

Data-Driven Strategies: Healthcare Data

Utilizing Emergency Department and EMS Data to Monitor Trends and Enhance Local and State Safety Efforts

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Disclosures



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- **NC DETECT 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.
- **NC OEMS/NC EMS Data System Data Attribution & Disclaimer:** The NC OEMS and the NC EMS Data System supports state, regional and local EMS and healthcare related service delivery from a patient care, resource allocation, and regulatory perspective. This report was not prepared in collaboration with investigators of the NC EMS Data System and does not necessarily reflect the opinions or views of the NC OEMS, ESO or the study sites participating in the NC EMS Data System.

What are Public Health Data Sources?

- Public health data sources are the systems and organizations that collect, analyze, and share information about **population health**
- Public health data include **healthcare data sources**, such as **prehospital** (e.g., Emergency Medical Services) and **hospital** (Emergency Department/Hospital Admission), as well as many others (e.g., Vital Records, Social Determinants of Health)

Uses of Healthcare Data for Traffic Injury Surveillance

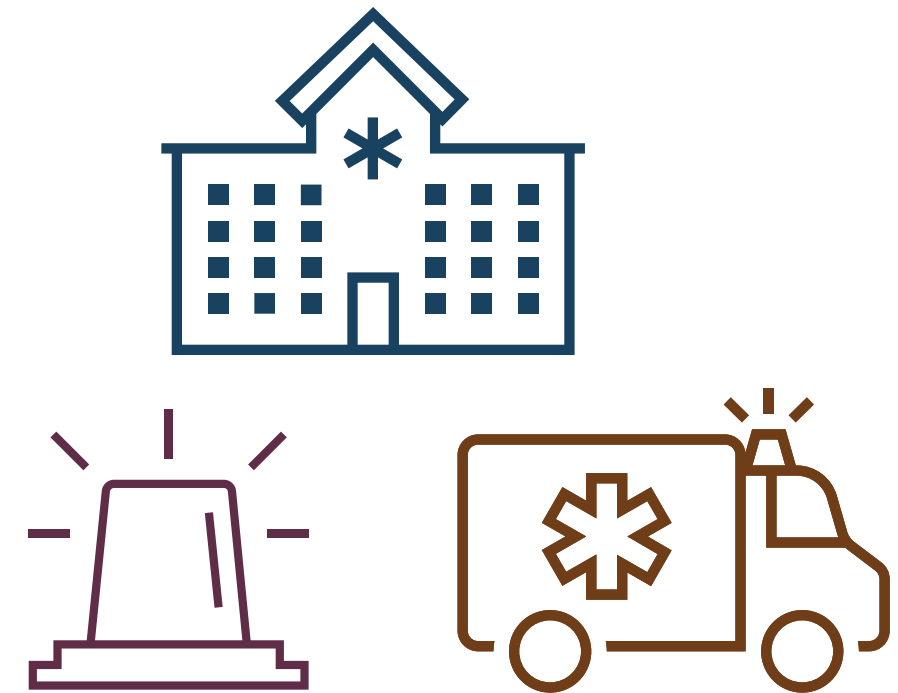


1. **Complement crash data** to better demonstrate the **full burden** of motor vehicle crashes
2. **Reveal patterns** in post-crash outcomes, healthcare utilization, and population-level impacts not captured in crash data
3. **Engage nontraditional partners**, a cornerstone of the Safe System approach
4. **Enhance evaluation** by connecting countermeasure implementation to post-crash outcomes, supporting an evidence-based framework for safety

How Are We Using Healthcare Data in North Carolina?*

Leveraging EMS, Emergency Department Visit, and Crash Data to Inform Traffic Safety Action in North Carolina

*Nearly all examples included in this presentation were obtained from the North Carolina Health Outcomes Data Dashboard



Key Data Sources



Police-Reported Crashes (N.C. DMV, 2021-2025)



Emergency Departments (N.C. Division of Public Health, 2017-2026)



Emergency Medical Services (N.C. Office of EMS, 2021-2022, 2024)*



Fatality Analysis Reporting System (NHTSA, 2019-2023)

