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Child safety and booster seat use in five tribal communities, 2010–2014☆,☆☆

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Abstract

Problem: Motor-vehicle crashes are a leading cause of death for American Indian/Alaska Natives (AI/AN) including AI/AN children. Child safety seats prevent injury and death among children in a motor-vehicle crash, yet use is low among AI/AN children.

Methods: To increase the use of child safety seats (CSS; car seats and booster seats), five tribal communities implemented evidence-based strategies from the Guide to Community Preventive Services during 2010–2014. Increased CSS use was evaluated through direct observational surveys and CSS event data. CSS events are used to check the installation, use, and safety of CSS and new CSS can be provided. Results: CSS use increased in all five programs (ranging from 6% to 40%). Four out of five programs exceeded their goals for increased use. Among the five communities, a total of 91 CSS events occurred resulting in 1417 CSS checked or provided.

Conclusions and practical applications: Evidence-based child passenger safety interventions are both feasible in and transferable to tribal communities.

Keywords

Child passenger safety; American Indian/Alaska Native; Racial/ethnic disparities; Tailoring evidence-based interventions; Motor vehicle

1. Introduction

Motor-vehicle crashes are a leading cause of death among children in the United States—with some U.S. populations disproportionately affected (WISQARS, 2015; Sauber-Schatz, West, & Bergen, 2014; West & Naumann, 2011, 2013a, 2013b). American Indians/Alaska Natives (AI/ANs) have death rates two to eight times higher by gender and age than that of other races/ethnicities (Murphy et al., 2014; West & Naumann, 2011, 2013a, b). Several factors place AI/ANs at increased risk for motor vehicle-related injuries and deaths,

☆ The *Journal of Safety Research* has partnered with the Office of the Associate Director for Science, Division of Unintentional Injury Prevention in the National Center for Injury Prevention & Control at the Centers for Disease Control and Prevention (CDC) in Atlanta, Georgia, USA, to briefly report on some of the latest findings in the research community. This report on child safety and booster seat use is the 42nd in a series of CDC articles for this journal.

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including low rates of child safety seat (CSS; car seat and booster seat) use. In 2004, approximately 66% of fatally injured AI/AN children aged <5 years were unrestrained at the time of the crash (NHTSA, 2006), compared with 35% in the general population (NHTSA, 2005).

Research has identified proper restraint use as the most effective way to reduce the risk of death or injury in the event of a crash. CSS use reduces the risk of death to infants by 71% and to toddlers (aged 1–4 years) by 54% in passenger vehicles (Kahane, 1986 and NHTSA, 1996). Booster seat use reduces the risk for serious injury by 45% for children aged 4–8 years when compared with seat belt use alone (Arbogast, Jermakian, Kallan, & Durbin, 2009). However, 38% of children aged 12 and under who died in motor vehicle crashes in 2013 were not restrained (NHTSA, 2015). Three strategies have been proven effective at increasing CSS use and/or decreasing motor vehicle-related injuries and deaths among children including child passenger restraint laws (Zaza, Sleet, Thompson et al., 2001), CSS distribution plus education programs (Ehiri et al., 2006; Zaza, Sleet, Thompson, et al., 2001), and community-wide information plus enhanced enforcement campaigns (Zaza, Sleet, Thompson et al., 2001). Additionally, a recent study found that CSS/booster use increased while fatal and incapacitating injuries decreased in states that expanded their child passenger restraint law to cover children ages 7 to 8 years (Eichelberger, Chouinard, & Jermakian, 2012).

Previous reports have documented successful tailoring of these child passenger safety (CPS) interventions to some high-risk groups, including AI/AN (Letourneau, Crump, Bowling, Kuklinski, & Allen, 2008; West & Naumann, 2014). However, there are few studies that have implemented or tested interventions targeting motor vehicle crash deaths among AI/AN (Pollack, Frattaroli, Young, Dana-Sacco, & Gielen, 2011). During 2010–2014, the CDC funded eight tribal communities to tailor, implement, and evaluate evidence-based road safety interventions. Five of these communities chose CPS interventions. The purpose of this report is to describe results from the five tribal communities that implemented evidence-based strategies to increase CSS use.

