

Children's Mercy Kansas City

SHARE @ Children's Mercy

Research Days

GME Research Days 2024

May 13th, 11:30 AM - 1:30 PM

Socioeconomic Differences in Penicillin Allergy Label Rates of Children Evaluated in Pediatric Emergency Departments and Urgent Cares

Zoya Siddiqui
UMKC

Brian R. Lee
Children's Mercy Kansas City

Amanda Nedved
Children's Mercy Hospital

Jennifer McKinsey
Children's Mercy Kansas City

Frances Turcotte Benedict
Children's Mercy Hospital

Let us know how access to this publication benefits you

See next page for additional authors

Follow this and additional works at: <https://scholarlyexchange.childrensmercy.org/researchdays>

 Part of the [Allergy and Immunology Commons](#), and the [Pediatrics Commons](#)

Siddiqui, Zoya; Lee, Brian R.; Nedved, Amanda; McKinsey, Jennifer; Turcotte Benedict, Frances; Missel, Brandi; Pandya, Aarti; and El Feghaly, Rana, "Socioeconomic Differences in Penicillin Allergy Label Rates of Children Evaluated in Pediatric Emergency Departments and Urgent Cares" (2024). *Research Days*. 12. https://scholarlyexchange.childrensmercy.org/researchdays/GME_Research_Days_2024/ResearchDay1/12

This Poster Presentation is brought to you for free and open access by the Conferences and Events at SHARE @ Children's Mercy. It has been accepted for inclusion in Research Days by an authorized administrator of SHARE @ Children's Mercy. For more information, please contact hlsteel@cmh.edu.

Authors

Zoya Siddiqui, Brian R. Lee, Amanda Nedved, Jennifer McKinsey, Frances Turcotte Benedict, Brandi Missel, Aarti Pandya, and Rana El Feghaly

Submitting/Presenting Author (must be a trainee): Zoya Siddiqi

Primary Email Address: zsiddiqui@mail.umkc.edu

X Medical Student

Resident/Psychology Intern (≤ 1 month of dedicated research time)

Resident/Ph.D/post graduate (> 1 month of dedicated research time)

Fellow

Primary Mentor (one name only): Rana El Feghaly MD, MSCI

Other authors/contributors involved in project: Brian Lee PhD, MPH, Amanda Nedved MD, Jennifer McKinsey MD, Frances Turcotte Benedict MD, MPH, Brandi Missel APRN, Aarti Pandya MD

IRB Number: STUDY00002871

Describe role of Submitting/Presenting Trainee in this project (limit 150 words):

Zoya identified the project, reviewed the relevant literature, submitted for IRB approval, created the data collection tool, reviewed subset of charts to validate accuracy, revised the data, and wrote the initial abstract draft.

Title: Socioeconomic Differences in Penicillin Allergy Label Rates of Children Evaluated in Pediatric Emergency Departments and Urgent Cares

Introduction: Penicillins are the most widely prescribed antibiotics. About 10% of children are labeled as penicillin allergic, although 95% of those do not exhibit a type 1 hypersensitivity allergic reaction following skin testing or oral challenge. Penicillin allergy labels are less commonly reported in Black patients compared to White patients. However, few studies investigate differences in penicillin allergy label rates associated with patients' primary language, interpreter use, insurance type, and other socioeconomic demographic factors.

Objective: To investigate whether sociodemographic factors, such as race, ethnicity, primary language spoken, insurance type, and area deprivation index (ADI), a tool used to display the relative socioeconomic conditions of neighborhoods, are associated with penicillin allergy labels in children.

Methods: We performed a retrospective chart review of all children 19 years and younger evaluated in our pediatric urgent care centers and emergency departments from July 2022-June 2023. We collected patients' self-reported race, ethnicity, language, use of interpreter, and insurance type, in addition to street address and zip code used to calculate patients' ADI. We ran logistic regression models to identify groups with higher odds of having a penicillin allergy label.

