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# Motor vehicle injury prevention in eight American Indian/Alaska Native communities: results from the 2010–2014 Centers for Disease Control and Prevention Tribal Motor Vehicle Injury Prevention Program☆

**Carolyn E. Crump**[a,*], **Robert J. Letourneau**[a], **Holly Billie**[b], **Xinjian Zhang**[b], **Bethany West**[b]

[a]Department of Health Behavior, Gillings School of Global Public Health, The University of North Carolina at Chapel Hill, 173 E. Franklin Street, Suite 21, Chapel Hill, NC, 27599-7506, USA

[b]National Center for Injury Prevention and Control, Centers for Disease Control and Prevention, 4770 Buford Highway NE, Mailstop F-62, Atlanta, GA, 30341, USA

## Abstract

**Objectives:** The aim of the study is to increase seat belt (SB) use and reduce motor vehicle (MV) injuries and death; eight tribal communities implemented evidence-based strategies from the Guide to Community Preventive Services during 2010–2014.

**Study design:** SB use was measured through direct observational surveys and traffic safety activity data. Traffic safety activities included enhanced enforcement campaign events, ongoing enforcement of SB laws, and media. The number of MV injuries (including fatal and non-fatal) was measured through MV crash data collected by police.

**Results:** Percentage change increases in SB use were observed in all eight projects; average annual increases of three projects were statistically significant (ranging from 10% to 43%). Four of the eight projects exceeded their goals for percentage change increases in SB use. Approximately 200 media events and 100 enforcement events focused on SB use were conducted across the eight projects. Five projects had an annual average of ≥100 SB use citations during the project period. MV injuries (fatal and non-fatal combined) significantly decreased in three projects (ranging from a 10% to 21% average annual decrease).

**Conclusions:** Increases in SB use and decreases in the number of MV injuries can be achieved by tailoring evidence-based strategies to tribal communities.

### Keywords

American Indians; Alaska Natives; Tribes; Seat belt use; Health disparities; Evidence-based strategies; Traffic injury; Motor vehicle crash

☆The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

*Corresponding author. Department of Health Behavior, Gillings School of Global Public Health The University of North Carolina at Chapel Hill 173 E. Franklin Street, Suite 21, Chapel Hill, NC, 27599-7506, USA. Tel.: +919 966 5598; fax: +919 966 7955. Carolyn_Crump@unc.edu (C.E. Crump).

Competing interests

None of the authors have any potential conflict of interest.

## Introduction

Motor vehicle (MV) crashes are the leading cause of death for American Indians/Alaska Natives (AIs/ANs) aged 1 to 44 years.[1] The overall MV death rate among AI/AN adults is 2.3–5.7 times higher than that of other races/ethnicities.[1] In the event of a crash, seat belt (SB) use reduces the risk of death and serious injury by about half.[2,3] Despite this, low rates of SB use are observed among AIs/ANs.[4–6] In 2014, the overall SB use rate among AIs/ANs was 73%[7] compared with 87% among the general US population.[8] Furthermore, nearly two-thirds (65%) of AI/AN passenger vehicle occupants who died in MV crashes were unrestrained at the time of the fatal crash, compared with the national proportion of 49%.[8,9]

To support AI/AN communities in their efforts to prevent MV injuries and death, the Centers for Disease Control and Prevention (CDC) funded eight tribal communities ($70 K/year/community) from 2010 to 2014 to increase SB use, increase child safety seat use, and/or reduce alcohol-impaired driving. This article describes the results from eight projects that used evidence-based strategies to increase SB use and decrease MV injuries and death among AIs/ANs.

