

Session: E3.0

Title: Transportation Injuries

Moderator: Linda Frederick

E3.1

Title: Nonfatal Injuries Resulting from Transportation Incidents

Author: Windau JA

Although transportation incidents account for only about 4 percent of occupational injuries resulting in days away from work, they result in some of the most serious injuries among private sector wage and salary workers. Transportation incidents recorded the third highest median days-away-from-work total in 2001, behind repetitive motion and falls to lower level. Transportation incidents resulted in a median of 10 days away from work, compared with 6 days for all types of events. Thirty percent of the transportation incidents involving days away from work required more than 30 days to recuperate.

The incidence rate for days away from work cases from transportation incidents was 7.4 per 10,000 workers in 2001, a drop of about 17 percent from the rate in 1992. This decline is well below that for all events and exposures combined, which fell 45 percent during the same time period. The number of days away from work cases also declined between 1992 and 2001. Cases resulting from transportation incidents fell about 2 percent, compared with 34 percent for all types of events.

Highway incidents accounted for about two-thirds of the transportation incidents that resulted in days away from work in 2001. Transportation and public utilities and services together accounted for about half the transportation incidents. This presentation will further profile injuries resulting from transportation incidents using data from the Bureau of Labor Statistics' Survey of Occupational Injuries and Illnesses. The discussion will include occupational and demographic characteristics of injured workers, nature of injury and part of body affected, and type of vehicles involved.

E3.2

Title: Pedestrian Injuries Caused by Powered Material Handling Vehicles at a U.S. Heavy Manufacturing Company from 1998 to 2002

Authors: Stout AW, Reeve GR, Graham DM

The purpose of this study was to describe the experience of pedestrian injuries caused by Powered Material Handling Vehicles (PMHVs) in a heavy manufacturing setting from 1998 to 2002; to describe the progress of an intensive intervention effort intended to reduce the number of pedestrian injuries, and to discuss what portions of the intervention had an impact on

reducing pedestrian injuries. The study data were abstracted from a validated occupational health and safety data system through database text searches of all First Time Occupational Visit (FTOV) case narratives for company manufacturing and parts distribution facilities in the U.S., and then a manual review of all retrieved records was conducted to determine actual cases. The 853 cases identified were then stratified as primary hits (direct pedestrian contact with PMHVs) N=448 and secondary hits (pedestrian contact with materials moved or struck by PMHVs) N=405.

The results indicated that PMHV/Pedestrian FTOV rates were relatively unchanged until after an aggressive PMHV Safety Initiative was launched in the 3rd quarter of 2000. Rates had a modest decline in 2001 with an overall rate of 0.235 FTOVs / 200,000 Hours Worked (95%CI: 0.201, 0.272) compared with the 2000 overall rate of 0.304 FTOVs / 200,000 Hours Worked (95%CI: 0.267, 0.344). Rates then significantly declined in 2002 with an overall rate of 0.072 FTOVs / 200,000 Hours Worked (95%CI: 0.053, 0.093). The ratio of primary hits to secondary hits remained approximately even over the 5 year period. A PMHV/Pedestrian Safety Survey was then administered at 4 of the company facilities (one from each major division) to approximately 20 randomly selected subjects (10 PMHV Operators and 10 Pedestrians) at each facility. The results detail what factors of the intervention appeared to have contributed to the overall rate reduction and what factors may have detracted or had no impact.

E3.3

Title: Ambulance Crash-Related Injuries among EMS Workers

Authors: Bobick TG, Proudfoot SL, Romano NT, Moore PH, Current RS, Green JD

Introduction

Ambulance crashes are one of many hazards faced by U.S. emergency medical services (EMS) workers. EMS personnel have an estimated fatality rate of 12.7 deaths per 100,000 workers, more than twice the national average. NIOSH's Division of Safety Research is engaged in a project investigating EMS-worker fatalities from ambulance crashes. This project involves: surveillance data analysis, crash investigations, computer modeling, sled testing of occupant restraint systems, and ambulance crash testing. The project's goal is to define injury risk and evaluate restraint systems for EMS workers. This presentation is focused on an analysis of surveillance data and selected NIOSH crash investigations.

Methods

Data analysis used the Fatality Analysis Reporting System (FARS) of the National Highway Traffic Safety Administration (NHTSA). FARS is a census of fatal vehicle crashes. NIOSH conducted field investigations of fatal crashes, and evaluated

NHTSA reconstruction reports of selected fatal incidents.

Results

From 1991-2000, there were 300 fatal crashes involving ambulances. In these incidents, 82 occupants were killed, of which 27 were EMS providers. Of these, seven were in the patient compartment, five in the right-front passenger seat, 11 in the driver's seat, and four were uncoded.

Discussion

Ambulance drivers experience the majority of less-severe injuries (coded "Possible" and "Non-Incapacitating Evident"), while patient compartment occupants (EMS providers and civilians) are most likely to suffer "Incapacitating" and "Fatal" injuries. In incidents involving fatalities to EMS providers, failure to wear seatbelt restraints appears to be the primary factor. Seat belts do not allow complete access to patients who need appropriate medical attention.

Conclusions

Improved restraint systems are needed for the patient compartment that permit workers to stand and attend to the patient, yet still protect workers during sudden stops or avoidance maneuvers. Also, restraints should be used by all occupants, including the driver and front-seat passenger.

