

Rural Transportation: What Role Does Safety Play?



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Why CDC?

CDC known for its ground-breaking work on epidemics like smallpox, Ebola virus, pandemic flu, and Zika.

Norman Y. Mineta

An Epidemic on Wheels

A few years ago, I led a U.S. delegation to Bangkok for a high-level meeting on aviation safety. At the end of the meeting, the Thai transportation minister brought up an issue that had not been on our agenda.

"What I really need to talk with you about is road safety," he said. "This is such a huge problem for us."

Last year, 965 people lost their lives in air crashes around the world. But more than 3,000 people will die on the world's highways *today*. More than 1.2 million people die each year from road traffic injuries, a toll comparable to the number of people killed by malaria or tuberculosis. For every death there are at least 20 serious injuries. This is an epidemic in progress.

to climb through the middle of the century. It took the United States about 40 years to reverse a trend of increasing traffic deaths. It took time for us to build safer roads and require safer cars, and for safer behavior to evolve on the part of drivers and other road users. We are still losing 43,000 lives in the United States every year, but we have learned many painful lessons.

The best-performing nations in terms of highway safety, such as Sweden, the Netherlands and Australia, are adopting a "safe systems" approach that is similar to the philosophy governing aviation safety. These nations are showing that road deaths are preventable through sustained political commitment to the

Ten Great Public Health Achievements— US, 1900-2000

- Vaccination
- Safer Workplaces
- Control of Infectious Diseases
- Declines in H D and stroke
- Safer and healthier foods
- Healthier mothers and babies
- Advances in Family planning
- Floridation of Drinking water
- Tobacco Hazard Awareness
- Motor Vehicle Safety

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WEEKLY REPORT

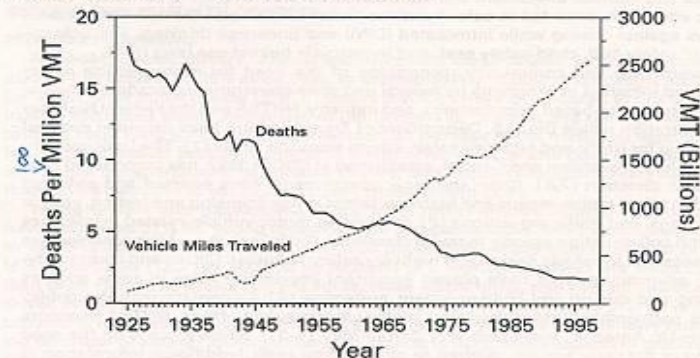
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Achievements in Public Health, 1900–1999

Motor-Vehicle Safety: A 20th Century Public Health Achievement

The reduction of the rate of death attributable to motor-vehicle crashes in the United States represents the successful public health response to a great technologic advance of the 20th century—the motorization of America. Six times as many people drive today as in 1925, and the number of motor vehicles in the country has increased 11-fold since then to approximately 215 million (1). The number of miles traveled in motor vehicles is 10 times higher than in the mid-1920s. Despite this steep increase in motor-vehicle travel, the annual death rate has declined from 18 per 100 million vehicle miles traveled (VMT) in 1925 to 1.7 per 100 million VMT in 1997—a 90% decrease (Figure 1) (1).

FIGURE 1. Motor-vehicle-related deaths per million vehicle miles traveled (VMT) and annual VMT, by year — United States, 1925–1997



U.S. DEPARTMENT OF HEALTH & HUMAN SERVICES

10 Leading Causes of Death by Age Group, United States – 2014

Rank	Age Groups										Total
	<1	1-4	5-9	10-14	15-24	25-34	35-44	45-54	55-64	65+	
1	Congenital Anomalies 4,746	Unintentional Injury 1,216	Unintentional Injury 730	Unintentional Injury 750	Unintentional Injury 11,836	Unintentional Injury 17,357	Unintentional Injury 16,048	Malignant Neoplasms 44,834	Malignant Neoplasms 115,282	Heart Disease 489,722	Heart Disease 614,348
2	Short Gestation 4,173	Congenital Anomalies 399	Malignant Neoplasms 436	Suicide 425	Suicide 5,079	Suicide 6,569	Malignant Neoplasms 11,267	Heart Disease 34,791	Heart Disease 74,473	Malignant Neoplasms 413,885	Malignant Neoplasms 591,699
3	Maternal Pregnancy Comp. 1,574	Homicide 364	Congenital Anomalies 192	Malignant Neoplasms 416	Homicide 4,144	Homicide 4,159	Heart Disease 10,368	Unintentional Injury 20,610	Unintentional Injury 18,030	Chronic Low. Respiratory Disease 124,693	Chronic Low. Respiratory Disease 147,101
4	SIDS 1,545	Malignant Neoplasms 321	Homicide 123	Congenital Anomalies 156	Malignant Neoplasms 1,569	Malignant Neoplasms 3,624	Suicide 6,706	Suicide 8,767	Chronic Low. Respiratory Disease 16,492	Cerebro-vascular 113,308	Unintentional Injury 136,053
5	Unintentional Injury 1,161	Heart Disease 149	Heart Disease 69	Homicide 156	Heart Disease 953	Heart Disease 3,341	Homicide 2,588	Liver Disease 8,627	Diabetes Mellitus 13,342	Alzheimer's Disease 92,604	Cerebro-vascular 133,103
6	Placenta Cord. Membranes 965	Influenza & Pneumonia 109	Chronic Low. Respiratory Disease 68	Heart Disease 122	Congenital Anomalies 377	Liver Disease 725	Liver Disease 2,582	Diabetes Mellitus 6,062	Liver Disease 12,792	Diabetes Mellitus 54,161	Alzheimer's Disease 93,541
7	Bacterial Sepsis 544	Chronic Low Respiratory Disease 53	Influenza & Pneumonia 57	Chronic Low Respiratory Disease 71	Influenza & Pneumonia 199	Diabetes Mellitus 709	Diabetes Mellitus 1,999	Cerebro-vascular 5,349	Cerebro-vascular 11,727	Unintentional Injury 48,295	Diabetes Mellitus 76,488
8	Respiratory Distress 460	Septicemia 53	Cerebro-vascular 45	Cerebro-vascular 43	Diabetes Mellitus 181	HIV 583	Cerebro-vascular 1,745	Chronic Low. Respiratory Disease 4,402	Suicide 7,527	Influenza & Pneumonia 44,836	Influenza & Pneumonia 55,227
9	Circulatory System Disease 444	Benign Neoplasms 38	Benign Neoplasms 36	Influenza & Pneumonia 41	Chronic Low Respiratory Disease 178	Cerebro-vascular 579	HIV 1,174	Influenza & Pneumonia 2,731	Septicemia 5,709	Nephritis 39,957	Nephritis 48,146
10	Neonatal Hemorrhage 441	Perinatal Period 38	Septicemia 33	Benign Neoplasms 38	Cerebro-vascular 177	Influenza & Pneumonia 549	Influenza & Pneumonia 1,125	Septicemia 2,514	Influenza & Pneumonia 5,390	Septicemia 29,124	Suicide 42,773

Data Source: National Vital Statistics System, National Center for Health Statistics, CDC.
Produced by: National Center for Injury Prevention and Control, CDC using WISQARS™.



