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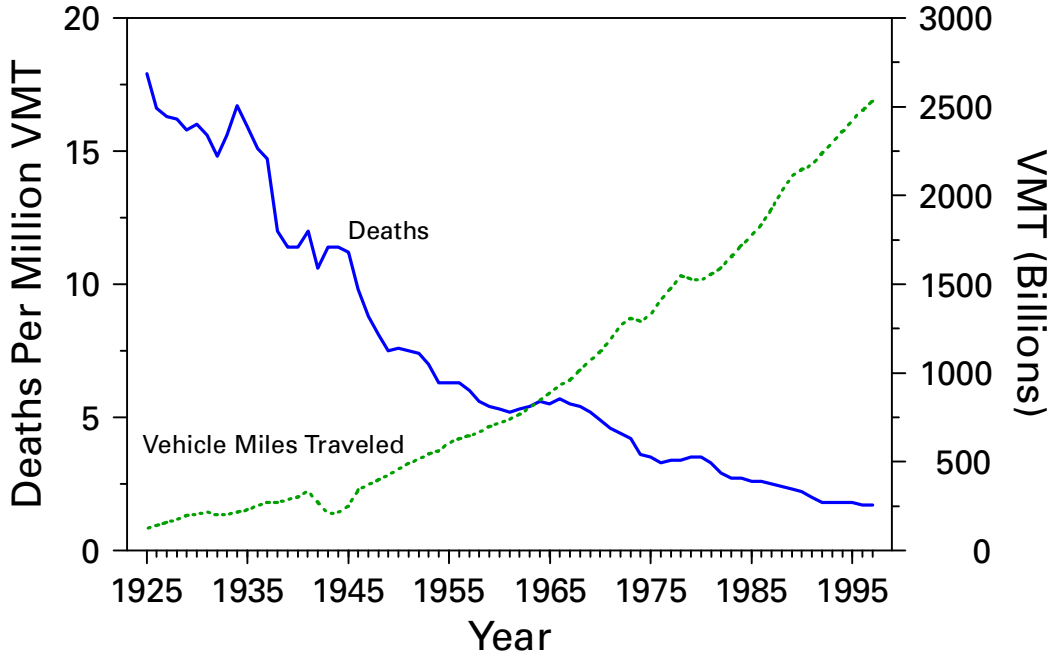
WEEKLY REPORT

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



Motor-Vehicle Safety — Continued

Systematic motor-vehicle safety efforts began during the 1960s. In 1960, unintentional injuries caused 93,803 deaths (*1*); 41% were associated with motor-vehicle crashes. In 1966, after 5 years of continuously increasing motor-vehicle–related fatality rates, the Highway Safety Act created the National Highway Safety Bureau (NHSB), which later became the National Highway Traffic Safety Administration (NHTSA). The systematic approach to motor-vehicle–related injury prevention began with NHSB's first director, Dr. William Haddon (*2*). Haddon, a public health physician, recognized that standard public health methods and epidemiology could be applied to preventing motor-vehicle–related and other injuries. He defined interactions between host (human), agent (motor vehicle), and environmental (highway) factors before, during, and after crashes resulting in injuries. Tackling problems identified with each factor during each phase of the crash, NHSB initiated a campaign to prevent motor-vehicle–related injuries.

