thus limiting the effectiveness of secondary prevention strategies. This finding was nearly identical to that of a previous report for the period 1982-2000.[1] These data also support previous studies indicating that provision of prophylaxis is not always optimal, at least in part because tetanus can result from seemingly trivial wounds that would not trigger suspicion of tetanus risk; clinical determination of tetanus-prone wounds is not exact.[4,9] In addition, this report indicates that, during 2001-2008, 13% of patients reported experiencing chronic wounds or conditions that were considered the source of tetanus infection. Many of these were not considered classic tetanus-prone wounds, according to treatment guidelines.

The findings in this report are subject to at least two limitations. First, surveillance for tetanus is passive and likely to be limited by underreporting and potential misclassification of disease. Second, because not all tetanus case reports were complete, missing data regarding outcome, risk factors, and other patient characteristics might affect the accuracy of the case-fatality ratio and certain other calculations.

Because *C. tetani* is ubiquitous in the environment, thorough assessment and management of wounds are especially important to the prevention of tetanus. Health-care providers should assess their patients' TT vaccination status with particular emphasis on up-to-date vaccination, especially if the patients are older adults, IDUs, persons with diabetes, and persons with chronic wounds.

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*The patient was a premature male who was delivered at home and developed tetanus 11 days after birth. His mother was an immigrant with an unknown vaccination history.

Occupational Highway Transportation Deaths—United States, 2003-2008

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1 figure, 2 tables omitted

HIGHWAY TRANSPORTATION CRASHES ARE the leading cause of fatal injuries in the United States for both workers and the general population.[1,2] Prevention of work-related highway transportation deaths, and highway transportation deaths in general, are long-standing public health priorities.[1,3] To assess trends and help guide the prevention of occupational highway transportation deaths, CDC analyzed data from the Census of Fatal Occupational Injuries (CFOI) for 2003-2008.[2]

A total of 8,173 workers died from highway transportation incidents during 2003-2008, representing 24% of all fatal occupational injuries for the period. The annual average fatality rate for workers was 0.9 highway transportation deaths per 100,000 workers; that rate decreased an average of 2.8% annually during the period. Workers employed in the trucking industry accounted for the greatest number (2,320) and highest rate of highway transportation deaths (19.6 per 100,000 workers). Public health, highway safety, labor, and state agencies; highway designers; and transportation-related associations need to work together to implement effective interventions to reduce the risk for highway transportation deaths for all workers. Employers should adopt, communicate, and enforce safety policies designed to reduce highway transportation deaths (e.g., requiring the use of safety belts in fleet vehicles, restricting cellular telephone use while driving, and allowing for adequate travel time), and ensure these policies are followed by employees.

The U. S. Department of Labor Bureau of Labor Statistics (BLS) collects CFOI data on occupational injury deaths from multiple sources, including death certificates, police reports, and workers' compensation reports. To be included in CFOI, the decedent must have been working, working as a volunteer in a similar manner to a paid employee, or present at a site as a job requirement.[2] Occupational highway transportation* deaths are defined as those events that involve a motorized or nonmotorized vehicle on a public roadway where the victim was the operator or passenger in the vehicle. Pedestrians struck by vehicles in or on the side of public roadways are excluded. Deaths while traveling between work locations are included; deaths while commuting to and from work are not. To calculate fatality rates, labor force denominator estimates were derived from the Current Population Survey (CPS) for U.S. workers aged ≥16 years.[4] Workers aged <16 years, volunteers, and military personnel posted in the United States are included in the fatality counts but excluded from the fatality rate calculations because they are not included in the CPS. Trends and demographic differences were assessed using Poisson regression and significance set at $\alpha = 0.05$.

During 2003-2008, a total of 8,173 occupational highway transportation deaths occurred in the United States (average: 1,362 per year), equating to an annual average fatality rate of 0.9 deaths per 100,000 workers. The fatality rate decreased an estimated 2.8% annually during the period (p=0.0268). Highway transportation fatality rates were highest among workers aged ≥65 years (2.1 deaths per 100,000 workers), followed by those aged 55-64 years (1.2 deaths per 100,000 workers). The fatality rate for males (1.6 deaths per 100,000 workers [p<0.0001]) was significantly greater than for females (0.2 deaths per 100,000 workers). American Indians or Alaska Natives had a highway transportation fatality rate of 1.8 per 100,000 workers. That rate was significantly greater than the rates seen for any other racial or ethnic group, which had rates of ≤1.0 (p<0.0001 for all comparisons).

