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Work characteristics associated with injury among light/short-haul transport drivers

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ABSTRACT

Introduction: This study aims to describe the hazard environment facing drivers of light freight vehicles and short-haul transport drivers and to examine the relationships between hazard exposure and injury.
Methods: Drivers ($n = 321$) of rigid vehicles up to 12 tonnes Gross Vehicle Mass working within a 100 km radius of their base across the Australian state of New South Wales were surveyed regarding their experience of occupation-specific hazards and their experience of workplace injury in the past year.
Results: Principal components analysis identified four clusters of hazards corresponding to those associated with work organisation, vehicles, road and access, and interpersonal conflict. In logistic regression analysis, work organisation and vehicle-related hazards, explained unique variance in the experience of injury in the past year. However, frequent stress replaced work organisation when included as a predictor in the analysis.
Conclusions: Drivers' most common safety concern (road and driving issues) reflected the frequency of their exposure to road and access hazards but did not parallel their injury experience. Examination of the hazards most strongly associated with injury suggest that industry risk management efforts should target work organisation and vehicle-related hazards, and particularly work practices that engender frequent stress among drivers.

1. Introduction

Safety at work depends, fundamentally, upon the hazard environment of the job—the number of different hazards present, the likelihood that each particular hazard will be experienced (i.e., exposure), the likelihood (i.e., risk) that an exposure to a particular hazard will result in injury, and the severity of any potential injury. The hazard profile of a job reflects the interactions between the physical workplace and tasks, person and interpersonal factors, management operations and the external environment in which the organisation operates (Makin and Winder, 2008). Understanding the specific hazard profile of a particular workplace or job is central to the Risk Management (RM) approach to Occupational Health and Safety (OHS) adopted in many countries, including Australia. On the ground, RM typically involves the conduct of workplace risk assessments to identify and prioritise hazards on the basis of exposure frequency, risk, and potential injury severity. Safety management then involves removing hazards, reducing exposure, and/or lessening the impact of exposures. In individual workplaces, risk assessment is often conducted using omnibus checklists that have several potential problems: (i) reliance on subjective risk assessments that are uninformed by safety outcomes to set hazard priorities, (ii) inappropriately broad coverage of potential hazards, and (iii) engendering a bias toward discrete, observable, physical hazards at the expense of work and management processes.

This paper describes the hazard environment for one common but understudied occupational group—drivers in the light and short haul road transport sector. An empirical strategy is used to identify dimensions of hazard relevant to drivers and to prioritise those hazard dimensions according to their relationships with reported injury outcomes.

Light and short haul (LSH) transport drivers carry goods over relatively short (local) distances using vans or small trucks. Light goods vehicles and drivers far outnumber heavy vehicles in the freight fleet. In Australia in 2008, around 80–90% of registered freight-carrying vehicles were light goods vehicles (Australian Bureau of Statistics, 2009). LSH drivers typically collect or deliver freight items directly from or to individual end users, they make large numbers of freight stops per shift, much of their driving is urban and they are predominantly day workers (Friswell and

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Williamson, 2008). This work profile is very different to that reported for long distance heavy vehicle drivers (Williamson et al., 2001), yet isolating information about light and short haul drivers and the particular OHS issues posed by their work is difficult. In Australia, formal sources of occupational and OHS data, such as the national Census and workers' compensation datasets, do not distinguish well between different types of professional drivers and, in the latter case, do not provide full workforce coverage (Larsson and Field, 2002). Similarly, vehicle registration and road crash data do not distinguish well between light vehicles used for freight-carrying and those used for other work and non-work purposes (Stuckey and LaMontagne, 2005).

Despite shortcomings, Australian national OHS data (Safe Work Australia) show that manual handling is the most common cause of occupational injuries requiring at least one week's absence among all types of employee, goods drivers. In 2004/2005, the year the current study data were collected, professional drivers ranging from long distance heavy vehicle drivers to fast food delivery drivers were compensated primarily for workplace injuries involving sprains and strains (60%). The mechanisms of injury were typically body stressing (34%), falls/trips/slips (30%), hit by moving object (15%) and vehicle accidents (12%) and most commonly affected the back (22%), shoulder (11%), knees (10%), hands (8%) and ankles (8%). Larsson and Field (2002) examined non-fatal injury compensation claims for light commercial car and delivery (including taxi) drivers in the state of Victoria and recommended that this group receive priority intervention efforts because both the incidence and severity of compensation claims were considerably higher than the average occupation (four times and 40%, respectively). The high incidence figures were primarily a reflection of manual handling claims whereas the high severity score was underpinned by falls, vehicle crashes and cargo-related hit/crush incidents.

