

tries with asbestos exposures were identified using national exposure data. National mean exposures in these industries were multiplied by the number employed (obtained from Bureau of Census County Business Patterns data for 1982) in these industries for each county. The results within each county were summed and then divided by the total county employment to provide an overall county occupational exposure index. This index was then regressed on the observed asbestosis mortality rate for each county for the years 1989 to 1998. Counties lying outside of the upper 67, 95, and 99 percent confidence limits were identified as potentially having excess asbestosis mortality unexplained by the model, possibly due to non-occupational asbestos exposure. **Results.** Counties were classified as having "probable" non-occupational asbestos exposure (those falling within the region defined by the 67 and 95 percent limits), "highly probable" non-occupational asbestos exposure (those falling within the region defined by the 95 and 99 percent limits), and "very highly probable" non-occupational asbestos exposure (those beyond the 99 percent limit). Counties identified as having high asbestosis mortality but low apparent occupational risks are candidates for follow-up investigation to determine cause.

291. SHOULD BRAIN TANNING BE A LOST ART? POTENTIAL HAZARDS OF PROCESSING MAD DEER. G. Harvey, USAF, Wright-Patterson AFB, OH; T. Lentz, NIOSH, Cincinnati, OH.

The recent Bovine Spogiform Encephalopathy crisis in the United Kingdom has brought international attention to transmissible spongiform encephalopathies (TSEs), neurological disorders that produce holes in brain and spinal tissue leading to dementia and death. TSEs such as Creutzfeldt-Jakob Disease, scrapie in sheep and goats, and Chronic Wasting Disease (CWD) in North American deer and elk are believed to be caused by self-replicating infectious proteins called prions. Prions are highly stable and resistant to drying, freezing, boiling, and other conventional sterilization techniques. Although research suggests that intraspecific transmission of TSEs is markedly more common than interspecific transmission, studies have shown that 1 gram of infected brain or central nervous system tissue is theoretically enough to transfer a TSE across species. On this premise, an investigation was performed to determine the potential hazards involving use of deer brains for traditional leather tanning techniques employed by some North American Indians and primitive technology enthusiasts. While brain tanning is a cottage industry, a review of books, articles, on-line materials, and a video indicate that this craft is actively practiced. The review found that brain tanning processes employ minimal precautions, and the potential for dermal contact with infectious brain material exists. Brain-tanned products may also

present a hazard for transmission to a wider population. Details of the brain tanning process are described with attention to possible routes of exposure, a characterization of numbers of persons involved in brain tanning and peripheral industries, and recommendations for hazard communication and preventive measures to address the potential for occupational exposures to a TSE. Conclusions regarding additional surveillance of this are presented.

292. HEALTH CONSEQUENCES OF THE OCCUPATIONAL EXPOSURE TO LEAD. I. Vanadzins, M. Eglite, M. Bake, Institute of Occupational and Environmental Health, Riga Stradins University, Riga, Latvia.

Objective. There are increasing numbers of occupational poisonings with lead in Latvia during the last 10 years. The aim of the study is to link data of lead concentrations in work places with clinical data of lead poisonings in order to improve early diagnostics and elaborate preventive measures. **Materials and methods.** 1020 measurements of lead concentration in workplaces of different fields of industry (ceramic, glass, accumulators production, ship repairing, etc.) and analysis of chronic lead poisoning cases during years 1991–2001 were performed. The results of lead biomonitoring (lead in blood, coproporphyrin (CP), and δ -aminolevulinic acid (ALA) in urine) have been analysed from 1991 till 2001 (number of investigated workers = 3041). Clinical examinations of patients were carried out. The concentrations of lead in blood were analysed by atomic absorption spectrophotometer. **Results and discussions.** In 64% of cases investigated, the concentration of lead in workers' breathing zone were higher than occupational exposure limits (OEL) (as high as 0.72 mg/m³ with OEL of 0.01 mg/m³). 170 chronic poisonings with lead have been reported during years 1991–2001—22% subclinical poisonings, 30%—1-stage (light), 33%—2-stage (moderate), and 15%—3-stage (severe) poisonings. Total working force of Latvia during this period was approximately 1 million including 2.1–3.4. thousands of workers working with lead. The first clinical signs of chronic lead poisoning were observed for workers with lead level in blood higher than 60 μ g/dl. Biomonitoring detected that number of workers with increased lead, CP, and ALA levels are remarkably higher than number of workers with registered subclinical poisonings showing insufficient diagnostics of early lead poisonings. **Conclusions.** Lead biomonitoring must be improved and associated with early diagnostics of lead poisonings through implementing of legal requirements and advanced training for occupational health specialists.

293. OVERVIEW OF EXPOSURE DATA IN THE NIOSH 2002 WORK-RELATED LUNG DISEASE (WORLD) SURVEILLANCE REPORT. M.

Greskevitch, P. Middendorf, K. Linch, B. Doney, NIOSH, Morgantown, WV.

Goals of the NIOSH Work-Related Lung Disease (WORLD) Surveillance Report include: effecting prevention, targeting research, and strengthening surveillance programs for occupational respiratory hazards among U.S. workers. Previous editions have provided limited information on workers' exposures to respiratory disease agents such as asbestos, coal mine dust, respirable quartz and cristobalite, cotton dust, and other pneumoconiotic agents. The most recent edition has expanded the exposure information to include: geometric mean exposures and percent of exposures exceeding regulatory and NIOSH recommended exposure limits (RELs) by year and major industry division. The sources of exposure information, previously limited to MSHA and OSHA inspector data, have also been expanded to include data from mine operators and OSHA consultation. Some general findings for the period 1990 to 1999 are: (1) for asbestos, the miscellaneous nonmetallic mineral and stone products industry had the greatest geometric mean exposure, 0.03 f/cc; the highest percentage of samples exceeding the permissible exposure limit, 26%; and the highest percent of samples exceeding the NIOSH REL, 41%; (2) the geometric mean respirable coal mine dust exposure of 0.5 mg/m³ MRE in coal mining was half the REL and 26% of the samples for the period 1995 to 1999 exceeded the REL; (3) the geometric mean respirable quartz exposures in metal mining, nonmetallic mining/quarrying, and miscellaneous nonmetallic mineral and stone products industries were 8, 2, and 1 times the REL; and (4) the geometric mean cotton dust exposure for the yarn, thread, and fabric mills industry was 67% of the REL and 32% of OSHA's samples exceeded the REL. For each year between 1979 and 1999, at least 45% of pneumoconiotic agent exposures in the metal/nonmetal mining industry exceeded the REL. For the construction and manufacturing industries, the percent of exposures exceeding the REL ranged from 2% to 40%.

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