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Heavy vehicle driver fatalities: Learning's from fatal road crash investigations in Victoria

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ABSTRACT

This study describes the nature and extent of fatal heavy vehicle driver crashes in Victoria between 1999 and 2007 and the factors associated with the crash.

A descriptive study was conducted comprising the population of heavy vehicle drivers killed in a road transport crash while operating a vehicle of ≥4.5 tonne Gross Vehicle Mass (GVM) for the purposes of work. Information about the nature of crash, environmental, driver, vehicle and occupational factors were collected from the coroner's death investigation file.

Of the 91 deaths identified 61 were eligible for review. All 61 cases were male, solo drivers with a mean age of 44.7 years. Most vehicles were articulated in configuration. One-third of crash scenarios involved a single vehicle leaving the roadway on a straight road. One in every six fatally injured drivers was detected with the presence of stimulants or cannabis. Twenty-two drivers were travelling at excessive or inappropriate speeds for the circumstances. Seatbelt wearing status was documented for only 25 of 61 drivers.

This study is the first to comprehensively examine a population of fatally injured heavy vehicle drivers using coroner's investigation files and these findings are consistent with previous, less detailed, Australian research. Information about potential associations between occupational factors and crash risk was limited. Improving driver safety requires incorporation of occupational factors into a standardised approach to heavy vehicle crash investigations.

1. Introduction

The transport and logistics industry plays a significant role in the Australian economy, employing almost 5% of the Australian workforce (National Road Transport Commission [NRTC], 2003). The Australian road transport industry is growing both in terms of freight task and vehicle numbers. Heavy vehicles deliver 72% of the total freight task in Australia, an increase of approximately 40% over the decade preceding 2003 (NRTC, 2003). The rate of growth is predicted to double by 2020 (NRTC, 2003). Between 2003 and 2007 the number of heavy vehicles (rigid, articulated and non-freight carrying types) in Australia increased on average by 14.3% (Australian Bureau of Statistics [ABS], 2007) and future increases of heavy vehicles numbers are expected.

Transport is the most common setting of work-related death in Australia. Heavy vehicle driving occupations comprise the vast majority of these deaths (Harrison et al., 1993; Mitchell et al., 2004; Boufous and Williamson, 2006). A decrease in the transport and storage industry work-related road fatality rate per 100,000 workers has occurred (from 21.5 to 15.5; from 1982–1984 to 1989–1992) (Mitchell et al., 2004). However, the industry currently has the second highest fatality rate in Australia (12.3 deaths per 100,000 employed persons) after agriculture, forestry and fishing (Australian Safety and Compensation Council, 2008). Heavy vehicle transport crashes are estimated to account for AUD $2 billion per year (NRTC, 2003).

The health and safety of employees directly involved in the transport and logistics industry has been recognised in Victoria and nationally via increased regulation, including the 'chain of responsibility' concept (VicRoads, 2008). This places greater emphasis on driving hour limits, vehicle load restraints, and mass and dimension limits. Further measures are still needed to reduce the incidence of heavy vehicle transport crashes.

Opportunities remain to advance the safety of heavy vehicle drivers through learnings from fatal crash investigations and the systematic analysis of contributing factors. Extensive information is generated through death investigations involving the coroner, police and the occupational health and safety authority.

Deaths resulting from road crashes in Victoria, Australia are legally required to be reported to the coroner for investigation, as stated in the Coroner's Act, 1985 (Vic). At the completion of the coroner's investigation a finding must be made which states: the

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identity of the deceased; cause of death and circumstances of the death. A coroner may decide to hold a public inquest to investigate a death where the circumstances are unclear or where issues of public importance are present. The coroner may also formulate recommendations on public health and safety and the administration of justice.

Victoria Police are delegated responsibility for the conduct of the death investigation and the preparation of a brief of evidence for the coroner, which is used to inform the coroner's finding. Crashes of a serious nature (i.e. where three or more persons are fatally injured) are investigated by the Major Collision Investigation Unit (MCIU) of Victoria Police, an expert branch in crash investigation and reconstruction. The occupational health and safety authority of Victoria may also investigate work-related deaths and provide a brief of evidence to the coroner. On-road transport deaths of working drivers are not routinely investigated as they do not typically fall within their investigative jurisdiction, unless a work-related factor to a transport crash is specifically identified or suspected.

