Comparison of Motor Vehicle Crash Injuries, Fatalities, and Crash Circumstances On- and Off-Tribal Lands In Arizona, 2007-2014

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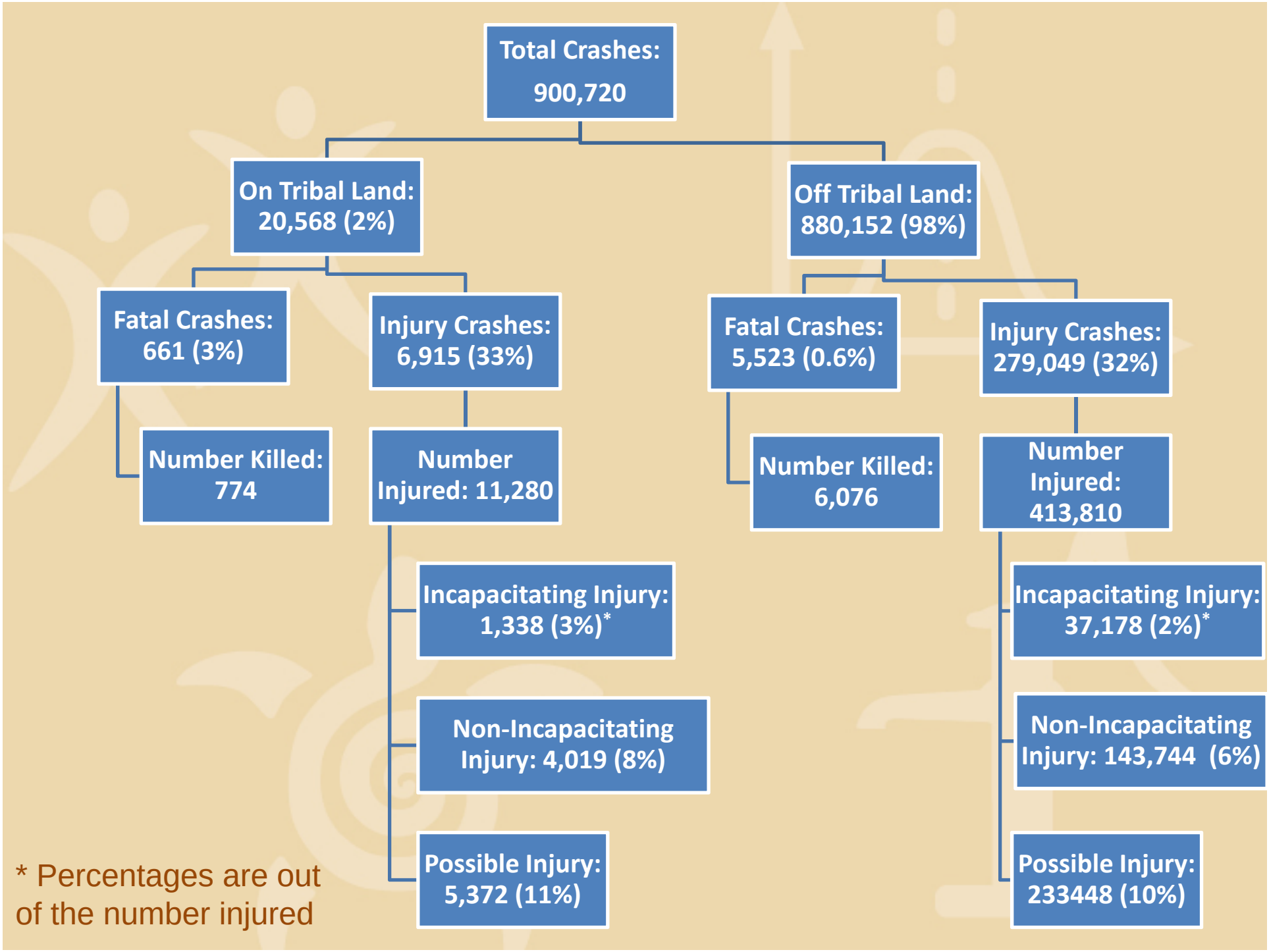
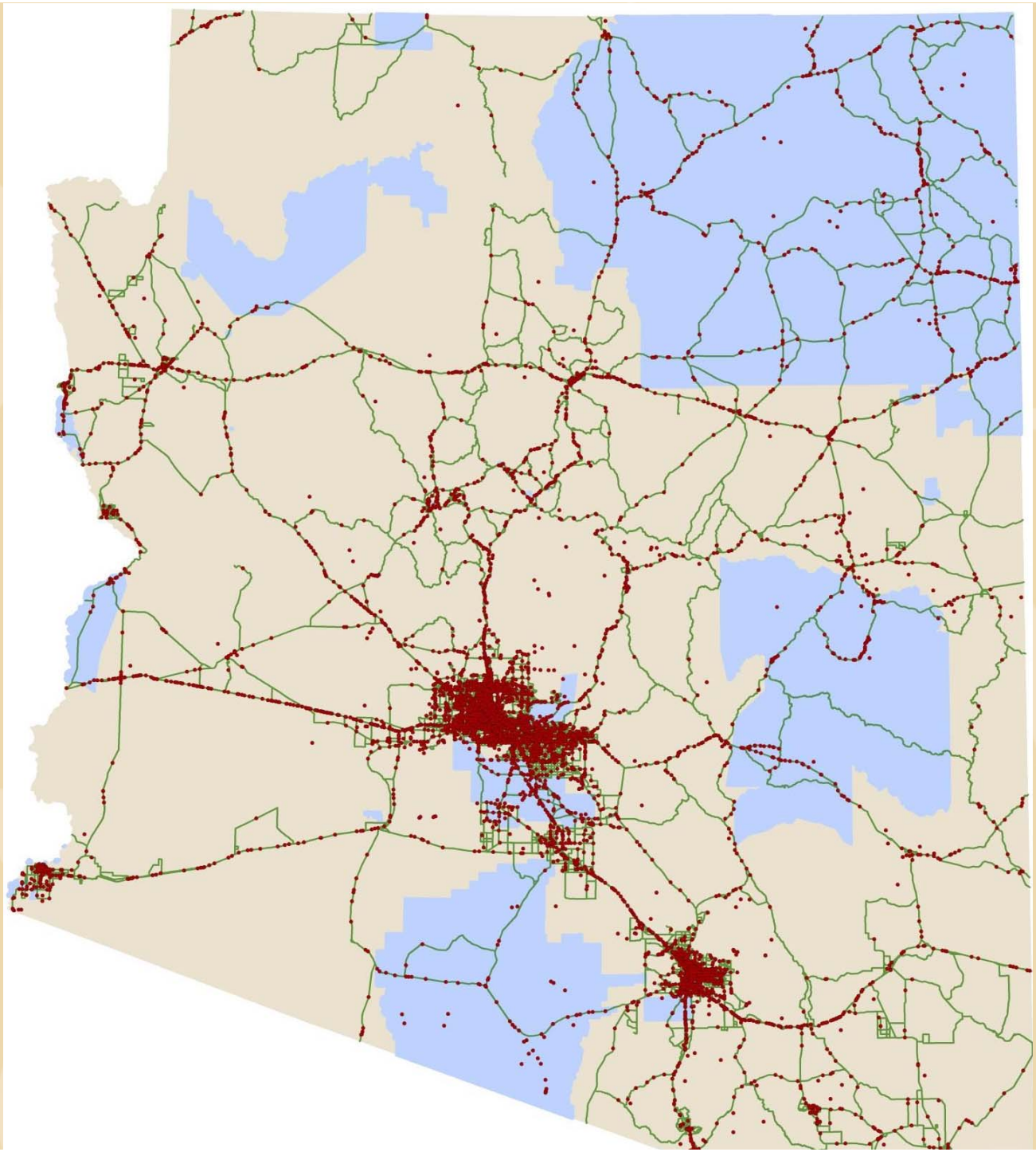
Methods