## Methods

Data were collected from eight tribal communities that implemented evidence-based strategies to increase SB use and decrease MV injuries during 2010–2014. Sixteen tribes/tribal organizations submitted a proposal in response to Funding Opportunity Announcement #CDC-RFA-CE 10–1001. The proposal evaluation criteria included work plan (35%), organizational capacity (25%), management/staffing (20%), and collaboration (20%). The tribal communities (hereafter, called projects) were AIs/ANs in Caddo County, Oklahoma, via project A (‘project’ used when the tribe requested its name not to be used), Yurok tribe via the California Rural Indian Health Board (Yurok-CRIHB), AIs/ANs on the Arizona-California border via project B, Hopi tribe (Hopi), AIs/ANs in southern South Dakota via project C, Rosebud Sioux Tribe (Rosebud), AIs/ANs in Juneau, Alaska, via project D, and AIs/ANs in northern South Dakota via project E. The projects were required to focus efforts on two of three evidence-based strategies to reduce MV injury and death listed in the Guide to Community Preventive Services.[10] All eight projects sought to increase SB use as one of their strategies. Each project hired a full-time coordinator, identified measurable objectives to increase SB use, and developed annual work plans for traffic safety activities. Project coordinators were guided by the Tribal Motor Vehicle Injury Prevention Program (TMVIPP) manual that describes recommendations and requirements for program administration, tailoring implementation of evidence-based strategies, and evaluation.[11,12]

### Traffic safety activities

The projects were encouraged to take a multifaceted approach by incorporating enforcement, education and awareness-raising activities, and media campaigns. All eight projects chose to include three traffic safety activities-enhanced enforcement events; ongoing enforcement of SB laws (i.e., regular traffic safety patrols); and media activities.

Enhanced enforcement events were called Enhanced Occupant Restraint Use Enforcement (EORUE) events. During EORUE events, law enforcement conducted saturation patrols or checkpoints[13] and collected data on EORUE forms. The EORUE forms documented the number of events conducted, number of vehicles stopped, and number of citations/warnings issued. For ongoing enforcement of SB laws, tribal coordinators documented the number of citations issued by year from local law enforcement and/or state traffic safety offices. For media activities, coordinators used 'use of media' forms to document the focus and type of media (both free and paid). Examples of free media included press releases, public service announcements, and local community reporting. Examples of paid media included brochures, posters, flyers, billboards, and print, radio, or television ads.

### SB use

All eight projects identified measurable objectives for increased SB use. The coordinators were allowed to set their objectives for improvement based on local circumstances (e.g., the type of SB law) and infrastructure (e.g., the type and extent of law enforcement). The objective for project A was a 9% increase in SB use; Yurok-CRIHB's objective was a 5% increase; project B's, a 20% increase; Hopi's, a 25% increase; project C's, a 20% increase; Rosebud's, a 24% increase; project D's, an 8% increase; and project E's, a 15% increase. During the 2010–2014 project period, observational surveys of the front seat occupant's SB use were conducted by tribal project staff and followed the Indian Health Service's Observational Seat Belt Use Protocol.[14] SB use data were collected for the four program years. Average annual percent change (AAPC) is presented for SB use rates by program. The Poisson distribution expresses the probability of a given number of events (SB use) occurring in a fixed interval of time (calendar year) if these events occur with a rate independent of the time since the last event. In addition, power tests under the Poisson distribution were performed to satisfy that the power was a minimum of 80% under the minimum sample size and treatment effects. The SAS GENMOD procedure was used to perform Poisson regression to calculate AAPC (SAS version 9.3) to model the SB use (event) or SB use change within a specified time period (calendar year). However, owing to overdispersion of project E's SB use rates, a negative binomial model was used to calculate AAPC. *P*-values ≤0.05 were considered statistically significant.

