Crashes and Injuries on Rural Roads in Alaska - Toward a Better Understanding of Rural Safety Issues through Linked Data

FINAL PROJECT REPORT

by

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for

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CSET
rural ◦ isolated ◦ tribal ◦ indigenous

DISCLAIMER

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16. Abstract

In this study, motor-vehicle crash records (MVCD) are linked with hospital-based trauma data from the Alaska Trauma Registry (AKTR) using a probabilistic method using open-source record linkage software (FRIL) with the aim of developing a more comprehensive and accurate depiction of transportation-related injuries across the state. The study achieved a successful match for 66% of AKTR cases using demographic, temporal, and geographic identifiers. Injury classifications from both datasets were harmonized through a reclassification scheme to evaluate the accuracy and completeness of MVCD reporting relative to trauma data. Key findings reveal that while most records were either adequately classified or slightly overclassified, approximately 17% of MVCD records underestimated injury severity. Discrepancies were particularly evident in rural and remote communities. In addition, over 10% of linked records involving alcohol-related trauma were either not suspected of impairment or categorized as "Unknown" in MVCD, despite confirmation of intoxication in AKTR. This research demonstrates the viability and utility of data linkage to identify and address critical gaps in transportation safety records as well as support more effective injury prevention strategies, particularly in underserved and remote communities.

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SI* (MODERN METRIC) CONVERSION FACTORS

APPROXIMATE CONVERSIONS TO SI UNITS				
Symbol	**When You Know**	**Multiply By**	**To Find**	**Symbol**
		LENGTH		
in	inches	25.4	millimeters	mm
ft	feet	0.305	meters	m
yd	yards	0.914	meters	m
mi	miles	1.61	kilometers	km
		AREA		
in^2	square inches	645.2	square millimeters	mm^2
ft^2	square feet	0.093	square meters	m^2
yd^2	square yard	0.836	square meters	m^2
ac	acres	0.405	hectares	ha
mi^2	square miles	2.59	square kilometers	km^2
		VOLUME		
fl oz	fluid ounces	29.57	milliliters	mL
gal	gallons	3.785	liters	L
ft^3	cubic feet	0.028	cubic meters	m^3
yd^3	cubic yards	0.765	cubic meters	m^3
		NOTE: volumes greater than 1000 L shall be shown in m^3		
		MASS		
oz	ounces	28.35	grams	g
lb	pounds	0.454	kilograms	kg
T	short tons (2000 lb)	0.907	megagrams (or "metric ton")	Mg (or "t")
		TEMPERATURE (exact degrees)		
°F	Fahrenheit	5 (F-32)/9 or (F-32)/1.8	Celsius	°C
		ILLUMINATION		
fc	foot-candles	10.76	lux	lx
fl	foot-Lamberts	3.426	candela/m^2	cd/m^2
		FORCE and PRESSURE or STRESS		
lbf	poundforce	4.45	newtons	N
lbf/in^2	poundforce per square inch	6.89	kilopascals	kPa

APPROXIMATE CONVERSIONS FROM SI UNITS				
Symbol	**When You Know**	**Multiply By**	**To Find**	**Symbol**
		LENGTH		
mm	millimeters	0.039	inches	in
m	meters	3.28	feet	ft
m	meters	1.09	yards	yd
km	kilometers	0.621	miles	mi
		AREA		
mm^2	square millimeters	0.0016	square inches	in^2
m^2	square meters	10.764	square feet	ft^2
m^2	square meters	1.195	square yards	yd^2
ha	hectares	2.47	acres	ac
km^2	square kilometers	0.386	square miles	mi^2
		VOLUME		
mL	milliliters	0.034	fluid ounces	fl oz
L	liters	0.264	gallons	gal
m^3	cubic meters	35.314	cubic feet	ft^3
m^3	cubic meters	1.307	cubic yards	yd^3
		MASS		
g	grams	0.035	ounces	oz
kg	kilograms	2.202	pounds	lb
Mg (or "t")	megagrams (or "metric ton")	1.103	short tons (2000 lb)	T
		TEMPERATURE (exact degrees)		
°C	Celsius	1.8C+32	Fahrenheit	°F
		ILLUMINATION		
lx	lux	0.0929	foot-candles	fc
cd/m^2	candela/m^2	0.2919	foot-Lamberts	fl
		FORCE and PRESSURE or STRESS		
N	newtons	0.225	poundforce	lbf
kPa	kilopascals	0.145	poundforce per square inch	lbf/in^2

*SI is the symbol for the International System of Units. Appropriate rounding should be made to comply with Section 4 of ASTM E380.
(Revised March 2003)

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EXECUTIVE SUMMARY

Alaska's expansive geography, sparse road networks, and reliance on non-traditional modes of transportation in rural communities present unique challenges to understanding and improving transportation safety. Many rural communities lack the infrastructure and administrative resources to report motor vehicle crashes through traditional systems, such as the state's Motor Vehicle Crash Database (MVCD), resulting in possible underrepresentation of crash and injury events. To address this issue, this study investigates the potential for enhanced safety data integration through the linkage of MVCD records with hospital-based trauma data from the Alaska Trauma Registry (AKTR), with the aim of developing a more comprehensive and accurate depiction of transportation-related injuries across the state.

Using open-source record linkage software (FRIL), crash-level data (MVCD) are matched with patient-level injury data (AKTR) for the period of 2013 to 2021. The study achieved a successful match for 3,305 records—approximately 66% of AKTR cases—using demographic, temporal, and geographic identifiers. Injury classifications from both datasets were harmonized through a reclassification scheme to evaluate the accuracy and completeness of MVCD reporting relative to trauma data.

Key findings reveal that over 12% of cases with confirmed injuries in AKTR were recorded as "No Apparent Injury" in MVCD, underscoring systemic underreporting in traditional crash databases. Further, while most records were either adequately classified or slightly overclassified, approximately 17% of MVCD records underestimated injury severity. Discrepancies were particularly evident in rural and remote communities and could be due to the fact that law enforcement presence and crash documentation in these areas tend to be more limited or inconsistent. In addition, over 10% of linked records involving alcohol-related trauma were either not suspected of impairment or categorized as "Unknown" in MVCD, despite confirmation of intoxication in AKTR.

This research demonstrates the viability and utility of data linkage to identify and address critical gaps in transportation safety records. It provides a replicable framework for future statewide integration efforts and offers actionable insights for public health officials, emergency responders, and transportation safety professionals. The study findings and recommendations support more effective injury prevention strategies, particularly in underserved and remote communities. Future work will focus on refining probabilistic matching techniques, improving classification alignment, and expanding the reach of this methodology to better inform policy, infrastructure investment, and community-based safety interventions throughout Alaska.

CHAPTER 1. INTRODUCTION

The State of Alaska has a high percentage of low-volume roads and many rural communities (see Figure 1). Quite often, these communities rely on less conventional and “non-traditional” forms of transportation from an engineering and planning perspective that may not be captured in traditional datasets. Additionally, many of these communities do not have the personnel or systems to report to the standard motor vehicle crash database. Reporting discrepancies and non-reporting present significant issues for the purposes of planning, tracking, and reporting transportation safety outcomes. In addition, the sparse transportation network and rural nature of Alaska presents inherent data size issues, making most statistical methods of analysis erroneous.

