Abstracts

O-306 PERFORMANCE OF SELF-REPORTED AND URINARY BIOMARKER-BASED MEASURES OF EXPOSURE TO GLYPHOSATE AND MANCOZEB IN A STUDY ON SLEEP PROBLEMS AMONG SMALLHOLDER FARMERS IN UGANDA

1Hans Kromhout, 2Samuel Fuhrmann, 3Institute for Risk Assessment Sciences (IRAS), Utrecht University, Utrecht, The Netherlands; 4Swiss Tropical and Public Health Institute (Swiss TPH), Allschwil, Switzerland

Introduction We aim to showcase the impact of applying self-reported and biomarker-based exposure measures for glyphosate and mancozeb on the association with sleep problems in a study among 253 smallholder farmers in Uganda.

Methods The questionnaire-based exposure measures included: (1) application days of any pesticide last 7 days (never, 1–2; >2 days) and four glyphosate and mancozeb-specific measures: (2) applicator status last 12 months (yes/no), (3) recent applicator status (never, last 7 days and last 12 months), (4) number of application days last 12 months, (5) average exposure–intensity scores (EIS) derived from a semi-quantitative exposure algorithm and (6) EIS-weighted number of application days in last 12 months. Based on 384 repeatedly collected urinary samples of ETU and glyphosate biomarkers from 83 farmers, we also used (7) estimated biomarker levels.

Multivariable logistic regression models to assess the association between the different exposure measures and three selected Medical Outcomes Study Sleep Scale (MOS-SS) indices (6-item sleep inadequacy and snoring) indicate sleep problems in the preceding week.

Results We observed statistically significant relationships between (1) any pesticide application days in last 7 days and all three sleep problem indices. Glyphosate application in last 7 days and mancozeb application in last 12 months were significantly associated with the 6-item sleep problem index. For the other glyphosate and mancozeb exposure measures based on self-reports, no significant associations were observed. For estimated biomarker levels exposure-response trends pointing in the same direction (p-value < 0.1) with associations with the 6-item sleep problem index and sleep in adequacy was seen with as the measures based on self-report.

Conclusion Our results suggest that different pesticide-active ingredient-specific short and long-term exposure measures are relevant when studying the association with (acute) sleep problems.

COVID 19

O-31 SYNTHESIS OF EVIDENCE FROM THE PROTECT UK NATIONAL CORE STUDY: EXPLORING OCCUPATIONAL RISKS OF SARS-COV-2 INFECTION AND COVID-19 MORTALITY

1Martie van Tongeren, 2Sarah Rhodes, 3Sarah Beale, 4Neil Pearce, 5Mark Cherrie, 1Fiona Holland, 2Andrew Hayward, 3Matthew Gittins, 4Will Mueller, 1University of Manchester, UK; 1UCU; 2LSHTM; 3ICOM, UK

Introduction The PROTECT National Core Study was funded by the UK Health and Safety Executive (HSE) to investigate how SARS-CoV-2 is transmitted from person to person, and how this varies in different settings.

One area of research aimed to compare relative differences between occupational groups and sectors in SARS-CoV-2 infection and COVID-19 mortality over time and explore the likely reasons.

Methods We brought together evidence from nine published epidemiological studies supported by PROTECT relating to four data sets, plus new analyses relating to the Omicron period. We organised these studies into the following categories: those that specifically compared risks of infection mortality; and those that looked at risk factors for SARS-CoV-2 infection and/or COVID-19 mortality. We extracted descriptive study level data and results. We investigated risk across four pandemic waves using forest plots for key occupational groups by time. A workshop was organised in Oct 2022 with authors from each study to discuss and document key strengths and expected biases.

Results Healthcare and social care sectors saw elevated risks of SARS-CoV-2 infection and COVID-19 mortality early in the pandemic but thereafter these declined and varied by specific occupational subgroup. The education sector saw sustained elevated risks of infection after the initial lockdown period with little evidence of elevated mortality. Results were largely consistent across different studies with differing expected biases, although unmeasured confounding cannot be ruled out.

