

USING CORONER'S NARRATIVE DATA TO IDENTIFY WORK-RELATED ROAD-TRAFFIC FATALITIES IN IRELAND

A. DRUMMOND

School of Public Health and Population Science, University College Dublin, Ireland.

D. A. CUSACK

Forensic and Legal Medicine, School of Medicine and Medical Science, University College Dublin, and Coroner, Co. Kildare, Ireland.

ABSTRACT

International research shows that the true extent of work-related road traffic deaths is not reflected in official statistics because of limitations in data collection systems. In Ireland, and other countries, it is difficult to ascertain how many road traffic collisions involve persons at work; however, it is known that many employees drive for a living, work close to public roads, and are at risk as pedestrians and as passengers in vehicles in the course of their work. Road transport is the dominant mode of moving goods in Ireland (about 93%) and is likely to remain so.

The aim of this study was to explore the differences in the work-related road traffic fatality data collected by different agencies in one administrative geographical area (a county), in the Republic of Ireland. The study explored the differences over three years (2002-2004), with three national datasets: the County's coronial road traffic records; fatality data from the national Health and Safety Authority; and the National Roads Authority dataset.

Narrative data in 45 road traffic coronial files were examined, and classified (independently by 2 researchers) as: worker death, by-stander death, death with worker involvement, or not work-related. Cases were matched with data in the other datasets.

Eighteen percent of the 45 road traffic fatalities identified in the coroner's data placed the victim either at work or killed as a result of another person's work activity (by-stander). When 'worker-involvement' cases are included, 36% of the fatal road traffic incidents directly or indirectly involved at least one person who was at work.

Results revealed flaws in the work-related death data capture system, which result in failure to capture occupational road fatalities, and underestimation of the extent of the problem. Use of narrative coroner data facilitated identification of cases of work-related death and highlighted the need for occupational road risk prevention strategies.

1. INTRODUCTION

Road traffic injuries, and their prevention, are a growing global public health problem (World Health Organisation, 2004). Prevention strategies, such as enforcement of legislation to control speed and alcohol consumption, use of seatbelts and crash helmets, and safer design of roads and vehicles have helped to reduce the incidence and impact of road traffic collisions in high-income countries. Prevention strategies are based on collaborative approaches from a variety of agencies involved in enforcement, planning, infrastructure, health and research (transport ministries, police, legislators). Despite national and international efforts the scale of the problem in Europe remains large. In order to address the problem and to evaluate the effectiveness of interventions, collection of data on the incidence and types of crashes, and the circumstances surrounding incidents are necessary. International comparisons are limited by differences in definitions and collection methodologies, but fatality rates can be relatively easily compared.

The World Health Organisation estimates that 1.18 million people died from road traffic collisions in 2002, and that 127,000 persons lose their lives in the European region annually as a result (Racioppi et al. 2004). Road-traffic fatalities are the leading cause of death for citizens aged 45 and under in Europe (European Transport Safety Council, 2006), and in Ireland, road-traffic fatalities have been found to be the leading cause of unintentional injury death (Scallan et al. 2004). In 2006, 365 persons were killed on Irish roads (Road Safety Authority, 2007), with a fatality rate per million population of 86.

International and national statistics provide analyses of road traffic collisions from a variety of perspectives, but it is rare to see any reference to the 'work-relatedness' of collisions. One hundred of the vehicles involved in the 365 fatal incidents in Ireland in 2006 were either goods or public service vehicles (Road Safety Authority, 2007), implying a work-relatedness in a substantial proportion of the incidents, however, in general, it is quite simply not known how many road traffic collisions are work-related. With road transport currently, and predicted to remain, the dominant mode of moving goods in Ireland (Department of Transport, 2005) it is likely that many road-traffic fatalities involve persons at work. It is also known that many employees drive for a living, or work close to public roads, in addition to being at risk as pedestrians and as passengers in vehicles in the course of their work. Yet, Irish and international research shows that the extent of work-related road traffic deaths is not reflected in official statistics; this is generally considered to be due to limitations in data collection systems (European Commission, 2001; Pratt, 2003; New Zealand Environmental and Occupational Health Research Centre, 2003). Even in countries where work-relatedness is factored into data collection, underestimation remains an issue (Harrison et al. 1993; Work-Related Road Safety Task Group, 2001a and b; Driscoll et al. 2005).

