Scand J Work Environ Health. 2024;50(7):489–502. doi:10.5271/sjweh.4190

Five decades of occupational cancer epidemiology

by Michelle C Turner, PhD,[1–3] Kurt Straif, MD, PhD, MPH,[1, 4] Manolis Kogevinas, MD, PhD,[1–3, 5] Mary K Schubauer-Berigan, PhD[6]

Turner MC, Straif K, Kogevinas M, Schubauer-Berigan MK. Five decades of occupational cancer epidemiology. *Scand J Work Environ Health*. 2024;50(7):489–502.

Objective In this discussion paper, we provide a narrative review of past and present occupational cancer studies in the journal with a viewpoint towards future occupational cancer research.

Method We reviewed all references in the journal that mentioned cancer according to relevance to etiology, cancer type, agent type, study design, and study population.

Results The *Scandinavian Journal of Work, Environment & Health* has published over 300 manuscripts on occupational cancer over the 50 past years. Although studies of cancer represent the primary health outcome in the journal overall, the relative ranking of cancer manuscripts has declined somewhat over time. A large body of evidence from studies of occupation and industry was apparent both in early research and continuing in recent years. There are several examples of the utility of pooled multi-country collaborative studies. Studies also took advantage of available high-quality national population and cancer registers in Nordic countries. There have been notable shifts in focus with regard to the cancer types examined, with increases in publications examining female breast cancer over the decades. The interplay of studies of occupational and environmental cancer has also been apparent.

Conclusions The journal offers a unique viewpoint to consider the evolution of occupational cancer evidence over time. Studies of occupational cancer have played a central role in global cancer hazard identification efforts. Although much has been gained, there remains a need for renewed global support for occupational cancer research. Concerted efforts will be needed to ensure a future robust evidence-base for occupational and environmental cancer worldwide.

Key terms cancer research; cancer type; etiology; occupation; workplace.

The *Scandinavian Journal of Work, Environment & Health* has published over 300 manuscripts on occupational cancer over the 50 past years. Although studies on cancer represent the primary health outcome in the journal overall, representing 18% of total publications, the relative ranking of cancer manuscripts has declined somewhat over time from being the most common topic between 1975–1984 to the fourth in 2015–2023 behind mental disorders, musculoskeletal disorders, and circulatory diseases (1). Cancer was most often studied in relation to chemical exposures, including organic solvents and pesticides. Studies of occupational cancer were submitted primarily by authors in Nordic countries as well as elsewhere in Europe and North America. Changing trends in occupational health research more broadly were recently described in an analysis of 26 peer-reviewed journals from 1990–2022, with studies of occupational cancer, chemical exposures (lead, asbestos), and organ damage (lung and respiratory) predominant in the 1990s; studies of psychosocial factors, productivity, and biological factors emerged over the 2000s (2).

This paper presents a narrative description of occupational cancer studies published in the journal over the 50 past years with a viewpoint towards future research. We reviewed all references in the journal that mentioned

1 Barcelona Institute for Global Health (ISGlobal), Barcelona, Spain
2 Universitat Pompeu Fabra (UPF), Barcelona, Spain
3 CIBER Epidemiología y Salud Pública (CIBERESP), Madrid, Spain
4 Boston College, MA, USA
5 Hospital del Mar Medical Research Institute (IMIM), Barcelona, Spain
6 International Agency for Research on Cancer (IARC), Lyon, France

Correspondence to: Michelle C Turner, Barcelona Institute for Global Health (ISGlobal), Doctor Aiguader, 88, Barcelona, Spain, 08003. [E-mail: michelle.turner@isglobal.org]

cancer (see hawcproject.iarc.who.int/assessment/918/ for search terms and reference tags). We tagged each reference by relevance to etiology (ie, whether it examined the association between one or more agents and cancer), cancer type, agent type, study design (cohort, case-referent, case report or series, meta-analysis, ecological study), and study population type (industry-based, general population-based, exposure registry-based, hospital or clinic-based). Review articles without a meta-analysis were excluded from tagging but are noted below. Other related publications in this 50-year anniversary series have recently summarized topics in asbestos, solvents, and working hours, and as such they are not covered in detail here (3–5).

Fifty years of occupational cancer studies

The journal offers a unique viewpoint to consider the evolution of occupational cancer evidence over time. A large body of evidence from studies of occupation and industry was apparent in early studies, shifting to more targeted agent-specific analysis, including complex exposures over time.

Case reports or series

In some of the earliest publications, Infante et al (6) described three cases of aplastic anemia and acute leukemia with previous occupational or residential chlordane or heptachlor use and five neuroblastoma cases with pre- and post-natal residential exposure to chlordane. Fingerhut et al (7) reviewed seven cases of soft tissue sarcomas among chemical workers with exposure to dioxin-contaminated products, and called for larger, well-designed studies. Difficulties in retrospective exposure assessment through work history records were described as was inadequacy of death certificate information for case ascertainment (7). The International Agency for Research on Cancer (IARC) last convened a Working Group to evaluate chlordane and heptachlor in 2000 and classified them in Group 2B with inadequate evidence in humans, with either no clear findings observed, or multiple co-exposures (8). Classified as a Group 1 agent with sufficient evidence for all cancer sites combined, 2,3,7,8-tetrachlorodibenzo-p-dioxin was the first agent classified initially in Group 1 based on sufficient evidence in experimental animals and strong mechanistic data, which was later confirmed by increased cancer incidence in humans (9, 10).

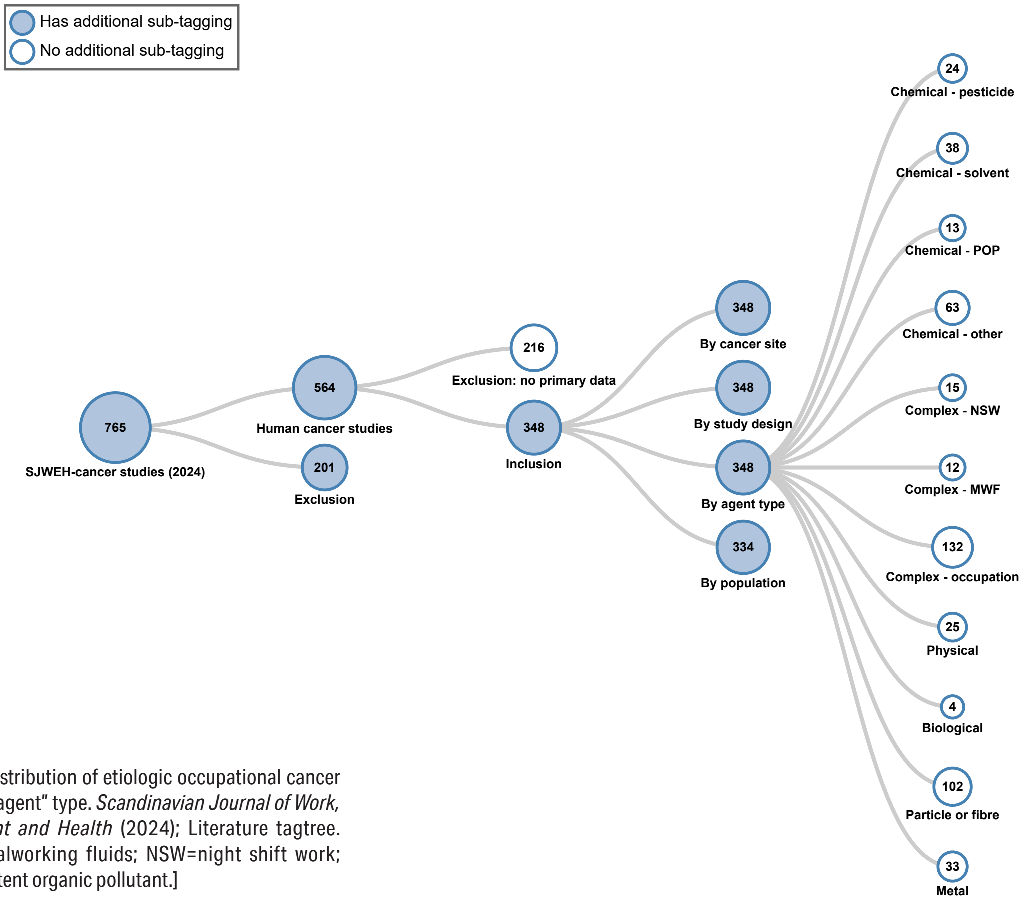

Figure 1. Distribution of etiologic occupational cancer studies by "agent" type. *Scandinavian Journal of Work, Environment and Health* (2024); Literature tagtree. [MWF=metalworking fluids; NSW=night shift work; POP=persistent organic pollutant.]

Industry-based research, including studies of occupations

Studies of cancer among workers in various occupations and industries have been examined extensively, comprising more than ⅓ of all etiologic cancer studies (figure 1). The number of etiologic cancer studies peaked in the late 1980s and 1990s, largely due to the publication of industry-based cohort studies, many of which were subsequently pooled or meta-analyzed. Despite various methodological limitations (below), historical cohort studies have contributed substantially to the body of evidence and cancer hazard identification efforts (11). Examples of early studies include of railroad workers (12), furniture makers (13), pickling house workers (14), rubber workers (15), mineral wool production workers (16), foundry workers (17), granite workers (18), stone workers (19), shoe workers (20, 21), and thermoelectric plant workers (22). Studies typically examined single or multiple cancer outcomes, comparing cancer incidence or mortality rates among workers by job title overall, or according to task, job area, or exposure status for example, to those of a reference population, often the regional or national population.

