

Factors Associated with Caregiver Refusals for Children Left at Scene by Emergency Medical Services (EMS)

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Introduction

Almost one third of pediatric 911 calls result in a child not being transported by Emergency Medical Services (EMS). In some of these encounters a caregiver refuses transport, while in other cases EMS advises that transport is not needed. There is limited information regarding what proportion of pediatric non-transport are due to caregiver refusals. It is unknown whether demographic, encounter or agency factors are associated with refusals. Our primary objective was to determine the prevalence of, and factors associated with, caregiver refusal for children assessed by EMS. Our secondary objective was to determine how pediatric non-transport and caregiver refusals vary across EMS agencies.

Methods

We conducted a retrospective cross-sectional study with data from the national 2019 ESO Data Collaborative (a convenience sample from > 2,000 EMS agencies). We included 911 responses for children <17 years. The primary outcome was caregiver refusal (per EMS documentation). Descriptive data for patient dispositions were generated. Bivariate and multivariable logistic regression identified factors associated with caregiver refusal.

Results

Of 313,903 eligible records, 37% resulted in non-transport. 52% of non-transport was due to caregiver refusals, with the remainder initiated by EMS. Demographic characteristics of these cohorts are presented in Table 1. Amongst all non-transport, in our multivariable model caregiver refusals were most strongly associated with calls originating in the South and Northeast regions (aOR 1.78 [95% CI 1.72, 1.85] and 1.63 [1.44, 1.84] respectively), records with complete vital signs (aOR 1.35 [1.31, 1.40]), and encounters where an injury was identified (aOR 1.30 [1.25, 1.36]) (Table 2). Weaker positive associations with caregiver refusal were found for Hispanic ethnicity, calls originating in urban areas, and calls attended to by an ALS team. The median non-transport rate for EMS agencies was 37 % (IQR 23–44%). Amongst non-transport cases, the median caregiver refusal rate by agency was 44% (IQR 14–80%) (Figure 1).

Conclusions

In this national dataset, 37% of all children were not transported by EMS with a majority of cases due to caregiver refusal. Patient demographics, nature of the medical complaint, composition of the EMS team, and urbanicity were associated with caregiver refusals. Both the rates of non-transport, and caregiver refusals varied significantly between EMS agencies. Further research is needed to describe patient outcomes after non-transport and to explore reasons for EMS agency practice variability.

Table 1. Characteristics of enrolled children sorted by reason for non-transport (caregiver refusal vs. EMS decision)

	Caregiver Refusal (N=54793)	EMS Decision (N=46641)
Age (Years)		
Mean (SD)	8.73 (5.86)	8.59 (5.95)
Median [Min, Max]	9.00 [0, 17.0]	9.00 [0, 17.0]
Gender		
Female	26742 (48.8%)	22032 (47.2%)
Male	27519 (50.2%)	23414 (50.2%)
Missing	532 (1.0%)	1195 (2.6%)
Race		
Black or African American	14432 (26.3%)	11123 (23.8%)
White	29855 (54.5%)	24260 (52.0%)
Asian	644 (1.2%)	667 (1.4%)
Hispanic or Latino	6249 (11.4%)	3993 (8.6%)
Other	1980 (3.6%)	1801 (3.9%)
Missing	1633 (3.0%)	4797 (10.3%)
EMS Requested By		
Patient	6717 (12.3%)	5137 (11.0%)
Bystander	12310 (22.5%)	9559 (20.5%)
Family	25734 (47.0%)	22142 (47.5%)
First Responder or Health Professional	5519 (10.1%)	5130 (11.0%)
Missing	4513 (8.2%)	4673 (10.0%)
Urbanicity		
Rural	8252 (15.1%)	7289 (15.6%)
Super Rural	1550 (2.8%)	1275 (2.7%)
Urban	44961 (82.1%)	38065 (81.6%)
Missing	30 (0.1%)	12 (0.0%)
Geographic Region		
Midwest	9474 (17.3%)	11179 (24.0%)
Northeast	1011 (1.8%)	1623 (3.5%)
South	38517 (70.3%)	23007 (49.3%)
West	5487 (10.0%)	10647 (22.8%)
Missing	304 (0.6%)	185 (0.4%)
Priority		
Emergent	46722 (85.3%)	39735 (85.2%)

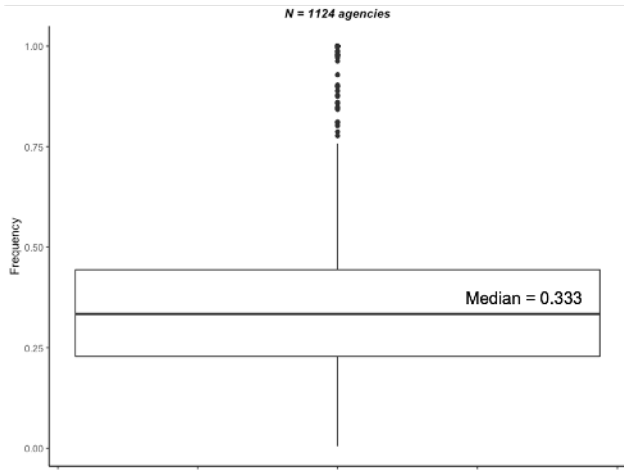
	Caregiver Refusal (N=54793)	EMS Decision (N=46641)
Non-emergent	8071 (14.7%)	6906 (14.8%)
Unit Level		
ALS	48721 (88.9%)	35018 (75.1%)
BLS	3663 (6.7%)	6030 (12.9%)
Missing	2409 (4.4%)	5593 (12.0%)
Injury		
No injury	36580 (66.8%)	31652 (67.9%)
Injury	17016 (31.1%)	11932 (25.6%)
Missing	1197 (2.2%)	3057 (6.6%)
Medical v. Trauma		
Medical	30725 (56.1%)	26077 (55.9%)
Trauma	22344 (40.8%)	17444 (37.4%)
Medical and Trauma	774 (1.4%)	657 (1.4%)
Missing	950 (1.7%)	2463 (5.3%)
Pregnancy		
Not pregnant	54704 (99.8%)	46566 (99.8%)
Pregnant	89 (0.2%)	75 (0.2%)
Time of Day		
During office hours	30408 (55.5%)	25977 (55.7%)
Outside office hours	24385 (44.5%)	20664 (44.3%)
Vital Signs Obtained		
Incomplete	24526 (44.8%)	24843 (53.3%)
Complete	30267 (55.2%)	21798 (46.7%)
Language Barrier Present		
No language barrier	52901 (96.5%)	42692 (91.5%)
Language Barrier	505 (0.9%)	359 (0.8%)
Missing	1387 (2.5%)	3590 (7.7%)

