TRANSITIONS BETWEEN UPPER EXTREMITY MUSCULOSKELETAL SYMPTOMS AND WORK LIMITATION OUTCOMES: A PROSPECTIVE STUDY
Bethany Gardner, Ann Marie Dale, Alexis Descatha, Bradley Evanoff, Washington University in St. Louis, St. Louis, MO, USA; Université Versailles-Saint Quentin, Versailles, France
10.1136/oemed-2014-102362.135

Objectives Selection of appropriate outcome measures in studies of work-related musculoskeletal disorders (MSDs) directly affects the observed exposure-response relationship. Considering that many different factors might affect different stages of disease severity, we examined disability outcomes that represent a spectrum of disease in a newly hired working population and described the transitions between various states of symptoms and disability.

Method From July 2004 to October 2006, 1107 newly hired workers were recruited to participate in the study. Subjects completed self-reported questionnaires including demographics, medical and work history, and current symptom and work status, nerve conduction studies, and a physical exam. Surveys were repeated at 6, 18, and 36 month follow-up; 827 subjects (75%) completed all follow-ups and were included in the analysis. The outcomes of interest were presence of upper extremity symptoms and limitations in work abilities, productivity, job restrictions, lost time, and job changes due to these symptoms.

Results A majority of workers (72%) reported symptoms at least once during the study, yet less than half (44–46%) reported symptoms within any single follow-up period. Similarly, 31% of workers reported work limitations due to their symptoms at least once during the study, but only 15–16% within any single follow-up period.

Conclusions These results provide evidence for the dynamic nature of both MSD symptoms and work abilities over time, which has been theorised but with few explicit studies. If the risk factors for these outcomes differ, this may explain some of the lack of clarity in the current literature on work-related risk factors and MSD.

THE LIFETIME RISK APPROACH TO ESTIMATING THE BURDEN OF OCCUPATIONAL CANCER
Lin Fritschi, Renee Carey, Susan Peters, Alison Reid, Deborah Glass, Geza Benke, Tim Driscoll. The University of Western Australia, Perth, Australia; Monash University, Melbourne, Australia; Sydney University, Sydney, Australia
10.1136/oemed-2014-102362.136

Objectives The main approaches to estimating the burden of occupational cancer are attributable risk and lifetime risk. In this presentation we will explain why we used the lifetime risk approach.

Method The lifetime risk of cancer is an estimation of an individual’s risk of being diagnosed with cancer during their life (without considering occupational exposures). The lifetime risk for the general population (LR\textsubscript{GP}) is estimated by multiplying cohort person-years-at-risk (from life table data) by age-sex specific incidence rates.

The excess lifetime risk of cancer in a cohort of workers exposed to the carcinogen of interest (LR\textsubscript{exposed}) is a product of the LR\textsubscript{GP} and the excess relative risk of developing cancer associated with that exposure. LR\textsubscript{exposed} is multiplied by the prevalence of exposure to obtain the number of cancers attributable to the exposure in the general working population.

Results The lifetime risk approach estimates the number of cancers which would occur over a number of years in the future, due to exposures in a specific year. In contrast, the attributable risk approach estimates the number of cancers which would occur in a specific year due to exposures over a number of years in the past. Because we had exposure prevalence information for a specific year based on a national survey, we determined that the lifetime risk approach was more applicable in our case.

Conclusions The lifetime risk approach is an alternative method for calculating burden of disease when exposure prevalence information is available.

OBTAINING POPULATION ESTIMATES OF THE PREVALENCE OF OCCUPATIONAL EXPOSURE
Lin Fritschi, Renee Carey, Susan Peters, Alison Reid, Deborah Glass, Geza Benke, Tim Driscoll. The University of Western Australia, Perth, Australia; Monash University, Melbourne, Australia; Sydney University, Sydney, Australia
10.1136/oemed-2014-102362.137

Objectives Good occupational health policy requires an overall understanding of the proportion of the working population who are exposed to hazards at work. This is difficult to estimate when nearly three-quarters of the workforce are in small and medium sized companies and so not easily surveyed or monitored. We are undertaking a series of national surveys of the workforce to estimate how many people are exposed to hazards, where those people work, and to identify areas where controls could be used more effectively.

Method A random sample of the working population were invited to participate in a telephone interview regarding carcinogens at work using a web-based application (OccIDEAS). Participants were asked about their job tasks and predefined algorithms were used to automatically assign exposures.

Results Overall, 40.3% of the working population were estimated to be exposed to at least one of the 38 carcinogens we were interested in. Farmers, heavy vehicle drivers and miners were the most likely to be exposed. The most common exposures were solar radiation, diesel engine exhaust and environmental tobacco smoke. We are now undertaking similar surveys to estimate the prevalence of occupational exposure to asthmagens, noise and ototoxic chemicals. We are also examining whether migrant workers are more likely to be exposed than the Australian born population.