Centers for Disease Control and Prevention
National Center for Injury Prevention and Control

Intersection of Transport and Public Health

Transport

- Roads
- Vehicles
- Licensing
- Enforcement
- Mobility/Safety
- Industry/economy



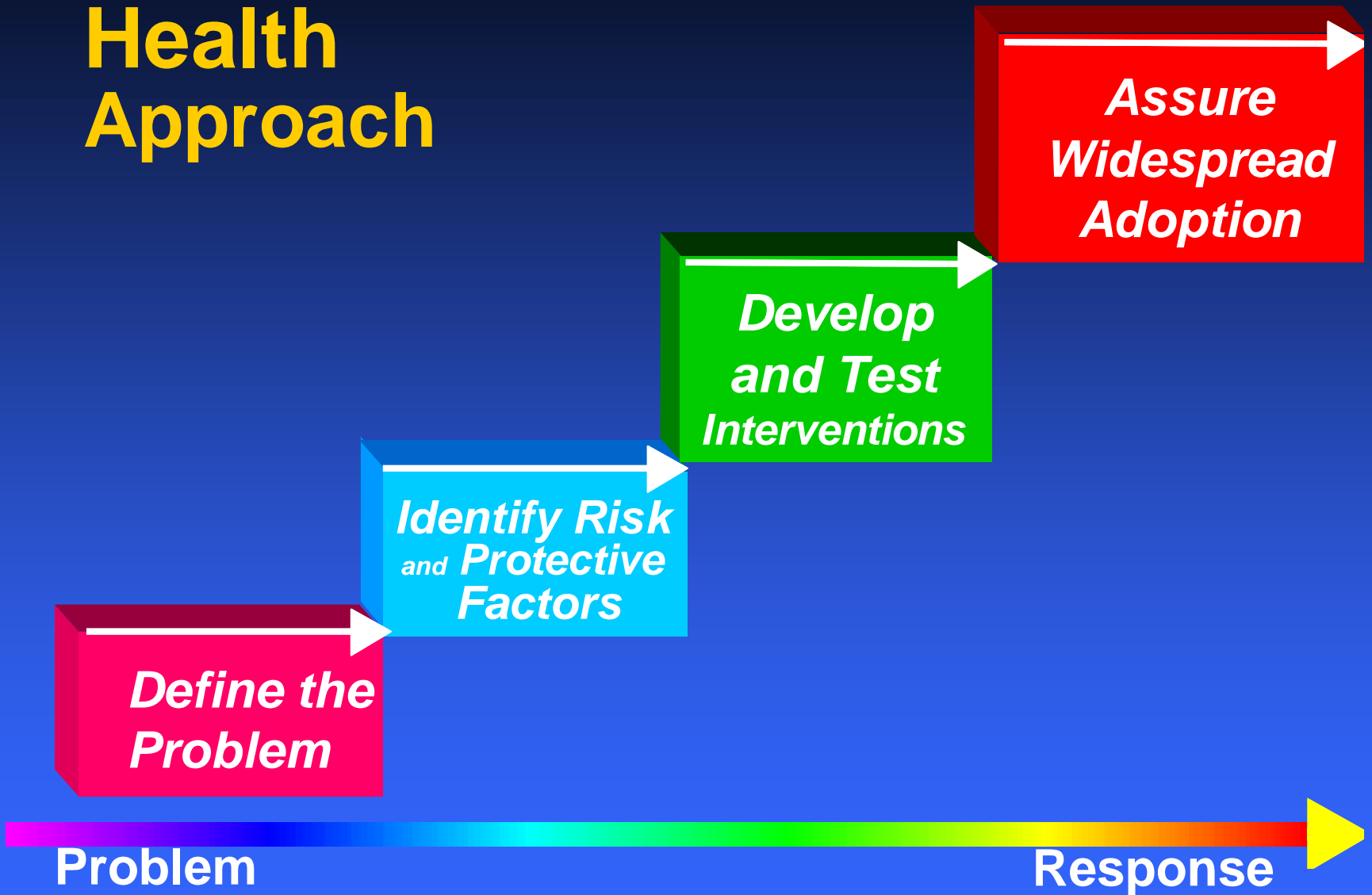
Public Health

- Population health
- Illness/injury
- Health care
- Prevention
- EMS services
- Rehabilitation

Public Health Role in Road Traffic Injury Prevention

- Epidemiology
Monitor road deaths & injuries
- Education & Training
Inform Health & Transport Agencies
- Prevention
Identify & implement “best practices”
- Acute Care
Improve EMS and trauma care

