Occupational cancer risk factors in Europe
A gender perspective

Interviews with workers: Germany, Ireland, Spain, France, Hungary and Finland (24,402 interviews)
Fieldwork dates: September 2022 – February 2023 | **Methodology:** telephone | **Exposure assessment:** www.occideas.org

Background

The European Agency for Safety and Health at Work (EU-OSHA) carried out an exposure survey on cancer risks factors, based on an adaptation of the Australian Workplace Exposures Study (AWES). The survey provides prevalence and semi-quantitative levels of occupational exposure, using the Occupational Integrated Database Exposure Assessment System (OccIDEAS).

The information provided by the survey on occupational exposures to selected cancer risk factors supports one of the key objectives of the EU Strategic Framework on Health and Safety at Work 2021-2027 on improving the prevention of work-related diseases and contributes to Europe's Beating Cancer Plan and the EU Roadmap on Carcinogens initiative.

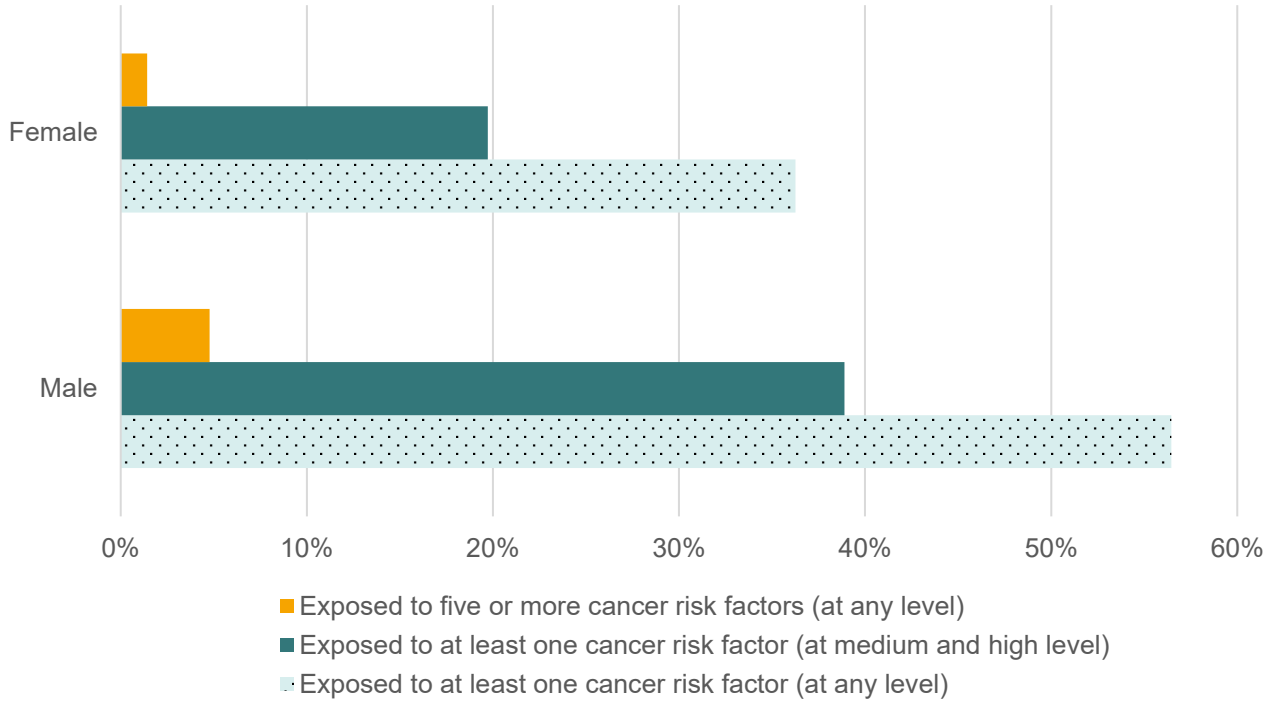
Material and methods

WES is a large telephone survey covering a representative selection of the working population from six EU Member States: Germany, Ireland, Spain, France, Hungary and Finland. The interviews were held between September 2022 and February 2023 with 24,402 respondents, including both employed and self-employed workers. It estimates probable occupational exposure during the last working week to 24 known cancer risk factors, including chemicals, process-generated substances and mixtures, and physical risk factors.

The selection of the 24 cancer risk factors was based on different criteria (EU-OSHA, 2024), including their classification by the IARC Monographs as Group 1 or 2A, or their inclusion in the Carcinogens, Mutagens and Reprotoxic substances Directive (CMRD) or in one of the planned or adopted amendments.

