was last evaluated revealed whether evidence gaps have been addressed and highlighted remaining uncertainties.

Conclusions During the past decade, new research addressed many of the 2009 recommendations, and supported updated classifications for several priority agents. This supports future efforts to systematically apply the findings of monograph reviews to the identification of research gaps and priorities, including with regard to advances in understanding mechanisms of carcinogenesis and their application in evaluation criteria established in the updated IARC Monograph preamble.

Respiratory effects/Diseases

Cleaning and disinfecting tasks, products and volatile organic compound exposures associated with asthma outcomes in healthcare settings

Introduction Cleaning products are complex mixtures of chemicals, and their use is associated with elevated prevalence of asthma symptoms among healthcare workers. In this study, we evaluate the effects of cleaning and disinfecting tasks, products used, and quantitative volatile organic compound (VOC) exposures on asthma outcome clusters of cough/phlegm, mild asthma, undiagnosed asthma and uncontrolled asthma.

Materials and Methods Healthcare workers from nine select occupations working in New York City hospitals and nursing homes completed a questionnaire with modules on cleaning and disinfecting tasks and product use. Frequency of cleaning tasks and products were calculated and quantitative exposure to total and 12 specific or composite VOCs were assigned to participants based on predictive statistical models. Exposure-response relationships for asthma outcome clusters were explored using polytomous logistic regression adjusted for age, gender, race, smoking and allergic status.

Results Various cleaning and disinfecting tasks were significantly associated with at least one of four asthma clusters including tasks involved in cleaning fixed surfaces, disinfecting medical instruments, administration of aerosolized medications and dental tasks. Products significantly associated with asthma clusters included use of orthophthaldehyde, alcohol, bleach, acids, ammonia, enzymatic cleaners, detergents, glass cleaners and phenolics on surfaces or instruments. Most VOC exposures were significantly associated with at least one of four asthma clusters. Specifically, chloroform, methylene chloride and VOC 11 (sum of 11 specific VOCs) were significantly associated with at least one of four asthma clusters. Notably, VOC exposures were highly correlated and specific VOCs with the greatest influence on the asthma clusters remain unclear.

Conclusion These results confirm previous findings of the association between cleaning and disinfecting products and asthma outcomes and highlight the need for prudent actions to mitigate exposures. However, these single predictor models do not represent workplace conditions; multipollutant models are needed to investigate mixed exposures and their interactions.

Disease surveillance

Incidence of malignant mesothelioma in Lombardy, Italy: accuracy of predictive models 2013–2020

Introduction The Lombardy Mesothelioma Registry (RML) was established in Lombardy Region in 2000 as a regional operative center of the National Mesothelioma Registry (ReNaM-INAIL). It covers a population of 10 million inhabitants and records about a quarter of cases in Italy (60 million inhabitants). In 2016, the RML published incidence predictions over the period 2013-2029, based on age-cohort Poisson regression models applied to 2000-2012 data. Aim of this study is to verify the accuracy of the prediction models and to describe the characteristics of the affected subjects in the period 2013-2020.

Material and Methods The RML collects clinical information on MM cases (all sites) occurring among regional residents at the time of first diagnosis. Information sources include hospital admissions and pathology reports, local health units archives, reports of occupational diseases, and mortality data. In confirmed cases, previous exposure to asbestos is assessed through a standardized questionnaire administered by trained personnel. We extracted from RML databases the record of MM cases collected in the period 2013-2020.

Results Over the period 2013-2020 we had predicted 2102 cases in men (on average 263/year) and 1176 in women (147/year). We recorded 2390 cases in men (299/year) and 1140 (143/year) in women. During the same period, occupational exposure to asbestos was reported by about two-thirds of men and one third of women. Non-occupational exposure to asbestos was reported in <5% in men and about 10% in women.

Conclusions In the period 2013-2020 there was good agreement between predicted and observed MM cases in women, while we recorded 288 more cases than predicted (36/year) in men. The impact of asbestos in Lombardy is still high 30 years after the national ban in 1992, with a total of 7986 cases (5250 in men, 4027 in women) in the period 2000-2020.

Carcinogens/Cancer

Occupational exposure to endocrine disruptors and colorectal cancer risk in two Canadian cohorts

Introduction Sex hormones have been implicated in the etiology of colorectal cancer. Endocrine disruptors (EDCs) are