Public Health Approach



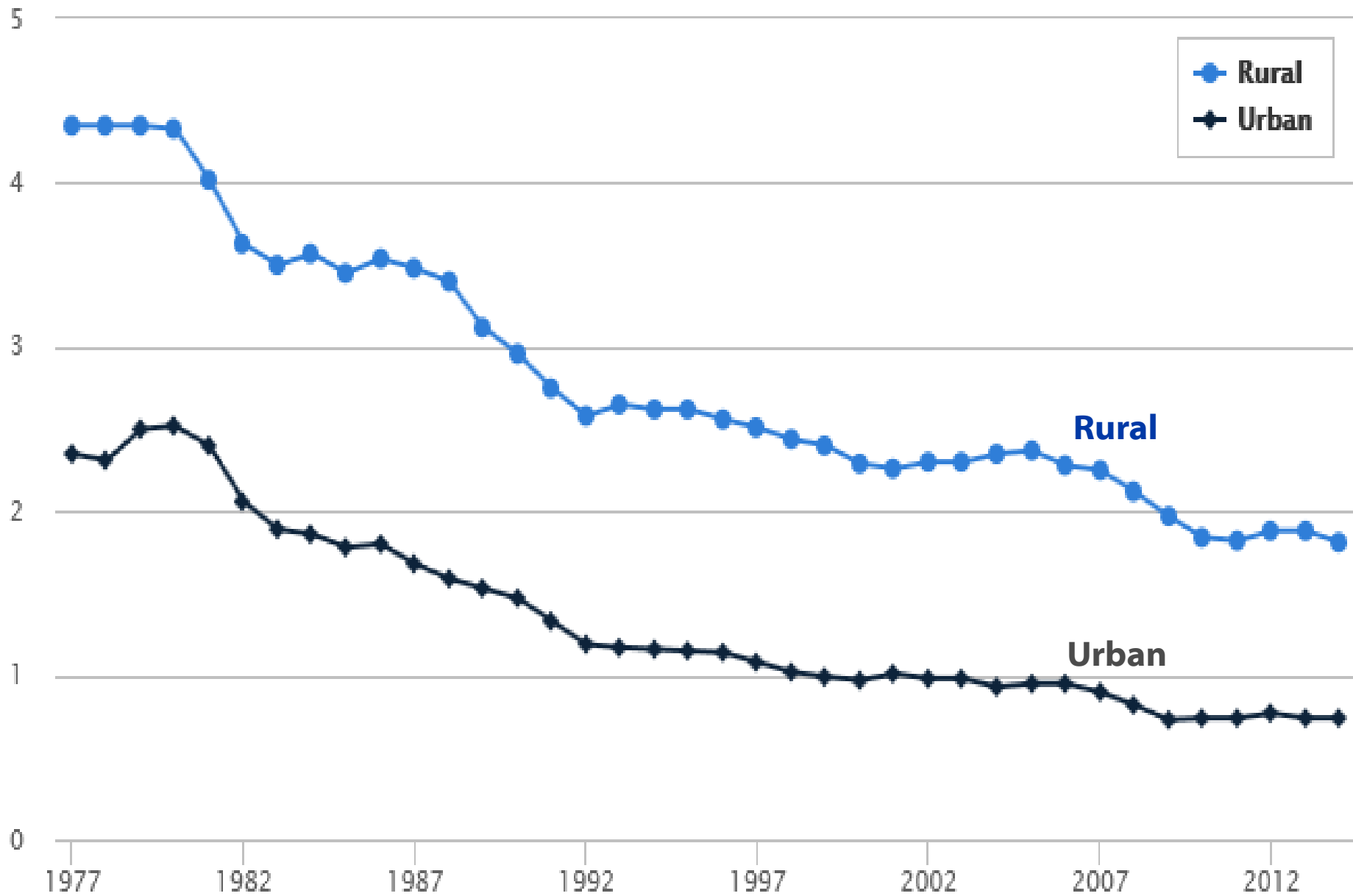
1. Define the problem

Epidemiology

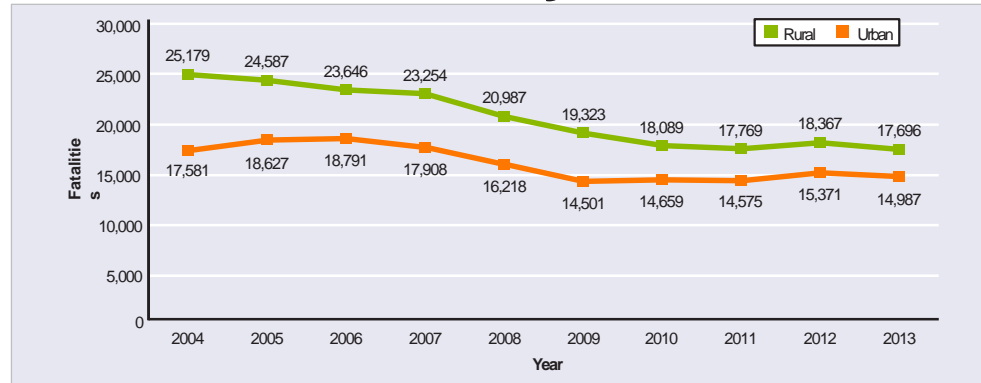
- 19% live in rural areas, yet...
 - 30% of miles traveled & 55% of crash deaths occur there
- Death rate 2.5 times higher in rural vs. urban areas
- 40% of rural fatalities are in rollover crashes
- EMS response times are 50% longer in rural areas
- 16% of crash deaths in rural areas occur at intersections vs. 31% in urban areas
- Safety belt use among front seat occupants; 83% in rural areas, 86% in urban areas

- Source: IIHS, 2014; NHTSA, 2014

Motor vehicle crash deaths per 100 million miles traveled by land use, 1977-2014



Motor Vehicle Traffic Fatalities, by Year and Area, 2004–2013



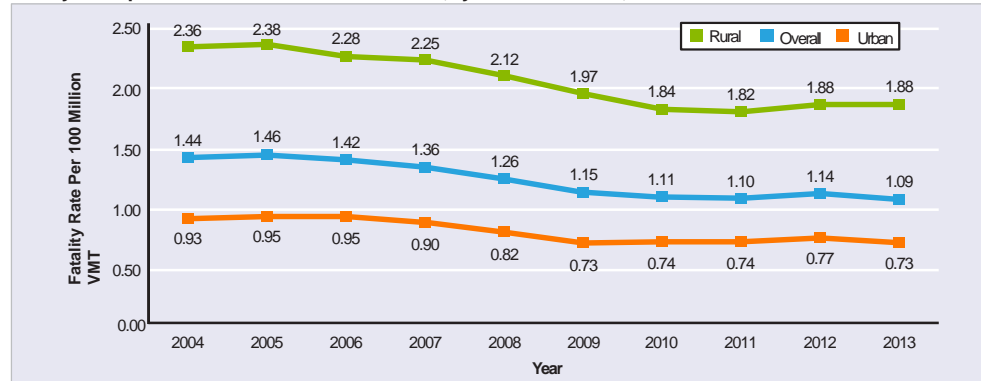
Source: Fatality Analysis Reporting System (FARS) 2004-2012 Final File, 2013 Annual Report File (ARF)

Figure 2 presents the fatality rates per 100 million vehicle miles traveled (VMT) by location (rural, urban, and overall) in the most recent 10-year period for which data is available:

- The fatality rate in rural areas decreased 20 percent from 2.36 in 2004 to 1.88 in 2013.

