How Complete is the Fatality Analysis Reporting System (FARS) for Northwest tribes?

Nicole Smith, MPH & Meena Patil, MPH

Northwest Portland Area Indian Health Board

Aug 25, 2022

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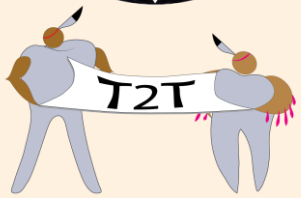
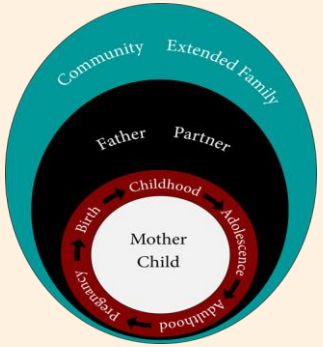
ToddlerObesity & Tooth Decay
TOTS
Prevention Project


T2T


NATIVE CARS
NATIVE CHILDREN ALWAYS RIDE SAFE


Community
Extended Family
Father
Partner
Childhood
Birth
Adolescence
Pregnancy
Adulthood
Mother
Child


NATURAL RESOURCES
ENVIRONMENTAL
HEALTH

- Biostatistician at NPAIHB since 2019
- Previously worked at the Oregon Health Authority
- >12 years of Public health experience
- Love performing record linkages

At my free time

- ❖Love working in my backyard
- ❖Awarded as the “Best Indian cook” by my kids☺
- ❖Yoga a day keeps my insanity away☺☺
- ❖Dream destination to retire “Hawaii”

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Native CARS Team

Tam Lutz

Jodi Lapidus

Nicole Smith

Meena Patil

Olivia Whiting Tovar

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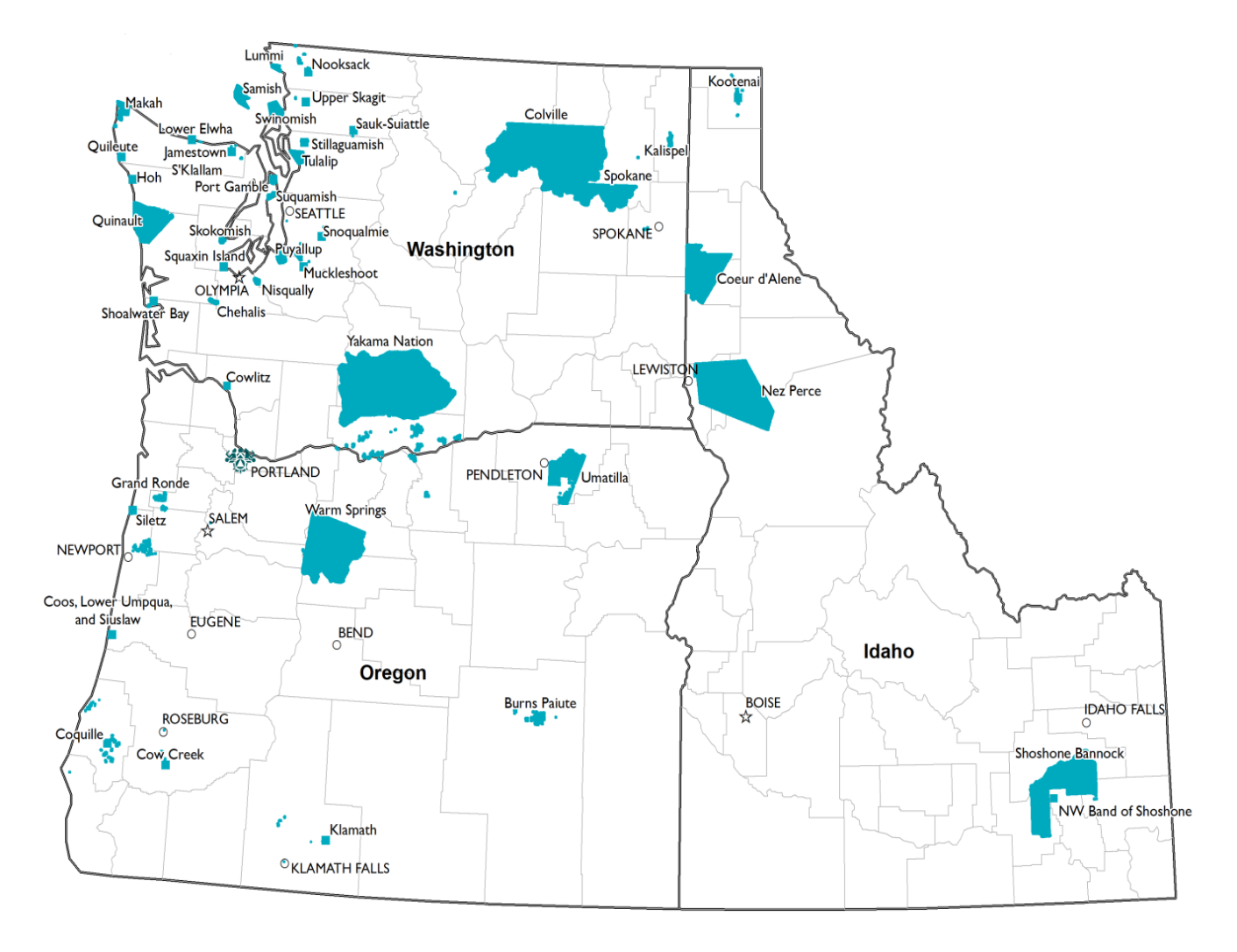

- NPAIHB serves the 43 federally recognized tribes of Idaho, Oregon, and Washington
- Preventing MVC-related injuries and fatalities is a priority for Northwest tribes
- Addressing this issue requires comprehensive, evidence-based, community-responsive ongoing work by planning, health, tribal council, police, transportation, etc.

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Outline

- Overview of the Motor Vehicle Injury Data (MVID) project
- Why evaluate FARS?
- Evaluation approach
  - Data description
  - Methods
- Findings
  - Estimated % of MVT deaths with a FARS record
  - AI/AN race considerations
- Data uses & limitations

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Motor Vehicle Injury Data Goals/Context

- Funded by National Institute on Minority Health and Health Disparities (NIMHD)
- Aims to facilitate use of MV injury data by tribes and tribal organizations
- Analysis of race-corrected and publicly available MVI data sources
  - Death certificates
  - Hospital discharge data
  - FARS
  - Crash data
  - Syndromic data - ESSENCE

"Race corrected" means we linked the data source to the Northwest Tribal Registry

NW Tribal Epicenter

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How do you use FARS data?

Vote for up to 9 choices

1. Grant writing
2. Roadway/infrastructure improvements
3. Policy/legislation
4. Law enforcement strategies
5. Research
6. Understand/quantify fatal crashes in my community
7. Planning
8. Something else
9. I don't use FARS

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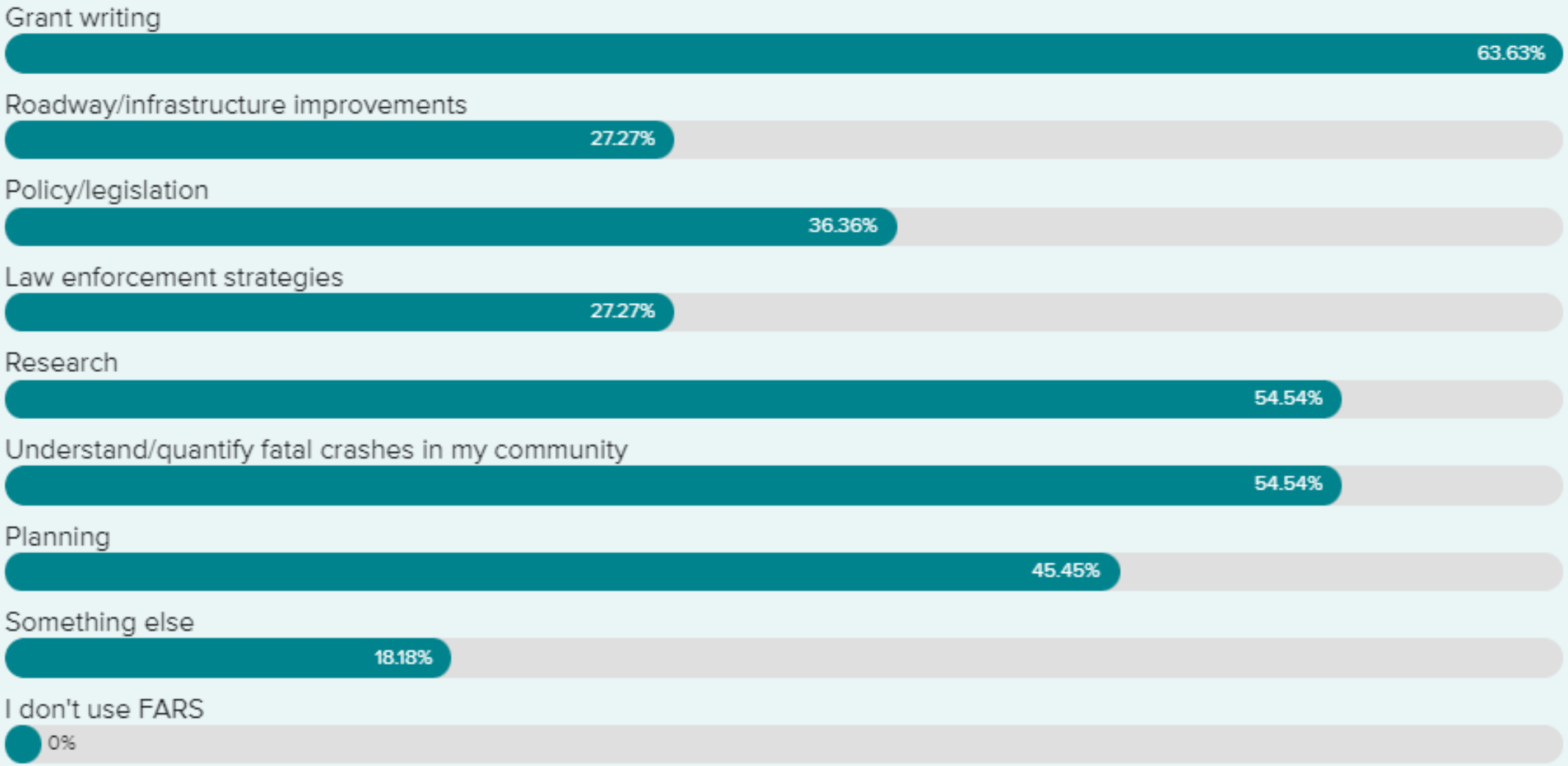
12. How do you use FARS data?

11

11 responses



Allowed selections: 9

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How do you access FARS data?

Vote for up to 7 choices

1. Published crash statistics
2. Tables on FARS website
3. Query system (FIRST)
4. Native American Traffic Safety Facts tables and maps
5. Download and analyze the data
6. Something else
7. I don’t use FARS data

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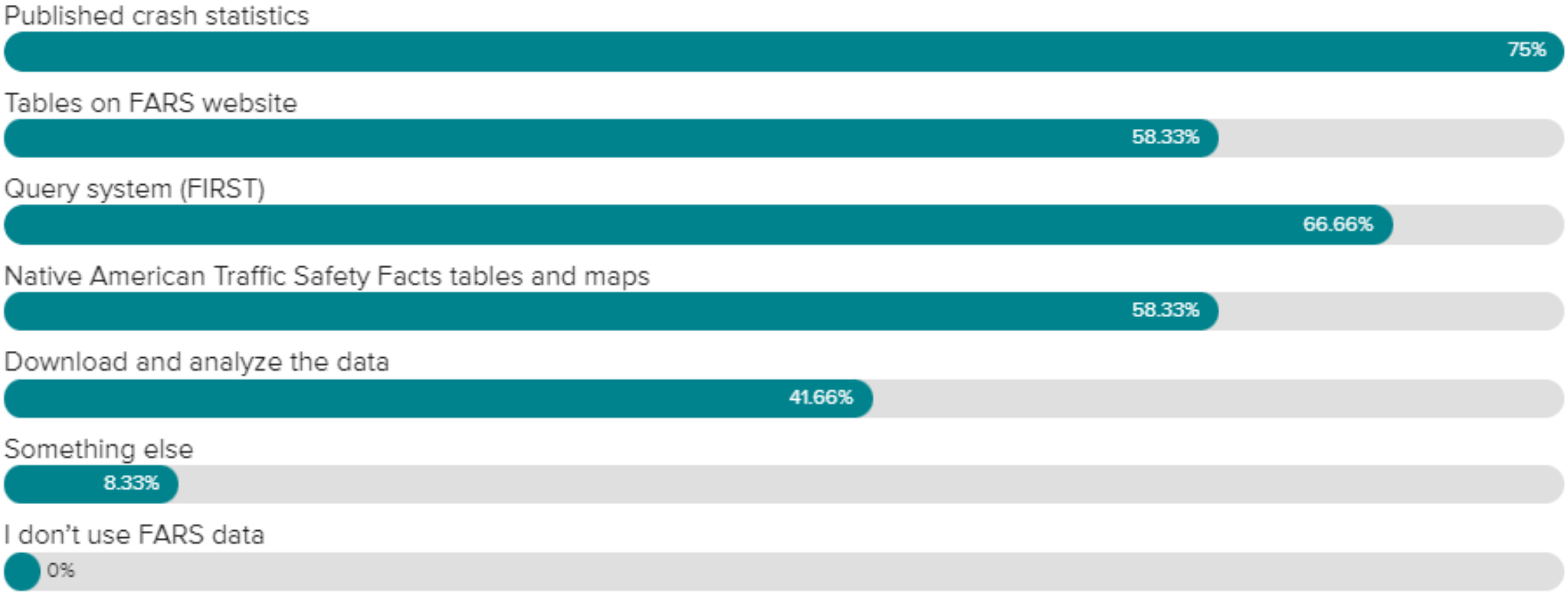
13. How do you access FARS data?

