TRANSPORTATION SAFETY RESEARCH PRIORITIES

Problem Description

Motor vehicle crashes (MVCs) are a leading cause of death in the United States. The economic impact of crash deaths and injuries is substantial, even beyond the immeasurable loss and hardship for families and friends of those killed or injured. Each year, fatal crashes result in billions in medical costs and cost estimates for lives lost. Many occupants who died in crashes were unrestrained, and alcohol-impaired driving is a contributing factor in many crash deaths. Data limitations prevent calculation of the proportion of crash deaths involving drugs, but drug- and polysubstance-impaired driving is of increasing concern. Additionally, children, teens, older adults, and some racial and ethnic groups are at particular risk in both urban and rural settings. For example, older adults are more likely to suffer serious injury or death in a motor vehicle crash than younger adults. Widespread implementation of proven prevention strategies (e.g., mandatory ignition interlock devices for all offenders—including first-time offenders, primary seat belt laws that cover all seating positions, child passenger safety laws that require proper car seat and booster seat use until at least age 9) can reduce motor vehicle crashes, injuries, and fatalities.

CDC's mission is to provide public health leadership to advance proven prevention strategies and support a Safe System approach for motor vehicle crash and injury prevention. The comprehensive Safe System approach addresses the needs of all road users through five elements: safer people, safer roads, safer vehicles, safer speeds, and post-crash care. We carry out this mission of reducing injury and death due to MVCs through surveillance, research, and implementation and evaluation of evidence-based programs and policies. Prevention strategies focus on reducing alcohol-, drug-, and polysubstance-impaired driving; improving proper restraint use; increasing safe transportation for older adults; and preventing crashes and injuries among high risk populations. Research is needed to identify which programs, policies, and strategies are effective with various populations, and which risk and protective factors can account for variations in injuries and deaths across states, Tribes, localities, and territories (STLTs).

CDC
U.S. CENTERS FOR DISEASE CONTROL AND PREVENTION

Research Gaps and Priorities

Understand **differences in and prevention strategies for impaired driving** (i.e., alcohol-, drug-, and polysubstance-impaired) especially among populations highly affected by impaired driving.

Impaired driving is a major risk factor for motor vehicle crashes and fatalities. These proportion of fatalities are higher for some people, with the highest death rates among American Indian and Alaska Native persons and persons in rural areas. Recent trends are concerning, with rates of alcohol-impaired driving fatalities stabilizing rather than declining and drug-involved and drug-impaired driving (which can involve marijuana, other illicit drugs, prescription, and over-the-counter medications) potentially increasing. Each year, millions U.S. residents aged ≥16 years reported driving under the influence of alcohol, driving under the influence of marijuana, and driving under the influence of illicit drugs other than marijuana.

Research questions under this priority include:

- What risk and protective factors contribute to some people and communities having high rates of driving while impaired and impaired driving fatalities?
- What are the population- and setting-specific barriers and facilitators to not driving while impaired, including among those most affected by crash deaths involving impaired drivers, such as American Indian and Alaska Native persons?
- In what ways do different substances (e.g., cannabis, opioids) alone or in combination (i.e., polysubstance use) impact driving behaviors and motor vehicle crashes, injuries, and deaths?
- What strategies are effective for the prevention of alcohol-, drug-, and polysubstance-impaired driving in the current landscape and what is their health impact? Does their effectiveness and acceptability vary across demographic groups and settings, including among those most affected by crash deaths involving impaired drivers, such as American Indian and Alaska Native persons?

Examine **key factors and effective strategies** for increasing consistent and proper **restraint use**.

Motor vehicle crashes are a leading cause of death nationwide, with many occupants who die in crashes being unrestrained. Seat belt and child restraint use are the most effective ways to save lives and reduce injuries in crashes—yet millions of adults and children still do not use restraints on every trip, or they do not use them properly. Restraint use varies significantly by age, race/ethnicity, geographic location, and other factors. As age increases among children and youth, restraint use decreases. Compared with other age groups, teens and young adults often have the lowest seat belt use rates. Increasing restraint use will reduce motor vehicle injuries and deaths.

In addition, there are racial/ethnic and geographical differences in motor vehicle crash injuries and deaths. For instance, a larger proportion of total deaths among American Indian and Alaska Native and Hispanic populations are attributed to

crashes as compared with other racial/ethnic groups. The rate of motor vehicle traffic deaths on rural roads is twice that of urban roads. Therefore, research to identify effective strategies for increasing restraint use, especially among populations at increased risk, is needed.

