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THYROID DISEASE ASSOCIATED WITH EXPOSURE TO THE NEVADA TEST SITE RADIATION – A REEVALUATION BASED ON CORRECTED DOSIMETRY AND EXAMINATION DATA. J. Lyon, *S Alder, M Stone, L Anspaugh, R Holubkov, O Hoffman, K Hegmann, W Meikle, J Reading, A Scholl, X Sheng, S Simon, B Thomas, and G White (University of Utah, Salt Lake City, UT 84108)

In 1993 we reported an association between exposure to radioactive iodine in fallout from nuclear weapons testing at the Nevada Test Site and the development of thyroid neoplasms in a cohort of 2473 exposed as children, and followed for up to 38 years. In 2001 when preparing to re-examine this cohort again we discovered errors in the dosimetry model used to assign individual radiation exposure, and corrected them. A panel of three medical experts, blinded to the exposure history of the subjects and using the most recent diagnostic criteria, reviewed the medical history of the 358 subjects with thyroid disease. Thirty were eliminated, and 18 others assigned a new diagnoses. Radioactive iodine exposure in the cohort ranged from 0 to 140 milliGray with a mean dose of 10.5 mGy. Using four levels of exposure the Rate Ratios for the highest exposure category compared to the lowest for all neoplasms changed from 3.4 (95% Confidence Interval 0.5–26.9) to 7.5 (95% CI 2.6–23.2, trend $p = 0.00053$), and 13.8 (95% CI 3.5–63.0) for benign neoplasms (trend $p = 0.00112$). Thyroiditis became significant with the RR changing from 1.1 to 2.9 (95% CI 1.7–5.2, trend $p = 0.00013$). Exposure before age 8 to low doses of radioactive iodine was associated with increased risk of thyroid neoplasms and thyroiditis in this cohort. The findings agree with results from those exposed to radioactive iodine from the Chernobyl accident. This is the first report of increased risk of thyroiditis in this cohort, and among residents of the United States.

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INCREASED INCIDENCE OF TESTICULAR TUMOURS IN CAR MANUFACTURING WORKERS. *W Ahrens, W Schill, A Gottlieb, J. Weib, W. Dahlke, B. Marschall (Bremen Institute for Prevention Research and Social Medicine, University Bremen, 28359)

Aim: A practitioner had observed several testicular tumours in the automobile industry which raised suspicion of an occupational cause. An incidence study examined whether the incidence rate of male germ cell tumours is actually increased in the cohort of car manufacturing workers. Methods: The cohort includes 167,212 men, who were active between 1989 and 2000 in 6 plants. 250 Patients were identified. Work phases were grouped according to time spent in different departments of the plant. Age and period-specific incidence rates of the Saarland for testicular cancer served as reference for the calculation of standardized incidence ratios (SIRs). Hazard ratios for internal comparisons between work areas were estimated by cox regression. Results: The study confirmed the increased incidence in Plant A (SIR 2.3; 95%-confidence intervals (CI) 1.74–3.07). For the entire cohort, the standardized incidence rate was 14.03, compared with an incidence rate of 10.60 in the reference population; implying a statistically significant increased SIR of the cohort of 1.3 (95%-CI 1.11–1.43). The excess risk was pronounced in older employees aged 50–59 years (SIR 1.7; 95%-CI 1.09–2.57; $N=21$) and particularly in workers aged 60–69 years (SIR 9.3; 95%-CI 4.85–17.93; $N=9$). The internal comparison showed elevated risks in the work areas engine construction (hazard ratio (HR) 1.32; 95%-CI 0.95–1.83), office work (HR 1.60; 95%-CI 1.08–2.35), tool manufacture (HR 1.99; 95%-CI 1.22–3.24) and machine support (HR 2.45; 95%-CI 1.25–4.79). Conclusions: The assumed increased incidence was confirmed by our analysis. The excess in older workers is compatible with a possible occupational cause. Explorative evaluation by work areas provides hints that can only be investigated in the context of a nested case-control study, in consideration of the role of non-work factors. Keywords: Testis cancer, Incidence, Car industry