12 responses



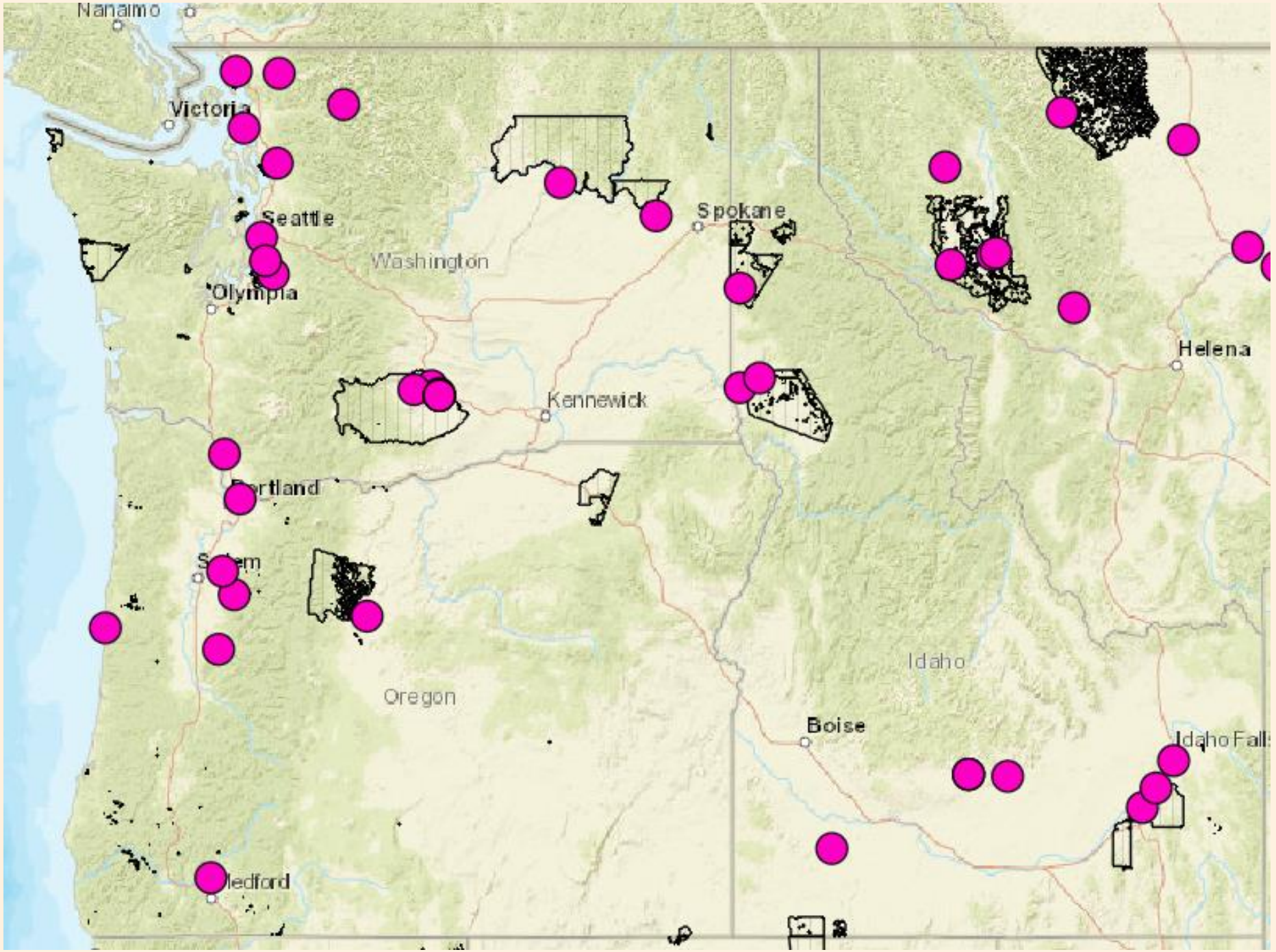
Allowed selections: 7

Native American Traffic Safety Facts
FARS 2015-2019

Identifying Fatal Crashes involving Native Americans/Alaskan Natives: Methodology Overview

IMPORTANT: Hispanic Origin and Race data for the 2020 FARS Annual Report File (ARF) is currently incomplete due to delays in processing the death certificates. Many of the missing values will be resolved when the file is finalized and the data will be updated at that time.

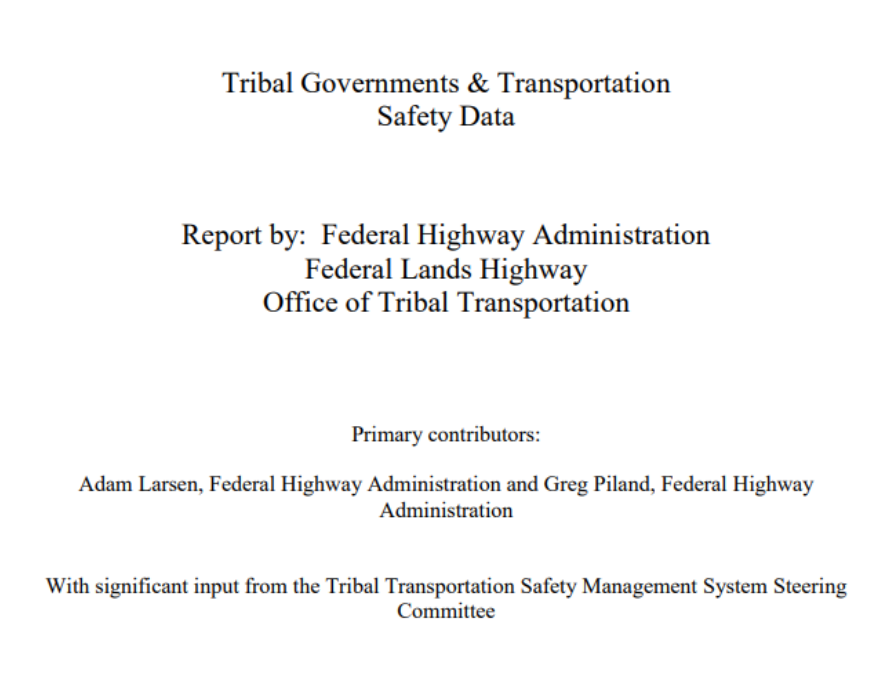
Categories		Year					
		2015	2016	2017	2018	2019	Total 2015-2019
1. Total Traffic Fatalities	a. All Native American Fatalities	676	704	717	604	541	3,242
	b. Native American Fatalities on Reservations	215	219	230	174	133	971
	c. All fatalities on reservation	369	383	394	377	313	1,836
2. Traffic Fatalities (Driver Only)	a. All Native American Fatalities	328	355	349	302	268	1,602
	b. Native American Fatalities on Reservations	101	90	101	83	63	438
	c. All fatalities on reservation	202	185	200	204	175	966
3. Traffic Fatalities (Driver Only) Aged 20 and Under	a. All Native American Fatalities	32	31	27	31	31	152
	b. Native American Fatalities on Reservations	7	8	11	8	8	42
	c. All fatalities on reservation	15	15	18	16	17	81
4. Passenger Vehicle Occupant Fatalities (all seat Positions)	a. All Native American Fatalities	430	462	450	362	362	2,066
	b. Native American Fatalities on Reservations	136	155	138	114	99	642
	c. All fatalities on reservation	239	267	254	251	218	1,229
5. Alcohol Impaired Driving Fatalities BAC .01 to .07	a. All Native American Fatalities	33	44	40	32	24	173
	b. Native American Fatalities on Reservations	14	10	14	9	12	59
	c. All fatalities on reservation	26	19	21	21	19	106
6. Alcohol Impaired Driving Fatalities BAC .08+	a. All Native American Fatalities	262	296	283	234	199	1,274
	b. Native American Fatalities on Reservations	118	125	100	90	71	504
	c. All fatalities on reservation	165	175	154	164	130	788
7. Speed Related Fatalities	a. All Native American Fatalities	195	210	202	169	163	939
	b. Native American Fatalities on Reservations	76	66	56	68	45	311
	c. All fatalities on reservation	125	117	119	120	96	577
8. Fatalities by Age (Driver Only) < 15	a. All Native American Fatalities	0	2	0	0	1	3
	b. Native American Fatalities on Reservations	0	1	0	0	1	2
	c. All fatalities on reservation	0	1	0	0	1	2


Nanaimo
Victoria
Seattle
Spokane
Washington
Olympia
Kennewick
Helena
Portland
Salem
Idaho
Oregon
Boise
Idaho Falls
Medford

What do you think about FARS data quality?

- What is FARS reputation for quality/completeness?
  - What percentage of fatalities that are supposed to have a FARS record do?
  - Does it have the data you're looking for?
- Do you have any concerns for the data quality or completeness for FARS in your area?
- Have you evaluated FARS data? How?

Why evaluate the data?



Tribal Governments & Transportation
Safety Data

Report by: Federal Highway Administration
Federal Lands Highway
Office of Tribal Transportation

Primary contributors:

Adam Larsen, Federal Highway Administration and Greg Piland, Federal Highway Administration

With significant input from the Tribal Transportation Safety Management System Steering Committee

"Federal agencies and Tribes are not required to share their crash data with State government or FARS."

"The Washington Traffic Safety Commission provided documentation showing that from 2004-2015, only 4 of the 29 federally recognized Tribes in Washington State consistently reported crash data."

"There is concern that American Indians and Alaska Natives are occasionally incorrectly identified as another race, reported as mixed race, or reported as unknown race."

https://irp-cdn.multiscreensite.com/7e0c8ed5/files/uploaded/2016_Tribal_Safety_FHWA-161122-007_signed_by_WCW%20052417.pdf

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It could all be so simple…

TRIBAL EPIDEMIOLOGY CENTERS

NHTSA

FARS ID	Death Certificate #
8675309	24601
…….	……
…….	……
…….	……
…….	……

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Evaluation approach

← RESEARCH & DATA

Fatality Analysis Reporting System (FARS)

Northwest Tribal Registry

Privacy preserving linkage

- There are methods to link data systems in the absence of personal identifiers
- Death certificate numbers are censored in publicly available FARS datasets
- MatchPro, a probabilistic linkage software developed by the National Cancer Institute that can be freely downloaded from https://surveillance.cancer.gov/matchpro/download

Data descriptions: Fatality Analysis Reporting System(FARS)

- A census of motor vehicle crashes that occur on public trafficways in the US that resulted in one or more fatality
  - Only includes fatalities that occurred within 30 days of the crash
- Data collected from:
  - Police crash reports
  - Driver licensing and vehicle registration files
  - Highway department data
  - Coroner/ medical examiner reports
  - Death certificates
  - Emergency medical service reports
  - Vital statistics

Information in FARS

Crash file

Exact location
Time
Roadway
Weather

Person file: Demographics

Age
Sex
Race & Ethnicity

Person file: Contributing factors

Speed
Impaired driving
Restraint use

Data descriptions: Death certificate

- Collected in cooperation between the National Center for Health Statistics (NCHS) and the State Vital statistics offices
- Demographics: sex, age, race and ethnicity, county of residence
- Injury related fields: State and county of injury, time of injury
- Underlying causes of death are coded using the International Classification of Diseases Tenth Revision (ICD-10) format from 1999 onwards

Data inclusion

ID Death Certificates 2013-2016
Motor vehicle traffic and non-traffic related resident deaths

ID FARS
2013-2016
Motor vehicle traffic fatalities that occurred in Idaho

OR Death Certificates 2010-2016
Motor vehicle traffic and non-traffic related resident deaths

OR FARS
2010-2016
Motor vehicle traffic fatalities that occurred in Oregon

WA Death Certificates 2010-2016
Motor vehicle traffic and non-traffic related resident deaths

WA FARS
2010-2016
Motor vehicle traffic fatalities that occurred in Washington

Privacy preserving linkage method

Date of injury	Date of injury
Date of death	Date of death
Age at death	Age at death
Sex	Sex
Race	Race
County of injury	County of injury
Time of injury	Time of injury

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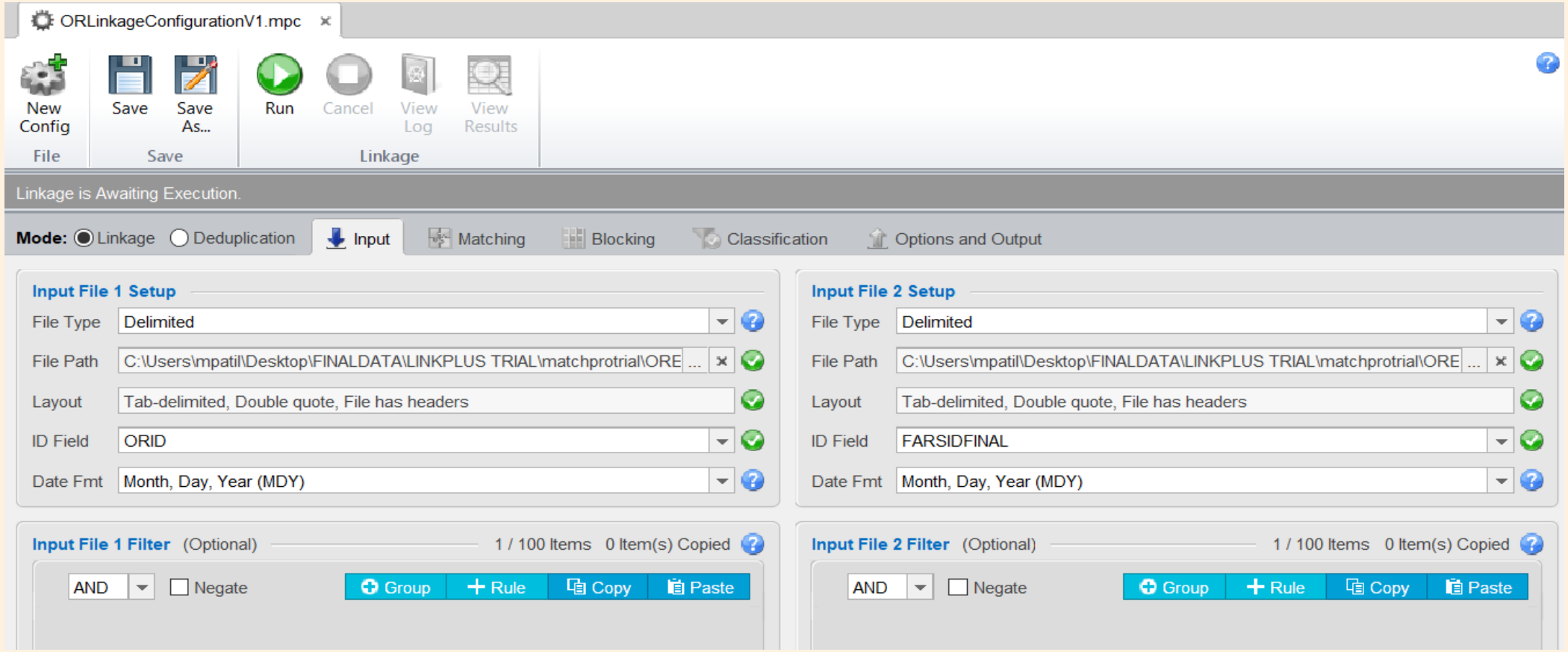
MatchPro - data input



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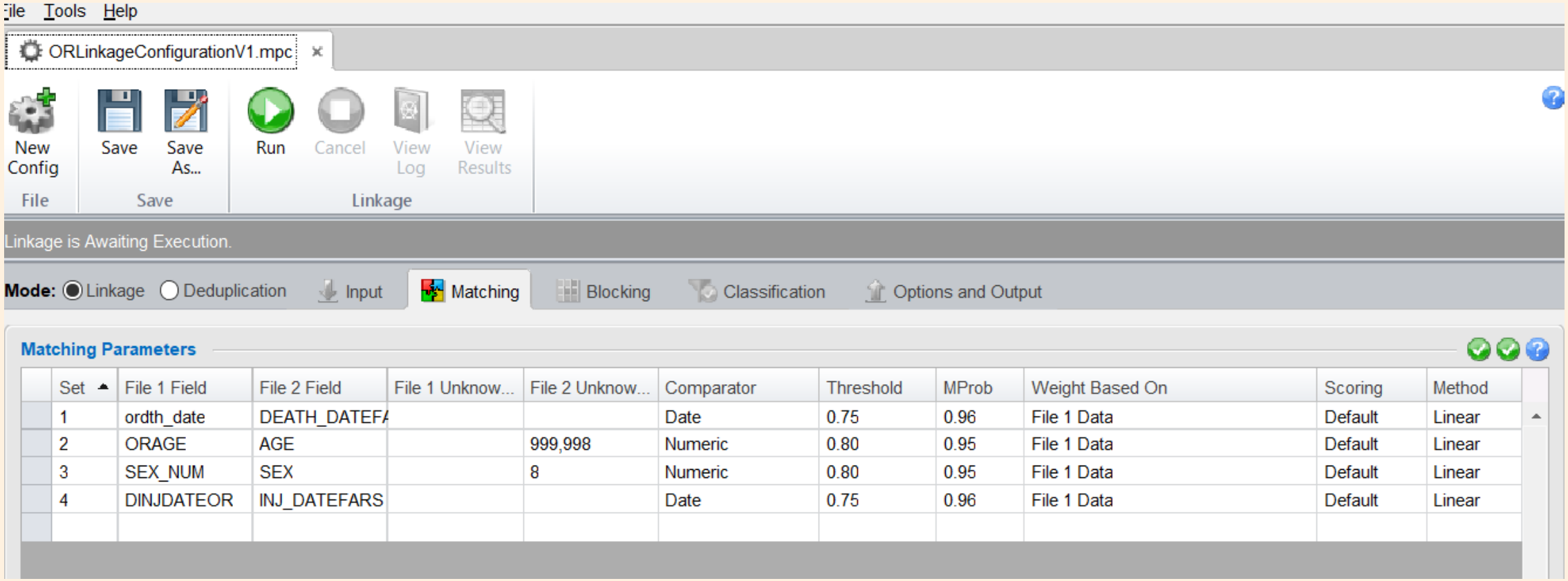
MatchPro – Matching fields