Conclusions This study demonstrates a practical, web-based approach to collecting population information on occupational exposure prevalence.

CANCER MORBIDITY AND MORTALITY OF INORGANIC LEAD EXPOSED WORKERS IN KOREA
Yeon-sun Ahn, Min-ki Kim. Dongguk University Ilsan Hospital, Goyang, Republic of Korea; Dongguk University Gyeongju Hospital, Gyeongju, Republic of Korea
10.1136/oemed-2014-102362.138

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Method The lifetime risk of cancer is an estimation of an individual’s risk of being diagnosed with cancer during their life (without considering occupational exposures). The lifetime risk for the general population (LR\textsubscript{GP}) is estimated by multiplying cohort person-years-at-risk (from life table data) by age-sex specific incidence rates.

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Conclusions The lifetime risk approach is an alternative method for calculating burden of disease when exposure prevalence information is available.
RENAL DISEASE INCIDENCE AMONG 58,000 MALE CANCER INCIDENCE AND MORTALITY IN AN AUSTRALIAN COHORT OF LEAD WORKERS WITH HISTORICALLY COLLECTED BLOOD LEAD DATA

**Objectives**
This study was conducted to compare the cancer incidence in inorganic lead exposed workers with the Korean general population, and to explore the relationship between cancer mortality and blood lead levels.

**Method**
Using the Korean annual medical surveillance for exposure to lead, a cohort comprising 74,659 inorganic lead exposed workers working between January 1st, 2000 and December 31st, 2004 was compiled. This cohort was merged with the Korea National Central Cancer Registry (KNCCR) and death registry of the Korea National Statistical Office (KNSO) in order to evaluate the cancer morbidity for these workers between 2000 and 2008.

**Results**
There were 793 cases cancer and, the incidence of stomach cancer (SIR 1.17, 95% CI=1.01–1.36) was found to be elevated in lead chromate workers. Excesses were observed for kidney (2.15, 1.19–3.88) and bladder cancers (2.29, 1.149–4.58) in lead exposed workers ≥20 years of job duration., kidney cancer (2.23, 1.21–4.18) in workers with ≥10 ug/dl of blood lead level and lung cancer in female workers with ≥10 ug/dl. Workers with ≥40 ug/dl of blood lead levels had a significantly higher risk of overall cancer mortality (RR: 2.75; 95% CI: 1.60–1.98) compared with workers who had less than 10 ug/dl.

**Conclusions**
Our study showed incidence excess of lung cancer in female workers, stomach cancer in lead chromate exposed workers and a possible dose-response relationship between d kidney cancers and lead exposure. Also overall cancer mortality excess was observed in high lead exposed workers.

**0364 CANCEER INCIDENCE AND MORTALITY IN AN AUSTRALIAN COHORT OF LEAD WORKERS WITH HISTORICALLY COLLECTED BLOOD LEAD DATA**

**Objectives**
To measure cancer incidence and mortality in a retrospective cohort of Australian lead-exposed workers.

**Method**
The cohort comprised male lead workers who had been participants in state government occupational blood lead surveillance programs conducted since the 1970s. Historically collected blood lead data were accessed from surveillance records. Linkage was undertaken to the National Death Index and the Australian Cancer Database to identify causes of death and incident cancers.

**Results**
4,114 male subjects were followed for an average of 16.2 years, giving 68,172 person years. All incident cancers and cancer mortality and blood lead levels.

**Conclusions**
The increase in gastrointestinal stract cancers is consistent with some previous studies of lead workers. Confounding from lifestyle factors, such as alcohol, could not be examined. It is planned to include this cohort in an international pooling study of lead exposed workers.

**0365 CHALLENGES TO OCCUPATIONAL CANCER EPIDEMIOLOGY IN QATAR**

**Objectives**
Assess exposures to occupational carcinogens in Qatar.

**Method**
IARC conducted a review of environmental carcinogens (IARC Group 1 and 2A) in Qatar 2013. Information was ascertained from ministries and a survey among Qatar Petroleum associated companies.

**Results**
Major parts of the population are migrant workers; male migrant workers are primarily recruited for the construction and the oil-and gas industry, while female migrant workers mostly do domestic work. The predominant material for construction is lime stone with increasing use of gabbro containing low silica levels compared to quartz. Only small quantities of asbestos have been used. The technologies used for natural gas extraction in Qatar are mostly closed processes.

**Conclusions**
Workers in construction and in the oil and gas sector are mainly migrant workers who remain in the country for short