- Data from the Arizona Department of Transportation (ADOT) Accident Location Identification Surveillance System for years 2007-2014[2] were analyzed
- Based on geocoded locations, MVCs were classified as on or off Tribal land
- Analysis was conducted using SAS v. 9.3


Total Crashes: 900,720
On Tribal Land: 20,568 (2%)
Off Tribal Land: 880,152 (98%)
Fatal Crashes: 661 (3%)
Injury Crashes: 6,915 (33%)
Fatal Crashes: 5,523 (0.6%)
Injury Crashes: 279,049 (32%)
Number Killed: 774
Number Injured: 11,280
Number Killed: 6,076
Number Injured: 413,810
Incapacitating Injury: 1,338 (3%)*
Non-Incapacitating Injury: 4,019 (8%)
Possible Injury: 5,372 (11%)
Incapacitating Injury: 37,178 (2%)*
Non-Incapacitating Injury: 143,744 (6%)
Possible Injury: 233448 (10%)
* Percentages are out of the number injured



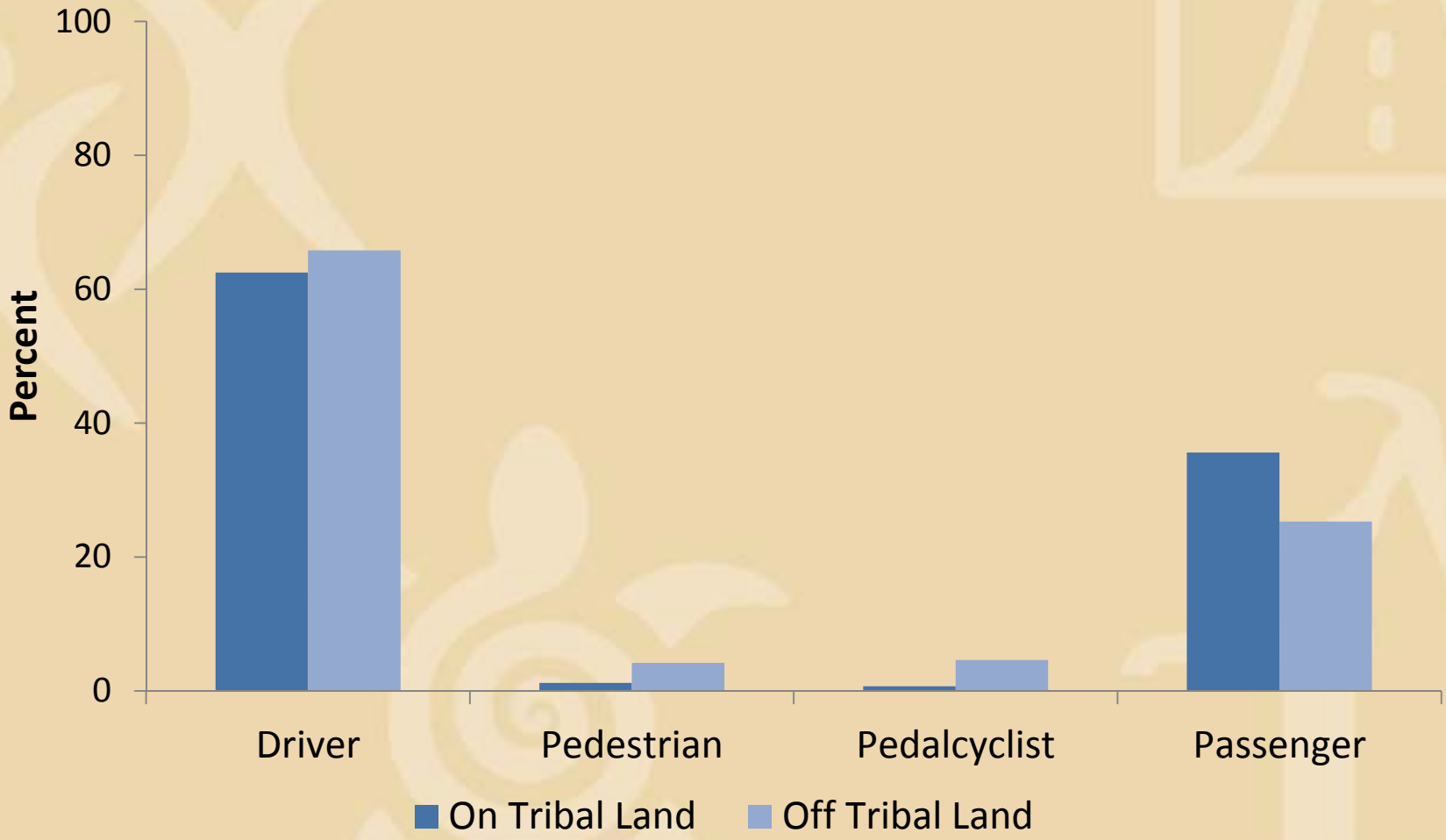
Results

Odds of a Fatality or Injury by Crash Location: On vs Off Tribal Lands

Outcome	Odds Ratio	95% CI
Fatality	5.9	5.4-6.3
Injury - Any	1.5	1.4-1.5
Injury - Incapacitating	1.8	1.6-1.8

