

Hepatitis Awareness Month — May 2011

This month marks the 16th anniversary of Hepatitis Awareness Month in the United States. Viral hepatitis, particularly infection with hepatitis B virus (HBV) or hepatitis C virus (HCV), is a major cause of morbidity and mortality. This issue of *MMWR* includes a report that focuses on a recent trend in HCV infection.

The report shows an increase in cases of HCV infection during 2002–2009 among adolescents and young adults aged 15–24 years in Massachusetts and highlights the fundamental role of surveillance in identifying emerging patterns of transmission and developing appropriate public health response. The Massachusetts cases were reported from all areas of the state, primarily among non-Hispanic whites. Injection drug use (IDU) was the most common risk factor for HCV transmission, and the increase in case reports suggests an epidemic of HCV infection related to IDU in this age group in Massachusetts.

In 2010, the Institute of Medicine (IOM) of the National Academies of Sciences issued a report on viral hepatitis outlining recommendations for the prevention and control of HBV and HCV infection, including improvement in public health surveillance for viral hepatitis and viral hepatitis screening linked with prevention and care (1). In response to the IOM report, the U.S. Department of Health and Human Services is developing a comprehensive viral hepatitis action plan that will set forth strategies to improve viral hepatitis prevention, care, and treatment in the United States. Additional information regarding viral hepatitis is available from CDC at <http://www.cdc.gov/hepatitis>.

Reference

1. Institute of Medicine. Hepatitis and liver cancer: a national strategy for prevention and control of hepatitis B and C. Washington, DC: National Academies Press; 2010. Available at http://www.nap.edu/openbook.php?record_id=12793&page=1. Accessed April 28, 2011.

Hepatitis C Virus Infection Among Adolescents and Young Adults — Massachusetts, 2002–2009

Hepatitis C virus (HCV) infection is a major cause of liver disease and hepatocellular carcinoma in the United States (1,2). Of the estimated 2.7–3.9 million persons with active HCV infection, most were born during 1945–1964 and likely were infected during the 1970s and 1980s, before the advent of prevention measures (3). Nationwide, rates of acute, symptomatic HCV infection declined during 1992–2005 and then began to level (4). Declines also were observed in rates of newly reported HCV infection in Massachusetts. Although these declines were evident among reported cases overall in Massachusetts during 2002–2006, an increase was observed among cases in the 15–24 year age group. In response to this increase, the Massachusetts Department of Public Health (MDPH) launched a surveillance initiative to collect more detailed information on cases reported during 2007–2009 among this younger age group and to examine the data for trends through 2009. This report describes results of both efforts, which revealed continued increases in rates of newly reported HCV infection among persons aged 15–24 years. These cases were reported from all areas of the state, occurred predominantly among non-Hispanic white persons, and were equally distributed among males and females. Of cases with available risk data, injection drug use (IDU) was the most common risk factor for HCV transmission. The increase in case reports appears to represent an epidemic of HCV infection related to IDU among new populations of

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Fatal Injuries Among Grounds Maintenance Workers — United States, 2003–2008

A total of 1,142 grounds maintenance workers (GMWs) were fatally injured at work during 2003–2008, an average of 190 each year. GMWs accounted for 3.4% of all occupational fatalities, and 31% of those GMWs were Hispanic or Latino. Approximately 83% of the Hispanic or Latino GMWs who died were born outside the United States. In 2008, approximately 1.52 million persons were employed as GMWs, constituting 1.0% of the U.S. workforce (1). During 2003–2007, an average of 13.3 per 100,000 employed GMWs died each year, compared with an overall rate of 4.0 fatalities per 100,000 U.S. workers. The rate of on-the-job fatal injuries among GMWs has remained elevated relative to other workers for >20 years (2,3). This report characterizes events leading to GMW fatalities and differences in fatality characteristics across demographic groups among GMWs, based on an evaluation of 2003–2008 data from the U.S. Department of Labor's Bureau of Labor Statistics (BLS) Census of Fatal Occupational Injuries (CFOI) program. The report also identifies workplace interventions that might reduce the incidence of fatal injuries. Major events leading to GMW occupational fatalities included transportation incidents (31%), contact with objects and equipment (25%), falls (23%), and traumatic acute exposures to harmful substances or environments (e.g., electrocution and drowning) (16%). To reduce the incidence of such fatalities, employers, trade and worker associations, and policy makers should focus on effective, targeted workplace safety interventions such as frequent hazard identification and training for specific hazards. Diversity among the populations of workers requires use of culture- and language-appropriate training techniques as part of comprehensive injury and illness prevention programs.

