

Motor Vehicle Crash (MVC) Case Definitions and How They Impact MVC Surveillance

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Objective

Identify and describe how the case definition used to identify MVC patients can impact results when conducting MVC surveillance using ED data. We compare MVC patients identified using external cause of injury codes (E-codes), text searches of triage notes and chief complaint, or both criteria together.

Introduction

In 2012, an estimated 2.5 million people presented to the ED for a MVC injury in the U.S.¹ National injury surveillance is commonly captured using E-codes.² However, use of E-codes alone to capture MVC-related ED visits may result in a different picture of MVC injuries compared to using text searches of triage or chief complaint notes.

Methods

MVC-related ED visit data were obtained from the North Carolina Disease Event Tracking and Epidemiologic Collection Tool (NC DETECT) from one central county in NC for the year 2013. Data were categorized based on case definition used to identify the record as pertaining to an MVC. The three case definitions were: 1) MVC injuries identified using E-codes (E810-E825), 2) text searches for MVC-related key words in either the triage note or chief complaint field, and 3) MVC injuries identified using both text searches and E-codes. Demographic and descriptive characteristics included: sex, age, disposition, transport mode, payor source, visit time, and injury diagnosis (based on the Barell Injury Matrix³). Descriptive statistics were used to describe differences in patient characteristics based on the case definition used to identify MVC injury. Analyses were conducted using SAS Version 9.2 (Cary, NC) and Microsoft Excel 2007.

Results

Most ED visits contained both MVC-text and MVC-related E-codes (n=13422, 76%). Another 4265 visits were identified by including the additional case definitions of text only (n=2139, 12%) or E-code only (n=2101, 12%). Patients identified using E-codes only were more likely to be male, arrive by ambulance, and admitted to the hospital compared to patients identified by text searches or both text and E-codes. Review of triage notes for those patients without E-codes suggests that patients identified with text searches are more likely to be presenting to the ED for late effects or chronic injuries from MVCs in the past.

Conclusions

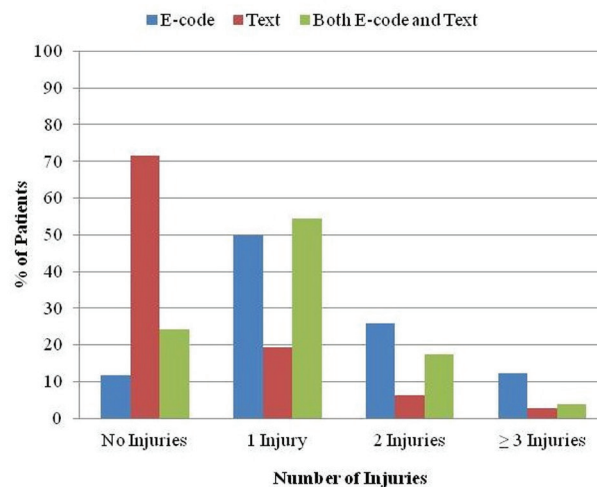
The choice of case definition used for MVC surveillance appears to impact the picture of MVC injury severity. When developing a research question or surveillance project, it is important that public health researchers are aware of the impact case definition has on their results.

Table 1: Comparison of 2013 MVC injuries presenting to the ED based on case definition, N (%)

Patient Characteristic	Case Definition			Total N=17662
	E-codes N=2101	Text Fields* N=2139	E-codes & Text N=13422	
Sex				
Male	1180 (56.2)	990 (46.3)	6000 (44.7)	8170 (46.3)
Female	921 (43.8)	1148 (53.7)	7422 (55.3)	9491 (53.7)
Age				
0-15	225 (10.7)	170 (7.9)	1411 (10.5)	1806 (10.2)
16-20	224 (10.7)	161 (7.5)	1528 (11.4)	1913 (10.8)
21-35	750 (35.7)	749 (35.0)	5034 (37.5)	6533 (37.0)
36-55	639 (30.4)	741 (34.6)	3997 (29.8)	5377 (30.4)
56+	263 (12.5)	318 (14.9)	1452 (10.8)	2033 (11.5)
Disposition				
Discharged home	1561 (75.7)	1713 (82.8)	12522 (94.7)	15796 (91.0)
Transferred to another unit	29 (1.4)	53 (2.6)	68 (0.5)	150 (0.9)
Left without being seen or against medical advice	15 (0.7)	136 (6.6)	229 (1.7)	380 (2.2)
Admitted	436 (21.1)	149 (7.2)	364 (2.8)	949 (5.5)
Other (including deaths)	22 (1.1)	19 (0.9)	37 (0.3)	78 (0.5)
Missing	38	69	202	309
Transport Mode				
Ambulance	375 (20.1)	144 (10.1)	1045 (9.4)	1564 (8.9)
Walk-in	859 (46.1)	905 (63.5)	5771 (51.9)	7535 (42.7)
Other	119 (6.4)	197 (13.8)	1527 (13.7)	1843 (10.4)
Unknown	510 (27.4)	180 (12.6)	2782 (25.0)	6720 (38.0)
Payor Source				
Private	672 (32.0)	631 (29.5)	4402 (32.8)	5705 (32.3)
Medicare	179 (8.5)	172 (8.0)	710 (5.3)	1061 (6.0)
Medicaid	332 (15.8)	250 (11.7)	1508 (11.2)	2090 (11.8)
Self-pay	800 (38.1)	914 (42.7)	6099 (45.4)	7813 (44.2)
Other ^b	102 (4.9)	114 (5.3)	622 (4.6)	838 (4.7)
Unknown	16 (0.8)	58 (2.7)	81 (0.6)	155 (0.9)
Visit Time				
0-5:59	221 (10.5)	147 (6.9)	822 (6.1)	1190 (6.7)
6:00-11:59	473 (22.5)	532 (24.9)	2939 (21.9)	3944 (22.3)
12:00-17:59	810 (38.6)	849 (39.7)	5137 (38.3)	6796 (38.5)
18:00-23:59	597 (28.4)	611 (28.6)	4524 (33.7)	5732 (32.5)

*Text used in search: MVC, MVTA, MVTC, MVA, MCTC, MCTA, MCC, MCA, motor vehicle, motorcycle, car accident, motorcycle accident, car crash, motorcycle crash, car wreck, motorcycle wreck, pedestrian, auto accident, automobile accident, automobile roll, moped
^bOther includes: Workers' comp and other government payments

Barell Injury Diagnoses Among MVC-related ED Visits



Keywords

MVC Injury; surveillance; ED visit data



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