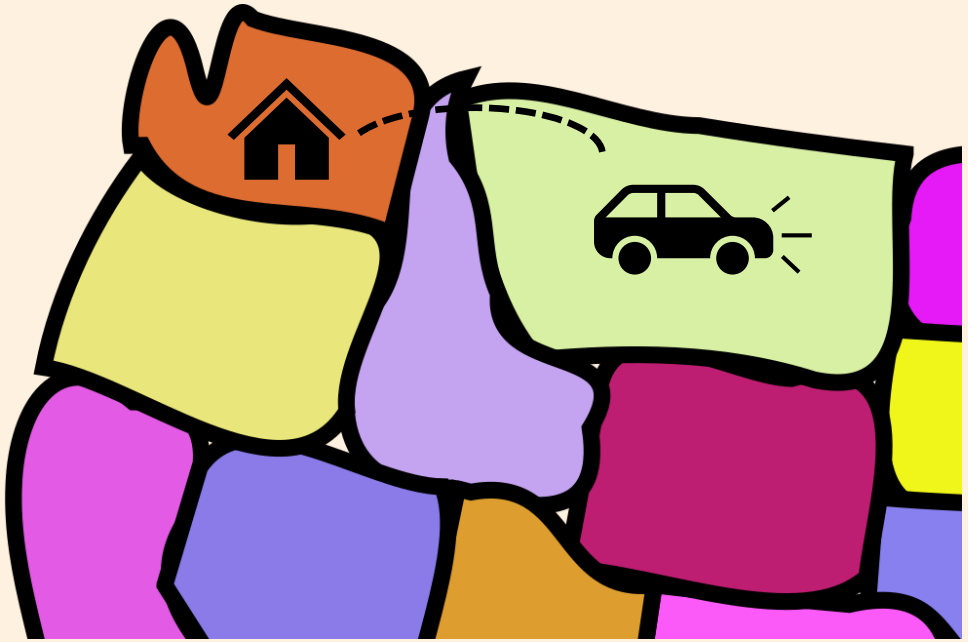
Set	File 1 Field	File 2 Field	File 1 Unknow...	File 2 Unknow...	Comparator	Threshold	MProb	Weight Based On	Scoring	Method
1	ordth_date	DEATH_DATEFA			Date	0.75	0.96	File 1 Data	Default	Linear
2	ORAGE	AGE		999,998	Numeric	0.80	0.95	File 1 Data	Default	Linear
3	SEX_NUM	SEX		8	Numeric	0.80	0.95	File 1 Data	Default	Linear
4	DINJDATEOR	INJ_DATEFARS			Date	0.75	0.96	File 1 Data	Default	Linear

Criteria for assigning match status

Death date	Age	Sex	Crash date	County of injury	Crash Hour	Race*	Match status
✓	✓	✓	✓	✓	✓	✓	YES
✓	✓	✓	✓	✓	±2 hours		YES
✓	Missing	✓	✓	✓	✓		YES
✓	Miss coded max +2yrs	✓	✓	✓	✓		YES
✓	✓	Missing	✓	✓	✓		YES
✓	✓	✓	Possibly date miscoded	✓	✓		YES
Possibly date miscoded	✓	✓	✓	✓	✓		YES

*All other variables were prioritized for assigning match status over race field.

Death certificates not expected to match



State residents who died in crashes in another state

Non-traffic motor vehicle deaths

Deaths that occurred >30 days after the crash

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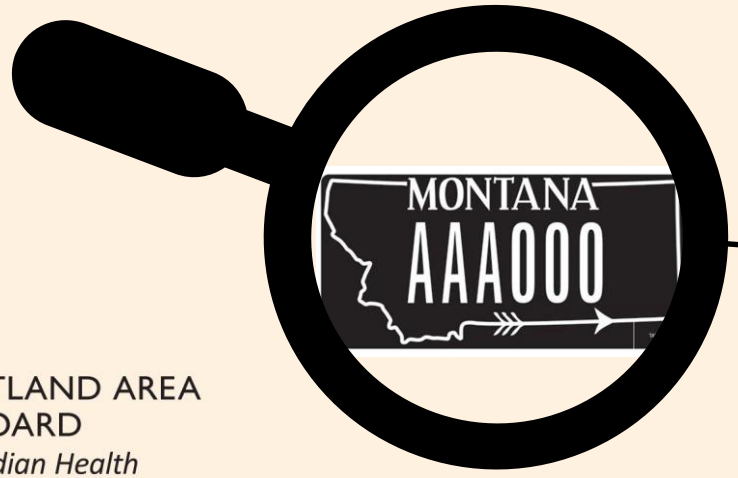
FARS records not expected to match

Residents of other states with a fatal crash in OR, WA, or ID



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What percent of “Expected to match” death certificate had a matching FARS record in Washington State?

1. <50%
2. 50-69%
3. 70-89%
4. 90%+

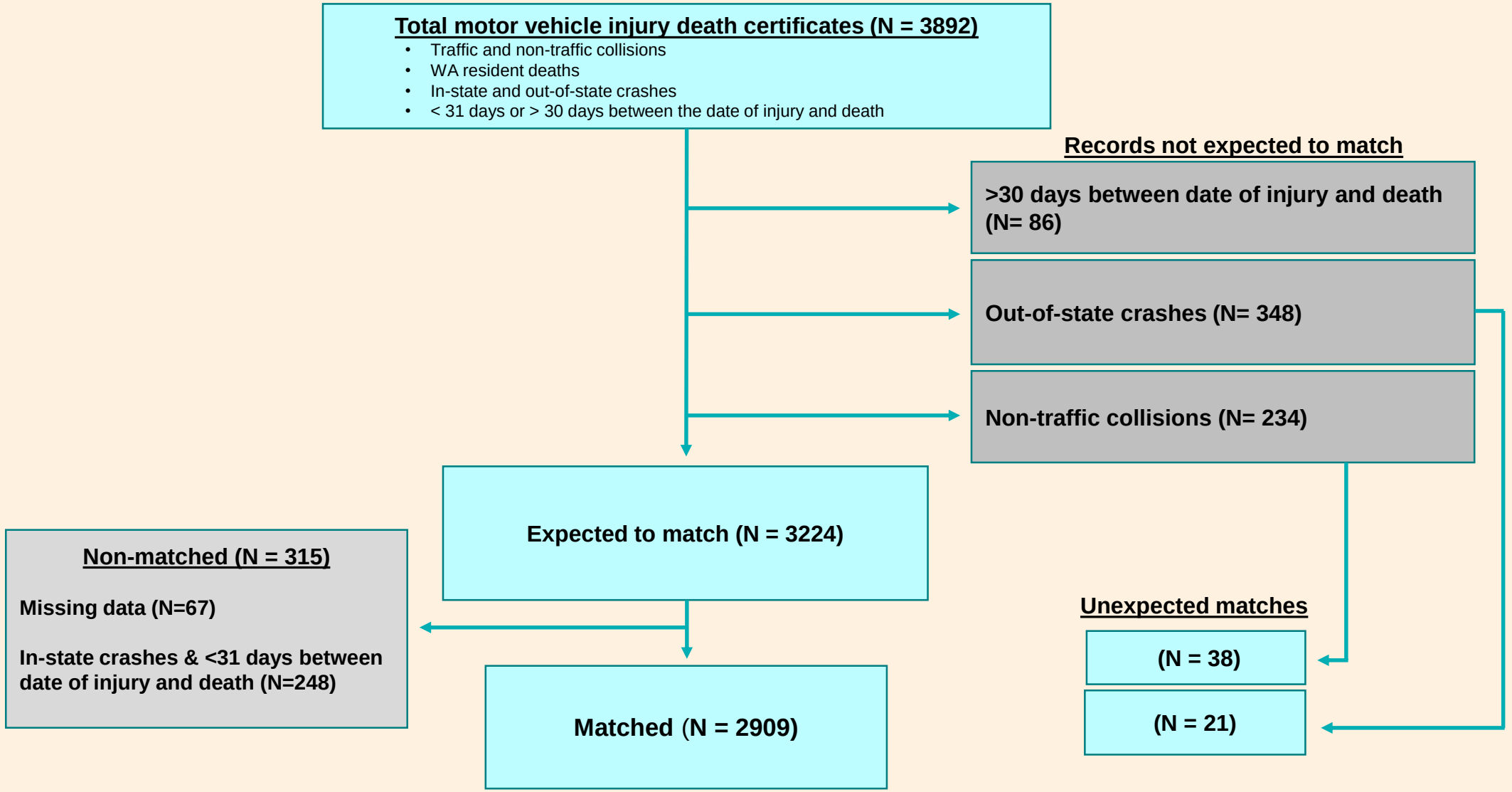
14. What percent of “Expected to match” death certificate had a matching FARS record in Washington State?

9

9 responses

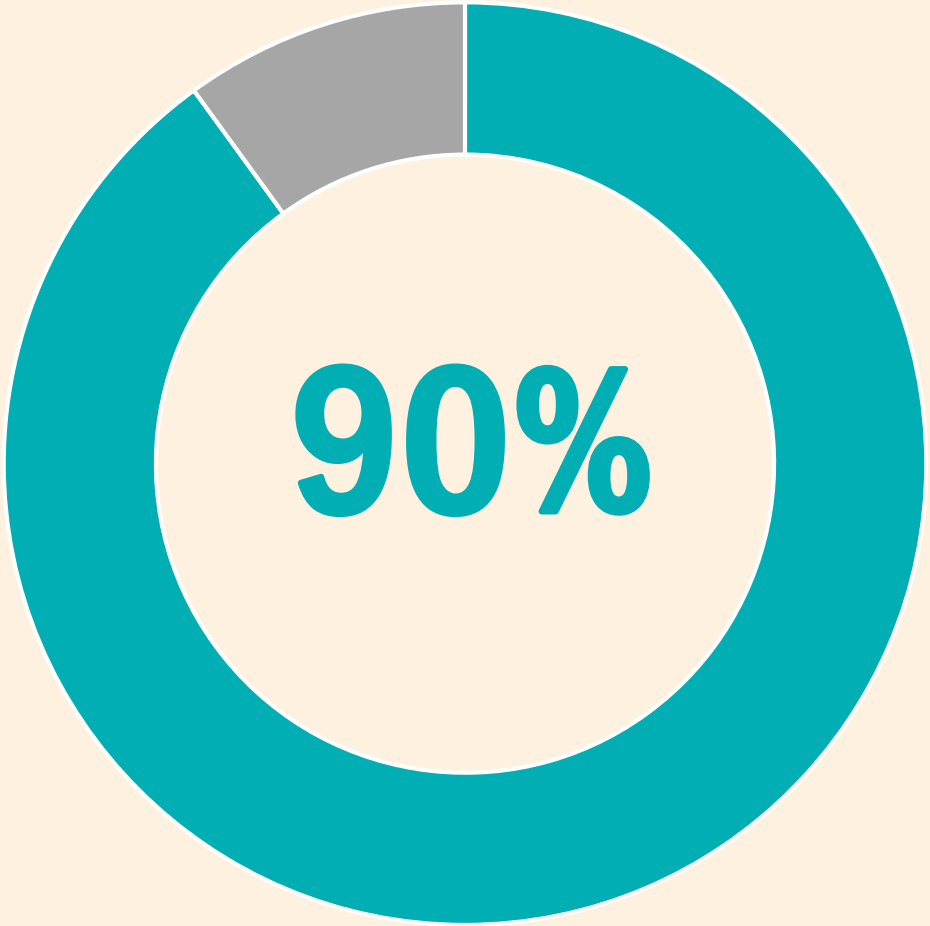
Allowed selections: 1

Death certificate matches and non-matches with FARS, Washington State 2010-2016

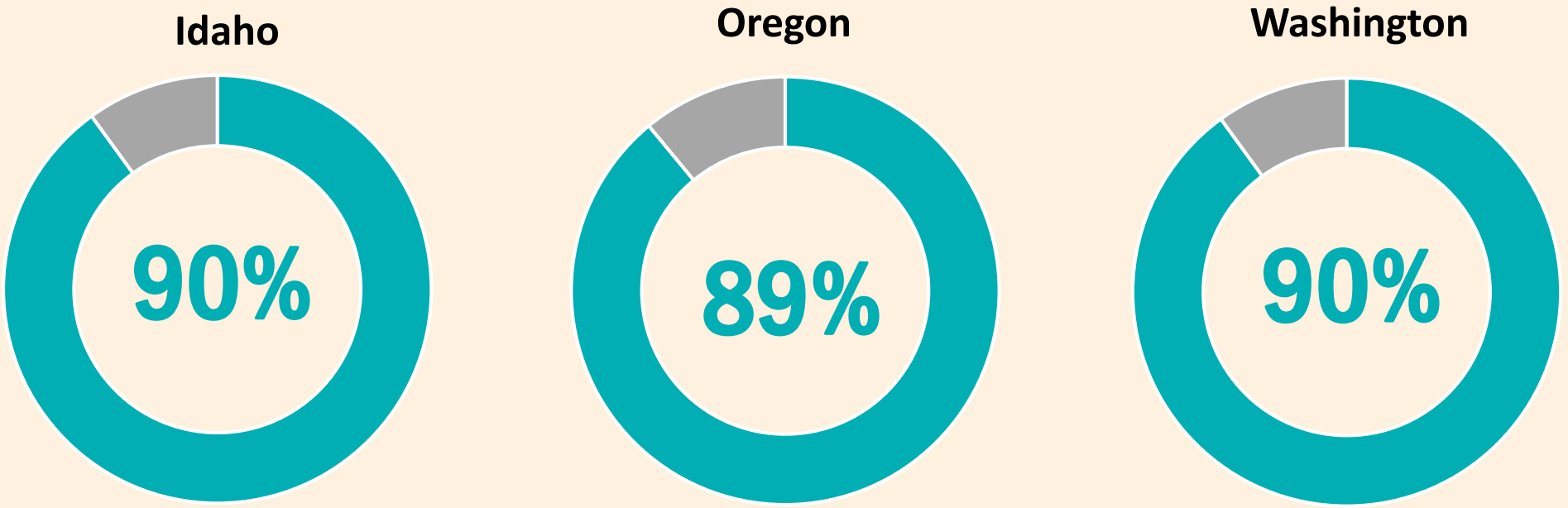


Total death certificate matches (N=2968)

