Farm-Tractor–Related Fatalities—Kentucky, 1994

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FATALITIES associated with farm tractors are the most common cause of work-related death in the U.S. agricultural industry.[1] To characterize farm-tractor–related fatalities in Kentucky, the Kentucky Fatality Assessment and Control Evaluation (KY FACE) Project studied all fatal farm injuries occurring among persons in that state during 1994, the initial year of operation for FACE in Kentucky. This report summarizes the results of that study.

KY FACE is part of a 14-state surveillance and investigation program coordinated by CDC's National Institute for Occupational Safety and Health (NIOSH) and is designed both to evaluate the circumstances of fatal occupational injuries and to develop prevention strategies. KY FACE employs multiple reporting sources* to identify occupational fatalities throughout the state and conducts follow-up investigations. A farm-tractor–related fatality was defined as a death caused by operating or working on or near a farm tractor. A farm tractor was defined as a two- or four-wheel-drive vehicle or track vehicle with a >20-horsepower engine designed to furnish the power to pull, carry, propel, or drive implements designed for agricultural activities.[2]

During 1994, the KY FACE surveillance system identified 28 tractor-related fatalities in Kentucky; 14 (50%) of these incidents occurred during June-August. Tractor-related fatalities accounted for 16% of the 176 occupational fatalities recorded in Kentucky during 1994.

The most common cause of tractor-related fatalities was rollover (23 [82%]), followed by runover (five [18%]). The most common activity at the time of injury was mowing with a rotary mower trailing a tractor (i.e., bush-hogging) on private farms (32%). Other activities included transporting equipment or farm products (21%); checking livestock or property (14%); pulling logs (11%); and planting, plowing, or cutting hay (11%). Of the 28 deaths, 23 (82%) occurred on farms, and five (18%) occurred on public roadways. Four of those occurring on roadways were attributed to loss of control; one tractor was struck by a truck in a rear-end collision.

All decedents were males who ranged in age from 15 to 86 years (median: 46 years); one was aged <18 years, and 15 (54%), ≥60 years. One death occurred in a 15-year-old student who was killed in a tractor rollover incident while working a summer job plowing tobacco. Farming was listed as the usual occupation on 11 (39%) of the 28 death certificates. Ten (36%) of those fatally injured also held jobs off the farm, and 12 (43%) were retired from nonfarming occupations. Most (53%) fatalities occurred from 12:01 to 6 p.m.; 32% occurred from 7 a.m. and noon, and 14% after 6 p.m.

An industrial hygienist conducted on-site investigations of 16 of the incidents. Tractors involved in these 16 incidents ranged in age from 2 to 41 years (median: 23 years). In three of the cases, the operators were driving directly up or down steep slopes (of 8, 14, and 30 degrees); in two of these incidents, the operator lost control while descending, and in the third, the operator rolled over backward while ascending a hill. In eight of the 16 incidents, one or both wheels on one side of the tractor slid down an embankment, causing a rollover. In one case, the operator backed the tractor over an embankment, causing the tractor to roll over backwards. In eight of the incidents, tires were air-filled rather than fluid-filled; fluid-filled tires lower the center of gravity, improve traction, and can prevent skidding, loss of control, and rollover. Only two of the tractors were equipped with front-end counterweights, which improve traction and stability. In eight cases, poor equipment condition (e.g., minimally operable brakes), was a contributing factor.

Only one of the tractors involved in a rollover fatality was fitted with a rollover-protective structure (ROPS); in this incident, a tractor manufactured in 1962 had been retrofitted with a ROPS but not equipped with seatbelts.

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CDC Editorial Note: During 1994, the fatality rate for civilian workers in the agriculture/forestry/fishing industry in Kentucky was 85 per 100 000 workers, a rate more than three times greater than that for the industry in the United States (26 per 100 000 workers in 1993).[3] Operating tractors is a particularly hazardous activity for older workers and adolescents. The proportion of Kentucky tractor-related fatalities among workers aged >60 years (54%) was greater than that reported in the NIOSH National Traumatic Occupational Fatalities surveillance system (44%).[4] Operating tractors with a >20-horsepower engine is extremely hazardous to youth, and federal Child Labor Laws prohibit this activity for employees aged <16 years; however, children working on their family farm are exempt from Child Labor Laws.

In 1994, tractor rollovers and runovers accounted for 62% of agricultural fatalities in Kentucky. The findings of the KY FACE investigations indicated that in most of the incidents rollover fatalities could have been prevented if the tractors had been equipped with ROPS and the operators secured with seatbelts, which ensure that the operator remains within the ROPS-protected zone during a rollover.

ROPS first became available as optional equipment on farm tractors in 1971 (tractors manufactured before 1971 were not designed to accommodate ROPS devices). However, ROPS were not required for new tractors until 1976, when a standard promulgated by the Occupational Safety and Health Administration (OSHA) required employers to provide ROPS and seatbelts for all employee-operated tractors† manufactured after October 25, 1976.[2] Although virtually all tractors sold after 1985 have been equipped with ROPS, farms with <11 employees are not subject to OSHA inspection or enforcement, and farms managed by family members with no other employees are not required to comply with OSHA standards; in Kentucky, 94%

of the farms are family-owned businesses with <11 employees.[5] The median age of tractors investigated in this report was 23 years. One fatal tractor rollover in this study involved a 1979 tractor manufactured without ROPS. Because it was purchased for use on a family farm without employees, it was not subject to the ROPS standard. The cost to retrofit tractors manufactured before 1975 ranges from $400 to $1800, and economic constraints associated with farms in Kentucky limit the feasibility of appropriately modifying all tractors.

