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NIOSH national survey of long-haul truck drivers: Injury and safety

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ABSTRACT

Approximately 1,701,500 people were employed as heavy and tractor-trailer truck drivers in the United States in 2012. The majority of them were long-haul truck drivers (LHTDs). There are limited data on occupational injury and safety in LHTDs, which prompted a targeted national survey. The National Institute of Occupational Safety and Health conducted a nationally representative survey of 1265 LHTDs at 32 truck stops across the contiguous United States in 2010. Data were collected on truck crashes, near misses, moving violations, work-related injuries, work environment, safety climate, driver training, job satisfaction, and driving behaviors. Results suggested that an estimated 2.6% of LHTDs reported a truck crash in 2010, 35% reported at least one crash while working as an LHTD, 24% reported at least one near miss in the previous 7 days, 17% reported at least one moving violation ticket and 4.7% reported a non-crash injury involving days away from work in the previous 12 months. The majority (68%) of non-crash injuries among company drivers were not reported to employers. An estimate of 73% of LHTDs (16% often and 58% sometimes) perceived their delivery schedules unrealistically tight; 24% often continued driving despite fatigue, bad weather, or heavy traffic because they needed to deliver or pick up a load at a given time; 4.5% often drove 10 miles per hours or more over the speed limit; 6.0% never wore a seatbelt; 36% were often frustrated by other drivers on the road; 35% often had to wait for access to a loading dock; 37% reported being noncompliant with hours-of-service rules (10% often and 27% sometimes); 38% of LHTDs perceived their entry-level training inadequate; and 15% did not feel that safety of workers was a high priority with their management. This survey brings to light a number of important safety issues for further research and interventions, e.g., high prevalence of truck crashes, injury underreporting, unrealistically tight delivery schedules, noncompliance with hours-of-service rules, and inadequate entry-level training.
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1. Introduction

According to the Bureau of Labor Statistics (BLS), approximately 1,701,500 people were employed as heavy and tractor-trailer truck drivers in the United States in 2012 (BLS, 2014a). The majority of these drivers were over-the-road or long-haul truck drivers (LHTDs), meaning they delivered goods over intercity routes that may span several states (BLS, 2014a). Heavy and tractor-trailer truck drivers were 12 times more likely to die on the job and 3 times more likely to suffer an injury involving days away from work than the U.S. general worker population (Chen et al., 2014; BLS, 2014b). In 2012, 695 heavy and tractor-trailer truck drivers died on the job, the largest number of work-related fatalities in a single occupation. The majority (488/695 or 70%) of these fatalities were caused by motor vehicle crashes. Truck driver safety is not only a national occupational safety priority (NIOSH, 2009) but also a general public health concern because of the high death toll of truck crashes among both drivers and occupants of other vehicles and the economic burden of truck crashes on society. In 2012, there were

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3464 large trucks that were involved in fatal crashes, 73,000 were involved in injury crashes, and 241,000 were involved in property-damage-only crashes (FMCSA, 2014a). In the aggregate, for each large-truck driver death, six other persons (persons in other vehicles, pedestrians, or cyclists) died in truck crashes (FMCSA, 2014b). Motor vehicle crashes involving large trucks and buses cost the U.S. economy an estimated $99 billion in 2012 (FMCSA, 2014a). The cost included productivity losses, property damage, medical costs, rehabilitation costs, travel delay, legal and court costs, emergency services (such as medical, police, and fire services), insurance administration costs, and the costs to employers (Blincoe et al., 2002).

Most of the existing studies of commercial truck driver safety in industrialized nations have focused on the risk of roadway truck crashes. These studies suggest an array of factors may increase the risk of roadway truck crashes. These risk factors can be grouped into individual differences, work environment, and safety climate. Individual risk factors may include age, sleep apnea, fatigue, distracted driving, speeding, and number of moving violation tickets received in the previous 12 months, etc. (Bunn et al., 2005, 2009; Bunn et al., 2012, 2013; Apostolopoulos et al., 2010; ATRI, 2011; FMCSA, 2007, 2012a; Sabbagh-Ehrlich et al., 2005; Bigelow et al., 2012; Heaton et al., 2008; Brodie et al., 2009). Work environmental risk factors may include long work hours, tight delivery schedule, being paid by-the-mile/kilometer, road and traffic conditions (Belzer, 2012; Belzer et al., 2002; Stevenson et al., 2010; Quinlan and Wright, 2008; Birdsey et al., 2010; Hanowski et al., 2007, 2009; Chen and Chen, 2011; Khorashadi et al., 2005). Truck drivers can be influenced by the pressures, beliefs, instructions, and safety policies of the company in which they work. The company safety climate could have an influence on their driving behaviors (Zohar, 2010; Boyle et al., 2010; Brady et al., 2009; Chen et al., 2015; NIOSH, 2007). Unsafe driving behaviors are the risk factors for motor vehicle crashes (ATRI, 2011; NHTSA, 2014; AAA Foundation for Traffic Safety, 2015; CDC, 2015).