E3.4

Title: Road Compactor Overturn Injury Risk Factors

Author: Myers ML

The Occupational Safety and Health Administration (OSHA) promulgated a ROPS standard for construction vehicles in 1972 that did not include compactors, and OSHA has yet to promulgate this standard. The specific aims of this project were to:

1. Identify the machine, environmental, and human factors that contribute to compactor overturns,
2. Identify design defects of ROPS that result in them crushing operators/drivers during an overturn,
3. Evaluate the likely consequences of overturns of ROPS-equipped compactors if they had not been equipped with a ROPS,
4. Evaluate the potential of ROPS and seatbelt-equipped compactors in preventing injuries as a result of falls from or collisions of the machines if a seatbelt had been used, and
5. Evaluate OSHA's application of the General Duty Clause to enforce the use of ROPS on compactors.

This project addressed the need to protect compactor operators and drivers from injury in the event of an overturn of their equipment. Many of these workers have been killed or seriously injured over the last 30 years, and they continue to be killed or

injured by compactor overturns each year. Most of these injuries occur on compactors that lack a ROPS, but some occur with ROPS-equipped compactors.

The research design is to use OSHA and NIOSH investigation reports of compactor overturns and runovers to determine the risk factors related to these incidents. Data from these reports were placed into a Haddon matrix to analyze the role of machine, environment, and human factors and the temporal dimension (prior, during, and after) of the incident. In addition, a flowchart was constructed for each incident to understand the antecedent factors leading to and the characteristics of the overturn.

E3.5

Title: The Work Zone Analysis System: A Tool to Evaluate Worker Exposure Around Hazardous Equipment

Author: Schiffbauer WH

Worker injuries and fatalities in industrial work zones are a major concern to the National Institute for Occupational Safety and Health Administration (NIOSH). Highway workers (SIC 1611) are at great risk from passing motorists, and construction vehicles. The Mine Safety and Health Administration (MSHA) maintains a database that has identified a high number of mine workers killed or disabled as a result of working near vehicles. Surface drilling operations have been investigated by the Occupational Safety and Health Administration (OSHA) to determine how many workers have lost or have had their hearing impaired by working close to drill rigs. Dust exposure in industrial work environments has also been heavily investigated. NIOSH has developed a research tool called a Work Zone Analysis System (WZAS), which can greatly enhance data collecting and analysis in efforts to mitigate the aforementioned hazards. The basic components of the WZAS are: differential mode GPS receivers, machine vision processors, wired and wireless video links (ground and air-borne), proximity determination devices, and data analysis tools. The WZAS is housed in a mobile trailer which includes: power, a 58 foot mast, a satellite internet dish, and numerous other features. The WZAS will enable NIOSH researchers to perform detailed task analyses of outside work environments. This information will help identify what remedial actions could benefit worker safety. Expected outcome variables include: incidence of workers-on-foot (WOF) within vehicle blind spots; amount of time a WOF is in a blind spot, or within a specified distance of a vehicle; number of WOFs in proximity to operating vehicles; amount of time a vehicle backs up per hour of operation; process operational efficiency; intervention feasibility; areas of exposures to high noise levels; and areas of exposures to high dust levels.

NOIRS 2003 ABSTRACTS

CONTENTS

DAY ONE —TUESDAY, OCTOBER 28, 2003

CONCURRENT SESSION: A

10:30am - 12:00pm

Session: A1.0—Title: Lack of Progress on Construction Fatalities: What are the Obstacles to Prevention?	12
A1.1 What Do BLS Data Tell Us About Current Construction Fatality Trends?	12
A1.2 Analysis of Fatal Events in the Construction Industry 1993-2000: What Do OSHA Data Show?	12
A1.3 New Developments in OSHA Fatality Inspection Data: Enhancing Information Available for Surveillance	12
A1.4 Moving Beyond Surveillance: Lessons Learned from NIOSH Construction Safety Projects	13
A1.5 Comparing U.S. and European Construction Performance: Promising Leads for Research and Policy?	13
Session: A2.0— Title: Cutting Edge Research: The NORA Intervention Evaluation Contest	13
A2.1 Evaluation of the Effect of the Vertical Fall Arrest Standard in Washington State on Union Carpenters	13
A2.2 A Randomized and Controlled Trial of Participative Ergonomics for Manual Tasks (<i>Perform</i>)	14
A2.3 The Use of Supervisory Practices as Leverage to Improve Safety Behavior: A Cross-Level Intervention Model	14
Session: A3.0—Title: Economic Issues in Injury Research	14
A3.1 Relationships Between Work-related Injury Costs and Individual Risk Factors	14
A3.2 Measuring the Economic Burden of Fatal Occupational Injuries	15
A3.3 Economic Cost Model: Transferring Innovative Technology to the States	15
A3.4 How Large is the Government's Underestimate of the Number of Non-Fatal Occupational Injuries?	16
Session: A4.0—Title: Injury Surveillance: Monitoring Workplace Health and Safety	16
A4.1 Fatal Occupational Injuries, 1980-1998: Two Decades of Surveillance	16
A4.2 A Descriptive Study of Logger Fatalities from 1992-2000	17
A4.3 A Comparative Study of Occupational Fatal Injury Rates in South Korea and the United States	17
A4.4 Reported Workplace Fatalities: How Complete is the Picture?	17
A4.5 Incompleteness of the BLS Surveillance System in Estimating Work Related Amputations	18