Conclusion Differences between occupations and sectors in the UK in terms of COVID-19 risks that were observed in the early stages of the pandemic largely dissipated over time. Studies investigating risk factors suggest that reasons could include vaccination roll out, introduction of risk mitigation within high risk sectors, changes in patterns of home-working and lifting of restriction on social mixing (thereby reducing the relative effect of work).

Respiratory effects/Diseases

O-32 THE EXPOSURE-RESPONSE RELATION BETWEEN OCCUPATIONAL EXPOSURE TO RESPIRABLE CRYSTALLINE SILICA AND INCIDENT INTERSTITIAL LUNG DISEASES: A PROSPECTIVE FOLLOW-UP STUDY

1Henrik A Kolstad, 2JM Vestergaard, 3KS Thorup, 4J Thygesen, 2F Rasmussen, 1MB Andersen, 6E Bendstrup, 7ZA Stokholm, 8J Ohlander, 9S Peters, 2ET Würtz, 6V Schlünsen, 7JP Bonde, 10H Banlekke, 2H Kromhout, 1Ingge Brobal Iversen, 1Professor, Aarhus University Hospital, Denmark; 2Department of Occupational Medicine, Danish Ramazzini Centre, Aarhus University Hospital; 3Department of Radiology, Aarhus University Hospital; 4Department of Clinical Engineering, Aarhus University Hospital; 5Department of Radiology, Herlev and Gentofte Hospital; 6Department of Respiratory Diseases and Allergy, Aarhus University Hospital; 7Institute for Risk Assessment Sciences, Utrecht University; 8Department of Public Health, Danish Ramazzini Centre, Aarhus University; 9Department of Occupational and Environmental Medicine, Bispebjerg and Frederiksberg Hospital; 10Department of Occupational and Environmental Medicine, Danish Ramazzini Centre, Aalborg University Hospital, Denmark

Introduction Occupational exposure to respirable crystalline silica is a well-known cause of silicosis, but studies have indicated that silica exposure is also associated with increased risk of other types of interstitial lung disease (ILD). Our objective was to examine the risk of different types of ILD following occupational silica exposure.
Material and Methods The study population includes the total Danish working population of 5,478,664 workers, followed 1979–2015. Annual individual exposure to respirable crystalline silica was estimated using a quantitative job exposure matrix. Cases of ILD were identified in the National Patient Register. We conducted adjusted analyses of exposure-response relations between cumulative silica exposure and different types of ILD. Register studies in Denmark without biological materials do not need approval from the National Committee of Health Research Ethics. This study is approved by the Danish Data Protection Agency.

Results The risk of silicosis increased with increasing cumulative exposure with an incidence rate ratio (IRR) of 3.07 (95% confidence interval (CI) 2.40–3.93) in the highest exposure group (the highest tertile among the silica exposed) compared to the non-exposed group. The risk of other pneumoconioses was also increased with an IRR of 1.18 (95% CI 1.05–1.33) for the highest exposed compared to the non-exposed. For idiopathic ILD, ILD associated with connective tissue disease and other ILD the risks were increased in the highest exposure group compared to the non-exposed, but the analyses did not show clear exposure-response patterns.

Conclusion This study confirms an exposure response relation for occupational silica exposure and silicosis and indicates increased risks for other types of ILD. This warrants further examination of the specific risk patterns for different types of ILD.

Risk assessment

0-329 OPERATING MANAGEMENT SYSTEM: AN INTEGRATED APPROACH TO DELIVER SAFE, RELIABLE, AND COMPLIANT OPERATIONS AT PETROCHEMICAL SITES AND REFINERIES

Nikunj Desai, R Rajesh. Reliance Industries Ltd, India

Introduction Operating Management System (OMS) is a universally validated framework that provides a systematic and consistent approach by managing four risks – People, Plant, Process and Performance for managing the Health, Safety, and Environment (HSE) performance and improve quality. A leading Indian petrochemical conglomerate introduced this framework that defines a set of operating requirements setting out a systematic way to improve operations towards building a sustainable organization. We have used protocols for occupational health monitoring, tasked based industrial hygiene monitoring and job specific PPE under the OMS and seek to show the subsequent changes in safety and health-related outcomes.