That said, injury information maintained by hospitals and acute care facilities has the potential to help fill these data gaps. Based on previous research conducted by Perkins, Bennett, and Belz (2019), the use of non-standard safety data and crash reporting, i.e., records sourced from the Alaska Trauma Registry (AKTR) and local newspaper articles were particularly important in rural and remote regions where travel does not always occur on highways, non-traditional vehicles are common, administrative resources are scarce, and the state Motor Vehicle Crash Database (MVCD) was found to be lacking in comprehensive representation of roadway crashes. While there were commonalities between the datasets analyzed in the case study, the authors found that both the trauma data from acute care facilities (i.e., the AKTR) and police reports in the local newspaper identified a significant number of on-road crash events that were not in the state crash data particularly in the small and medium-sized communities used in the case study. This previous work identified a few issues that serve as the key focus for the research efforts being presented here:

- Standardized methods of injury/fatality reporting (e.g., AKTR) are not directly compatible with the MVCD;
- Varying data structures between years makes trend analyses difficult or erroneous;
- Discrepancies between the number of injury/fatality events (e.g., AKTR) and reported crashes (MVCD); and
- Lack of safety data and crash reporting of non-traditional/less-conventional forms of transportation (e.g., all-terrain vehicles, off-highway vehicles, etc.) that are used as primary forms of transportation in rural states like Alaska.

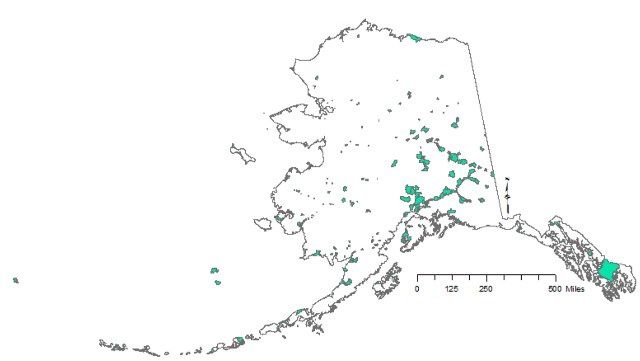


Figure 1. Rural communities in Alaska.

To that end, this research builds on that data linkage work with a more concentrated focus on extending the application at the statewide level to evaluate potential discrepancies at both geographic, demographic, and temporal scales. The methods, analysis, and results presented herein are an effort to move the state of transportation safety research toward a better understanding of rural safety issues through linked data. This research specifically addresses critical research identified under the Center for Safety Equity in Transportation (CSET) focus area Coordination and Context Sensitive Solutions and uses a *data-driven approach to better understand characteristics of high-risk roadways and propose solutions.*

The primary research goals presented in this report are threefold. The first and primary goal of this research was to determine the extent to which the crash data and the trauma data sources could be linked together and provide a reliable method for doing so. The second goal of this study was to determine the extent to which the crash data accurately represented the level of injury sustained by persons involved in crash. The third goal was to quantify disparities between crash reporting and injury reporting. Additionally, the secondary goals of this research were to: 1) engage relevant parties needed to develop a systems-based approach and streamline the data linkage process; 2) establish a "small numbers" suppression protocol to protect and ensure confidentiality in rural communities where data that would otherwise be non-identifiable in larger datasets could jeopardize anonymity in locations that have very low populations; and 3) establish a framework and a baseline by creating a more robust and comprehensive set of transportation safety data. The findings of this project may inform engineering, education, and enforcement activities with the intent of reducing roadway crashes in Alaska.

CHAPTER 2. DATA AND METHODOLOGY

This study utilizes two primary datasets, the statewide motor vehicle crash database and the trauma registry, to better understand crashes and related injuries in roadway-related incidents in the State of Alaska. An open-source record linking software is utilized to execute the linking process and a difference classification schema is established for the purpose of quantifying disparities in injury reporting between the two datasets.

2.1. Crash Data

UAF obtained access to the motor vehicle crash database (MVCD) through the Alaska Department of Transportation and Public Facilities (DOT&PF) Highway Safety Office for the period of 2013 to 2021. The crash data are formatted based on Model Minimum Uniform Crash Criteria (MMUCC) which was last updated in 2013 and is the rationale for the start date of the data request. The end date of the request was selected as 2021 as that was the most current data available at the time of the request.

The MVCD is a compilation of records derived from crash reports completed by a responding public safety officer (i.e., State Trooper, City Police Officer, or Village Public Safety Officer) or a public citizen, typically someone who was involved in the crash event. The information and variables contained within the DOT&PF crash database are used primarily for highway safety planning purposes and are void of any personal identifiable information. Federal law prohibits its discovery or admissibility in litigation against state, tribal or local government that involves a location or locations mentioned in the crash data.[1]

The database used for the purpose of the study provides information at the person-level, meaning that there is a single record for each person involved in a crash event. That is, if one crash involved more than one person then there would be a record in the data for each person involved in that crash. Since the database does not include crashes for which there is no motor vehicle crash report (e.g., crashes where there was no personal injury or property damage meeting a specific threshold), it is not comprehensive of all crash events but still considered to be adequately representative of the historic status of roadway safety. The MMUCC utilizes a five-level categorization scheme for injury severity known as KABCO.

The KABCO severity categories are as follows:

- Fatal Injury (K)
- Suspected Serious Injury (A)
- Suspected Minor Injury (B)
- Possible Injury (C)
- No Apparent Injury or Property Damage Only (O)

Figure 1 shows the distribution of injury severity for all crash-involved persons (N=217,800) from 2013 through 2021. Crashes in which “No Apparent Injury” were listed account for the vast majority of records. Concerningly, records with “Unknown” categorization account for more than 15% of the dataset.

[1] 23 U.S.C. § 407; 23 U.S.C. § 148(h)(4); Walden v. DOT, 27 P.3d 297, 304-305 (Alaska 2001)

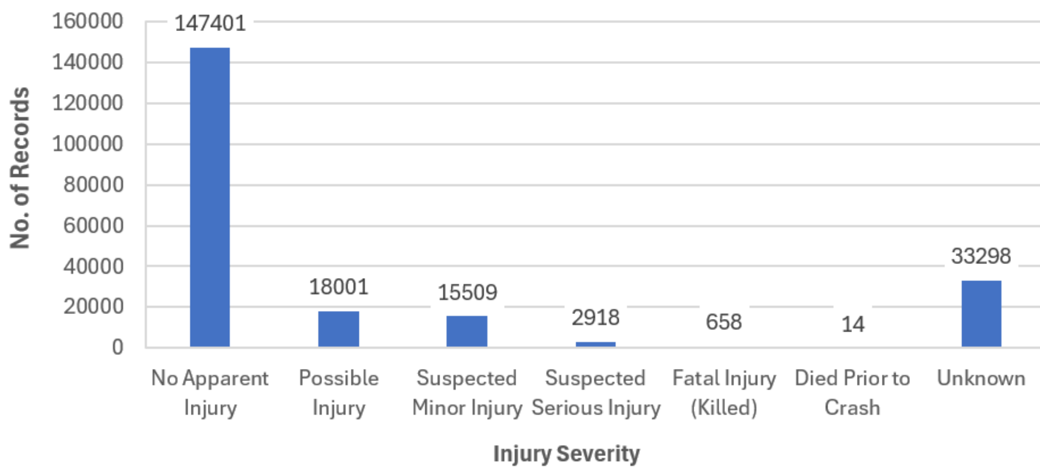


Figure 1. Person-level injury for motor vehicle crashes in Alaska MVCD, 2013-2021

2.2. Alaska Trauma Registry

The Alaska Trauma Registry (AKTR) is an information system of injured patients in Alaska, and the treatment that they have received at an acute care facility. The AKTR is maintained by the Division of Public Health in the Alaska Department of Health and Social Services and compiles data from all 24 of Alaska's acute care hospitals. The criteria for inclusion in the trauma registry are:

- patients with injuries who are admitted to an Alaska hospital;
- patients who are held for observation, transferred to another acute care hospital, or declared dead in the emergency department; and
- patients for who contact occurred within 30 days of the injury.

The types of injuries coded in the AKTR database include trauma, poisoning, suffocation, and the effects of reduced temperature. The AKTR data as provided to UAF does not include patient, physician, hospital, clinic, or ambulance service identifiers.

