

**SEXUAL ASSAULT OF WOMEN IN THE WORKPLACE**

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Rape accounts for 6% of violent crimes in the U.S. and is the "most underreported" of all serious violent crimes. In 1989, 94,504 rapes were reported to law enforcement authorities nationwide. In Ohio, 3,387 rape cases (66 per 100,000 females) were reported. In 1987, we reviewed 21 workers' compensation claims (WCC) for sexual assault in Ohio for the period 1983-1985. This earlier study revealed that five (31%) of rapes by unknown assailants occurred in convenience food stores. The rape rate was 7.0 per 100,000 females employed in Ohio (IRR=25.6, CI 8.1-132.3). In addition, three rapes occurred among motel housekeepers, and three among property managers. In this follow-up study presented here, 47 WCC for sexual assault in Ohio were reviewed for the period 1986-1990. Of the sexual assaults committed by unknown assailants, 25% were of females employed in convenience stores, 17% occurred in the Health Services Industry, and 11% occurred in the Restaurant Industry. In convenience stores, 75% of the rapes were committed during the course of a robbery and 75% occurred between midnight and 6:00 a.m. Of the sexual assaults committed by a known assailant, 45% were by a supervisor or co-worker.

**ASSESSMENT OF OCCUPATIONAL EXPOSURES TO ELF MAGNETIC FIELDS**  
Dana P. Loomis, Ph.D.

Most workers in industrialized countries are occupationally exposed to ELF magnetic fields. The intensity of this exposure is highly variable and its sources are diverse, including office equipment, computers, industrial devices, and medical equipment, besides the electric power supply system. Assessment of occupational exposures to magnetic fields is complicated by their ubiquitousness and variability. Exposures in electric power companies have been characterized in some detail, but little is known about the exposures encountered by most workers. Fortunately, current instrumentation facilitates large, systematic exposure surveys at relatively low cost. Exposure assessments associated with two recent epidemiological studies have used several innovative strategies, such as mailing exposure meters to workers. Data from a large, randomized assessment of exposures in electric utilities indicate that office workers have time-weighted average (TWA) exposures on the order of 1-2 mG, with TWA exposures for specialized electrical trades reaching 10-15 mG. Other industrial occupations, such as machinists, automotive mechanics, and laborers appear to have intermediate exposures, in the range of 2-10 mG. Exposures in trades that involve varied work and irregular schedules, like welders and power company linemen, can involve a high degree of day-to-day exposure variability. Given the current state of knowledge, large numbers of measurements, ideally with each worker measured on at least two days, are preferable to detailed characterizations of individual exposures. Future assessments can take advantage of technology and methods recently tested in research to characterize exposure in workplaces that may be hard to characterize using classical occupational hygiene approaches.

**OCCUPATIONAL HOMICIDES IN LOS ANGELES COUNTY AND CALIFORNIA**  
Robert Harrison, Lilia Vargas, James Rogge, John Fowler, Pat Prather, Marion Gillen, Ana Osorio

In 1992, homicide was the leading manner of occupational death in Los Angeles County and the second most common for California as a whole. Until recently, with the exception of a few industries, occupational homicide has not been examined from a public health perspective. Consequently, some types of information that would be helpful in risk-reduction planning have not been available.

The California FACE (Fatality Assessment and Control Evaluation) and CFOI (Census of Fatal Occupational Injuries) programs, as part of their larger duties, perform surveillance of occupational fatalities. Information obtained by these two programs has been used to better characterize the circumstances surrounding occupational homicides with regard to time and date of incident, type of industry, occupation, demographics, instrument of death, possible motive, and risk reduction practices/safeguards in place at time of incident.

Three findings of data from L.A. County suggest areas for further consideration. Although random killings have been given prominent media coverage, the largest proportion of occupational homicides in L.A. County occur during robberies. The instrument of death has overwhelmingly been firearms. Finally, homicide has been the number one occupational manner of death for women.

**POWER FREQUENCY ELECTRIC AND MAGNETIC FIELDS (Extremely Low Frequencies)**

The public discussion on ELF-EMF carries a sense of urgency, while the scientific aspect of the issue carries many uncertainties. In the face of this scientific uncertainty, public health specialists are being asked for answers and to help make decisions. As the discussion continues into the arena where science and policy meet, people find themselves with more questions than answers.