### Motor vehicle crash (MVC) data

Tribal coordinators collected annual crash and injury data from local police departments and/or state offices of highway safety. The number of crashes and the number of injuries are reported by year and project from one year before TMVIPP implementation (preprogram year) through the four program years. Fatal and non-fatal injuries were combined owing to small fatality cell counts as analyses based on only a few cases would not be considered statistically reliable. Of the eight projects reporting MVC data, only six projects reported crash data for the preproject year and all four project years. Of the eight projects reporting MV injury data, only five projects reported injury data for all years. AAPC is presented for MVC and MV injury counts by program, using all reported data years. Poisson regression was used to measure the probability of a given number of events (MVC and MV injury) occurring in a fixed interval of time (calendar year). The SAS GENMOD procedure was used to perform Poisson regression to calculate AAPC (SAS version 9.3). Owing to

overdispersion of project E's MVC and project C's MV injury counts, a negative binomial model was used to calculate AAPC for these two projects. *P*-values ≤0.05 were considered statistically significant.

## Results

Project population sizes ranged from 700 to 28,787 among the eight projects (Table 1). The five reservation-based and three non-reservation-based projects were located across five states.

### Traffic safety activities

From 2010 to 2014, 102 EORUE events reached 8230 vehicles across six projects (Table 2). Three (A, C, and E) of these six projects issued 99% (268/272) of the EORUE citations. The majority of EORUE events (81%) were not conducted during national enforcement campaigns (e.g., Click It or Ticket) (data not shown).

Including both ongoing/regular enforcement and EORUE events, a total of 7487 citations were issued among the eight projects over the project period (Table 2). Two projects (A and C) issued 82% of total citations. Five projects (A, C, Rosebud, D, and E) had an average of ≥100 total citations per year over the project periods.

Of the 199 SB use-focused media events conducted across eight projects, 22% (n = 43) publicized EORUE events (Table 2). Of the media activities reported, projects used paid radio announcements most frequently (38%), followed by free press releases/public service announcements on television, radio, or newspaper (15%) and free local news coverage in the tribal newspaper (14%) (data not shown).

### SB use

Percentage change increases in SB use were observed in all eight projects; average annual increases of three projects were statistically significant (ranging from 10% to 43% AAPC) (Table 3). From the first program year to the last, the percentage change in use increased 2% for project A (objective was 9%), 8% for Yurok-CRIHB (objective was 5%), 9% for project B (objective was 20%), 37% for Hopi (objective was 25%), 140% for project C (objective was 20%), 176% for Rosebud (objective was 24%), 1% for project D (objective was 8%), and 5% for project E (objective was 15%).

### MVC data

MVCs decreased for seven of the eight projects over the project period; five of the seven decreases were statistically significant (ranging from a 9% to 15% average annual decrease) (Table 4). MV injuries decreased for five of eight projects over the project period; three of the five decreases were statistically significant (ranging from a 10% to 21% average annual decrease).

## Discussion

This report documents that evidence-based strategies to increase SB use and decrease MV injury can be successfully tailored to tribal communities. Two key improvements observed during the project period documented the strongest evidence for this. First, average annual SB use significantly increased in three tribal communities (from 10% for Hopi to 43% for Rosebud). Four projects achieved or exceeded their stated objectives for percentage change increases in SB use. As expected, the two projects with the largest increases in belt use (43% and 17%, respectively) had the lowest baseline rates (9% and 32%, respectively). This is expected because there was more room for improvement. Similarly, the projects with high (75–77%) or moderately high (55%) baseline use rates had no or low average annual increases in belt use. Increases in SB use during the 2010–2014 TMVIPP were similar to those of the prior 2005–2009 TMVIPP funding cycle. In the prior cycle, four tribal programs, funded by the CDC, had percentage change increases in driver SB use—by 38% in the Ho-Chunk Nation; 46% in the San Carlos Apache Tribe; 73% in the Tohono O'odham Nation; and 315% in the White Mountain Apache Tribe.[15] Since the 2010–2014 projects ended, increases in SB use have been maintained. For example, SB use on the Rosebud reservation was 27% in 2015—compared with the 25.9% SB use reported in 2014 during the 2010–2014 project. Based on this, improved SB use rates can be sustainable. Future research should examine the sustainability of increases in SB use after the funded projects have ended.