The percentage of records in the Washington state death certificate file with a matching FARS record was very high

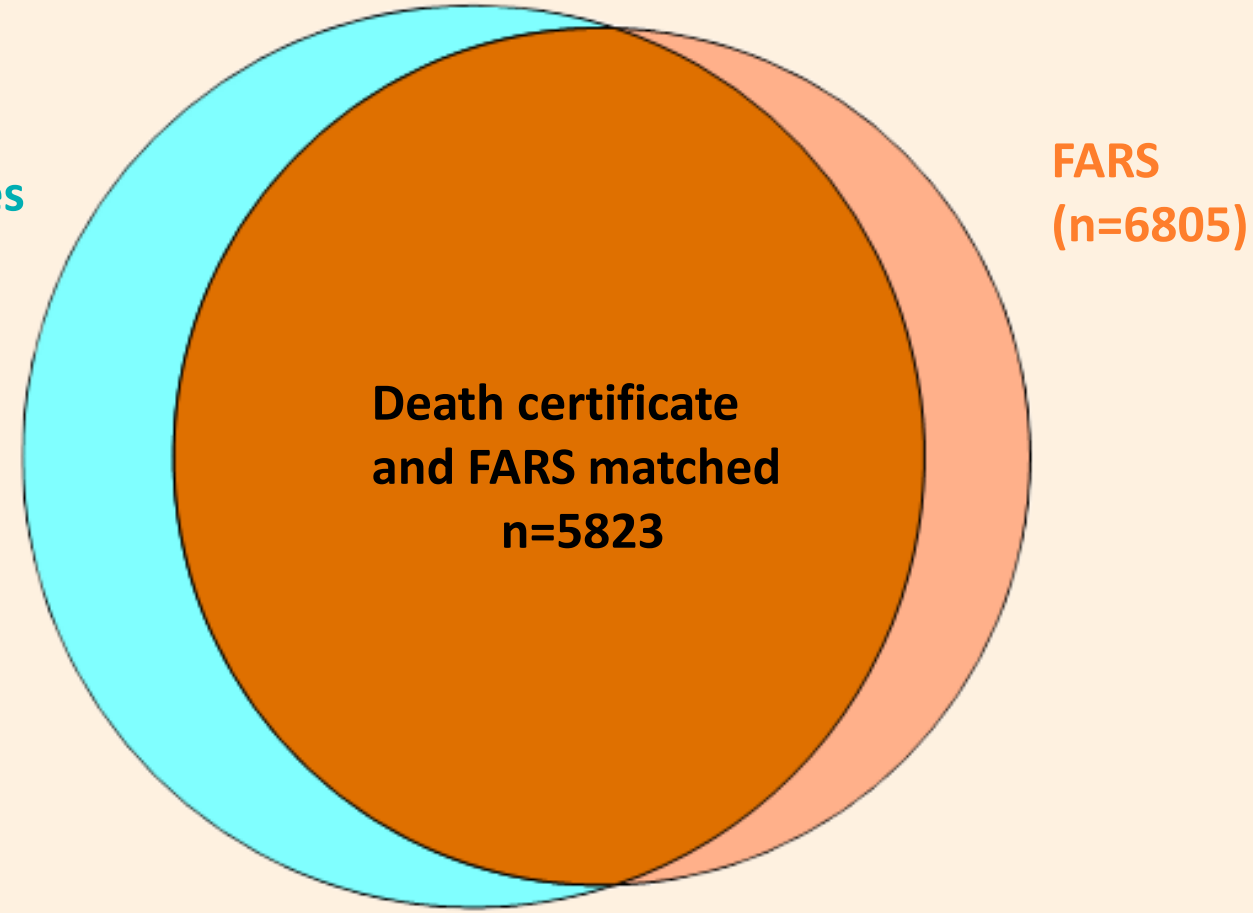


What percentage of records in death certificate file that were 'Expected to match' actually matched in each state?

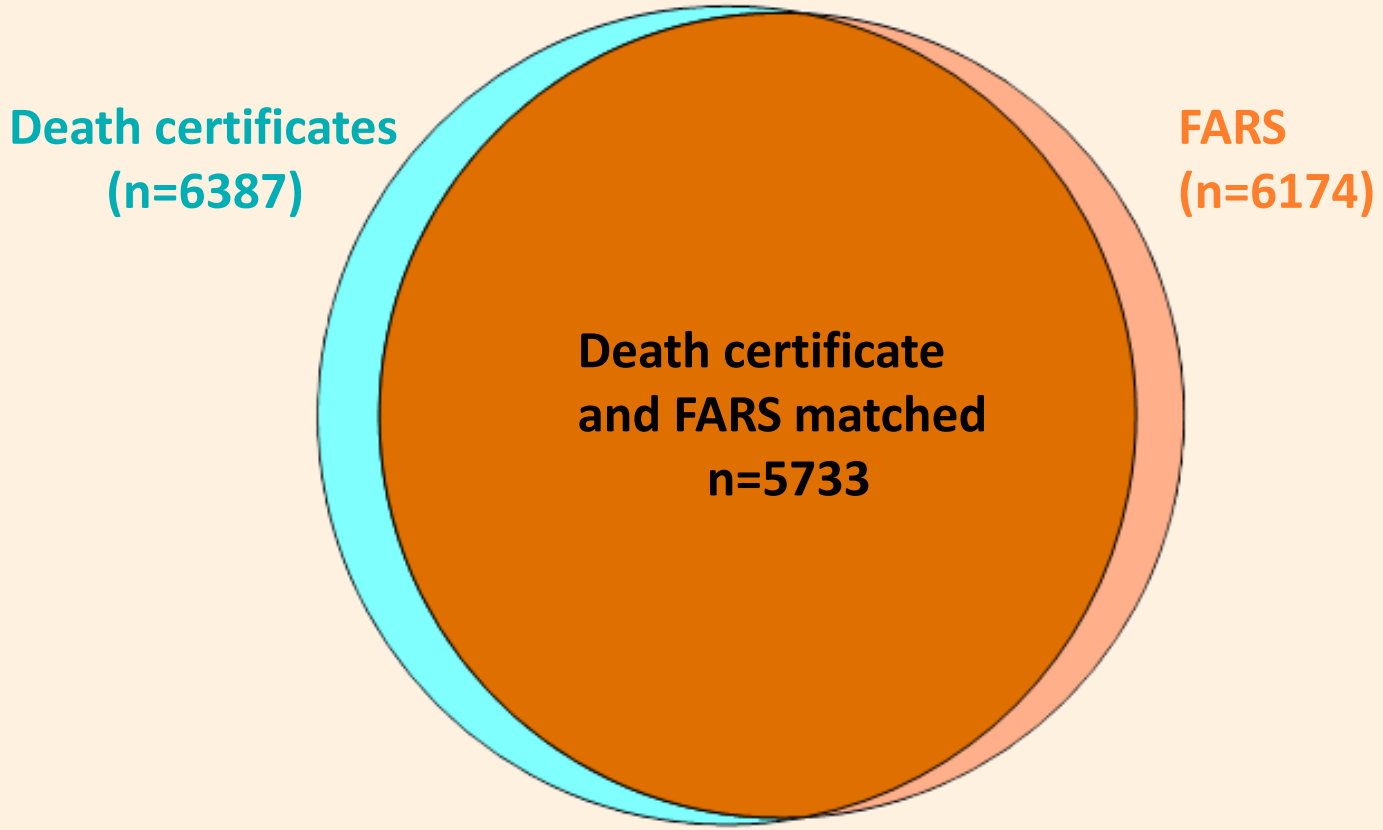


Total matches for the Northwest region

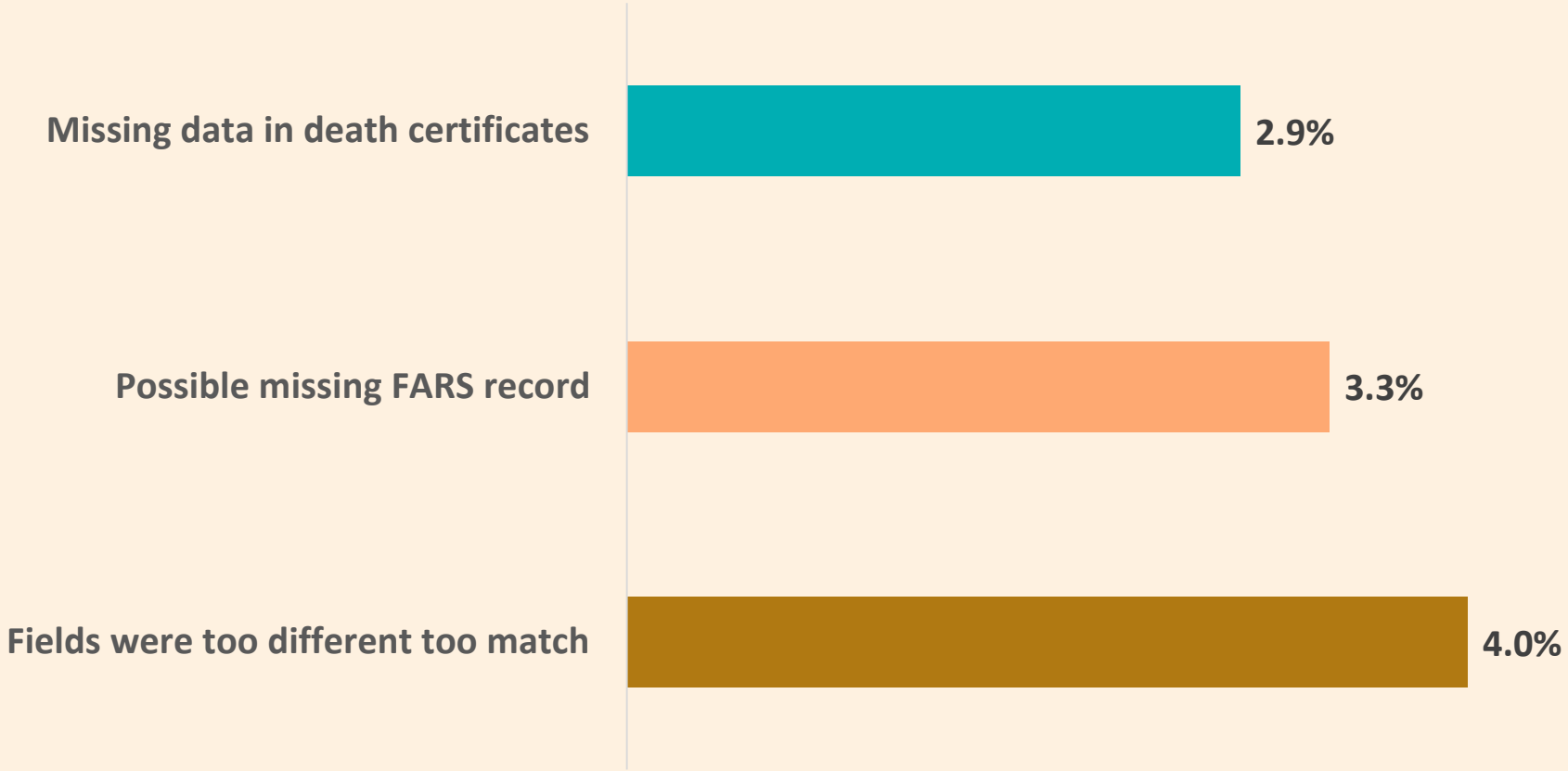
(WA,OR & ID states combined)

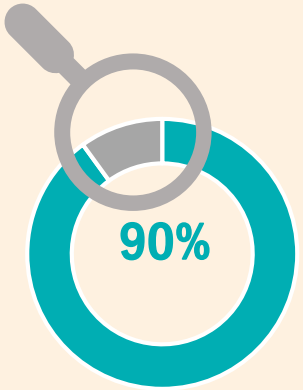


Records expected to match for the Northwest region (WA,OR & ID states combined)



Why isn’t it higher than 90%?





FARS is very complete for Idaho, Oregon, and Washington States

OK, but what about for American Indian people?

What percent of “Expected to match” American Indian death certificates had a matching FARS record?

