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## How do you know you are making a difference? Use of data tracking tools and technical assistance to support tribal motor vehicle injury prevention programs

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#### Acknowledgements

We would like to thank the dedicated TMVIPP Coordinators and other health, law enforcement, and administrative professionals participating in the 2010-2014 CDC TMVIPP funding cycle for their commitment to traffic safety in American Indian communities, and the tireless efforts to collect data to show how their work is making a difference. We also acknowledge the support, dedication, and commitment to motor vehicle injury prevention in AI/AN communities from CDC Project Officers Captain Holly Billie, MPH, Injury Prevention Specialist, and Leanna P. Fox, MPH, Public Health Advisor, both from the Division of Unintentional Injury Prevention, National Center for Injury Prevention and Control, Centers for Disease Control and Prevention in Atlanta, GA. They helped ensure that consistent process and outcome data could be collected to show TMVIPP progress.

#### Background

Following a five-year pilot (2004-2009) with four American Indian/Alaska Native (AI/AN) tribes/tribal organizations, the Centers for Disease Control and Prevention (CDC) initiated a second cycle (2010-2014) of the *Tribal Motor Vehicle Injury Prevention Program (TMVIPP)*, reaching eight AI/AN tribes/tribal organizations with \$70K/year.

Funded projects were required to focus efforts on two of three evidence-based strategies to reduce motor vehicle crash (MVC) injuries: 1) increasing seat belt use; 2) increasing child safety seat (CSS) use; and/or 3) reducing driving under the influence (DUI).<sup>1</sup>

The eight projects were located in five states (Oklahoma, California, Arizona, South Dakota, and Alaska), at land- and non-land-based reservations, and with target populations ranging from 700 to 28,787. Six projects sought to address two strategies, and two projects opted to address three strategies. All eight projects sought to Increase seat belt use. Five projects sought to reduce alcohol-impaired driving. A TMVIPP Administration, Implementation and Evaluation Manual was developed to guide the 2010-2014 projects.<sup>2</sup>

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As part of a four-year contract to support the TMVIPP projects, a team of two from the University of North Carolina at Chapel Hill (UNC), Gillings School of Global Public Health, Department of Health Behavior, and coauthors for this article, provided on-going training, technical assistance, and evaluation services to the eight projects and TMVIPP CDC project officers. The support provided was similar to and built upon lessons learned through the authors' prior experiences providing technical assistance:

- during the pilot funding cycle<sup>3-6</sup>;
- to over 50 tribes/tribal organizations funded by the Indian Health Service (IHS) Tribal Injury Prevention Cooperative Agreements Program (TIPCAP) from 1997-2010<sup>7-8</sup>; and
- through the development and use of program administration, implementation, and evaluation manuals for the CDC<sup>2</sup> and IHS.<sup>9</sup>

#### Methods

TMVIPP project coordinators conducted a range of interventions and activities (e.g., education, enforcement, enhanced policies, media) aligned with their selected evidence-based strategies. The coordinators were also required to collect data to document project progress. To assist coordinators with data collection requirements, UNC team members worked with CDC staff to: 1) define required and recommended variables; 2) adapt/develop data collection instruments; and 3) develop templates and database files to archive and summarize data over the fouryear project period. On-going support was provided via: a) initial and annual review/revision of project work plans (e.g., goals, objectives, activities); b) monthly conference calls with TMVIPP Coordinators; c) annual site visits to each project to discuss progress; d) annual workshop for TMVIPP Coordinators and other staff; and e) monthly calls with two CDC project staff.

