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.

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.
Acknowledgement Pneumoconiosis Compensation Fund Board, Hong Kong.

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.

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).

Conclusions These findings must be interpreted with caution because any word search is dependent on the use of language, which varies between countries and language groups, and over time. Also, the affiliation field refers only to the first author. With these caveats, this historical analysis supports some anecdotal impressions about occupational epidemiology: Nordic countries, relative to their size, have made a major contribution; historically, papers have come from a small pool of countries; the large volume of papers from the USA is likely to be influential; and the trend of accelerating research output seen in the twentieth century may have stabilised.

181 ADDRESSING CONTINUOUS DATA FOR PARTICIPANTS EXCLUDED FROM TRIAL ANALYSIS: A GUIDE FOR SYSTEMATIC REVIEWERS

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Objectives To develop a framework for handling missing participant data for continuous outcomes in systematic reviews and assess its impact on risk of bias.

Methods We conducted a consultative, iterative process. We considered sources that reflect real observed outcomes in participants followed-up in individual trials included in the systematic review, and developed a range of plausible strategies that would be progressively more stringent in challenging the robustness of the pooled estimates. We applied our approach to two example systematic reviews.

Results We used 5 sources of data for imputing the means for participants with missing data: [A] the best mean score among the intervention arms of included trials, [B] the best mean score among the control arms of included trials, [C] the mean score from the control arm of the same trial, [D] the worst mean score among the intervention arms of included trials, [E] the worst mean score among the control arms of included trials. To impute SD, we used the median SD from the control arms of all included trials. Using these sources of data, we developed four progressively more stringent imputation strategies.

In the first example review, effect estimates were diminished and lost significance as the strategies became more stringent, suggesting the need to rate down confidence in estimates of effect for risk of bias. In the second review, effect estimates maintained statistical significance using even the most stringent strategy, suggesting missing data does not undermine confidence in the results. The differences are due to: [1] the size of the effect and its precision, and [2] the percentage of missing participant data.

Conclusions Our approach provides rigorous yet reasonable and relatively simple, quantitative guidance for judging the impact of risk of bias as a result of missing participant data in systematic reviews of continuous outcomes.

182 ENGLISH-SPEAKING REVIEWERS CAN CORRECTLY IDENTIFY FOREIGN-LANGUAGE ARTICLES THAT MEET ELIGIBILITY CRITERIA FOR A SYSTEMATIC REVIEW OF MANAGEMENT FOR FIBROMYALGIA

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Objective To assess whether English-speaking reviewers can identify foreign-language articles that are eligible for a systematic review of all treatments for fibromyalgia.

Methods Systematic review of AMED, CINAHL, EMBASE, MEDLINE, HealthSTAR, PsycINFO, Papers First, Proceedings First and CENTRAL, from inception of each database to April, 2011, to identify all randomised controlled trials exploring any form of therapy for fibromyalgia. All non-English language articles were identified and screened for eligibility by native-language reviewers. English-speaking reviewers screened all non-English language, guided by 10 questions, in order to identify those that were eligible for review.

Results Of 15,466 potentially eligible studies we retrieved 763 in full text, of which 133 were published in 19 non-English languages; 431 studies proved eligible of which 53 were published in languages other than English. Agreement between English and native-language reviewers for assessment of eligibility of the 133 foreign language articles was 89% and the chance-corrected agreement was substantial (kappa = 0.77). Use of a simple 4-step rule (excluding languages with only one or two articles, reviewing titles and abstracts for clear indications of eligibility, noting the lack of a clearly reported statistical analysis unless the word 'random' appears, and noting features of systematic review) preserved the highest proportion of eligible articles (96%) with the fewest number of foreign-language reviewer teams needed (n = 9).

Conclusions We identified strategies that English-speaking reviewers can implement to ameliorate the burden associated with including eligible non-English language studies in systematic reviews.

183 THE USE OF ECOLOGICAL DATA TO GENERATE HYPOTHESES ON EXOGENOUS RISK FACTORS FOR (RARE) CANCERS

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There is a public health need to balance timely generation of hypotheses with cautious causal inference. For rare cancers this is particularly challenging because standard epidemiological study designs may not be able to elucidate causal factors in an early period of emerging risks.

We have previously demonstrated that open-access databases (the GLOBOCAN 2008 resource combined with data from the United Nations Development Report and the World Bank list of Development Indicators) can be used to explore associations between potential risk factors and incidence of cancer of the brain and central nervous system at an ecological level (publication in press).

In this study we showed that the only exogenous risk factor consistently associated with higher incidence rates of cancer of the brain and central nervous system was the penetration rate of mobile/cellular telecommunications subscriptions. Furthermore,