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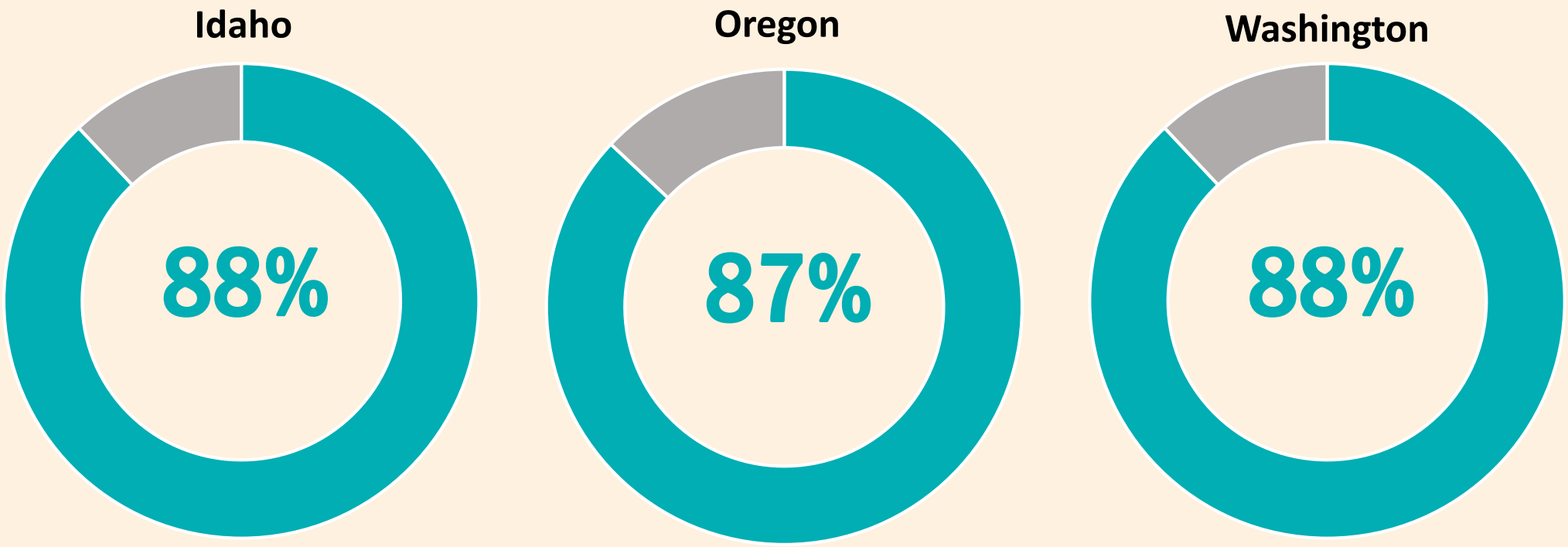
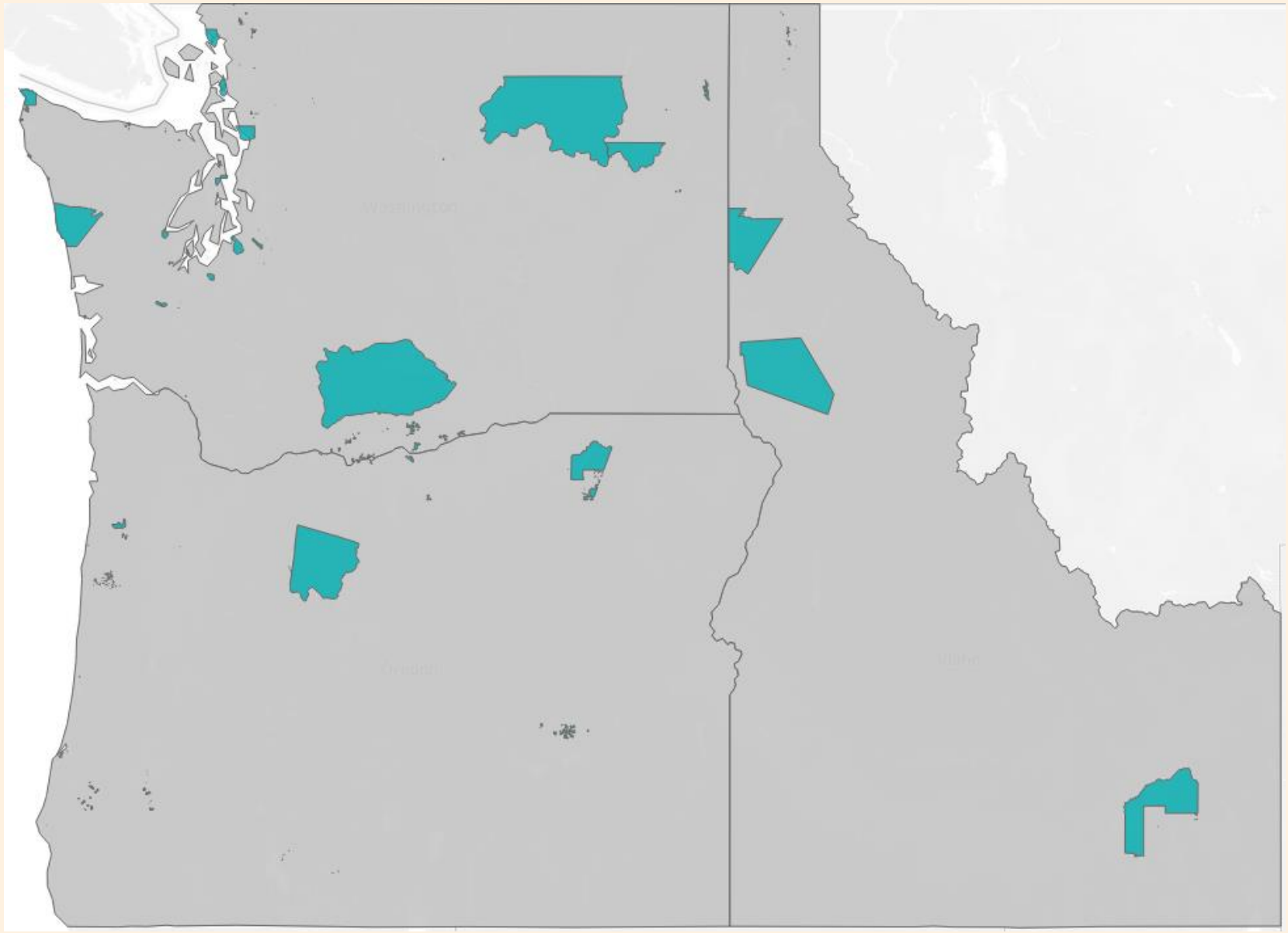
Percentage of expected AI/AN death certificates with matching FARS

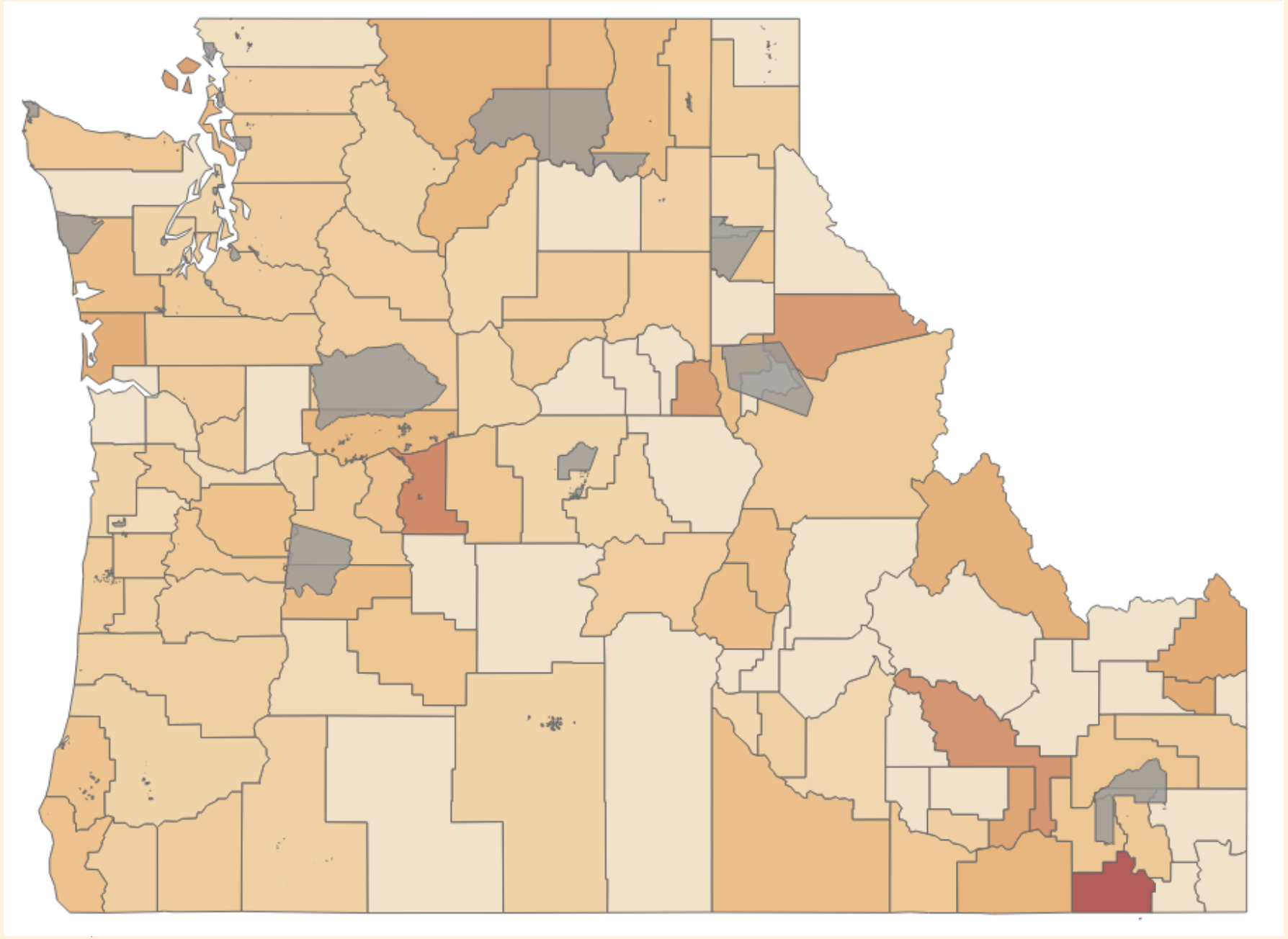


Location evaluation



But,

How complete is FARS on tribal lands?

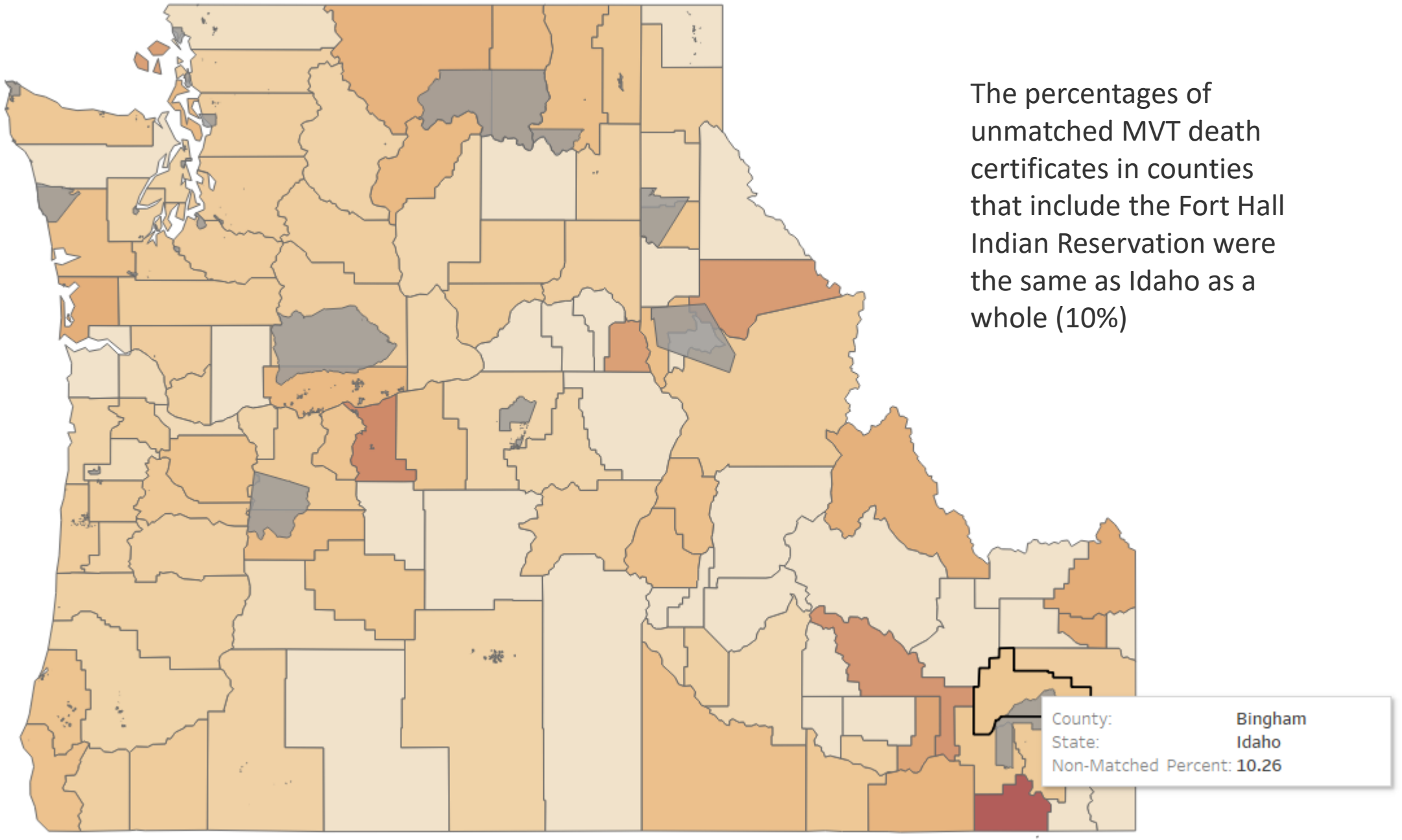


Percent of in-state Motor Vehicle Traffic death certificates without a matching Fatality Analysis Reporting System (FARS) Record

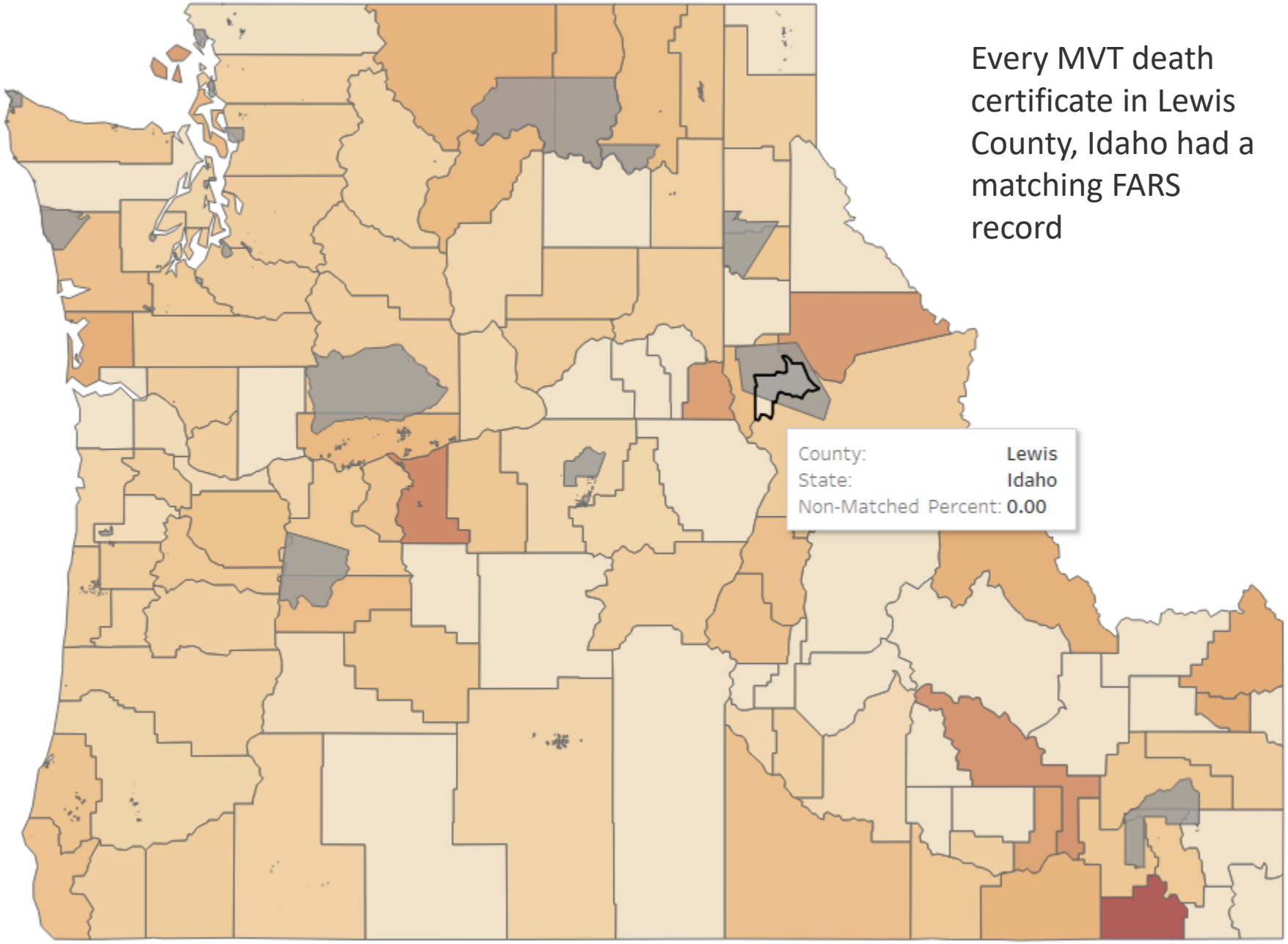
Washington & Oregon 2010-2016 deaths
Idaho 2013-2016 deaths