The AKTR data are confidential and protected under Alaska Statute 18.23.010-070. All AKTR personnel and those requesting AKTR data are required to sign a confidentiality statement. In order to obtain the AKTR data, one must complete a signed Release of Information Policy and Confidentiality Statement form and a Data Element list be sent to the Alaska Trauma Registry Manager. The data are then provided to the requesting party via secure file transfer. Data were obtained for 2013 through 2021 to cover the same period as the crash data and include only cases that were deemed to have occurred on a roadway and/or in a vehicle being used for transportation purposes.

When admitted to an acute care facility, patients are assessed based on the level and extent of their injuries. This assessment determines the patient's initial state after a traumatic injury and the severity of their condition upon arrival, serving as a baseline for and informing the measurements of impact of care. The AKTR uses a four-level categorization scheme for patient condition upon admittance as follows:

- Emergency Room Unstable
- Prehospital Unstable
- Potential Unstable
- Stable

Figure 2 shows the distribution of patient condition for all admitted persons (N=5,018) from 2013 through 2021. Patients categorized with "Stable" condition account for more than half of the total records with "Potential Unstable" accounting for the next largest share with 30% of records.

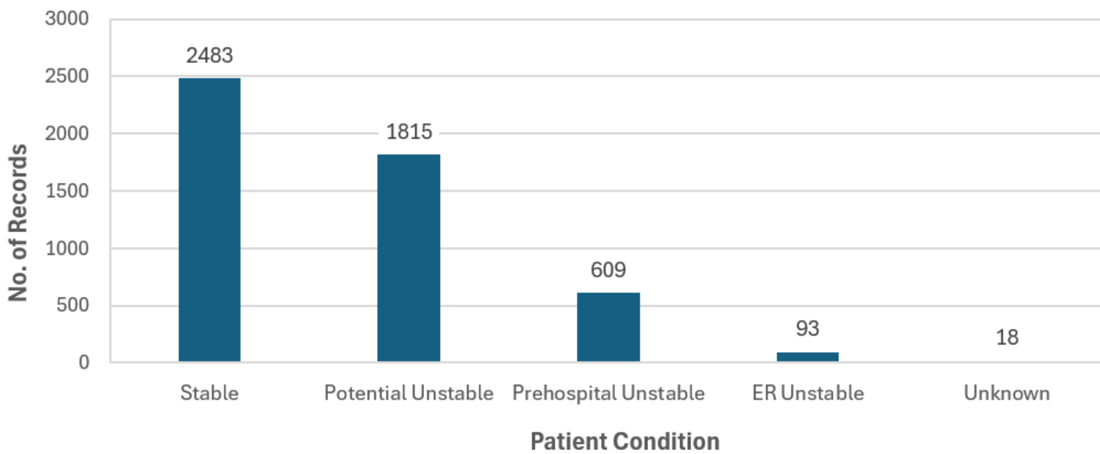


Figure 2. Person-level injury for roadway incidents in the AKTR, 2013-2021

2.3. Injury Reclassification

Since the injury classification schema is not the same between the AKTR and MVCD, a reclassification process was used to evaluate and quantify the extent to which each dataset corroborates the other dataset with respect to the representation of the level of injury sustained in the roadway crash event.

For the MVCD, FATAL INJURY (K) and SUSPECTED SERIOUS INJURY (A) were assigned a value of 3, SUSPECTED MINOR INJURY (B) and POSSIBLY INJURY (C) were assigned a value of 2, and NO APPARENT INJURY (O) was assigned a value of 1. Records coded with UNKNOWN or NOT REPORTED were assigned a value of zero.

For the AKTR, EMERGENCY ROOM UNSTABLE and PREHOSPITAL UNSTABLE were assigned a value of 3, POTENTIAL UNSTABLE was assigned a value of 2, and STABLE was assigned a value of 1. Records coded with UNKNOWN or NOT RECORDED were assigned a value of zero.

Table 1 summarizes the classifications used based on the difference between the MVCD value and the AKTR value, with the MVCD value serving as the minuend (i.e., base) value and the AKTR serving as the subtrahend value.

Table 1. Injury Score Difference Classification

Injury Score Difference	Difference Classification
-3	Significantly Underclassified
-2	Underclassified
-1	Possibly Underclassified
0	Adequately Classified
1	Possibly Overclassified
2	Overclassified
3	Significantly Overclassified

For example, a difference classification of “0” or *Adequately Classified* indicates that the MVCD and AKTR both represented the person-level injury sustained in the event to roughly the same degree. Conversely, a difference classification of “3” or *Significantly Overclassified* indicates that the MVCD overrepresented the level of injury (e.g., serious versus stable) as compared to the AKTR while a difference classification of “-3” or *Significantly Underclassified* indicates that the MVCD underrepresented the level of injury (e.g., stable versus serious) as compared to the AKTR.

2.4. Data Linkage Process

The overall goal of record linkage is to find two distinct data entries from two different input sources that refer to the same entity. In this case, this refers to a person record in the MVCD and a person record in the AKTR. To achieve this linked dataset, an open-source software referred to as the Fine-Grained Records Integration and Linkage Tool, or “FRIL” (Jurczyk, 2008) was utilized. FRIL has been a common data-linkage asset used quite widely in the health and epidemiology realms. FRIL allows for systematic and iterative exploration in the optimal combination of parameter values in order to enhance linking performance and accuracy and is based on a probabilistic approach similar to that proposed by Fellegi et. al. (1969).

A nested loop join (NLJ) method was used as the search method with the AKTR as the “to” dataset and the MVCD as the “from” dataset. While NLJ is typically better suited for smaller datasets, the nature of the three primary linkage variables (date of event, age of person, and gender of person) required exact matches and therefore eliminated the need to use more advanced search methods such as sorted neighborhood method (SNM). Table 2 summarizes the search and linkage parameters used for the join conditions.

Table 2. Join Condition Parameter Summary

MVCD Parameter	AKTR Parameter	Comparison Method	Weight
DATE	INJ_DATE	Equal Fields Boolean	30
AGE	AGE_YEARS	Equal Fields Boolean	25
GENDER	PATIENT_GENDER	Equal Fields Boolean	25
BOROUGH	INJ_ADDRESS	Jaro-Winkler	10
CITY	INJ_ADDRESS	Jaro-Winkler	10

The Jaro-Winkler distance method was used for injury location to account for potential misspellings and varied formats used in the reference to the city and borough. The Jaro-Winkler method treats the input values as raw strings and compares matching characters over a series of transpositions and assigns a match probability based on the number of matching characters in each transposition. For example, if the injury location was coded as “Municipality of Anchorage” in the MVCD and “Anchorage” in the AKTR, the Equal Fields Boolean would not identify a match, but the Jaro-Winkler method would return a high probability of match.

The total sum of weights is equal to 100 with date, age, and gender accounting for 80 of the total weight. A minimum acceptance level of 85 was set and ensured that at least the first three criteria and one or a portion of both the borough and city criteria were also met.

CHAPTER 3. RESULTS AND DISCUSSION

The linkage process resulted in a total of 3,305 matched records and represents approximately 66% of records from the original AKTR dataset. Figure 3 represents the number of matched records by year for the period of analysis. Of note is the small number of matched (i.e., linked) records in 2020 which is likely due to the coincidence with the COVID-19 pandemic. Figure 4 shows the spatial distribution of linked records with the confidence scores which range from 85 (minimum criteria for being matched) to 99. Linked records and confidence scores are well distributed across the state with good representation in both urban and rural areas.