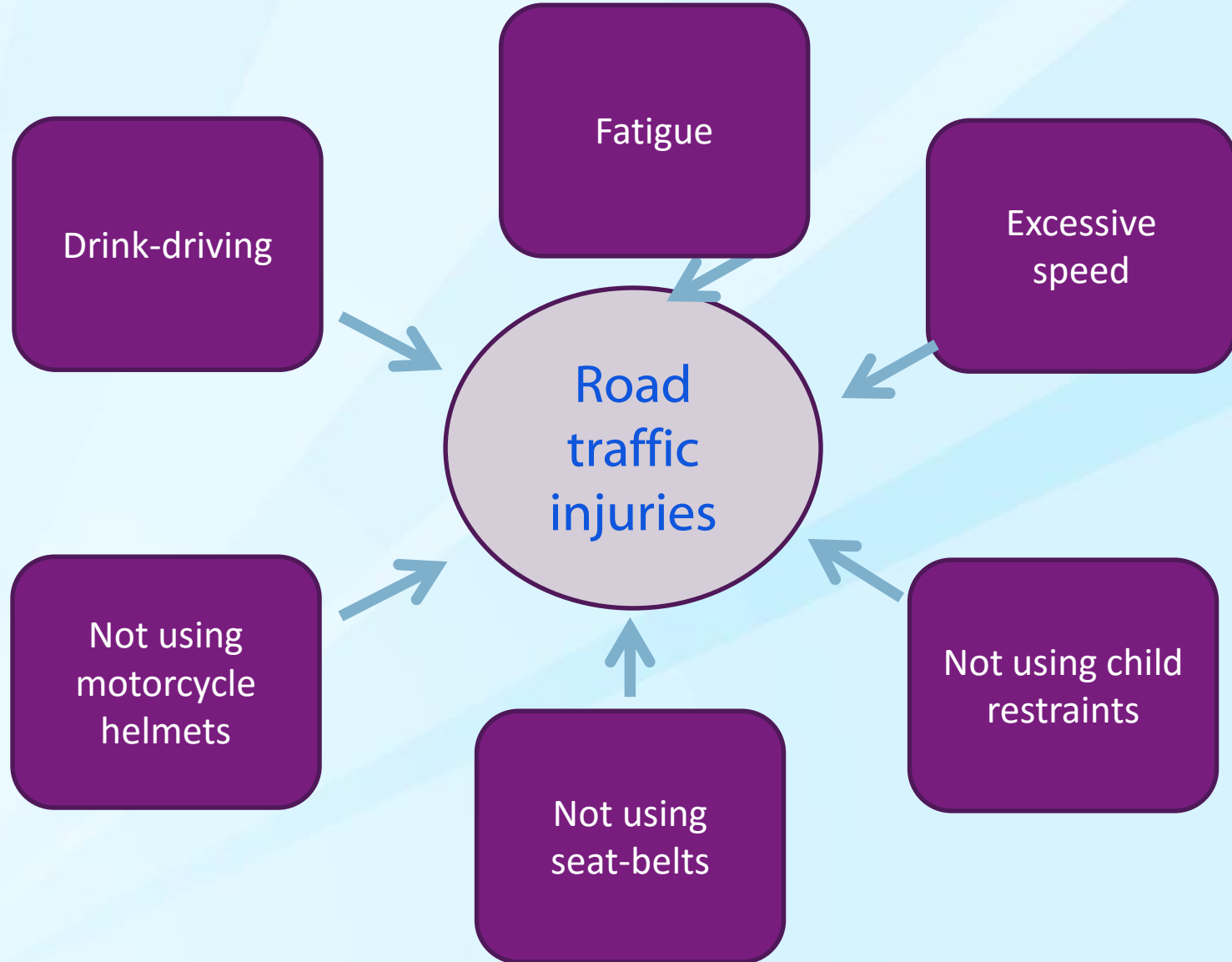
- The fatality rate in urban areas decreased 22 percent from 0.93 in 2004 to 0.73 in 2013.
- In 2013, the fatality rate was 2.6 times higher in rural areas than in urban areas (1.88 and 0.73, respectively).

Figure 2
Fatality Rates per 100 Million Vehicle Miles Traveled, by Year and Location, 2004–2013

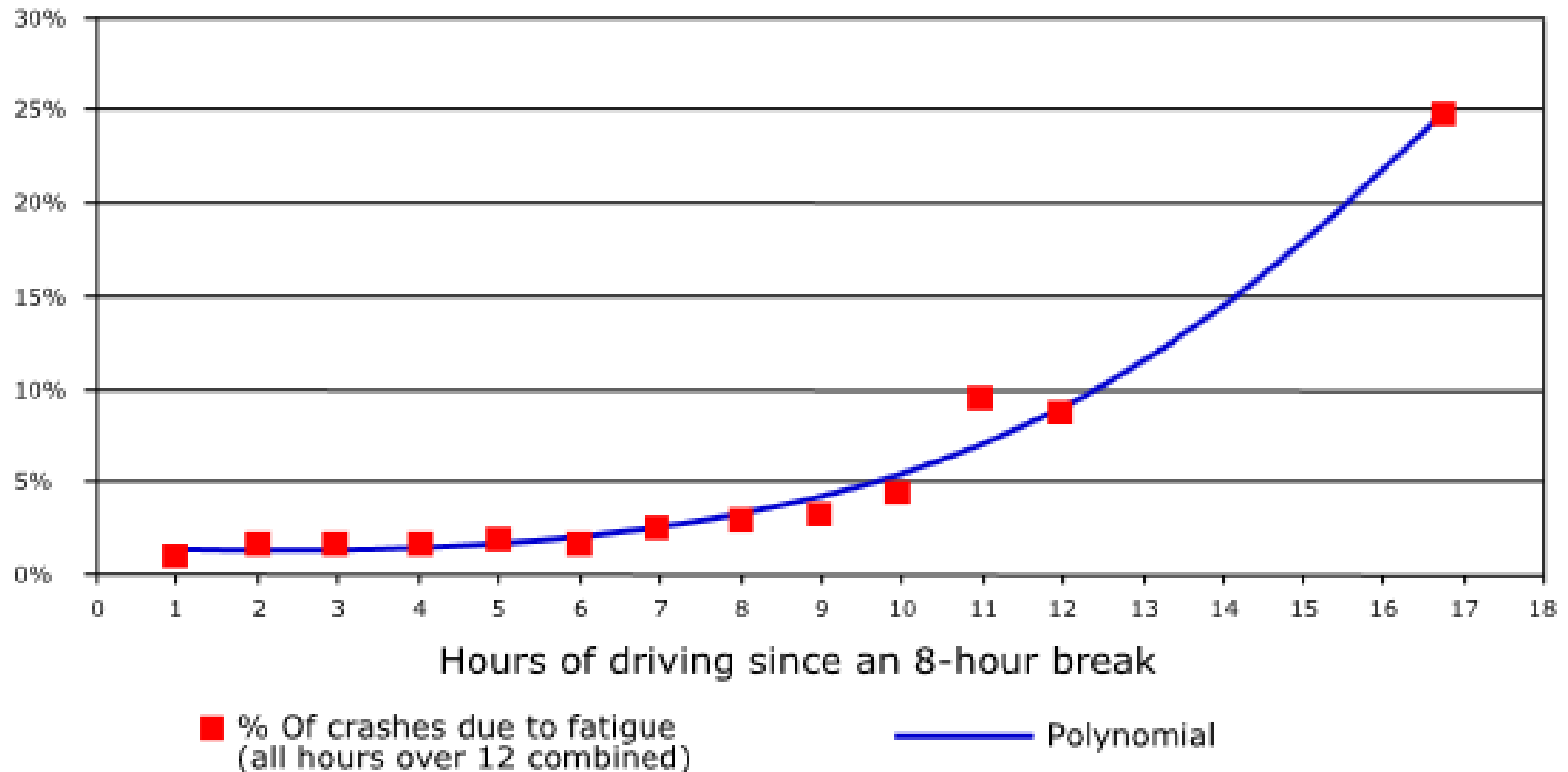


Sources: FARS 2004-2012 Final File, 2013 ARF; VMT – Federal Highway Administration