Potential limitations have been described (23), including a lack of detailed exposure assessment. Studies were conducted to generate hypotheses and stimulate further investigation into specific exposures in more detail. For example, Acheson et al (13) conducted a retrospective cohort study of furniture makers using employment records. IARC classified work in the furniture and cabinet-making industry in Group 1 in 1987 (24). In 1994, the causal association of work in the furniture and cabinet-making industry and sinonasal and nasopharyngeal cancers were attributed to wood dust (25).

Evaluations of cancer risk among workers in specific occupations or industries typically are more informative in settings with single high-level exposures. In occupational settings with multiple or combined exposures, interpretation of findings and prevention of specific exposures are more complex (26, 27). Potential challenges of disentangling co-exposures were highlighted in a study of railroad workers exposed to herbicides (12). In contrast, studies of granite (18) and stone (19) workers were carried out among those not exposed to other occupational lung carcinogens (PAH, radon). In 1996, crystalline silica dust was classified as a Group 1 lung carcinogen, findings from studies with the least potential for confounding by other occupational lung carcinogens were informative in the evaluation (28). In another example, cancer incidence and mortality were studied among rubber manufacturing workers (15). Occupational exposures in the rubber manufacturing industry were classified as Group 1 with *sufficient* evidence in humans for leukemia, lymphoma, and cancers of the urinary bladder, lung and stomach (10). However, the complexity of exposures in the industry was noted precluding a clear conclusion with a particular chemical. Future studies using detailed exposure data in the industry were suggested.

More recent studies examined cancer risk among seafarers and fishermen (29), offshore workers (30), or firefighters (31), who are exposed to various known or suspected carcinogenic agents and organizational factors. In the case of firefighters, IARC's recent reclassification of this occupation into Group 1, with *sufficient* evidence for mesothelioma and bladder cancer (32), has been followed by extensive prevention efforts, including studies evaluating cancer-related biomarkers of early effect and implementation of the hierarchy of controls to reduce exposure to carcinogens (33–35).

Other limitations may also include lack of information on potential confounders such as personal lifestyle factors. For example, there was concern regarding impacts of cigarette smoking in a study observing elevated rates of lung cancer mortality among foundry workers (17). In contrast, among woodworkers, cigarette smoking maybe less prevalent, and lower mortality rates from lung cancer were observed (13). In a more recent paper of lung cancer risk among coal miners, ore miners and quarrymen from the SYNERGY pooled analysis of population-based case-referent studies, there was detailed personal information on cigarette smoking as well as of work in other at-risk occupations captured (36).

The importance of the reference population has been described (23). For example, in studies of farmers there were both excesses and deficits of cancer compared with the general population (15, 37–39). Limitations of a general population reference group may include a lack of comparability related to personal-level factors, healthy worker bias, or bias in medical diagnostic practices. The impact of the reference population was previously discussed in studies of underground miners (40) or more recently firefighters (31, 32).

Case-referent studies

Numerous case-referent studies have been published in the journal. Case-referent studies have often been based in registry data (below). One early example is a multi-country case-referent investigation of nasal and sinonasal cancer using data from cancer registers/hospitals in Denmark, Finland, and Sweden, studying several occupational exposures assessed by telephone interview (41, 42). Other examples include of occupation and liver or renal cell cancer in Finland (43, 44) or of occupational solvents and acute myeloid leukemia in four Nordic countries (45). Other case-referent studies have been based in death certificate (46) or burial registry data (47), were hospital-based (48–50), population-based (51–54), or population-based in geographical areas with a predominant industry [such as of agriculture, textiles, or woodworking (47, 55–58)]. There was also a multi-center case-referent study of rare cancers in Europe, including of uveal melanoma (59) and male breast cancer risk (60).

Early efforts to advance occupational exposure assessment in population studies included a multi-cancer, multi-exposure case-referent study of 20 types of cancer designed to identify new occupational cancer risks (61). Exposure assessment was conducted with probing interviews and translation into occupational exposures by trained chemists including confidence that exposure took place, frequency, level, and number of years of exposure. Information regarding 300 common past occupational exposures was captured. Analysis was performed for each cancer site with referents composed of the other included cancer cases in an effort to limit potential recall bias, by using other cancer rather than healthy controls (62–63). Numerous analyses from the study have been published, including of petroleum-derived liquids (62) and exhaust and combustion products (63).

Large-scale registry-data

Studies in the journal took advantage of available high-quality national population- and cancer registers in Nordic countries examining cancer incidence and mortality outcomes in large-scale studies (1, 64). In one study, cancer incidence by occupation among 10 million employed persons in Denmark, Finland, Norway, and Sweden was evaluated including of one million incident cancer cases diagnosed during a 20-year period (65). Further, high-quality cancer registries allow examination of trends in disease over time, for example of rates of mesothelioma incidence and predictions of future disease (66, 67). They are also useful to identify cancer cases among exposed populations, produce unbiased case series for case-referent studies, and identify cases of rare cancers (68). In the Italian national mesothelioma registry, Marinaccio et al (69) examined the epidemiology of pericardial and tunica vaginalis testis mesothelioma and associations with occupational asbestos exposure. Another recent study linked farmers' health insurance and cancer registry data in Taiwan (70). The availability of long-term registry-data also offers the opportunity to examine parental occupational exposures and cancer outcomes among offspring (71–74). Limitations of registry-based studies typically include lack of refined exposure and potential confounder data (75–77). There have been some recent advances in register-based exposure assessment, for instance in using algorithms of working time patterns based on employer electronic records (4,78).

Collaborative studies

There are several examples of the utility of pooled multi-country collaborative studies to improve statistical power, especially for rare outcomes, among workers in a range of occupations or industries. These include studies of vinyl chloride workers (79), workers in the production of man-made mineral fibers (80), workers in the reinforced plastics industry with high levels of styrene exposure (81), road pavement and asphalt mixing workers exposed to bitumen fumes (82, 83), and workers in wood-related industries (84). Advances in disease outcome classification have been examined in updated analyses of styrene exposed workers regrouping lymphatic and hematopoietic malignancy outcomes to the latest WHO classification (85). In another example, a pooled analysis of population-based case-referent studies of glyphosate use in North America examined non-Hodgkin lymphoma sub-types in relation to different exposure metrics (86).

Meta-analyses

A smaller number of meta-analyses have appeared, including several on cancer risks among farmers (87–89) and welders (90, 91). One review compared results among published meta-analyses on night shift work and breast cancer risk to identify research gaps (92). The study reported fairly consistent pooled effect sizes for 'ever versus never' night shift work, with findings for other metrics of exposure inconclusive and pointed to only one meta-analysis (93) that was considered strong in key domains of quality. Future research with more detailed and comparable metrics of night shift work was suggested, as were future high quality meta-analyses that consider in detail quality of individual studies. Accordingly, the carcinogenicity of night shift work was re-evaluated in 2019 and classified as Group 2A, with *limited* evidence for breast as well as prostate and colorectal cancer due to variability in findings and concerns regarding potential bias (94).

Job-exposure matrices

Studies linking information on job titles to job exposure matrices (JEM) are also prominent in the journal, to assign occupational exposure estimates to study participants using a standardized approach. One study described the utility of a plant- and period-specific JEM based on homogeneous exposure zones for 12 exposures to increase sensitivity and specificity in exposure assessment among wood workers (95). The JEM was based on workplace measurements, expert data, and other historical data and allowed for comparison of several metrics of exposure in internal cohort analyses.

General population JEM, including the expert-based quantitative Finnish JEM (FINJEM), designed to approach quality levels in industry-specific JEM (76), were applied in a census-based study of iron and welding fumes and lung cancer risk (96), in a study of biologically monitored workers for lead to assess potential confounding by other occupational carcinogens (97), and in a hierarchical Bayesian meta-analysis of pancreatic cancer and occupational agents (98). The Nordic Occupational Cancer Study (NOCCA) JEM, an adaptation of the FINJEM by national experts, was used in a large-scale study of solvent exposure and acute myeloid leukemia (45). In one study, a measurement-based quantitative gender-specific JEM for extremely low-frequency magnetic field exposure was applied in an attempt to reduce misclassification from applying a JEM designed for males to females (99).

Most recently, the impact of different JEM dimensions in exposure–response relationships of occupational silica exposure and lung cancer risk was examined in the SYNERGY study (100). Generally similar findings with alternative JEM specifications were observed, though they were optimized in analyses that incorporated prior rating, job, time, and region, with quantitative job-specific estimates being the most prominent dimension.

Advancing exposure assessment

Previous reviews described the need for advances in exposure assessment beyond job-title based approaches (23, 26, 101), including by integrating quantitative workplace monitoring data, work histories, work practices, and biological monitoring data (12, 102, 103). Detailed retrospective exposure assessment efforts, however, are often resource-intensive (101).

Some studies reported use of workplace measurement data. In one study of aluminum smelter workers, associations of coal-tar pitch volatiles and bladder cancer incidence were based on quantitative estimates of past workplace exposure to total tar (benzene-soluble matter) and benzo-a-pyrene (BaP) based on personal or stationary sampling (104). In a cohort of male metal workers, lifetime individual exposure to welding fume particulates was estimated through questionnaire information and welding-process-specific measurements of fume particulates (105).