Key Data Sources: Uses, Strengths, & Limitations

Data Source	What It Captures	Primary* & Secondary Uses	Strengths	Limitations
Crash Reports	Crash circumstances, vehicles, people involved	To serve as an official, legal record* , traffic safety analysis, planning, evaluation	Location, roadway factors, vehicular factors, driver behavior	Often misclassifies injury severity; only includes “reportable” crashes
Emergency Medical Services (EMS) Records	Vitals, demographics, treatment on-site and in-route to hospital	Operational performance & improved patient care* , public health surveillance	On-site assessment & treatment; geospatial information; time stamps; includes injuries not reported to LEOs	Misses minor injuries; limited diagnostic detail; road user missingness/ misclassification
Emergency Department (ED) Visit Records	Demographics, diagnoses, procedures, comorbidities, outcomes	Hospital administration and billing* , clinical research, public health surveillance	Population-based; healthcare utilization; includes injuries not reported to LEOs	No crash location; misses minor injuries; road user missingness/ misclassification

What Characteristics Are Important for Traffic Records Data Quality?



TIMELY



ACCURATE



COMPLETE



UNIFORM /
CONSISTENT



LINKABLE



ACCESSIBLE

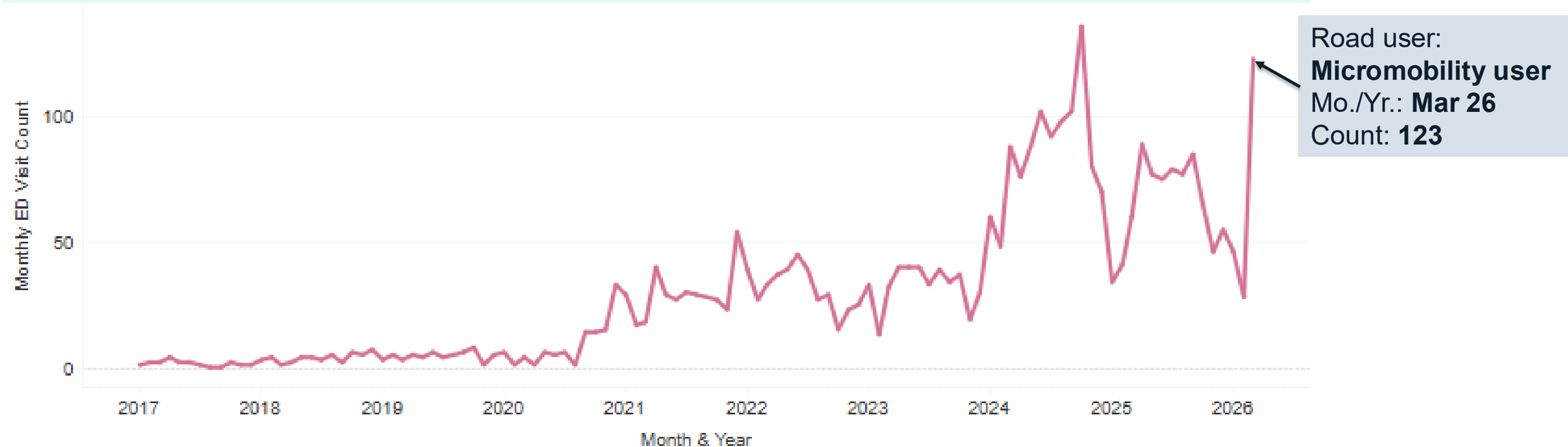
Healthcare data can help **fill gaps** in crash data quality

Healthcare Data Can Provide Timely Updates

Example: Monthly Counts of Emergency Department Visits Among Micromobility Users. 2017-2026 (Statewide)



Comparing Selected Locations by Transport Type: Micromobility Device Users (All Causes)
Locations: North Carolina



Injuries among micromobility users display seasonal trends, but are **increasing** statewide

Healthcare Data Can Complete the Picture of Traffic Injuries



Example: Post-Crash Outcomes in EMS Data, 2021-2022 (Forsyth County)

Health Outcomes Dashboard: EMS



This dashboard provides a county-level (EMS system) profile of motor vehicle crash patients treated by emergency medical services (EMS). Users can view data on suspected impairment, patient disposition, transport times, time of day, and demographic characteristics such as race, age, and gender.

