Metrics for Local Community Planning and Evaluation: The Case for Observational Measurement of High Risk Rural Sub-Populations in Occupant Safety

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Introduction: The purpose of this study is to examine the relevance of non-specific safety belt use data for interventions to rural teens and to pilot a data collection project to provide more specific data to traffic safety stakeholders and educators in rural areas.

Methods: Twelve high schools in Southeast Georgia were used for observed safety belt data collection over a 16 month period. Observational surveys were conducted at the entrance to student parking lots of the studied schools in the morning or afternoon. Observers were trained and survey methods were standardized to maintain comparability between results.

Results: Observational surveys revealed a safety belt usage rate of 38.6% among high schools teens at the studied high schools. Safety belt usage rates ranged from 9.5% to 66.9%. Observed safety belt use for female vehicle occupants was 48.4% compared to 35.6% for males.

Conclusion: The observational survey results from this study support research showing that rural teens have lower safety belt usage rates than adults or urban teens. Despite efforts to target rural areas, programs must specifically target sub populations, especially rural male teens, in order to hold any traction. Because of the wide gap between measured safety belt use in rural Georgia (79.9%) and the studied rural high schools (38.6%), local program planners must assess actual safety belt usage in their high risk rural teen population in order to use accurate metrics for intervention and education efforts. [West J Emerg Med. 2013;14(4):380–383.]

BACKGROUND

Motor vehicle collisions (MVC) are the leading cause of death for Americans ages 15 to 19.[1] In 2009, the death rate for U.S. teenaged drivers was nearly twice that of all other drivers.[2] Teenagers frequently do not use safety belts, making them more vulnerable to injuries.[3] According to studies, the observed belt use among teens was 80% in 2008, the lowest of any age group with 56% of teenagers in fatal crashes unbuckled in 2009.[4]

The risk for death in a MVC is greater for rural teens. In 2009, 60% of fatal crashes and 59% of fatalities involving teen drivers occurred on rural roadways.[2] These higher rates can result from design elements including narrower lanes, soft shoulders, and tree-lined roadways, as well as behavioral factors and higher speed limits.[5-6] Additionally, commuting longer distances exposes rural drivers to greater risk of crashing from drowsy driving.[7,8,9] The remoteness of rural roads can delay the detection of crashes and the administration of medical care.[8-11]

Rural teens are more likely to ride unrestrained than their urban counterparts.[10] Rural teens are less likely to consider legal or physical consequences of driving unrestrained.[11] Observed safety belt usage rates of teens on high school campuses are generally lower than state rates or those of

Table 1. 2009 Georgia unbelted teen crashes, injuries and fatalities (Source: Georgia Department of Transportation).

	Rural teens	Urban teens
Unbelted crash rate per 10,000 licensed Drivers	42.3	24.0
Unbelted Injury rate per 10,000 licensed Drivers	21.5	8.7
Unbelted fatality rate per 10,000 licensed Drivers	1.1	0.2

Table 2. Observational survey results with 1,538 vehicle occupants.

High school	Date observed	Vehicle occupants observed	Female safety belt usage rate	Male safety belt usage rate	Overall safety belt usage rate
1	Sept 2009	136	39.1%	25.4%	25.7%
2	Sept 2009	135	20.0%	13.8%	17.0%
3	Sept 2009	95	37.5%	17.9%	29.5%
4	Oct 2009	84	17.1%	4.1%	9.5%
5	Oct 2009	121	67.1%	66.7%	66.9%
6	Feb 2010	73	17.5%	6.1%	12.3%
7	Dec 2009	55	21.4%	22.2%	21.8%
8	Feb 2010	64	39.4%	45.2%	42.2%
9	Oct 2010	124	60.3%	52.5%	55.6%
10	Oct 2010	128	63.2%	43.7%	52.3%
11	Nov 2010	481	55.0%	38.5%	45.9%
12	Jan 2011	42	52.4%	9.5%	31.0%

other age groups.[12] Research on rural high school campuses is less extensive, but some studies indicate safety belt use among rural high school teens is even lower.[13] It is of great importance for rural communities to conduct programs to prevent teen MVC.

The observed safety belt usage rate in Georgia was 89.6% in 2010.[14] Since passage of a primary safety belt law in 1996, belt use in rural Georgia increased from 62.9% to 88.2% in 2011, 5% lower than the rest of the state, but consistent with a study by the CDC finding rural belt use higher in states with primary safety belt laws.[15] In 2009, the rate of rural teen drivers unbelted in crashes was 42.3 per 10,000 licensed drivers compared to 24.0 for urban teens (Table 1).

