Cohort profile: The Taiwan nanomaterial handling workers cohort study (TNHWCS)

Introduction This cohort was established to evaluate whether engineered nanoparticle (ENPs) exposure is related to long-term health risk in workers engineered nanomaterials.

Methods This cohort study enrolled workers handling nanomaterials (n=258) and control workers (n=200) from 14 nanomaterial manufacturing and/or handling factories in Taiwan since 2009. The factories were involved in toilet ceramic coating, nanofiber injection, and the production of semiconductor nano conductive mold material. Blood, urine, exhaled breath condensate, and questionnaire were repeatedly collected at baseline, 6 months later, 18 months later, 30 months later, and 42 months later. Informed consent was obtained from individual participants. Health hazard markers include cardiopulmonary dysfunction markers, inflammation and oxidative damage markers, antioxidant enzymes activity, and genotoxicity markers. Control banding was adopted to categorize risk level for each participant as a surrogate marker of exposure. This cohort was linked to the National Health Insurance Research Database from 2009 to 2021 to observe new cardiopulmonary disease cases in the 13-year research observation period.

Conclusion TNHWCS provides a valuable platform for research and opens unique possibilities for testing whether ENPs exposure since the start of working will affect health across the life course. Using a longitudinal study and repeated measurement design to find the causal relationship between exposure and disease, which resulted in recommendations for reducing workplace environmental exposures.

Healthcare workers

Study on incidence and sequelae of needle stick injuries among healthcare workers

Introduction Most of the burden estimates on needle stick injury (NSI) from India were either record based or through passive surveillance studies. Thus, an active surveillance study is set-up to estimate incidence of NSI across primary, secondary, and tertiary healthcare facilities.

Material and Methods This prospective study is being carried out in primary, secondary and tertiary health facilities in Karnataka, India, where healthcare workers (HCWs) are recruited and followed-up once in a month telephonically, for a period of 1 year, to estimate the number of NSI occurring at workplace. At baseline, information on hospital safety climate and self-reported compliance with universal precautions are being collected using pre-tested questionnaire. Blood samples are collected at recruitment and planned to be collected at six-months following the NSI, to assess for seroconversion to HIV, HBV and HCV following NSI. Costs towards laboratory testing for blood borne infections and post exposure prophylaxis are estimated. A sample size of 400 HCWs is estimated for the study.

Results Between August and November 2022, 168 HCWs have been recruited from 3 Primary Health Centres and 4 Government General Hospitals in Karnataka, and are under monthly follow-up. Recruitment of remaining 232 HCWs from 1 Government Hospital and 2 Medical College hospitals is expected to complete by January 2023. Expected outcomes of this study include incidence of NSI across HCWs and level of health facility, proportion of HCWs seroconverted to HBV or HCV or HIV following NSI and median cost of managing NSI in healthcare provider and HCW perspective. Interim analysis will be performed by February 2023 for aforementioned outcomes.

Conclusion Results of this study is expected to strengthen policy on safe handling of needles/sharps for HCWs at respective hospitals and also at state level.

Occupational epidemiology in unorganised sectors agriculture, construction, service sectors

Assessing long-term trends of pesticide poisoning in agricultural workers and prohibited pesticide policy in Taiwan

Introduction Recently, Taiwan has promoted a number of policies to ban and restrict the use of extremely toxic organophosphorus pesticides and to reduce the use of active ingredients from 1,090 tonnes in 2014 to 365 tonnes in 2019. This intervention policy provides the opportunity to observe the long-term trend data of incidence of pesticide poisoning and to compare it with the pesticide intervention policy.

Methods More than one million agricultural workers enrolled in Taiwan’s national Farmers Health Insurance since its inception in 1989, and linked to the National Health Insurance Research Database from 2001 to 2016 for age-standardized incidence of pesticide poisoning. We used the Annual Percent Change (APC) method and the Joint regression model to find out the turning point of the trend change.

Results The age-standardized incidence of pesticide poisoning among farmers showed a decreasing trend by year from 76.43 (per 100,000 people) in 2001 to 18.98 (per 100,000 people) in 2016 (R2 reached 0.7333). The turning point of the trend change in 2011 and 2014, this trend is in line with the ban on 11 extremely toxic organophosphorus pesticides,
such as balazone, since 1997, and the announcement of the ban on 30 pesticides (mevinone, etc.) and 87 pesticides (dibenzoate, etc.) from 2013 to 2019.