The most common type of crash resulting in an occupational highway

transportation death was a collision between two or more vehicles (4,009 deaths). Crashes between vehicles moving in opposite directions accounted for 38% (1,532) of these multiple-vehicle crash deaths. The most common noncollision highway crashes involved jackknifed or overturned vehicles (1,551 deaths). Victims most often had been in a tractor-trailer (2,761 deaths) or automobile (1,353 deaths) at the time of the crash.

The transportation, warehousing, and utilities industry had the highest number (2,776) and crude rate (7.9 deaths per 100,000 workers) of occupational highway transportation deaths by industry. Within that industry, truck transportation (i.e., trucking) accounted for 2,320 highway transportation deaths (average: 386 per year) and had the highest fatality rate (19.6 deaths per 100,000 workers) among the industry sectors. Government, which includes local, state, and federal workers, accounted for the second highest number of deaths (1,029), and logging had the second highest fatality rate (11.7 deaths per 100,000 workers). The finance and insurance industry had the lowest rate of occupational highway transportation deaths (<0.2 deaths per 100,000 workers) among the industry sectors.

Occupational highway transportation fatality rates varied geographically during this 6-year period.† The highest rates (≥1.0 deaths per 100,000 workers) were concentrated in the Mountain, North West Central, and South regions of the United States.§The lowest fatality rates (<1.0) were concentrated in the East North Central, Northeast, and Pacific regions. Wyoming had the highest highway transportation fatality rate (7.0), followed by Montana (3.3). The lowest rates were in Rhode Island and Massachusetts (0.2).

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CDC Editorial Note: Prevention of work-related highway deaths and injuries has long been a priority for CDC's National Institute for Occupational Safety and Health (NIOSH).[1] CDC recently has denoted highway transportation injury and fatality prevention as a public health "winnable battle."[3] In 2008, a total of 32,883 nonpedestrian highway deaths occurred in the United States, equating to a fatality rate of 10.8 deaths per 100,000 U.S. residents.[5]§ Workers accounted for 1,215 of these highway deaths, which made up 23.3% of all occupational deaths in 2008.[2] The rate of all highway transportation deaths declined an estimated 3.2% annually (p=0.0008) during 2003-2008,[5] a rate of decline slightly greater than the 2.8% annual decline for occupational highway transportation deaths reported in this analysis. Reasons for these declines are unclear, but might be related to the improved crashworthiness of vehicles, increases in safety belt use, or reductions in the number of workers driving and work-related miles driven during the recent economic recession.

Occupational highway transportation deaths differ from those among the general motoring public in terms of persons at risk, type of vehicle, and type of crash. Occupational highway transportation deaths pose the greatest risk to workers aged ≥55 years and to males (rate ratio: 8.4 compared with female workers). For transportation deaths overall in 2008, persons aged 16-24 years were at greatest risk, and males were at greater risk than females, although the relative difference was smaller (rate ratio: 2.6).[5] Contributing factors for work-related transportations deaths include fatigue and prescription drug use, which might be associated with age; roadway crash deaths overall are known to be associated with alcohol consumption, especially for drivers aged 16-24 years.[1,5,6] Alcohol has not been shown to be a major contributor to work-related crashes involving large trucks,[7] nor work-related crashes in general.[1,6]

The majority of work-related highway transportation fatalities occurred among occupants of trucks (67% of deaths), especially tractor-trailers (34% of deaths), whereas occupants of passenger cars constituted the largest percentage of road traffic fatalities (40% of deaths) in 2008.[5] Occupational highway deaths involved a high number of collisions between two or more vehicles (49% of deaths) and noncollision incidents, especially jackknifed trucks and overturned vehicles (19% of deaths). For all road traffic fatalities during 2008, the most common crash types were collisions between vehicles (37%) and collisions between a vehicle and a fixed object (34%).[5] By state, risk patterns for occupational highway transportation deaths were similar to those for all road traffic fatalities.[5]

Workplace driving in the United States falls into two distinct categories: large trucks and buses, whose operation is regulated by the U.S. Department of Transportation (DOT),‖ and lighter-weight fleet or personal vehicles driven for work purposes, whose operation is largely unregulated by the federal government.¶ A voluntary consensus standard (Safe practices for motor vehicle operations, ANSI Z15.1-2006)[8] outlines a comprehensive, corporate fleet motor-vehicle safety program, but the operation of lighter vehicles (including light trucks) in the workplace is governed primarily by state traffic laws and augmented by individual employer policies.