Almost 62% of the respondents were male workers, and 38% female. Nevertheless, the survey data was weighted with the 2021 EU Labour Force Survey annual data as reference statistics, considering gender, to represent the 98.5 million working population of the six countries.

Figure 1. Occupational exposure to one or more of the 24 cancer risk factors, by gender (%)



Source: WES 2023, EU-OSHA | reference population: all workers in Germany, Spain, Finland, France, Hungary, and Ireland.

Results

Male workers are assessed to be exposed more often than female workers to at least one of these cancer risk factors, to several of them (Figure 1), and to most of the 24 single risk factors, except for exposure to ionising radiation, ethylene oxide, trichloroethylene, leather dust, acrylamide, and epichlorohydrin, which are either similar for both genders, or slightly higher for female workers, but concerning fewer workers (Table 1). The same pattern applies to exposure at higher levels, except for ethylene oxide and trichloroethylene.

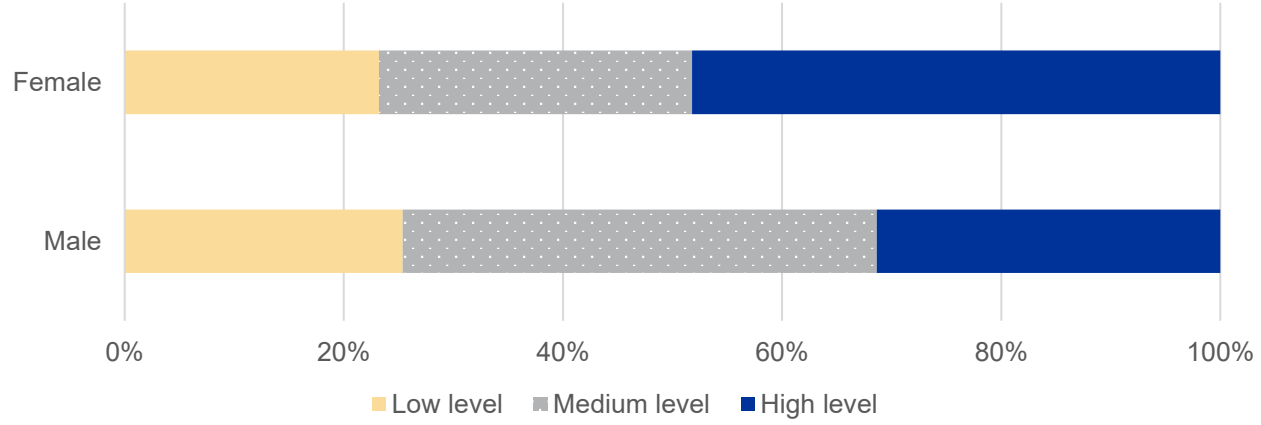
Table 1. Occupational exposure to a selection of the 24 cancer risk factors, at any level, by gender (%)

CANCER RISK FACTOR	Exposed female	Exposed male
Ionising radiation	2.5%	2.4%
Ethylene oxide	1.6%	1.6%
Trichloroethylene	1.1%	0.9%
Leather dust	0.7%	0.7%
Acrylamide	0.8%	0.7%
Epichlorohydrin	0.4%	0.3%

Source: WES 2023, EU-OSHA | reference population: all workers in Germany, Spain, Finland, France, Hungary, and Ireland.

When looking at specific sectors or occupations, there are some exceptions. For example, 48% of the female workers exposed to formaldehyde in the healthcare sector are exposed at a high level, compared to 31% of male workers (EU-OSHA, 2025, and Figure 2).

Figure 2. Healthcare workers probably exposed to formaldehyde, by exposure level and gender (%)



Source: WES 2023, EU-OSHA | reference population: healthcare workers exposed to formaldehyde.

Discussion

There are two main gender biases to be considered. First, the 24 cancer risk factors included in the survey are more prevalent in male-dominated industries and sectors. Notably, when looking at a female-dominated sector such as healthcare, the pattern of exposure is reversed. Second, the lack of consideration for gender in research. This implicit bias has led to the historical underrepresentation of women in clinical studies, as well as the exclusion of female workers in occupational exposures and health studies (See, for example, Schlünssen V, Jones RM, 2023).

Conclusion

Although the Workers' Exposure Survey does not address a possible gender bias, the data should contribute to increasing awareness of cancer risks at the workplace and to a better understanding of where these exposures may occur, enhancing prevention and risk management across the EU. It does address some very relevant risk factors for female workers, such as exposure to formaldehyde, a wide-used chemical present in many applications and products.

This flyer was originally presented as a poster at the 30th EPICOH conference.
For more information, please consult EU-OSHA web section dedicated to the survey.