Truck drivers are a mobile and difficult to reach population because they are on the road away from home most of the time. As a result, the majority of previous studies of LHTD safety were often on a small scale, used a convenience sample (Chen and Chen, 2011; Bunn et al., 2013; Khorashadi et al., 2005; Stevenson et al., 2010), examined one or a few risk factors at a time (ATRI, 2011), or included only a subgroup of LHTDs (e.g., independent owner operators or company drivers) (Birdsey et al., 2010). Results from these studies were thus often not generalizable to all LHTDs in the United States.

In 2010, the National Institute for Occupational Safety and Health (NIOSH) conducted the National Survey of LHTD Health and Injury (Sieber et al., 2014). The objective of the NIOSH survey was to assess the prevalence of selected health outcomes and injuries from a nationally representative sample of U.S. LHTDs. While results from the health component of the survey and the survey methodology were reported in Sieber et al. (2014), this paper presents the descriptive analysis showing results of the injury and safety component of the NIOSH LHTD survey. More in-depth analysis of the survey data is forthcoming. The goal of this paper is to provide descriptive data on truck crashes, work-related injuries, work environments, safety climate, driver training, job satisfaction, and driving behaviors among U.S. LHTDs.

2. Methods

2.1. Survey methods and study population

The NIOSH survey was a cross-sectional, personal interview of LHTDs at 32 truck stops along select interstate highways across the contiguous United States in October to December 2010. A complex three-stage sampling process was used to achieve a best possible nationally representative sample of LHTDs: (1) a selection of interstate or other limited-access highway sections, (2) a selection of individual truck stops along the selected highway sections, and (3) a selection of drivers for interview at the selected truck stops.

LHTDs were eligible for the survey if they had driven a truck with three or more axles as their main job for at least 12 months and took at least one mandatory 10-h rest period away from home during each delivery run. Eligible drivers were asked to participate in the survey and provided informed consent. If eligible drivers were not willing or unable to participate in the full-length interview due to time or other constraints, they were asked to participate in a short non-respondent interview that collected basic demographic information. As a result of the data collection, 1265 LHTDs completed the full interview. Details of the sampling design, survey administration, data collection, and response rate can be found in Sieber et al. (2014).

2.2. Questionnaire development

In the development of the survey instrument, a stakeholder meeting was conducted to solicit input. Participants in the stakeholder meeting included representatives from the trucking industry, Owner Operator Independent Drivers Association, unions, Federal Motor Carrier Safety Administration (FMCSA), academia, and other truck and roadway safety organizations. The injury questionnaire was designed to collect date on roadway safety, work-related injuries (truck crash injuries and non-crash injuries), work environment, safety culture, drivers' opinions on their training, and drivers' attitudes. Truck driver demographic and employment history questions were adapted from Belman and Monaco (2004). The draft questionnaire was reviewed by truck safety and survey design experts from academia and governmental agencies. Two cognitive tests and one pretest were conducted with LHTDs to evaluate the questionnaire and survey administration. The survey was approved by both the Office of Management and Budget (OMB no. 0920-0865) and the NIOSH Human Subjects Review Board. The questionnaire is available from the authors upon request.

2.3. Measures of injury and safety

Three roadway safety outcomes were measured: (1) number of Department of Transportation (DOT) recordable truck crashes since working as a LHTD and in what calendar year the first and the most recent crash occurred. A DOT recordable crash is a truck crash on a public road in intrastate or interstate commerce that resulted in a fatality, an injury to a person requiring immediate treatment away from the scene of the accident, or disabling damage to a vehicle, requiring it to be towed (FMCSA, 2013). In this study, two truck crash totals were tabulated, the number of crashes in 2010 and the cumulative number of crashes since working as a LHTD. (2) Number of a near miss in the previous 7 days. A near miss was defined as an incident on a public road that made the truck driver feel lucky not to have been in a crash while driving a truck at work. (3) Number of moving violation tickets in the previous 12 months.

Truck crash injuries and work-related non-crash injuries were collected separately. A truck crash injury was defined as an injury caused by a truck crash which required immediate medical attention by a doctor, nurse, paramedic, or other health professional. The truck crash injury data were restricted to those occurred in the most recent crash. A non-crash injury was defined as a work-related injury which required the worker to visit a doctor or other health professional. Non-crash injuries were restricted to those that occurred in the previous 12 months. The definition of lost work day