

2B and/or US EPA Group C and higher). Logistic regression was used to calculate odds ratios (ORs) and 95% confidence intervals (CIs). Models were adjusted for age, province, and use of a proxy respondent.

Results Nearly 20 “probably” and 50 “possibly” carcinogenic pesticides were reportedly used by participants. Men who used any “probably” carcinogenic pesticide had increased odds for NHL (OR = 1.63, 95% CI: 1.23–2.16) and MM (OR = 1.56, 95% CI: 1.12–2.18), but not for STS (OR = 1.13; 95% CI: 0.81–1.58) and HL (OR = 0.99, 95% CI: 0.66–1.48) relative to men who did not use these pesticides. Similarly, men who used any “possibly” carcinogenic pesticide had higher odds for NHL (OR = 1.54, 95% CI: 1.21–1.96) and MM (OR = 1.36, 95% CI: 1.02–1.81), but not for STS (OR = 1.02, 95% CI: 0.77–1.35) and HL (OR = 0.97, 95% CI: 0.70–1.33).

Conclusions The use of any carcinogenic pesticide was associated with modest increases in odds for NHL and MM, but not for STS and HD. The ORs were slightly larger from use of “probably” compared to “possibly” carcinogenic pesticides. These results are consistent with IARC and US EPA pesticide classifications.

163 RISK OF MAJOR LYMPHOMA SUBTYPES AND USE OF MOBILE PHONES

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Introduction Recent case-control studies have suggested an increase in risk of non Hodgkin Lymphoma (NHL) among mobile phone users. We explored the association in a case-control study conducted in Sardinia Italy in 1999–2004. **Methods.** Three hundred twenty two adult (age range 25–75) cases, first diagnosed with lymphoma along the study period, and 422 controls, randomly selected from population Registrars, frequency matched to cases by age, gender and local health unit of residence, participated to the study. In person interviews gathered information on data and age of purchase of a mobile telephone and duration of its daily use. We conducted unconditional logistic regression analysis in 322 lymphoma cases and 446 population controls, adjusting by age, gender and education.

Results Risk of lymphoma (all types; OR = 1.5; 95%CI 1.0 - 2.1), and particularly chronic lymphocytic leukaemia (OR = 1.8; 95%CI 1.0 - 3.4) was elevated in subjects reporting use of mobile phones, but it decreased with duration of use, and it was more elevated for the most recent purchases and for age at first purchase³ 56 years.

Conclusions Our findings contradict some assumptions about the association between use of mobile phones and cancer risk. Information bias possibly played a role Overall, our study cannot provide support to the aetiological nature of the observed associations.

164 CANCER INCIDENCE IN A COHORT OF BIOLOGY RESEARCH LABORATORY WORKERS IN THE NETHERLANDS

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Objectives Research laboratory personnel is exposed to a wide variety of carcinogenic agents. The link between biological research work and a possible increased cancer risk has been studied in several European countries. We examined the incidence of cancer among persons employed in Dutch biology research laboratories, particularly cancer of the pancreas, brain, breast, and lung and non-Hodgkin's lymphoma.

Methods In a historical cohort study, 7307 laboratory workers employed in four Dutch institutions between 1960 and 1992 were followed for incidence of cancer and mortality from 1989 to 2009 based on linkage with the Netherlands Cancer Registry. Information on the agents used in the research laboratories was obtained by a questionnaire sent to 2536 participants (64% response) and by another questionnaire completed by 98 laboratory heads. Cancer incidence was compared with the general population via standardised incidence ratios (SIR). Internal comparisons of laboratory workers with a control group of 2404 unexposed employees of the same institutions were based on Cox regression.

Results During follow-up (mean duration, 16.6 years), 809 cancers were observed among exposed and unexposed cohort members, which affords 80% power to detect a SIR of 1.1 for all cancers among the laboratory workers and a hazard ratio of roughly 1.3 for laboratory workers compared with the unexposed group. Analyses by duration of employment, type of research lab, and job title are ongoing. Results on cancer mortality until 1995 have been previously published (*Cancer Causes Control* 2004;15(1):55–66). No increased cancer mortality risks were observed compared to the general population. However, based on internal comparisons, risks were elevated for several sites, particularly lung cancer.

Conclusions Strength of this cohort are the long follow-up and large size, including a sizeable control group. This allows external comparisons of cancer incidence with the general Dutch population as well as internal comparisons with similar, however unexposed, workers.

165 BREAST AND CERVICAL CANCER SCREENING UTILISATION AMONG INSURED FEMALE EMPLOYEES AT A LARGE US COMPANY

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Objectives Female employees enrolled in a company-sponsored health insurance plan are eligible to receive preventive care benefits. We examined the utilisation of recommended screening tests for breast and cervical cancer among female employees of a large U. S. company.

Methods Using health insurance claims data, we identified female employees who were continuously enrolled from 2009 through 2011. The prevalence of biennial screening mammography among employees aged 40 to 64 years and the prevalence of Pap tests in the past three years among employees aged 21 to 64 years were calculated for groups defined by demographic and work characteristics.