The rate of rural Georgia teens who are unbelted in crashes is an ongoing problem and indicates low belt use for this population. Because state level observational reports do not break down seatbelt use by age demographic, traffic safety stakeholders and educators in rural areas may use incomplete or inappropriate data as metrics to focus interventions on most at risk groups. At 88.2%, seatbelt use in rural Georgia is up 10.1% over the last 10 years, according to available data.[16] This study sought to collect specific and relevant data for evaluating and planning for rural sub-populations.

METHODS

High schools for data collection were located within the 22-county Southeast Region Rural Roads Initiative (RRI). The RRI is a cooperative program between the Georgia Department of Public Health and the University of Georgia, funded by the Georgia Governor's Office of Highway Safety (GOHS), aimed to decrease deaths and injuries on rural roads.[17] Southeast Georgia is populated by small towns located in largely unpopulated areas. Population density is often one half to one third of the state average. All counties in this area are above the state average for people living under the poverty rate, and except for one with a large state university, all counties have education rates lower than the state average.

We chose 12 high schools based on a convenience sample of counties with established community mobilization groups. Selected schools had personnel who were previously connected to the Rural Roads Initiative. Observational safety belt surveys were conducted at the entrance to student parking lots of the studied high schools by staff from the Rural Roads Initiative, members of community mobilization groups, and/or students from the high schools over a 16-month period from September 2009 to January 2011. Surveyors were to observe at least 100 vehicles where possible, and report the safety belt usage of drivers and front seat passengers with gender as a variable. We based our survey instrument on one used by the University of Oklahoma for their state observational study.[18] If safety belt usage could not be determined, the vehicle occupants were not counted.

Observers located in safe areas where they could see vehicles entering the student parking lots. Surveys were conducted one time per school in either the morning or afternoon. RRI staff trained students and volunteers on

observation methods, the observation instrument, and recording procedures. RRI staff members were present for all observations to ensure survey integrity. Observational survey methods were consistent in all cases.

RESULTS

Observational surveys revealed a safety belt usage rate of 38.6% among high school teen drivers and front seat passengers at 12 rural high schools in southeast Georgia (Table 2). A total of 1,538 teenage vehicle occupants were observed driving into or out of student parking lots. Of these, 593 were wearing safety belts, and 945 were not restrained.

Observed safety belt use for female teenage vehicle occupants was higher than males at 10 of 12 high schools participating in this study. Overall, female occupants had a safety belt usage rate of 48.4% compared to 35.6% for males.

DISCUSSION

In Georgia, overall rural seatbelt usage rates were raised 10.1% over the past 10 years due to state level legislation, enforcement and educational efforts. Recently, the National Highway Traffic Administration (NHTSA) performed Rural Seatbelt Use Demonstration Projects across rural areas of the country, including Georgia.[19] Although Georgia results are not yet published, the Wyoming Demonstration Project raised rural belt use from 61.2% at the start of the initiative to 72.2% at the conclusion.[20] The current study indicates that even with such rural-specific traffic safety initiatives, high risk sub-populations may not change.

Teen drivers, especially males, in Georgia rural areas are perhaps the most susceptible population to vehicle crashes for both behavioral and environmental reasons. The local, specific and relevant observational data gathered in this study is needed for health professionals and other stakeholders to design programmatic efforts to reach this sub-population and reduce morbidity and mortality resulting from traffic crashes.

LIMITATIONS

Seatbelt surveys were conducted primarily by local stakeholders and students with no previous experience with observational studies. The program lacked a second set of observers at each location to derive a measure of observer reliability and internal validity. Because observers were visible in most cases, students could have buckled up just prior to entering schools grounds only on observation days. Sample sizes from schools varied based on student populations. Schools chosen for observations were based on convenience sampling and access to reliable observers in the immediate area.

CONCLUSION

The observational survey results from this study support research showing that rural teens have lower seatbelt usage rates than adults or urban teens. The gaps between overall teen and adult belt use, rural and urban belt use, and rural and urban fatality rates suggest the need for traffic safety efforts in rural high schools to prevent the perpetuation of existing high risk behaviors.

The current study illuminates disparities that exist in Georgia between rural seatbelt use data reported at the state level and actual seatbelt use data gathered from local observations. At the state level, rural belt use was 88.2% in 2011, which is a 10.1% increase over the last 10 years. The state report also does not include age demographics in its analysis. Based on the results of seatbelt observations in rural southeast Georgia high schools, which measured seatbelt use at 38.6%, this state level data is not appropriate or applicable for local interventions. In order to base seatbelt intervention programs on suitable data tailored to sub-populations, local programmers must go into the field to observe their own communities.

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