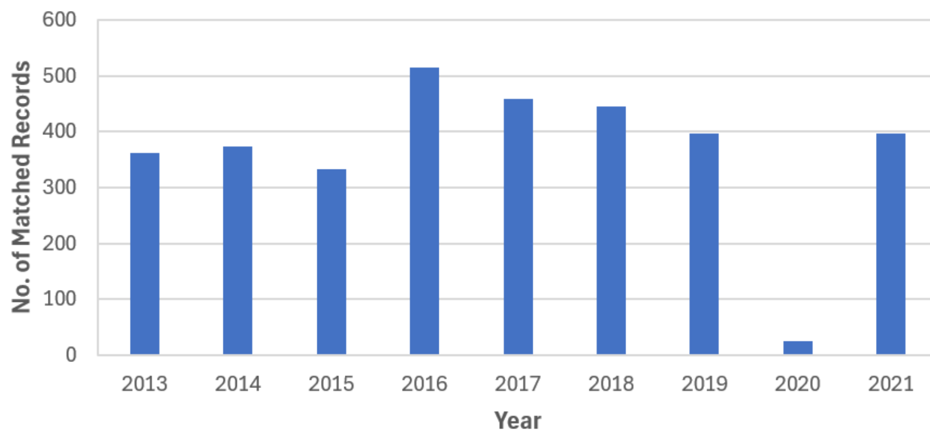


Figure 3. Matched records between AKTR and MVCD by year, 2013-2021

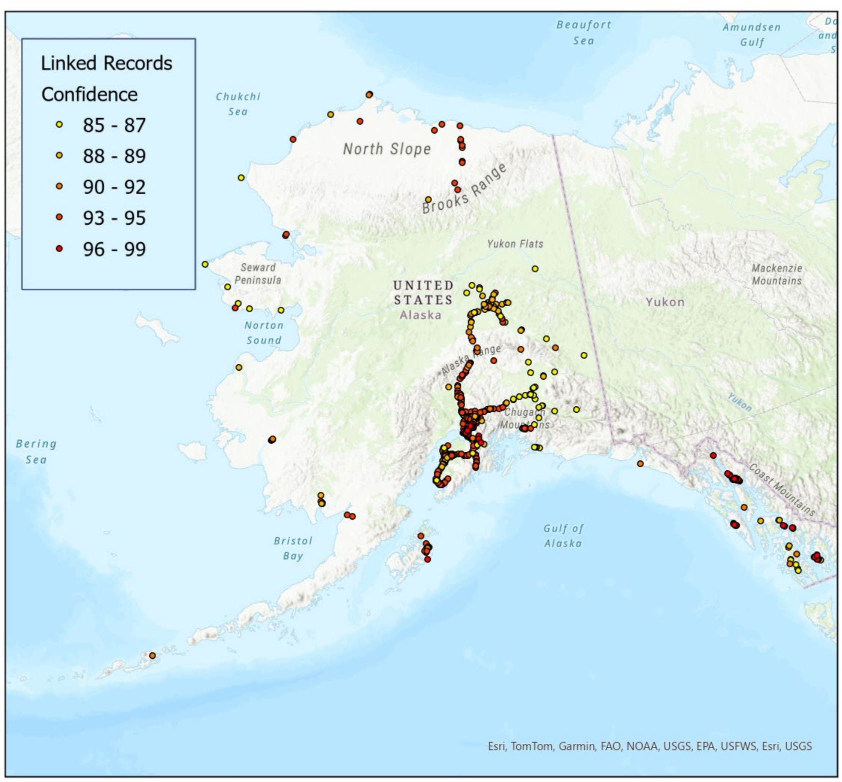


Figure 4. Linked record spatial distribution with confidence score

Figure 5 shows patient condition as recorded in the AKTR by locale type (e.g., urban, rural. etc.). These distributions are similar across locale type. That is, across each patient condition classification the distribution across each locale type is roughly the same.

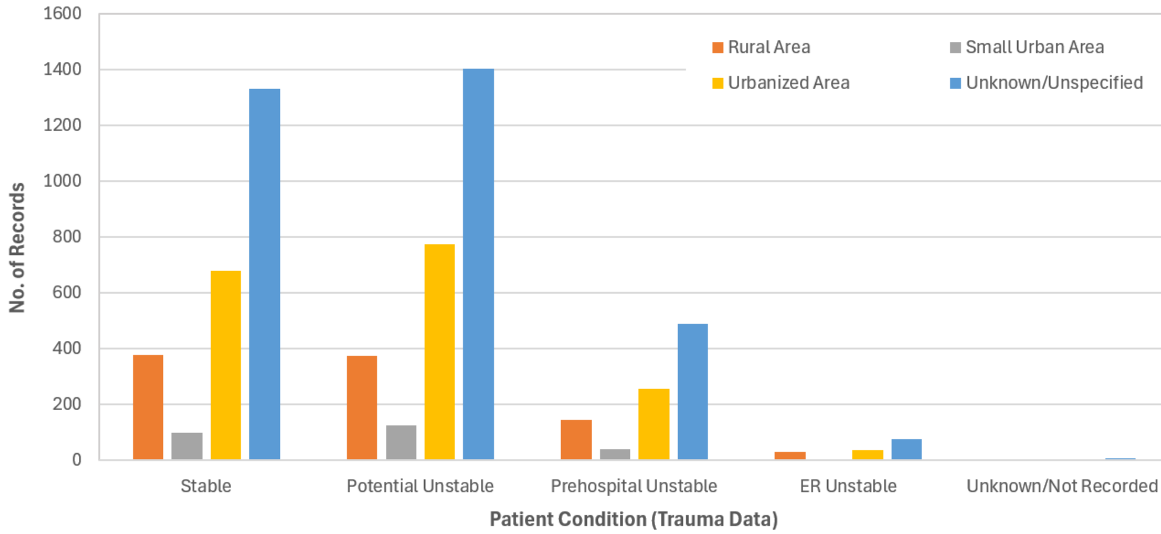


Figure 5. Patient condition from AKTR by locale type from MVCD, 2013-2021

Figure 6 illustrates the comparison between injury classification in the MVCD to the condition classification from the AKTR. The key point to be made with this comparison is the number of records that were classified in the MVCD as *No Apparent Injury* but were classified in the AKTR at a level other than *Stable* (n = 398). In practical terms, this is interpreted as a person for which no injuries were documented in the MVCD but were determined to have sustained some level of notable injury according to the AKTR.