Select EMS System County:

Forsyth

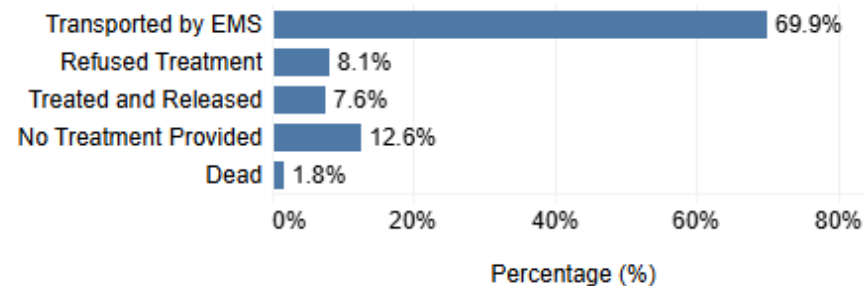
According to assessment by EMS personnel, **6.5%** of road users were suspected of being under the influence of drugs or alcohol, compared to NC state level as **5.1%**



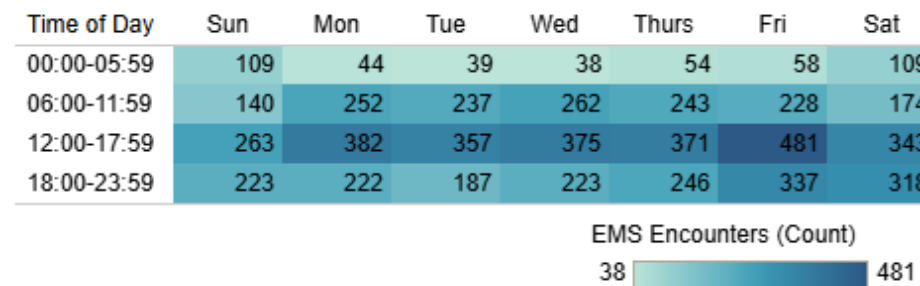
In **Forsyth**, on average, it took **42.89** minutes for patients to be transported, compared to the NC average of **44.12 minutes**.



