

Sociodemographic Factors of Asthma Prevalence and Costs for Children in the United States, 2016-2021

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BACKGROUND

- Asthma is a chronic condition with a high prevalence in children and a high economic burden.
- While sociodemographic factors associated with childhood asthma prevalence have been described, the impact of these factors on medical expenditures is limited.
- In this study, we examined disparities in treated asthma prevalence among US children and medical expenditures associated with asthma.

METHODS

- This is a pooled cross-sectional study of 2,365 children with treated asthma (3,697,530 weighted) compared to 40,497 children without treated asthma (69,795,477 weighted) in the 2016-2021 Medical Expenditures Panel Survey.
- Treated asthma was defined as whether the child had a medical event (emergency room visit, hospital inpatient stay, hospital outpatient visit, office-based medical visit, home health, and/or prescribed medicines) due to asthma.
- We included sociodemographic factors of race/ethnicity, age, gender, health insurance coverage, family income poverty status, and census region.
- Two-part models and generalized linear models were used to estimate annual per-person incremental medical expenditures associated with asthma. All expenditures are adjusted to 2021 price levels.

Table 1. Weighted Sample Characteristics of US Children by Treated Asthma Status, 2016-2021

Characteristic	Children without treated asthma (%)	Children with treated asthma (%)	Total (%)	P Value
Race/Ethnicity				<0.001
Hispanic	25.38	26.96	25.46	
Non-Hispanic White	49.85	40.96	49.40	
Non-Hispanic Black	13.23	21.75	13.66	
Non-Hispanic Asian	5.35	3.66	5.26	
Non-Hispanic Other	6.19	6.67	6.22	
Age				<0.001
0-4 years	27.08	14.75	26.46	
5-14 years	55.19	66.11	55.74	
15-17 years	17.73	19.14	17.80	
Gender				<0.001
Male	50.62	58.86	51.03	
Female	49.38	41.14	48.97	
Health Insurance Coverage				<0.001
Any private	60.59	50.46	60.08	
Public only	36.60	48.12	37.18	
Uninsured	2.81	1.42	2.74	
Family Income				<0.001
≤100% FPL	16.41	22.70	16.73	
100%-125% FPL	5.51	7.42	5.60	
>125%-200% FPL	15.01	17.99	15.16	
>200%-400% FPL	29.95	24.66	29.68	
>400% FPL	33.12	27.23	32.83	
Region				0.002
Northeast	15.70	19.59	15.90	
Midwest	20.92	24.60	21.11	
South	39.04	35.10	38.84	
West	24.34	20.71	24.15	
Year				<0.001
2016	16.72	18.42	16.80	
2017	16.61	18.67	16.71	
2018	16.57	19.11	16.70	
2019	16.75	16.66	16.75	
2020	16.55	14.21	16.43	
2021	16.80	12.93	16.60	

Notes. Data: 2016-2021 Medical Expenditures Panel Survey. The Pearson chi-squared test was used to test differences. All estimates are pooled and weighted adjusting for the complex survey design. FPL: Federal Poverty Level

Table 2. Multivariable Logistic Regression of Factors Influencing Children's Treated Asthma Status

Characteristic	Odds Ratio	P value	95% Confidence Interval	
Race/Ethnicity (Ref: Non-Hispanic White)				
Hispanic	1.221	0.040	1.009	1.477
Non-Hispanic Black	1.785	<0.001	1.454	2.192
Non-Hispanic Asian	0.822	0.403	0.520	1.301
Non-Hispanic Other	1.287	0.089	0.962	1.722
Age (Ref: 0-4 years)				
5-14 years	2.215	<0.001	1.832	2.679
15-17 years	2.046	<0.001	1.614	2.594
Gender (Ref: Female)				
Male	1.401	<0.001	1.222	1.606
Health Insurance Coverage (Ref: Any private)				
Public only	1.276	0.012	1.055	1.542
Uninsured	0.554	0.035	0.320	0.959
Family Income (Ref: >400% FPL)				
≤100% FPL	1.247	0.101	0.958	1.622
100%-125% FPL	1.245	0.163	0.914	1.696
>125%-200% FPL	1.171	0.239	0.900	1.522
>200%-400% FPL	0.890	0.261	0.726	1.091
Region (Ref: South)				
Midwest	1.510	<0.001	1.209	1.887
Northeast	1.468	0.001	1.177	1.832
West	1.028	0.801	0.831	1.271

Notes. Data: 2016-2021 Medical Expenditures Panel Survey. All estimates are pooled and weighted adjusting for the complex survey design. FPL: Federal Poverty Level