The second key improvement observed during the project period was significant decreases in the number of injuries (ranging from a 10% to 21% average annual decrease) documented by three projects. Previous tribal programs also documented similar results. For example, in the prior TMVIPP funding cycle, the number of injuries decreased by 31% (from 161 in 2004 to 111 in 2008) in the San Carlos Apache Tribe.[16] Better understanding of the sustainability of decreases in injury crashes after projects end is needed.

One factor known to affect SB use rates is SB use laws.[10] Although no policy interventions were implemented during the TMVIPP, the SB use laws in place during the TMVIPP program period may have had an effect and should therefore be taken into consideration. SB use laws are effective at increasing belt use and decreasing MV injuries and deaths.[10] Currently, 49 states and the District of Columbia have SB use laws; however, the type of enforcement varies. Primary enforcement SB laws, which allow police officers to stop and ticket someone for not wearing a SB, are more effective at increasing SB use than secondary enforcement laws. Secondary enforcement laws only allow an officer to issue a ticket for someone not wearing a SB if the driver has been pulled over for some other offense. Belt use rates are an average of 9–14 percentage points higher in primary enforcement states than in secondary states.[17–21] Similarly, tribal projects in states with primary SB laws (California, Oklahoma, and Alaska) had higher baseline use rates (range, 75–77%) than those in states (Arizona and South Dakota) with secondary SB laws (range, 9–55%).

In addition to differences in SB use rates by the enforcement type, differences in belt use were documented by reservation status. Lower baseline SB use rates (range, 9–55%) were observed among five reservation-based projects, when compared with baseline use rates

(range, 75–77%) among three non-reservation projects. These results are similar to the prior TMVIPP cycle. During the 2005–2009 TMVIPP cycle, three reservation-based projects had lower baseline driver SB use rates (range, 13–45%) compared with the non-reservation-based project (50%).[15,22] Further exploration of the differences in SB use rates between reservation-based and non-reservation-based communities would help us better understand how community types influence MV safety behaviors.

When conducting traffic safety activities, tailoring evidence-based strategies is important.[23] Tailoring allows changes to implementation approaches without compromising the integrity of the intervention. Four examples of tailoring MV injury prevention interventions among the eight tribal projects were as follows: (1) timing of enforcement events; (2) using local language and images in media campaigns; (3) using local spokespeople for education and media events; and (4) all project coordinators were AIs/ANs. In the first example, EORUE events were promoted and conducted during the local tribal powwow or other community events that draw large crowds and/or traffic instead of during national enforcement events (such as the Click It or Ticket campaign). In a second example, several media programs and messages were aired on tribal radio stations in their native, tribal language. In a third example, local tribal community members or tribal law enforcement officers were used as spokespersons in messaging and photos on billboards and flyers. Finally, having AI/AN project coordinators helped to further tailor programming and media messages in culturally appropriate ways.

Six projects sought to educate the community and decision-makers about the effectiveness of SB use (data not shown). At three of these projects, new SB policies were later adopted: Yurok-CRIHB adopted California's primary SB law; fines for not using SBs increased at Hopi and project C; and project C changed the law from a secondary to a primary SB law. (No CDC funds were used for law change activities.)

The reported data have four limitations. First, the use, submission, and completeness of traffic safety activity data forms (i.e., EORUE, use of media) varied by project. Summary data about these activities might underestimate intervention activities for some projects. For example, EORUE event data were obtained from event summary forms; however, progress reports did not always include event forms for all events reported. Second, completeness of SB citation data also varied by project. Therefore, SB citation data summaries may underestimate citations for some projects. For example, projects reported that collecting data about ongoing SB enforcement (conducted by law enforcement on a regular basis) was challenging, time-consuming, and/or unsuccessful. A third limitation was incomplete MVC data. MVC data and MV injury data were unavailable for the last project year for two projects and three projects, respectively. Therefore, the decreases reported for MVCs and injuries are likely underestimates as the effect of four full program years was not quantifiable. Finally, true baseline data were not available for SB use. Therefore, the increases reported for SB use are likely underestimates.