2. Methods

Data come from five tribal communities (AI/AN in Caddo County, Oklahoma via Tribal Program A (tribe requested their name not be used), Yurok Tribe via California Rural Indian Health Board (Yurok/CRIHB), Hopi Tribe (Hopi), Rosebud Sioux Tribe (Rosebud), and AI/AN in Juneau, Alaska via Tribal Program B (tribal organization requested their name not be used)) that implemented evidence-based strategies to increase CSS use during 2010–2014. Each tribal program was expected to implement evidence-based interventions chosen from the Guide to Community Preventive Services (Community Preventive Services Task Force, 2013). The tribal communities were encouraged to take a multi-faceted approach by incorporating education and awareness-raising activities, media campaigns, and enforcement components. All five tribal programs chose to include both enhanced enforcement campaigns and CSS distribution plus education programs. Enhanced enforcement campaigns involved targeted police enforcement with increased resources and staffing during specific

times. For example, CSS use checkpoints with increased citations. Additionally, enhanced enforcement campaigns include mass media, safety information, and publicity.

All five tribal programs set measurable objectives to increase CSS use by the fourth program year (2013–2014). The objective for both Tribal Program A and Yurok/CRIHB was a 5% increase in CSS use; Hopi's objective was a 25% increase; Rosebud's a 20% increase; and Tribal Program B's an 8% increase. Tribal Program B had an additional objective to distribute at least 125 CSSs and provide seat installation plus education. CSS distribution for all programs occurred during two types of CSS events including: (1) CSS installation and check events and (2) CSS enforcement and installation events. The primary purpose of CSS installation and check events was to provide seats and education to community members. The purpose of the CSS enforcement and installation events was to have law enforcement officers identify cars that needed CSSs and divert them to an area where tribal program staff could conduct CSS checks and installation.

During the 2010–2014 program period, observational surveys of CSS use conducted by tribal staff were adapted from the Indian Health Service's Ride Safe Program guidelines (Indian Health Service, 2011 and Letourneau et al., 2008). The observational CSS use data were collected at Head Start Centers, child-focused events (such as Halloween carnivals, Easter egg hunts), and at intersections throughout the communities.

3. Results

Tribal enrollment ranged from 5000 to 24,000 with the 3 smallest communities being non-reservation-based (Table A). Enhanced enforcement campaign activities and CSS distribution plus education activities were incorporated in all five tribal programs (Table B). While all tribal programs included both free and paid media events, press releases and public service announcements (PSAs) were the most common type of media (Table C).

CSS use increased for all tribes during the program period, although only one tribe reported observational survey results for all four program years (Fig. 1). CSS use increased 40% for Tribal Program A (goal was 5% increase), 38% on the Rosebud reservation (goal was 20%), 34% for Yurok/CRIHB (goal was 5%), 32% on the Hopi reservations (goal was 25%), and 6% for Tribal Program B (goal was 8%).

From 2010 to 2014, a total of 91 CSS events (90 of which were installation and check events) reached 1276 vehicles across the five tribal programs (Table 1). Hopi and Tribal Program A conducted the largest number of events (35 and 33, respectively). During these events, a total of 1417 CSSs were either checked or provided, including 896 new seats provided. Of the 896 new seats provided, 45% were booster seats, 32% were convertible CSSs (seats that can be used as both a rear-facing and forward facing seat), 21% were combination seats (forward-facing CSS that can convert into high-backbooster seats), and 3% were infant seats (rear-facing only) (data not shown). Of the 187 seats re-installed due to misuse, the majority (45%) were due to incorrect seat belt placement, followed by incorrect seat direction (17%), incorrect harness use (16%), incorrect use of lower anchors (10%) and tethers (5%) for children (LATCH), and other errors (8%) (data not shown).