Annual data for 2003–2008 on occupational fatalities resulting from traumatic injuries were obtained from CFOI, a national surveillance system for work-related traumatic injury deaths maintained by BLS. Occupations in CFOI were classified using the 2000 Standard Occupational Classification (SOC) system. Cases were defined as all fatalities among persons classified as either GMWs (SOC 37-301) or first-line supervisors/managers of landscaping, lawn service, and groundskeeping workers (SOC 37-1012).^{*} Case characteristics, such as events, were coded by CFOI using the Occupational Injury and Illness Classification System. Industries were classified by

^{*}GMWs are further defined as persons working in the following occupations, based on the 2000 SOC system: first-line supervisors/managers of landscaping, lawn service, and groundskeeping workers (SOC 37-1012); landscaping and groundskeeping workers (SOC 37-3011); pesticide handlers, sprayers, and applicators, vegetation (SOC 37-3012); tree trimmers and pruners (SOC 37-3013); and grounds maintenance workers, all other (SOC 37-3019).

CFOI using the 2002 North American Industry Classification System (NAICS). The CFOI program uses multiple source documents, an average of almost four unique documents per case, to identify and describe all fatal occupational injuries in the United States. Common source documents include death certificates, media reports, Occupational Safety and Health Administration (OSHA) reports, coroner/medical examiner reports, and workers' compensation reports. For a fatality to be included in CFOI, the decedent must have been employed at the time of the event, engaged in a legal work activity, and present at the site of the incident as a job requirement. Fatalities that occur during a person's normal commute to or from work are excluded from CFOI counts (4).

An average of 13.3 per 100,000 employed GMWs died each year as a result of injuries on the job, compared with an overall rate of 4.0 fatalities per 100,000 U.S. workers during 2003–2007[†]; a total of 1,142 GMWs died during 2003–2008 (Table 1). Among those, 901 (79%) were employed in the private-sector landscaping services industry (NAICS 56173). Another 43 fatalities were incurred by GMWs employed by private-sector golf courses and country clubs (NAICS 71391). Among the 70 GMWs fatally injured while working for a government entity, most (54) were working for a local government.

In 172 instances (15% of deaths) during this period, GMWs were struck by a falling tree or limb and died.[§] Another 145 GMWs (13%) were killed after falling from or falling because of a tree (e.g., knocked off a ladder by a falling branch), almost all of whom were involved in tree-care tasks. Highway transportation incidents while on the job accounted for 122 fatalities (11%). Nonhighway vehicle overturns were responsible for 102 (9%) deaths during the 6 years. The majority of these involved riding lawnmowers or tractors. Contact with overhead power lines caused 97 (8%) fatalities, of which 27 (2%) resulted from a cutting hand tool contacting a power line. In addition, 34 (3%) workers drowned. Distributions of these events varied across the GMW occupations (Table 2).

Approximately 99% of the fatally injured 1,142 GMWs were males. Approximately 27% of the fatally injured GMWs were self-employed, compared with 20% of all fatally injured U.S. workers during the same period. Fatally injured GMWs

[†]Fatal injury rates were calculated for 2003–2007, rather than 2003–2008, because CFOI changed its method for calculating fatal injury rates in 2008. These fatal injury rates are employment-based. Fatal injury rates currently published by CFOI are hours-based. Additional information is available at <http://www.bls.gov/iif/oshnotice10.htm>.

[§]Additional information on fatalities in tree-care operations is available at <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5815a2.htm>.