In the Republic of Ireland road traffic collision data is currently collated and reported by the Road Safety Authority (RSA), a body established in 2006 to take a lead role in road safety. Data on collisions is collected at the roadside by the police, and a fatal incident one where death occurs within 30 days of the incident. Work-related fatality data is collected by the national Health and Safety Authority (HSA). Work-related deaths, which occur within one year of a work incident, must be reported to the Authority by the employer.

There are flaws in the system, however: a) the HSA is often not notified of work-related road-traffic fatalities, and b) the police do not have an 'at work' or 'involved in work activity' option available when collecting data, therefore this information is not captured. In addition, while category of vehicle data collected by the police includes options for 'goods vehicles' and 'public service vehicles', which can suggest a work-relatedness, there is no means of capturing whether or not those who are driving private vehicles are driving for work purposes at the time of the collision (Drummond, 2007).

This problem is not unique to Ireland; similar difficulties have been reported in the United Kingdom (Work-Related Road Safety Task Group, 2001a, 2001b; Health and Safety Commission, 2006). In fact, because reliable data on fatal road traffic and transport accidents is not available in the UK and Ireland, Eurostat excludes road traffic and transport fatalities from all other countries to calculate the fatal incidence rate at work for all member states (Eurostat, 2005).

Experience internationally suggests that a multifaceted approach is needed and that no single source will supply the answer. In the United States a national analysis of work-related death certificates, covering deaths in the period 1980-1995, found that the leading cause (23%) of work-related fatalities was motor vehicle crashes (Marsh and Layne, 2001). The National Census of Fatal Occupational Injuries (CFOI), carried out by the American Bureau for Labour Statistics, reported highway incidents as the highest cause of occupational fatalities on a year-on-year basis (US Department of Labour, 2004). This census uses multiple state and federal data sources (death certificates, workers' compensation records, and reports to federal and state agencies) to identify, verify, and profile fatal work injuries. This method assures counts are as complete and accurate as possible and overcomes some of the limitations of using death certificates alone. In Australia (Harrison et al, 1993; Driscoll et

al, 2003) and New Zealand (New Zealand Environmental and Occupational Health Research Centre, 1999 and 2003) research findings from as early as the 1980s, found coronial records to be a very useful means to identify cases, and included a category of 'by-stander death', as well as actual worker deaths (National Occupational Health and Safety Commission, 1998; New Zealand Environmental and Occupational Health Research Centre, 1999). Despite limitations in data collection systems, road-traffic collisions (excluding commuter incidents) are acknowledged to be either the leading or a leading cause of work-related death in most countries that have carried out research in this area.

The aim of this pilot study was to explore the differences in the work-related road traffic fatality data collected by different agencies in an administrative area (county) in the Republic of Ireland, with a view to establishing whether differences existed in the data. This study compared fatality data from three national datasets: coronial road traffic fatality records; work-related fatality data; and the road traffic accident dataset. The geographical administrative area of County Kildare was chosen for analysis. Kildare is a bordering southwest county to Dublin, with a population of approximately 186,000 (Central Statistics Office, 2006), within the commuter area for workers in Dublin city. The main Dublin to Cork road (incorporating one of Ireland's busiest motorways) bisects the county in a south-westerly direction.

2. METHODS

Data for the years 2002, 2003 and 2004 in the geographical area of Co. Kildare were examined. Three data sources were identified for examination: (i) narrative data from the coronial files from the office of the Coroner for Co. Kildare; (ii) published fatality information from the Health and Safety Authority (HSA) annual statistical reports; (iii) National Roads Authority (NRA) dataset.

2.1. Coronial Records

The Coroner is a judicial officer who enquires into sudden and unexplained deaths. An inquest is a hearing, held by the coroner, which enquires into the circumstances surrounding the death to establish the facts and to place those facts on the public record. Where a road traffic collision is the subject of an inquest, it is mandatory for the coroner to sit with a jury. Records of deaths resulting from road traffic collisions were identified using Kildare County Coroner's Register, and coronial files for all road traffic collisions in 2002, 2003 and 2004 were requested. The 45 deaths so identified were verified using the Coroner's Certificate in individual files. Coroner's files contain written depositions from witnesses who can provide information about the circumstances leading up to and following the incident, and from the police. Narrative data in depositions were manually examined to establish the 'work-relatedness' of each incident. Commuting fatalities were not included.