2. Identify Risk & Protective Factors



Percentages of crashes due to fatigue as a function of hours of driving



SOURCE: FHWA & NIOSH

3. Develop & Test Interventions

- **Increasing Seat Belt Use**
- **Reducing Alcohol-impaired driving**
- **Reducing Vehicle Speed**
- **Improving Pedestrian environments**
- **Wearing Bicycle and Motorcycle Helmets**
- **Improving Licensing**
- **Increasing Enforcement**
- **Building safer roads**



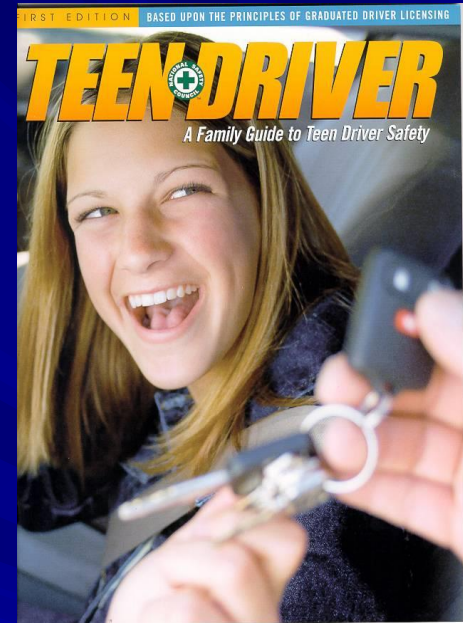
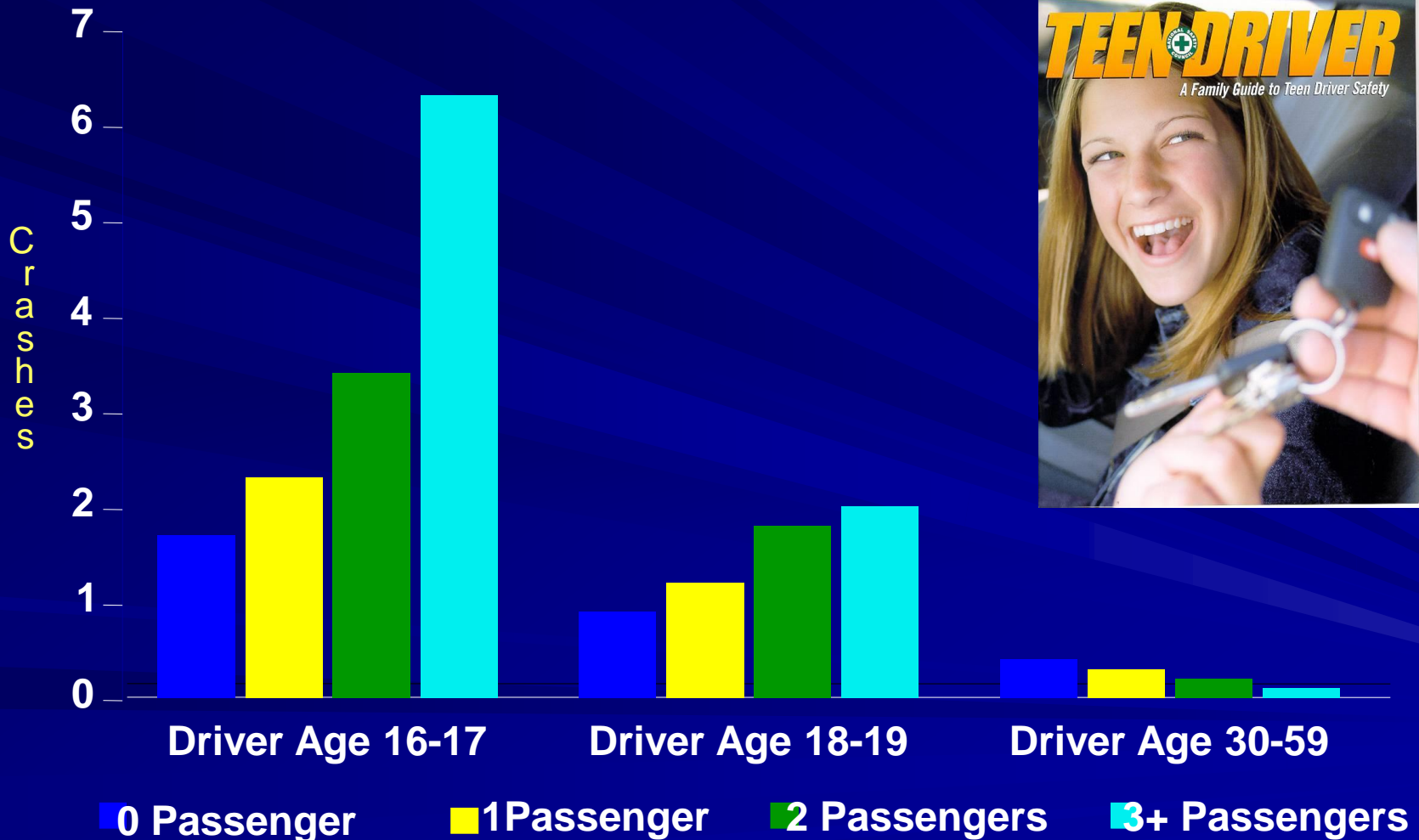
CDC Research Findings

- .08 BAC law saves 400-600 lives
- Motorcyclists have highest death rate per vehicle mile traveled
- Bike helmets reduce head injury by 85%
- 123 million episodes of drunk driving each year...but only 1.4 million arrests
- 1/3 of adult pedestrians killed have been drinking
- Driver education increases teen fatalities

Rural Prevention Strategies

- Rumble strips reduce run-off-road crashes by 40%
- Roundabouts may reduce intersection crashes by 75%
- Alcohol Checkpoints reduce fatalities by 9-20%
- Ignition interlocks reduce re-arrests by 40%
- Primary SB laws reduce fatal injuries by 8%
- Motorcycle Helmets cut fatals 40%; injuries 70%
- Child Safety Seat Laws reduce fatalities by 35%
- Graduated Driver Licensing (35% fatal reduction)