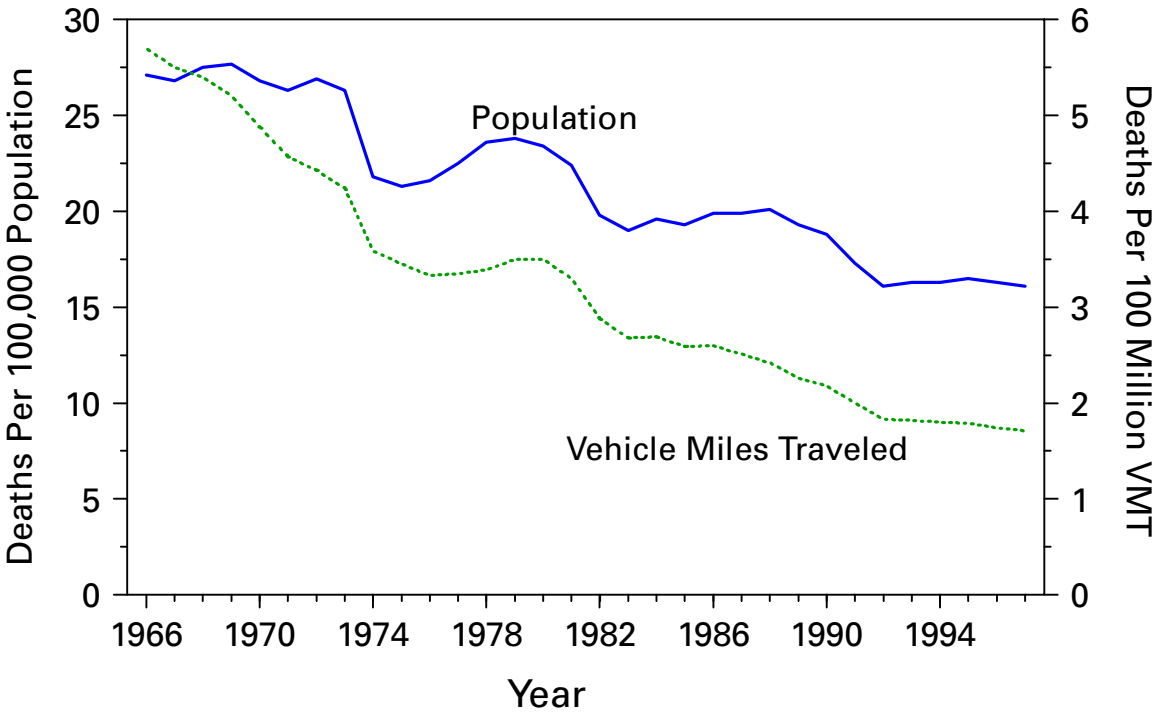
In 1966, passage of the Highway Safety Act and the National Traffic and Motor Vehicle Safety Act authorized the federal government to set and regulate standards for motor vehicles and highways, a mechanism necessary for effective prevention (*2,3*). Many changes in both vehicle and highway design followed this mandate. Vehicles (agent of injury) were built with new safety features, including head rests, energy-absorbing steering wheels, shatter-resistant windshields, and safety belts (*3,4*). Roads (environment) were improved by better delineation of curves (edge and center line stripes and reflectors), use of breakaway sign and utility poles, improved illumination, addition of barriers separating oncoming traffic lanes, and guardrails (*4,5*). The results were rapid. By 1970, motor-vehicle–related death rates were decreasing by both the public health measure (deaths per 100,000 population) and the traffic safety indicator (deaths per VMT) (Figure 2) (*1*).

Changes in driver and passenger (host) behavior also have reduced motor-vehicle crashes and injuries. Enactment and enforcement of traffic safety laws, reinforced by public education, have led to safer behavior choices. Examples include enforcement of laws against driving while intoxicated (DWI) and underage drinking, and enforcement of safety-belt, child-safety seat, and motorcycle helmet use laws (*5,6*).

Government and community recognition of the need for motor-vehicle safety prompted initiation of programs by federal and state governments, academic institutions, community-based organizations, and industry. NHTSA and the Federal Highway Administration within the U.S. Department of Transportation have provided national leadership for traffic and highway safety efforts since the 1960s (*2*). The National Center for Injury Prevention and Control, established at CDC in 1992, has contributed public health direction (*7,8*). State and local governments have enacted and enforced laws that affect motor-vehicle and highway safety, driver licensing and testing, vehicle inspections, and traffic regulations (*2*). Preventing motor-vehicle–related injuries has required collaboration among many professional disciplines (e.g., biomechanics has been essential to vehicle design and highway safety features). Citizen and community-based advocacy groups have played important prevention roles in areas such as drinking and driving and child-occupant protection (*6*). Consistent with the public/private partnerships that characterize motor-vehicle safety efforts, NHTSA sponsors "Buckle Up America" week (this year during May 24–31), which focuses on the need to always properly secure children in child-safety seats (additional information is

Motor-Vehicle Safety — Continued

FIGURE 2. Motor-vehicle–related death rates per 100,000 population and per 100 million vehicle miles traveled (VMT), by year — United States, 1966–1997



available by telephone, [202] 366-5399, or on the World-Wide Web at http://www.nhtsa.dot.gov).