4. Discussion

We found that evidence-based strategies to increase CSS use were successfully tailored by five tribal programs. The strongest evidence of this was the documented improvements in CSS use observed during the project period. CSS use increased in all five programs (from 6% for Tribal Program B to 40% for T ribal Program A) —with 4 out of 5 programs exceeding their goals. As expected, tribes with higher initial rates of use had smaller increases over time compared to tribes with very low baseline use rates. For example, the smallest increase (6%) over this program period occurred in the tribal community with the highest baseline CSS use (82.6%). This is expected because there was less room for improvement. Other programs that employed similar evidence-based interventions, including CSS distribution plus education campaigns, also have been effective at increasing CSS use in tribal communities (Letourneau et al., 2008; West & Naumann, 2014). For example, two pilot tribal programs funded by CDC from 2005 to 2009 were successful at increasing CSS use—by 45% (from 34% to 49%) on the Tohono O'odham Nation reservation and by 85% (from 41% to 76%) in the Ho-Chunk Nation (West & Naumann, 2014). Additionally, two tribal communities involved in the Indian Health Service's Ride Safe program reported CSS use increases from Fall 2003 to Spring 2006—by 72% (from 41.0% to 70.4%) at Ride Safe site A and by 138% (from 26.4% to 62.9%) at site B (Letourneau et al., 2008). Since the 2010–2014 funded programs ended, increases in CSS use and CSS distribution plus education efforts have continued. For example, CSS use on the Rosebud reservation was 19% in 2015—an increase from the 11% CSS use reported in 2013 during the 2010–2014 program. Yurok/CRIHB's tribal police department continues to provide seats and education to the community and the CPS technician still serves the Yurok/CRIHB community. Continued improvements have also been seen among tribes funded through CDC's 2005–2009 pilot tribal programs. For instance, CSS use in the Ho-Chunk Nation was 83% in 2015 —an increase of 9% since the 76% CSS use reported in 2009. As another example, CSS use on the San Carlos Apache Tribe (SCAT) was 52% in 2013 and 55% in 2016. Additionally, both SCAT and the White Mountain Apache Tribe continue to distribute CSSs to their communities. Future research should further explore the sustainability of these gains after the funded programs have ended.

An important part of tribal programs is tailoring interventions to local communities. Tailoring allows changes to implementation approaches without compromising the integrity of the intervention. Two examples of tailoring CSS interventions among the five tribal communities were (1) using local symbols and language in media campaigns and (2) adopting a CSS curriculum developed for tribal audiences. In the first example, the Hopi Tribe worked with a local artist to develop colorful culturally appropriate tribal symbols and buckle up messages in the Hopi language which reportedly resonated with tribal parents and caregivers. In a second example, the Yurok Tribe adopted a tribal CSS training module for use in their CSS fine diversion program. The purpose of the fine diversion program was to negate the citation fine for CSS non-use if offenders attended the CSS training. Unique to the training module is the topic of cradle board use versus CSS use. The module gives particular emphasis on using CSSs when transporting children without discouraging the general use of traditional cradle boards.

Community-wide information plus enhanced enforcement campaigns is a scientifically supported evidence-based strategy (Task Force on Community Preventive Services, 2001). This strategy was successfully tailored in all five of the 2010–2014 tribal programs. For example, tribal program coordinators for all five programs were American Indian/Alaska Native which helped to inform programming and media messages in culturally appropriate ways. As part of the comprehensive media campaigns, programs and messages that were aired on tribal radio stations were conducted in English and/or in the tribe's native language (e.g., Hopi). For other types of media, such as billboards or flyers, local tribal community members or tribal law enforcement officers were used in messaging (e.g., Tribal Program A). These findings indicate that disparities in child safety seat and booster seat use can be reduced through continued translation and application of tailored evidence-based strategies to other tribal populations.

CSS laws are another evidence-based strategy (Zaza, Sleet, Thompson et al., 2001). All 50 states and the District of Columbia currently have some form of child passenger restraint law. However child passenger restraint laws are not as common among tribes as each of the 567 federally recognized sovereign tribes are governed by tribal laws. Because of this, the safety behaviors of AI/AN who live on reservations could differ from those living in non-reservation-based communities. Of the five tribal programs highlighted in this report, the two programs located in reservation-based communities had much lower baseline rates of CSS use (8% and 21.7%) than the three programs in non-reservation-based communities (53.3%, 55.6%, and 82.6%). Further research should explore differences in CSS use rates between reservation-based AI/AN communities and non-reservation-based AI/AN communities to determine how differences in community type influence motor vehicle safety behaviors.