One study described a deterministic model for retrospective exposure assessment of phenoxy herbicides, chlorophenols and dioxins, to improve upon expert-based approaches (106). There were a small number of studies of workers biologically monitored for exposure to lead (97, 107, 108) or more recently N,N-dimethylformamide (109). One study characterized metal exposures in lung tissue among deceased smelter workers compared with rural and urban referents (110). An example published elsewhere describes integration of a JEM with serum dioxin concentrations and biokinetic models in an occupational cohort study to estimate dose–response for risk assessment of all-cancer mortality (111).

Occupation and the environment

The interplay of studies of occupational and environmental cancer has been apparent over previous decades (27, 112–116). Occupational chemicals may spread from the workplace to the general environment (103). One study examined non-Hodgkin lymphoma and soft-tissue cancer incidence among a population previously exposed to chlorophenol, 20-years following the closing of a water intake plant contaminated by a local sawmill (117). In a more recent example among women in North Jutland, Denmark, the main causes of malignant mesothelioma included environmental (distance to industrial source) and domestic (due to living with an asbestos worker) exposure, which may be neglected risk factors (118). Asbestos fibers in artificial clay for toys was also described as a novel exposure source in the journal (119).

Studies of occupational exposures may inform understanding of environmental exposures typically experienced at lower levels. In the case of radon, there were previous studies of lung cancer among zinc-lead miners (120), niobium miners (121), and pyrite miners with low-level exposure to radon daughters (40). Exposure assessment included underground work (40, 120) or categories of cumulated dose of alpha radiation based on underground working time and mean underground measurement levels (121). There were also studies of residential radon by residency type (as an indicator of radon exposure) in a rural area (122), and with estimated or measured exposure levels to radon daughters in homes (123, 124). Potential interactions of smoking, passive smoking, and radon were examined (120, 123, 124). Occupational exposure to radon and its decay products were classified in Group 1 with *sufficient* evidence for lung cancer in 1988 (125). In 2001, the consistency of estimates from studies of underground miners and the growing body of literature on residential exposure was highlighted (126). In 2006, Darby et al (127) reported results of a pooled analysis of residential radon and lung cancer from 13 case-referent studies in Europe with information on individual smoking histories and long-term residential radon gas measurements. A recent study of childhood leukemia was based on predicted indoor radon concentrations, however future studies using measured rather than modeled data were suggested (128).

Studies of residential exposures can also vice versa, inform occupational exposures. For passive smoking, not fully conclusive information on health effects of workplace exposure was described (129). Later in the 2002 IARC evaluation of involuntary smoking (classified in Group 1), published meta-analyses reported a 12–19% increase in lung cancer risk among never smokers exposed at the workplace, though the smaller evidence base of studies of workplace compared with residential exposure was noted (130).

The changing landscape of occupational cancer research

The evolution of study designs across the 50-year history of the journal can be seen in figure 2. Since the early 1980s, the number of case-referent studies has been fairly stable, with large, pooled population-based studies published since the early 2010s. Most meta-analyses on cancer were published between 1990 and 2009. More stringent editorial criteria resulted in fewer meta-analyses published more recently. There have also been notable shifts in focus with regard to the cancer types examined (figure 3). Interest in mesothelioma has remained steady, while studies examining lung cancer declined. Publications describing breast and ovarian cancer increased, reflecting inclusion of women in cohort studies and detailed examination of these cancers in case-referent studies.

There have also been shifts in topics with the most recent studies encompassing a broader range of topics and methods. Although studies of chemicals, particles, and fibers remained, recent etiologic studies also covered shift work (4), noise (131), biological agents (132, 133), heat (134), complex mixtures (eg, welding and early cancer-related biomarkers) (135) or the psychosocial work environment. In a study of job demands in the SYNERGY study, there were stronger associations for lung cancer with higher physical rather than psychosocial demands, likely due to capturing undetermined effects of occupational lung carcinogens (136). There were also recent studies of labor force participation and return-to-work among cancer patients. One study examined predictors of employment among cancer survivors, highlighting the importance of motivation and skepticism towards returning to work (137). Other studies highlighted the need for improved support from healthcare professionals, supervisors and colleagues (138–140).

Future research on occupational cancer

Studies of occupational cancer have played a central role in global cancer hazard identification efforts including identification of 61 Group 1 occupational carcinogens (including exposure circumstances) having one or more sites with *sufficient* evidence of carcinogenicity, nearly half of the 129 Group 1 agents (11). This includes findings from recent evaluations that identified two additional occupationally relevant Group 1 agents including occupational exposure as a firefighter [*sufficient* evidence for mesothelioma and bladder cancer and *limited* evidence for several other cancer types (32)] and acrylonitrile [*sufficient* evidence for lung cancer and *limited* evidence for bladder cancer (141)]. Chemicals and chemical mixtures, radiation and radionuclides, and airborne particles represented the most frequent occupational carcinogens, and lung cancer the most frequent cancer type (11).

Although much has been gained in 50 years of

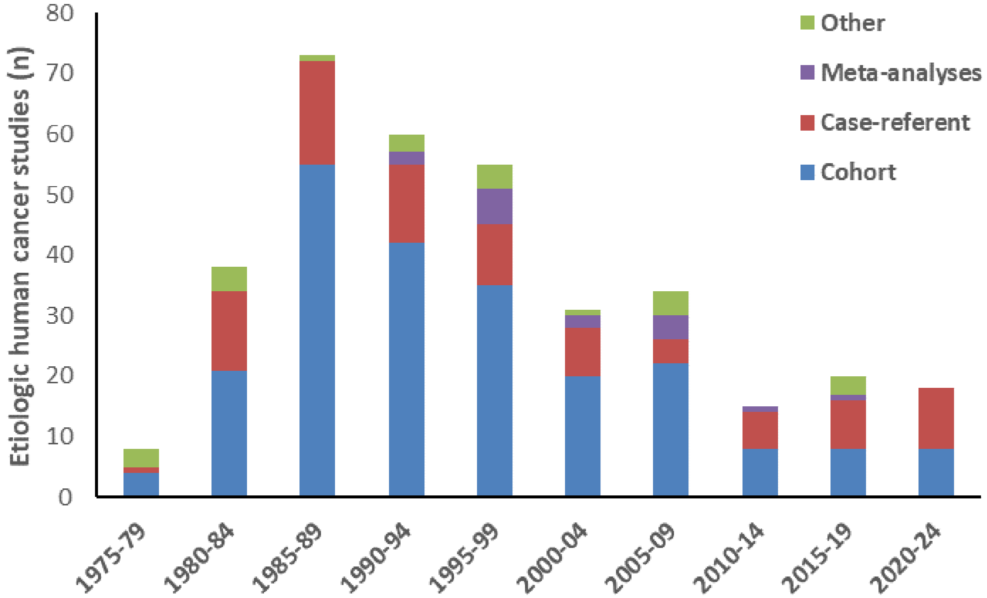

Figure 2. Frequency of etiologic occupational epidemiology studies published in the *Scandinavian Journal of Work, Environment and Health*, by year and study design.

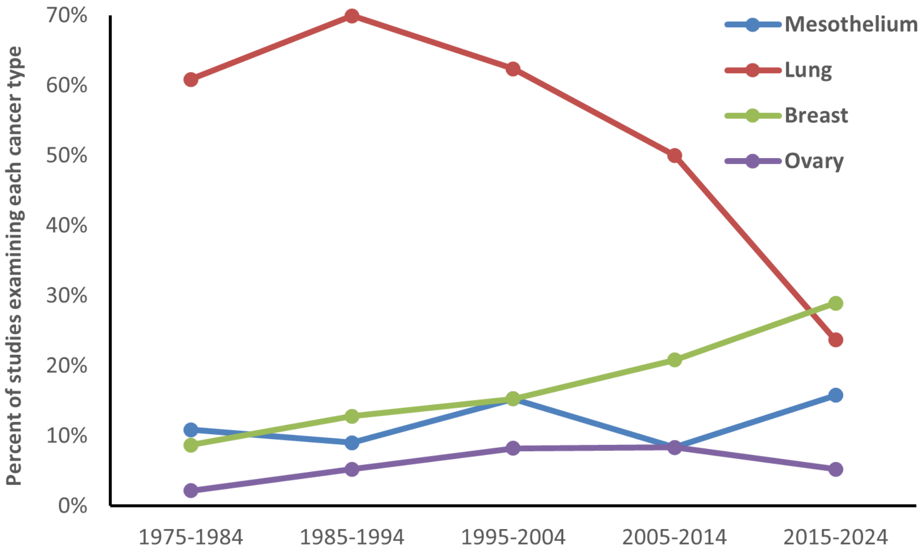

Figure 3. Percentage of etiologic occupational studies examining cancers of mesothelium, lung, breast, and ovary in *Scandinavian Journal of Work, Environment and Health* over the decades (includes multiple cancer outcomes in cohort studies).

occupational cancer studies, there remains the need for renewed global support for occupational cancer research (142–144). The declining trend in published cancer research observed in the journal may at least partially reflect earlier calls for renewed funding for cancer studies of this type (144). There remain many agents with *limited* human cancer evidence and an even larger number with *sufficient* evidence of carcinogenicity in experimental animals and potential occupational exposure, and global efforts to highlight research gaps to resolve classification uncertainties are needed (143, 144). There are large numbers of workers exposed to Group 1 agents (145–147), as well as new chemical hazards and changing workplace tasks over time (148).