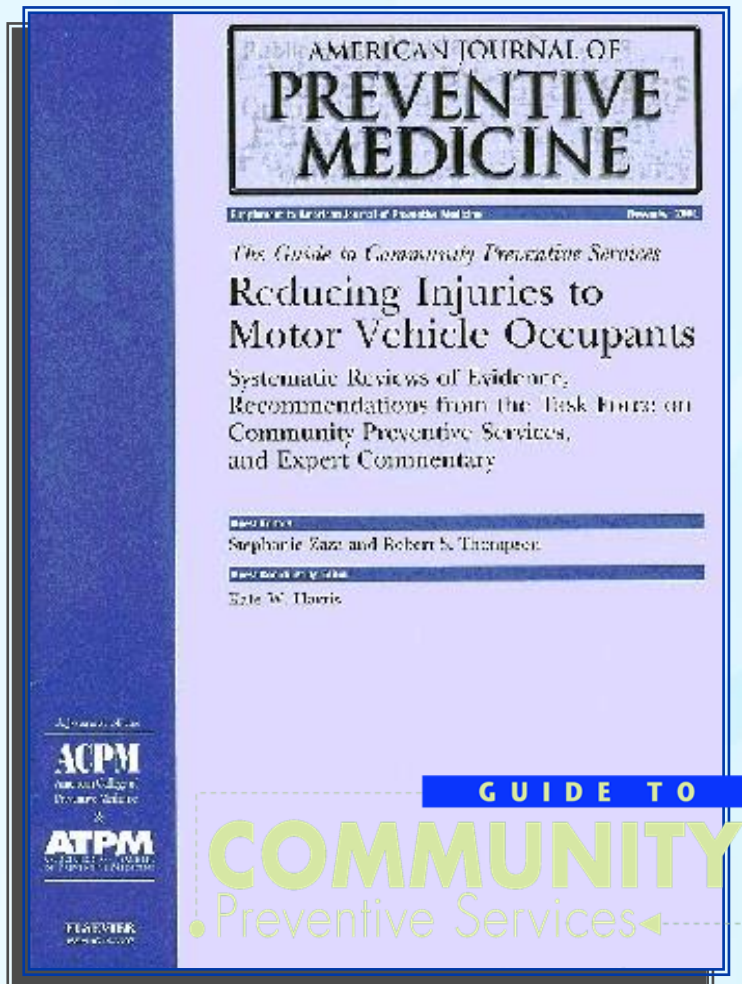
16 Year old drivers with passengers and Crashes (per 10,000 trips)



4. Disseminate for Widespread Adoption

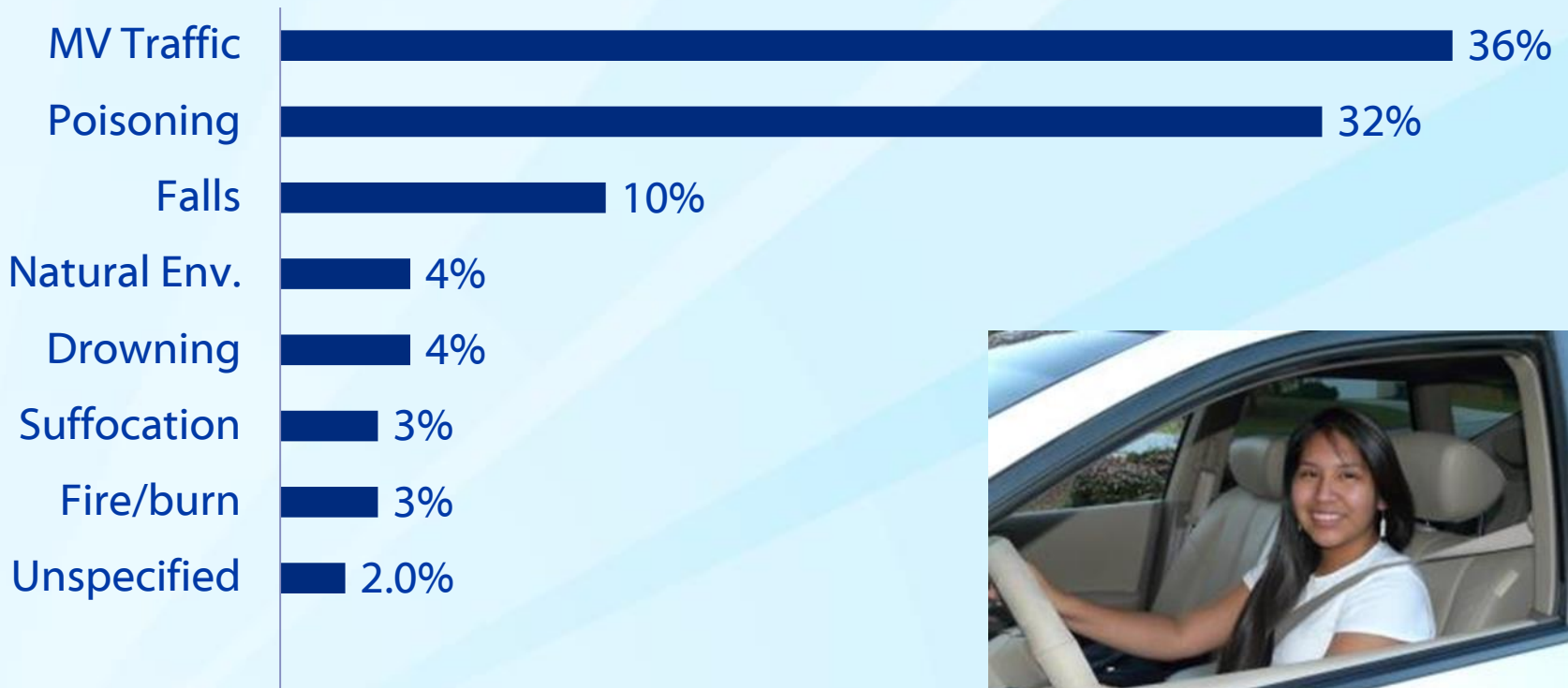
CDC Systematic reviews of evidence

- Reducing alcohol impaired driving
- Increasing Safety Belt Use
- Increasing Child Safety Seat Use