Research questions under this priority include:

- How do those who never, sometimes, and always use seat belts differ by characteristics such as age, sex, race/ethnicity, geographic location, seating position, and reasons for using seat belts?
- What are barriers and facilitators to consistent restraint use among populations at high risk of inconsistent restraint use (e.g., teens/young adults, people living in rural areas, American Indian and Alaska Native and Hispanic populations)?
- What unique risk and protective factors, as well as the population- and setting-specific barriers and facilitators (e.g., child restraint laws), contribute to variability in premature graduation (e.g., prematurely moving from a booster seat to a seat belt) of child passengers, and how do these factors differ among populations at high risk?

Identify risk and protective factors and effective strategies for reducing transportation-related injuries **among older adults while preserving their mobility** and increasing safe transportation.

In the past decade, the number of Americans aged 65+ increased substantially. In comparison, the population in the United States younger than 65 had modest growth. Mobility is the ability to get where one wants to go, when one wants to go, and how one wants to get there. Mobility is important for quality of life, access to healthcare and other services and goods, social connectedness, and maintaining independence. Prevention of crashes and falls are both important for maintaining mobility as people age. The public health burden of these injuries is substantial: crashes and falls are leading causes of unintentional injury death for adults aged 65 years and older. For adults, including older people, the primary means of transportation in the United States is by driving passenger vehicles. Most older adults (aged 65+ years) have a driver's license. Motor vehicle crashes are of particular concern for older adults as they are more likely to be injured or die when a crash occurs. However, driving cessation is associated with adverse health and quality of life outcomes including depression, poor health status, cognitive decline, social isolation, high risk of entry into long-term care facilities, and high risk of mortality from any cause. These adverse health outcomes point to a critical need to identify alternatives to driving that can help older adults maintain their mobility and achieve greater access to (safe) transportation. Given the public health burden of both crashes and falls among older adults, understanding shared risk and protective factors for falls and crashes could help identify effective strategies to reduce these injuries.

Research questions under this priority include:

- What are the risk and protective factors for MVC injury among older adults, and how do these differ by factors including but not limited to race/ethnicity, health conditions, and road user type?
- What risk and protective factors contribute to differences in health outcomes in access to transportation among older adults, and how do these differ between older adults and community settings at high risk for MVC injuries?
- Among older adults, what are the shared, modifiable risk and protective factors for MVC and fall injuries and how do these vary and contribute to differences in health outcomes by age, sex, race/ethnicity, or community setting? How can these shared factors be used to develop evidence-based prevention activities that improve health for those at high risk for both MVC and fall injuries?

- To what extent are healthcare providers aware of and willing to recommend strategies (e.g., medication safety) that promote older driver safety?

Better understand **risk factors for new, emerging, or evolving trends** in transportation safety including prevention of pedestrian injuries and deaths.

In the past decade, deaths have increased among some types of road users, particularly pedestrian-related deaths. Many crashes that resulted in a pedestrian death involved alcohol. People aged 65 years and older and children under the age of 15 years are at higher risk for pedestrian deaths relative to other age groups. With the increasing numbers, pedestrian deaths now account for a greater proportion of all traffic deaths.

CDC supports the Safe System approach to address transportation safety, including pedestrian safety. Proven strategies known to reduce pedestrian deaths and injuries (e.g., reducing vehicle speeds) often require engineering measures and creating and enforcing traffic safety. There is a need for evidence-based research to drive the effects of engineering and pedestrian enforcement programs on the safety, mobility, health, and well-being of various populations. It is also important to monitor trends in transportation safety among populations at high risk and identify different types of road users at increased risk.

Research questions under this priority include:

- What risk and protective factors explain MVC-related pedestrian injury rates?[1]
- To what extent is the implementation of traffic safety policies and roadway design countermeasures (e.g., crosswalks, roundabouts, variable speed limits, etc.) consistent with a Safe System approach and result in positive or negative impacts across populations?
- What are the barriers to the implementation of traffic safety policies and roadway design countermeasures consistent with a Safe System, and do these barriers vary based on societal and community factors?
- How do societal and community factors impact pedestrian death rates and how do these factors relate to pedestrian-related health outcomes?

[1]Involves working with partners, including the National Highway Traffic Safety Administration (NHTSA), to link crash data and injury health data.

CDC's National Center for Injury Prevention and Control (the Injury Center) advances research to prevent injuries and violence and reduce their consequences. Research includes identification of factors that increase or decrease risk and rigorous evaluation of innovative prevention strategies. The Injury Center translates science into effective policies and programs and guides how to adapt evidence-based strategies to community needs to increase widespread use. The research priorities strategically focus on research gaps that the Injury Center can address to strengthen public health action and impact. The Injury Center research priorities are updated as research and public health needs evolve.

Suggested citation: National Center for Injury Prevention and Control. Drowning Prevention Research Priorities. Atlanta, GA: US Department of Health and Human Services, Centers for Disease Control and Prevention; 2025. Available at **https://www.cdc.gov/injury-violence-prevention/programs/research-priorities.html**