Patient Disposition



Day and Time



Nearly **70%** of road users treated by EMS were **transported** to a hospital

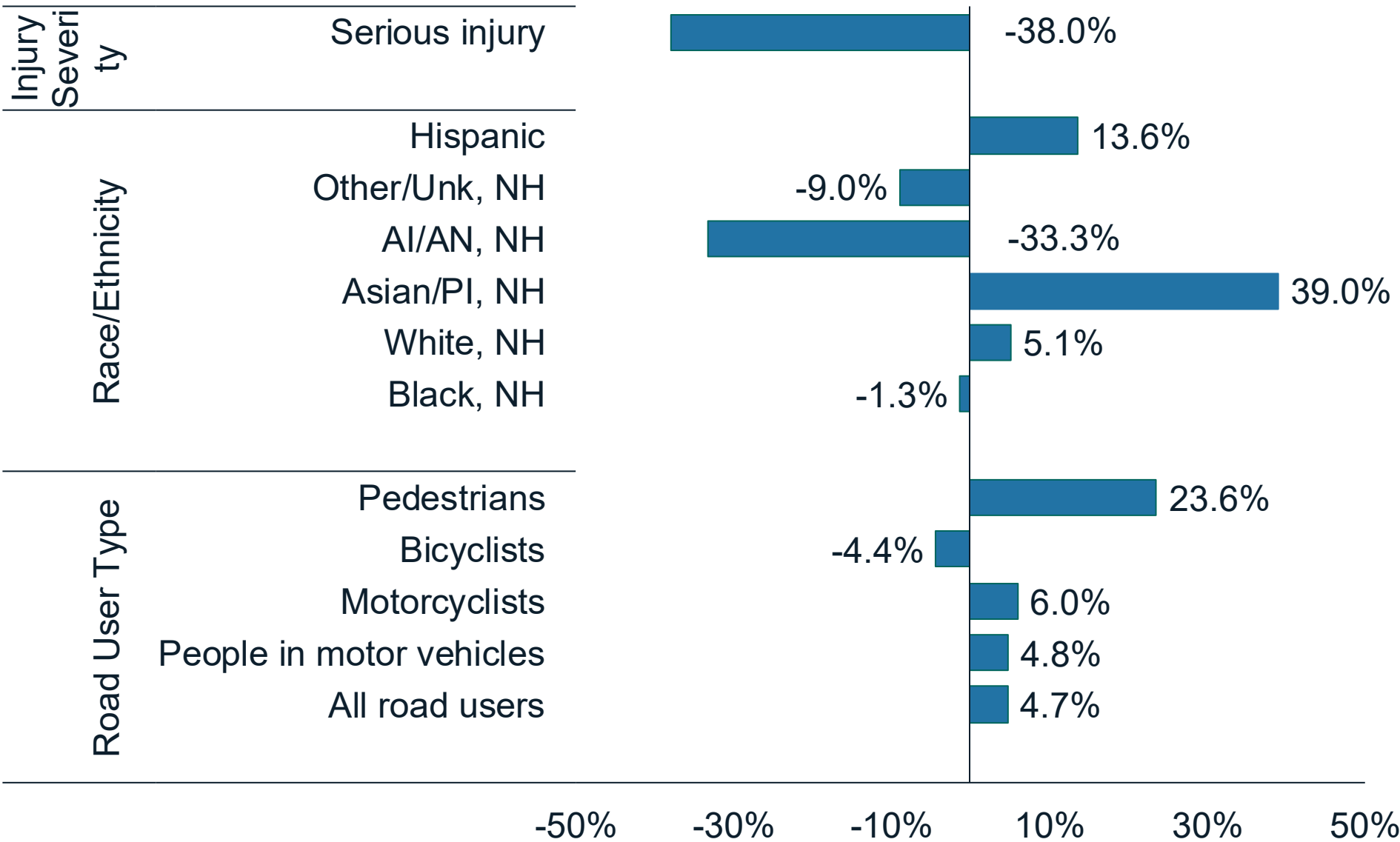
Among road users treated by EMS in Forsyth county, injuries **peaked on 12-5 PM on Fridays**

Healthcare Data Can Be Used for Local Benchmarks

Example: Monitoring Emergency Department Visit Trends (Orange County)



Orange County, North Carolina: 2025 YTD % Increase of ED Visit Counts (2021-2025)



Serious injuries among Orange County residents are **down**; however, **pedestrian injuries** are **up**

Healthcare Data Can Be Used for Local Benchmarks

Example: Vision Zero County Profile, 2019-2023 (Forsyth County)



Health Outcomes Dashboard: Vision Zero County Profile



This dashboard provides a county-level profile (Vision Zero county) of motor vehicle traffic injuries to support Vision Zero initiatives. Users can select a county and road user type to view fatality counts and emergency department visit rates, along with breakdowns by demographics, injury severity, and annual trends.

Select Vision Zero County: Forsyth
Select Road User Type: All People Injured in MVCs

212

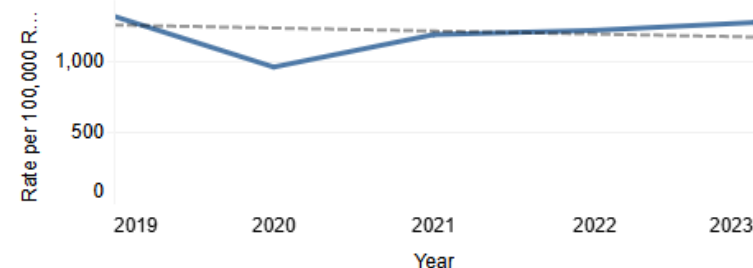
Total fatalities
from 2019-2023
(FARS)

1,193 (Higher than state rate)

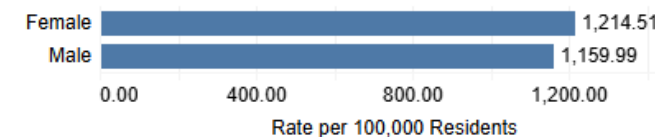
MVC ED Visits Rate
per 100,000 Residents

