hospital key areas which can substantially reduce the risk to HCP from common, serious, and preventable injuries.

F3.4
Title: **Workers' compensation claims among ambulance services workers -- Ohio, 2001-2010**
Authors: Chia Wei, Steve Wurzelbacher, Alysha Meyers, Steve Bertke, Mike Lampl, Dave Robins

Objectives**:** A concurrent study identified Ambulance Services as having one of the highest claim rates by industry subsector among all of Ohio Bureau of Workers' Compensation (OHBWC) insured, single-location, private employers from 2001-2010 across all NIOSH industry sectors. This study further examined workers' compensation (WC) claims for Ambulance Service workers.

Methods**:** OHBWC insured workers' compensation policies and claims for the Ambulance Services industry subsector was identified among single-location, private employers with a North American Industry Classification System (NAICS) code of 62191. Rates of WC claims per 100 adjusted full-time equivalent employees (FTEs) estimated from labor, productivity, and costs surveys were calculated. Two claim types (medical-only and lost-time) were used to determine the severity of injury. In Ohio, lost-time claims are those with more than seven days away from work. Causes of injury were manually and auto-coded into three mutually exclusive categories: ergonomic-related musculoskeletal disorders (MSD), slips/trips/falls (STF), or any other event/exposure (OTH). In addition, one of 57 injury categories (e.g. contusion, fracture, or sprains, etc.) were assigned to each claim based on the ICD-9-CM diagnosis code for the most severe diagnosis. Occupational Injury and Illness Classification System (OIICS) codes were also utilized to further determine the exposure of the injury claims.

Results: A total of 4,853 WC claims were identified among Ambulance Service workers from 2001-2010. The majority of claims were medical-only claims (81.9%) found among those workers aged 25-44 years (63.7%) working at employers with 50-249 employees (57.9%). The risk class for 78.5% of all claims was, "7370: Employee and Drivers," based on the National Council on Compensation Insurance (NCCI) manual class industry code. The overall claim rate was 11.36 per 100 FTE among Ambulance Service workers. MSDs were the leading cause of injury among ambulance workers (49.0%) with a claim rate 5.6 per 100 FTE, followed by OTH (3.7 per 100 FTE), and STF (2.1 per 100 FTE).

Conclusions: Results of this study serve as a basis for further studies and can inform the development of targeted intervention strategies to reduce injury claims by focusing on the leading causes relevant to ambulance workers.

Session F4.0
Title: **Safety Climate and Culture: A Brief Tutorial and Review of the Current State of Research, with an Emphasis on the Inter-Relationships with Safety Management Systems**
Moderators: Ted Scharf and Jennifer Taylor

Authors: NIOSH Safety Climate/Culture Working Group, Scott Schneider, Jennifer A. Taylor

Presenters: Ted Scharf, Thomas Cunningham, Oliver Wirth, Cammie Chaumont Menéndez, Murrey Loflin, Stephanie Pratt, Scott Schneider, Elizabeth Garza

The terms “safety climate” and “safety culture” have received – and continue to receive – increasing attention in the literature addressing safe work processes and safety management. Assessments of safety climate have been shown to be reliable and valid ***leading indicators*** of safety at work (both positive and negative, e.g., Zohar, 2010).

One real-world problem is that failures in “safety culture” (most often) and “safety climate” (sometimes) are blamed for major catastrophes in firefighting, oil drilling and exploration, transportation, nuclear power, and even in bio-safety at CDC (e.g., Frieden, 2014; Guldenmund, 2000, and 2010; NIOSH, 2013). This short tutorial will review the inter-related concepts of safety culture and safety climate in relation to safety management systems, socio-technical systems, and the overall organization of work in hazardous work environments. We will provide a very brief introduction to safety climate and culture definitions, research status, and challenges. We will also connect safety climate and culture to safety management. Perhaps most important, we will focus on examples of safety culture in the fire service and in construction with suggestions for tools to improve both safety culture and safety management. Following this working group’s charge, we will summarize:

1) competing definitions of safety climate and culture, including the similarities linking these two terms: although there are conceptual and empirical differences between “culture” and “climate,” one of the principal differences is that term “climate” is used primarily by researchers, while “culture is used by workers, supervisors, top-level managers, and by safety professionals, i.e. just about everyone else;

2) current status of research connecting safety climate to safe work practices: safety climate has been clearly established as a leading indicator of safety and safe work practices in hazardous work environments;