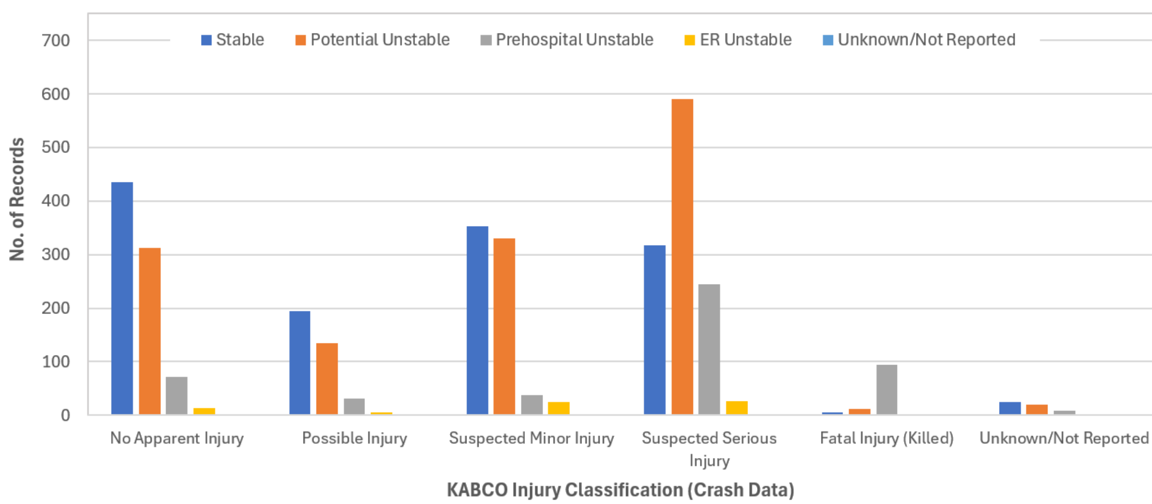
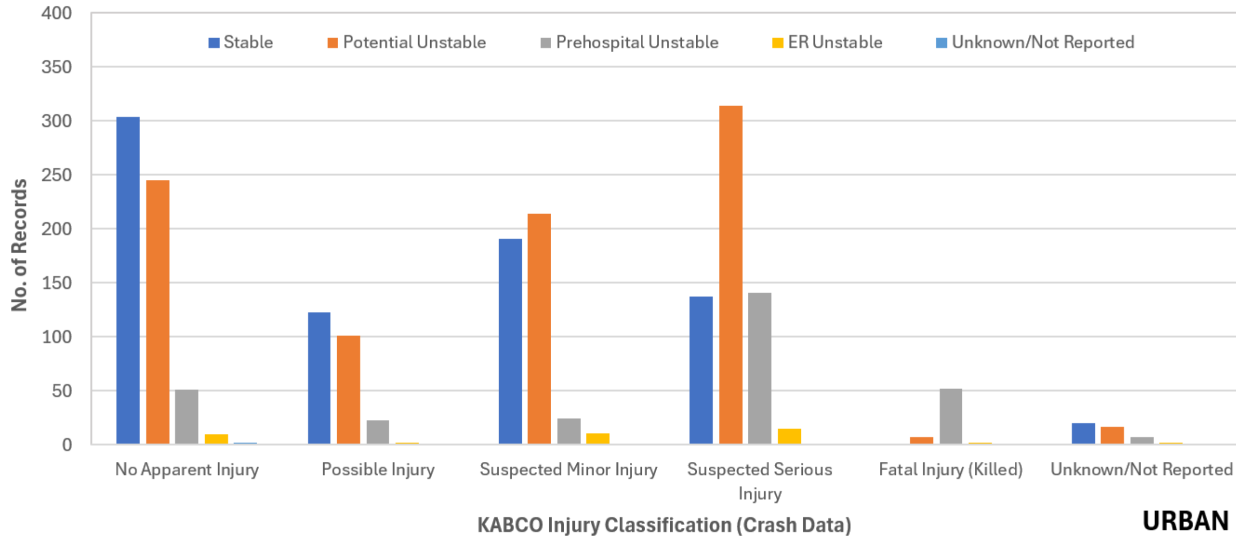
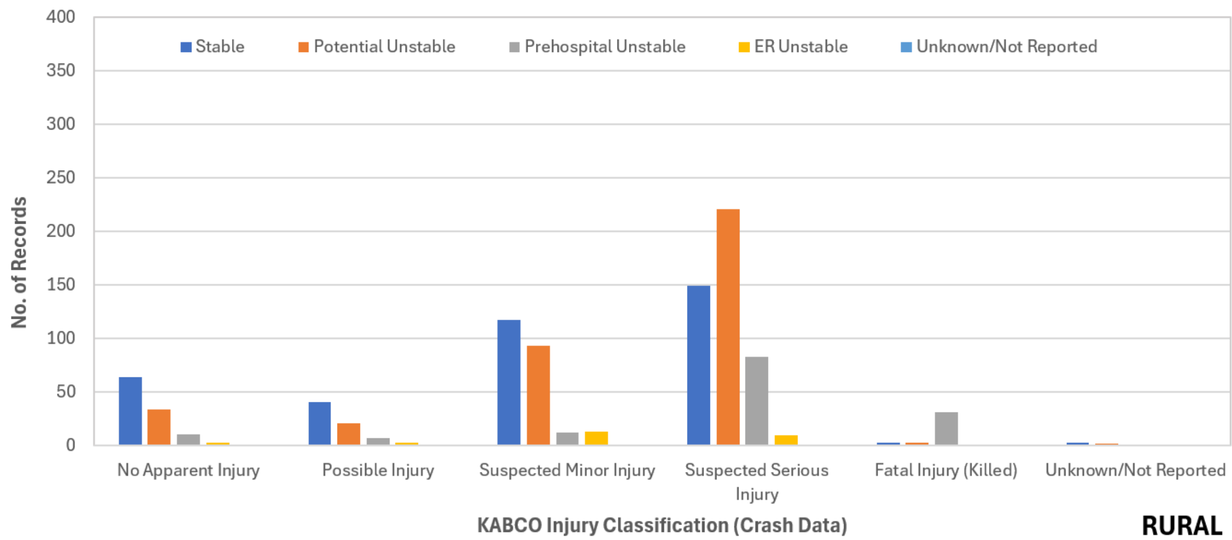


Figure 6. Comparison of injury classification from MVCD to condition classification from AKTR, 2013-2021

To further explore the differences between injury reporting in the MVCD and condition classification in the AKTR, Figure 7 shows the same classification comparison broken down by urban and rural. Other than a slight difference between *Stable* and *Potential Unstable* AKTR classifications in the *Suspected Minor Injury* MVCD category, both distributions are quite similar. As could be expected, there are more matched/linked records for events occurring in locale types classified as urban but this is merely a function of there being more motor vehicle crashes and trauma events in urban areas due to the higher population.



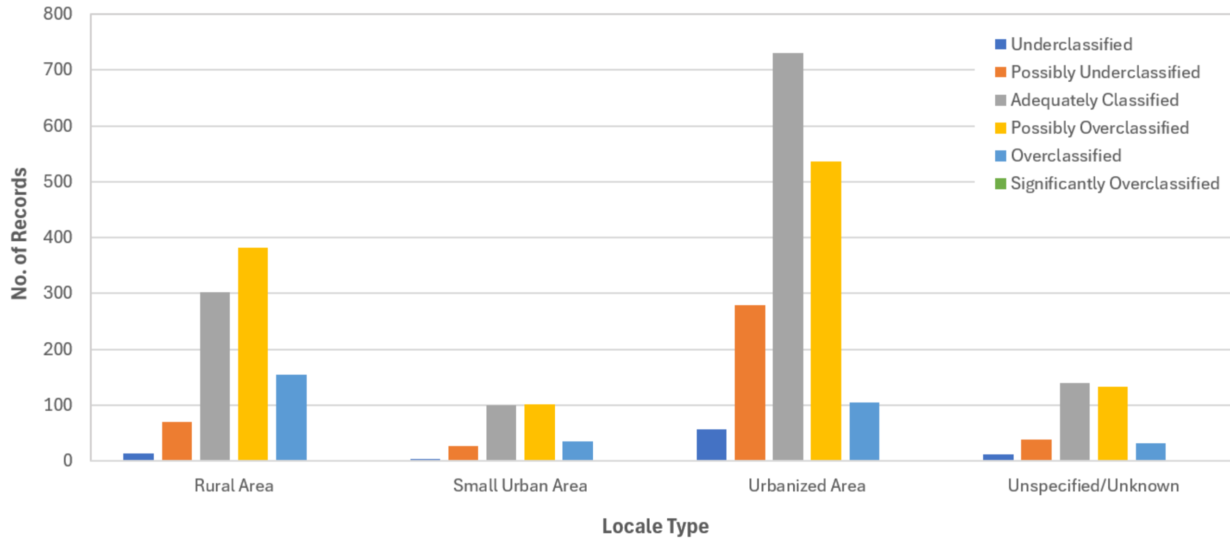
(a)



