Injury Characterization for Wildlife-Vehicle Collisions of Motorcyclists in Wisconsin

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INTRODUCTION

Professional rescuer and federal data have highlighted an increased burden of wildlife-vehicle collisions with motorcyclist involvement in the State of Wisconsin. Documentation of these events typically occurs in the patient narrative, as electronic patient care reporting relies on ICD-10 codes without specification to animal or pedestrian involvement. Identification and characterization of these events is important for development of system-level interventions to improve response readiness and overall reduction of motorcyclist mortality.

OBJECTIVE

Identify, characterize, and contextualize EMS activations with injury involving wildlife-vehicle collisions among motorcyclists in Wisconsin leveraging patient narratives in Wisconsin.

METHODS

- Retrospective observational evaluation of motor vehicle collisions involving motorcycles with injury from 2018-2023
- Data obtained via the ImageTrend platform with permission from Wisconsin Office of Preparedness and Emergency Health Care
- Collisions identified using ICD-10 codes (e.g., V20, V21, V30, V39) indicating motorcycle involved injury
- Narratives flagged if wildlife present in Wisconsin is present (e.g., turkey, bear, elk), animal involvement tested against a 5% random sample of chosen collisions
- Analysis: Descriptive statistics (n, %; median, interquartile range), Rate of animal involved motorcycle collision per 100 motorcycle collisions identified, Trend evaluation using Joinpoint regression

RESULTS

- 7,078 Motorcycle involved collisions were identified over the study period, with 1,695 (24%) flagged as animal involved
- Median age of patient in animal involved vs non-animal involved was higher (45 vs 41), proportion of white, non-Hispanic patients lower (90% vs 84%), and proportion of patients receiving treatment and transport higher (78% vs 71%) (Table 1)
- Monthly counts of animal involved motorcycle collisions with injury exhibited seasonal trends, with numbers decreasing during November to February of each yearly cycle (Figure 1)
- Overall trend of animal involved motorcycle collisions per 100 motorcycle collisions with injury showed consistent increase over the study period, accounting for repeating seasonality (Figure 2)

Table 1. Demographics of motorcycle injury related collisions in Wisconsin from January of 2018 to December 2023.

Characteristic	Overall n (%)	Animal Involved n (%)	No Animal Involved n (%)
N Incidents	7,078	1,695 (24)	5,383 (76)
Age (Median, IQR)	42 (27-56)	45 (30-57)	41 (27-56)
Sex			
Male	5,615 (80)	1,364 (81)	4,251 (79)
Female	1,421 (20)	326 (19)	1,095 (21)
Missing	*42*	*5*	*37*
Race and Ethnicity			
White, non-Hispanic	4,995 (85)	1,338 (90)	3,657 (84)
Black, non-Hispanic	389 (6)	67 (5)	322 (7)
Hispanic or Latino	279 (5)	41 (3)	240 (6)
Other	201 (4)	38 (3)	163 (4)
Missing	*1,214*	*211*	*1,003*
Patient Disposition			
Treated, Transported	5,129 (72)	1,313 (78)	3,816 (71)
Treated, Released	676 (10)	142 (8)	534 (10)
Treated, Transferred Care	741 (10)	150 (9)	591 (11)
Evaluated, No Treatment Needed	148 (2)	26 (1)	122 (3)
Refused Care	226 (3)	31 (2)	195 (4)
Dead at Scene	158 (2)	33 (2)	125 (2)
Chief Complaint Anatomic Location			
Abdomen	64 (1)	19 (2)	45 (1)
Back	325 (7)	68 (6)	257 (7)
Chest	306 (7)	96 (8)	210 (6)
Extremity-Lower	1,109 (24)	293 (24)	816 (24)
Extremity-Upper	867 (19)	220 (18)	647 (19)
General/Global	1,118 (24)	307 (25)	811 (24)
Genitalia	5 (0)	2 (0)	3 (0)
Head	775 (17)	214 (17)	561 (16)
Neck	99 (2)	13 (1)	86 (3)
Missing	*1,952*	*463*	*1947*

Figure 1. Distribution monthly counts of animal involved motorcycle injury collisions in Wisconsin, January 2018 to December 2023.

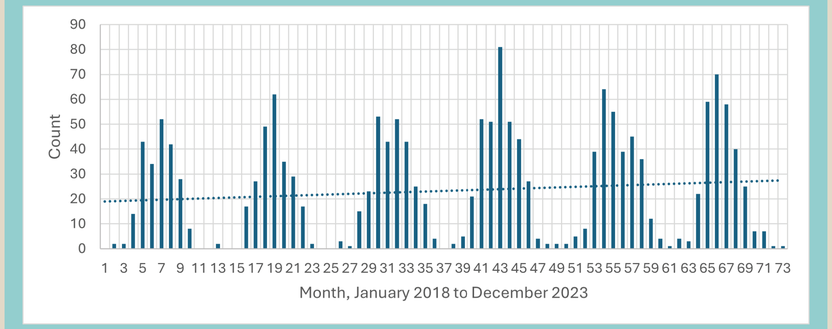
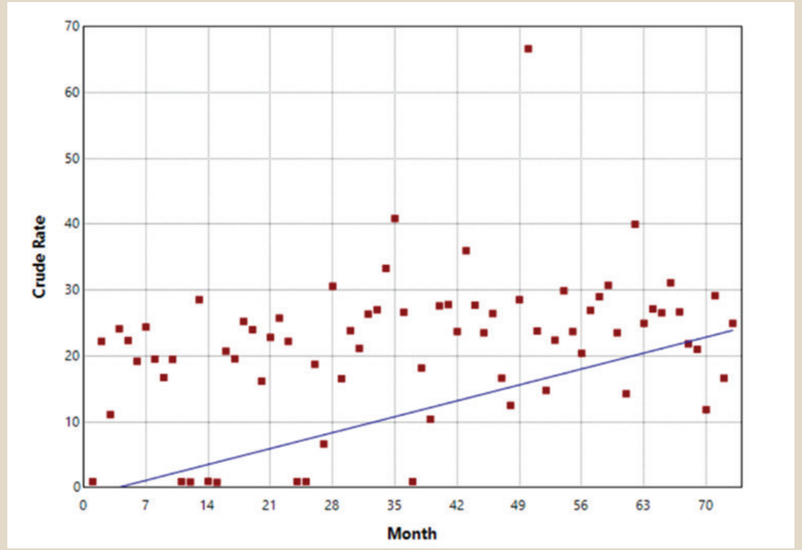


Figure 2. Crude rates of animal involved motorcycle collisions per 100 motorcycle collisions with injury over the study period.



CONCLUSION

Use of free-text narratives allowed for identification of motorcyclists involved in wildlife-vehicle collisions. Small proportional differences were noted among patient demographics and disposition outcomes. Results highlight the value of using unstructured EMS patient care report data for identifying injury data phenotypes. These methods and foundational data allow researchers to more accurately characterize this population, yielding potential for additional analysis and intervention development. Findings have immediate utility to public health and safety professionals working to develop and implement countermeasures to reduce motorcyclist morbidity and mortality.

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