The five tribal communities included in this report have diverse infrastructures, levels of collaboration among law enforcement entities, structure and functionality of tribal courts, and data quality. However, all five tribal programs shared some common elements, including a full time coordinator, use of CSS events, CSS distribution plus education programs, mass media, and access to technical assistance. Overarching lessons learned from these five programs include: the need for several strong partners, including police and tribal leaders; a full-time tribal program coordinator; evaluation consultants; and local Indian Health Service and tribal environmental health professionals who can provide on-the-ground technical assistance. Additionally, implementation of evidence-based strategies and a multicomponent approach that includes elements of media, education, and enforcement were thought to contribute to program successes. These lessons learned may be useful in future programs among other tribal communities; even with considerable diversity among tribes, all five tribal programs were successful at increasing CSS use.

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Biography

Holly Billie is an Injury Prevention Specialist and Indian Health Service Liaison at CDC's Injury Center. Holly is the subject matter expert on tribal road safety on CDC's Transportation Safety Team.

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Robert J. Letourneau, MPH, is a research associate at the Department of Health Behavior in the Gillings School of Global Public Health at The University ofNorth Carolina at Chapel Hill. Robert's work includes providing training/capacity building, strategic planning, and technical assistance to community and governmental organizations at the local, state, and national level, including American Indian/Alaska Native tribes and tribal organizations.

Bethany West, MPH, serves as an epidemiologist on the Transportation Safety Team of the CDC's Injury Center. Bethany's work is in the area of motor vehicle safety focusing on child passenger safety and minority groups.

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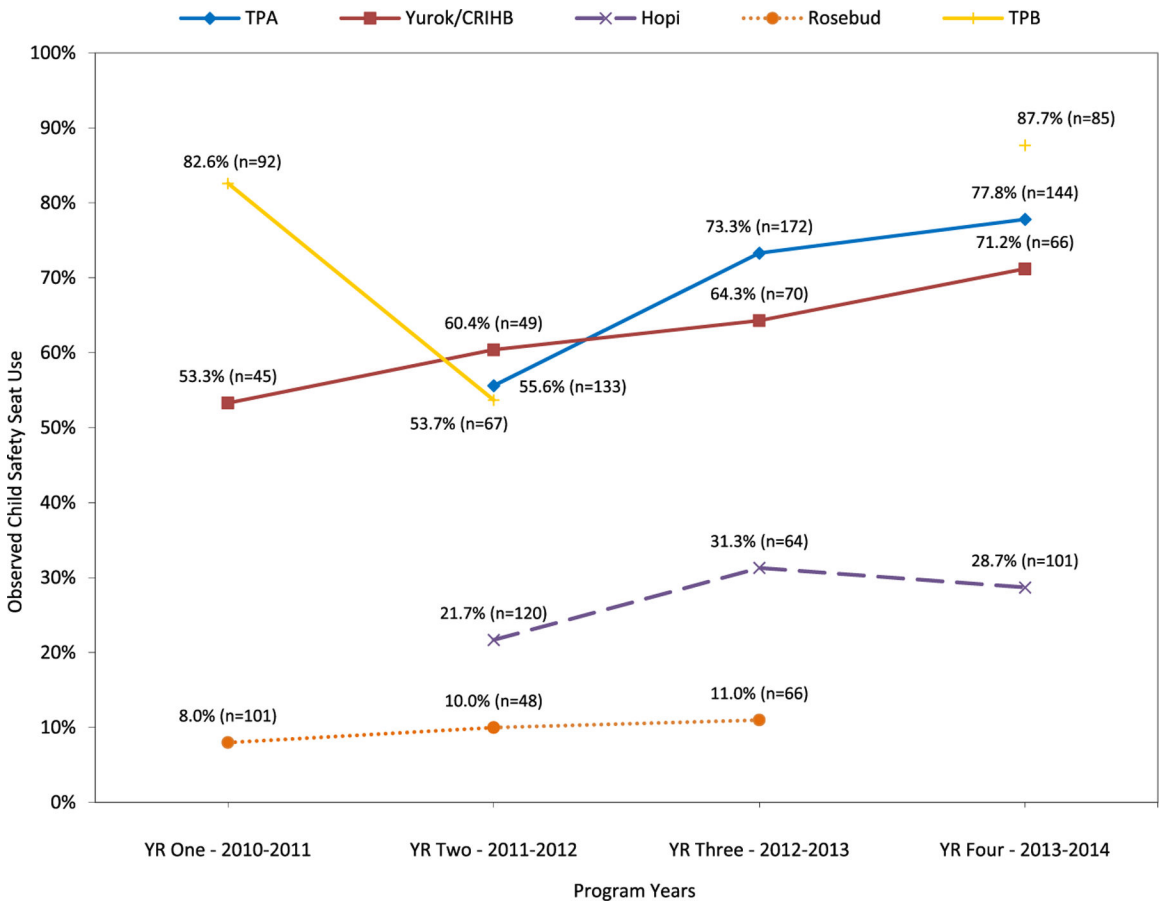

Fig. 1.
Child safety seat (CSS) use among 5 tribal communities, 2010–2014.