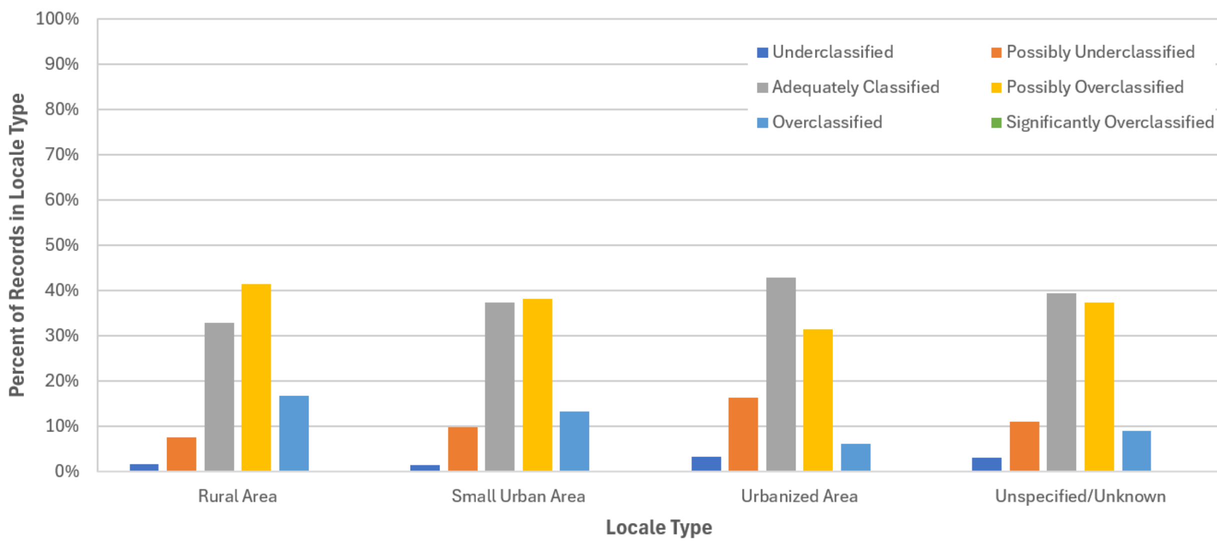
(b)

Figure 7. Comparison of injury classification from MVCD to condition classification from AKTR by urban and rural locale types, 2013-2021

Figure 8 shows the injury score difference by locale type based on the classifications defined in Table 1 for linked records where person injury was known. Figure 8a depicts the number of records and Figure 8b depicts the percentage of records in each locale type. In general, most records in each locale type were either adequately classified or possibly overclassified based on the injury score difference. Urbanized areas had a slightly higher share of adequately classified records while rural areas had a slightly higher share of possibly overclassified records.



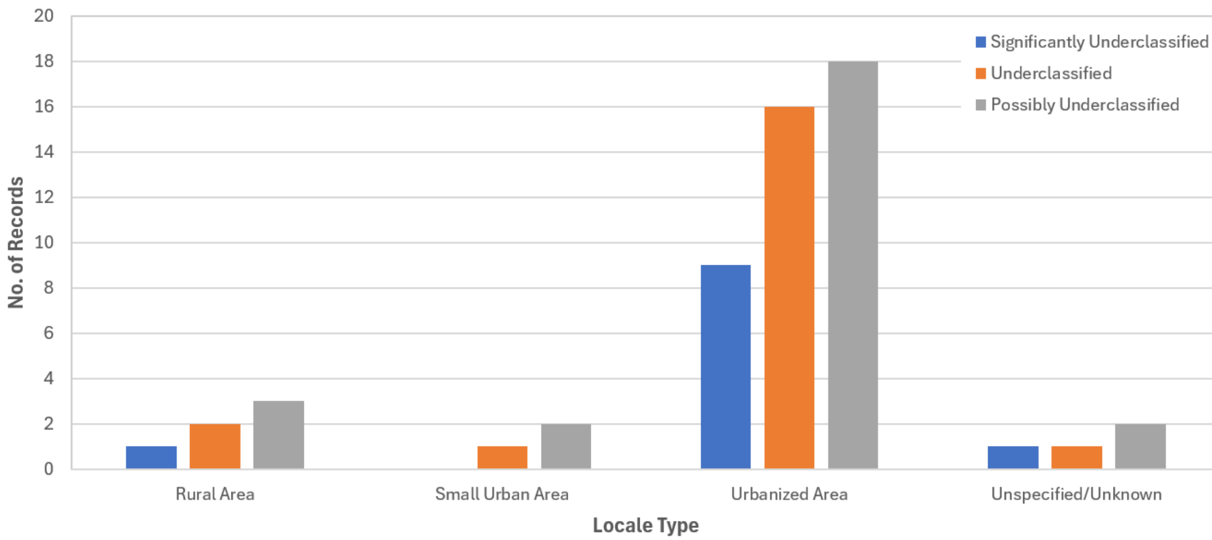
(a)



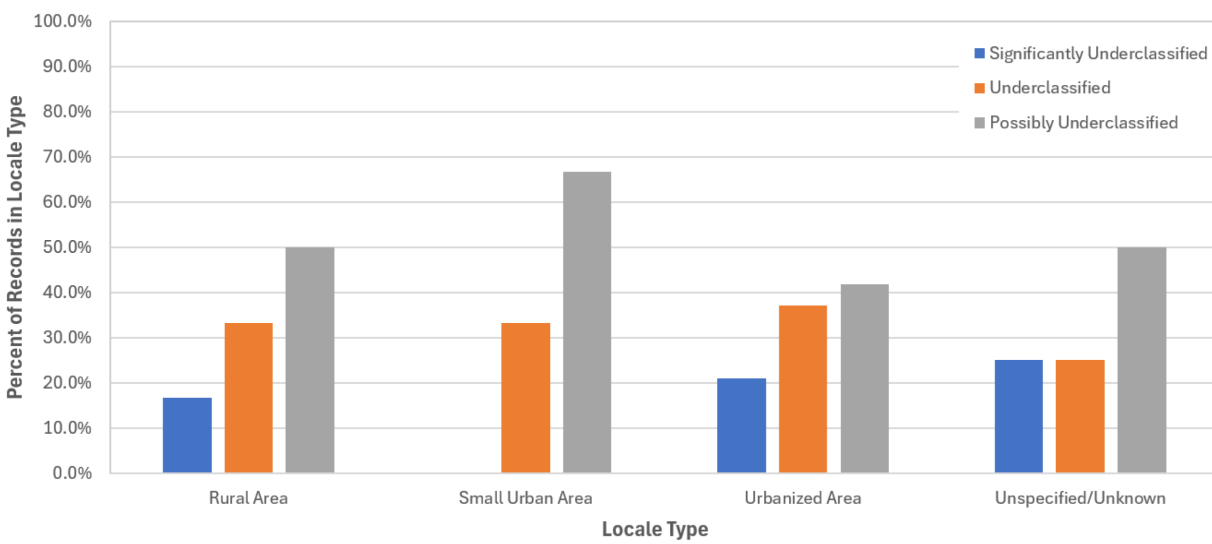
(b)

Figure 8. Injury score difference classification (a) frequency and (b) percentage of records by locale type (2013-2021) for linked records where person injury was known.

Similarly, Figure 9 shows the injury score difference by locale type based on the classifications defined in Table 1 for linked records where person injury was unknown. Figure 9a depicts the number of records and Figure 9b depicts the percentage of records in each locale type. In general, most records in each locale type were, for the most part, either adequately classified or possibly underclassified based on the injury score difference. Urbanized areas and records where locale type was unspecified or unknown had approximately 20% of records that were significantly underclassified.



(a)



(b)

Figure 9. Injury score difference classification (a) frequency and (b) percentage of records by locale type (2013-2021) for linked records where person injury was classified as unknown.