Priorities for evaluation by the *IARC Monographs* may influence short- and longer-term research agendas; one example is the large number of studies of night shift work in the journal in close proximity to the *Monographs* evaluation (4). In a recent effort to recommend priority agents for future evaluation by *IARC Monographs* for 2025–2029, the accrual of pesticides as high-priority agents for evaluation was described, as was the need for systematic appraisal of all Group 1 agents to identify new cancer sites with *sufficient* or *limited* evidence (149). The importance of maintaining and strengthening global cancer hazard identification efforts, free from corporate and political interests, was highlighted some twenty years ago (150, 151), and remains today (152). The recent transition of the journal to full open access is also an important development, facilitating access to occupational cancer studies globally (153).

There remains a need for new studies to identify emerging risks, including an emphasis on potential impacts of climate change on occupational cancer risk. Climate change will lead to changes in frequency or intensity of a range of hazardous exposures and tasks (154). The future of occupational cancer research will take place amidst a changing workplace and green transition (155). The ongoing transformation and reorientation of global economies towards sustainability, includes the elimination and transformation of jobs and changes in exposure to known and unknown hazardous agents, and has yet to be fully understood (156, 157). One example includes electronic waste work, predominant in low- and middle-income countries, often unregulated and informal work, where the infrastructure is poor to support the types of studies that have been influential in reaching *sufficient* evidence (149).

Advances in exposure science and exposome methods to characterize the occupational (and non-occupational) environment will contribute to the literature (158). However, gains in hazard identification will also result from continued investment in the types of historical cohort studies outlined above, which have already greatly informed the field. Efforts to support continued updating of follow-up, refining exposure assessment, and to consider potential confounders either directly or indirectly are needed, as are efforts to support new cohorts on novel exposures, and studies with up-to-date outcome classification (85, 86). Industry-based studies, even if decades old, are frequently considered highly informative, and have been important in moving human cancer evidence from inadequate to limited or even sufficient (figure 1.4 in 159).

There is need for further studies of women and vulnerable populations. Although studies including female breast or reproductive cancers have typically not formed a large proportion of studies in the journal, the substantial increase in studies of female breast cancer in more recent decades has been observed (figure 3).

Other potentially vulnerable populations, with greater exposure to occupational carcinogens include workers in smaller companies and migrants (146).

There is need to study effective workplace interventions for cancer prevention. Few studies of primary or secondary cancer prevention were published in the journal. One previous review described health promotion trials for cancer risk factors at the workplace (160). Another publication discussed recommendations for prevention of adverse effects of night work for breast cancer (161). One study evaluated cost-effectiveness of low-dose computed tomography screening among asbestos-exposed workers (162). In other work, occupational health researchers were encouraged to follow the field of lung cancer screening and advance understanding regarding which workers will benefit (163). Concerted efforts among the occupational cancer research and broader interdisciplinary community are needed to ensure a robust future evidence-base for occupational and environmental cancer worldwide.

Acknowledgements

MCT is funded by a Ramón y Cajal fellowship (RYC-2017-01892) from the Spanish Ministry of Science, Innovation and Universities and co-funded by the European Social Fund. ISGlobal acknowledges support from the grant CEX2023-0001290-S funded by MCIN/ AEI/ 10.13039/501100011033, and support from the Generalitat de Catalunya through the CERCA Program. MCT, KS, MK acknowledge funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101137149 (INTERCAMBIO; https://intercambio-project.eu/).

The authors have no conflict of interest to declare.

Disclaimer

Where authors are identified as personnel of the IARC/ WHO, the authors alone are responsible for the views expressed in this article and they do not necessarily represent the decisions, policy or views of the IARC/WHO.

References

1. Burdorf A, Rugulies R. Fifty years of research in the Scandinavian Journal of Work, Environment & Health. Scand J Work Environ Health 2024 Jan;50(1):3–10. https://doi.org/10.5271/sjweh.4135
2. Sakai K, Nagata T, Mori T, Inoue S, Fujiwara H, Odagami K et al. Research topics in occupational medicine, 1990-2022: A text-mining-applied bibliometric study. Scand J Work Environ Health. 2024;50(7):567–576. https://doi.org/10.5271/sjweh.4177
3. Albin M, Johanson G, Hogstedt C. Successful prevention of organic solvent induced disorders: history and lessons. Scand J Work Environ Health 2024 Apr;50(3):135–41. https://doi.org/10.5271/sjweh.4155
4. Härmä M, Kecklund G, Tucker P. Working hours and health - key research topics in the past and future. Scand J Work Environ Health 2024 May;50(4):233–43. https://doi.org/10.5271/sjweh.4157
5. Järvholm B, Burdorf A. Asbestos and disease - a public health success story? Scand J Work Environ Health 2024 Mar;50(2):53–60. https://doi.org/10.5271/sjweh.4146
6. Infante PF, Epstein SS, Newton WA Jr. Blood dyscrasias and childhood tumors and exposure to chlordane and heptachlor. Scand J Work Environ Health 1978 Jun;4(2):137–50. https://doi.org/10.5271/sjweh.2718
7. Fingerhut MA, Halperin WE, Honchar PA, Smith AB, Groth DH, Russell WO. An evaluation of reports of dioxin exposure and soft tissue sarcoma pathology among chemical workers in the United States. Scand J Work Environ Health 1984 Oct;10(5):299–303. https://doi.org/10.5271/sjweh.2325
8. IARC. Some Thyrotropic Agents. IARC Monogr Carcinogen Risks Hum 2001;79:1–773.
9. IARC. Polychlorinated Dibenzo-Para-Dioxins and Polychlorinated Dibenzofurans. IARC Monogr Eval Carcinog Risks Hum 1997;69:1–631.
10. IARC. Chemical Agents and Related Occupations. IARC Monogr Carcinogen Risks Hum 2012;100F:1–628.
11. Loomis D, Guha N, Hall AL, Straif K. Identifying occupational carcinogens: an update from the IARC Monographs. Occup Environ Med 2018 Aug;75(8):593–603. https://doi.org/10.1136/oemed-2017-104944
12. Axelson O, Sundell L, Andersson K, Edling C, Hogstedt C, Kling H. Herbicide exposure and tumor mortality. An updated epidemiologic investigation on Swedish railroad workers. Scand J Work Environ Health 1980 Mar;6(1):73–9. https://doi.org/10.5271/sjweh.2631
13. Acheson ED, Pippard EC, Winter PD. Mortality of English furniture makers. Scand J Work Environ Health 1984 Aug;10(4):211–7. https://doi.org/10.5271/sjweh.2339
14. Ahlborg G Jr, Hogstedt C, Sundell L, Aman CG. Laryngeal cancer and pickling house vapors. Scand J Work Environ Health 1981 Sep;7(3):239–40. https://doi.org/10.5271/sjweh.3118
15. Gustavsson P, Hogstedt C, Holmberg B. Mortality and incidence of cancer among Swedish rubber workers, 1952-1981. Scand J Work Environ Health 1986 Dec;12(6):538–44. https://doi.org/10.5271/sjweh.2103
16. Olsen JH, Jensen OM. Cancer incidence among employees in one mineral wool production plant in Denmark. Scand J Work Environ Health 1984 Feb;10(1):17–24. https://doi.org/10.5271/sjweh.2368

17. Fletcher AC, Ades A. Lung cancer mortality in a cohort of English foundry workers. Scand J Work Environ Health 1984 Feb;10(1):7–16. https://doi.org/10.5271/sjweh.2361

18. Koskela RS, Klockars M, Järvinen E, Kolari PJ, Rossi A. Cancer mortality of granite workers. Scand J Work Environ Health 1987 Feb;13(1):26–31. https://doi.org/10.5271/sjweh.2088

19. Guénel P, Højberg G, Lynge E. Cancer incidence among Danish stone workers. Scand J Work Environ Health 1989 Aug;15(4):265–70. https://doi.org/10.5271/sjweh.1853

20. Paci E, Buiatti E, Seniori Costantini AS, Miligi L, Pucci N, Scarpelli A et al. Aplastic anemia, leukemia and other cancer mortality in a cohort of shoe workers exposed to benzene. Scand J Work Environ Health 1989 Oct;15(5):313–8. https://doi.org/10.5271/sjweh.1845

21. Pippard EC, Acheson ED. The mortality of boot and shoe makers, with special reference to cancer. Scand J Work Environ Health 1985 Aug;11(4):249–55. https://doi.org/10.5271/sjweh.2223

22. Cammarano G, Crosignani P, Berrino F, Berra G. Cancer mortality among workers in a thermoelectric power plant. Scand J Work Environ Health 1984 Aug;10(4):259–61. https://doi.org/10.5271/sjweh.2333

23. Hernberg S. "Negative" results in cohort studies--how to recognize fallacies. Scand J Work Environ Health 1981;7 Suppl 4:121–6.

24. IARC. Overall Evaluations of Carcinogenicity: An Updating of IARC Monographs Volumes 1–42. IARC Monographs 1987; Supplement 7:1–449.

25. IARC. Wood Dust and Formaldehyde. IARC Monogr Carcinogen Risks Hum 1995;62:1–423.

26. Stewart P. Challenges to retrospective exposure assessment. Scand J Work Environ Health 1999 Dec;25(6):505–10. https://doi.org/10.5271/sjweh.473

27. Vineis P, Blair A. Problems and perspectives in the identification of new occupational carcinogens. Scand J Work Environ Health 1992 Oct;18(5):273–7. https://doi.org/10.5271/sjweh.1577

28. IARC. Silica, Some Silicates, Coal Dust and *Para*-Aramid Fibrils. IARC Monogr Eval Carcinog Risks Hum 1997;68:1–475.