Table 2. Factors associated with caregiver refusal of pediatric transport

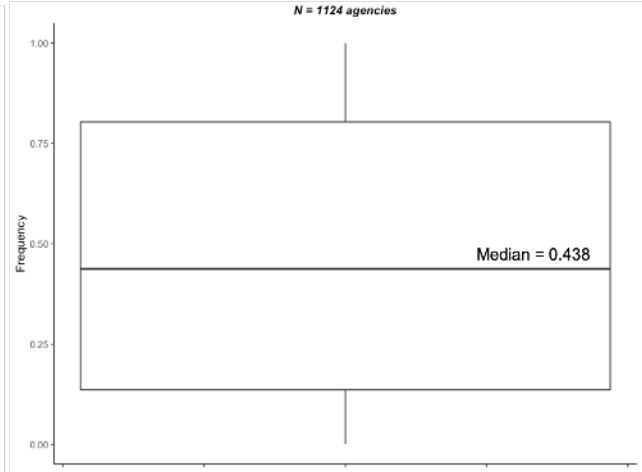
	Caregiver Refusal (%)	EMS Decision (%)	OR (95% CI)	aOR (95% CI)
Gender				
Male	54.0	46.0	Reference	
Female	54.8	45.2	1.03 (1.01, 1.06)	1.03 (1.00, 1.06)
Race				
White	55.2	44.8	Reference	
Black	56.5	43.5	1.05 (1.02, 1.09)	0.84 (0.81, 0.87)
Asian	49.1	50.9	0.78 (0.70, 0.88)	0.73 (0.64, 0.82)
Hispanic	61	29	1.27 (1.22, 1.33)	1.11 (1.06, 1.16)
Other	52.4	47.6	0.89 (0.84, 0.95)	1.00 (0.92, 1.08)
Urbanicity				
Rural	53.1	46.9	Reference	
Urban	54.2	45.8	1.04 (1.01, 1.08)	1.23 (1.12, 1.35)
Super-rural	54.9	45.1	1.07 (0.99, 1.16)	1.13 (1.09, 1.18)
Region				
Midwest	45.9	54.1	Reference	
Northeast	38.4	61.6	0.74 (0.68, 0.80)	1.63 (1.44, 1.84)
South	62.6	37.4	1.98 (1.91, 2.04)	1.78 (1.72, 1.85)
West	34.0	66.0	0.61 (0.58, 0.63)	0.94 (0.89, 0.99)
Priority				
Non-emergency	53.9	46.1	Reference	
Emergency	54.0	46.0	1.01 (0.97, 1.04)	0.84 (0.81, 0.88)
Requested By				
Patient	56.7	43.3	Reference	
Bystander	56.3	43.7	0.98 (0.94, 0.92)	0.98 (0.93, 1.03)
Family	53.8	46.2	0.89 (0.85, 0.93)	0.87 (0.83, 0.91)
Health Professional	51.8	48.2	0.82 (0.78, 0.87)	0.81 (0.76, 0.86)
EMS Unit				

BLS	37.8	62.2	Reference	
ALS	58.2	41.8	2.29 (2.19, 2.39)	1.27 (1.20, 1.35)
Time of Dispatch				
During office hours	53.9	46.1	Reference	
Outside of office hours	54.1	45.9	1.01 (0.98, 10.03)	1.00 (0.97, 1.03)
Vital Signs				
Incomplete	49.7	50.3	Reference	
Complete	58.1	41.8	1.41 (1.37, 1.44)	1.35 (1.31, 1.40)
Presence of Trauma				
Medical	54.1	45.9	Reference	
Trauma	56.2	43.8	1.09 (1.06, 1.12)	0.94 (0.90, 0.98)
Medical and Trauma	54.1	45.9	1.00 (0.90, 1.11)	0.93 (0.82, 1.06)
Presence of injury				
No injury	53.6	46.4	Reference	
Injury	58.8	41.2	1.23 (1.20, 1.27)	1.30 (1.25, 1.36)
Pregnancy				
No pregnancy	54.0	46.0	Reference	
Pregnancy	54.3	45.7	1.01 (0.74, 1.37)	0.82 (0.59, 1.16)
Language Barrier				
No language barrier	55.3	44.6	Reference	
Language barrier	58.4	41.6	1.14 (0.99, 1.30)	1.14 (0.97, 1.34)

Figure 1. Variation by EMS agency in the proportion of pediatric 9-1-1 calls that result in non-transport (a) and in the proportion of pediatric non-transport cases that are due to caregiver refusal (b)



a. Variation by EMS agency in the proportion of pediatric 9-1-1 calls that result in non-transport



b. Variation by EMS agency in the proportion of pediatric non-transport cases that are due to caregiver refusal