Results Among 3,972 female employees aged 40 to 64 years, 62% had at least one screening mammography in 2010 or 2011. Screening mammography utilisation did not differ substantially by race, marital status, pay-type or work location. Screening mammography utilisation was higher among employees aged 50 to 64 years (65%) compared to those aged 40 to 49 years (57%) and was higher among employees with day work schedules (64%) compared to those with rotating work schedules (51%).

Among 4,972 female employees aged 21 to 64 years, 74% had at least one Pap test within the past three years. Pap test utilisation was higher among employees aged 21 to 39 years (84%) compared to employees aged 40 to 49 years (76%) and 50 to 64 years (70%). Pap test utilisation was higher among employees with day work schedules (75%) compared to those with rotating work schedules (62%).

Conclusion More than one-half of female employees utilised recommended breast and cervical cancer screening tests; however, in the US population, the prevalence of screening mammography and Pap tests was 72% and 83%, respectively. Breast and cervical cancer screening for this insured employee cohort was slightly lower relative to the general US female population.

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166 THE CORRELATION BETWEEN WORKING CONDITIONS AND HEALTH STATUS OF NURSING PERSONNEL IN NURSING HOMES IN TAIWAN

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Objectives To understand working conditions and potential occupational hazards among nursing personnel (registered nurses and nursing assistants) of nursing homes.

Methods A self-administered questionnaire was used to identify the hazards in nursing homes. Chinese Job Content Questionnaire, Chinese Copenhagen Burnout Inventory, and Chinese Nordic Musculoskeletal Questionnaire were used to measure the health status of nursing personnel. An expert focus group and two field visits to nursing home were performed to better understand the potential occupational hazards of nursing homes.

Results A total of 477 eligible questionnaires were completed and returned for final analysis. For biological hazards, needle-stick injuries were associated with high job strain of registered nurses. In regard to psychosocial hazards, for registered nurses, low level of employment security was associated with high personal burnout. For nursing assistants, it was associated with high personal burnout, work burnout, and client burnout. Low level of workplace justice was the risk factor for high personal burnout, work burnout of nursing personnel. For ergonomic hazards, the prevalence of musculoskeletal discomforts was 94.8%. Standing ≥ 6 hours was highly associated with high job strain for registered nurses. Twisting waist ≥ 20 times during work was also related to musculoskeletal discomforts in the past year.

Conclusions This study has identified that the work environment of nursing homes would affect health status of nursing personnel in different aspects. To minimise those health effects on nursing home staff, improving the working environment practically and designing educational programs in preventing occupationally induced harms are warranted. A periodical evaluation system is also suggested, to better understand the psychosocial conditions of nursing home staff.

167 OCCUPATIONAL RISK ASSESSMENT AND RISK MANAGEMENT OF ANTINEOPLASTIC DRUGS IN ACUTE CARE SETTINGS

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Background Antineoplastic drugs (ADs) that are carcinogenic, teratogenic and mutagenic are prescribed to manage cancer and immune diseases. Through patient care activities, many health-care workers (HCWs) are routinely exposed to ADs.

These drugs are associated with secondary cancers along with established evidence on adverse occupational reproductive outcomes but due to lack of precise exposure assessment tools, evidence regarding occupational cancer risks following long term occupational exposures is limited and there is concern for additional risk due to interaction between multiple drug exposures.

Despite safe handling guidelines, recent evidence describes continued exposure to ADs among HCWs, in particular pharmacists and nurses, and also suggest a wider range of hospital occupations may be at risk.

Methods We conducted:

Systematic review of evidence for biological exposures to cyclophosphamide among HCWs and lifetime cancer risks assessments.

Observations and job shadowing of local oncology personnel performing associated tasks. The HCWs' interactions with each other and their environment were monitored for transmission of contamination.

Discussions with stakeholders evaluated the impact of policies, procedures and settings on HCWs' exposures.

Results HCW's AD urinary contamination levels have been decreasing over the years. Animal and human models were used to quantify the occupational lifetime risks for cancer. Results based on pharmacists and nurses suggest elevated lifetime risks for bladder cancer and leukaemia.

Observations suggest that despite precautionary actions, exposures cannot be controlled without considering the entire hospital AD network. Interviews of stakeholders confirmed the existence of gaps that enable contamination.

Conclusions The entire health care facility should be investigated to address gaps in the control of AD exposures through network analysis of contacts and probabilities for contamination for each AD related task; technological improvements are needed for safer preparation, delivery, administration and disposal of ADs; changes in policies are required to address the entire AD system, from 'cradle to grave'.

168 WORK ABILITY AND FATIGUE AMONG NURSING PERSONNEL WITH AND WITHOUT WORK RESTRICTION

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Objective The inadequate conditions of nursing work have been associated with illness of workers and, consequently, decreasing the Work Ability Index (WAI) and higher levels of fatigue. Often it is observed that sickened workers continue working, performing their activities with restrictions by physical or mental health problems. Thus, we became interested in verifying the association between the work ability index and fatigue among workers who have restriction to perform daily activities or not.

Methods This is a cross-sectional epidemiological study, with 100 workers of population. It was conducted in medical and surgical units of a University Hospital in Sao Paulo-Brazil. For data collection was applied the WAI and Chalder Fatigue Scale. Data analysis considered the Pearson correlation coefficient to associate WAI and fatigue, and analysis of variance and chi-square test to investigate association between work restriction, gender and working hours.