Despite these challenges, the 2010–2014 TMVIPP showed that meaningful increases in SB use and decreases in MV injury can be achieved by tailoring evidence-based strategies to AI/AN communities. Intervention efforts should continue to be prioritized for AI/AN

communities with disproportionately low SB use rates and/or high MV injury rates. Lessons learned from TMVIPP and other federal agency and tribal MV safety programs have been summarized in the *Tribal Motor Vehicle Injury Prevention Best Practices Guide*,[11] and the CDC's *Roadway to Safer TribalCommunities Toolkit*.[24] These lessons learned and tools may be useful in future MV injury prevention projects among tribal communities.

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## REFERENCES

1. Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. Web-based injury statistics query and reporting system (WISQARS)(online). 2016 {cited 2016 November 28}.
2. Kahane CJ. Lives saved by vehicle safety technologies and associated federal motor vehicle safety standards, 1960 to 2012 - passenger cars and LTVs. Washington, DC: National Highway Traffic Safety Administration; 2015 Available at: www.nrd.nhtsa.dot.gov/pubs/812069.pdf.
3. National Highway Traffic Safety Administration. Final regulatory impact analysis amendment to Federal Motor Vehicle Safety Standard 208. Passenger car front seat occupant protection. Washington, DC: US Department of Transportation, National Highway Traffic Safety Administration; 1984 Publication no. DOT-HS-806–572.
4. National Highway Traffic Safety Administration. Race and ethnicity in fatal motor vehicle traffic crashes 1999–2004. Washington, DC: US Department of Transportation, National Highway Traffic Safety Administration; 2006 Available at: http://www-nrd.nhtsa.dot.gov/Pubs/809956.pdf.
5. National Highway Traffic Safety Administration. Seat belt use estimate for Native American tribal reservations. Washington, DC: US Department of Transportation, National Highway Traffic Safety Administration; 2008; 2006 Available at: http://www.nhtsa.gov/DOT/NHTSA/Traffic%20Injury%20Control/Articles/Associated%20Files/810967.pdf.
6. National Highway Traffic Safety Administration. Traffic safety facts: race and ethnicity 2006 data. Washington, DC: US Department of Transportation, National Highway Traffic Safety Administration; 2009 Available at: http://www-nrd.nhtsa.dot.gov/Pubs/810995.pdf.
7. Department of Transportation (US). National highway traffic safety administration (NHTSA). Bureau of Indian affairs Indian highway safety program. 2014 Final Report - 2014 safety belt use estimate for the Indian nations. Publication no. not noted. Available at: http://www.ewu.edu/Documents/CBPA/NWTTAP/BIA/BIA%20Seat%20Belt%20Survey%202014.pdf.
8. National Highway Traffic Safety Administration. Traffic safety facts: occupant protection: 2014 data. Washington, DC: US Department of Transportation, National Highway Traffic Safety Administration; 2016 Report no. DOT HS 812 262.
9. National Highway Traffic Safety Administration. Fatality analysis reporting system (FARS)(online). 2017 {cited 2017 January 26}.
10. Task Force on Community Preventive Services. Motor vehicle occupant injury. In: Zaza S, Briss PA, Harris KW, editors. The Guide to community preventive services: what works to promote Health? Atlanta (GA): Oxford University Press; 2005 p. 329–84.