TABLE 1. Fatal occupational injuries among grounds maintenance workers,* by selected characteristics — United States, 2003–2008†

Characteristic	All grounds maintenance workers	% of total	Hispanic or Latino grounds maintenance workers	% of total
Total fatal occupational injuries	1,142	(100)	356	(100)
Employee status				
Wage and salary [§]	836	(73)	296	(83)
Self-employed [¶]	306	(27)	60	(17)
Sex				
Male	1,130	(99)	354	(99)
Female	12	(1)	—	—
Age group (yrs)				
<16	4	(<1)	—	—
16–17	7	(1)	4	(1)
18–19	33	(3)	17	(5)
20–24	130	(11)	64	(18)
25–34	209	(18)	98	(28)
35–44	261	(23)	79	(22)
45–54	256	(22)	57	(16)
55–64	149	(13)	28	(8)
≥65	93	(8)	7	(2)
Race/Ethnicity**				
White, non-Hispanic	620	(54)	—	—
Black, non-Hispanic	129	(11)	—	—
Hispanic or Latino	356	(31)	356	(100)
Asian, Native Hawaiian or other Pacific Islander, non-Hispanic	24	(2)	—	—
U.S. born				
Yes	802	(70)	61	(17)
No	340	(30)	295	(83)
Event††				
Transportation incidents	355	(31)	125	(35)
Highway	122	(11)	56	(16)
Nonhighway	155	(14)	36	(10)
Overtaken	102	(9)	20	(6)
Pedestrian struck by vehicle, mobile equipment	67	(6)	31	(9)
Contact with objects and equipment	290	(25)	76	(21)
Struck by object or equipment	223	(20)	49	(14)
Struck by falling object or equipment	186	(16)	46	(13)
Struck by falling tree/branch ^{§§}	172	(15)	41	(12)
Caught in or compressed by equipment or objects	52	(5)	17	(5)
Falls	259	(23)	60	(17)
Falls to a lower level	247	(22)	56	(16)
Fall from or because of tree ^{§§}	145	(13)	33	(9)
Exposure to harmful substances or environments	180	(16)	76	(21)
Contact with electric current	109	(10)	41	(12)
Contact with overhead power lines	97	(8)	33	(9)
Drowning, submersion	34	(3)	23	(6)
Assaults and violent acts	48	(4)	15	(4)
Homicides	19	(2)	8	(2)
Suicides	26	(2)	6	(2)
Occupation¶¶				
First-line supervisors/managers	186	(16)	35	(10)
Landscaping and groundskeeping workers	559	(49)	235	(66)
Pesticide handlers, sprayers, and applicators, vegetation	5	(<1)	—	—
Tree trimmers and pruners	377	(33)	85	(24)
Grounds maintenance workers, all other	15	(1)	—	—

See table footnotes on page 544.

tended to be younger than all fatally injured U.S. workers; 44 (4%) were aged <20 years, and 174 (15%) of GMWs were aged <25 years when they died. For the entire United States, workers aged <25 years accounted for fewer than 10% of fatal work-related traumatic injuries.

Hispanic or Latino workers constituted approximately 36% of GMWs (1) and approximately 31% of fatally injured

GMWs. The average age at death for all Hispanic and Latino GMW fatalities was 35.6 years, compared with age 45.0 years for GMW fatalities among persons of other races/ethnicities. In nearly five of every six fatalities involving a Hispanic or Latino worker, the worker was born in a country other than the United States, particularly Mexico (218), Guatemala (33), and El Salvador (19). Although foreign-born Hispanic or Latino

TABLE 1. (Continued) Fatal occupational injuries among grounds maintenance workers,* by selected characteristics — United States, 2003–2008†

Characteristic	All grounds maintenance workers	% of total	Hispanic or Latino grounds maintenance workers	% of total
Industry***				
Private industry	1,072	(94)	351	(99)
Landscaping services	901	(79)	297	(83)
Golf courses and country clubs	43	(4)	14	(4)
Government	70	(6)	5	(1)
Federal	3	(<1)	—	—
State	13	(1)	—	—
Local	54	(5)	4	(1)

Sources: U.S. Department of Labor, Bureau of Labor Statistics, Census of Fatal Occupational Injuries, and data from state, New York City, District of Columbia, and federal agencies.

* Includes, as coded in the 2000 Standard Occupational Classification (SOC) system, first-line supervisors/managers of landscaping, lawn service, and groundskeeping workers (SOC 37-1012) and grounds maintenance workers (SOC 37-3011, 37-3012, 37-3013, and 37-3019).

† Data for all years are revised and final. Totals for major categories might include subcategories not shown separately. Fatality counts exclude illness-related deaths unless precipitated by an injury event.

§ Might include volunteers and workers receiving other types of compensation.

