.177
Insurance type							
Private	Ref.			Ref.			
Public only	2.26	1.79, 2.86	<0.001	2.32	1.64, 3.28	<0.001	0.907
None	2.34	1.35, 4.05	0.002	2.51	1.31, 4.81	0.006	0.872
Parental educational attainment							
High school or less	Ref.			Ref.			
Some college	0.57	0.42, 0.78	<0.001	0.93	0.58, 1.51	0.777	0.091
Bachelor's degree	0.35	0.26, 0.48	<0.001	0.53	0.34, 0.84	0.006	0.136
Graduate/professional degree	0.34	0.25, 0.48	<0.001	0.46	0.27, 0.76	0.003	0.367
Tobacco exposure	1.51	1.17, 1.94	0.002	1.23	0.80, 1.88	<0.001	0.420
Has usual source of care	0.66	0.50, 0.88	0.004	0.58	0.36, 0.92	0.004	0.612

CI, confidence interval; OR, odds ratio; Ref. reference

DISCUSSION

- The data available in the tables now suggests that **SDOH do not have a stronger associations in children with moderate/severe asthma compared to children with mild asthma.**
- Children with **moderate/severe asthma had more Emergency Department (ED) visits compared to children with mild asthma.**
- Knowing the severity of asthma beforehand can help prioritize resources to this group and **reduce ED utilization and healthcare costs.**

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