29. Ugelvig Petersen K, Pukkala E, Martinsen JI, Lynge E, Tryggvadottir L, Weiderpass E et al. Cancer incidence among seafarers and fishermen in the Nordic countries. Scand J Work Environ Health 2020 Sep;46(5):461–8. https://doi.org/10.5271/sjweh.3879

30. Aas GB, Aagnes B, Strand LA, Grimsrud TK. Suggested excess of occupational cancers in Norwegian offshore workers: preliminary results from the Cancer Registry Offshore Cohort. Scand J Work Environ Health 2009 Oct;35(5):397–9. https://doi.org/10.5271/sjweh.1341

31. Marjerrison N, Jakobsen J, Grimsrud TK, Hansen J, Martinsen JI, Nordby KC et al. Cancer incidence in sites potentially related to occupational exposures: 58 years of follow-up of firefighters in the Norwegian Fire Departments Cohort. Scand J Work Environ Health 2022 Apr;48(3):210–9. https://doi.org/10.5271/sjweh.4009

32. IARC. Occupational Exposure as a Firefighter. IARC Monogr Carcinogen Risks Hum 2023;132:1–739.

33. Furlong MA, Liu T, Snider JM, Tfaily MM, Itson C, Beitel S et al. Evaluating changes in firefighter urinary metabolomes after structural fires: an untargeted, high resolution approach. Sci Rep 2023 Nov;13(1):20872. https://doi.org/10.1038/s41598-023-47799-x

34. Nwanaji-Enwerem JC, Cardenas A, Goodrich JM, Furlong MA, Jung AM, Collender PA et al. Occupational years of service and leukocyte epigenetic aging: relationships in United States firefighters. J Occup Environ Med 2023 May;65(5):e312–8. https://doi.org/10.1097/JOM.0000000000002817

35. Horn GP, Fent KW, Kerber S, Smith DL. Hierarchy of contamination control in the fire service: review of exposure control options to reduce cancer risk. J Occup Environ Hyg 2022 Sep;19(9):538–57. https://doi.org/10.1080/15459624.2022.2100406

36. Taeger D, Pesch B, Kendzia B, Behrens T, Jöckel KH, Dahmann D et al. Lung cancer among coal miners, ore miners and quarrymen: smoking-adjusted risk estimates from the synergy pooled analysis of case-control studies. Scand J Work Environ Health 2015 Sep;41(5):467–77. https://doi.org/10.5271/sjweh.3513

37. Blair A, Malker H, Cantor KP, Burmeister L, Wiklund K. Cancer among farmers. A review. Scand J Work Environ Health 1985 Dec;11(6):397–407. https://doi.org/10.5271/sjweh.2208

38. Blair A, Zahm SH, Pearce NE, Heineman EF, Fraumeni JF Jr. Clues to cancer etiology from studies of farmers. Scand J Work Environ Health 1992 Aug;18(4):209–15. https://doi.org/10.5271/sjweh.1578

39. Forastiere F, Quercia A, Miceli M, Settimi L, Terenzoni B, Rapiti E et al. Cancer among farmers in central Italy. Scand J Work Environ Health 1993 Dec;19(6):382–9. https://doi.org/10.5271/sjweh.1458

40. Battista G, Belli S, Carboncini F, Comba P, Levante G, Sartorelli P et al. Mortality among pyrite miners with low-level exposure to radon daughters. Scand J Work Environ Health 1988 Oct;14(5):280–5. https://doi.org/10.5271/sjweh.1919

41. Hernberg S, Collan Y, Degerth R, Englund A, Engzell U, Kuosma E et al. Nasal cancer and occupational exposures. Preliminary report of a joint Nordic case-referent study. Scand J Work Environ Health 1983 Apr;9(2 Spec No):208–13. https://doi.org/10.5271/sjweh.2423

42. Hernberg S, Westerholm P, Schultz-Larsen K, Degerth R, Kuosma E, Englund A et al. Nasal and sinonasal cancer. Connection with occupational exposures in Denmark, Finland and Sweden. Scand J Work Environ Health 1983 Aug;9(4):315–26. https://doi.org/10.5271/sjweh.2405

43. Kauppinen T, Riala R, Seitsamo J, Hernberg S. Primary liver cancer and occupational exposure. Scand J Work Environ Health 1992 Feb;18(1):18–25. https://doi.org/10.5271/sjweh.1616

44. Partanen T, Heikkilä P, Hernberg S, Kauppinen T, Moneta G, Ojajärvi A. Renal cell cancer and occupational exposure to chemical agents. Scand J Work Environ Health 1991 Aug;17(4):231–9. https://doi.org/10.5271/sjweh.1708

45. Talibov M, Lehtinen-Jacks S, Martinsen JI, Kjærheim K, Lynge E, Sparén P et al. Occupational exposure to solvents and acute myeloid leukemia: a population-based, case-control study in four Nordic countries. Scand J Work Environ Health 2014 Sep;40(5):511–7. https://doi.org/10.5271/sjweh.3436

46. Thomas TL, Stewart PA, Stemhagen A, Correa P, Norman SA, Bleecker ML et al. Risk of astrocytic brain tumors associated with occupational chemical exposures. A case-referent study. Scand J Work Environ Health 1987 Oct;13(5):417–23. https://doi.org/10.5271/sjweh.2024

47. Esping B, Axelson O. A pilot study on respiratory and digestive tract cancer among woodworkers. Scand J Work Environ Health 1980 Sep;6(3):201–5. https://doi.org/10.5271/sjweh.2615

48. Hours M, Dananche B, Fevotte J, Bergeret A, Ayzac L, Cardis E et al. Bladder cancer and occupational exposures. Scand J Work Environ Health 1994 Oct;20(5):322–30. https://doi.org/10.5271/sjweh.1390

49. Kjuus H, Skjaerven R, Langård S, Lien JT, Aamodt T. A case-referent study of lung cancer, occupational exposures and smoking. I. Comparison of title-based and exposure-based occupational information. Scand J Work Environ Health 1986 Jun;12(3):193–202. https://doi.org/10.5271/sjweh.2158

50. Kjuus H, Skjaerven R, Langård S, Lien JT, Aamodt T. A case-referent study of lung cancer, occupational exposures and smoking. II. Role of asbestos exposure. Scand J Work Environ Health 1986 Jun;12(3):203–9. https://doi.org/10.5271/sjweh.2157

51. Boffetta P, Gaborieau V, Nadon L, Parent MF, Weiderpass E, Siemiatycki J. Exposure to titanium dioxide and risk of lung cancer in a population-based study from Montreal. Scand J Work Environ Health 2001 Aug;27(4):227–32. https://doi.org/10.5271/sjweh.609

52. Merletti F, Boffetta P, Ferro G, Pisani P, Terracini B. Occupation and cancer of the oral cavity or oropharynx in Turin, Italy. Scand J Work Environ Health 1991 Aug;17(4):248–54. https://doi.org/10.5271/sjweh.1706

53. Petralia SA, Vena JE, Freudenheim JL, Dosemeci M, Michalek A, Goldberg MS et al. Risk of premenopausal breast cancer in association with occupational exposure to polycyclic aromatic hydrocarbons and benzene. Scand J Work Environ Health 1999 Jun;25(3):215–21. https://doi.org/10.5271/sjweh.426

54. Soskolne CL, Jhangri GS, Siemiatycki J, Lakhani R, Dewar R, Burch JD et al. Occupational exposure to sulfuric acid in southern Ontario, Canada, in association with laryngeal cancer. Scand J Work Environ Health 1992 Aug;18(4):225–32. https://doi.org/10.5271/sjweh.1585

55. Serra C, Bonfill X, Sunyer J, Urrutia G, Turuguet D, Bastús R et al.; Working Group on the Study of Bladder Cancer in the County of Vallès Occidental. Bladder cancer in the textile industry. Scand J Work Environ Health 2000 Dec;26(6):476–81. https://doi.org/10.5271/sjweh.571

56. Vineis P, Terracini B, Ciccone G, Cignetti A, Colombo E, Donna A et al. Phenoxy herbicides and soft-tissue sarcomas in female rice weeders. A population-based case-referent study. Scand J Work Environ Health 1987 Feb;13(1):9–17. https://doi.org/10.5271/sjweh.2077

57. Hoar Zahm S, Weisenburger DD, Cantor KP, Holmes FF, Blair A. Role of the herbicide atrazine in the development of non-Hodgkin's lymphoma. Scand J Work Environ Health 1993 Apr;19(2):108–14. https://doi.org/10.5271/sjweh.1499

58. Zappa M, Paci E, Seniori Costantini A, Kriebel D. Lung cancer among textile workers in the Prato area of Italy. Scand J Work Environ Health 1993 Feb;19(1):16–20. https://doi.org/10.5271/sjweh.1509

59. Behrens T, Lynge E, Cree I, Lutz JM, Eriksson M, Guénel P et al. Occupational exposure to endocrine-disrupting chemicals and the risk of uveal melanoma. Scand J Work Environ Health 2012 Sep;38(5):476–83. https://doi.org/10.5271/sjweh.3265

60. Laouali N, Pilorget C, Cyr D, Neri M, Kaerlev L, Sabroe S et al. Occupational exposure to organic solvents and risk of male breast cancer: a European multicenter case-control study. Scand J Work Environ Health 2018 May;44(3):310–22. https://doi.org/10.5271/sjweh.3717

61. Siemiatycki J, Wacholder S, Richardson L, Dewar R, Gérin M. Discovering carcinogens in the occupational environment. Methods of data collection and analysis of a large case-referent monitoring system. Scand J Work Environ Health 1987 Dec;13(6):486–92. https://doi.org/10.5271/sjweh.2009

62. Siemiatycki J, Dewar R, Nadon L, Gérin M, Richardson L, Wacholder S. Associations between several sites of cancer and twelve petroleum-derived liquids. Results from a case-referent study in Montreal. Scand J Work Environ Health 1987 Dec;13(6):493–504. https://doi.org/10.5271/sjweh.2008

63. Siemiatycki J, Gérin M, Stewart P, Nadon L, Dewar R, Richardson L. Associations between several sites of cancer and ten types of exhaust and combustion products. Results from a case-referent study in Montreal. Scand J Work Environ Health 1988 Apr;14(2):79–90. https://doi.org/10.5271/sjweh.1949

64. Tola S. Overview of Finnish epidemiologic studies on occupational cancer. Scand J Work Environ Health 1981;7 Suppl 4:133–9.