UNC and CDC staff identified three categories for data collection (n=18 variables): A) Traffic Safety Enforcement; B) Motor Vehicle Crashes (MVC) (events); and C) MVC Injuries/Fatalities (people) (Table 1). Six of six enforcement-related variables were required; one of eight variables about MVC events was required; and two of four variables about people injured/killed in MVCs were required. All other variables (n=9) were recommended. The data entry file provided by UNC team members allowed TMVIPP coordinators to enter and annually summarize information for the three categories of data. Instructions included with the file described procedures for using 21 color-coded Microsoft Excel worksheets, six of which included embedded formulas to enter monthly and annual data that were linked to 15 worksheets with summary figures (e.g., bar or line graphs) which could be tailored for each project. UNC team members provided regular assistance to TMVIPP Coordinators to answer questions about local data sources and to update project-specific data files. In Year IV, UNC developed a comprehensive data entry file to store and summarize data across all eight TMVIPP projects.

In addition to data about enforcement, MVCs, and MVC injuries/fatalities, UNC team members provided 14 tools (Table 2) to assist with the collection and summarization of other process and outcome variables. TMVIPP Coordinators used these tools to submit semi-annual progress reports with data summaries as appendices. The tailored progress report templates developed by UNC linked project progress to measurable objectives and activities describes in annual work plans.

[	Table 1. Data Variables by Category for TMVIPP Project Data Collection, 2010-
	2014
	<b>A. Enforcement</b> ( <i>n</i> =6, all required)
	1. Seat belt warnings
	2. Seat belt citations
	3. CSS warnings
	4. CSS citations
	5. DUI checkpoints
	6. DUI arrests
	<b>B.</b> MVCs (events) ( <i>n</i> =8, 1 required)
	7. MVCs Total (required)
	8. MVCs without Injury or Fatality (property-only MVCs)
	9. MVCs with only Non-Fatal Injuries
	10. MVCs with at least 1 Fatality
	11. Alcohol-Impaired (AI) Motor Vehicle Crashes Total
	12. AI MVCs without Injury or Fatality (property-only MVCs)
	13. AI MVCs with only Non-Fatal Injuries
	14. AI MVCs with at least 1 Fatality.
	<b>C.</b> MVC Injuries/Fatalities (people) ( <i>n</i> =4, 2 required)
	15. MVC Injuries Total (required)
	16. MVC Fatalities Total (required)
	17. AI MVC Injuries Total
	18. AI MVC Fatalities Total
Table 2	2. Tools Developed for Summarizing TMVIPP Project Progress (n=14)
Seat b	elt Use Tools
1.	Observational survey protocol
2.	
3.	
Child S	Safety Seat Use Tools
4.	•
5.	Data entry and summary file
6.	Annual use summary template
7.	Installation data entry and summary file (seats installed by year/type)
	Summary Templates
8.	Child Safety Seat Event (child safety seat installation/check <u>or</u> enforcement/installation)
	Enhanced Occupant Restraint Use Enforcement (saturation patrols/checkpoints)
	DUI Enforcement (saturation patrols/checkpoints)
	Use of Media Events (free or paid, by type)
	Program Management Tools
	Tailored Progress Report Template
	Coalition Meeting Notes and Summary template
	Community Educational and Training Event Summary template
14.	Community Educational and Training Event Summary template

Table 3. TMVIPP Project Progress to Increase Seat Belt Use, by Type of Project.

	Project	Obj. Met	Project Years (2010 - 2014)				Range in	Percent Use
			Year I	Year II	Year III	Year IV	Annual Number of Observations	Increase Yr I to Yr IV
Non-Reservation and/or	G	No	75.1%	85.4%	75.1%	76.1%	607 - 854	1.3%
Predominately State Road Managed Projects	A	No	76.8%	74.0%	77.1%	78.1%	4,402 - 4,951	1.7%
Wanaged 1 Tojeets	В	Yes	75.2%	81.0%	73.8%	80.9%	499 - 850	7.6%
	Н	No	55.3%	54.2%	48.3%	58.0%	1,010 - 2,899	4.9%
Reservation-Based Projects (intermediate baseline use <sup>a</sup> )	С	No	45.3%	51.7%	50.2%	49.5%	723 - 1,304	9.3%
	D	Yes	38.8%	49.6%	51.5%	53.1%	1,378 - 1,529	36.9%
Reservation-Based Projects	E	Yes	21.9%	39.2%	44.8%	52.5%	2,242 - 2,765	139.7%
(low baseline use <sup>a</sup> )	F	Yes	9.4%	18.0%	29.9%	25.9%	2,745 - 3,185	175.3%