11. Letourneau RJ, Crump CE. Tribal motor vehicle injury prevention (TVMIP) best Practices guide. Atlanta, GA: Centers for Disease Control and Prevention, National Center for Injury Prevention and Control; 2016 Available at: https://www.cdc.gov/motorvehiclesafety/native/best_practices_guide.html.
12. Letourneau RJ, Crump CE, Billie H, Naumann RB. Centers for Disease Control and prevention tribal motor vehicle injury prevention program (TMVIPP) manual. Chapel hill. NC: UNC Gillings School of Global Public Health, Department of Health Behavior and Health Education; 2010.
13. Bergen G, Pitan A, Qu S, Shults RA, Chattopadhyay SK, Elder RW, Sleet DA, Coleman HL, Compton RP, Nichols JL, Clymer JM, Calvert WB. Community preventive services task force. Publicized sobriety checkpoint programs: a community Guide systematic review. Am J Prev Med 2014;46(5):529–39. [PubMed: 24745644]
14. Bowling JM, Crump CE, Cannon M, Letourneau RJ, Elmore R, Purcell P. Seat belt use observational Protocol. Chapel hill, NC: university of North Carolina and Washington, DC: Indian Health Service; 2011.
15. West BA, Naumann RB. Tribal motor vehicle injury prevention programs for reducing disparities in motor vehicle-related injuries. MMWR (Morb Mortal Wkly Rep) 2014;63(1, Supplement):28–33.
16. Piland NF, Berger LR, Naumann RM. Economic costs of motor vehicle crashes and economic benefits of prevention for the San Carlos Apache Tribe. IHS Primary Care Provider 2010;35(12):272–7.
17. Shults RA, Nichols JL, Dinh-Zarr TB, Elder RW. Effectiveness of primary enforcement safety belt laws and enhanced enforcement of safety belt laws: a summary of the Guide to Community Preventive Services systematic reviews. J Saf Res 2004;35(2):189–96.
18. Goodwin A, Kirley B, Sandt L, Hall W, Thomas L, O'Brien N, Summerlin D. Countermeasures that work: a highway safety countermeasures guide for State Highway Safety Offices. 7th ed. Washington, DC: National Highway Traffic Safety Administration; 2013 (Report No. DOT HS 811 727).
19. Shults RA, Elder RW, Sleet DA, Thompson RS, Nichols JL. Primary enforcement seat belt laws are effective even in the face of rising belt use rates. Accid Anal Prev 2004;36(3): 491–3. [PubMed: 15003594]
20. Beck LF, West BA. Vital signs: nonfatal, motor vehicle-occupant injuries (2009) and seat belt use (2008) among adults—United States. MMWR (Morb Mortal Wkly Rep) 2011;59(51):1681–6. [PubMed: 21209609]
21. Shults RA, Beck LF. Self-reported seatbelt use, United States, 2002e2010: does prevalence vary by state and type of seatbelt law? J Saf Res 2012;43(5e6):417–20.
22. Letourneau RJ, Crump CE, Thunder N, Voss R. Increasing occupant restraint use among Ho-Chunk Nation members: tailoring evidence-based strategies to local context. IHS Primary Care Provider 2009;35(7):212–8.
23. Institute of Medicine. Committee on communication for behavior change in the 21st century. Speaking of Health: assessing Health communications strategies for diverse populations. Washington, DC: National Academy Press; 2002.
24. Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. Roadway to Safer Tribal Communities Toolkit. Available at: https://www.cdc.gov/motorvehiclesafety/native/toolkit.html.

**Table 1 -**

Characteristics of eight funded tribal projects, 2010–2014.

| Project | Location | Reservation status | Tribal enrollment[a] | Project target population |
|---|---|---|---|---|
| Project A | Caddo County, OK[b] | Non-reservation–based | 5200[b] | 7717[b] |
| Yurok-CRIHB | Klamath, CA | Non-reservation–based[c] | ~5000 | 700 |
| Project B | AZ/CA border | Reservation-based | ~4070 | 7077[d] |
| Hopi | Hopi Reservation, AZ | Reservation-based | 14,000 | 7704 |
| Project C | Southern SD | Reservation-based | 44,824 | 28,787 |
| Rosebud | Rosebud Sioux Reservation, SD | Reservation-based | 24,200 | 13,000 |
| Project D | City/Borough of Juneau, AK | Non-reservation–based | 5100[e] | 3821 |
| Project E | Northern SD | Reservation-based | 13,177 | 5000 |

AIs/ANs, American Indians/Alaska Natives; CRIHB, California Rural Indian Health Board; TMVIPP, Tribal Motor Vehicle Injury Prevention Program.

