

CTDs relative to a state which does not is 2.79 (95% CI: 1.33, 5.92); for forearm/elbow conditions the odds ratio is 4.42 (1.20, 19.29); for shoulder/upper arm conditions the odds ratio is 4.34 (1.43, 14.73); and for conditions involving the hands/wrist, forearm/elbow, and shoulder/upper arm combined the odds ratio is 3.90 (2.31, 6.65).

**Conclusion.** The consistency of findings suggests that a significant difference in reporting may exist, possibly related to state workers' compensation policy regarding compensation for CTDs.

### Session 30: Occupational Violence

#### **Workplace Violence: Research for Prevention**—Jenkins EL

An average 20 workers are murdered and another 18,000 become the victims of nonfatal assaults in the workplace each week in the U.S. While all workers are potentially at risk for such attacks, surveillance data indicate that the largest number of workplace homicides occur in retail trade (38%) and service (17%) sectors. The largest number of nonfatal workplace assaults occur in the service sector (64%), particularly in nursing homes (27%) and hospitals (11%). The highest rates of workplace homicide occur in retail trade (1.60 per 100,000 workers) and public administration (1.30). Homicide is the leading cause of occupational injury death for women in the workplace and the second leading cause of death overall. For homicides, men are at three times higher risk than women, but for nonfatal assaults women are at slightly higher risk than men. Risk factors for workplace violence include dealing with the public, the exchange of money, and the delivery of services or goods. Prevention strategies include environmental designs (e.g., visibility and lighting, cash-handling devices, and bullet-resistant barriers), administrative controls (e.g., staffing plans and violence prevention policies) and behavioral strategies (e.g., training in non-violent response to robbery). There are, however, very little scientific data as to the effectiveness of these strategies in various settings, either alone or in combination. Research on workplace violence (surveillance and risk factor research) is made more difficult by the lack of complete victim, perpetrator, risk factor, and exposure information. The description of the nature and magnitude of this problem has, to date, relied on information collected for other purposes (e.g., death certificates, workers' compensation files) or as part of a larger criminal justice information system (e.g., victimization surveys). Future research on workplace violence will have to address the limitations of existing data and focus heavily on evaluating the efficacy of prevention strategies in various settings.

#### **Evaluation of Risk Factors for Workplace Violence in Liquor Stores**—Hartman C, Peek-Asa C, Kraus JK, Erickson J, Howard J

**Introduction.** Liquor stores have the second highest workplace homicide rates in the U.S., second only to taxicab drivers. The number of nonfatal injuries to liquor store employees is unknown, but likely exceeds the number of fatal events. Workplace violent injuries in liquor stores are due predominantly to robbery and shoplifting, but little is known about the risk factors that make liquor stores especially vulnerable. This study examines the robbery history and risk factors for workplace violence found in a small sample of Southern California liquor stores.

**Methods.** Robbery and assault histories for liquor stores in Santa Monica, California were collected from January 1992 through July

1996 from the Santa Monica Police Department (SMPD). Owners from 20 liquor stores in Santa Monica were eligible to participate in the study; 12 (60 percent) agreed. Environmental surveys to determine risk factors for robbery and workplace violence injury were conducted in each of the participating liquor stores.

**Results.** Robberies and assaults are very common among liquor stores in Santa Monica. On average, liquor stores were robbed one time in the four-and-one-half-year time period covered by SMPD records, with a range of 0 to 5 robberies. During the same period, three assault-type offenses were averaged, with a range of 0 to 8 assaults. Robberies accounted for 13 percent of all crimes reported to police by liquor stores; assaults accounted for 60 percent. The survey of risk factors identified many potential areas to introduce prevention strategies, including cash handling, store-front window visibility, indoor and outdoor lighting and training in crime control.

**Conclusion.** This survey found a number of risk factors for robbery and workplace violence for which interventions could be both inexpensive and easily-implemented. This research is a pilot-study for a large-scale intervention of workplace violence.

#### **Risk Factors for Robbery and Employee Injury in Convenience Stores**—Hendricks S, Landsittel D, Amandus H, Malcan J

Homicide is the second leading cause of workplace fatalities. Additionally, the annual number of workplace assaults have been estimated to be one million or more. The majority of these workplace assaults and homicides are robbery related. Convenience stores have been shown to be especially vulnerable to robbery and employee injury. The results of two studies examining the risk factors associated with robbery and employee injury in convenience stores are reported here. The first study consisted of collecting information from police reports of convenience stores in the metropolitan areas of seven states. The purpose of these data was to examine risk factors (use of a weapon by the robber; number of customers in the store at the time of a robbery; gender of a lone employee; the number of employees on duty; the amount of money stolen; time of day of the robbery; the stores past experience with robberies) which are associated with the risk of an injury given a robbery occurs. Results from this study as well as the limitations of using police reports are discussed. The second effort was a case-control study of convenience store robbery in the three largest metropolitan areas in the Commonwealth of Virginia where a case store was a store with a robbery reported to the police and a control store was a store within a 2-mile radius of the case store which was open at the time of the robbery. The purpose of these data was to examine the association of store environmental designs (use of a cash limit and drop safe; location of the cash register; escape routes and hiding places; lighting inside and outside the store; view into the store from outside, within the store, and out from the store; use of security cameras, videos, and security mirrors; presence and location of gas pumps and pay phones), geographical factors (proximity to major highways and traffic routes and amount of traffic; surrounding criminal activity; surrounding land use; socio-demographic characteristics of the surrounding community), and store operational characteristics (number of employees on duty; training of employees in robbery prevention; weapons available to the employees) to the risk of a store being robbed. Results from these data are presented. Difficulties and limitations of assessing factors