MVC ED Visit Rate with
3.7% Decrease
in 2023 vs. 2019

Annual Trends of All People Injured in MVCs ED Visits Rates per 100,000 Residents



Sex: All People Injured in MVCs



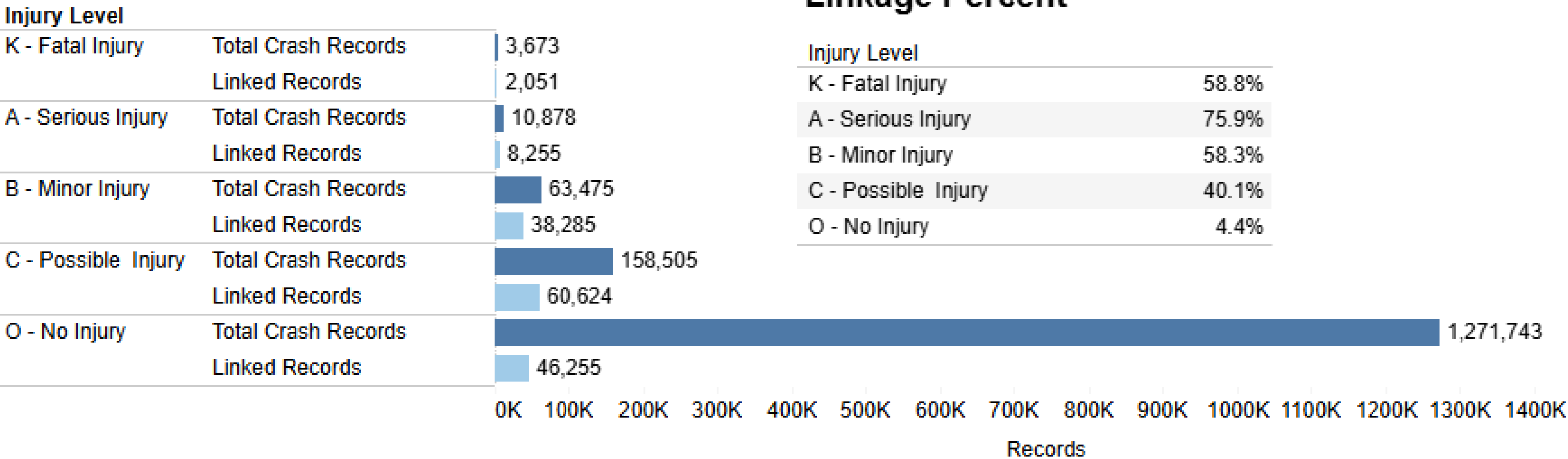
During 2019-2023, MVCs caused 212 deaths and ~23,000 injuries requiring treatment in local emergency departments. While the ED visit rate has decreased slightly, it is still **higher** than the state rate

Healthcare Data Linkage and Accuracy

Example: Crash & EMS Data Linkage, 2021-2022 (Statewide)



Linkage Status by Crash Injury Severity



Linkage Percent

Injury Level	
K - Fatal Injury	58.8%
A - Serious Injury	75.9%
B - Minor Injury	58.3%
C - Possible Injury	40.1%
O - No Injury	4.4%

While only ~4% of crash victims with linked crash-EMS records were reported as “not injured” by law enforcement, that equates to nearly **25,000 unreported injuries per year**

Health Outcomes Dashboard

DATA AND ANALYTICS

[VIEW ALL VISUALIZATIONS](#)



Visit the Health Outcomes Dashboard:
<https://ncvisionzero.org/visualizations/health-outcomes-dashboard/>

We Request your Feedback on our Dashboard

- What performance metrics help you evaluate success in your organization or community?
- Does your organization or community include healthcare data in community storytelling, planning documents, or decision-making processes?
- What additional healthcare data or indicators would you like to see included in the Dashboard, and how would you use them?
- Would you be willing to participate in a cognitive walkthrough to help us continue improving the Dashboard's usability?

Contact Information

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Interested in Cognitive Walkthroughs?

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