Material and Methods This study seeks to prove how the implementation of OMS has defined changes in People Risk Management through comparison of specific outcomes before and after the introduction of the intervention. These observations are based in the hydrocarbon production and refining business stretching across manufacturing and refining facilities. The implementation process initiated with internalisation of the OMS framework enabled through digital platform. Risk management was reinforced with technical risk analysis and putting in place mitigation measures through the project lifecycle by cross functional competent and experienced teams. In addition, developing a robust risk culture has been a focus, which included enhancing risk management competency among the leadership and the asset facing personnel.

Results Health index of the organisation, a composite indicator has moved from 87 to 89 per cent and the Emergency Management System score improved to nearly 94 per cent from 87 per cent subsequent to OMS. There has been an increase in collection of personal monitoring samples for noise (254 from 130) and toxic chemicals (234 from 55). There has been a reduction in the tonnes for Highly Toxic Material Inventory for ammonia, chlorine and hydrofluoric acid. The lost days have reduced from 5822 to 4374. Total 1184 high risk activities as per OH health hazards were identified through Risk assessment which were taken as workplace improvement projects and risk level has been reduce to Moderate and low level by implementing engineering control and 100% PPE compliance. There is significant reduction in LTIFR (per million man-hours) (Lost Time Injury Frequency Rate) to 0.13, year 2021–22 and improvement in uptime of the assets.

Conclusion OMS is very useful platform for continual improvement and significant reduction of HSE risk even with expanding businesses and newer challenges to the organization. As the experienced professional superannuate from the workplace and younger generation take charge, the OMS framework helps in knowledge retention and codification of skill and experience.

Respiratory effects/Diseases

0-33 POTENTIAL OCCUPATIONAL SENSITIZING EXPOSURES AND DEVELOPMENT OF ASTHMA: AN OVERVIEW OF SYSTEMATIC REVIEWS

Vivi Schlünssen, Annet Dalbøge, Henrik Albert Kolstad, Charlotte Suppli Uhlk, David Lee Shen, Harald William Meyer, Niels Ebbeloe, Torben Sigsgaard, Jan-Paul Zock, Xavier Baur. 1Research Unit for Environment, Occupation and Health, Danish Ramazzini Centre, Aarhus University, Aarhus, Denmark; 2Department of Occupational Medicine, Danish Ramazzini Centre, Aarhus University Hospital; 3Department of Respiratory Medicine, Hvidore Hospital; 4Department of Occupational and Environmental Medicine, Odense University Hospital; 5Department of Occupational and Environmental Medicine, Bispebjerg and Frederiksberg Hospital; 6National Institute for Public Health and the Environment (RIVM), Bilthoven, the Netherlands; 7Institut für Arbeitsmedizin, Charité Universitätsmedizin Berlin, Germany

Introduction and Aim Several hundred occupational agents are suspected to be able to cause asthma. However, the amount and type of evidence for these agents is not clear. As a first step, we aimed to identify, appraise, and synthesise the scientific evidence in systematic reviews of the relation between potential occupational sensitizing exposures and development of asthma.

Material and Methods We conducted a systematic literature search where the study criteria included persons in or above working age, potential occupational sensitizing exposures, outcome defined as asthma, and study design restricted to systematic reviews. Potential occupational sensitizing exposures were divided into 23 main groups comprising both subgroups and specific exposures. Two of the authors independently selected studies and extracted study data. Assessment of study quality and evaluation of the confidence in each systematic reviews level of evidence was performed using AMSTAR 2.