<sup>a</sup> For the purposes of grouping results, the authors identified project baseline seat belt use in two categories: a) intermediate baseline use (between 33% and 66%); and b) low baseline use (between 0 and 33%). Based on statistical principles, a project's ability to expect seat belt use increases over time is related, in part, to its baseline use.

Project	Obj. met	P	roject Year	rs (2010 - 20	14)	Range in Annual Number of Observations	Percent Use Increase	
		Year I	Year II	Year III	Year IV		Yr I or Yr II to Yr III or Yr IV	
А	Yes	<sup>a</sup>	55.6%	73.3%	77.8%	133 – 172	39.9%	
В	Yes	53.3%	60.4%	64.3 %	71.2%	45 - 70	33.6%	
D	Yes	<sup>a</sup>	21.7%	31.3%	28.7%	64 - 120	32.3%	
F	Yes	8%	10%	11%	a	48 - 101	37.5%	
G	No	82.6%	53.7%	a	87.7%	67 – 92	6.2%	

 Table 4. TMVIPP Project Progress to Increase Child Safety Seat Use.

<sup>a</sup> For the purposes of grouping results, the authors identified project baseline seat belt use in two categories: a) intermediate baseline use (between 33% and 66%); and b) low baseline use (between 0 and 33%). Based on statistical principles, a project's ability to expect seat belt use increases over time is related, in part, to its baseline use.

#### Results

Each project used their tailored report template to summarize progress semi-annually in Years I-III and for Year IV in a final progress report. There was variability across projects in the frequency and extent to which each used tools provided (Table 2) to summarize process and outcome variables associated with their activities (e.g., restraint use tools, event summary templates).

Project data summary files (e.g., Microsoft Excel) to track information about traffic safety enforcement, MVC events, and MVC injuries/fatalities were not uniformly completed by the eight projects. Seven projects submitted data for most of the six required <u>enforcement</u> variables. Only four projects submitted a complete set of data for the one required and seven recommended variables related to <u>MVCs</u> (one project was missing one variable, and three projects were missing several). Five projects submitted complete data for the two required and two recommended variables related to <u>MVC</u> <u>injuries/fatalities</u> (one project submitted three years and two did not collect any data).

Most projects followed protocols and utilized database tools to maintain seat belt use and child safety seat use data for Years I-IV. All projects reported following the recommended observational survey protocol for selecting valid seat belt use observation sites and collecting sufficient number seat belt use observations.<sup>10</sup> For seat belt and child safety seat use observational surveys, the range of occupant observations varied by year across projects. The annual number of seat belt use observations across the eight projects ranged from 499 to 4,951. Annual child safety seat use observations across the five projects ranged from 45 to 172.

All eight projects documented some increase in seat belt use among occupants (range 1% to 175%) (Table 3). Four of the eight projects achieved one or more of their measurable objectives regarding seat belt use. Six of the eight projects working to increase seat belt use conducted a total of 102 Enhanced Occupant Restraint Use Enforcement (EORUE) events, with the vast majority being checkpoint events (i.e., when vehicles are stopped at a specific location along a roadway exclusively for checking restraint use). Nineteen percent of events were conducted as part of national campaigns (e.g., Click-It or Ticket). The average EORUE duration was 1.7 hours, reaching a total of 8,230 vehicles, with 81 average number of vehicles per event (42-427 vehicles across eight projects), and resulting in a total of 272 seat belt citations and 191 seat belt warnings, among other outcomes. Two projects conducted the largest number of events (42 and 32, respectively), representing approximately 75% of total EORUE events.