[a]When tribal enrollment is higher than target population, it is often because tribal members live off-reservation.

[b]Tribal Program A served all AI/AN in Caddo County including members of the following tribes: Caddo, Kiowa, Comanche, Apache, Wichita, and Delaware. Enrollment is noted for the tribe awarded TMVIPP funding. AI/ANs representing 25.4% of County population of 29,594 based on 2010 Census.

[c]CRIHB is a non-reservation-based tribal organization. Although Yurok is reservation-based Tribe, the project was classified as non-reservation based because the roads are primarily state-managed.

[d]Includes tribal and non-tribal members who live on the Reservation based on 2010 Census.

[e]Approximate AI/AN population based on 2010 Census estimates.

**Table 2 -**

Seat belt enforcement and media activities by project, 2010–2014.

| Project | Seat belt enforcement[a] | | | | | | Seat belt use-focused media activities[a] | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Enhanced Occupant Restraint Use Enforcement (EORUE) events | | | Total number of citations,[b] | | | EORUE-focused media activities | | Media activities in total | |
| | # event | s # cars | # citations | Preproject year | Project period total | Project period annual average | N | % | N | % |
| Project A | 16 | 879 | 131 | 338 | 2229 | 557.3 | 5 | 55.6% | 9 | 4.5% |
| Yurok-CRIHB | 5 | 212 | 2 | 0 | 2 | 0.5 | 5 | 45.5% | 11 | 5.5% |
| Project B | 2 | 854 | 2 | 0 | 15 | 3.8 | 4 | 15.4% | 26 | 13.0% |
| Hopi | 5 | 636 | 0 | 3 | 16 | 4.0 | 0 | – | 4 | 2.0% |
| Project C | 32 | 2674 | 74 | 1039 | 3943 | 985.8 | 20 | 33.3% | 60 | 30.2% |
| Rosebud | 0 | 0 | 0 | 0 | 383 | 127.7[c] | 0 | – | 55 | 27.6% |
| Project D | 0 | 0 | 0 | 0 | 366 | 122.0[c] | 0 | – | 4 | 2.0% |
| Project E | 42 | 2975 | 63 | 152 | 533 | 133.3 | 9 | 30.0% | 30 | 15.1% |
| Total | 102 | 8230 | 272 | **1532** | **7487** | **1871.8** | 43 | 21.6% | 199 | 100% |

CRIHB, California Rural Indian Health Board.

[a] Zero (0) indicates no activity occurred (e.g., no events were conducted).

[b] Includes citations issued at EORUE events and ongoing enforcement citations.

[c] Project period average calculation based on only three years of data.

**Table 3 -**

Seat belt law and use by project, 2010–2014.

