

### Road Safety

**Amy Hunter, MPH, PhD**, UCONN Health, Farmington, CT

*APHA 2021 Annual Meeting and Expo*

#### Abstract

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##### **Factors associated with fatalities of sober pedestrians, United States, 2017-2019**

**Lindsay Arnold, MPH**, Brian Tefft and William Horrey, Ph.D.  
AAA Foundation for Traffic Safety, Washington, DC

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**Background:** Pedestrian fatalities have significantly increased since 2009. Research has identified major risk factors and shifts in these factors over time. Research and countermeasures often focus on alcohol-impaired among pedestrians, however, the majority of pedestrians who die on U.S. roadways are sober, and fatalities of sober pedestrians have increased at a faster rate than fatalities of alcohol-impaired pedestrians.

**Methods:** We examined all crashes that occurred on public roadways in the U.S. from 2017-2019 that resulted in the death of a pedestrian using the Fatality Analysis Reporting System (FARS) database. Pedestrian, driver, vehicle, environmental, and roadway factors were tabulated among fatally-injured pedestrians with blood alcohol concentrations (BAC) of 0.00 and 0.08 g/dL or above. In cases where the driver's or pedestrian's BAC was unknown, we used multiply-imputed values from FARS.

**Results:** Drivers who struck intoxicated pedestrians were somewhat more likely than drivers who struck sober pedestrians to have also been intoxicated. While majorities of all pedestrian fatalities occurred at night or in the early morning and in darkness, the proportions were lower among sober pedestrians. Most fatalities occurred in urban areas and at non-intersection locations, and pedestrians were most frequently crossing the road, though sober pedestrians were less likely than intoxicated pedestrians to be struck at non-intersections.

**Conclusions:** The outcomes can help guide discussion and consideration of countermeasures to help reduce pedestrian fatalities, the majority of whom are sober. Thus, countermeasures that are applicable regardless of pedestrian and driver intoxication should be more impactful than those designed to reduce alcohol intoxication.

Epidemiology Public health or related research Social and behavioral sciences

#### Abstract

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##### **Public health and traffic safety communities apply shared risk and protective factor approaches to reduce motor vehicle injuries**

**Ina Robinson, MPH**  
Safe States Alliance, Atlanta, GA

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Decreasing motor vehicle-related injuries and fatalities requires strong partnerships between agencies across many disciplines. Informed by the public health approach and the social ecological model, the Safe States Alliance released a resource document with recommendations for: 1) applying a shared risk and protective factors approach to motor vehicle safety, 2) identifying interventions that address multiple types of

risky driving behavior, and 3) utilizing data to measure the impact of behavior change strategies. Putting the recommendations into action, Safe States launched the *Driver Behavior Change Seed Grant Program* (Seed Grant Program) which enhances state and local motor vehicle safety efforts by addressing shared risk and protective factors for driver safety in local communities. A cohort of four interdisciplinary teams consisting of public health and traffic safety professionals at the state and local level received funds to implement behavior change strategies in their communities. The teams have participated in comprehensive training events focused and receive customized technical assistance opportunities to support strategy intervention activities. Recommendations for applying a shared risk and protective factors approach to reduce risky driving behavior, insights from ongoing case studies examining the successes and challenges of each interdisciplinary team, and findings from the continued evaluation of the Seed Grant Program will be shared during the presentation. Given the scarcity of resources and competing issues in the public health injury prevention and traffic safety communities, practitioners can have the largest reach by applying evidence-based strategies to traffic safety challenges that address shared risk or protective factors among diverse audiences.

Conduct evaluation related to programs, research, and other areas of practice Implementation of health education strategies, interventions and programs Planning of health education strategies, interventions, and programs Public health or related research Social and behavioral sciences Systems thinking models (conceptual and theoretical models), applications related to public health

## Abstract

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### **Increasing rates of pedestrian fatalities in relation to broader societal trends, United States, 2009–2018**

**Brian Tefft**, Leon Villavicencio, M.P.H., Lindsay Arnold, MPH and William Horrey, Ph.D.  
AAA Foundation for Traffic Safety, Washington, DC

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**Background:** The number of pedestrians killed on U.S. roads increased by 55% from 2009 through 2018, the largest 10-year increase on record. The annual number of traffic fatalities has been shown to be correlated with socioeconomic indicators. The purpose of this study was to investigate the extent to which the recent increase in pedestrian fatalities was associated with such factors.

**Methods:** We used random effects Poisson regression to model the association of annual county-level pedestrian fatalities per capita with cross-sectional and temporal variation in county-level socioeconomic indicators in years 2009–2018 in 706 counties for which all data were available. These counties accounted for 82–84% all pedestrian fatalities in the U.S. each year. The model was then used to estimate the change in the total number of pedestrian fatalities that would have been expected based on changes in socioeconomic indicators alone.

**Results:** Our model predicted that there would have been 5,255 pedestrian fatalities in 2018 in the counties examined, 1,597 (44%) more than predicted in 2009. There were actually 5,368 pedestrian fatalities in those counties in 2018; 1,940 (57%) more than in 2009.