Figure 10 and Figure 11 depict the raw and simplified injury score difference classification by race represented as a percentage of records within each race category, respectively. In general, most records for all races were either adequately classified or overclassified. Approximately 17%, 15%, and 21% of records were underclassified for injured persons of white, Alaska Native, and other races, respectively.

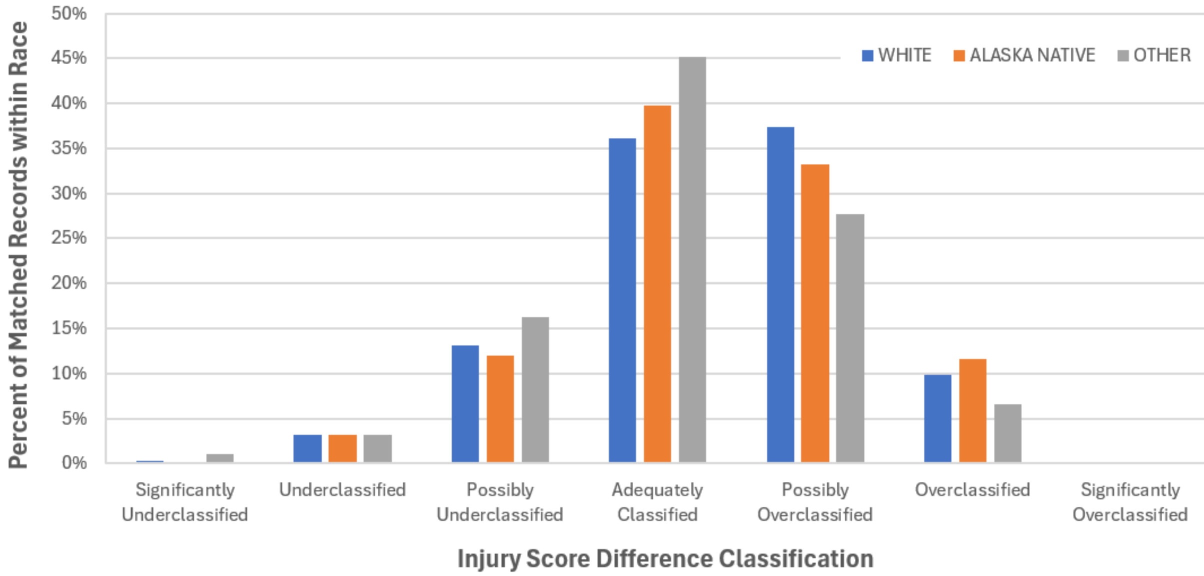


Figure 10. Injury score difference classification by race represented as a percentage of records within each race category

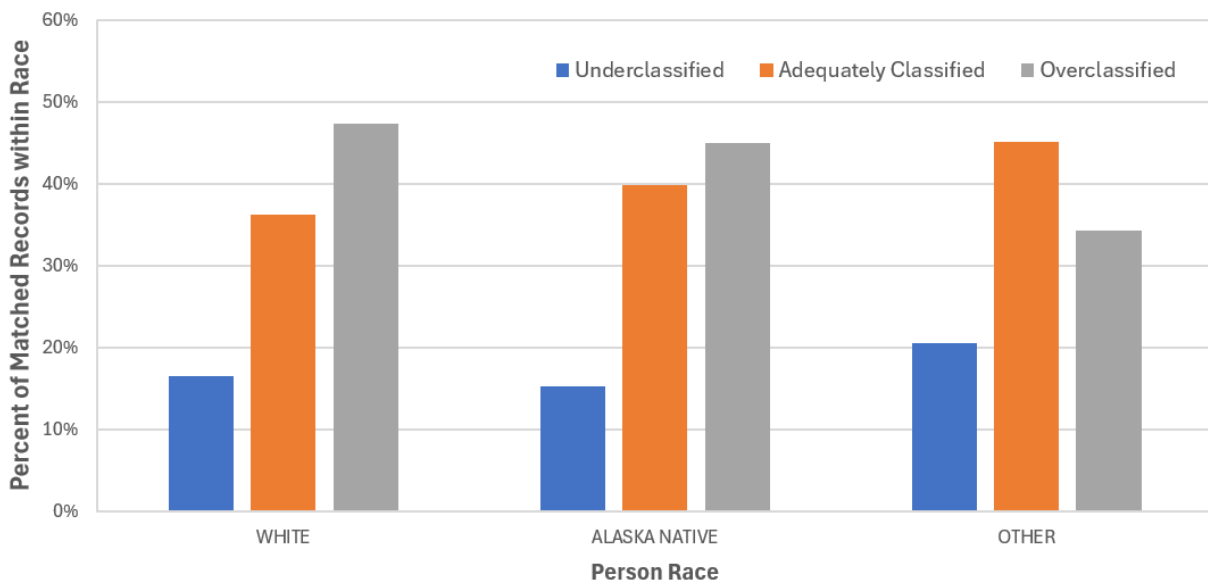
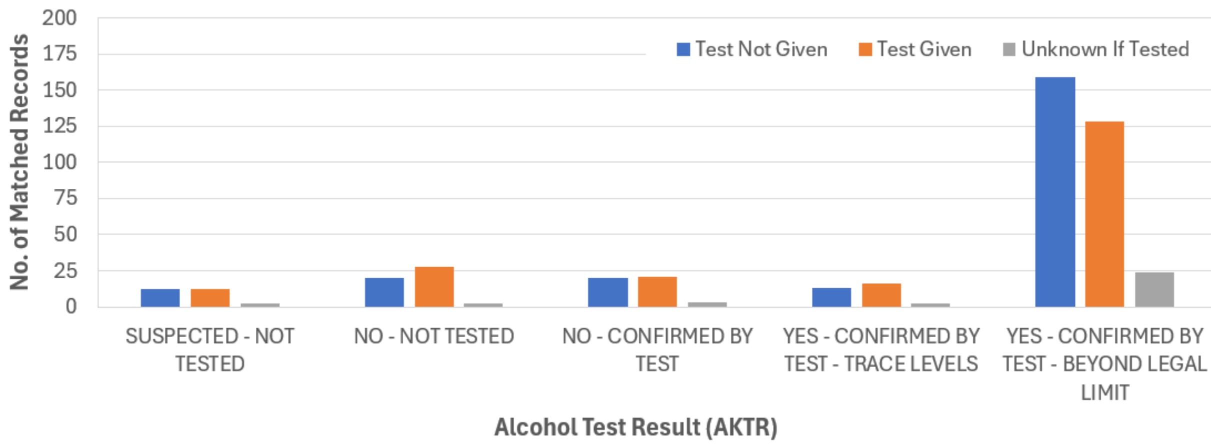
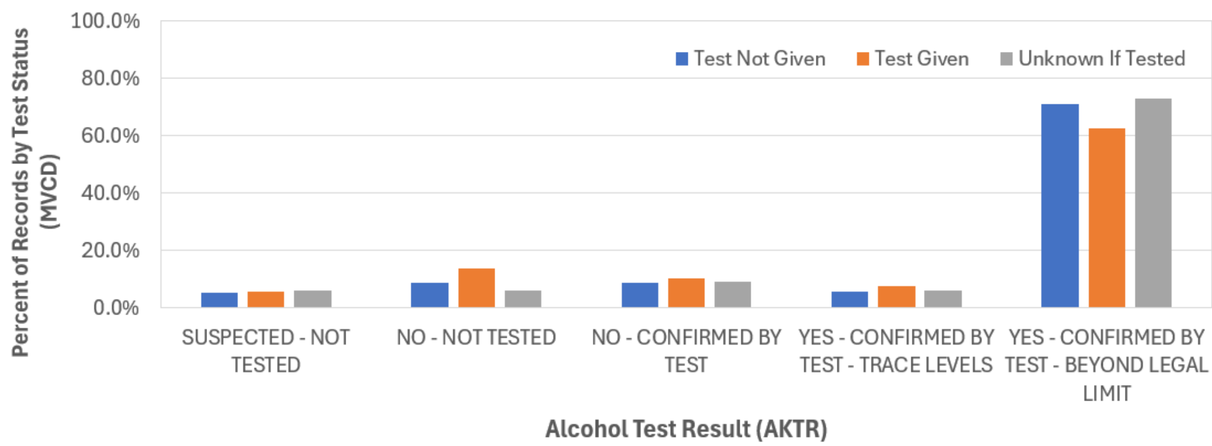