¶ Includes self-employed workers, owners of unincorporated businesses or farms, paid and unpaid family workers, and might include some owners of incorporated businesses or members of partnerships.

** Persons identified as Hispanic or Latino might be of any race. The race categories shown exclude data for Hispanics and Latinos.

†† Coded per the Occupational Injury and Illness Classification System (OIICS).

§§ Data for this event were compiled using the Event and Source or Secondary Source categories in OIICS.

¶¶ Coded per the 2000 SOC system.

*** Coded per the 2002 North American Industry Classification System.

TABLE 2. Fatal occupational injuries (N = 1,142) among grounds maintenance workers, by specified occupation and event — United States, 2003–2008*

Occupation†/Event§	Total fatal occupational injuries	% of total
Landscaping and groundskeeping workers	559	(49)
Highway incident	81	(7)
Nonhighway overturned mower/tractor¶	63	(6)
Struck by falling tree or limb¶	47	(4)
Drowning	32	(3)
Fall from or because of tree¶	23	(2)
Contact with overhead powerlines	20	(2)
Fall from ladder	19	(2)
Tree trimmers and pruners	377	(33)
Struck by falling tree or limb¶	96	(8)
Fall from or because of tree¶	91	(8)
Contact with overhead powerlines	64	(6)
Fall from nonmoving vehicle	31	(3)
First-line supervisors/managers**	186	(16)
Highway incident	27	(2)
Struck by falling tree or limb¶	26	(2)
Fall from or because of tree¶	17	(1)
Fall from nonmoving vehicle	12	(1)
Contact with overhead powerlines	12	(1)
Caught in or compressed by equipment or objects	12	(1)
All other grounds maintenance workers	20	(2)

Sources: U.S. Department of Labor, Bureau of Labor Statistics, Census of Fatal Occupational Injuries, and data from state, New York City, District of Columbia, and federal agencies.

* Data for all years are revised and final. Totals for major categories might include subcategories not shown separately.

† Coded per the 2000 Standard Occupational Classification (SOC) system.

§ Coded per the Occupational Injury and Illness Classification System (OIICS).

¶ Data for this event were compiled using the Event and Source or Secondary Source categories in OIICS.

** Includes SOC 37-1012 first-line supervisors/managers of landscaping, lawn service, and groundskeeping workers as coded per the 2000 SOC system.

workers accounted for 26% of fatalities among GMWs, they accounted for 22 of the 34 (65%) work-related drownings in this occupational group.

Approximately half (568 deaths) of the GMW fatalities occurred in seven states: California (137), Florida (136), Texas (91), Virginia (56), North Carolina (52), Georgia (49), and Ohio (47) (Figure). A total of 463 (41%) of the GMW fatalities occurred at private residences.

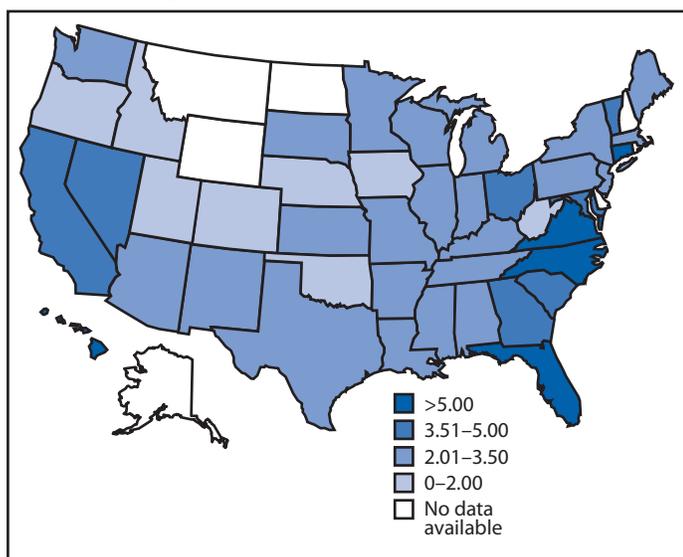
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Editorial Note

GMWs typically are employed as intermittent labor at private residences, recreational facilities, public buildings, parks and cemeteries, and other locations. Most GMWs work year-round and many change work locations throughout the day. GMWs complete tasks such as lawn care, landscape installation and maintenance, and tree care and removal. In the course of this work, GMWs frequently operate on- and off-road vehicles, and often use heavy equipment and various types of machinery and power tools. GMWs frequently work at heights and along busy streets and highways (5). Weather-related hazards can change throughout the day and across the seasons. As a result, GMWs are likely to encounter wet ground surfaces, especially

FIGURE. Fatal occupational injuries (N = 1,142) among grounds maintenance workers,* as a percentage of all occupational fatalities† — United States, 2003–2008



Source: U.S. Department of Labor, Bureau of Labor Statistics.