3) current challenges and key questions in safety climate research: while generic measures of safety climate have been validated, the issue of industry specific measures

and the proper context for safety climate measurement are just two of the many challenges facing researchers;

4) safety culture within the fire service, a case study example from DSR: theoretical discussions of safety culture do not always translate easily or directly onto the fireground. This presentation will provide examples from firefighter fatality investigations to keep the more theoretical discussions of safety climate and culture grounded in the real world, and to provide an example of a successful model of safety management: the Incident Command System;

5) a brief introduction to safety management systems: professionals distinguish between process and worker safety management; this presentation will suggest that from the perspective of the worker in the hazardous environment with respect to safety climate, such distinctions are unimportant. All elements of safety and safe work practices must function well, and together must contribute to the work group's perception of safety climate;

6) competing models linking safety climate to safety management (and socio-technical) systems – placing safety climate into its proper context: a coherent and consistent model will connect safety climate to work group and organizational-level productivity and safety management systems;

7) current guides and checklists to help improve safe work practices and safety climate in hazardous industries: results from the CWPR-NIOSH workshop on safety culture and climate in construction, along with contributions from four focused workgroups regarding: 1) worker participation, 2) integration of safety, 3) supervisor training, and 4) incident investigation.

Session G1.0
Title: **Industry and Occupation –Strategies and Impact**
Moderator: Lisa Steiner

G1.1
Title: **Analyzing occupational injuries to develop a mining research strategy**
Authors: Jeffrey Welsh, Linda McWilliams

Objective: The mining process involves large, powerful equipment to extract and transport the mined ore. Often the work is in confined spaces, and in close proximity to mobile equipment. The work environment is continually changing as the ore is removed, and the roof needs supported underground to prevent it from collapsing. Work areas may have trip hazards and slippery surfaces. In addition, many tasks involve manual labor. Although the numbers of injuries and fatalities in mining have declined over the years, they are still at unacceptable levels. For the period 2003 - 2012 there were 536 fatal injuries in mining, and 70,756 nonfatal, lost-time injuries. The objective is to reduce injuries in mining through a focused research program.

Methods: The National Institute for Occupational Safety and Health (NIOSH) uses the Mine Safety and Health Administration (MSHA) *Employment and Accident, Illness and Injury Database* to help determine where to invest research dollars to make the greatest impact on reducing occupational injuries and illnesses in mining. Data fields in the MSHA database for each incident resulting in an injury include: Accident Classification, Mine Worker Activity, Nature of Injury, Source of Injury, Total Mining Experience, Experience in this Job, Degree of Injury, Mine Size, and Age, among others. Narratives provide additional information about each incident. Numbers and rates of injuries are determined.

Results: As an example, for nonfatal lost-time injuries in underground mining (2008-2012), handling material (30.4%), slip or fall of person (19%), fall of ground (14.8%), machinery (11.4%), and powered haulage (11.2%) are the major accident classifications, or the circumstances which contributed most directly to the incident. For nonfatal lost-time injuries in surface mining (2008-2012), handling material (34.4%), slip or fall of person (29.3%), and hand tools (10%) are the major accident classifications. This data is analyzed in more detail to help determine how workers are being injured. From this information, along with stakeholder input, strategic goals and research priorities are established.

Conclusion: This presentation will provide an analysis of injuries in mining, and provide an overview of how the NIOSH mining research program is targeting the most urgent occupational safety needs.

G1.2
Title: **Reducing the number of injuries and fatalities among workers in the Manufacturing Sector: A priority goal in the National Occupational Research Agenda**
Authors: Thais Morata, Gregory Lotz, Alberto Garcia

In 2012, over 14 million U.S. workers were employed in manufacturing. That year, 327 manufacturing sector workers died from work-related injuries (http://www.bls.gov/iif/oshwc/cfoi/cftb0268.pdf). The leading causes of death were contact with objects and equipment, transportation incidents, and falls. The U.S. Bureau of Labor Statistics (BLS) reported 502,800 recordable injury or illness cases in manufacturing industries in 2012 with more than half of these requiring days away from work, job transfer or restriction (http://www.bls.gov/news.release/archives/osh_11072013.pdf). The leading causes of days-away-

NOIRS

National Occupational Injury Research Symposium

2015

May 19-21, 2015

Camp Dawson Training Center
Kingwood, West Virginia

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health