65. Andersen A, Barlow L, Engeland A, Kjaerheim K, Lynge E, Pukkala E. Work-related cancer in the Nordic countries. Scand J Work Environ Health 1999;25 Suppl 2:1–116.

66. Karjalainen A, Pukkala E, Mattson K, Tammilehto L, Vainio H. Trends in mesothelioma incidence and occupational mesotheliomas in Finland in 1960-1995. Scand J Work Environ Health 1997 Aug;23(4):266–70. https://doi.org/10.5271/sjweh.219

67. Kjaergaard J, Andersson M. Incidence rates of malignant mesothelioma in Denmark and predicted future number of cases among men. Scand J Work Environ Health 2000 Apr;26(2):112–7. https://doi.org/10.5271/sjweh.520

68. Teppo L. Cancer registries in environmental cancer epidemiology. Scand J Work Environ Health 1998 Feb;24(1):1–2. https://doi.org/10.5271/sjweh.270

69. Marinaccio A, Consonni D, Mensi C, Mirabelli D, Migliore E, Magnani C et al.; ReNaM Working Group. Association between asbestos exposure and pericardial and tunica vaginalis testis malignant mesothelioma: a case-control study and epidemiological remarks. Scand J Work Environ Health 2020 Nov;46(6):609–17. https://doi.org/10.5271/sjweh.3895

70. Chen WL, Lin GL, Lin YJ, Su TY, Wang CC, Wu WT. Cancer risks in a population-based study of agricultural workers: results from the Taiwan's Farmers and Health Cohort study. Scand J Work Environ Health 2023 Sep;49(6):419–27. https://doi.org/10.5271/sjweh.4106

71. Begtrup LM, Bonde JP, Flachs EM, Mehlum IS, Brauer C, Pedersen M et al. Cohort Profile: DOC*X-Generation-a nationwide Danish pregnancy cohort with OCcupational eXposure data. Int J Epidemiol 2024 Jun;53(4):dyae090. https://doi.org/10.1093/ije/dyae090

72. Nordby KC, Andersen A, Irgens LM, Kristensen P. Indicators of mancozeb exposure in relation to thyroid cancer and neural tube defects in farmers' families. Scand J Work Environ Health 2005 Apr;31(2):89–96. https://doi.org/10.5271/sjweh.855

73. Olsson A, Togawa K, Schüz J, Le Cornet C, Fervers B, Oksbjerg Dalton S et al. Parental occupational exposure to solvents and heavy metals and risk of developing testicular germ cell tumors in sons (NORD-TEST Denmark). Scand J Work Environ Health 2018 Nov;44(6):658–69. https://doi.org/10.5271/sjweh.3732

74. Volk J, Heck JE, Schmiegelow K, Hansen J. Risk of selected childhood cancers and parental employment in painting and printing industries: A register-based case–control study in Denmark 1968-2015. Scand J Work Environ Health 2019 Sep;45(5):475–82. https://doi.org/10.5271/sjweh.3811

75. Bondo Petersen S, Flachs EM, Prescott EI, Tjønneland A, Osler M, Andersen I et al. Job-exposure matrices addressing lifestyle to be applied in register-based occupational health studies. Occup Environ Med 2018 Dec;75(12):890–7. https://doi.org/10.1136/oemed-2018-104991

76. Pukkala E, Guo J, Kyyrönen P, Lindbohm ML, Sallmén M, Kauppinen T. National job-exposure matrix in analyses of census-based estimates of occupational cancer risk. Scand J Work Environ Health 2005 Apr;31(2):97–107. https://doi.org/10.5271/sjweh.856

77. Thygesen LC, Ersbøll AK. When the entire population is the sample: strengths and limitations in register-based epidemiology. Eur J Epidemiol 2014 Aug;29(8):551–8. https://doi.org/10.1007/s10654-013-9873-0

78. Härmä M, Ropponen A, Hakola T, Koskinen A, Vanttola P, Puttonen S et al. Developing register-based measures for assessment of working time patterns for epidemiologic studies. Scand J Work Environ Health 2015 May;41(3):268–79. https://doi.org/10.5271/sjweh.3492

79. Simonato L, L'Abbé KA, Andersen A, Belli S, Comba P, Engholm G et al. A collaborative study of cancer incidence and mortality among vinyl chloride workers. Scand J Work Environ Health 1991 Jun;17(3):159–69. https://doi.org/10.5271/sjweh.1715

80. Boffetta P, Saracci R, Andersen A, Bertazzi PA, Chang-Claude J, Ferro G et al. Lung cancer mortality among workers in the European production of man-made mineral fibers--a Poisson regression analysis. Scand J Work Environ Health 1992 Oct;18(5):279–86. https://doi.org/10.5271/sjweh.1576

81. Kogevinas M, Ferro G, Andersen A, Bellander T, Biocca M, Coggon D et al. Cancer mortality in a historical cohort study of workers exposed to styrene. Scand J Work Environ Health 1994 Aug;20(4):251–61. https://doi.org/10.5271/sjweh.1400

82. Partanen TJ, Boffetta P, Heikkilä PR, Frentzel-Beyme RR, Heederik D, Hours M et al. Cancer risk for European asphalt workers. Scand J Work Environ Health 1995 Aug;21(4):252–8. https://doi.org/10.5271/sjweh.34

83. Randem BG, Burstyn I, Langård S, Svane O, Järvholm B, Kauppinen T et al. Cancer incidence of Nordic asphalt workers. Scand J Work Environ Health 2004 Oct;30(5):350–5. https://doi.org/10.5271/sjweh.822

84. Demers PA, Boffetta P, Kogevinas M, Blair A, Miller BA, Robinson CF et al. Pooled reanalysis of cancer mortality among five cohorts of workers in wood-related industries. Scand J Work Environ Health 1995 Jun;21(3):179–90. https://doi.org/10.5271/sjweh.26

85. Loomis D, Guha N, Kogevinas M, Fontana V, Gennaro V, Kolstad HA et al. Cancer mortality in an international cohort of reinforced plastics workers exposed to styrene: a reanalysis. Occup Environ Med 2019 Mar;76(3):157–62. https://doi.org/10.1136/oemed-2018-105131

86. Pahwa M, Beane Freeman LE, Spinelli JJ, Blair A, McLaughlin JR, Zahm SH et al. Glyphosate use and associations with non-Hodgkin lymphoma major histological sub-types: findings from the North American Pooled Project. Scand J Work Environ Health 2019 Nov;45(6):600–9. https://doi.org/10.5271/sjweh.3830

87. Khuder SA, Schaub EA, Keller-Byrne JE. Meta-analyses of non-Hodgkin's lymphoma and farming. Scand J Work Environ Health 1998 Aug;24(4):255–61. https://doi.org/10.5271/sjweh.318

88. Khuder SA, Mutgi AB, Schaub EA, Tano BD. Meta-analysis of Hodgkin's disease among farmers. Scand J Work Environ Health 1999 Oct;25(5):436–41. https://doi.org/10.5271/sjweh.457

89. Khuder SA. Etiologic clues to lip cancer from epidemiologic studies on farmers. Scand J Work Environ Health 1999 Apr;25(2):125–30. https://doi.org/10.5271/sjweh.414

90. Ambroise D, Wild P, Moulin JJ. Update of a meta-analysis

on lung cancer and welding. Scand J Work Environ Health 2006 Feb;32(1):22–31. https://doi.org/10.5271/sjweh.973

91. Moulin JJ. A meta-analysis of epidemiologic studies of lung cancer in welders. Scand J Work Environ Health 1997 Apr;23(2):104–13. https://doi.org/10.5271/sjweh.187

92. Pahwa M, Labrèche F, Demers PA. Night shift work and breast cancer risk: what do the meta-analyses tell us? Scand J Work Environ Health 2018 Jul;44(4):432–5. https://doi.org/10.5271/sjweh.3738

93. Ijaz S, Verbeek J, Seidler A, Lindbohm ML, Ojajärvi A, Orsini N et al. Night-shift work and breast cancer--a systematic review and meta-analysis. Scand J Work Environ Health 2013 Sep;39(5):431–47. https://doi.org/10.5271/sjweh.3371

