

INTRODUCTION

- Pediatric poisoning can occur from a variety of toxic substances, and children in rural settings have a higher incidence of exposure to poisoning events.
- Barriers to healthcare in rural areas can delay treatment in pediatric patients who experienced poisoning.
- Limited community resources; transportation barriers, inadequate medical personnel training, and language barriers.
- Primary Aim
- To compare the Emergency Medical Services (EMS) response time between pediatric poisoning events treated by rural as compared to urban EMS agencies.
- Secondary Aims
- To compare the incidence of dispatch delays, response delays, scene delays, and transport delays between rural and urban settings.

MATERIALS & METHODS

- 2021 National Emergency Medical Services Information System (NEMSIS)
- Patients under 18 years old transported by EMS with a provider primary impression of poisoning were included ○ (N=11,911, 12% rural).
- Analysis
- Study variables compared using rank-sum tests and Chisquare tests.
- Outcomes analyzed using quantile regression and logistic regression

Comparing prehospital time among pediatric poisoning patients in rural and urban settings

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RESULTS

- The median total prehospital time by EMS was 40 minutes (interquartile range: 29, 57)
- The most common type of delay was scene delay (6%). Patients transported by rural EMS agencies experienced 7 minutes (95%) confidence interval: 5, 8) longer prehospital time than those transported by urban agencies.
- There were no differences between rural and urban EMS agencies in the occurrence of dispatch, response, scene, and transportation delays.

Variable	Time prior to hospital	Р
	Coefficient (95% CI)	
EMS agency location		
Urban	Ref.	
Rural	6.6 (5.2, 8.0)	< 0.001
Age (years)	-0.4 (-0.5, -0.3)	< 0.001
Sex		
Male	Ref.	
Female	1.8 (0.9, 2.8)	< 0.001
Race and ethnicity		
Non-Hispanic White	Ref.	
Non-Hispanic Black	-3.2 (-4.3, -2.0)	< 0.001
Hispanic	-2.6 (-4.0, -1.2)	< 0.001
Other	-0.4 (-2.2, 1.4)	0.673
Acuity		
Critical – red	Ref.	
Emergent – yellow	6.2 (4.3, 8.2)	< 0.001
Lower acuity – green	5.6 (3.6, 7.5)	< 0.001
Transported by air	68.5 (65.0, 72.1)	< 0.001

				Transportation	
Variable	Dispatch delay	Response delay	On scene delay	delav	
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	
EMS agency location					
Urban	Ref.	Ref.	Ref.	Ref.	
Rural	0.8 (0.4, 1.7)	0.9 (0.7, 1.2)	0.8 (0.6, 1.0)	0.9 (0.6, 1.3)	
Age (years)	0.98 (0.95, 1.01)	1.01 (0.99, 1.02)	0.99 (0.84, 1.16)	0.97 (0.95, 0.99)**	
Sex					
Male	Ref.	Ref.	Ref.	Ref.	
Female	1.0 (0.7, 1.5)	1.1 (0.9, 1.3)	1.0 (0.8, 1.2)	1.6 (1.2, 2.1) ***	
Race and ethnicity					
Non-Hispanic White	Ref.	Ref.	Ref.	Ref.	
Non-Hispanic Black	4.6 (3.0, 7.1) ***	1.5 (1.2, 1.8)***	1.2 (1.0, 1.5)*	1.1 (0.8, 1.4)	
Hispanic	1.5 (0.8, 3.0)	1.4 (1.1, 1.8)**	1.4 (1.2, 1.8)***	1.3 (1.0, 1.8)	
Other	2.6 (1.3, 5.3)**	1.7 (1.2, 2.2)***	1.2 (0.9, 1.7)	0.8 (0.5, 1.3)	
Acuity					
Critical – red	Ref.	Ref.	Ref.	Ref.	
Emergent – yellow	1.6 (0.5, 5.3)	1.0 (0.7, 1.4)	0.6 (0.5, 0.9)**	0.8 (0.5, 1.2)	
Lower acuity – green	3.4 (1.0, 11.0) *	1.0 (0.7, 1.4)	0.7 (0.5, 0.9)**	0.8 (0.5, 1.3)	
Transported by air	1.9 (0.5, 8.4)	1.3 (0.7, 2.3)	1.1 (0.6, 2.0)	0.5 (0.2, 1.6)	
CI, confidence interval; OR, odds ratio; Significance levels (*, p=<0.05; **, p=<0.01; ***,p=<0.001)					

DISCUSSION

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• These results elucidate the need for equitable allocation of resources and training to enhance rural EMS responders. • By integrating targeted interventions to rural pediatric populations, better care can be achieved across all geographic regions. Multifaceted Strategies Equitable resource allocation, targeted training for rural EMS personnel, and integration of technology. • Further research must be conducted to ascertain the specific factors, outside of delays, resulting in the disparity between rural and urban prehospital time.

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