

Data Linkage Indicator Report

North Carolina Crash Injury Surveillance System

November 2020

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Report Description

This report represents a summary of data linkage indicators as part of Recipient Activity 4 of the FY 2019 Supplemental Guidance for the Core State Violence and Injury Prevention Program (Core SVIPP) CE16-1602 Notice of Funding Opportunity. A description of the data linkage methodology is available in the [North Carolina Crash Injury Surveillance System Year 1 Final Report](#).

The project is a collaboration between the North Carolina Division of Public Health (NC DPH) Injury and Violence Prevention Branch, the University of North Carolina Injury Prevention Research Center, the UNC Carolina Center for Health Informatics, and the UNC Highway Safety Research Center.

Funding

The funding source for this project was based on the year four motor vehicle supplement of the five year CDC grant Core State Violence and Injury Prevention Program (Core SVIPP), which was awarded to the North Carolina Department of Health and Human Services Injury and Violence Prevention Branch (NCDHHS IVPB). The University of North Carolina at Chapel Hill Injury Prevention Research Center (UNC IPRC) was contracted (contract number 00039605) to complete the work.

NC DPH Data Attribution & Disclaimer

NC DETECT is a statewide public health syndromic surveillance system, funded by the NC Division of Public Health (NC DPH) Federal Public Health Emergency Preparedness Grant and managed through collaboration between NC DPH and UNC-CH Department of Emergency Medicine's Carolina Center for Health Informatics. The NC DETECT Data Oversight Committee does not take responsibility for the scientific validity or accuracy of methodology, results, statistical analyses, or conclusions presented.

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Descriptions of Source Data

In Year 1 (2019-2020), we linked two health datasets with crash report data: death certificate data and emergency department (ED) visit data from the North Carolina Disease Event Tracking and Epidemiologic Collection Tool (NC DETECT). All data were from 2018.

Crash Report Data

Crash report data are recorded by law enforcement officers for motor vehicle crashes involving a motor vehicle in transport resulting in an un-stabilized situation, which includes at least one harmful event. North Carolina crash records must meet at least one of the following criteria: The crash resulted in a fatality, a non-fatal personal injury, total property damage amounting to \$1,000.00 or more, property damage of any amount to a vehicle seized, or the vehicle has been seized and is subject to forfeiture under G. S. 20-28.3. In addition, a reportable motor vehicle traffic crash must occur on a trafficway (any land way open to the public as a matter of right or custom for moving persons or property from one place to another) or occur after the motor vehicle runs off the roadway but before events are stabilized.

There were 832,058 persons involved in 355,571 crashes in the 2018 crash report data.

Death Certificate Data

Death certificate data represent the death certificates for deaths occurring in North Carolina and filed with the North Carolina Vital Records office. These data include resident and non-resident deaths within state boundaries.

There were 94,867 deaths recorded in North Carolina in 2018.

NC DETECT Emergency Department Visit Data

Emergency department visit data are pulled from NC DETECT, North Carolina's statewide syndromic surveillance system. As mandated by North Carolina Statute § 130A-480 Emergency Department Data Reporting, NC DETECT receives daily extracts through the North Carolina Healthcare Association (NCHA), consisting of select data elements from all ED visits to 24/7 civilian acute care hospital affiliated EDs in NC.

There were 5,084,987 emergency department (ED) visits in the 2018 dataset.

Data Linkage Indicators: Crash and Death Certificate Data

Number and percent of persons in each dataset used for data linkage

100% of crash report data and death certificate data were included in the linkage process (N=832,058 and N=94,867 respectively).

Note: Linkage totals reflect the linked datasets at the time of this report. Future analysis using later iterations of the linked datasets may produce different totals due to additional data validation and linkage evaluation.