All five projects addressing child safety seat use documented increases in the percent of children observed using child safety seats (range of 6-40 percent) (Table 4). Four of the five projects achieved their measurable objectives to increase child safety seat use. The five projects working to increase CSS use conducted a total of 91 CSS Events, with the vast majority (99%) being installation and check events, where the primary purpose was to provide seats to community members on a voluntary basis. TMVIPP Coordinators played the lead role in 79% (n=73) of CSS events with an overall average event duration of 3.4 hours, reaching a total of 1,276 vehicles, with an average number of vehicles per event of 14 (range of 3-19 vehicles across the five projects). Two projects conducted the largest number of events (33 and 36, respectively), representing approximately 33% of the CSS events. During the 91 events, staff/volunteers either: provided new seats (896); checked existing seats (273); re-installed existing seats (187); and/or replaced existing seats (61). Among the 896 new seats provided, the majority of seat types were booster (45%), followed by convertible (32%), combination (21%) and infant (3%).

Four of five projects addressing DUI sought to do so by reducing alcohol-involved motor vehicle crash injuries and fatalities as their measurable objective. Two of the four projects achieved their measurable objectives to reduce alcohol-involved MVC injuries. Two of the four projects achieved their measurable objectives to reduce alcoholinvolved MVC fatalities. The fifth project sought to increase DUI arrests (and strengthen DUI laws) and met its objective to increase DUI arrests.

Most sites used tools provided to maintain data about efforts to reduce DUIs. Of the five projects addressing DUI, four conducted a total of 112 Enhanced DUI enforcement events, with the majority (86%) being <u>checkpoint</u> events. The majority of events (n=105, or 94%) were conducted as part of national campaigns (e.g., *Booze It or Lose It; Don't Shatter the Dream, Don't Drink and Drive; Drunk Driving Over the Limit Under Arrest*), with an average event duration of 2.5 hours. A total of 9,515 vehicles participated in the 112 DUI enforcement events, with an average 85 vehicles per event (range of 15-240 vehicles across four projects), resulting in a total of 67 DUI arrests, 16 DUI Drug arrests, 109 seat belt citations, and seven child restraint use citations, among other outcomes. One project conducted the largest number and proportion of events (57, or 51%).

Most sites used tools to summarize information about use of media, including free media (e.g., announcements on radio, participation in radio call-in shows, and use of tribal casino marquee, website, and employee emails/listservs) and paid media (e.g., advertising using brochures, posters, flyers, billboards, and print/radio advertisements). Approximately 400 media events were conducted by the eight projects during the four-year funding cycle, with approximately onethird of events being free media. Media events addressed a variety of topics, with an average of 2.1 topics per event. Coordinators categorized the primary topics for media events as: seat belt use (50%); DUI prevention (41%); and general traffic safety awareness (34%). Of the 19 types of media events (11 free, seven paid and one other), projects used paid radio announcements most frequently (n=101 or 25%), followed by free press releases/PSAs on tv, radio or newspaper (n=85 or 21%), and free local news coverage in the tribal newspaper (n=77 or 19%).

Annual work plans for six of the eight TMVIPP projects included policy-related change interventions. These involved changing/enhancing existing tribal or state laws that govern traffic safety (e.g., restraint use, driving under the influence). Six projects sought to change laws regarding seat belt use. At three of these projects, new seat belt use laws were passed to adopt the state's primary enforcement law and to increase fines and make the law a primary enforcement law. For the other three projects, law changes were either not proposed or remained pending at the end of TMVIPP, with pending changes involving alignment with state primary enforcement laws or increasing fines for violations. Five projects sought to change laws regarding child safety seat use. For three projects, new child safety seat laws were passed to adopt the state's primary enforcement law or to include language for height/weight requirements. For two projects, law changes were not proposed or remained pending at the end of TMVIPP, with pending changes to expand the definition of who can be cited for children not properly installed in seats that align with federal safety standards. Three projects sought to change laws regarding DUI. At one of these projects, new DUI laws were passed to include a court diversion program, an increase in fines and penalties, an increase in sentence length, a decrease in the minimum BAC, and to disallow pleas to nullify the charge. For two projects, law changes remained pending at the end of TMVIPP, with pending changes involving reductions in the minimum BAC levels (from .10 to .07 or .08), aggravated DUI penalties for repeat offenders, requiring mandatory blood draw testing for violators, and adding an 'extreme BAC' (>.20) provision.