SPECIFIC PUBLIC HEALTH CONCERNS

High-Risk Populations

Alcohol-impaired drivers. Annual motor-vehicle crash-related fatalities involving alcohol has decreased 39% since 1982, to approximately 16,000; these deaths account for 38.6% of all traffic deaths (*9,10*). Factors that may have contributed to this decline include increased public awareness of the dangers of drinking and driving; new and tougher state laws; stricter law enforcement; an increase in the minimum legal drinking age; prevention programs that offer alternatives such as safe rides (e.g., taxicabs and public transportation), designated drivers, and responsible alcohol-serving practices; and a decrease in per capita alcohol consumption (*5,6*).

Young drivers and passengers. Since 1975, motor-vehicle–related fatality rates have decreased 27% for young motor-vehicle occupants (ages 16–20 years). However, in 1997 the death rate was 28.3 per 100,000 population—more than twice that of the U.S. population (13.3 per 100,000 population) (*9*). Teenaged drivers are more likely than older drivers to speed, run red lights, make illegal turns, ride with an intoxicated driver, and drive after drinking alcohol or using drugs (*11*). Strategies that have contributed to improved motor-vehicle safety among young drivers include laws restricting purchase of alcohol among underaged youths (*6*) and some aspects of graduated licensing systems (e.g., nighttime driving restrictions) (*12*).

Motor-Vehicle Safety — Continued

Pedestrians. From 1975 to 1997, pedestrian fatality rates decreased 41%, from 4 per 100,000 population in 1975 to 2.3 in 1997 but still account for 13% of motor-vehicle–related deaths (*9*). Factors that may have reduced pedestrian fatalities include more and better sidewalks, pedestrian paths, playgrounds away from streets, one-way traffic flow, and restricted on-street parking (*6*).

Occupant-Protection Systems

Safety belts. In response to legislation, highly visible law enforcement, and public education, rates of safety belt use nationwide have increased from approximately 11% in 1981 to 68% in 1997 (*8*). Safety belt use began to increase following enactment of the first state mandatory-use laws in 1984 (*6*). All states except New Hampshire now have safety-belt use laws. Primary laws (which allow police to stop vehicles simply because occupants are not wearing safety belts) are more effective than secondary laws (which require that a vehicle be stopped for some other traffic violation) (*6,13*). The prevalence of safety belt use after enactment of primary laws increases 1.5–4.3 times, and motor-vehicle–related fatality rates decrease 13%–46% (*13*).

Child-safety and booster seats. All states have passed child passenger protection laws, but these vary widely in age and size requirements and the penalties imposed for noncompliance. Child-restraint use in 1996 was 85% for children aged <1 year and 60% for children aged 1–4 years (*14*). Since 1975, deaths among children aged <5 years have decreased 30% to 3.1 per 100,000 population, but rates for age groups 5–15 years have declined by only 11%–13% (*9*). Child seats are misused by as many as 80% of users (*15–17*). In addition, parents fail to recognize the need for booster seats for children who are too large for child seats but not large enough to be safely restrained in an adult lap-shoulder belt (*18*).

21ST CENTURY CHALLENGES

Despite the great success in reducing motor-vehicle–related death rates, motor-vehicle crashes remain the leading cause of injury-related deaths in the United States, accounting for 31% of all such deaths in 1996 (CDC, unpublished data, 1999). Furthermore, motor-vehicle–related injuries led all causes for deaths among persons aged 1–24 years. In 1997, motor-vehicle crashes resulted in 41,967 deaths (16 per 100,000 population), 3.4 million nonfatal injuries (1270 per 100,000 population) (*9*), and 23.9 million vehicles in crashes; cost estimates are $200 billion (*1*).