ELF-EMF epidemiological studies and biological research are directed towards solving the mystery of causality, searching for a dose-response relationship, and focusing on what particular aspect or aspects of the fields may interact with biological systems and affect human health. This session will provide public health specialists information on how to interpret the scientific studies, both the strengths and limitations of the studies. The session will describe what ELF-EMF is and where the sources of exposure are and how and when measurements could be conducted. Public health specialists need to know how to utilize risk communication skills and what resources are available to them as they encounter the various issues.

**WORKERS' COMPENSATION CLAIMS AMONG NURSES IN ONTARIO FOR INJURIES DUE TO VIOLENCE**

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Although questionnaire surveys have reported that a high prevalence of nurses have been assaulted at work, the extent to which this has resulted in compensation claims is less clear. Ontario Workers' Compensation Board (WCB) data for claims among nurses for injuries due to violence for 1987-1989 have been analyzed. The number of lost-time claims exceeded 100 per year; there were 5 claims for permanent disability over the 3 years. Days lost varied from 1,898 to 3,113 per year. The rates for such claims were about 9.7 times higher (95% CI 7.0, 12.8) among male nurses (13.9 per 1000) than female nurses (1.4 per 1000). Compared to the Ontario workforce as a whole, the rates among nurses were significantly higher among both male (54 [95% CI 39-70] and female nurses (6 [95% CI 5.2-6.6]). These WCB data are consistent with surveys showing that nurses (and health care workers) are at risk of violent injury in the workplace. However, the problem is likely to be underestimated by WCB data because: there are no statistics for claims with no lost time; there is uncertainty about the estimates for sequelae such as psychological illness; and a number of reports indicate that many assaults go unreported. Specific recommendations for increasing awareness and prevention will be summarized.

**POWER FREQUENCY ELECTRIC AND MAGNETIC FIELD CHARACTERIZATION: WHAT AND WHERE**  
William E. Feero

This presentation reviews the elementary principals of physics relative to understanding electric and magnetic fields that exist in our everyday environment. The characteristics of naturally occurring fields are quantified in the context of ELF fields. The increase in electric and magnetic field levels in the ELF band created as a by-product of electro-technologies are briefly summarized to show the magnitude and frequency characteristics of man-made electric and magnetic fields. By presenting what is produced by our electrical world and where these fields are concentrated, relative to space normally occupied by human beings, the audience can make more informed decisions about the importance of biological findings reported in the literature.

**VIOLENCE IN THE WORKPLACE: THE CANADIAN UNION OF PUBLIC EMPLOYEES' HEALTH AND SAFETY SURVEY OF AGGRESSION AGAINST STAFF**

Anthony Pizzino Senior Officer, National Health and Safety Department, Canadian Union of Public Employees, Ottawa, Canada. Members of the Canadian Union of Public Employees' (CUPE), representing 406,000 members, are employed in a wide variety of occupations. These workers are employed by municipalities, school boards, hospitals and nursing homes, libraries, universities, community and social service agencies, public utilities, the airlines and may other diverse institutions. Violence in the workplace appears to be a growing occupational health and safety hazard for members of Canada's largest union. A national survey has found that violence in the workplace occurs with high frequency among public sector employees. Among surveyed workers, 61.2% indicate they had been subjected to an aggressive act in the past two years. Of those workers, 55.0% were subjected to three or more aggressive acts. The objectives of the survey were to measure the prevalence and impact of workplace violence against CUPE members. In addition, workers describe working conditions and evaluate the existence of workplace training, policies and procedures to minimize assaults. This presentation will present a summary of the information collected during the survey. It will also outline specific recommendations aimed at eliminating assaults for public sector workers.

**LABORATORY STUDIES**  
Martin L. Meltz, Ph.D.

An overview will be presented of published studies investigating biological effects of extremely low frequency (ELF) electric and magnetic fields. A critical examination will be made of some of the papers more frequently referred to as suggesting a relationship to an adverse human health effect. Attention will also be given to placing positive results reported into a toxicological reference frame which is used (when investigating other hazardous agents) to signal possible adverse human health effects.



ABSTRACTS

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