

Identifying Occupational Carcinogens: Example of an *IARC Monographs Meta-assessment**

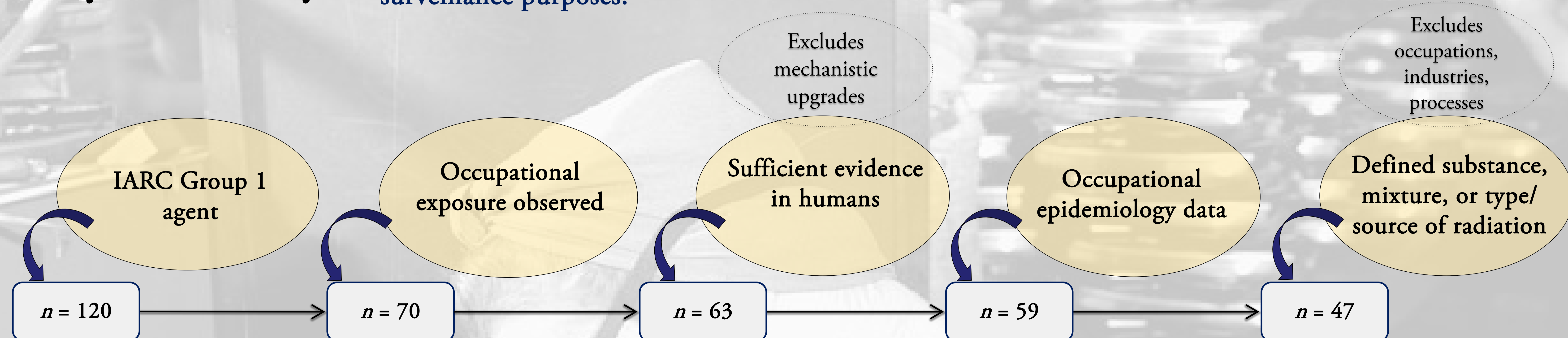
*Monographs Meta-assessment**

Amy Hall on behalf of the IARC Monographs Programme


* From Loomis D, Guba N, Hall AL, Straif K (2018). Identifying occupational carcinogens: an update from the IARC Monographs. *Occup Environ Med.* 75:593-603. PMID:29769352

Why this study?

It is important to identify occupational carcinogens for research, prevention, compensation, and surveillance purposes.




47 Occupational carcinogens identified (Volumes 1–120)



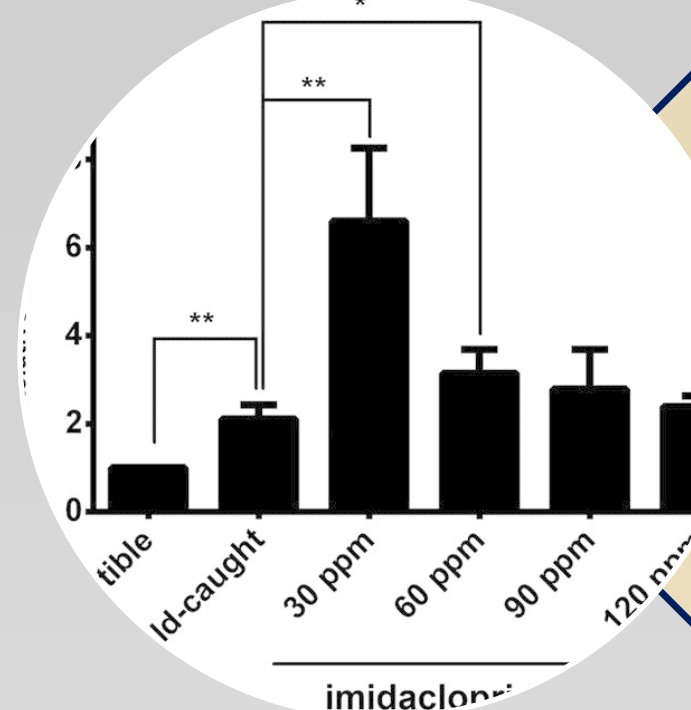
Class

- Chemicals: 15
- Chemical mixtures: 4
- Airborne particles: 8
- Airborne complex mixtures: 3
- Metals & metal compounds: 5
- Radiation & radionuclides: 12




Group 1 Classification (first instance)

