

Injured Pedestrians: A National Descriptive Analysis (2012 – 2016)

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Abstract:

Effective planning for pedestrian safety relies on accurate assessment of pedestrian injuries and fatalities. While robust reporting systems exist for pedestrian fatalities, underreporting of pedestrian injuries is well documented. The National Emergency Medical Services Information System (NEMSIS) collects a convenience sample of emergency medical services (EMS) data from 43 – 49 U.S. States and Territories (depending on the year). Our descriptive analysis of the NEMSIS Public Release Research Datasets from 2012 – 2016 describes patterns in demographics, temporality, urbanicity and medical care necessity among pedestrian EMS responses. Attendees will gain a better understanding of the national pedestrian injury burden and the benchmarking potential of EMS data.

Background:

- Pedestrian fatalities increased 35% nationwide from 2008 – 2017¹
- 5,987 pedestrians killed in 2016, largest number in US in over 25 years²
- Trend appears to be worsening: estimated 6,227 pedestrian deaths in 2018³
- Underreporting of pedestrian injuries in police crash reports; studies call for analysis of new data sources and improved linkage with hospital data^{3,4}
- Age and gender disparities among injured pedestrians previously reported^{5,6}

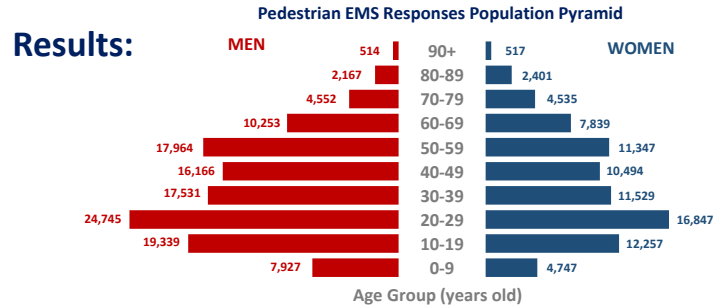


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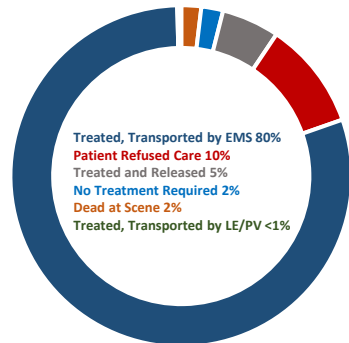
EMS responses nationwide for pedestrian traffic crashes from 2012 – 2016

Methods:

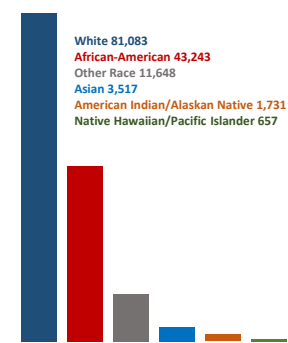
- Data source: National Emergency Medical Services Information System (NEMSIS) Public Release Research Datasets 2012 – 2016
- Inclusion criteria: all EMS responses where the patient's cause of injury was "Pedestrian Traffic Accident," limited to EMS first contact with the patient via 911 activation, transfers excluded to remove duplicate records
- Descriptive analysis performed using SAS 9.4



Pedestrian EMS Responses by Patient Disposition



Pedestrian EMS Responses by Race



56% of 911 callers **received instructions about what to do prior to EMS arrival**, indicating a possible opportunity for post-crash intervention



6PM – 9PM (19%) was the **MOST COMMON TIME** for pedestrian EMS responses, followed by 3PM – 6PM (18%), suggesting an increased risk of walking in the evening



89% were in **URBAN** areas vs suburban, rural or wilderness, indicating that cities need safety interventions



1 in 10 pedestrian EMS responses **arrived to a HOME** vs a street or other location, suggesting that some patients require care after they have left the crash scene

Results (cont.):



Most Common Primary Symptoms	Frequency (%) N = 137,490; missing = 68,721
Pain	93,657 (68.2)
Wound	13,884 (10.1)
Change in Response	8,981 (6.5)
Bleeding	8,926 (6.5)
None	3,699 (2.7)



Most Common Medications Given	Frequency (%) N = 136,040; missing = 3,793
Oxygen	25,246 (18.6)
IV Fluids - NaCl 0.9%	19,246 (14.2)
Fentanyl	13,015 (9.6)
Morphine Sulfate	5,608 (4.1)
Epinephrine 1:10,000	3,692 (2.7)



Most Common Chief Complaint Location	Frequency (%) N = 112,693; missing = 93,518
Leg	36,476 (32.4)
General/Global	34,655 (30.8)
Head	14,881 (13.2)
Arm	12,664 (11.2)
Back	7,423 (6.6)



Most Common Procedures	Frequency (%) N = 443,970; missing = 8,450
Spinal Immobilization	101,119 (22.8)
IV Catheter	65,620 (14.8)
Cardiac Monitor	29,752 (6.7)
Pulse Oximetry	28,501 (6.4)
Wound Care	27,098 (6.1)

Limitations:

- Possible selection bias: convenience sample, not necessarily nationally representative
- NEMSIS captured approximately 70 – 85% of all EMS responses nationwide from 2012 – 2016 (depending on the year), so our findings are still underestimates
- Injured pedestrians who do not interact with EMS and transport themselves to medical care are not captured in EMS data, so total injury burden is likely higher

Discussion & Conclusions:

- Pedestrian injuries from 2012 – 2016 were at least 7.9X higher than the number of pedestrian fatalities from the same period, indicating a much larger injury burden
- Walking in urban areas from 6PM – 9PM appears to be particularly dangerous
- Males (60%), African-Americans (30%) and 20-29 year-olds (20%) were the most represented groups, suggesting the need for further study into possible disparities
- Among pedestrian EMS responses, 80% of patients were transported to the hospital, showing that the majority required further medical attention
- EMS data may be useful for pedestrian safety benchmarking and program evaluation, possible opportunities for collaborative research with EMS agencies
- **Everyone is a pedestrian**



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References: 1. Governors Highway Safety Association. *Pedestrian Traffic Fatalities by State: 2018 Preliminary Data*. 2019. 2. NHTSA FARS Traffic Safety Facts: *Pedestrians*. 2018. 3. National Transportation Safety Board. *Special Investigation Report: Pedestrian Safety*. 2018. 4. Collaborative Sciences Center for Road Safety. *Completing the Picture of Traffic Injuries: Understanding Data Needs and Opportunities for Road Safety*. 2018. 5. Nesoff et al. Local vs. national: Epidemiology of pedestrian injury in a mid-Atlantic city. *Traffic Injury Prevention*. 2018;19(4): 440-445. 6. Chong et al. Epidemiology of Pedestrian-Motor Vehicle Fatalities and Injuries, 2006 – 2015. *American Journal of Preventive Medicine*. 2018;55(1): 98-105.