Cases were classified as follows: (i) Worker deaths: if, according to depositions, the victim was engaged in a work-activity at the time of the collision (e.g. driving a truck or van, which was noted to be delivering or collecting goods), the case was classified as a 'worker' death. (ii) By-stander deaths: if one of the parties directly involved in the collision was engaged in a work-activity at the time of the collision, the case was classified as a 'by-stander' death. An example is a case of a pedestrian, knocked down by a van or truck, noted in witness statements to be making deliveries at the time of the collision; thus the truck driver was considered to be at work. By-stander deaths, in the international literature, refer to deaths of persons, usually members of the general public, who are not at work, but who are killed as a result of exposure to a workplace hazard. In Ireland, the Safety, Health and Welfare at Work (General Application) Regulations require the notification of such deaths (Part X, 1, b) to the HSA; such deaths are considered work-related deaths. (iii) Worker-involvement: a number of cases were noted in which the fatally injured party was neither at work, nor killed as a result of exposure to a work-place hazard, but where another person involved in the collision was at work; these cases were classified as 'worker-involvement'. An example is a case where the car in which the victim was traveling veered inexplicably into a public service vehicle or a goods vehicle, the driver of which was at work, but who was neither injured in, nor a factor in the lead-up to, the incident. (iv) Not work-related: if there was no evidence in depositions that any party involved in the incident was at work at the time of the collision, the case was classified as not work-related. All classifications were independently verified by a second researcher; there was 100% agreement on classifications.

2.2 Health and Safety Authority (HSA) fatality statistics

Published annual work-related fatality statistical reports for the calendar years 2002, 2003 and 2004 were examined. The following data is provided: the date of the incident or the date of the fatality, the geographical location (by county) and the age and occupation of the victim, in addition to a brief description of the incident.

2.3 National Roads Authority (NRA) data

Anonymous raw road traffic collision data is available in electronic spreadsheet format for research purposes, from the NRA. Road traffic fatalities for 2002, 2003 and 2004 were extracted from the full data set, and the data for Co. Kildare was identified and extracted for analysis. The effect of differences in fatality definitions used by the HSA (one year after the day of an accident) and the NRA (within 30 days of the incident) was not explored, as the majority of deaths occur at, or shortly after, road traffic collisions.

3. RESULTS

Two 'worker' and 6 'by-stander' deaths were identified in the Coronial files in the specified time period. Four of the six by-stander deaths involved the 'worker' driver being arrested under Road Traffic legislation following the collision; two of the incidents involved pedestrians being knocked down by a vehicle that was making deliveries. Another 8 fatalities within this period were categorised as 'worker-involvement' cases (Table 1).

Table 1. Work-related road traffic deaths (Coroner)

Year	All deaths	Road Traffic deaths	Worker deaths	Bystander deaths	Worker involvement cases	Not work-related
2002	158	15	2	2	1	10
2003	177	15	0	3	5	7
2004	198	15	0	1	2	12
Total	533	45	2	6	8	29

Thus 17.7% of the 45 road traffic fatalities in this area, within the specified time period, were fatalities where the victim was either at work or was killed as a result of another person's work activity. When 'worker-involvement' cases are included, more than one third (35.5%) of the 45 fatal road traffic incidents directly or indirectly involved at least one person who was at work.

Witness lists for cases deemed to be work-related were revealed that none of the inquests were attended by the HSA, however, there is no evidence to suggest that the HSA was ever informed of these deaths.

The Health and Safety Authority (HSA) annual statistical reports for Co. Kildare for 2002 to 2004 inclusive revealed 1 reported work-related fatality in 2002; 2 reported fatalities in 2003; and 1 reported fatality in 2004. Examination of the narrative description of the circumstances of the deaths confirmed that none of these deaths were as a result of, or associated with, road traffic collisions. This data did not match any of the work-related fatality cases identified in the Coroner's files. The HSA accident notification scheme is reliant on the ability of third parties (police, employers) to recognise a road traffic fatality as a work-related death and on their awareness of, and compliance with, relevant legislation and local agreements.