*Includes 2000 Standard Occupational Classification codes 37-1012, 37-3011, 37-3012, 37-3013, and 37-3019.

† For the entire United States, fatal occupational injuries to grounds maintenance workers accounted for 3.4% of all fatal occupational injuries during 2003–2008.

early in the day, which can reduce traction, and heat stress is a common hazard during summer in many regions.[¶]

Wide-ranging injury prevention strategies that emphasize intervention for specific hazards and tasks (Table 2), focus on key worker groups, and are language and literacy-level appropriate are needed to reduce fatalities among GMWs. CDC's National Institute for Occupational Safety and Health (NIOSH) and its partners previously have recommended specific types of training and comprehensive safety and health programs for grounds maintenance operations (6,7). These programs should provide formal training to workers to ensure proper use of personal protective equipment (e.g., fall protection gear and seat belts). Some GMWs specialize in specific tasks (e.g., tree care), so they encounter a more limited, although severe, set of hazards. However, nearly all GMWs are on crews that might engage in a large variety of tasks over the course of a day and week. Worksite hazard identification should be completed by knowledgeable persons at the beginning of each day and before work begins at other sites throughout the day.

The frequently changing and mobile nature of groundskeeping work makes it difficult to train crews effectively. GMW employers and supervisors should use tailgate or toolbox safety

[¶] During 2003–2008, job-related exposure to environmental heat caused the deaths of 12 GMWs, including eight who were Hispanic or Latino.

What is already known on this topic?

Grounds maintenance workers (GMWs) experience elevated rates of fatal occupational injuries; however, previous reports examined the landscaping industry rather than the GMW occupation group.

What is added by this report?

Nearly one third (31%) of fatally injured GMWs were Hispanic or Latino, and five out of six of these workers were born outside the United States. Nearly one third (31%) of fatal occupational injuries were transportation-related, and almost all (99%) of fatally injured GMWs were male. Fatally injured Hispanic or Latino GMWs were 9.4 years younger at death than the remaining GMWs fatalities.

What are the implications for public health practice?

GMW employers should tailor injury and illness prevention programs to specific hazards and worker demographics, to include worksite hazard identification and language and literacy-level appropriate training. Oversight agencies should increase outreach and enforcement activities in states where GMW workplace fatalities are more prevalent.

training techniques** and repeat and reinforce safety topics regularly. Topics should be specific to the work tasks, location, and season. Training might include tree care, trimming, and removal, and safe operation and maintenance of all vehicles in use, such as riding lawnmowers, tractors, trucks, and other highway vehicles. All hazards (e.g., overhead power lines, tree work, bodies of water, unstable and slippery ground surfaces, steep grades, trenches, and roadway traffic) must be identified at all worksites and appropriate safety training provided.

The findings in this report are subject to at least three limitations. First, workers with other occupational titles might have died while performing similar operations and tasks, such as roadside maintenance. Second, inclusion of cases is dependent on identification of work-relatedness. Such determinations can be difficult for certain types of incidents, such as those on private property. Finally, the Current Population Survey (1) is a monthly household survey that might underreport employment for some workers, such as those without telephone access or permanent addresses or those who are undocumented. Underestimates of the workforce would result in overestimation of the fatality rates in this report.

Small businesses, which are common employers of GMWs (2), often do not have the resources to employ occupational safety professionals, and their owners and supervisors might lack the knowledge, skills, and resources to identify safety hazards and to develop safe work practices. NIOSH and OSHA have developed guides for small businesses that identify government and other sources of information (8,9). Trade associations also are useful sources of health and safety information that is specific to the landscape services industry (6).

** Brief, on-site training modules that remind workers about specific hazards and proper use of equipment.

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