

# Examining contemporary occupational carcinogen exposure, bladder cancer

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Despite manufacturing and legislative changes to improve workplace hygiene, the risk of occupational bladder cancer appears to be on the rise in some industries, although the profile of at-risk occupations has changed over time, according to an article published online by *JAMA Oncology*.

Bladder cancer is a common cancer and most tumors arise following exposure to carcinogens that enter the circulation through inhalation, ingestion or skin contact. The two most frequent routes are through tobacco smoking and occupation.

James W.F. Catto, M.B.Ch.B., Ph.D., F.R.C.S., of the University of Sheffield, England, and coauthors reviewed the medical literature and examined contemporary risks of occupational bladder cancer. Their review included 263 articles reporting on 31.4 million people. The authors used Nordic Occupational Classification and International Standard Classifications of Occupations.

The authors' meta-analysis reported increased bladder cancer risk in 42 of 61 occupational classes and increased risk of bladder cancer-specific mortality in 16 of 40 occupational classes. Reduced incidence risk and mortality risk were seen in 6 of 61 and 2 of 40 classes, respectively. Risk varied with sex and was greatest in men, although it varied over time, according to the results.

Overall, the highest bladder cancer risks were for workers exposed to

aromatic amines (tobacco, dye and rubber workers, hairdressers, printers and leather workers) and polycyclic aromatic hydrocarbons (chimney sweeps, nurses, waiters, aluminum workers, seamen and oil/petroleum workers). The lowest risks were seen in agricultural sector workers.

The highest risks of death from bladder cancer occurred in workers exposed to heavy metals and polycyclic aromatic hydrocarbons (metal workers, aluminum workers, electricians and mechanics), to diesel and combustion products (military and public safety workers) and those exposed to aromatic amines (domestic assistants and cleaners, rubber workers, painters and hairdressers).

While there appeared to be increased risk of bladder cancer, it appears to be increasing faster in women than in men, according to the authors. This increasing risk could be due to improved detection mechanisms and screening. The authors also suggest the increase among women may be due to an increase in the number of women in the workforce and the emergence of carcinogens in occupations dominated by women.

The authors noted several study limitations including that risk was divided according to occupational title or class rather than tasks and they were unable to adjust for smoking, the most common carcinogen.

"Efforts to reduce the impact of BC [bladder cancer] on [workers](#) should be targeted to occupations at risk of mortality," the authors conclude.

In a related commentary, Elisabete Weiderpass, M.D., M.Sc., Ph.D., of the Institute of Population-Based Cancer Research, Oslo, Norway, and Harri Vainio, M.D., Ph.D., Finnish Institute of Occupational Health, Helsinki, Finland, write: "In summary, this meta-analysis revealed that [bladder cancer](#) incidence and mortality are still elevated in many occupational groups, despite recent improvements in occupational hygiene, as observed in particular in Western countries. Bladder cancer

continues to vary considerable by occupation, sex and calendar time - all indications that prevention is possible, and warranted. Workers around the world have the right to demand and get a safe and carcinogen-free workplace."

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