#### Discussion

On-going training and technical assistance for TMVIPP projects (e.g., regular conference calls, annual site visits and

annual coordinator meetings) reinforced the importance of documenting process and outcome variables through the use of data collection instruments and templates. UNC team members provided tailored guidance and encouragement, which enabled the consistent submission of data from the eight 2010-2014 TMVIPP projects. This contributed to the authors' ability to summarize the degree to which each TMVIPP project's measurable objectives were met and to describe the extent of activities (e.g., enforcement, media, policy) conducted by TMVIPP projects.

The enhanced support for program evaluation was built into the structure of the 2010-2014 CDC TMVIPP funding program, based in part on lessons identified from the 2004-2009 pilot TMVIPP funding cycle that reached four Tribes.<sup>4</sup> During the pilot cycle, tribal project data were collected inconsistently across projects<sup>3,5</sup>, particularly because a single, centralized source of technical assistance was not established at the start of the pilot. Following the completion of the pilot cycle, however, the authors were contracted to develop a TMVIPP Administration, Implementation, and Evaluation Manual as a reference guide for program goals, expectations, and resources available to the TMVIPP projects during the 2010-2014 funding cycle. The manual helped to establish expectations and subsequent technical assistance provided project coordinators with a list of required and recommended variables at the start of their projects.

#### Table 5

Table 5. Components needed for Tribal Motor Vehicle Injury Prevention         1. Commitment       Support staff and project intervention activities.         Staffing       Direct efforts to prevent and avoid motor vehicle injury.         Training       Enhance existing knowledge and skills.         Supervisory/Administrative Support       Assist the administrative and financial functioning of traffic safety.         2. Collaboration       Develop, enhance, and support enforcement laws for seat belt/child safety seat use impaired driving.         Coordinate efforts of the Tribe to plan or conduct activities, and evaluate progress or example, determine if changes in driving safely have happened as planned).         Roads or Transportation       Conduct highway safety improvements that focus on environmental conditions, and engineering (design) weaknesses that cause or add to MVCs.         Legal System       Manage citations and arrests handled in traffic and impaired driving courts, track th of cases, identify repeat offenders, and collect fines.         Emergency Medical Services       Safely transport those injured in MVCs and collect data about MVC events.         Media       Promote and educate the public about prevention of MVCs and MVC injury/fatalit, Community Members, (MVCs)         Motor Vehicle Crashes (MVCs)       How many; where; when; and why MVCs are occurring.         MVC Injuries/Fatalities       How many; where; when; and why injuries and fatalities are occurring from MVCs         Restraint Use       Community behavi	for
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Restraint Use Community behaviors and barriers to using occupant restraints.	
Enforcement and ProsecutionPractices or barriers to enforcing and prosecuting violations.	
Laws and Policies Degree to which laws and policies exist or can be enhanced.	
4. Tailored Evidence-Based Strategies	
Child Safety Seat Use Increase child safety seat use.	
Seat Belt Use Increase seat belt use.	
Impaired Driving Reduce impaired driving.	
5. Technical Support	
Commitment Prioritize injury as an important tribal priority.	
Collaboration Build multi-disciplinary teams.	
Data and Evaluation Know what data are needed to assess the problem and evaluate interventions.	
Evidence-Based Strategies Tailor recommended strategies for use in AI/AN communities.	