94. IARC. Night Shift Work. IARC Monogr Carcinogen Risks Hum 2020;124:1–381.

95. Kauppinen T, Partanen T. Use of plant- and period-specific job-exposure matrices in studies on occupational cancer. Scand J Work Environ Health 1988 Jun;14(3):161–7. https://doi.org/10.5271/sjweh.1936

96. Siew SS, Kauppinen T, Kyyrönen P, Heikkilä P, Pukkala E. Exposure to iron and welding fumes and the risk of lung cancer. Scand J Work Environ Health 2008 Dec;34(6):444–50. https://doi.org/10.5271/sjweh.1296

97. Anttila A, Uuksulainen S, Rantanen M, Sallmén M. Lung cancer incidence among workers biologically monitored for occupational exposure to lead: a cohort study. Scand J Work Environ Health 2022 Sep;48(7):540–8. https://doi.org/10.5271/sjweh.4046

98. Ojajärvi A, Partanen T, Ahlbom A, Hakulinen T, Kauppinen T, Weiderpass E et al. Estimating the relative risk of pancreatic cancer associated with exposure agents in job title data in a hierarchical Bayesian meta-analysis. Scand J Work Environ Health 2007 Oct;33(5):325–35. https://doi.org/10.5271/sjweh.1153

99. Lope V, Pérez-Gómez B, Aragonés N, López-Abente G, Gustavsson P, Floderus B et al. Occupational exposure to ionizing radiation and electromagnetic fields in relation to the risk of thyroid cancer in Sweden. Scand J Work Environ Health 2006 Aug;32(4):276–84. https://doi.org/10.5271/sjweh.1011

100. Ohlander J, Kromhout H, Vermeulen R, Portengen L, Kendzia B, Savary B et al. Respirable crystalline silica and lung cancer in community-based studies: impact of job-exposure matrix specifications on exposure-response relationships. Scand J Work Environ Health 2024 Apr;50(3):178–86. https://doi.org/10.5271/sjweh.4140

101. Stewart PA, Carel R, Schairer C, Blair A. Comparison of industrial hygienists' exposure evaluations for an epidemiologic study. Scand J Work Environ Health 2000 Feb;26(1):44–51. https://doi.org/10.5271/sjweh.509

102. Vainio H. Current trends in the biological monitoring of exposure to carcinogens. Scand J Work Environ Health 1985 Feb;11(1):1–6. https://doi.org/10.5271/sjweh.2260

103. Blair A, Rothman N, Zahm SH. Occupational cancer epidemiology in the coming decades. Scand J Work Environ Health 1999 Dec;25(6):491–7. https://doi.org/10.5271/sjweh.471

104. Armstrong BG, Tremblay CG, Cyr D, Thériault GP. Estimating the relationship between exposure to tar volatiles and the incidence of bladder cancer in aluminum smelter workers. Scand J Work Environ Health 1986 Oct;12(5):486–93. https://doi.org/10.5271/sjweh.2109

105. Sørensen AR, Thulstrup AM, Hansen J, Ramlau-Hansen CH, Meersohn A, Skytthe A et al. Risk of lung cancer according to mild steel and stainless steel welding. Scand J Work Environ Health 2007 Oct;33(5):379–86. https://doi.org/10.5271/sjweh.1157

106. Kauppinen TP, Pannett B, Marlow DA, Kogevinas M. Retrospective assessment of exposure through modeling in a study on cancer risks among workers exposed to phenoxy herbicides, chlorophenols and dioxins. Scand J Work Environ Health 1994 Aug;20(4):262–71. https://doi.org/10.5271/sjweh.1399

107. Anttila A, Heikkilä P, Pukkala E, Nykyri E, Kauppinen T, Hernberg S et al. Excess lung cancer among workers exposed to lead. Scand J Work Environ Health 1995 Dec;21(6):460–9. https://doi.org/10.5271/sjweh.62

108. Lundström NG, Nordberg G, Englyst V, Gerhardsson L, Hagmar L, Jin T et al. Cumulative lead exposure in relation to mortality and lung cancer morbidity in a cohort of primary smelter workers. Scand J Work Environ Health 1997 Feb;23(1):24–30. https://doi.org/10.5271/sjweh.174

109. Yoon JH, Yoo CI, Ahn YS. N,N-dimethylformamide: evidence of carcinogenicity from national representative cohort study in South Korea. Scand J Work Environ Health 2019 Jul;45(4):396–401. https://doi.org/10.5271/sjweh.3802

110. Gerhardsson L, Nordberg GF. Lung cancer in smelter workers--interactions of metals as indicated by tissue levels. Scand J Work Environ Health 1993;19 Suppl 1:90–4.

111. Steenland K, Deddens JA. A practical guide to dose-response analyses and risk assessment in occupational epidemiology. Epidemiology 2004 Jan;15(1):63–70. https://doi.org/10.1097/01.ede.0000100287.45004.e7

112. Ahlbom A. A review of the epidemiologic literature on magnetic fields and cancer. Scand J Work Environ Health 1988 Dec;14(6):337–43. https://doi.org/10.5271/sjweh.1909

113. Doll R. Effects of exposure to vinyl chloride. An assessment of the evidence. Scand J Work Environ Health 1988 Apr;14(2):61–78. https://doi.org/10.5271/sjweh.1943

114. Doll R, Andersen A, Cooper WC, Cosmatos I, Cragle DL, Easton D, et al. Report of the International Committee on Nickel Carcinogenesis in Man. Scand J Work Environ Health 1990;16(1 Spec No):1-82.

115. Oberdörster G. Airborne cadmium and carcinogenesis of the respiratory tract. Scand J Work Environ Health 1986 Dec;12(6):523–37. https://doi.org/10.5271/sjweh.2104

116. Sunderman FW Jr. Mechanisms of nickel carcinogenesis.

Scand J Work Environ Health 1989 Feb;15(1):1–12. https://doi.org/10.5271/sjweh.1888

117. Lampi P, Tuomisto J, Hakulinen T, Pukkala E. Follow-up study of cancer incidence after chlorophenol exposure in a community in southern Finland. Scand J Work Environ Health 2008 Jun;34(3):230–3. https://doi.org/10.5271/sjweh.1242

118. Panou V, Vyberg M, Meristoudis C, Hansen J, Bøgsted M, Omland Ø et al. Non-occupational exposure to asbestos is the main cause of malignant mesothelioma in women in North Jutland, Denmark. Scand J Work Environ Health 2019 Jan;45(1):82–9. https://doi.org/10.5271/sjweh.3756

119. Silvestri S, Di Benedetto F, Raffaell C, Veraldi A. Asbestos in toys: an exemplary case. Scand J Work Environ Health 2016 Jan;42(1):80–5. https://doi.org/10.5271/sjweh.3542

120. Axelson O, Sundell L. Mining, lung cancer and smoking. Scand J Work Environ Health 1978 Mar;4(1):46–52. https://doi.org/10.5271/sjweh.2724

121. Solli HM, Andersen A, Stranden E, Langård S. Cancer incidence among workers exposed to radon and thoron daughters at a niobium mine. Scand J Work Environ Health 1985 Feb;11(1):7–13. https://doi.org/10.5271/sjweh.2261

122. Axelson O, Edling C, Kling H. Lung cancer and residency--a case-referent study on the possible impact of of exposure to radon and its daughters in dwellings. Scand J Work Environ Health 1979 Mar;5(1):10–5. https://doi.org/10.5271/sjweh.2671

123. Axelson O, Andersson K, Desai G, Fagerlund I, Jansson B, Karlsson C et al. Indoor radon exposure and active and passive smoking in relation to the occurrence of lung cancer. Scand J Work Environ Health 1988 Oct;14(5):286–92. https://doi.org/10.5271/sjweh.1918

124. Edling C, Kling H, Axelson O. Radon in homes--a possible cause of lung cancer. Scand J Work Environ Health 1984 Feb;10(1):25–34. https://doi.org/10.5271/sjweh.2366

125. IARC. Man-made Mineral Fibres and Radon. IARC Monogr Carcinogen Risks Hum 1988;43:1–309.

126. IARC. Ionizing radiation, part 2: some internally deposited radionuclides. Views and expert opinions of an IARC Working Group on the Evaluation of Carcinogenic Risks to Humans. Lyon, 14-21 June 2000. IARC Monogr Eval Carcinog Risks Hum 2001;78(Pt 2):1–559.

127. Darby S, Hill D, Deo H, Auvinen A, Barros-Dios JM, Baysson H et al. Residential radon and lung cancer--detailed results of a collaborative analysis of individual data on 7148 persons with lung cancer and 14,208 persons without lung cancer from 13 epidemiologic studies in Europe. Scand J Work Environ Health 2006;32 Suppl 1:1–83.

128. Nikkilä A, Arvela H, Mehtonen J, Raitanen J, Heinäniemi M, Lohi O et al. Predicting residential radon concentrations in Finland: model development, validation, and application to childhood leukemia. Scand J Work Environ Health 2020 May;46(3):278–92. https://doi.org/10.5271/sjweh.3867

129. Woodward A. Is passive smoking in the workplace hazardous to health? Scand J Work Environ Health 1991 Oct;17(5):293–301. https://doi.org/10.5271/sjweh.1699

130. IARC Working Group on the Evaluation of Carcinogenic Risks to Humans. Tobacco smoke and involuntary smoking. IARC Monogr Eval Carcinog Risks Hum 2004;83:1–1438.