Compensation claim data and narrative text analyses of injury event descriptions (Brooks, 2008; Shibuya et al., 2010) shed some light on accident processes and the immediate physical and temporal antecedents of certain types of injuries but they provide limited guidance about the preconditions of injury events and the range of work characteristics that should be targeted in prevention efforts. In one of the only studies that has looked more broadly at the hazard experience for LSH drivers, groups of drivers in the US reported the causes of driving and non-driving incidents and close calls that they had experienced or heard about (Hanowski et al., 1999). The most consistently cited and highest ranked causes of potentially injurious events were drivers of other light vehicles, particularly car drivers, stress due to time pressure, inattention, and roadway and dock design. The extent to which these perceived threats to safety translated into injuries, however, was not assessed. Consequently, the current paper aims to describe the hazard environment experienced by light and short haul drivers in the Australian state of NSW and to examine the relationships between reported workplace hazard exposures and recent injury experiences.

2. Method

2.1. Design

This study employed a cross-sectional design (self-report survey) to gather information about the work and Occupational Health and Safety issues of concern to drivers in the light and short-haul transport industry. Light transport was defined as the carriage of goods, other than tools of trade, in rigid vehicles up to and including 12 tonnes Gross Vehicle Mass (GVM). Short haul work was defined as occurring within a 100 km radius of base.

2.2. Survey instrument

Semi-structured interviews and group discussions were held with drivers, company operations and safety managers, and other industry stakeholders to gather information about the structure of the industry, the nature and organisation of drivers' work in different industry subsectors, and Occupational Health and Safety issues affecting drivers. This information informed the development of the survey.

The survey covered a wide range of work and safety topics and took approximately one hour to complete. Only those measures used in the current analyses are described in detail here. The full survey is appended to Friswell et al. (2006).

Survey questions addressed four main areas:

(i) Driver Information including age and sex.
(ii) Usual Work Information including industry experience and current employment circumstances.
(iii) Fatigue experiences. Information about the fatigue measures and findings has been reported elsewhere (Friswell and Williamson, 2008).
(iv) OHS hazards and experiences.

Drivers listed the top three safety problems that they faced in their job. Responses were examined for repeated themes and a two tiered classification system was developed to (a) code particular types of problems and (b) condense these problems into overarching classes (road/driving issues, physical nature and effects of work, depot/site issues, driver states, work organisation issues, freight/load issues, and vehicle-related issues). Responses were coded by consensus between two coders.

Drivers were asked how often they engaged in a number of illegal and potentially dangerous activities while driving for work; speeding, failing to wear a seat belt, illegal parking, running red traffic lights, disobeying traffic signs, and having blood alcohol over the legal limit. Responses were recorded on a six-point scale (Never, Rarely, One or two times a month, Once a week, A few times a week, Every day) and coded 0 (Never) through 5 (Every day). Drivers who engaged in these activities at least once a week were also asked to report why they did so.

Using the same six-point scale described above, drivers also indicated how often they experienced a list of potential safety hazards at work. These included difficulties with freight movement, site access, vehicle design and operation, working hours and time pressure, interpersonal conflict, and road conditions. The experience of stress was included as one of the hazards.

The occurrence of an injury at work in the preceding 12 months and the length of the absence from work for the most recent of these injuries was recorded.

Simplified, occupation-specific categories were devised to record the events leading to the most recent injury in the last year, the bodily locations of those injuries, and the types of injury experienced. The categories were derived from the Type of Occurrence Classification Scheme (National Occupational Health and Safety Commission, 2004) and the information gathered from industry stakeholders prior to the study. The customisation of categories was done to reduce the number presented to participants (e.g., mechanisms and agents of injury could be combined), and to provide more concrete response options (e.g., 'hit or crushed by freight' rather than 'hit by moving object' or 'hit by falling object'). Participants who reported a workplace injury in the past year selected the categories that best described their most recent injury event.