Conclusion This retrospective cohort study among workers exposed to MRI-related SMF showed that recent SMF exposure is associated with increased risks of accidents resulting in injuries and (near) traffic accidents during commute from home to work.

Session: W. Methods

175 CLINICAL RECORD KEEPING QUALITY INDICATORS FOR OCCUPATIONAL HEALTH SERVICES

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Objectives In any clinical speciality, the collection of accurate clinical information is a pre-requisite to providing high quality clinical care. Structured medical records can improve measures of performance and outcome in clinical care. In the United Kingdom (UK) record keeping standards have been developed for hospital medical records but none are available for occupational health services (OHS). This project reviewed the available evidence to develop generally applicable record keeping quality indicators (QI) for OHS.

Methods The results of three comprehensive UK literature reviews on record keeping standards were examined. Studies with direct or indirect relevance to the OHS setting were included. Evidence statements on medical record keeping were extracted. Bias, outcome measures and OHS implications were evaluated. Candidate QI were mapped against the results of a two-stage national consensus exercise on record standards, and suitable QI were developed.

Results 84 publications were included in the review, 22 were selected for full text appraisal. Performance improvements were shown with general structured assessment forms in seven publications and with context specific forms in 12 publications. No specific studies based in OHS were retrieved; however one publication was relevant to occupational health care. Following critical appraisal of the studies and the mapping process, four generally applicable record keeping QIs, with the headings "findings", "treatment", "assessment, and "advice" were developed.

Conclusions General and context specific record keeping standards have been shown to improve the quality of care in other medical specialities. We have developed four general record keeping QI for use in OHS. These indicators are applicable across all employment sectors. The indicators will be incorporated into a national UK clinical registry for OHS. Further work will be done to validate these QI in practice. Context specific record keeping indicators should be developed in occupational medicine.

176 ANALYSIS OF HIERARCHICAL DATA; COMPARING META-ANALYTICAL TO MULTILEVEL ESTIMATES

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Objectives To compare pooled risk estimates obtained by meta-analytical methods with the corresponding risk estimates derived by analysis of individual data, using hierarchical methods, and to explore explanations for possible differences.

Methods The data were obtained from a study of 12,426 participants from 47 occupational groups (mostly nurses and office workers) in 18 countries. Pain in the low back and wrist/hand that interfered with everyday activities and exposure to possible risk factors had been collected using standardised questionnaires. Unadjusted associations with potential risk factors were explored using logistic regression separately for each occupational group and then the 47 risk estimates for each risk factor were synthesised in a meta-analytical model. Risk estimates were also obtained from the individual data using multilevel logistic models. The multi-level estimates were then compared with the corresponding pooled estimates derived from the meta-analysis.

Results For most risk factors, the odds ratios were similar using the two methods, though the confidence intervals for the odds-ratio estimates obtained from the meta-analysis model were wider than the confidence intervals for those derived from the multilevel model. When disabling low back pain was used as an outcome, the mean of the ratios of the odds ratios derived from multilevel modelling to those derived from meta-analysis was 0.99 (range 0.87 to 1.07). When disabling wrist/hand pain was taken as the outcome, the mean ratio was 0.97 (range 0.84 to 1.11).

Conclusions In the analysis of these data, pooled risk estimates obtained by meta-analysis were very similar to those derived from multilevel analysis of the individual data. However, circumstances in which estimates from the two methods may differ will be discussed.

177 USE OF PROPENSITY SCORES IN OCCUPATIONAL HEALTH?

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Objectives Intervention studies are needed in occupational health in order to test if work improvements are effective, although not always possible. In the last decade, propensity score analysis has been widely used in clinical settings for treatments for which randomised controlled trials are unlikely to be conducted, such as socioeconomic factors in public health. It gives an estimate of a treatment effect in making treated and untreated group comparable for confounding factors by modelling treatment probability. We aimed to describe the frequency of propensity score cited in occupational health literature and its use.

Methods Using the key words "occupational" and "propensity score", studies were selected from PubMed database (last 20 years). Frequency of citation was compared to two other requests "clinical" "propensity score" - "public health" not "occupational" "propensity score". Embase and Web of sciences were also used to find extra papers. Relevant information was extracted including use of propensity score.

Results Twenty-four papers were found in PubMed with propensity score in occupational health [0.01% of all citations of this area, versus 1210 (0.06%), and 2731 (0.07%) in clinical or other public health domains respectively P < 0.001]. Among papers in occupational health, 12 were relevant, published since 2005, mostly from US teams (n = 10). The analyses included many subjects (median 7314), coming from pre-existing databases. The studies dealt with treatment evaluation (n = 2), economic evaluation (n = 2), and risk factors analysis (n = 5). Three papers studied implementation of programs in occupational setting, two for economic or quality purpose, one for effectiveness of multidisciplinary primary prevention program including work adaptation.

Conclusions Few studies used propensity score analysis, two used this method for evaluating interventions (safety or coaching programs) and only one considered work adaptations/rehabilitation. More widespread use of this methodology in large workers datasets might give information of efficiency of work adaptation when intervention studies are not suitable.