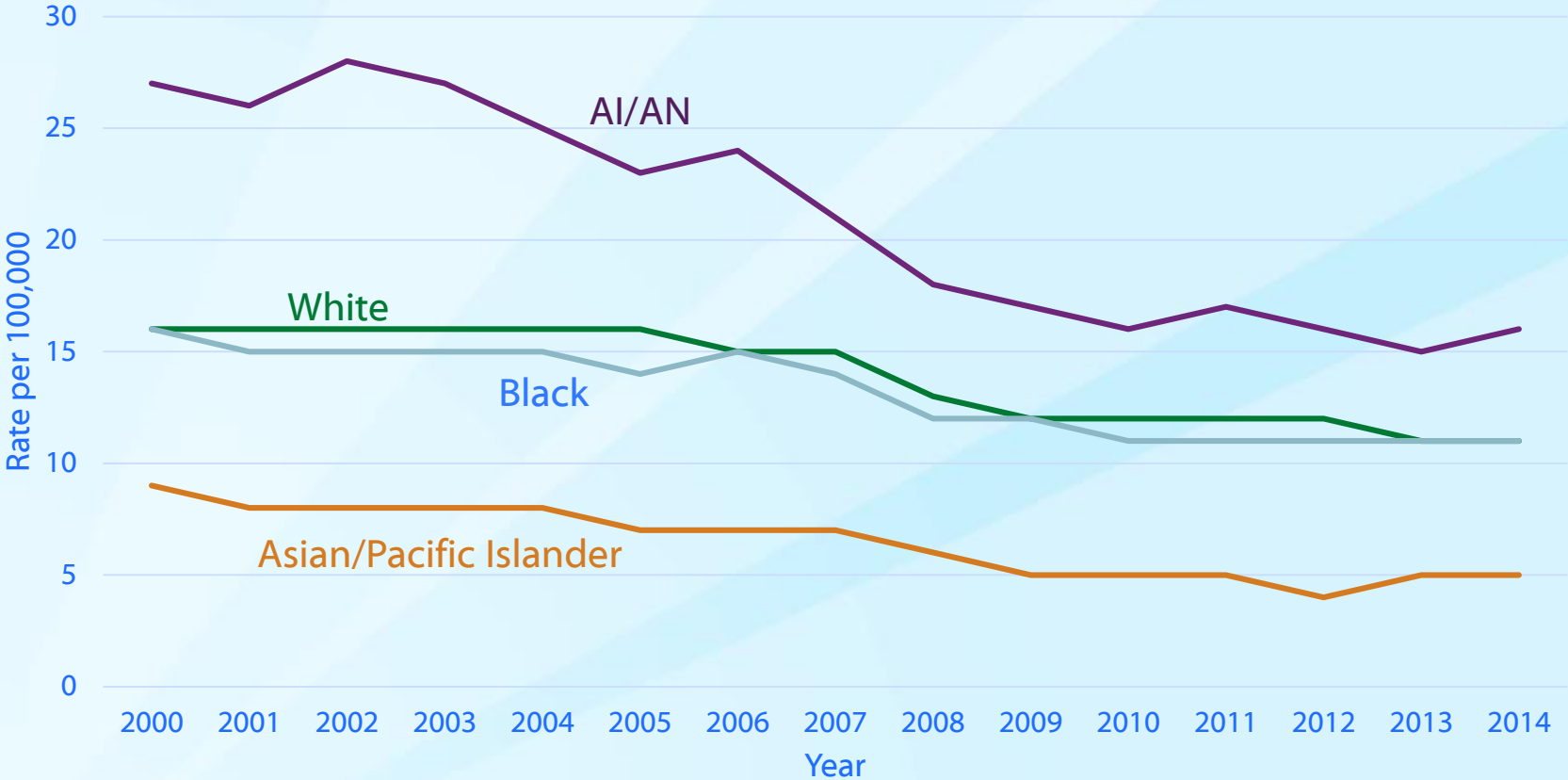


2010–2014 Unintentional Injury Deaths US, AI/AN, all ages, both sexes

N=9,139



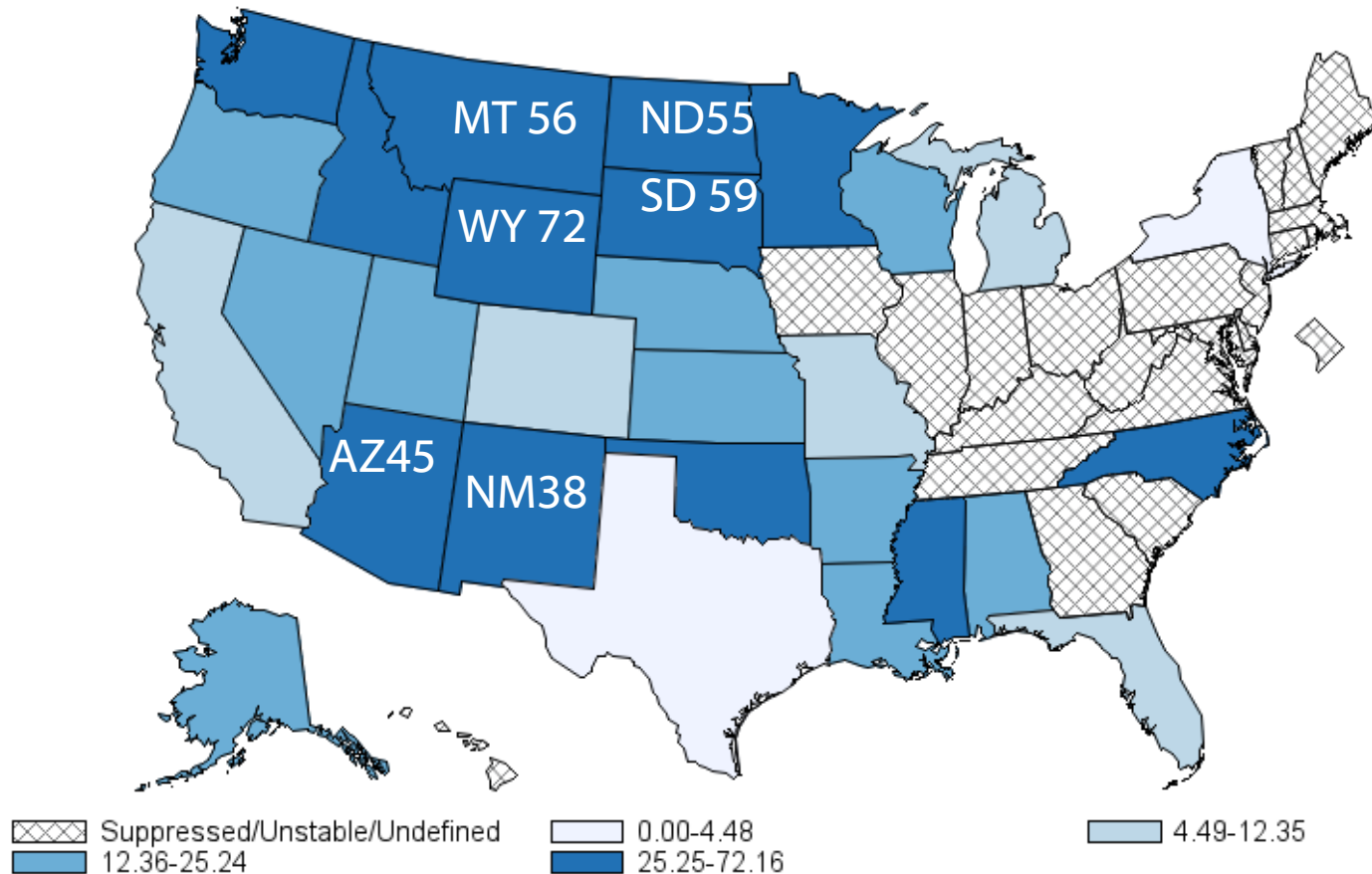
Motor Vehicle Death Rates by Race



Source: CDC WISQARS 2016; www.cdc.gov/ncipc/wisqars

2004-2010, United States Death Rates per 100,000 Population

Motor Vehicle, Overall, Unintentional, American Indian, All Ethnicities, Both Sexes, All Ages
Annualized Crude Rate for United States: 19.72



Reports for All Ages include those of unknown age.