Results: We reviewed 183,692 patients' charts and found 11,669 (6.3%) patients were labeled as penicillin allergic. Penicillin allergy labels were more common in older children (10-19 years), as expected, reaching 9.1%, while younger children (0-2 years) had a lower rate of 3%. There was no difference observed in penicillin allergy label rates by sex (**Table 1**). After adjusting for different sociodemographic variables, we found that, compared to White Non-Hispanic (NH) children, children of almost all races and ethnicities were less likely to have a penicillin allergy label, with particularly lower odds in Asian and Black NH children (aOR 0.46, CI 0.36, 0.6, p

<0.001 and aOR 0.48, CI 0.43, 0.55, $p < 0.001$ respectively). Additionally, we found that, compared to children with Medicaid, children with commercial insurance were more likely to carry a penicillin allergy label (aOR 1.11, CI 1.03, 1.2, $p = 0.007$), while patients who self-pay were less likely to carry this label (aOR 0.67, CI 0.56, 0.8, $p < 0.001$). Compared to patients not requiring language services, patients who required Spanish language services were less likely to be labeled as penicillin allergic (aOR 0.57, CI 0.45, 0.72, $p < 0.001$). (**Table 2**). Finally, patients from higher ADI deciles (i.e., the neighborhoods with greater socioeconomic disadvantages) were less likely to have penicillin allergy labels (**Tables 1 and 2**).

Conclusions:

In this review of over 180,000 children evaluated in pediatric emergency departments and urgent cares, we found that, in addition to race, there were differences in penicillin allergy label rates documentation associated with socioeconomic status, reflected by insurance and ADI. We are now conducting a quality improvement project to reduce inaccurate penicillin allergy labels, with an increased awareness of socioeconomic and demographic variables, to improve health equity among our patients.

Table 1 – Comparison of the demographics of children with penicillin allergy labels compared to those without an allergy label

		Penicillin Allergy Documented		
		Yes	No	Total
<i>Age quartile</i>				
	1 (0, 26.3 months)	1396 (3.0%)	44527 (97.0%)	45923
	2 (26.3, 64.8 months)	2681 (5.8%)	43241 (94.2%)	45922
	3 (64.8, 121.5 months)	3426 (7.5%)	42496 (92.5%)	45922
	4 (121.5, 228.0 months)	4166 (9.1%)	41756 (90.9%)	45922
<i>Sex</i>				
	Female	5651 (6.4%)	82879 (93.6%)	88530
	Male	6017 (6.3%)	89120 (93.7%)	95137
	Other/Unknown	1 (4.5%)	21 (95.5%)	22
<i>Race/ethnicity*</i>				
	American Indian or Alaska Native	43 (9.6%)	403 (90.4%)	446
	Asian	165 (3.8%)	4228 (96.2%)	4393
	Black or African American	1236 (3.6%)	32644 (96.4%)	33880
	Native Hawaiian or Other Pacific Islander	30 (4.0%)	715 (96.0%)	745
	White	7391 (8.2%)	82350 (91.8%)	89741
	Multiracial	557 (6.2%)	8394 (93.8%)	8951
	Hispanic	1955 (5.0%)	36767 (95.0%)	38722
	Other	148 (6.0%)	2330 (94.0%)	2478
	Unknown	144 (3.3%)	4189 (96.7%)	4333
<i>Insurance type</i>				
	Commercial	5687 (7.8%)	67598 (92.2%)	73285
	Medicaid	5216 (5.4%)	90774 (94.6%)	95990

	Self-pay	249 (3.6%)	6580 (96.4%)	6829
	Other/Unknown	517 (6.8%)	7068 (93.2%)	7585
<i>Language services</i>				
	No language services	11544 (6.4%)	167651 (93.6%)	179195
	Spanish	117 (2.7%)	4245 (97.3%)	4362
	Other/Unknown	8 (6.1%)	124 (93.9%)	132
<i>Area Deprivation Index (ADI)**</i>				
	1	2433 (7.9%)	28547 (92.1%)	30980
	2	1907 (7.4%)	23961 (92.6%)	25868
	3	1550 (7.1%)	20139 (92.9%)	21689
	4	987 (6.8%)	13446 (93.2%)	14433
	5	1238 (6.7%)	17214 (93.3%)	18452
	6	817 (5.8%)	13168 (94.2%)	13985
	7	737 (5.5%)	12626 (94.5%)	13363
	8	527 (5.4%)	9176 (94.6%)	9703
	9	668 (4.7%)	13525 (95.3%)	14193
	10	554 (3.5%)	15366 (96.5%)	15920

