



H193 Tractor-Related Fatalities

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Learning Overview: After attending this presentation, attendees will be more familiar with the variety of environmental and occupational settings in which tractor-related fatalities can occur, as well as trends in certification of these deaths.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by quantifying the frequency of physical injuries associated with tractor-related fatalities and examining the relationship of these traumatic injuries to underlying medical conditions, which can aid forensic pathologists in elucidating the medically relevant contributions to a given fatality.

Tractor-related fatalities remain a significant cause of preventable deaths, despite governmental attempts to reduce their prevalence. Approximately half of all agricultural fatalities are associated with farm tractor accidents.¹ The rural setting of many of these accidents also results in delayed transportation and treatment; the majority of deaths occur at the site of the accident.² These fatalities can vary widely by mechanism of death, contributions from underlying natural disease, environmental settings, and affected population. The majority of tractor-related fatalities involve overturned tractors, also known as tractor “rollovers.” The most common injury pattern leading to death in these fatalities is crushing of the chest from the weight of the overturned tractor. While tractor-related fatalities most commonly affect farmers, a significant portion of these deaths affect other occupations, including construction and manufacturing workers, military personnel, students, and others.³

This study hypothesizes that most tractor-related fatalities are accidental deaths and that most of these accidents include a component of asphyxia.

For the purposes of this study, a “tractor” is considered a four-wheeled or tracklaying automotive vehicle used especially for drawing heavy equipment; this also includes riding lawn mowers. This study examined a series of cases in which death occurred in the setting of tractor operation. To capture all tractor-related deaths, a search was conducted using multiple methods, including searching for the term “tractor” in the investigator narrative of the investigative report, in the *Vehicle Type* of the investigative report, and in the *Injury Description* of the death certificate. A search was also conducted for the term “lawn” in the *Injury Description* of the death certificate. This study includes cases investigated by medical examiners across multiple counties in Michigan from 2008 to 2018.

A total of 126 potential tractor-related cases were identified using the above search techniques. Of these 126 cases, 35 met the criteria for the purpose of this analysis. These decedents ranged in age from 1 to 90 years, with mean and median ages of 61 and 63 years, respectively. Only four (11%) of the 35 decedents were female. The majority of these deaths (77%) were certified as accidental; this study also located two (6%) suicides and six (17%) natural deaths related to tractor operation. Four of the deaths occurred at work, while 26 were not at work, and the remaining five deaths were unknown. Only two of the decedents were not the operator of the tractors at the time of the incidents; this included a 2-year-old passenger and a 1-year-old pedestrian. Of the 29 non-natural deaths, eight involved an overturned tractor causing blunt force injury and/or asphyxiation of the operator. Six of these 29 deaths involved a tractor versus a moving vehicle, including a snowmobile versus tractor, a moped versus tractor, and four lawn tractors versus cars. The remaining non-natural deaths included three fallen tree branches, three falls from the tractor, three carbon monoxide poisonings, two drownings, two pedestrians run over by the tractor, an entanglement in the tractor machinery, and a farm animal attack.

As hypothesized, the majority of tractor-related fatalities examined were accidental deaths. Notably, a minority of these accidental deaths involved asphyxia due to an overturned tractor. To conclude, tractor-related fatalities include a wide variety of causes of death, often occur outside of an occupational setting, and involve a wide age-range of decedents.

Reference(s):

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2. Gassend J., Bakovic M., Mayer D., Strinovic D., Skavic J., Petroveckii V. Tractor Driving and Alcohol: A Highly Hazardous Combination. *Forensic Science International Supplement Series* 2009;1(1): 76-79.
3. Goodman R., Smith J., Sikes R., et al. Fatalities Associated With Farm Tractors: An Epidemiologic Study. *Public Health Rep.* 1985;100(3): 329-333.

Tractor, Lawn Mower, Traumatic Asphyxia