**Conclusions:** A county-level model including only macroscopic socioeconomic indicators, likely correlated with social determinants of health, predicted 82% of the total increase in pedestrian fatalities from 2009 through 2018. Results can be used to identify counties that experienced substantially larger or smaller increases than predicted, as a step toward identifying critical pedestrian safety needs or successful approaches to reducing pedestrian fatalities.

Biostatistics, economics Epidemiology Public health or related research Social and behavioral sciences

## Abstract

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## Talking on cellphones while driving: The impact of handheld cellphone bans.

**Marco Benedetti, PhD<sup>1</sup>**, Li Li, MS<sup>2</sup>, Sijun Shen, PhD<sup>1</sup>, Neale Kinnear, PhD<sup>3</sup>, M. Kit Delgado, PhD<sup>4</sup> and Motao Zhu, MD, MS, PhD<sup>5</sup>

(1)Nationwide Children's Hospital, Columbus, OH, (2)The Ohio State University, Columbus, OH, (3)Transportation Research Laboratory, Wokingham, United Kingdom, (4)Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA, (5)Nationwide Children's Hospital, Columbus, OH

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**Background:** Nearly all states have laws that restrict cell phone use while driving, and studies of their efficacy yielded mixed results. Furthermore, few studies have considered handsfree phone use in association with handheld phone bans. To better understand the association between handheld phone policies and phone use while driving, we analyzed the Traffic Safety Culture Index.

**Methods:** Our data consisted of a nationally representative sample of US adult drivers from years 2012-2017. Our outcome variables were (i) self-reported talking on a phone while driving; (ii) self-reported talking on a handheld phone while driving; and (iii) self-reported talking on a handsfree phone while driving. Our primary exposure variable was handheld phone ban policy. We estimated adjusted relative risks (RR) using modified Poisson regression.

**Results:** Drivers in states with handheld bans were 13% less likely to self-report talking on a cell phone while driving than drivers in states with no handheld ban (RR = 0.87; 95% CI 0.84, 0.91), and 38% less likely to self-report talking on a handheld phone (RR = 0.62; 95% CI 0.59, 0.65). Drivers in states with handheld bans were 10% more likely to self-report talking on a handsfree phone (RR: 1.10; 95% CI: 1.05, 1.16).

**Conclusions:** Evidence that handheld phone bans were associated with higher self-reported talking on handsfree phones and lower talking on handheld phones was consistent with a substitution hypothesis. As handheld bans were also associated with lower talking on any phone while driving, our study supports these policies as a deterrent to distracted driving.

Epidemiology Public health or related laws, regulations, standards, or guidelines Public health or related public policy Public health or related research Social and behavioral sciences

## Abstract

### Motor vehicle crashes on 55+ MPH highways: An analysis of linked Nevada trauma and crash records to inform speed legislation

**Laura Gryder-Culver, MA<sup>1</sup>**, Samantha Slinkard, MPH<sup>2</sup>, Paul Chestovich, MD, FACS<sup>1</sup> and Deborah Kuhls, MD, FACS<sup>1</sup>

(1)University of Nevada, Las Vegas School of Medicine, Las Vegas, NV, (2)University of Nevada Las Vegas, Las Vegas, NV

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**Background:** During Nevada's 81<sup>st</sup> legislative session, Senate Bill 183 proposed to increase the speed limit for motor vehicles operating in lanes designated for high-occupancy vehicles (HOV) to no more than 5 MPH over the speed limit posted for the highway. Nevada statewide crash records linked to Nevada trauma registry records provide useful information on pre-injury behaviors and hospital outcomes for motor vehicle occupants (MVO) injured on Nevada highways.

**Methods:** A linked vehicular crash-trauma database was queried for MVOs involved in a crash on 55+MPH highways who presented to a Nevada trauma center (2015-2017). This sample was stratified by posted highway speed (55-65 MPH, 70+MPH). Pre-crash behaviors and post-crash health outcomes were compared between speed groups. Analyses consisted of descriptive statistics, Chi-square, and independent samples *t*-tests (significance  $p<.05$ ).

**Results:** 2,324 MVOs were injured during this period. 70+MPH MVOs were older than 55-65 MPH MVOs (median = 38 vs. 33) and male (57.3% vs. 49.1%). Speeding was a factor in 29.7% of 55-65 MPH MVO crashes, and 38.2% for 70+MPH MVO crashes ( $p<.001$ ). 70+MPH MVOs experienced greater injury severity compared to 55-65 MPH MVOs (mean Injury Severity Score 8.23 vs. 4.29,  $p<.001$ ), higher median hospital charges (\$39,745 vs. \$25,419,  $p<.001$ ), spent more days in hospital (5 vs. 2,  $p<.001$ ), were more frequently sent to nursing/rehabilitation (15.0% vs. 6.4%,  $p<.001$ ), and died (2.7% vs. 1.9%,  $p<.001$ ).

**Conclusions:** Vehicle speed is a major contributing factor to crashes and related injuries. Increased highway speed limits are associated with greater injury and death.

Biostatistics, economics Communication and informatics Epidemiology Public health or related laws, regulations, standards, or guidelines Public health or related public policy Public health or related research