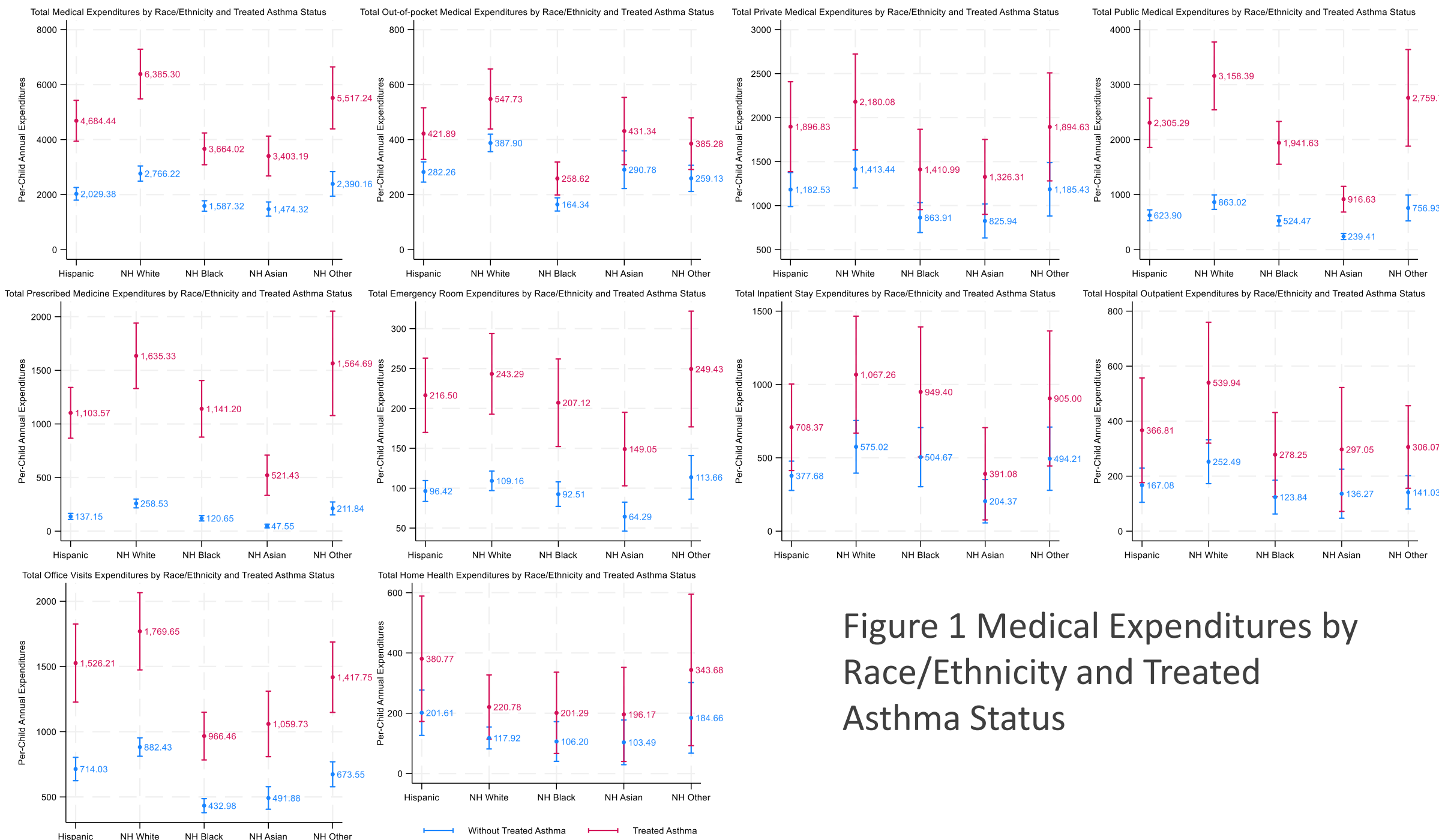


Figure 1 Medical Expenditures by Race/Ethnicity and Treated Asthma Status

FINDINGS

- Children with treated asthma were more likely to be Non-Hispanic Black and Hispanic than Non-Hispanic White, male than female, and publicly insured than privately insured (Table 2).
- Children with treated asthma had an annual additional \$3362.56 in total medical expenditures, \$174.06 in total out-of-pocket payments, \$955.96 for prescribed medicines, \$151.52 for emergency room visits, and \$858.17 for office-based medical visits.
- Non-Hispanic Black children with treated asthma had significantly less office-based medical visit expenditures (\$803.20) than Non-Hispanic White children with treated asthma.

DISCUSSION

- The \$3362.56 in incremental annual total medical expenditures is higher than previous estimates of treated asthma for children which may suggest that the incremental medical expenditures of treated asthma for children are increasing over time.
- Black Non-Hispanic and Hispanic children have a higher prevalence of treated asthma but also lower medical expenditures compared to White Non-Hispanic children; this is possibly due to drivers such as a lack of availability of health services within community resulting in undertreatment.
- Previous research shows that Black Non-Hispanic children with asthma have fewer family provider visits for asthma and were less likely to receive a written asthma treatment plan from their provider compared to White Non-Hispanic children with asthma which may increase the risk of uncontrolled asthma.

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