In collecting and summarizing data for required/recommended variables, several limitations were identified across the eight TMVIPP Projects. For the six enforcement-related variables, most projects reported that collecting data about enforcement was challenging and time consuming, and that warnings were not routinely recorded by law enforcement. For the data variables related to motor

vehicle crashes (events): four projects were able to collect a full set of data; one project was missing only one variable (alcohol-involved MVCs); and three projects submitted only selected years of data for some variables. Data sources for these variables ranged, from local law enforcement (Tribal and/or Bureau of Indian Affairs) to county/state departments of highway safety, and each Coordinator's ability to access or receive the data varied. Similarly, for the data variables related to MVC injuries/fatalities (people): five projects collected data for all four years; one project collected data for three years; and two projects did not collect any data about people injured in MVCs. Often, local sources about MVC events (e.g., Tribal or BIA law enforcement) did not systematically record information about the number of people injured or killed, or whether fatalities occurred after the completion of police reports (the primary data source for many TMVIPP Coordinators).

The incomplete submission of outcome data limited our ability to conduct analysis to investigate the relationship between the intensity of the interventions (e.g., frequency and duration associated with intervention activities such as enforcement or media events) and the projects' outcomes of interest (e.g., increases in restraint use, reductions in MVCs and/or MVC injuries/fatalities). Based on the authors' 20+ years experiences working with AI/AN injury prevention projects, it was not surprising that many projects faced challenges in collecting enforcement, MVC, and/or MVC injury/fatality data. The collection and sharing of traffic safety data at Tribes/Tribal organizations varies, particularly when multiple agencies (e.g., law enforcement, highway/roads, and/or public health departments) are responsible for different aspects of motor vehicle injury prevention interventions (e.g., education/awareness, environmental modifications, enforcement). Coordinators who were housed organizationally within a law enforcement entity, or had strong links to law enforcement, were generally able to collect and submit more complete data. A similar observation was made by Piontkowski et al. (2015) based on their experiences working with a tribe in Arizona.<sup>11</sup>

CDC will disseminate lessons learned from the two TMVIPP funding cycles. The lead authors of this article were contracted to develop a Tribal Motor Vehicle Injury Prevention (TMVIP) Best Practices Guide, expected to be published by the CDC in 2016. The Guide will be made available for download on the CDC's Tribal Road Safety and the IHS Injury Prevention Program web pages. The guide summarizes lessons learned from tribes/tribal organizations implementing and evaluating programs to reduce unintentional injury associated with MVCs in American Indian/Alaska Native communities. The guide is organized to highlight five essential components needed for Tribal Motor Vehicle Injury Prevention: 1) Commitment; 2) Collaboration; 3) Data and Evaluation; 4) Tailored Evidence-Based Strategies; and 5) Technical Support (Table 5). Designed as an easy-to-navigate electronic document, the primary target audience includes local injury prevention practitioners. Additional target audiences include: tribal leadership; tribal public health professionals; and/or state public health/injury prevention practitioners working with AI/AN tribes/tribal organizations. Case Examples are used

to highlight Tribe-specific application of 'essential components' to tribal motor vehicle injury prevention and examples of tailoring evidence-based strategies. The guide emphasizes the benefit of developing collaborative and multi-disciplinary relationships to collect data.

Funders supporting community-based motor vehicle injury prevention strategies often require projects to collect and report data to show that their efforts are making a difference. The provision of enhanced technical assistance and support for collecting and reporting traffic-safety related data ensured that 2010-2014 TMVIPP projects could document progress toward measurable objectives for the selected evidence-based strategies the projects implemented. Since data were consistently documented across the eight funded projects, overall program impact could be described: 50% of projects met seat belt use objectives; 80% met child safety seat use objectives; and 50% met alcohol-involved MVC injury or fatality objectives. In addition, use of tools and tailored technical assistance allowed TMVIPP projects to summarize important process evaluation information about interventions and activities (e.g., education, enforcement, policy change, and media) conducted to support those strategies.

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