Conclusions The intervention effects of major agricultural reforms and pesticide source control bans are actually reflected in the age-standardized incidence of pesticide poisoning. It also supports the view that the ban on extremely toxic organophosphorus pesticides in the past was indeed effective in the control of organic phosphorus pesticide poisoning among farmers.

Carcinogens/Cancer

The burden of pancreatic cancer associated with occupational exposure to chemical agents a hospital-based study in Taiwan

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Introduction Pancreatic cancer is one of the most aggressive cancers, and currently, there is no effective treatment. Addressing the contribution of occupational risk factors to pancreatic cancer can help eliminate the disease burden. This study identified the proportion of pancreatic cancer in different occupational exposures, including job titles and chemical exposures.

Material and Methods We recruited pancreatic cancer patients in a medical center in Taiwan from July 2020 to October 2022. Through face-to-face interviews, we collected information about job titles and historical exposure to chemical substances among pancreatic cancer patients.

Results A total of 100 patients (59 men and 41 women) were recruited at a mean age of 65. The most common occupation was farmers (11%), followed by metal processing workers (6%) and carpenters (5%). Farmers reported frequent exposures to pesticides. Metal processing workers reported frequent exposures to metalworking fluids, rust, degreasers, and emulsifiers. In addition, 16% of patients reported volatile organic compounds in diverse industries, such as carpentry, salons, textiles, and printing.

Conclusion Farmers with pesticide exposure may contribute to the largest proportion. Occupational exposure to metal processing chemicals and diverse types of volatile organic compounds diverse may play an important role in developing pancreatic cancer.

Return to work/Work capability assessment

COVID-19, long-COVID and return-to-work: a questionnaire to investigate the experience of the occupational physicians from an Italian region

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Introduction The issues related to return-to-work (RTW) after COVID-19, and the impact of long-COVID on workers’ health engaged in different occupations are far to be fully acknowledged. Occupational Physicians (OPs) represent an important and competent source for the evaluation of these issues in workplaces, scant considered in research up now.

Material and Methods A literature search was performed to develop a questionnaire targeting the Italian OPs. The survey collects data on COVID-19 related RTW issues and on long-COVID symptoms occurrence in workers of Emilia-Romagna region (Italy).

Results The questionnaire involves three sections.

The first with general information on the OPs activity (industrial sector and type of companies followed, main occupational hazards, health surveillance programs carried out). The second section is about long-COVID, defined according to the World Health Organization and the U.S. Centers for Disease Control and Prevention. A list of 22 symptoms based on a systematic search in MedLine has been developed: asthenia; air hunger; chest tightness; memory/concentration problems; mental confusion; joint/muscle pain; sleep disorders; heart palpitations; dizziness; tingling/dysesthesia; gastrointestinal problems; depression and/or anxiety; tinnitus; inappetence; low-grade fever; high-grade fever; cough; headache; sore throat; changes in smell/taste; skin rashes; other symptoms (to be specified). The main characteristics of the workers with long-COVID (age, gender, concomitant diseases, vaccination, smoking habit, body weight and previous infections etc.) and the frequency of the long-COVID symptoms are collected. The last section investigates RTW issues, to quantify the impact of the phenomenon in terms of workers involved, main characteristics of subjects with RTW problems, and implications for their work-ability.

Conclusions Using the OPs direct experience as source of information, the study is aimed to develop new knowledge on the long-term impacts of the SARS-CoV-2 pandemic on workers’ health, specifically considering RTW issues and the occurrence of long-COVID symptoms.

COVID 19

Longitudinal cohort study to assess the long-term trajectory of healthcare workers’ mental health during COVID-19 pandemic

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Introduction Early evidence following COVID-19 pandemic onset showed substantial impact on Healthcare Workers’ (HCWs) mental health. Most research relies on cross-sectional data collected during the pandemic early stages and longitudinal studies are mainly focused on its first year; more recent mental health data on HCWs are not yet available. The aim of this study is to assess the long-term trajectory of HCWs’ psychological symptoms and the associated risk factors.