Indian land layers in gray

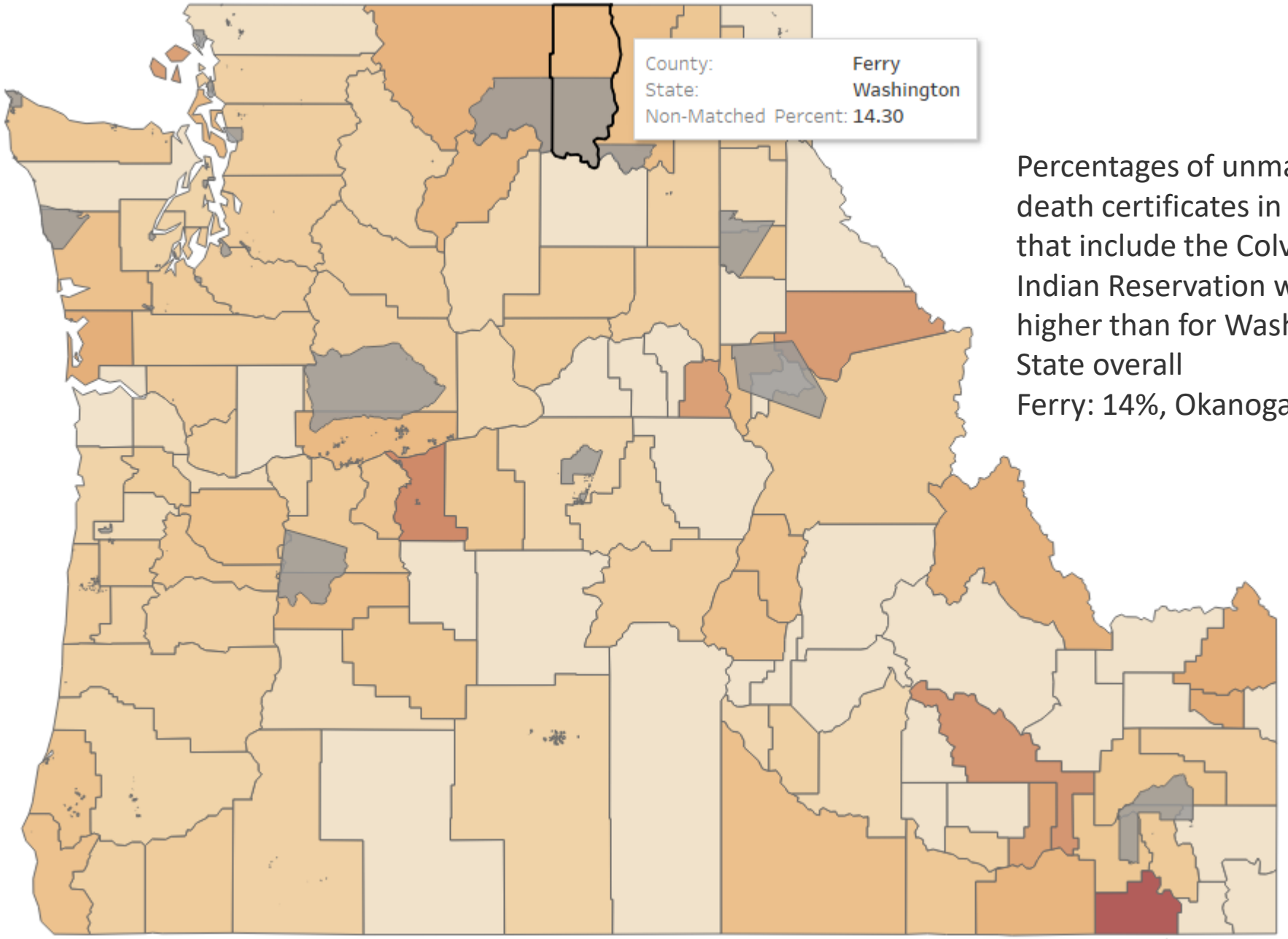
Darker color means higher percent of death certificates without a matching FARS record



The percentages of unmatched MVT death certificates in counties that include the Fort Hall Indian Reservation were the same as Idaho as a whole (10%)

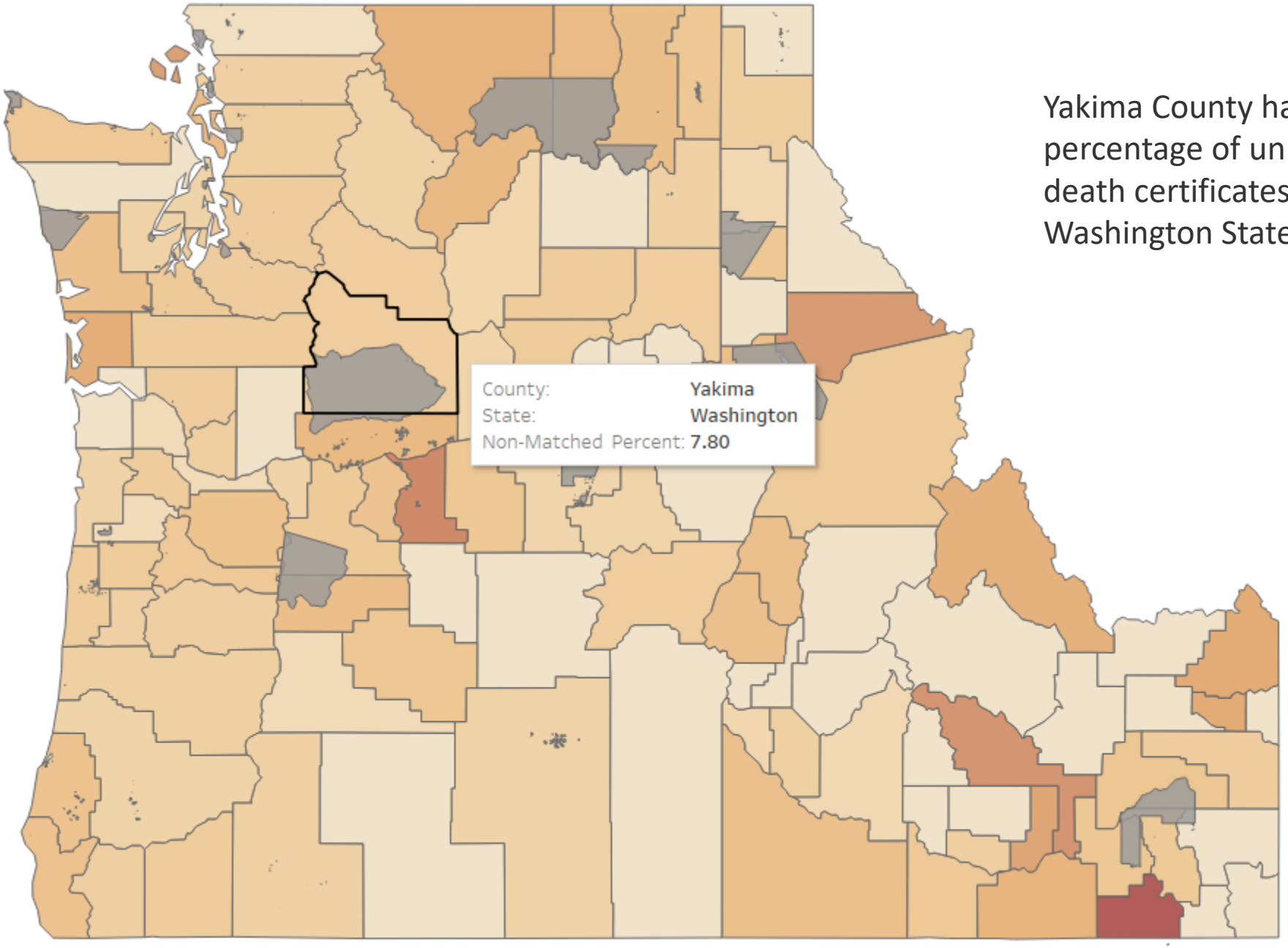


Every MVT death certificate in Lewis County, Idaho had a matching FARS record

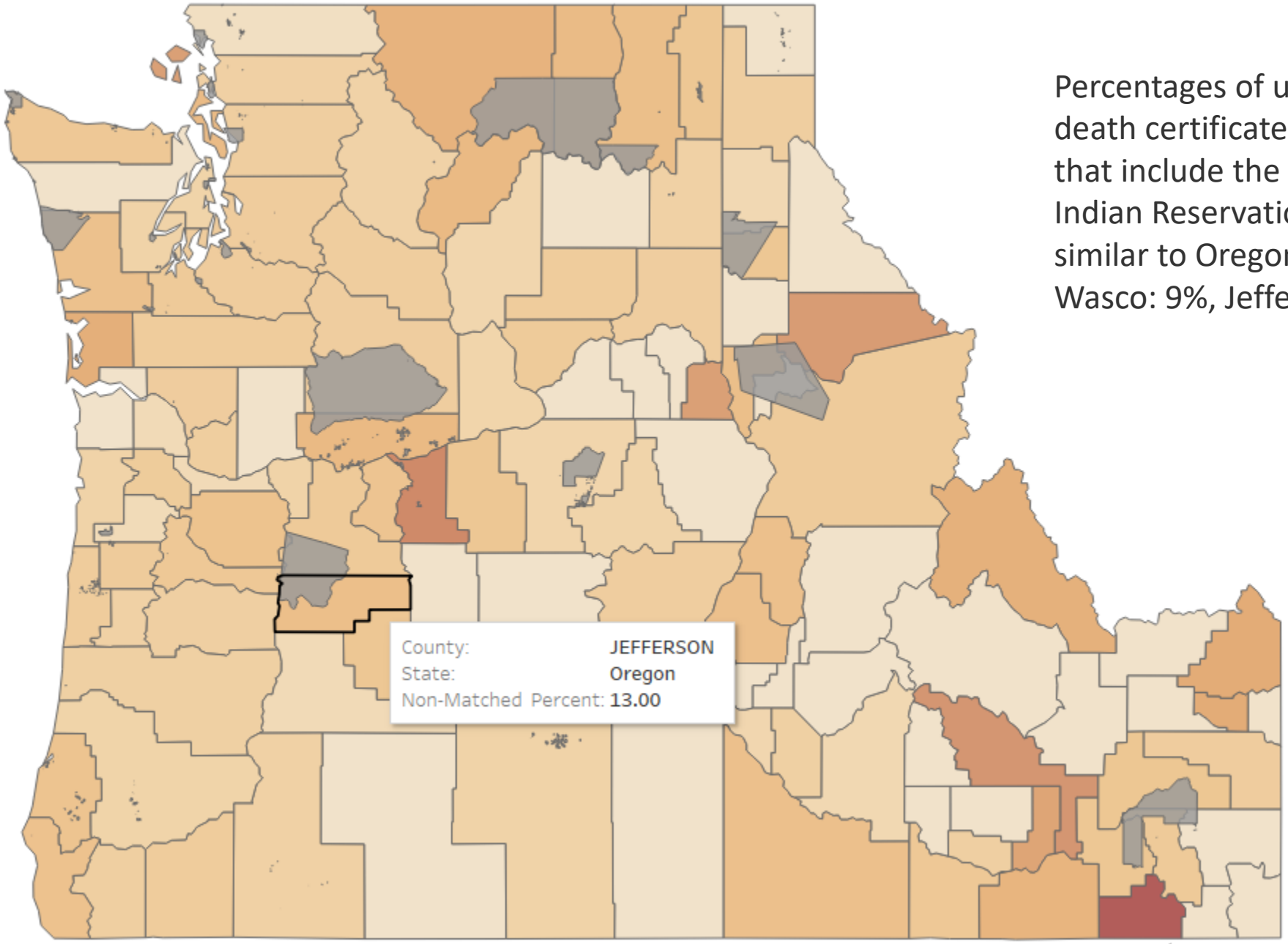


Percentages of unmatched death certificates in counties that include the Colville Indian Reservation were higher than for Washington State overall

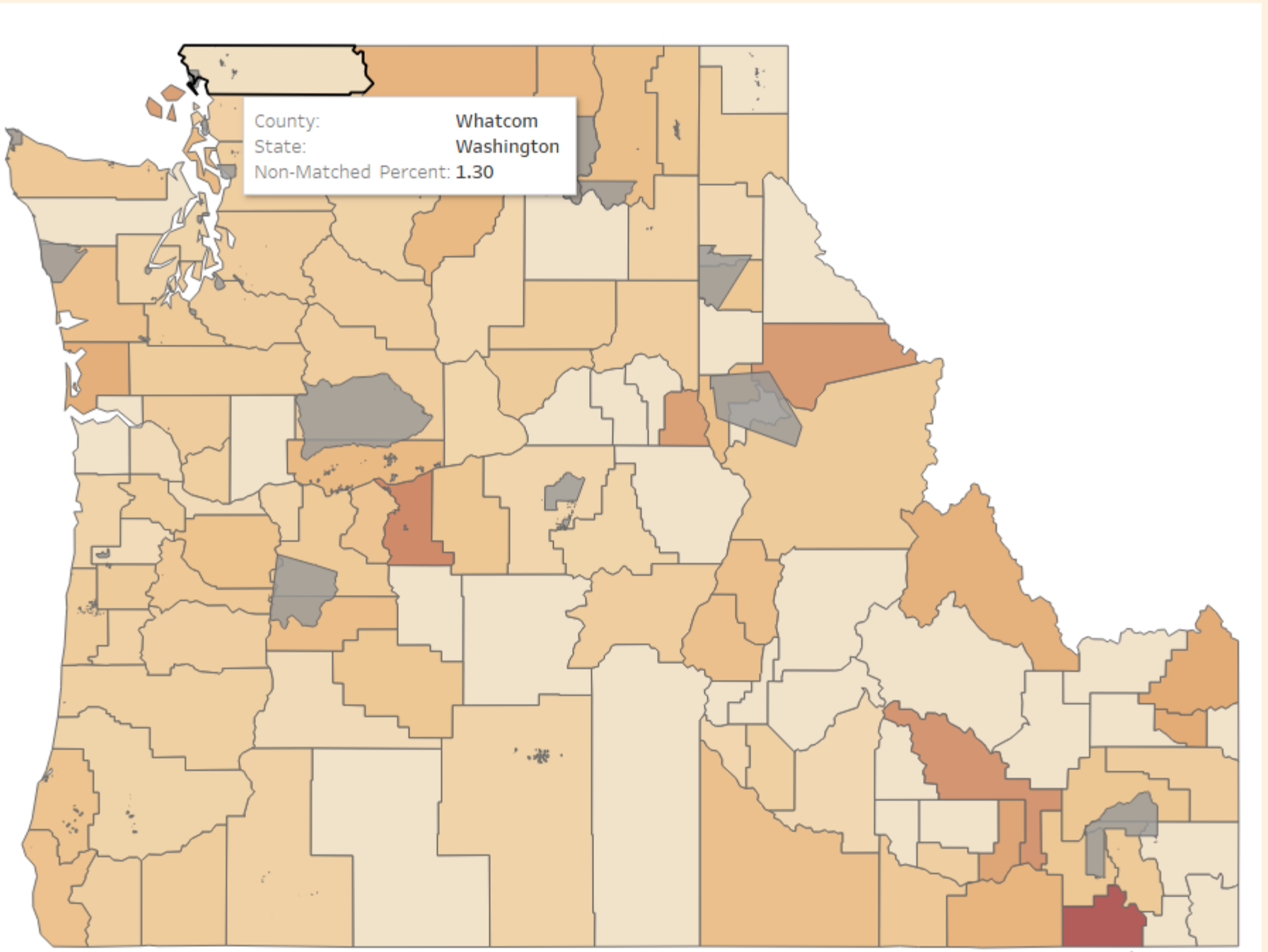
Ferry: 14%, Okanogan: 17%



Yakima County had a lower percentage of unmatched death certificates than Washington State overall (8%)



Percentages of unmatched death certificates in counties that include the Warm Springs Indian Reservation were similar to Oregon State overall
Wasco: 9%, Jefferson: 13%


County: Whatcom
State: Washington
Non-Matched Percent: 1.30

The percent of MVT death certificates with a matching FARS record is the same for counties with tribal lands

Beyond evaluation – What does linking FARS to death certificates add?