| Project | Primary (P) or secondary (S) enforcement seat belt law[d] | | Seat belt use | | | | Range in the number of annual seat belt use observations | AAPC | p-value | Met percentage change seat belt use objective? |
|---|---|---|---|---|---|---|---|---|---|---|
| | Tribal | State | Year 1 | Year 2 | Year 3 | Year 4 | | | | |
| Project A[a] | N/A[b] | P | 76.8% | 73.9% | 77.1% | 78.1% | 4402–4951 | 0.91 | 0.4267 | No |
| Yurok-CRIHB[a] | P | P | 75.2% | 81.0% | 73.8% | 80.9% | 499–850 | 1.40 | 0.5842 | Yes |
| Project B | S | S[c] | 42.8% | 49.4% | 48.0% | 46.9% | 723–1304 | 1.88 | 0.5191 | No |
| Hopi | S | S | 38.8% | 49.6% | 51.5% | 53.1% | 1378–1529 | **9.83** | **0.0125** | Yes |
| Project C | P | S | 31.9% | 39.2% | 44.8% | 52.5% | 2745–3185 | **17.46** | **<0.0001** | Yes |
| Rosebud | S | S | 9.4% | 18.0% | 29.9% | 26.0% | 2242–2765 | **43.06** | **0.0119** | Yes |
| Project D[a] | N/A[b] | P | 75.1% | 85.0% | 75.1% | 76.1% | 607–854 | −0.71 | 0.8171 | No |
| Project E | P | S | 55.3% | 54.2% | 48.3% | 58.0% | 1010–3179 | 0.15 | 0.9712 | No |

Bold indicates statistical significance at the $p \leq 0.05$.

CRIHB, California Rural Indian Health Board; AAPC, average annual percent change.

[a] Non-reservation-based project.

[b] Projects served multiple tribes; therefore, the existence of tribal seat belt law (P or S) is not applicable.

[c] Tribe located in CA and AZ. However, most of the tribe's reservation is located in AZ; therefore, the AZ's law type is noted.

[d] Seat belt laws provided for context.

**Table 4 -**

Motor vehicle crashes and injuries (fatal and non-fatal) by project and year, 2010–2014.

| Project | Number of crashes[a] | | | | | | | Number of injuries[a] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Preproject year | Year 1 | Year 2 | Year 3 | Year 4 | AAPC | P-value | Preproject year | Year 1 | Year 2 | Year 3 | Year 4 | AAPC | P-value |
| Project A | 391 | 368 | 369 | 351 | 244 | **−8.7** | **0.0140** | 274 | 245 | 262 | 227 | 166 | **−9.5** | **0.0056** |
| Yurok-CRIHB | 120 | 140 | 114 | 135 | 100 | −3.6 | 0.4017 | 47 | 63 | 50 | 66 | 38 | −2.8 | 0.7205 |
| Project B | 133 | 138 | 137 | 98 | 97 | **−8.9** | **0.0117** | 40 | 63 | 50 | 32 | 23 | −14.6 | 0.1322 |
| Hopi[b] | 273 | 207 | 233 | 175 | 146 | **−13.0** | **0.0001** | 83 | 51 | 57 | 41 | 29 | **−20.6** | **<0.0001** |
| Project C | 319 | 314 | 248 | 203 | 225 | **−10.9** | **0.0003** | 106 | 76 | 80 | 44 | 54 | **−17.5** | **0.0007** |
| Rosebud | _[c] | 541 | 458 | _[e] | _[c] | **−15.3** | **0.0087** | _[c] | 112 | 161 | _[e] | _[c] | 43.7 | 0.0032 |
| Project D | _[c] | _[c] | 925 | 859 | _[c] | −7.1 | 0.1182 | _[c] | _[c] | _[c] | _[c] | _[c] | _[d] | _[d] |
| Project E | 85 | 40 | 75 | 83 | 112 | 13.2 | 0.2203 | _[c] | _[c] | _[c] | _[c] | _[c] | _[d] | _[d] |
| Total | 1321 | 1748 | 2559 | 1904 | 924 | −3.7 | 0.7766 | 550 | 610 | 660 | 410 | 310 | −12.6 | 0.0756 |

Bold indicates statistical significance at the $p \leq 0.05$.

CRIHB, California Rural Indian Health Board; TMVIPP, Tribal Motor Vehicle Injury Prevention Program; MV, motor vehicle; AAPC, average annual percent change.

[a] MVC and MV injury data are not limited to the target population reported in Table 1.

[b] Data provided for the calendar year and not for the TMVIPP project year (October-September).

[c] Data not collected.

[d] AAPC not calculated.

[e] Only partial data collected.