for respiratory diseases. However, few population-based studies have been conducted to assess the alterations of circulating pulmonary proteins due to long-term PM_{2.5} exposure.

Methods We designed a two-stage study. At the first stage, we enrolled 558 coke plant workers with a wide range of PM_{2.5} exposure levels as the exposed group and 210 controls in China. Pulmonary injury was measured by lung function and serum Clara cell protein (CC16), surfactant protein A (SP-A), and surfactant protein D (SP-D). Linear regression models were used to assess the associations between PM_{2.5}, pulmonary injury markers, and lung function. At the second stage, significant initial findings were validated by an independent diesel engine exhaust (DEE) cohort with 50 DEE exposed workers and 50 controls.

Results Serum CC16 decreased in a dose-response manner in association with both external and internal PM_{2.5} exposures in two cohorts. In the first stage, serum CC16 levels decreased with increasing duration of occupational PM_{2.5} exposure history. An IQR (122.0 µg/m³) increase in PM_{2.5} was associated with a 5.76% decrease in serum CC16, whereas an IQR (1.06 µmol/mol creatinine) increase in urinary 1-OHP concentration was associated with a 5.36% decrease in serum CC16 in the COE cohort. In the validation stage, the concentration of serum CC16 in PM_{2.5} exposed group were 22.42% lower than that of the control and an IQR (1.24 µmol/mol creatinine) increase in urinary 1-OHP concentration was associated with a 12.24% decrease in serum CC16 in DEE cohort.

Conclusions Reduction of serum CC16 may be a sensitive marker for pulmonary damage in populations with high PM_{2.5} exposure.

Mini-Symposium 2: OMEGA-NET

03D.1 OMEGA-NET INVENTORY OF OCCUPATIONAL COHORTS

¹Michelle C Turner*, ^{2,3}Vivi Schlünssen, ¹Gemma Castano-Vinyals, ⁴Lode Godderis, ⁵Malcolm Sim, ⁶Ingrid Sivesind Mehlum, ¹Manolis Kogevinas. ¹Barcelona Institute for Global Health (ISGlobal), Barcelona, Spain; ²Aarhus University, Aarhus, Denmark; ³National Research Center for the Working Environment, Copenhagen, Denmark; ⁴University of Leuven, Centre for Environment and Health, Leuven, Belgium; ⁵Monash University, Melbourne, Australia; ⁶National Institute of Occupational Health (STAMI), Oslo, Norway

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Europe currently has some of the most valuable occupational, industrial, and population cohorts worldwide. However, in recent years there has been limited coordination and promotion of European health research on occupation and employment. OMEGA-NET is a COST Action (2017–2021) funded by the EU, currently involving researchers from 29 European countries and an increasing number of near neighbour and international partner countries. The overarching concept is to create a network to advance i) collaboration of existing cohorts, ii) coordination and harmonisation of exposure assessment, and iii) facilitation of an integrated research strategy for occupational health in Europe. As part of this work, OMEGA-NET is currently building an online searchable 'Inventory of Occupational Cohorts'. We will inventory epidemiological, occupational, population, and registry-based cohorts with data on occupational exposures and health effects. The inventory will include cohorts with data that is potentially accessible; that

have collected information on occupation and/or industry or at least one occupational exposure; and have at least one follow-up point with health outcomes. Cohorts will be identified through systematic searches and personal records. An initial search identified more than sixty cohorts including more than 40 million persons with information on occupation. Researchers responsible for the cohorts will be contacted and asked to complete a web-based questionnaire. An online searchable 'Inventory of Occupational Cohorts' database will be developed to make the information publicly accessible and to facilitate researcher and policy-maker access to information from past and ongoing cohort studies. Users will be able to search for specific exposures and outcomes and extract basic information on the methodology of the cohorts. The OMEGA-NET Inventory of Occupational Cohorts will be the most comprehensive inventory of occupational cohorts worldwide and is expected to enhance scientific output from individual studies, and facilitate pooled studies, data sharing, and more efficient use of existing cohorts.

03D.2 45 YEARS OF FOLLOW-UP FOR CANCER FOR JOBS AND OCCUPATIONAL EXPOSURES IN 15 MILLIONS IN FIVE NORDIC COUNTRIES – NOCCA

¹Johnni Hansen*, ²Jan Ivar Martinsen, ²Elisabete Weiderpass, ²Kristina Kjørheim, ³Pär Sparén, ⁴Laufey Tryggvadottir, ⁵Elsebeth Lynge, ⁶Eero Pukkala. ¹Danish Cancer Society Research Center, Copenhagen, Denmark; ²Norwegian Cancer Registry, Oslo, Sweden; ³Karolinska Institute, Stockholm, Sweden; ⁴Icelandic Cancer Registry, Reykjavik, Iceland; ⁵Copenhagen University, Copenhagen, Denmark; ⁶Finnish Cancer Registry, Helsinki, Finland

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Introduction A majority of established human carcinogens have been discovered in the occupational setting. For most cancers, including even frequent cancers like colorectal, prostate and breast, however, only a minor fraction of the overall causes has been identified so far. Therefore, it is obvious than even more carcinogens can be discovered through studies of occupation and cancer. This can be facilitated by the use of big high quality data.

Methods Our study covers 15 million working-aged persons who participated in population censuses between 1960 and 1990 in Denmark, Finland, Iceland, Norway and Sweden. These persons have been followed-up for cancer and divided into 70 cancer categories. Further, country and calendar time specific job exposure matrices (JEM) are developed for 30 documented and potential carcinogens, including e.g. asbestos, formaldehyde, wood dust, quartz and several specific metals and organic solvents.

Results In total 2.8 million incident cancer cases are diagnosed in these people during the follow-up. Even for all cancers combined, there is a wide statistically significant variation among men from a relative risk (RR) of 0.79 in domestic assistants to 1.48 in waiters. The occupations with the highest RR also includes workers producing beverage and tobacco, seamen and chimney sweeps. Among women, the overall RR varied from 0.58 in seafarers to 1.27 in tobacco workers. Low RRs were found for farmers, gardeners and forestry workers in both genders. We have also estimated RRs after exposure to e.g. various metals, solvents, formaldehyde and wood dust. Additional examples from the over 50 papers published so far based on this comprehensive on-going cohort will be presented.