1. Additional flagging of AI/AN crash deaths
2. County of residence for the decedent

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Agreement of AI/AN race between death certificate and FARS

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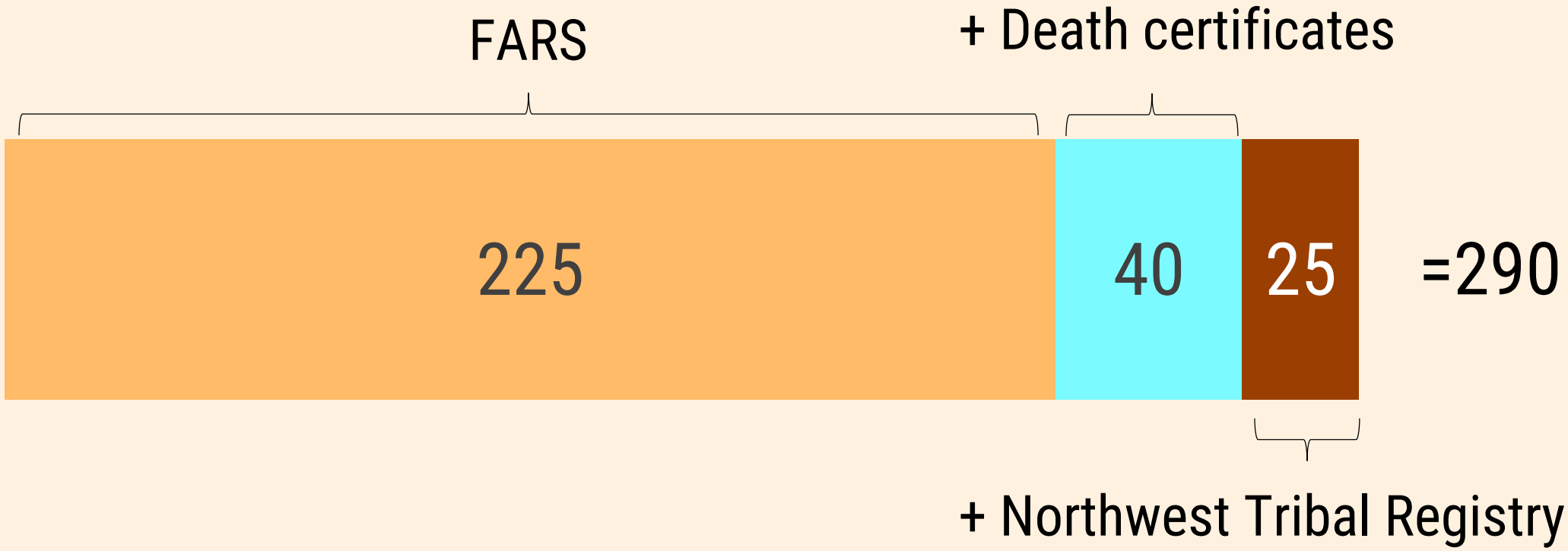
How many American Indian people died in crashes in Idaho, Oregon, and Washington?



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Technical assistance from two lenses

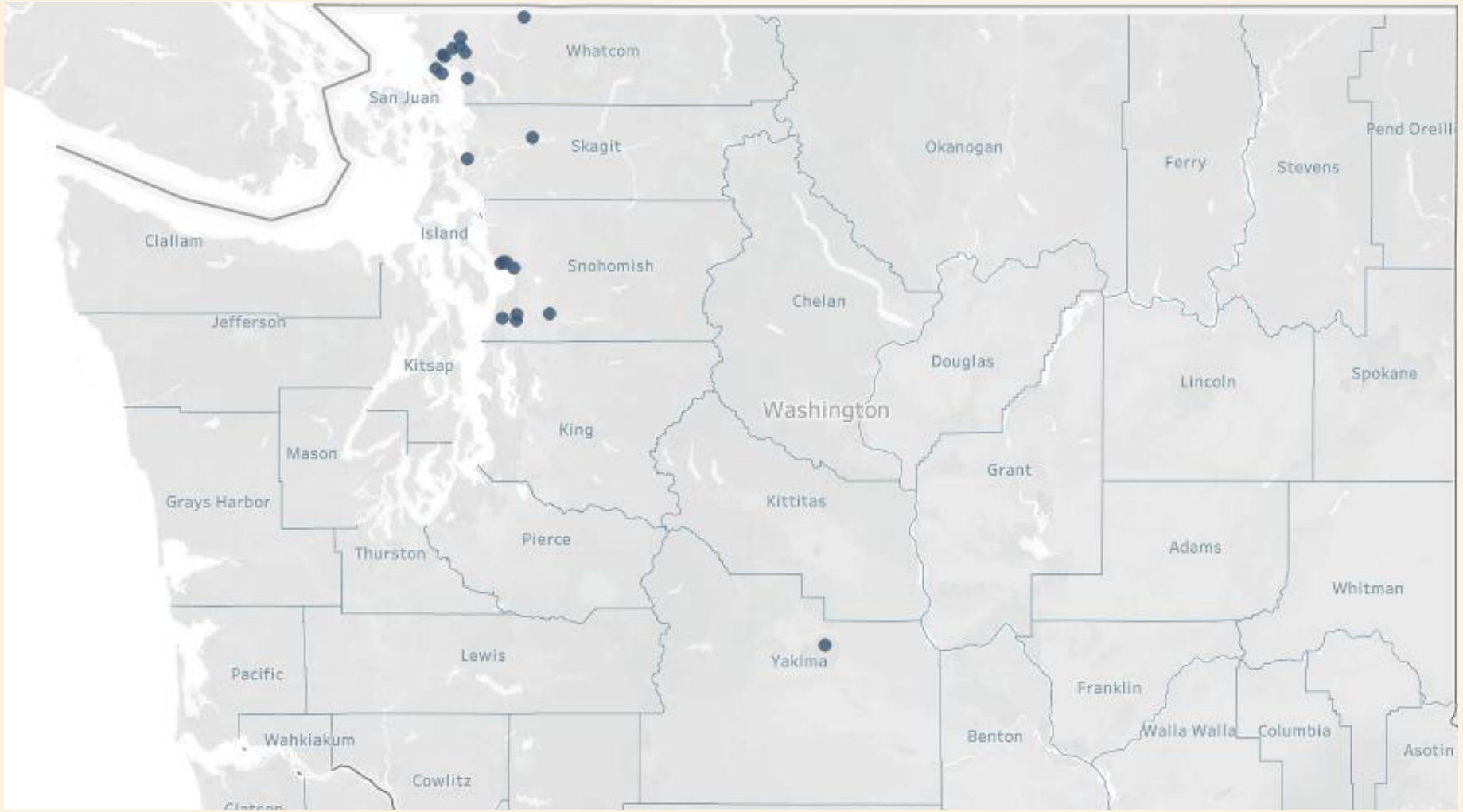
Location-based

Policy
Law enforcement
Planning/engineering

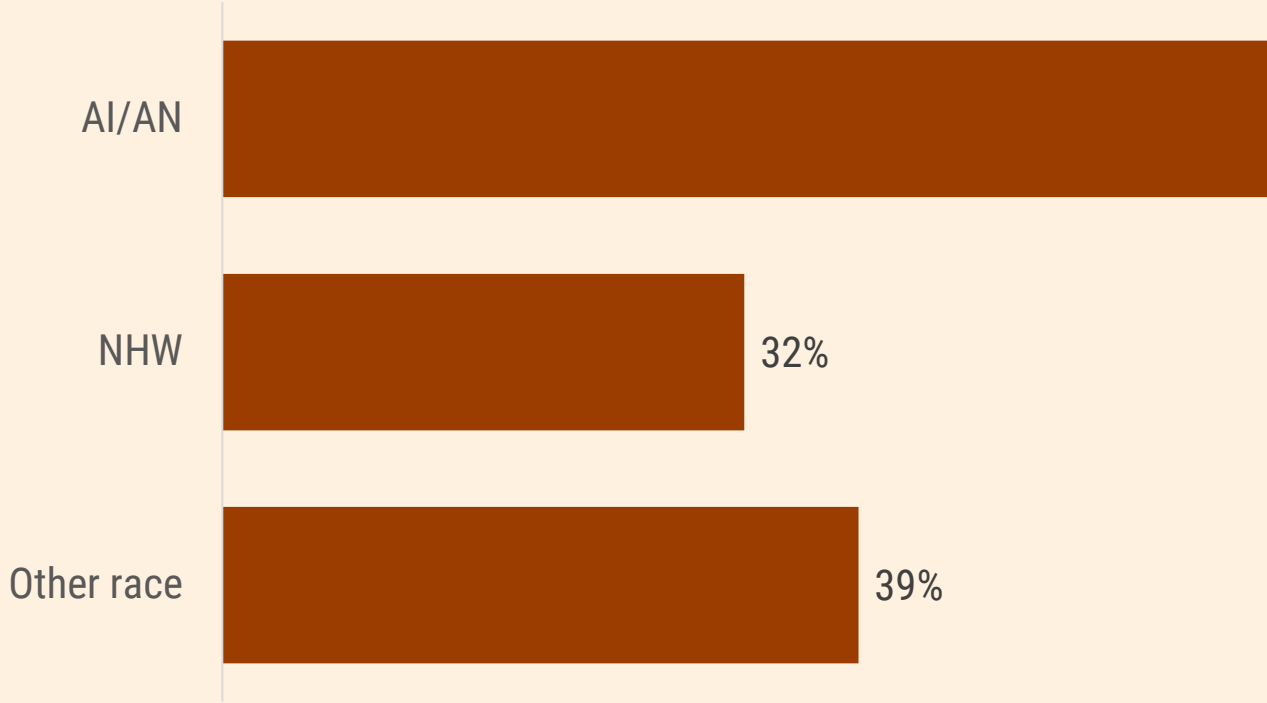
Residence-based

Behavior changes
Health education
Medical costs
Policy
Practice

“Where did American Indian residents of **[X county]** have fatal crashes?



American Indian people who lived in **[County]** and died in a crash were more likely to be **unrestrained**



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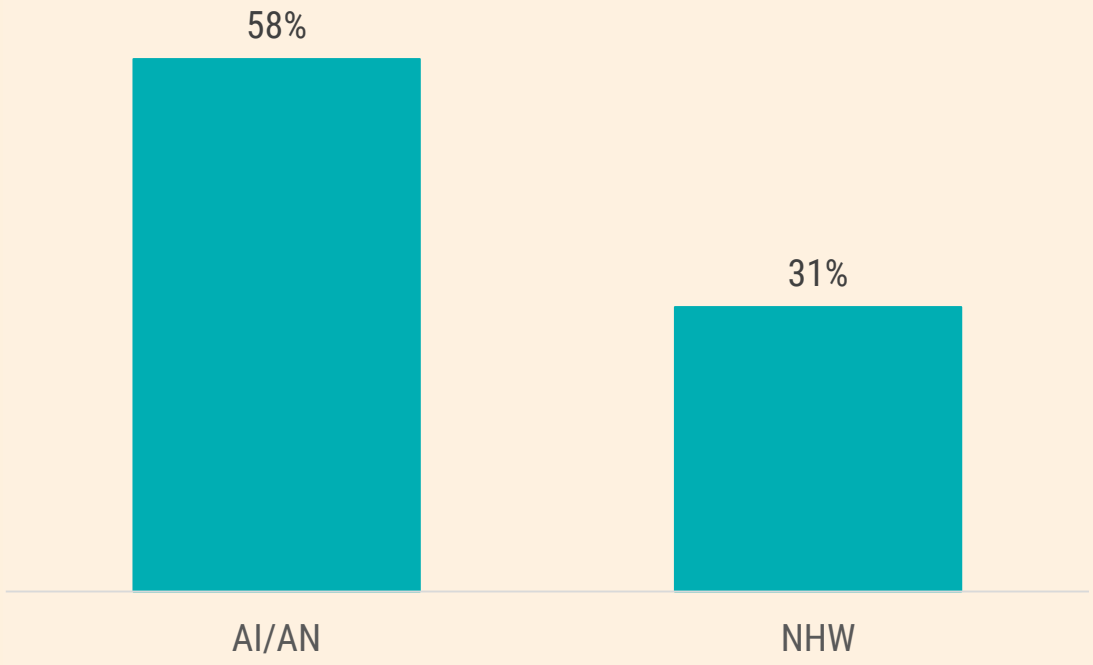
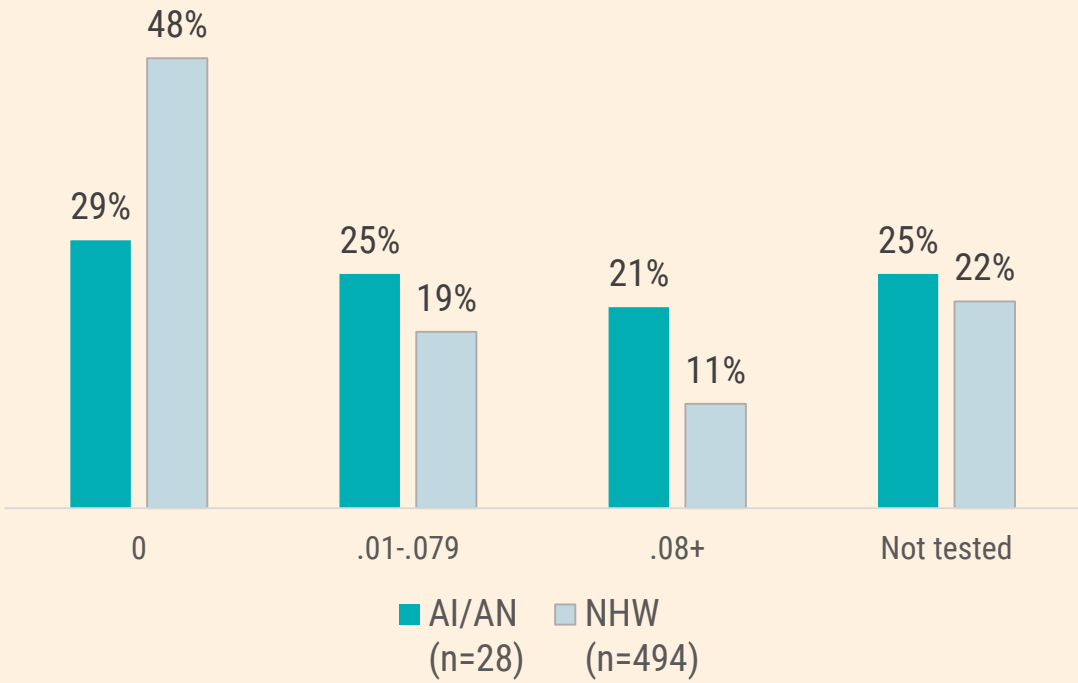
AI/AN crash deaths that occurred in **[tribal area]** were more likely to have police-reported **alcohol involvement** for the driver (not necessarily the decedent)