The National Roads Authority (NRA) data revealed 55 road traffic fatalities in 52 collisions in Co. Kildare for the calendar years 2002, 2003 and 2004. Cases were cross-referenced with the Coroner's files using date of incident and/or date of death, location of incident and the age and gender of victims. It was noted that while the Coroner's data contained files for 45 road traffic fatalities, the NRA data for the same area and time period contained 55 fatalities. There are a number of reasons why NRA cases may not present on the Coroner's files for the same district, for example where an incident occurs near a county border, the victim is brought to the nearest hospital for treatment, which may be across a county border; in such a case the Coroner for the county of death will investigate. This particularly occurs in counties bordering the capital city, such as the county under study.

The NRA data was also examined to identify cases where the purpose of journey for one or more victims was classified as 'to/from work', and for cases where vehicles were classified as either goods or public service vehicles. Such cases were cross-referenced with the Coroner's data by date of incident, location and gender and age of victims to establish whether witness depositions suggested that a driver was 'at work' as opposed to on the way 'to/from work' (commuter death). Mis-classifications were found for each year: in 2002 two worker deaths and one bystander death; in 2003 one worker death and two bystander deaths; and in 2004 three by-stander deaths

were found to be classified as commuter deaths, when in fact they were work-related deaths. Recall that this misclassification is due to a fault in the data collection system values list and not human error. Over the three year period, 7 (2 worker and 5 bystander) of 11 deaths (64%) were correctly classified as 'work-related' using the type of vehicle as an identifier. The gap may lie in the absence of a means of identifying work-related deaths associated with private vehicles.

Eighteen percent of the 45 road traffic fatalities identified in the coroner's data placed the victim either 'at work' or killed as a result of another person's work activity (by-stander). When 'worker-involvement' cases are included 36% of the fatal road traffic incidents directly or indirectly involved at least one person who was at work.

4. DISCUSSION

Under Irish legislation a place of work can be a vehicle, and road traffic fatalities that take place in, or are associated with, a vehicle in the course of work should be reported to the Authority as a work-related death. Under-reporting takes place but the full extent is not known. This pilot study illustrated that in a three-year period, there were 4 work-related fatalities reported to the Health and Safety Authority from this county. If road traffic fatalities identified as work-related from the Coroner's data are included, however, the work-related fatality figure for the county for the period rises to 12. In this small geographical area, the number of work-related deaths is tripled if relevant road-traffic fatalities are included in the statistics; in addition more than one third of all the fatal road traffic collisions involved someone who was at work at the time. Neither result should be extrapolated to national figures because the study was not designed to be representative, however the findings are in keeping with the findings of research in other countries and suggests that further research of this nature should be undertaken in Ireland, involving larger areas and using multiple data sources.

It is worth noting that the additional 8 'worker-involvement' road traffic fatalities were identified solely from the Coroner's data. 'Worker-involvement' cases were those where a witness, who was involved in the collision, was at work. In most of these cases the witness was driving a truck making deliveries or collections. In many of these cases, the witness appeared to play no part in the factors causing the incident, but was nonetheless affected by it (for example an intoxicated pedestrian walking out in front of a van driving to collect or deliver goods, a car veering inexplicably into the worker witness's side of the road, or the witness's vehicle colliding with debris from the collision). There is no way of knowing whether such witnesses had received education on occupational road risk, or driver training as part of their work safety and health training programme, and such investigation was beyond the scope of this study, but should be considered for future work.

Despite the fact that the Coroner's data revealed a number of 'at-work' and 'by-stander' fatalities, the police-collected roads authority data for the same cases imply that these cases are commuting incidents, simply because of the limited available categories for the 'purpose of journey' question on the data collection system.

Results revealed flaws in the work-related death data capture system, which result in failure to capture occupational road fatalities, and underestimation of the extent of the problem. Use of narrative coroner data facilitated identification of cases of work-related death and in particular, proved to be the only source of information on 'worker-involvement' cases. These findings highlighted the value of coroner's data in identifying work-related fatalities, and in providing data that would be valuable in developing occupational road risk prevention strategies for this vulnerable group of road-users: those who drive for a living.

REFERENCES

Central Statistics Office (2006). *Census 2006, Preliminary Report, Population of each Province and County*. Dublin: Central Statistics Office.

Department of Transport (2005). *Statement of Strategy 2005-2007*. Dublin: Department of Transport.

Driscoll, T., Marsh, S., McNoe, B., Langley, J., Stous, N., Feyer, A-M. and Williamson, A. (2005). Comparison of Fatalities from Work-Related Motor Vehicle Traffic Accidents in Australia, New Zealand, and the United States. *Injury Prevention*. **11** (5) pp. 294-299.