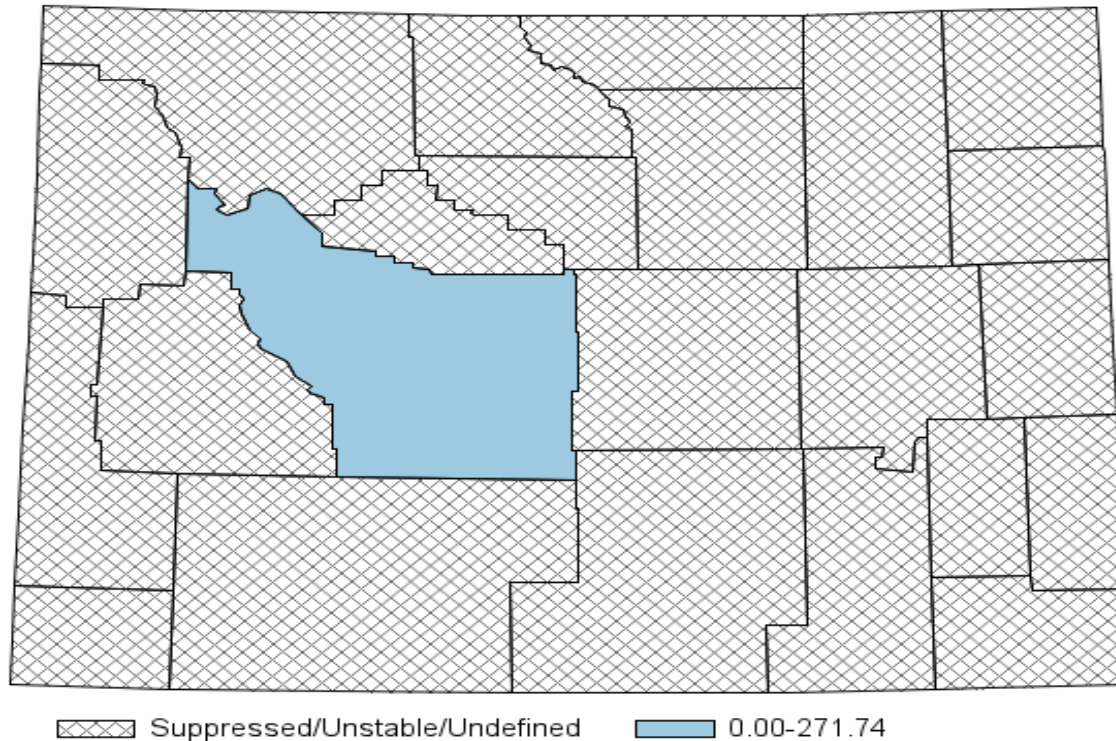
* Rates based on 20 or fewer deaths may be unstable. States with these rates are cross-hatched in the map (see legend above). Such rates have an asterisk

WYOMING

2004-2010, Wyoming

Death Rates per 100,000 Population

Motor Vehicle, Overall, Unintentional, American Indian, All Ethnicities, Both Sexes, All Ages
Annualized Crude Rate for Wyoming: 72.16



Reports for All Ages include those of unknown age.

* Rates based on 20 or fewer deaths may be unstable. These rates are suppressed for counties (see legend above); such rates in the title have an asterisk.

Source: CDC WISQARS interactive data mapping

<https://wisqars.cdc.gov:8443/cdcMapFramework/mapModuleInterface.jsp>

Produced by: the Statistics, Programming & Economics Branch, National Center for Injury Prevention & Control, CDC
Data Sources: NCHS National Vital Statistics System for numbers of deaths; US Census Bureau for population estimates.

CDC Tribal Motor Vehicle Injury Prevention Program

- ❑ **Purpose: Implement tailored evidence-based strategies**
 - Reduce alcohol impaired driving, increase child safety seat use, and increase safety belt use

- ❑ **2010-2014, eight tribes funded**
 - Results – increased restraint use and decreased injuries and fatalities

- ❑ **CDC Tribal Road Safety web page**
(<https://www.cdc.gov/motorvehiclesafety/native/>)



CDC Partnership with Federal Highway Administration (FHWA)

- **Tribal Safety Circuit Rider Program (TTAP)**
 - Provide injury prevention technical assistance to tribes in TTAP centers
 - Partners: Western (139), Southern Plains (44), and Northern Plains (24) TTAP Regions



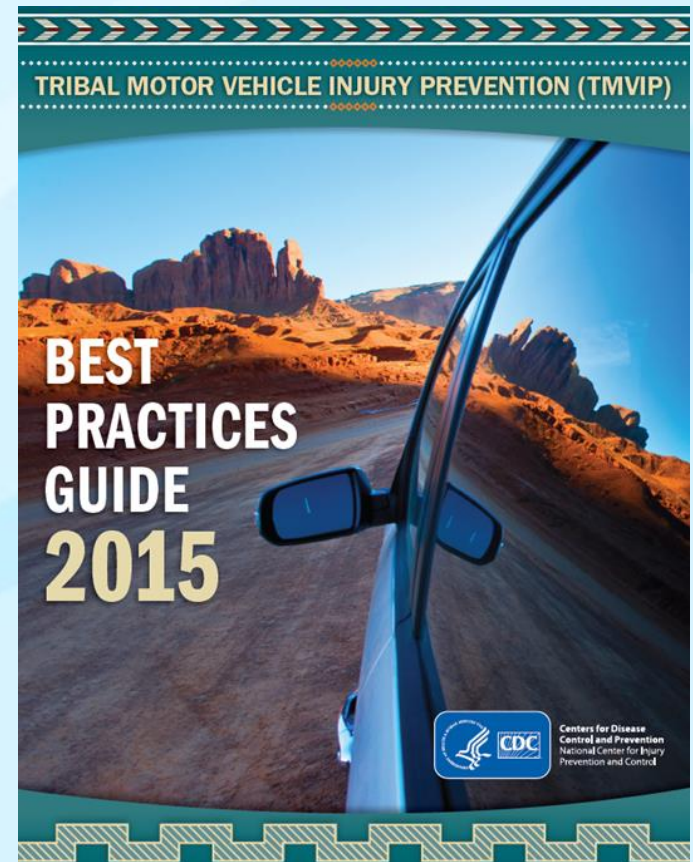
Motor Vehicle Toolkit

- ❑ Find it on CDC's Tribal Road Safety Website
- ❑ Toolkit for Restraint use and DUI prevention
 - Fact sheets
 - Posters
 - Video



Tribal MV Best Practices Guide

- ❑ **Guide for Tribes**
 - Successful MV programs
 - Lessons learned
 - Case examples
- ❑ **Contributors:**
 - CDC Tribal Motor Vehicle Injury Prevention Program
 - IHS Tribal Injury Prevention Cooperative Agreement
 - BIA Indian Highway Safety Program



Public health will be there to help rural road safety ...

- Improve and expand injury surveillance
- Uncover new emerging transportation injuries
- Conduct & support translational research
- Develop & test new interventions
- Evaluate existing prevention efforts
- Balance safety with mobility
- Strengthen partnerships



Toward Zero Deaths™
National Strategy on Highway Safety



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The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

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