Modifiable behavioral and environmental risk factors for work-related highway transportation deaths include long hours of work, fatigue, sleepiness, occupational stress, time pressures, distracted driving, nonuse of safety belts, use of prescription and nonprescription medications, road design and maintenance, and motor vehicle safety technology.[1,6] Employer commitment to road safety at the highest levels of management and a comprehensive, integrated approach to safety management at all supervisory levels are best-practice recommendations seen as

What is already known on this topic?

Highway transportation crashes are the leading cause of occupational fatalities in the United States.

What is added by this report?

Occupational highway transportation fatality rates declined 2.8% annually during 2003-2008, and groups at greatest risk for occupational highway transportation deaths (e.g., workers aged ≥55 years and truck occupants) differ from those identified for highway transportation deaths in the general motoring public.

What are the implications for public health practice?

Employers need to know more about the fatality risks to workers from highway transportation crashes, and employer-based strategies (e.g., requiring the use of safety belts in fleet vehicles, restricting cellular telephone use while driving, and allowing for adequate travel time) should be disseminated and implemented more widely.

essential ingredients in reducing the risk for work-related crashes.[1,8-10]

The findings in this report are subject to at least four limitations. First, the cross-sectional nature of this analysis allows for identification of associations between exposure and incidents, but is only suggestive of risk factors. Second, CPS is a monthly survey of households and might underreport the employment of certain workers, especially those without permanent addresses or telephone access, or those who are undocumented. Underreporting in the workforce results in an overestimation of the occupational fatality rates provided in this report. Third, the fatality rates presented in this report do not account for the amount of time or distance workers spend on public roadways as part of their job duties. Using either as a denominator could provide a different assessment of risk between industries and demographic variables. Such data are not available for all workers in the United States. Finally, CFOI includes cases determined to be in work status but excludes those in commuter status. These determinations are difficult where the work relationship might not be clear, or when the distinction between traveling between job sites and commuting is unclear.

Preventing workplace crashes rests on worker compliance with regulations and traffic laws, supplemented by best-practice safety initiatives by employers.[8] Under these recognized practices, employers should prioritize road traffic safety and initiate activities such as implementation and enforcement of policies that require use of safety belts and prohibit unsafe behaviors such as impaired driving and use of cellular phones and other mobile devices that might distract the driver while the vehicle is in motion. Proposed strategies for fatigue management focus on flexible voluntary programs to supplement regulatory requirements, route and trip planning to reduce stress and fatigue, and in-vehicle monitoring and feedback. Other recommended injury prevention practices include rigorous driver selection and training procedures as part of a comprehensive driver management program, prehire checks of employee driving records and periodic checks thereafter, continuing risk assessment of drivers, selection of fleet vehicles with high levels of occupant protection and advanced safety features, and collection of fleet safety performance indicators.[8-10]

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*BLS uses the term "highway transportation" to define events involving crashes of motorized and nonmotorized vehicles on a public roadway, regardless of the size or location of the public roadway. "Highway transportation" is interchangeable with the terms "motor vehicle" or "traffic" used by other groups to define these same crash events.

†Fatality rates were calculated as highway transportation deaths occurring within a state, using employment data within the state from CPS for the 6-year period.

§Regions classified by the Bureau of the Census. *Northeast:* Connecticut, Maine, Massachusetts, Pennsylvania, New Hampshire, New Jersey, New York, Rhode Island, Vermont; *East North Central:* Illinois, Indiana, Michigan, Wisconsin Ohio; *West North Central:* Iowa, Kansas, Missouri, Minnesota, Nebraska, North Dakota, South Dakota; *South:* Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, Tennessee, Texas, South Carolina, Virginia, West Virginia; *Mountain:* Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, Wyoming; *Pacific:* Alaska, California, Hawaii, Oregon, Washington.

§Road traffic fatalities for 2008 for the general motoring public are from the National Highway Traffic Safety Administration's Fatality Analysis Reporting System (FARS). The classification of fatalities might vary between CFOI and FARS because of differing inclusion criteria, definitions of public roadways, and vehicle classifications.

‖Access to the Federal Motor Carrier Safety Regulations and for information about DOT medical programs and commercial driver licensing are available at http://www.fmcsa.dot.gov.

¶The Occupational Safety and Health Administration (OSHA) has issued regulations covering some aspects of mobile industrial equipment operation in construction and logging that could impact the use of such machinery on public roads, although the use of such equipment on public roadways is limited. In addition, OSHA recently has indicated that, under the general duty clause, it will begin citing employers who require their employees to send text messages while driving on the job. However, OSHA has not issued broad regulations for employers related to the work-related use of motor vehicles on public roadways.