Figure 11. Simplified injury score difference classification by race represented as a percentage of records within each race category

Figure 12 and Figure 13 show the cross-classified alcohol test status (MVCD) and alcohol test result (AKTR) for records in the MVCD where alcohol was suspected and not suspected, respectively. The vast majority, greater than 60% of linked records, were confirmed to be beyond the legal limit regardless of whether a sobriety test was administered in the field or not. Additionally, and perhaps more concerningly, approximately 12% of "Test Not Given" and 23% of "Unknown if Tested" records in the MVCD were confirmed to be beyond the legal limit according to the AKTR and accounts for nearly 200 cases.

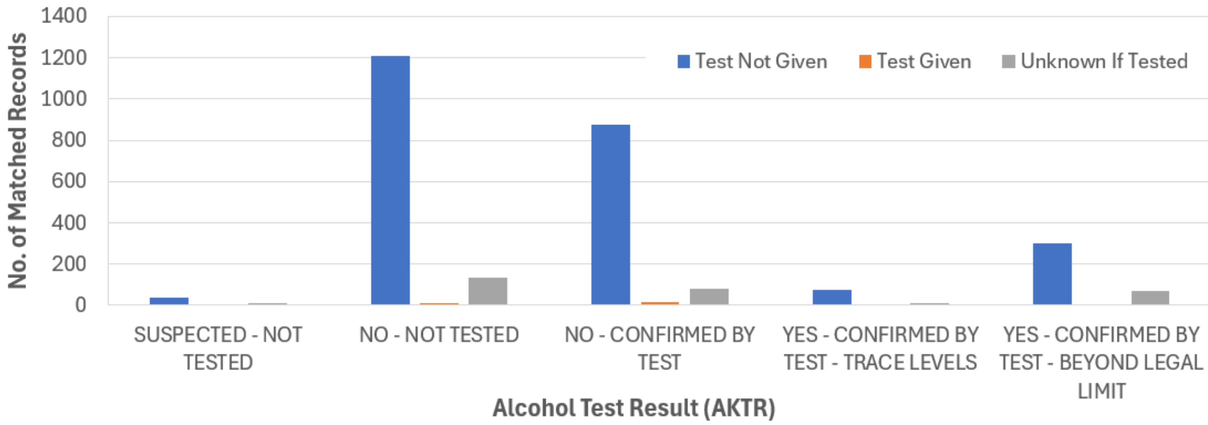


(a)

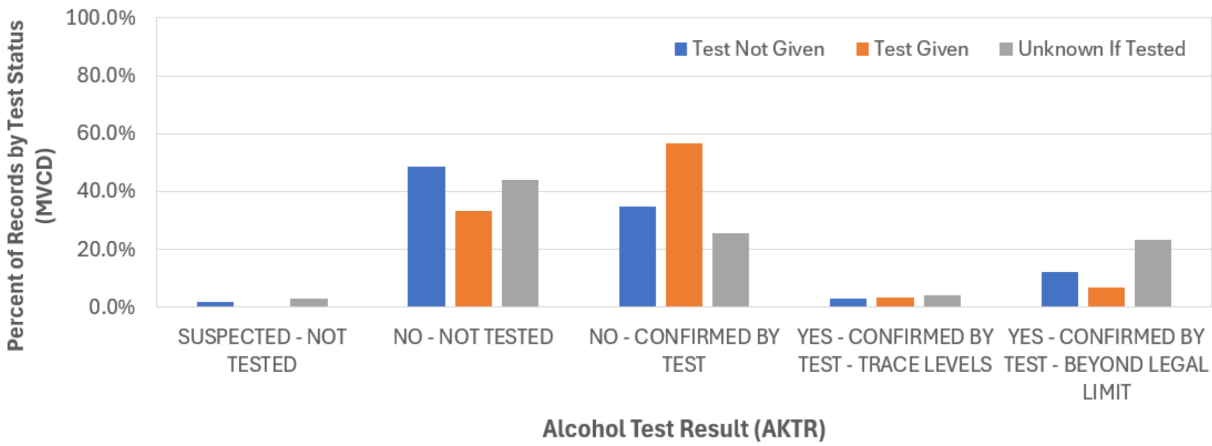


(b)

Figure 12. Alcohol test results from AKTR for linked records by (a) number of linked records and (b) percentage of linked records for records in the MVCD where alcohol was suspected.



(a)



(b)

Figure 13. Alcohol test results from AKTR for linked records by (a) number of linked records and (b) percentage of linked records for records in the MVCD where alcohol was not suspected.

CHAPTER 4. CONCLUSIONS

In Alaska, most communities are not “on the highway system.” Some of these are small cities, colloquially referred to as *rural hubs*. Typically, these hubs will have state-maintained airports or runways and some local highways. However, in these hubs and all the smaller communities, the road system is limited. Rural hubs generally have Alaska State Troopers while some smaller communities will have local police known as Village Public Safety Officers (VPSOs). Many of the smaller communities have do not have formal law enforcement presence. As a result, the nature of crash reporting in these areas is likely to vary from the standard.

To quantify differences and potential deficiencies in crash reporting, the research presented in this report focuses on crashes and injuries on rural roads in Alaska, with the intention of working toward a better understanding of rural safety issues through linked data. More specifically, the intent was to create linkages between the state Motor Vehicle Crash Database (MVCD) and the Alaska Trauma Registry (AKTR).

The results of the linkage analysis revealed the following key findings:

- The linkage process resulted in a total of 3,305 matched records and represents approximately 66% of records from the original AKTR dataset;
- The spatial distribution of successfully linked records provided relatively good representation across the state;
- The period during the COVD-19 pandemic resulted in a significant decrease in the number of linked records likely due to either reduced/modified reporting or lower propensity to visit an acute care facility after sustaining injuries;
- Over 12% of cases in the AKTR involved some level of injury for which the MVCD indicated *No Apparent Injury;*
- Most cases were either adequately classified or overclassified to some degree with only 555 records, approximately 17%, of cases being underclassfied in the MVCD to some degree; and
- There were 376 cases where the person was either not suspected of being under the influence of alcohol or where alcohol suspected was classified as “Unknown”, accounting for over 10% of all linked records, were identified in the AKTR as being beyond the legal limit for alcohol.

The methodology of the work presented here establishes a baseline for a statewide data linkage effort with intent to improve transportation safety tracking and outcome measurement. These findings are expected to have implications for crash reporting and emergency response in rural and isolated communities and identify gaps and opportunities for saving lives and injury mitigation. Findings may also provide insight into formal mechanisms regarding transfer of knowledge to parties and agencies that might use the data, such as school safety programs, hospitals and public safety, etc.

The results of this study will also inform the Alaska Department of Health Transportation Injury Prevention Community of Practice (TIP CoP) to build a more robust and comprehensive set of data related to transportation across our state for epidemiology and injury prevention. Future work will focus on improving the probabilistic join condition schema in an effort to improve the total number of linked records and explore opportunities to align reporting classifications to facilitate the linking process.

CHAPTER 5. REFERENCES

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