Driscoll, T., Mitchell, R., Mandryk, J., Healey, S., Hendrie, L. and Hull, B. (2003). Coverage of Work-Related Fatalities in Australia by Compensation and Occupational Health and Safety Agencies. *Occupational and Environmental Medicine*. (60) pp. 195 – 200.

- Drummond, A. (2007). *An Investigation into the official data sources and collection methods used to capture selected work-related death statistics in the Republic of Ireland*. Dublin: Health and Safety Authority.
- European Commission. (2001). *European Statistics on Accidents at Work (ESAW) Methodology*. Doc. ESTAT/E3/HSW/2001/1130.
- European Transport Safety Council. (2006). *ETSC Briefing: Third Road Safety Action Programme, Mid-term Review*. Brussels: ETSC.
- Eurostat. (2005). European Statistics on Accidents at Work (ESAW) and commuting accidents. Eurostat Metadata in SDDS format: Summary Methodology. http://europa.eu.int/estatref/info/sdds/en/hsw/hsw_acc_work_sm.htm
- Harrison, J.E., Mandryk, J.A. and Frommer, M.S. (1993). Work-Related Road Fatalities in Australia, 1982 – 1984. *Accident Analysis and Prevention*. 25 (4). pp. 443 – 51.
- Health and Safety Commission. (2006). *Review of the Reporting of Injuries, Diseases, and Dangerous Occurrences Regulations 1995, Progress and Strategic Steer*. Including Annexes A, B and C. <http://www.hse.gov.uk/aboutus/hsc/meetings/2006/250706/c40.pdf#search=%22%20HSC%2F06%2F40%22>
- Marsh, S. and Layne, A. (2001). *Fatal Injuries to Civilian Workers in the United States, 1980 – 1995; National Profile*. Cincinnati: NIOSH.
- National Occupational Health and Safety Commission (1998). *Work-Related Traumatic Fatalities 1989 – 1992*. Canberra: NOHSC.
- New Zealand Environmental and Occupational Health Research Centre, Injury Prevention Research Unit (1999). *Work-Related Fatal Injuries in New Zealand 1985 – 1994. Descriptive Epidemiology*. New Zealand: Department of Labour (NZ). <http://www.osh.govt.nz/order/catalogue/786.shtml>
- New Zealand Environmental and Occupational Health Research Centre, Injury Prevention Research Unit (2003). *Work-related Fatal Traffic Injuries in New Zealand 1985 – 1998: Descriptive Epidemiology*. Dunedin: Injury Prevention Research Unit. www.otago.ac.nz/ipru/Reports/WRFTI2003.pdf
- Pratt, S. (2003). Work-Related Roadway Crashes, Challenges and Opportunities for Prevention. *NIOSH Hazard Review*. Cincinnati: Centre for Disease Control, National Institute of Occupational Safety and Health.
- Racioppi, F., Eriksson, L., Tingvall, C. and Villaveces, A. (2004). *Preventing Road Traffic Injury: A Public Health Perspective for Europe*. Geneva: World Health Organisation.
- Road Safety Authority (2007). *Road Collision Facts 2006*. Ballina, Ireland: Road Safety Authority.
- Safety, Health and Welfare at Work (General Application) Regulations, 1993. S.I. No. 44 of 1993. Part X. Notification of Accidents and Dangerous Occurrences.
- Scallan, E., Staines, A., Fitzpatrick, P., Laffoy, M. and Kelly, A. (2004). Unintentional Injury in Ireland: a Comparison of Mortality and Morbidity Data. *Journal of Public Health*. 26 (1) pp. 6-7.
- US Department of Labour. (2004). Bureau of Labour Statistics. Census of Occupational Fatalities, 2004. <http://www.bls.gov/news.release/pdf/cfoi.pdf>
- Work-Related Road Safety Task Group (2001a). *Discussion Document Preventing At-Work Road Traffic Accidents*. Sudbury: HSE Books.
- Work-Related Road Safety Task Group (2001b). *Reducing At-Work Road Traffic Accidents. Report to the Government and the Health and Safety Commission*. Norwich: HMSO.
- World Health Organisation (2004). *World Report on Road Traffic Injury Prevention, Summary*. Geneva: World Health Organisation.