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 nanomaterial. Blood, urine, exhaled breath condensate specimens, and questionnaire were repeatedly collected at baseline, 6 months later, 18 months later, 30 months later, and 42 months after informed consent was obtained from individual participant. 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 observed 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 in India, where healthcare workers (HCWs) are recruited 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 assess the positive impact on farmer health. This study is to observe 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,