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178 | PREDICTION OF OPTIMAL INTERVALS OF RADIOLOGICAL SURVEILLANCE FOR WORKERS AT DIFFERENT RISKS OF SILICOSIS - CHINA'S EXPERIENCE

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Objectives To determine the optimal intervals of chest radiographic surveillance for workers at different risks of silicosis.

Methods All 3492 workers who were exposed to silica dust during 1964–74 in an iron-ore of China were recruited into this historical cohort study, and followed up till 31/12/2008. We obtained worker's information on socio-demographics, smoking habits, disease history, and lifetime occupational history; these variables were used to develop a risk score system according to a prediction model. The discriminative ability of prediction model was determined by the area under the receiver operating characteristic (ROC) curve. We determined the optimal interval of radiographic surveillance for workers at different risk of silicosis according to the OSHA's precedent role (unacceptable risk: >1/1000).

Results The model with the best fit was the least absolute shrinkage and selection operator (LASSO) Cox model which showed a good discrimination with an area of 0.83 (95% CI, 0.81–0.86) under the ROC curve. We classified workers into 3 risk groups according to the score chart, and found the observed probabilities matched well to the predictions. According to the OSHA's precedent role, we can determine that the initial interval of radiographic surveillance for workers in the low risk group (score <25) was 11 years and then a biyearly examination was recommended. The initial examination interval was 11 years and 5 years respectively for workers in the middle (score: 24–40) and high risk group (score ≥40), and a yearly examination was recommended thereafter. For patients with silicosis, an annual radiological surveillance program was recommended regardless of the stage of pneumoconiosis.

Conclusions This study is the first to provide scientific evidence on the optimal intervals of radiographic surveillance for workers at different risk levels of silicosis, whilst cross-setting industry validation in subsequent studies may worth exploring.

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179 | THE USE OF NON-RANDOMISED STUDIES IN SYSTEMATIC REVIEWS OF INTERVENTION EFFECTIVENESS: A CONTENT ANALYSIS OF COCHRANE SYSTEMATIC REVIEWS

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Objective Randomised controlled trials are the gold standard for evaluating interventions but especially in occupational health not always feasible. Therefore, non-randomised studies (NRS) are increasingly used as evidence for effectiveness of interventions also in Cochrane reviews. When and how NRS are included has not been evaluated to date. Our aim was to conduct an overview of practice to show what kinds of questions are addressed, what kind of methods are used and what reasons the review authors cite for the inclusion of NRS within the Cochrane Collaboration.

Methods We searched the Cochrane Database of Systematic Reviews (CDSR). We included all reviews that aimed to include NRS. We conducted study selection and data collection in duplicate and analysed the results with ATLAS.ti and Excel. We analysed how questions were addressed and reasons for inclusion were distributed over review groups, study participants and interventions.

Results We included 202 reviews. The earliest reviews were from the year 2000. The number of Cochrane reviews with NRS has consistently increased over the years. Most of the reviews (52%) did not cite a reason. Where cited the most common reason for inclusion of NRS was non-feasibility of RCTs for an intervention (30%). It was not always clear why RCTs were not feasible. The highest number of reviews with NRS (61) came from the EPOC group. The reviews mostly addressed health care providers (28%). The most common tools for risk of bias assessment were EPOC group's criteria (28%) followed by The Cochrane risk of bias tool (15%). The assessment was not described in 3% of the reviews.

Conclusions Reasons for including NRS in systematic reviews vary across Cochrane review groups. Reasons for non-feasibility of RCTs should be better elaborated. Definition of study designs and risk of bias assessment of NRS needs more attention.

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180 | OCCUPATIONAL EPIDEMIOLOGY: A BIBLIOMETRIC ANALYSIS BY COUNTRY AND ERA

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Objectives Bibliographic databases allow the study of historical trends in research output

Methods Countries active in occupational epidemiology were identified using the EPICOH membership list. Seven countries had more than 5 member scientists: USA, Canada, Sweden, UK, Italy, France, and Netherlands. Populations in 2000 were obtained from the UN website. Papers were sought in PubMed using "occupation*" and "epidemiolog*" in Title/Abstract. Country was obtained from the "affiliation" field.

Results 7,433 papers were retrieved, the earliest from the UK in 1937 [1]. An initially steep increase in publishing has decelerated, numbers quadrupling from the 1970s to 1980s, doubling from 1980s to 1990s, but increasing by only 30% from 1990s to 2000s. The seven active countries together published 42% (3,095) of the total retrieved. No papers were retrieved from these countries before 1980, so results comparing them relate to 1980–2012. After correcting for population size, Sweden had the highest publication rate of 18.1 per million population, followed by Netherlands and Canada (7.5 and 6.7). USA, UK, France, and Italy were similar (5.2, 4.9, 4.9, and 4.6). In absolute numbers, the USA was the most prolific (1,449).