Table A

Characteristics of the five funded tribal communities, 2010–2014.

	Location	Tribal enrollment	Reservation status	Type of law enforcement
Tribal Program A	Caddo County, OK[a]	5200	Non-reservation-based	State and County
Yurok/California Rural Indian Health Board (CRIHB)	Klamath, CA	5000	Non-reservation-based[b]	Tribal
Hopi Tribe	Hopi Reservation, AZ	14,000	Reservation-based	Tribal and BIA[c]
Rosebud Tribe	Rosebud Sioux Reservation, SD	24,200	Reservation-based	Tribal
Tribal Program B	Juneau, AK and surrounding Alaska Native villages	5,100[d]	Non-reservation-based	State and County

[a] Tribal Program A served all AI/AN in Caddo County including members of the following tribes: Caddo, Kiowa, Comanche, Apache, Wichita, and Delaware.

[b] CRIHB is non-reservation-based and Yurok is reservation-based. The Yurok/CRIHB CPS program was classified as non-reservation-based as the project was located in a state that had predominantly state-managed roads

[c] Bureau of Indian Affairs.

[d] Approximate AI/AN population based on Census estimates (available at http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml).

Table B

Strategies and activities to increase child safety seat (CSS[a]) use by tribal program, 2010–2014.

	Community-wide information plus enhanced enforcement campaigns			CSS distribution plus education programs	
	Increase citations for non-use of child restraints	**Conduct CSS use checkpoints**	**Develop strategy to publicize enhanced enforcement efforts through media**	**Distribute CSSs**	**Provide education on age- and size-appropriate restraint use to parent/guardians**
Tribal Program A			✓	✓	✓
Yurok/CRIHB	✓	✓	✓	✓	✓
Hopi	✓			✓	✓
Rosebud		✓		✓	✓
Tribal Program B		✓	✓	✓	✓

[a]Child safety seats include car seats and booster seats.

Table C

Number and type of child passenger safety (CPS)-related media events by tribal program, 2010–2014.

	Free media						Paid media					Total
	Press releases/ PSAs on TV, radio, newspaper	Local radio announcements	Local participation on radio talk show	Local news coverage in tribal newspaper	Posters	Local parade float	Posters	Billboard	Radio ad	TV ad	Print ad	
Tribal Program A	18							1				19
Yurok/CRIHB	5	3		6								14
Hopi Tribe	3	1	2	1								7
Rosebud Tribe	3			1	1	2			4	4	2	17
Tribal Program B	7						2				1	10
Total	36	4	2	8	1	2	2	1	4	4	3	67

Table 1

Child safety seat (CSS) events summary, vehicles participating, and number of seats by tribal community, 2010–2014.

	CSS events[a]	Total vehicles Total seats[b]		Checked seats[c]		Replaced seats[d]		Re-installed seats[e]		New seats provided[f]	
				n	%	*n*	%	*N*	%	*n*	%
Tribal Program A	33	577	591	127	21	28	5	99	17	337	57
Yurok/CRIHB[g]	9	171	215	42	20	15	7	27	13	131	61
Hopi	35	372	453	21	5	13	3	13	3	406	90
Rosebud	8	139	110	74	67	0	0	36	33	0	0
Tribal Program B	6	17	48	9	19	5	10	12	25	22	46
Total	91	1276	1417	273	19	61	4	187	13	896	63

[a] During CSS events, CSS installation, use, and safety are checked and new CSSs are provided.

[b] Seat totals are for all CSS events and do not include seats provided or checked at other non-CSS events in the tribal communities.

[c] Seats that were checked but did not need to be re-installed or replaced.

[d] Seats provided to those who arrived at event with an existing seat.

[e] Seats that were checked and re-installed due to misuse.

[f] Seats provided to those who arrived at event without a seat.

[g] California Rural Indian Health Board.