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CANCER INCIDENCE AMONG PESTICIDE APPLICATORS EXPOSED TO DIAZINON IN THE AGRICULTURAL HEALTH STUDY COHORT. *L E Beane Freeman, M R Bonner, A Blair, J A Hoppin, D P Sandler, CF Lynch, C Knott, M C R Alavanja (National Cancer Institute, Rockville, MD 20892)

Diazinon is an organophosphate insecticide registered for use on plants and animals. Although classified by the EPA as not likely a human carcinogen, there is some laboratory and epidemiological evidence that diazinon may impact cancer risk. We explore the potential association of diazinon exposure and risk of cancer in the Agricultural Health Study, a prospective cohort of licensed pesticide applicators in Iowa and North Carolina. Detailed information on pesticide and other exposures was obtained from a questionnaire completed by 23,106 applicators. Among the 4,961 applicators who reported using diazinon, 263 incident cancer cases were diagnosed during the follow-up period ending December 2001. During the same period, 814 incident cancer cases were diagnosed in the 18,145 participants who did not report diazinon use. The average time of follow-up was 6.5 years for both groups. After controlling for potential confounders [age, smoking (never, tertiles of pack-years in former and current smokers), alcohol use in the past year, education, state of residence, family history of cancer and total days of any pesticide application] and using lifetime exposure days as the exposure metric, we found increased risks for the highest tertile of exposure for all cancers (RR=1.4; 95% CI: 1.0, 1.8), lung cancer (RR=2.4; 95% CI: 1.3, 4.6) and bladder cancer (RR=2.8; 95% CI: 1.1, 7.2). No other cancer site showed a significant association with diazinon for the highest tertile of exposure. This is one of few studies, and the largest to date to examine the effects of diazinon exposure and cancer risk. Our finding supports the suggestion of association between diazinon and lung cancer risk which was reported in a previous study of pest control workers, but the observed associations with all cancers and bladder cancer have not previously been seen.

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CANCER MORTALITY IN A COHORT OF 100,000 VIETNAM VETERANS. *S D Stellman, C Tomasallo, J M Stellman (Dept. of Epidemiology, Mailman School of Public Health, Columbia University, New York, NY 10032)

Agent Orange was a dioxin-contaminated herbicide used extensively during the Vietnam War. An Institute of Medicine (IOM) Committee has concluded that "sufficient evidence" of an association with exposure exists for four cancers (soft-tissue sarcoma, non-Hodgkin lymphoma, Hodgkin's disease, and chronic lymphocytic leukemia) and that "suggestive/limited evidence" exists for lung and prostate cancer and multiple myeloma. During 1988–94 over 100,000 Vietnam veterans applied for compensation from the Agent Orange Veteran Payment Program (AOVPP), which was created by the US Federal Court to disburse payments resulting from settlement of a lawsuit against the herbicide manufacturers. We used proportionate cancer mortality ratios (PCMRs) to study the cancers named by the IOM in 14,926 deceased veterans whose survivors filed death claims, and standardized mortality ratios (SMRs) to study 84,010 veterans who died subsequent to filing claims for total disability, and whom we followed-up through 1998 using the National Death Index. SMRs and PCMRs for all four "sufficient evidence" cancers were significantly elevated and SMRs for the three "suggestive/limited evidence" cancers were also elevated in the 20-year follow-up. SMRs ranged from 1.4 for lung cancer (95% confidence interval 1.3–1.5) and 1.9 (1.3–2.7) for Hodgkin's disease to 3.1 (1.9–4.2) for chronic lymphocytic leukemia and 3.7 (3.0–4.5) for multiple myeloma. In contrast, SMRs for colon cancer and acute myeloid leukemia were not significantly elevated. Inasmuch as no specific diseases were solicited for the disability cohort, this suggests that claimants are not self-selected for all cancers or for hematopoietic cancers. These findings corroborate the conclusions of the Institute of Medicine and provide a basis for proceeding with assessment of individual veterans' herbicide exposures using a geographic information system we developed for this purpose.

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