- 1971–1980: 11
- 1981–1990: 6
- 1991–2000: 8
- 2001–2010: 11
- 2011–2017: 11



Quantitative Exposure–Response Data Reported in Monograph: 29

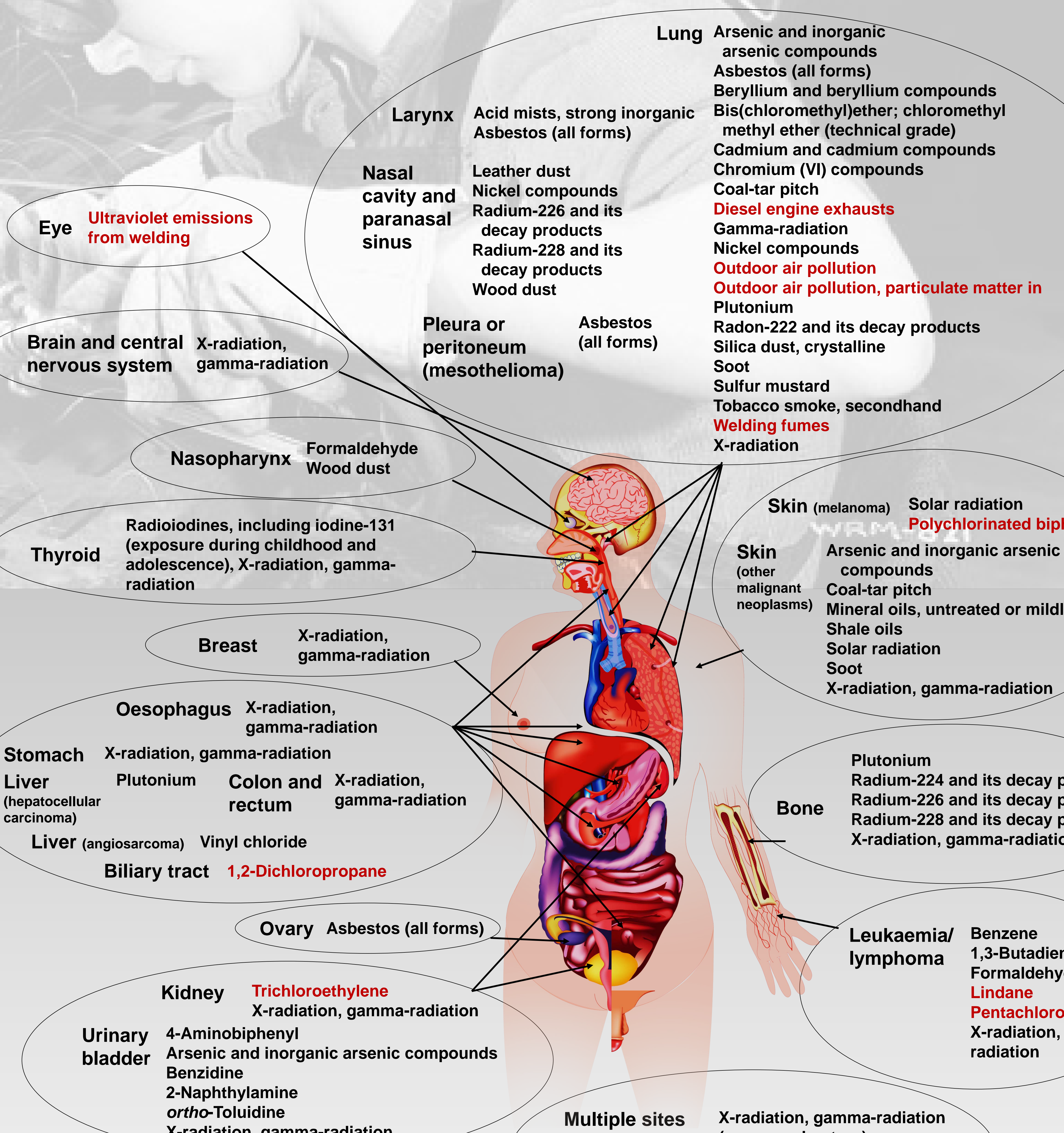


Primary Exposure Route(s)

- Inhalation: 34
- Ingestion: 18
- Dermal absorption: 4

Points to consider

- Pace of occupational carcinogen identification is increasing over time
- Many occupational exposures have not yet been evaluated for their carcinogenicity
- Improvements in study quality (e.g. reporting quantitative exposure–response data) strengthen causal inference and evaluations



- Eye:** Ultraviolet emissions from welding
- Brain and central nervous system:** X-radiation, gamma-radiation
- Nasopharynx:** Formaldehyde, Wood dust
- Thyroid:** Radioiodines, including iodine-131 (exposure during childhood and adolescence), X-radiation, gamma-radiation
- Breast:** X-radiation, gamma-radiation
- Oesophagus:** X-radiation, gamma-radiation
- Stomach:** X-radiation, gamma-radiation
- Liver (hepatocellular carcinoma):** Plutonium, Colon and rectum: X-radiation, gamma-radiation
- Liver (angiosarcoma):** Vinyl chloride
- Biliary tract:** 1,2-Dichloropropane
- Ovary:** Asbestos (all forms)
- Kidney:** Trichloroethylene, X-radiation, gamma-radiation
- Urinary bladder:** 4-Aminobiphenyl, Arsenic and inorganic arsenic compounds, Benzidine, 2-Naphthylamine, ortho-Toluidine, X-radiation, gamma-radiation
- Lung:** Arsenic and inorganic arsenic compounds, Asbestos (all forms), Beryllium and beryllium compounds, Bis(chloromethyl)ether; chloromethyl methyl ether (technical grade), Cadmium and cadmium compounds, Chromium (VI) compounds, Coal-tar pitch, Diesel engine exhausts, Gamma-radiation, Nickel compounds, Outdoor air pollution, Outdoor air pollution, particulate matter in Plutonium, Radon-222 and its decay products, Silica dust, crystalline, Soot, Sulfur mustard, Tobacco smoke, secondhand, Welding fumes, X-radiation
- Larynx:** Acid mists, strong inorganic, Asbestos (all forms)
- Nasal cavity and paranasal sinus:** Leather dust, Nickel compounds, Radium-226 and its decay products, Radium-228 and its decay products, Wood dust
- Pleura or peritoneum (mesothelioma):** Asbestos (all forms)
- Skin (melanoma):** Solar radiation, Polychlorinated biphenyls
- Skin (other malignant neoplasms):** Arsenic and inorganic arsenic compounds, Coal-tar pitch, Mineral oils, untreated or mildly treated, Shale oils, Solar radiation, Soot, X-radiation, gamma-radiation
- Bone:** Plutonium, Radium-224 and its decay products, Radium-226 and its decay products, Radium-228 and its decay products, X-radiation, gamma-radiation
- Leukaemia/lymphoma:** Benzene, 1,3-Butadiene, Formaldehyde, Lindane, Pentachlorophenol, X-radiation, gamma-radiation
- Multiple sites (unspecified):** X-radiation, gamma-radiation (exposure in utero)
- All cancers combined:** 2,3,7,8-Tetrachlorodibenzo-para-dioxin