The challenge for the 21st century is to sustain and improve motor-vehicle safety. Future success will require augmentation of the public health approach to 1) expand surveillance to better monitor nonfatal injuries, detect new problems, and set priorities; 2) direct research to emerging and priority problems; 3) implement the most effective programs and policies; and 4) strengthen interagency, multidisciplinary partnerships. Key public health activities will be to

- continue efforts shown to reduce alcohol-impaired driving and related fatalities and injuries.
- promote strategies such as graduated licensing that discourage teenage drinking and other risky driving behaviors such as speeding and encourage safety belt use.
- enhance pedestrian safety, especially for children and the elderly, through engineering solutions that reduce exposure to traffic and permit crossing streets safely

Motor-Vehicle Safety — Continued

and by encouraging safer pedestrian behaviors, such as crossing streets at intersections, and increasing visibility to drivers and driver awareness of pedestrians.

- accommodate the mobility needs of persons aged >65 years—a population that will almost double to 65 million by 2030—through a combination of alternative modes of transportation (e.g., walking and better public transportation) and development of strategies to reduce driving hazards (*6,19*).
- encourage the 30% of the population who do not wear safety belts to use them routinely.
- encourage proper use of age-appropriate child-safety seats and booster seats, especially for older children who have outgrown their child seats but are too small for adult lap-shoulder belts.
- conduct biomechanics research to better understand the causes of nonfatal disabling injuries, in particular brain and spinal cord injuries, as a foundation for prevention strategies.
- develop a comprehensive public health surveillance system at the federal, state, and local levels that track fatal and nonfatal motor-vehicle–related injuries and other injuries and diseases (i.e., outpatient and emergency department visits, hospitalizations, disabilities, and deaths) as a basis for setting prevention and research priorities.

Reported by: Div of Unintentional Injury Prevention, National Center for Injury Prevention and Control, CDC.

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Update: Influenza Activity — United States and Worldwide, 1998–99 Season, and Composition of the 1999–2000 Influenza Vaccine

In collaboration with the World Health Organization (WHO), the WHO international network of collaborating laboratories, and state and local health departments, CDC conducts surveillance to monitor influenza activity and to detect antigenic changes in the circulating strains of influenza viruses. This report summarizes surveillance for influenza in the United States and worldwide during the 1998–99 influenza season and describes the composition of the 1999–2000 influenza vaccine.

United States

Influenza activity began to increase in mid-January 1999 and peaked during the weeks ending February 6 through February 27. The predominant virus was influenza A(H3N2), although influenza type B viruses also circulated widely and were reported in all nine influenza surveillance regions. Influenza A(H1N1) viruses were sporadically isolated during the season in six of nine regions. During the weeks ending February 6 through February 27, 1999, >40 state and territorial epidemiologists reported widespread or regional influenza activity*, with widespread activity first reported from a state during the week ending January 16 and reported last during the week ending April 10. Beginning the week ending January 23, the proportion of patient visits to U.S. influenza sentinel physicians attributed to influenza-like illness (ILI) increased above baseline levels (0–3%) to 4% and remained elevated for 7 consecutive weeks. The proportion of visits for ILI was at baseline levels in all surveillance regions by the week ending March 20.

From October 4, 1998, through May 1, 1999, WHO and National Respiratory and Enteric Virus Surveillance System collaborating laboratories in the United States tested 86,826 specimens for respiratory viruses; 12,993 (15%) were positive for influenza. Of these, 10,041 (77%) were influenza type A, and 2952 (23%) were influenza

*Levels of activity are 1) *no activity*; 2) *sporadic*—sporadically occurring influenza-like illness (ILI) or culture-confirmed influenza with no outbreaks detected; 3) *regional*—outbreaks of ILI or culture-confirmed influenza in counties with a combined population of <50% of the state's total population; and 4) *widespread*—outbreaks of ILI or culture-confirmed influenza in counties with a combined population of ≥50% of the state's total population.