

#### MACHINERY-RELATED OCCUPATIONAL FATALITIES IN THE UNITED STATES, 1980-1989.

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The National Traumatic Occupational Fatalities (NTOF) surveillance system, based on death certificates, identified machinery-related incidents as the second leading cause of traumatic occupational fatalities in the United States for the period from 1980 through 1989. During this 10-year period, there were 8,505 machinery-related deaths for an average annual fatality rate of 0.80 per 100,000 workers. Annual machinery-related fatality rates declined steadily from 1.01 in 1980 to 0.63 in 1989. The rate for males (1.40) was 35 times higher than that for females (0.04). Workers aged 65 and older had 5.8 times the fatality rate of workers below age 65 (4.06 vs. 0.70). The highest industry-specific rates were in agriculture (7.43), mining (7.23), and construction (3.48). The rate for farming occupations (6.82) was 13.9 times that for all other occupations (0.49). Among specific machine types, tractors accounted for the highest fatality rate (0.25), although annual rates declined markedly over the decade. Tractor-related fatalities remained disproportionately high among older workers, primarily in the agriculture industry. The next highest rates-for forklifts, cranes, excavating machines, and loaders-ranged from 0.04 to 0.06, with smaller decreases in rates over the decade than those observed for tractors. High industry-specific rates were noted for: tractors, harvesting machinery, and power take-offs in agriculture; mining and drilling machinery and oil rigs in mining; and cranes, excavating machinery, and tractors in construction.

#### INJURIES IN SPANISH SPEAKING GARDENERS

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The purpose was to categorize and explain the injuries of Spanish speaking gardeners. Specifically: 1. What is the injury rate?; 2. What protection do they use to prevent injuries?; 3. What are the injuries?; 4. If injured, what medical care is used?; and 5. Who pays? This was a hard to reach population (Spanish-speaking, recent immigrants, workplace moved frequently throughout the day) yet there was complete cooperation and participation. An interview questionnaire in Spanish elicited answers to the above questions. The gardeners were found by identifying likely trucks and following them until they stopped at a worksite. Frequency distributions, t tests, chi squares, and rate ratios were done. Their injury rate was extremely high (27%). Those who used medical care paid for the care themselves. Injured workers were not significantly different from non-injured workers in age, years of experience, working alone, and gardening as their only job, but were more likely not to be using PPE on the day of the study. They were interested in knowing more about worker rights. There needs to be more creative ways to study others in this invisible population. Mass educational efforts to help these individuals know their rights under the law is necessary.

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#### OCCUPATIONAL RELATED INJURIES REQUIRING AEROMEDICAL TRANSPORTATION IN THE STATE OF PENNSYLVANIA.

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Using an existing data registry for all aeromedical helicopter flights in the state of Pennsylvania during 1991 and 1992 (n = 7,269), all flights for work related injuries were abstracted for this analysis (n = 241). The data originated from the "trip sheet", a computer coded form completed by the flight crew after every flight.

The sample consisted of 226 males, 11 females (4 missing) with a mean age of 38.85 ± 13.59 (mean ± sd) years (range 17 to 83). Glasgow coma scale scores averaged 13.49 ± 3.56 (range 3 to 15) at the pick-up location. A total of 834 injuries were coded for the entire sample. The injuries most often requiring helicopter transportation were: blunt trauma to the head (n = 58), blunt trauma to the chest (n = 50), and open tissue wounds to the face and head (n = 50). Data regarding how the workers were injured revealed that falls (25.2%), and vehicular accidents (13.4%) were the most common causes.

The majority of the flights were inter-facility transfers (n = 75, 31.4%) from an acute care facility to a trauma center. Fifty-four (22.6%) workers were transferred by rendezvousing with another EMS unit, and 46 (19.2%) workers were transported directly from the work-site.

Data comparing worker condition at the pick-up location and at the hospital destination were available for 235 (97.5%) of the sample. Ninety workers (38.3%) were judged to be in a life threatening condition at the pick-up location, 141 (60.0%) in moderate condition, and 4 (1.7%) had injuries reported in minor condition. At the destination, 7 (3.0%) workers were in an improved condition, 182 (77.4%) were stable, 37 (15.7%) were unstable, and 9 (3.8%) were in worse condition ( $\chi^2 = 59.58, p < 0.0001$ ).

#### FITNESS FOR TRAINING PROTOCOL FOR HAZARDOUS WASTE WORKERS

Millar A. Lewis, L. Cone, J. McDoogle, V. (Carpenters Health and Safety Fund of North America; Alice Hamilton Center for Occupational Health and Safety).

