

1977 and 2001 that were directly attributed to environmental heat. Medical Examiner records were reviewed for 161 decedents aged 10+ years to obtain information about occupation, on-the-job status, and environmental and work conditions at the time of each heat injury. Characteristics of fatal occupational injuries were compared to those of fatal non-occupational injuries. Fatality rates were calculated using employment information from the Decennial Census.

Results. During the 25-year observation period, rates of fatal heat injury declined in the general population and among workers. Twenty-five percent (n=40) of the decedents experienced heat injuries while working. Decedents who died on-the-job tended to be younger (median age: 41 years) than decedents who died in non-occupational settings (median age: 61 years). Occupational fatalities occurred most often among males employed in construction (n=14) and agriculture (n=18). Deaths in the agricultural industry were predominantly among Black, and more recently Hispanic, workers. Narrative portions of Medical Examiner records describe instances of agricultural workers, mainly field laborers harvesting row crops, dying unnoticed and without medical attention.

Conclusions. Heat-related injury continues to be an important problem for workers performing physically demanding tasks, especially during summer months. The incidence of heat-related death may seriously underestimate the public health impact of this problem; fatalities should serve as sentinel events indicating dangerous working conditions. These findings justify involving workers, employers and labor organizers in public health programs to prevent illness and injury while working in hot weather.

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Title: A Communication Intervention for Technology Transfer of NIOSH Field Portable Analytical Methods

Authors: Buzzard-Ott SD, Williams TA, Welbourne JL, Booth-Butterfield SJ, Clough-Thomas KS, Lawryk NJ

NIOSH researchers have recently developed new field portable analytical methods for measuring airborne metals. With the introduction of these new methods, NIOSH recognized the need to transfer these methods to potential end-users. To accomplish this, NIOSH implemented a communication intervention with the goal of increasing the use of the methods through communication. The intervention included a three step process: 1) conduct message pretesting on a random sample of industrial hygienists prior to sending the intervention, 2) implement the intervention, and 3) evaluate the effectiveness of the intervention and make mid-course modifications. The intervention included a multi-channel, multi-exposure technique and was disseminated to all members of the American Industrial Hygiene Association (AIHA).

AIHA members completed message testing and annual evaluations. Participants were asked to review materials (advertisements and brochures) on the new NIOSH field portable methods and to complete a survey regarding their thoughts and opinions toward the materials. Industrial hygienists preferred easy to read information presented in a low graphic style. The message testing results provided the framework from which the communication intervention was developed. The intervention consisted of advertisements in the AIHA Journal, a website, and direct personal mailings. All materials focused on the benefits of using the methods. An annual evaluation assessed the effectiveness of the intervention and provided information needed to make mid-course changes. Findings showed a positive change in behavior, and identified four barriers toward using the methods, which were addressed in a second intervention. This discussion will focus on message testing procedures, findings, and the overall effectiveness of the intervention on the self-reported use of the new NIOSH field portable analytical methods.

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Title: Research Program to Develop Optimal NIOSH Alerts for Farmers

Authors: Williams TA, Buzzard-Ott SD, Welbourne JL, Clough-Thomas KS

This NIOSH research project applies psychological and communication theories to experimentally manipulate features of the NIOSH Alert and then examine the effects of these manipulations on the effectiveness of the Alert. The goals of the project are to: (1) increase the degree to which workers are motivated to elaborate upon the health and safety message presented in the Alert and (2) to create messages that contain strong arguments. To design the experimental Alerts, researchers have manipulated the NIOSH Alert Preventing Injuries and Deaths from Skid-Steer Loaders with concepts from the Elaboration Likelihood Model and Imagery.

Farmers were recruited to review an experimental version of the Alert and then complete a survey assessing their risk awareness, comprehension of the message, message elaboration, recall of the recommendations, attitudes toward the recommendations and behavioral intentions. Field research has been conducted at 3 locations: (1) the West Virginia State Fair, (2) the Mid-West Ag Expo, and (3) the Ohio-Michigan Equipment Dealers Association. Results from the first two field studies showed that farmers who received the Alert containing goal attainment imagery found the Alert easier to visualize, stronger, more convincing and more attention getting than the standard Alert. Farmers who received the Alert containing goal attainment imagery reported heightened perceptions of risk awareness and more positive attitudes toward engaging in safety recommendations. In addition, they reported that they would be more likely to pass the information on to other farmers. Analyses on

the most recent field study are currently being conducted and will also be presented.