The findings of KY FACE suggest that installation of ROPS and seatbelts on farm tractors could have prevented the 23 tractor rollover deaths. These findings and previous reports[1] underscore the need for economically feasible ROPS retrofit programs. In Kentucky, the FACE program disseminates reports containing investigative findings and recommends intervention strategies to county extension agents, the Kentucky Labor Cabinet Division of Education and Training, the Kentucky Farm Bureau, and the National Safety Council. News media releases assist in disseminating this information further to the agriculture community and the general public.

References

1. CDC. Public health focus: effectiveness of rollover protective structures for preventing injuries associated with agricultural tractors. MMWR 1993;42:57-9.
2. Office of the Federal Register. Code of federal regulations: occupational safety and health standards. Subpart C: roll-over protective structures (ROPS) for tractors in agricultural operations. Washington DC: Office of the Federal Register, National Archives and Records Administration, 1994 (29 CFR § 1928.51).
3. Toscano G, Windau J. The changing character of fatal work injuries. Monthly Labor Review 1994;117(10): 17-28.
4. Etherton JR, Myers JR, Jensen RC, Russell JC, Braddee RW. Agricultural machine-related deaths. Am J Public Health 1991;81:766-8.
5. Bureau of the Census. 1992 Census of agriculture: Vol 1, Geographic Area Series, Part 17, Kentucky State and County Data. Washington, DC: US Department of Commerce, Economics and Statistics Administration, 1992 (AC92-A-17).

*Notification sources include newspapers, county coroners, emergency medical personnel, Kentucky Labor Cabinet, U.S. Bureau of Labor Statistics Census of Fatal Occupational Injuries, Kentucky Department of Motor Vehicles' Fatal Accident Reporting System, Southeast Center for Agricultural Health and Injury Prevention, Occupational Health Nurses in Agricultural Communities, and Kentucky Vital Statistics.
†The standard provides exemptions for tractors used in special circumstances where vertical clearances may be limited (e.g., in orchards or inside buildings).

Recommendations for Test Performance and Interpretation From the Second National Conference on Serologic Diagnosis of Lyme Disease

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THE Association of State and Territorial Public Health Laboratory Directors, CDC, the Food and Drug Administration, the National Institutes of Health, the Council of State and Territorial Epidemiologists, and the National Committee for Clinical Laboratory Standards cosponsored the Second National Conference on Serologic Diagnosis of Lyme Disease held October 27-29, 1994. Conference recommendations were grouped into four categories: (1) serologic test performance and interpretation, (2) quality-assurance practices, (3) new test evaluation and clearance, and (4) communication of developments in Lyme disease (LD) testing. This report presents recommendations for serologic test performance and interpretation, which included substantial changes in the recommended tests and their interpretation for the serodiagnosis of LD.

A two-test approach for active disease and for previous infection using a sensitive enzyme immunoassay (EIA) or immunofluorescent assay (IFA) followed by a Western immunoblot was the algorithm of choice. All specimens positive or equivocal by a sensitive EIA or IFA should be tested by a standardized Western immunoblot. Specimens negative by a sensitive EIA or IFA need not be tested further. When Western immunoblot is used during the first 4 weeks of disease onset (early LD), both immunoglobulin M (IgM) and immunoglobulin G (IgG) procedures should be performed.

A positive IgM test result alone is not recommended for use in determining active disease in persons with illness >1 month's duration because the likelihood of a false-positive test result for a current infection is high for these persons. If a patient with suspected early LD has a negative serology, serologic evidence of infection is best obtained by testing of paired acute- and convalescent-phase serum samples. Serum samples from persons with disseminated or late-stage LD almost always have a strong IgG response to *Borrelia burgdorferi* antigens.

It was recommended that an IgM immunoblot be considered positive if two of the following three bands are present: 24 kDa (OspC),* 39 kDa (BmpA), and 41 kDa (Fla).[1] It was further recommended that an that IgG immunoblot be considered positive if five of the following 10 bands are present: 18 kDa, 21 kDa (OspC),* 28 kDa, 30 kDa, 39 kDa (BmpA), 41 kDa (Fla), 45 kDa, 58 kDa (not GroEL), 66 kDa, and 93 kDa.[2]

The details of both plenary sessions and the work group deliberations are included in the publication of the proceedings, which is available from the Association of State and Territorial Public Health Laboratory Directors; telephone (202) 822-5227.

References

1. Engstrom SM, Shoop E, Johnson RC. Immunoblot interpretation criteria for serodiagnosis of early Lyme disease. J Clin Microbiol 1995;33:419-22.
2. Dressler F, Whelan JA, Reinhart BN, Steere AC. Western blotting in the serodiagnosis of Lyme disease. J Infect Dis 1993;167:392-400.

*The apparent molecular mass of OspC is dependent on the strain of *B. burgdorferi* being tested. The 24 kDa and 21 kDa proteins referred to are the same.

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IN THE article, "Human Granulocytic Ehrlichiosis—New York, 1995" (*JAMA*. 1995;274:867), the fourth and new fifth sentences of the first paragraph of the Editorial Note should read: "*E. chaffeensis* has most commonly been identified in the Lone Star tick (*Amblyomma americanum*).[6] HGE patients reported having been bitten by "deer ticks" and "wood ticks" (possibly *I. scapularis* and *Dermacentor variabilis*, respectively).[2]" The new reference 6 is: Anderson BE, Sims KG, Olson JG, et al. *Amblyomma americanum*: a potential vector of human ehrlichiosis. *Am J Trop Med Hyg* 1993;49:239-44.