Blood Alcohol Content: Test result categories for **[tribal area]** decedents by race



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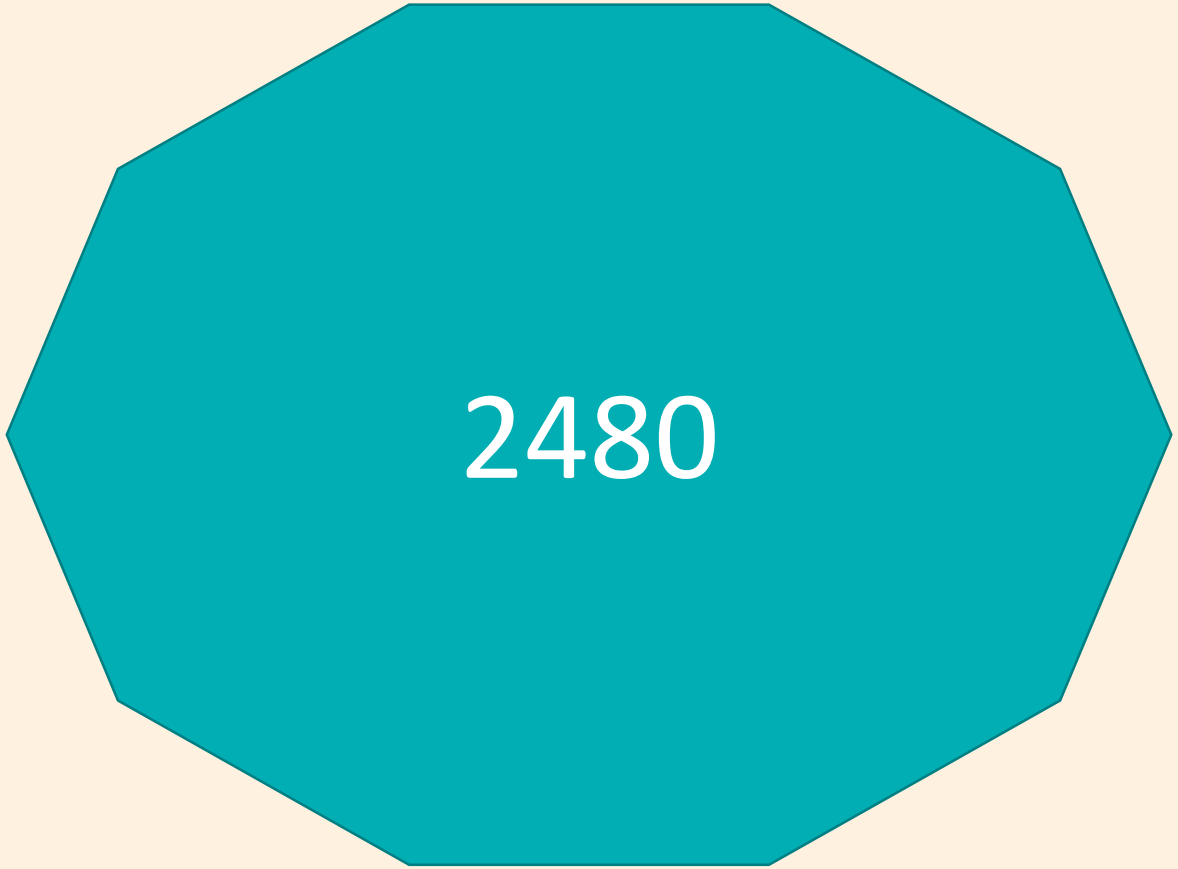
Limitations

- Reporting could have changed – for better or worse - since 2016
- We could have linked the out-of-state crashes to national FARS
- Evaluation may be very different for other states
- Missing data fields limited match %
- Cross match between records
- Some matches could be wrong
- Not feasible to do this regularly

Hours spent linking death certificates to FARS

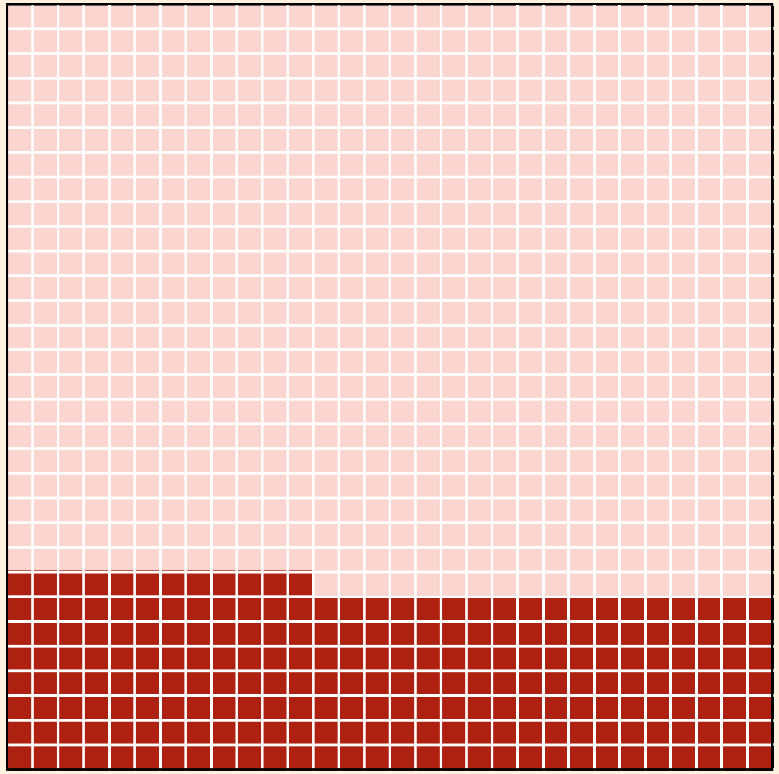


Hours spent if we had death certificate numbers in FARS

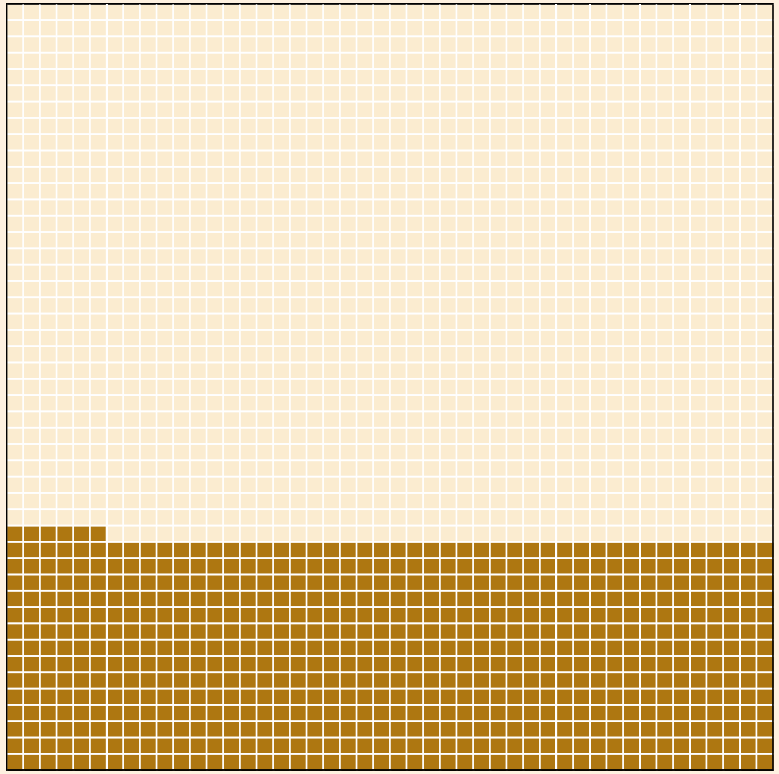
8

Many matches required manual review

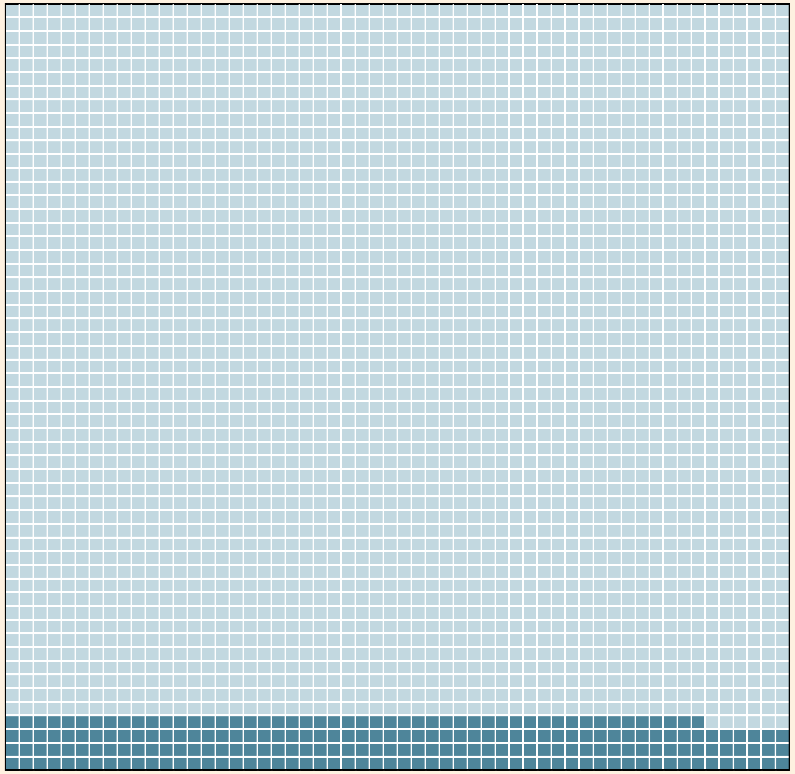
Idaho



Oregon



Washington



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Why was the evaluation so favorable?

Tribes complete and submit crash data because they use the data

- Funding and partnerships to make improvements is motivating
- Law enforcement takes data seriously
- Straightforward crash reporting helps
- User-friendly access to data helps

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Our takeaway

- We are confident in advising tribes to use FARS
- Having the death cert numbers would be an advantage as tribes can identify their population in multiple ways
- Tribal EpiCenters can help
  - Data quality, consultation for public health practice and policy
  - We can facilitate partnerships for a multidisciplinary approach

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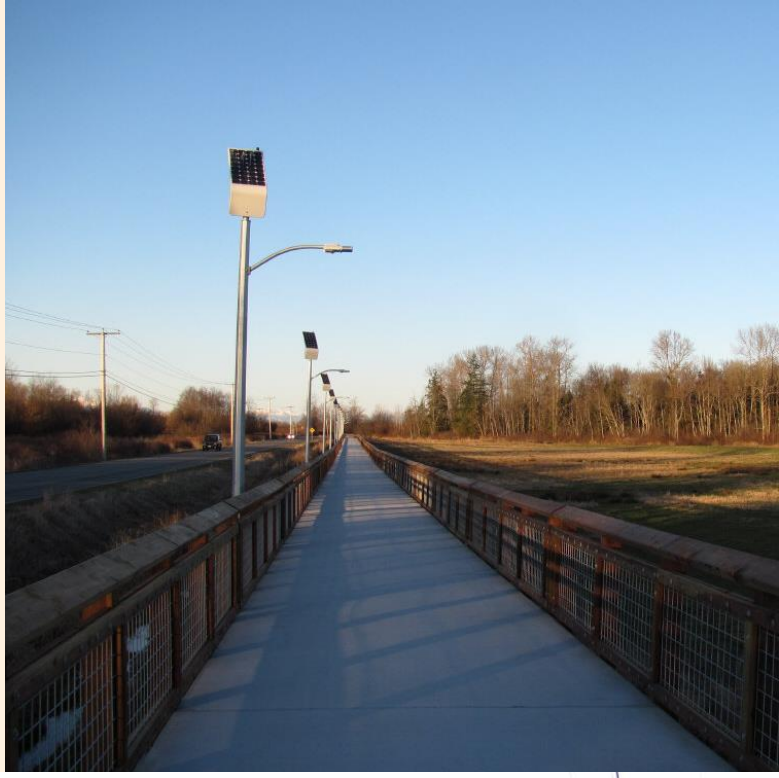
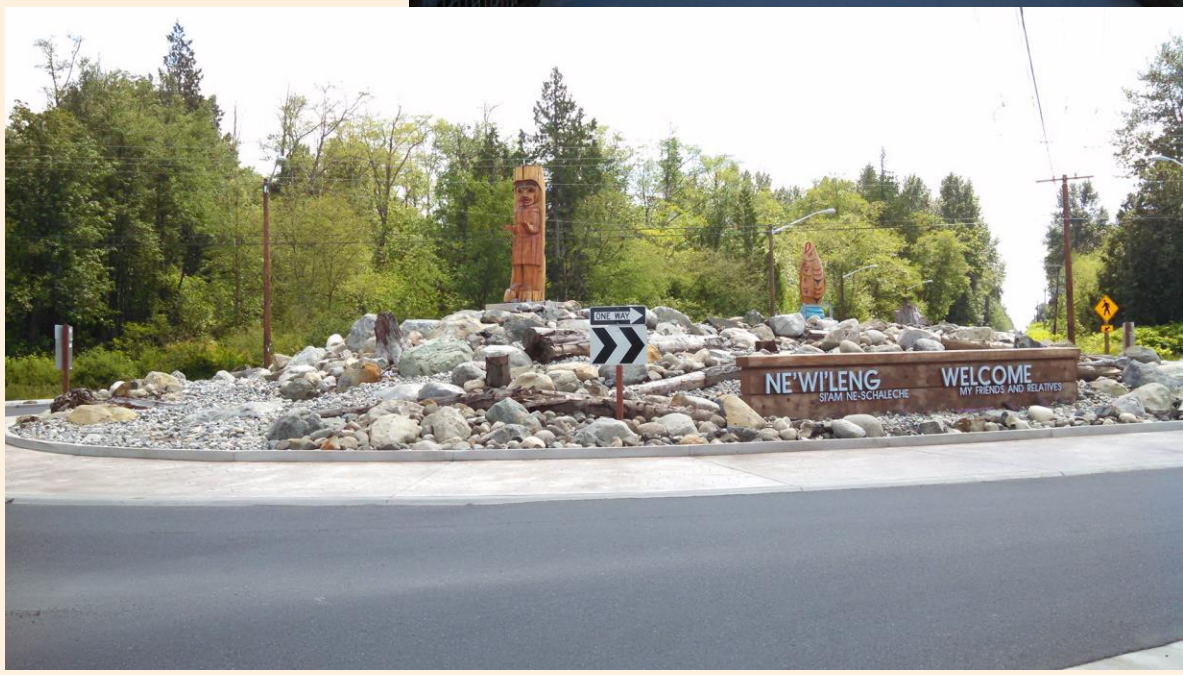
Next steps

- Technical assistance to tribes
- Continue to analyze the linked data
- Advocate to get death certificate numbers for FARS
- Publish evaluation if it's helpful
- Layer FARS with hospital data





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Questions?

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Funding and Contact

National Institute on Minority Health and Health Disparities

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