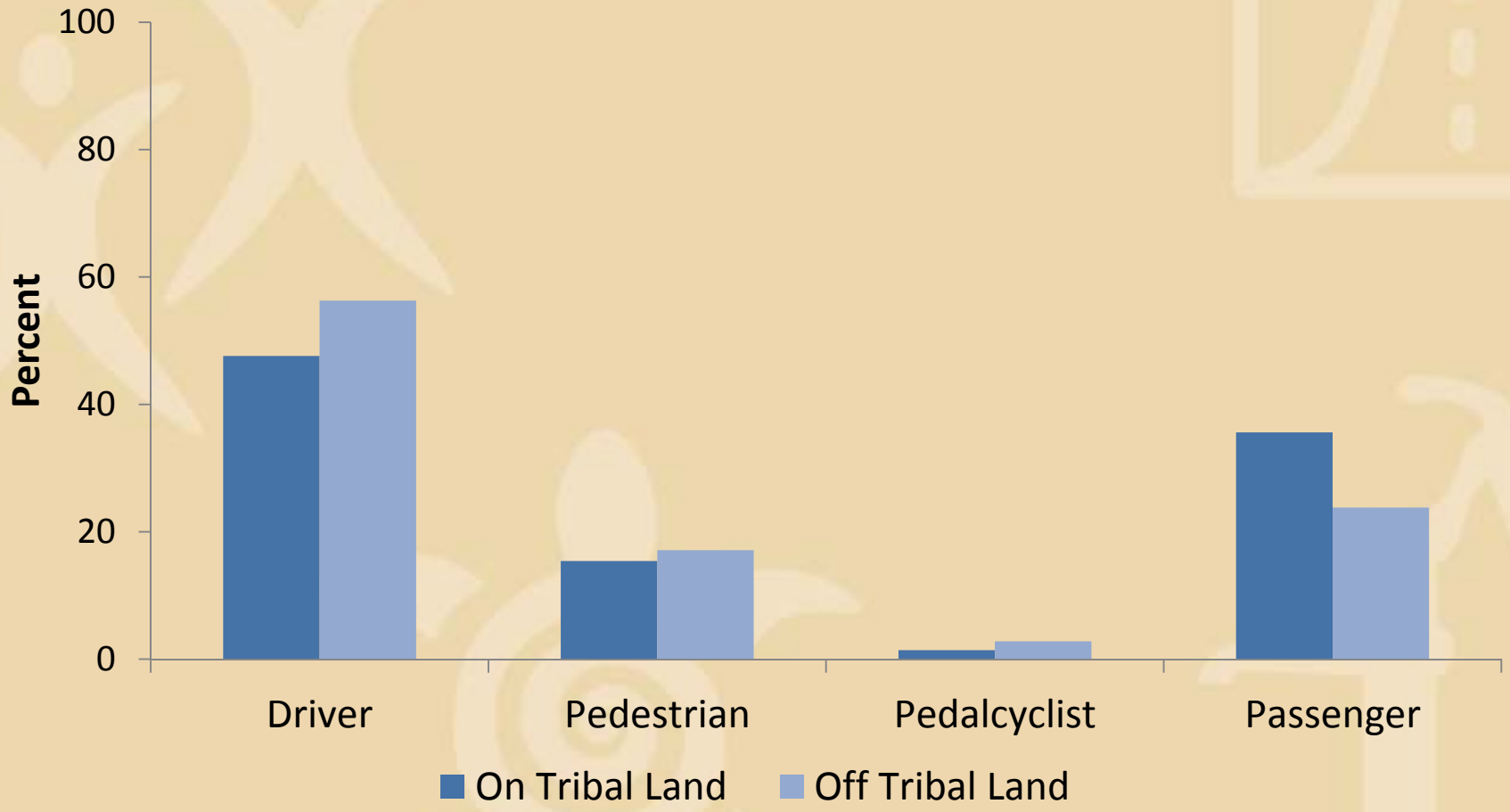
Results

Injury by Person Type, On and Off Tribal Lands



Results

Fatality by Person Type, On and Off Tribal Lands



Results

Behavioral Risk Factors by Crash Location: On vs Off Tribal Lands

Risk Factor	Odds Ratio	95% CI
Use of Appropriate Safety Device	0.83	0.8-0.9
Alcohol Involvement	1.6	1.5-1.6
Drug Involvement	1.2	1.0-1.4
Fatigue	2.4	2.2-2.6
Violation/Citation	0.9	0.93-0.97
Distracted Driving	0.9	0.88-0.93

Results

Vehicle & Environmental Risk Factors by Crash Location: On vs Off Tribal Lands

Risk Factor	Odds Ratio	95% CI
Road Condition Contributed to Crash	1.8	1.8-1.9
Vehicle Defect Contributed to Crash	1.6	1.1-2.3
Single Vehicle Crash	2.6	2.5-2.7
Single Vehicle Crash Among Injury MVCs	2.6	2.5-2.8
Fatality in Single Vehicle Crash Among Fatal MVCs	1.6	1.4-2.0

Strengths

- All records are geocoded
- All crash reports, including individual person and vehicle data, for time period of analysis
- All information in the incident, person and unit files available for analysis

Limitations

- Tribal law enforcement does not report MVCs to ADOT due to Tribal government concerns about sharing names of tribal members
- Data in many fields missing or “Unknown”

Conclusion

- The odds of a MVC resulting in injury or fatality is higher on Tribal lands than off Tribal lands
- Fatigue, alcohol and drugs had a higher odds of being involved in MVC on Tribal land than off Tribal land
- Road conditions and vehicle defects had a higher odds of contributing to MVC crashes on Tribal lands than off Tribal lands
- Among injury and fatality MVCs, single vehicle crashes had a greater odds of occurring on Tribal lands as compared to off Tribal lands

Recommendations

- Data Completion & Quality:
  - Develop agreements that allow Tribes to report to ALISS system without sharing unique identifiers or develop alternate reporting mechanism to improve data completeness
  - Increase training on completion of the crash report forms to improve data quality
- Repair and improve roads on Tribal lands to include shoulders, turn lanes, retroreflective markings, etc. to reduce crashes due to road conditions
- Increase public education on hazards of impaired and fatigued driving in remote, rural areas

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