Number and percent of persons with linked records

Linked crash report and death certificate records as a percentage of total crash reports by law enforcement-reported injury severity

Law enforcement-assigned injury severity designations	Original Crash Report Data	Linked Data	
	N	N	% of corresponding crash data
K-Fatal injury	1,468	1,433	97.6
A-Serious injury	4,700	15	0.3
B-Minor injury	29,339	14	<0.1
C-Possible injury	95,735	10	<0.1
O-No injury	689,423	7	<0.1
Unknown	11,393	4	<0.1
Total	832,058	1,483	0.2

Linked crash report and death certificate records as a percentage of total death certificates by medical examiner-reported causes of death*

ICD-10 cause of death categories	Original death certificate data	Linked Data	
	N	N	% of corresponding death certificate data
Any transportation-related cause of death	1,677	1,451	86.5
Injury cause of death without a transportation-related cause of death	7,680	23	0.3
No injury or transportation-related cause of death	85,510	9	<0.1
Total	94,867	1,483	1.6

*Injury causes of death: ICD-10 codes [S][0-9][0-9]|T[0-8][0-8]|V[0-8]|V9[8-9];
Transportation-related causes of death: ICD-10 codes U011|V[0-9][1-9]|X82|Y03|Y361

Number and percent of motor vehicle crashes with linked records

The 1,483 persons represented in the linked crash and death certificate data are from 1,370 crash events reported in 2018. This represents 0.4% of the 355,571 crash events reported in 2018.

Data Linkage Indicators: Crash and Emergency Department (ED) Visit Data

Number and percent of persons in each dataset used for data linkage

100% of crash report data was included in the linkage process (N=832,058).

ED data were first filtered to exclude any records with a disposition code of 20, representing a disposition of “transferred/discharged to another short-term general hospital.” This filter removed 1.2% of all ED visits (N= 58,547). The remaining 5,026,440 ED visit records were used in the linkage, representing 98.8% of the original records.

Note: Linkage totals reflect the linked datasets at the time of this report. Future analysis using later iterations of the linked datasets may produce different totals due to additional data validation and linkage evaluation.

Number and percent of persons with linked records

Linked crash report and ED visit records as a percentage of total crash reports by law enforcement-reported injury severity

Law enforcement-assigned injury designations	Original Crash Report Data	Linked Data	
	N	N	% of corresponding crash data
K-Fatal injury	1,468	158	10.8
A-Serious injury	4,700	2,329	49.6
B-Minor injury	29,339	14,141	48.2
C-Possible injury	95,735	36,032	37.6
O-No injury	689,423	30,163	4.4
Unknown	11,393	1,175	10.3
Total	832,058	83,998	10.1

Linked crash report and ED visit records as a percentage of total ED visits by diagnosis code category*

ICD-10-CM diagnosis code categories	Original ED visit data	Linked Data	
	N	N	% of corresponding ED visit data
Any transportation-related diagnosis code	148,713	76,814	51.7
Injury diagnosis code without a transportation-related diagnosis code	834,589	7,133	0.9
No injury or transportation-related diagnosis code	4,043,138	51	<0.1
Total	5,026,440	83,998	1.7

*Injury diagnosis codes: ICD-10-CM codes [S][T];

Transportation-related diagnosis codes: ICD-10-CM codes U011|V[0-9][1-9]|X82|Y03|Y361

Number and percent of motor vehicle crashes with linked records

The 83,998 persons represented in the linked crash and ED visit data are from 63,681 crash events in 2018. This represents 17.9% of the 355,571 crash events reported in 2018.

Number and percent of persons with non-fatal injuries from motor vehicle crashes

Linked crash report and ED visit records with non-fatal injuries* as a percentage of total ED visits by diagnosis code category**

ICD-10-CM diagnosis code categories	Original ED visit data	Non-fatal linked data*	
	N	N	% of corresponding ED visit data
Any transportation-related diagnosis code	148,713	76,671	51.6
Injury diagnosis code without a transportation-related diagnosis code	834,589	7,114	0.9
No injury or transportation-related diagnosis code	4,043,138	51	<0.1
Total	5,026,440	83,836	1.7

*Excludes 162 matches with either an ED visit disposition of death or a fatal injury status in the crash report.

**Injury diagnosis codes: ICD-10-CM codes [S][T];

Transportation-related diagnosis codes: ICD-10-CM codes U011|V[0-9][1-9]|X82|Y03|Y361