Identification of existing and emerging factors associated with heavy vehicle crashes resulting in the driver's death is necessary to inform the development of targeted prevention strategies. Information drawn from a coroner's investigation is vital to facilitate risk identification and strengthen countermeasure development.

1.1. Aim

This study aims to describe the nature and extent of fatal heavy vehicle driver crashes in Victoria and the factors associated with the crash as identified in the coroner's investigation file.

2. Methods

2.1. Research design

The research design was a descriptive study comprising the total population of heavy vehicle drivers killed in a road transport crash while operating a vehicle of ≥4.5 tonne Gross Vehicle Mass (GVM) for the purposes of work in Victoria.

A comprehensive standardised data set was collected for each case from the coroner's death investigation file. The presence or absence of each variable and the information source was recorded. The variables were primarily categorical and a limited number descriptive. Variables included:

(a) demographics (age, gender, residential state);
(b) cause of death;
(c) nature of crash (number of vehicles involved, description of crash);
(d) environmental factors (road configuration, weather, region);
(e) driver factors (forensic toxicology, health status, seatbelt compliance, speed, driving experience, driving and rest hours);
(f) vehicle factors (make, model, year of manufacture, load details, vehicle defects);
(g) occupational factors (driving hours, employment arrangements, supervision, work pressure, training and competency); and
(h) crash causation.

A legal finding on causation was determined by a coroner in a finding or, if not specified, the investigating police officer's conclusion. Causation was not the central focus of the current study.

Dataset development drew on existing national and international data sets and classification systems including the National Coroners Information System (NCIS) (NCIS, 2007), Australian Transport Safety Bureau Road Fatalities Crash Database (ATSB, 2007a), the International Statistical Classification of Diseases and Related Health Problems, 10th Revision (World Health Organisation, 2004), Australian and New Zealand Standard Classification of Occupation (Australian Bureau of Statistics, 2006) and Workplace Injury and Disease Recording Standard (AS, 1885) developed by WorkSafe and Standards Australia. Local government area coding specified the region of incident (Local Government Victoria, 2008) and Definitions for Coding Accidents (DCA) described the type of crash (VicRoads, 2007). Experts in crash investigation, coroner's data and road safety assessed each variable for inclusion.

2.2. Ethics

Ethics approval was granted by the Victorian Institute of Forensic Medicine Ethics Committee and approval for access to coroners' records was granted by the State Coroner of Victoria.

2.3. Data source

The state-based coronial system is the primary source of comprehensive information on work-related fatalities in Australia (Driscoll, 2003). The coroner's investigation file was deemed the most appropriate resource available to obtain the level of information required.

A diverse range of material (55 individual pieces identified) was available from the coroner's investigation file. Files typically consisted of a forensic autopsy report, forensic toxicology report, coroner's finding and the brief of evidence ('brief') compiled by the investigating police officer. A brief generally consisted of witness statements (employer, work colleagues, family or friends, incident witness), photographs, maps, driver log books, a mechanical inspection report and other relevant exhibits.

The entire brief was unable to be obtained for three driver deaths (resulting from two separate incidents). These cases have been included although data was missing for some variables.

2.4. Inclusion criteria and definitions

The study comprised the entire population of fatally injured truck drivers over a 9-year period in the State of Victoria. Cases under investigation by the coroner must be excluded as the Victorian State Coroner's Office and the Ethics Committee does not permit open investigations to be included for research purposes. Moreover, coronial records of deaths under investigation are not accessible.

The study population comprised all fatalities satisfying the following criteria:

- incident resulting in death reported to the Victorian State Coroner's Office between 1 January 1999 and 31 December 2007;
- death resulted from an 'external cause';
- deceased was the driver of a heavy vehicle;
- vehicle operated by the deceased had a GVM of ≥4.5 tonne;
- heavy vehicle was being used for a work activity;
- crash occurred on a public road (including emergency lanes);
- crash was unintentional; and
- the coroner's investigation was completed and formally closed by 30 June 2008.

Deaths of drivers resulting from natural or unascertained causes were excluded from the study. Public transport vehicles, special purpose vehicles (e.g. tractor, forklift), emergency service vehicles and rail vehicles (e.g. trams or trains) were also excluded.

The definition of a heavy vehicle can vary according to GVM and vehicle purpose. The Victorian state licencing authority defines