**Race: all Hispanic ethnicity included in "Hispanic". All other races include non-Hispanic patients*

*** ADI missing for 5103 (2.8%) of records*

Table 2: Logistic Regression models depicting the odds ratio of a penicillin allergy label of our patient population

		Unadjusted Logit Model (N=178586)			Adjusted Logit Model (N=178586)		
		Odds Ratio	p-value	95% CI	Odds Ratio	p-value	95% CI
<i>Age quartile</i>							
	1 (0, 26.3 months)	0.31	<0.001	0.28, 0.35	0.32	<0.001	0.28, 0.35
	2 (26.3, 64.8 months)	0.62	<0.001	0.57, 0.67	0.62	<0.001	0.58, 0.68
	3 (64.8, 121.5 months)	0.80	<0.001	0.75, 0.86	0.81	<0.001	0.75, 0.87
	4 (121.5, 228.0 months)	<i>-ref-</i>	---	---	<i>-ref-</i>	---	---
<i>Sex</i>							
	Female	<i>-ref-</i>	---	---	<i>-ref-</i>	---	---
	Male	0.99	0.733	0.93, 1.05	1.02	0.510	0.96, 1.09
	Other/Unknown	0.86	0.883	0.11, 6.74	0.65	0.685	0.08, 5.26
<i>Race/ethnicity*</i>							
	American Indian or Alaska Native	1.22	0.496	0.69, 2.17	1.27	0.433	0.70, 2.31
	Asian	0.44	<0.001	0.34, 0.57	0.46	<0.001	0.36, 0.60
	Black or African American	0.43	<0.001	0.38, 0.47	0.48	<0.001	0.43, 0.55
	Native Hawaiian or Other Pacific Islander	0.46	0.014	0.25, 0.85	0.54	0.053	0.29, 1.01
	White	<i>-ref-</i>	---	---	<i>-ref-</i>	---	---

	Multiracial	0.73	<0.001	0.62, 0.85	0.81	0.010	0.69, 0.95
	Hispanic	0.59	<0.001	0.54, 0.64	0.72	<0.001	0.65, 0.79
	Other	0.72	0.050	0.52, 1.00	0.75	0.086	0.54, 1.04
	Unknown	0.38	<0.001	0.31, 0.47	0.49	<0.001	0.40, 0.61
<i>Insurance type</i>							
	Commercial	1.46	<0.001	1.37, 1.56	1.11	0.007	1.03, 1.20
	Medicaid	<i>-ref-</i>	---	---	<i>-ref-</i>	---	---
	Self-pay	0.67	<0.001	0.56, 0.80	0.67	<0.001	0.56, 0.80
	Other/Unknown	1.31	0.001	1.12, 1.53	1.09	0.269	0.93, 1.29
<i>Language services</i>							
	No language services	<i>-ref-</i>	---	---	<i>-ref-</i>	---	---
	Spanish	0.41	<0.001	0.32, 0.51	0.57	<0.001	0.45, 0.72
	Other/Unknown	0.96	0.915	0.47, 1.97	1.22	0.589	0.59, 2.53
<i>Area Deprivation Index (ADI)**</i>							
	1	<i>-ref-</i>	---	---	<i>-ref-</i>	---	---
	2	0.93	0.168	0.85, 1.03	1.01	0.849	0.91, 1.11
	3	0.90	0.068	0.81, 1.01	1.02	0.794	0.91, 1.14
	4	0.86	0.021	0.76, 0.98	0.99	0.830	0.87, 1.12
	5	0.84	0.003	0.75, 0.95	1.01	0.843	0.90, 1.14
	6	0.73	<0.001	0.63, 0.84	0.91	0.200	0.78, 1.05
	7	0.68	<0.001	0.59, 0.79	0.88	0.094	0.76, 1.02
	8	0.67	<0.001	0.57, 0.79	0.92	0.343	0.78, 1.09
	9	0.58	<0.001	0.50, 0.67	0.83	0.021	0.70, 0.97
	10	0.42	<0.001	0.36, 0.50	0.66	0.000	0.55, 0.78

**Race: all Hispanic ethnicity included in "Hispanic". All other races include non-Hispanic patients*

*** ADI missing for 5103 (2.8%) of records*