A fitness for training protocol was developed and pilot-tested among Carpenters undergoing a 40-hour hazardous waste training course involving hands-on experience with self-contained breathing apparatus, air purifying respirators, and protective suits. The purpose of the protocol was to insure that prospective trainees are fit for training and to identify those requiring immediate medical followup or specific restrictions or modifications of hands-on training. *Methods:* The protocol involved a self-administered questionnaire; blood pressure (repeated 1-2 times if elevated initially) and pulse measurement by a trained health care professional; and review of questionnaire with consultation if needed with additional health care professionals. *Results:* A total of 101 trainees involved in 5 courses completed the protocol. Sixty-six (66%) were accepted for training without restriction. Thirty-five (35%) had medical conditions requiring some form of restriction. Of these, 27 (27%) had persistent elevation in blood pressure (>140/90) resulting in restriction from wearing negative pressure respirator or level A suit. Two were coughing at the time of the evaluation, two had back pain requiring restriction from lifting, one had a history of shoulder pain, one had a recent myocardial infarction, and two had other medical conditions resulting in restrictions from specific activities. *Conclusion:* Significant numbers of potential trainees in hazardous waste courses may have medical conditions requiring modification of their hands-on activity to reduce their risk of adverse health effects. It is of the utmost importance to identify at risk medical conditions prior to hands-on activity required for hazardous waste training.

#### FATAL WORK INJURIES OF THE SELF-EMPLOYED

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Individuals working for themselves are fatally injured more frequently than those working for others. Fatality data from the BLS Census of Fatal Occupational Injuries and employment data from the BLS Current Population Survey were used to profile the self-employed and their risk of being fatally injured on the job.

Areas to be discussed include the circumstances surrounding the fatal event as well as the industry, occupation, and demographic characteristics of the deceased.

#### OCCUPATIONAL HEALTH PROBLEMS AMONG NY CONSTRUCTION WORKERS

James Melius, M.D., Dr. P.H.; Matthew London, M.S.; and Sabina McGarrah, M.P.H.

Over the last six years, the New York State Occupational Health Clinic Network has evaluated nearly 3000 construction workers. These include workers from group screenings and individual patients seen in the clinics. Nearly 90% were unionized workers. Asbestos-related diseases were the most common diagnosis (438 or 14.8%) followed by noise-induced hearing loss (162), lead poisoning (94), work-related neurological disease (72), occupational asthma (43), and carpal tunnel syndrome (28). Information on disease prevalence among different construction trades will be presented as well as trends over time. The use of these data for surveillance will be evaluated.

#### INJURIES RELATED TO SHIFTWORK

Linda K. Glazer DrPH RN COHN CHES

This study identifies the frequency and types of injuries sustained during shift work by fire fighters in three different municipal fire departments (N=447). Interviews with the fire fighters as well as analysis of worker compensation claims provided the data.

In these studied fire fighters, most injuries occurred between 12PM and 3PM and between 6PM and 11PM (55% of all injuries) even though this time period accounted for only 44% of the alarms. These fire fighters had an injury rate of 41% but their serious accident rate of 24% was significantly higher (p=0.05) than the national rate. The serious accident rate was calculated from those injuries that would require immediate provider attention. Inhalation of combustion products; lacerations, contusion, abrasions and bruises; and at the fire scene were also significantly higher than the national figures (p=0.05).

At the time of the study, fire fighters did not have adequate personal protection equipment (PPE). They shared self-contained breathing apparatus. Since 92% of the injuries occurred at the fire scene, the causes were related to fire fighting duties of rescue, extinguishment and overhaul.

#### BACK INJURY PREVENTION (BIP) PROGRAM: WHAT DO CONSTRUCTION LABORERS KNOW, WHAT CAN THEY LEARN, AND HOW WELL DO THEY RETAIN NEW INFORMATION.

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In the construction industry the BACK is the most frequently injured area of the body. Of back injuries occurring in construction, laborers are the most frequently affected occupational group. In response to this problem the Laborers' Health & Safety Fund of North America (LHSFNA), a non-profit joint Labor-Management trust, under a NIOSH cooperative agreement developed a Back Injury Prevention (BIP) program for members of the Laborers' International Union of North America (LIUNA). This paper describes the results of a construction safety pilot study that was conducted in Baltimore, MD, consisting of LHSFNA's five minute back injury prevention video and a BIP instruction manual. Three assessment questionnaires were designed to gather information on the initial knowledge level, knowledge after training, and the knowledge retention of injury prevention methods. A survey questionnaire was completed at the beginning and end of the classroom portion of the CSTP program. These instruments evaluate knowledge changes before and after the video and classroom presentation. A follow-up questionnaire was sent to each participant, examining their knowledge retention over time and providing aggregate data on back injuries following the instruction. The BIP video and manual are being integrated with existing lifting instruction at the Laborers'-Associated General Contractors Education and Training Fund "Construction Skills Training Programs (CSTP)" at ten regional training centers. Information from the BIP Program will be provided to the Occupational Safety and Health Administration and the National Institute of Occupational Safety and Health.



ABSTRACTS

AMERICAN  
PUBLIC HEALTH  
ASSOCIATION

122nd Annual Meeting  
and Exhibition

October 30 - November 3

1994

Washington, DC

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Meeting and Exhibition

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October 30-November 3, 1994

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1015 Fifteenth Street, NW

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