131. Hegewald J, Schubert M, Wagner M, Dröge P, Prote U, Swart E et al. Breast cancer and exposure to aircraft, road, and railway-noise: a case-control study based on health insurance records. Scand J Work Environ Health 2017 Nov;43(6):509–18. https://doi.org/10.5271/sjweh.3665

132. Gold LS, De Roos AJ, Ray RM, Wernli K, Fitzgibbons ED, Gao DL et al. Brain tumors and occupational exposures in a cohort of female textile workers in Shanghai, China. Scand J Work Environ Health 2006 Jun;32(3):178–84. https://doi.org/10.5271/sjweh.996

133. Cocco P, Satta G, Meloni F, Pilia I, Ahmed F, Becker N et al. Occupational exposure to organic dust and risk of lymphoma subtypes in the EPILYMPH case-control study. Scand J Work Environ Health 2021 Jan;47(1):42–51. https://doi.org/10.5271/sjweh.3925

134. Hinchliffe A, Kogevinas M, Molina AJ, Moreno V, Aragonés N, Castaño-Vinyals G et al. Association of occupational heat exposure and colorectal cancer in the MCC-Spain study. Scand J Work Environ Health 2023 Apr;49(3):211–21. https://doi.org/10.5271/sjweh.4082

135. Dauter UM, Alhamdow A, Cediel-Ulloa A, Gliga AR, Albin M, Broberg K. Cancer-related changes and low-to-moderate exposure to welding fumes: A longitudinal study. Scand J Work Environ Health 2022 Jan;48(1):21–30. https://doi.org/10.5271/sjweh.3988

136. Hovanec J, Siemiatycki J, Conway DI, Olsson A, Guénel P, Luce D et al. Application of two job indices for general occupational demands in a pooled analysis of case-control studies on lung cancer. Scand J Work Environ Health 2021 Sep;47(6):475–81. https://doi.org/10.5271/sjweh.3967

137. Mehnert A, Koch U. Predictors of employment among cancer survivors after medical rehabilitation--a prospective study. Scand J Work Environ Health 2013 Jan;39(1):76–87. https://doi.org/10.5271/sjweh.3291

138. Lamort-Bouché M, Péron J, Broc G, Kochan A, Jordan C, Letrilliart L et al.; FASTRACS Group. Breast cancer specialists' perspective on their role in their patients' return to work: A qualitative study. Scand J Work Environ Health 2020 Mar;46(2):177–87. https://doi.org/10.5271/sjweh.3847

139. Nielsen AF, Zinckernage L, Tofte JB, Timm H. Cancer survivors on the process of returning to work: a Danish focus group study. Scand J Work Environ Health 2019 Jul;45(4):370–5. https://doi.org/10.5271/sjweh.3794

140. Tamminga SJ, de Boer AG, Verbeek JH, Frings-Dresen MH. Breast cancer survivors' views of factors that influence the return-to-work process--a qualitative study. Scand J Work Environ Health 2012 Mar;38(2):144–54. https://doi.org/10.5271/sjweh.3199

141. Stayner LT, Carreón-Valencia T, Demers PA, Fritz JM, Sim MR, Stewart P et al. Carcinogenicity of talc and

acrylonitrile. Lancet Oncol 2024 Aug;25(8):962–3. https://doi.org/10.1016/S1470-2045(24)00384-X

142. Turner MC. What is next for occupational cancer epidemiology? Scand J Work Environ Health 2022 Nov;48(8):591–7. https://doi.org/10.5271/sjweh.4067

143. Turner MC, Cogliano V, Guyton K, Madia F, Straif K, Ward EM et al. Research recommendations for selected IARC-classified agents: impact and lessons learned. Environ Health Perspect 2023 Oct;131(10):105001. https://doi.org/10.1289/EHP12547

144. Ward EM, Schulte PA, Straif K, Hopf NB, Caldwell JC, Carreón T et al. Research recommendations for selected IARC-classified agents. Environ Health Perspect 2010 Oct;118(10):1355–62. https://doi.org/10.1289/ehp.0901828

145. Delabre L, Houot MT, Burtin A, Pilorget C. Occupational exposure to silica dust in France: an ongoing concern. Scand J Work Environ Health 2023 Oct;49(7):526–34. https://doi.org/10.5271/sjweh.4105

146. Gustavsson P, Wiebert P, Tinnerberg H, Bodin T, Linnersjö A, Hed Myrberg I et al. Time trends in occupational exposure to chemicals in Sweden: proportion exposed, distribution across demographic and labor market strata, and exposure levels. Scand J Work Environ Health 2022 Sep;48(6):479–89. https://doi.org/10.5271/sjweh.4040

147. WHO/ILO. WHO/ILO joint estimates of the work-related burden of disease and injury, 2000-2016: global monitoring report. Geneva, Switzerland: World Health Organization and International Labour Organization; 2021.

148. Pedersen JE, Petersen KU, Hansen J. Historical changes in chemical exposures encountered by Danish firefighters. Scand J Work Environ Health 2019 May;45(3):248–55. https://doi.org/10.5271/sjweh.3784

149. Berrington de González A, Masten SA, Bhatti P, Fortner RT, Peters S, Santonen T et al. Advisory Group recommendations on priorities for the IARC Monographs. Lancet Oncol 2024 May;25(5):546–8. https://doi.org/10.1016/S1470-2045(24)00208-0

150. Hagmar L. Corporate interests as an obstacle to the primary prevention of cancer. Scand J Work Environ Health 2005 Jun;31(3):165–7. https://doi.org/10.5271/sjweh.865

151. Tomatis L. The IARC monographs program: changing attitudes towards public health. Int J Occup Environ Health 2002;8(2):144–52. https://doi.org/10.1179/oeh.2002.8.2.144

152. Samet JM, Chiu WA, Cogliano V, Jinot J, Kriebel D, Lunn RM et al. The IARC Monographs: updated procedures for modern and transparent evidence synthesis in cancer hazard identification. J Natl Cancer Inst 2020 Jan;112(1):30–7. https://doi.org/10.1093/jnci/djz169

153. Rugulies R, Burdorf A. Scandinavian Journal of Work, Environment and Health goes full open access. Scand J Work Environ Health 2020 Sep;46(5):455–6. https://doi.org/10.5271/sjweh.3916

154. Schulte PA, Jacklitsch BL, Bhattacharya A, Chun H, Edwards N, Elliott KC et al. Updated assessment of occupational safety and health hazards of climate change. J Occup Environ Hyg 2023;20(5-6):183–206. https://doi.org/10.1080/15459624.2023.2205468

155. HERA Consortium. 2021. Eu Research Agenda for the Environment, Climate & Health 2021-2030. Final Draft. https://www.heraresearcheu.eu/hera-2030-agenda

156. EU-OSHA. Foresight Study on the Circular Economy and its effects on Occupational Safety and Health, 2021. Available from: https://osha.europa.eu/en/publications/foresight-study-circular-economy-and-its-effects-occupationalsafety-and-health

157. Turner MC, Basagaña X, Broberg K, Burdorf A, Guseva Canu I, Kolstad HA et al. INTERCAMBIO: Promoting mental and physical health in changing working environments (climate change, sustainable work, and green jobs). ISEE 2024: 36th Annual Conference of the International Society of Environmental Epidemiology. Environmental Health Perspectives ISEE Conference Abstracts Volume 2024, Issue 1 https://doi.org/10.1289/isee.2024.0956

158. Pronk A, Loh M, Kuijpers E, Albin M, Selander J, Godderis L et al.; EPHOR Consortium. Applying the exposome concept to working life health: the EU EPHOR project. Environ Epidemiol 2022 Feb;6(2):e185. https://doi.org/10.1097/EE9.0000000000000185

159. Schubauer-Berigan MK, Saracci R. The role of epidemiology in cancer hazard identification by the IARC Monographs programme. Chapter 1 in Bias assessment in case-control and cohort studies for hazard identification, Berrington de González A, Richardson DB, Schubauer-Berigan MK, eds. Statistical Methods in Cancer Research Vol. V. IARC Scientific Publication No. 171. In press.

160. Janer G, Sala M, Kogevinas M. Health promotion trials at worksites and risk factors for cancer. Scand J Work Environ Health 2002 Jun;28(3):141–57. https://doi.org/10.5271/sjweh.658

161. Bonde JP, Hansen J, Kolstad HA, Mikkelsen S, Olsen JH, Blask DE et al. Work at night and breast cancer--report on evidence-based options for preventive actions. Scand J Work Environ Health 2012 Jul;38(4):380–90. https://doi.org/10.5271/sjweh.3282

162. Fitzgerald NR, Flanagan WM, Evans WK, Miller AB; Canadian Partnership against Cancer (CPAC) Cancer Risk Management (CRM) Lung Cancer Working. Eligibility for low-dose computerized tomography screening among asbestos-exposed individuals. Scand J Work Environ Health 2015 Jul;41(4):407–12. https://doi.org/10.5271/sjweh.3496

163. Markowitz S, Ringen K, Dement JM, Straif K, Christine Oliver L, Algranti E et al.; Collegium Ramazzini. Occupational lung cancer screening: A Collegium Ramazzini statement. Am J Ind Med 2024 Apr;67(4):289–303. https://doi.org/10.1002/ajim.23572

Received for publication: 18 September 2024