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Title: Hazards Associated with Military Service: Fatal Motor Vehicle Crashes among Veterans of the Gulf War Era

Authors: Lincoln AE, DeBakey S, Cowan DN, Kang HK, Hooper TI, Gackstetter GD

PURPOSE: Motor vehicle crashes (MVC) are the leading cause of death among military personnel, and deployment in a combat theater has been associated with an increased risk of fatal MVC within military populations, such as the Gulf War (GW). We evaluated selected variables as predictors of fatal MVC among GW era veterans using existing Department of Defense, Department of Veterans Affairs, and Department of Transportation databases.

METHODS: This is a nested case-control study of a cohort comprised of 696,516 Gulf War veterans and 746,291 non-deployed veterans. 1,343 cases of fatal MVC occurring between 1991 and 1995 were identified from the cohort by linkage with the Fatality Analysis Reporting System (FARS). Ten controls were selected per case, matched by gender and year of case ascertainment. We examined data on demographic and military characteristics; hospitalizations and outpatient visits; self-reported behaviors, lifestyle, and psychosocial factors; and possible GW exposures as potential risk factors for fatal MVC.

RESULTS: Fatal MVC on US public roads that caused the death of the driver were not randomly distributed across our study population. Fatalities involving female drivers were few (n = 28). Male fatalities were more likely to be younger, less educated, enlisted, deployed to the GW, in combat occupations, and never married compared to controls. Cases were also more likely to have had an inpatient hospitalization for substance abuse or previous MVC while on active duty.

CONCLUSION: These findings are consistent with previous studies that have reported military deployment as a risk factor for fatal MVC. We also identified prior hospitalizations for specific causes increase this risk. We did not discover meaningful differences in risk-taking behavior between GWV and NDV. Additional studies to investigate potential risk factors for all MVC, not just fatalities, are warranted so that appropriate interventions can be designed and evaluated.

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Title: Extended Work Schedule and Risk of Occupational Injury

Authors: MacLennan PA, McGwin G, Jr., Barbone F, Rue LW, III

PURPOSE: Extended work schedules (e.g. more than one job, > 40 hours worked per week) may be related to a number of health outcomes through several intermediate steps. Stress and fatigue at work may be associated with specific mental conditions, musculoskeletal disorders and ischemic heart disease. This study evaluated the association between exposure to extended work schedule and occupational injury.

METHODS: Utilizing the 1996 through 1998 Medical Expenditure Panel Survey (MEPS) household component, panels 1 through 3, a nested case-control study was used. Cases and controls were actively working and aged > 17 years. Cases were identified through the MEPS medical conditions file as reporting a work related injury (ICD9 800-999) during the follow-up period. Controls were matched (5:1) on age (+/- 1 year) at injury date, race and gender. For the 30 day period before the case injury date, subjects' average number of jobs (1, >1), peak number of jobs (1, >1), average (<40, >40) and peak (<40, >40) hours worked per week were calculated. Risk ratios (RRs) and 95 % confidence intervals (CIs) measured the association. Conditional logistic regression was used to calculate risk ratios (RRs) and 95 % confidence intervals (CIs) for the association between

RESULTS: Small but significant associations were found for average number of hours >40 (RR=1.33, 95% CI=1.09-1.62), and peak number of hours >40 (RR=1.48, 95% CI=1.22-1.78).

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Title: Work-RISQS — A Web-Based Injury Research Tool

Author: Jackson LL

The National Institute for Occupational Safety and Health has developed a public web-based Work-Related Injury Statistics Query System (Work-RISQS; <http://www2.cdc.gov/risqs/>) for researchers and other data users. Through user-defined queries, Work-RISQS provides estimates of the number and rate of nonfatal occupational injuries and illnesses treated in U.S. hospital emergency departments (ED). Work-RISQS data are collected through the National Electronic Injury Surveillance System (NEISS) by using a national probability sample of U.S. hospitals.

Work-RISQS provides overall and sub-population estimates—in 1999, among workers of all ages there were $3.9 \pm 0.8^*$ million

NOIRS 2003 ABSTRACTS

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