PUBLIC HEALTH COMMUNICATION CENTRE AOTEAROA

Carcinogen exposure in Aotearoa workplaces is unacceptably high

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Summary

New Zealand Carcinogens Survey reveals for the first time the extent to which New Zealanders experience cancer-causing substances and other exposures in their workplace. The survey, released in March this year, reports that more than half (58%) of all workers are exposed to at least one workplace carcinogen at some level. This article reviews the survey's main findings and highlights some urgently needed steps to reduce exposure and improve care. These include better collection of data, addressing ethnic inequalities in levels of exposure, and creating an Aotearoa Occupational Health Service, with a focus on establishing lifetime access to screening and healthcare for those at high risk of exposure.

Background

Work-related disease is estimated to account for 750-900 deaths each year in New Zealand and cancer contributes to ~50% of these deaths as well as to at least a third of hospitalisations due to work-related disease.[1] A relevant caveat is that these figures are largely based on overseas estimates applied to Aotearoa New Zealand health data.

Establishing the number of workplace injuries that occur is relatively straightforward but the investigation of work-related cancer is fraught with difficulty. There is often a long latency period between exposure at work and the onset of disease; further, there are difficulties in attributing a particular cancer to a specific workplace exposure. There are very few cancers where occupational exposures are the sole, and therefore the obvious, causal factor (e.g. asbestos and mesothelioma); hazardous exposures often cluster in work environments; and lifestyle factors (e.g. smoking) also contribute to cancer risk. Therefore, understanding the prevalence, frequency, and distribution of *exposure* to work-related carcinogens is crucial.

How do we know which workplace exposures potentially contribute to cancer risk? The International Agency for Research on Cancer (IARC; the WHO cancer-focused research agency in Lyon, France) conducts comprehensive investigations of potential cancer-causing agents using expert reviews of the relevant scientific literature: IARC Monographs on the Identification of Carcinogenic Hazards to Humans. Agents are classified according to the quality of evidence as: *Group 1*: sufficient evidence of carcinogenicity in humans; *Group 2A*: probably carcinogenic to humans; *Group 2B*: possibly carcinogenic to humans; or *Group 3*: not classifiable. Not only do we need to have Aotearoa-specific data for the estimates presented above, information on (at the very least) Group 1 and 2A carcinogenic exposures across NZ workplaces is critical to inform efforts to *reduce* these exposures.

Until recently, this information has been lacking in Aotearoa New Zealand.

The New Zealand Carcinogens Survey

In 2021, WorkSafe NZ commissioned the *New Zealand Carcinogens Survey (NZCS)* – the first survey examining the prevalence of occupational carcinogens in the working population.[2] Rather than relying on self-reported exposures, the NZCS used a web-based exposure assessment programme developed by Curtin University in Australia: the Occupational Integrated Database Exposure Assessment System (OccIDEAS). The programme estimates the likelihood of exposure and likely level of exposure (low, medium,

or high) based on questions presented in agent, job, and task modules that automatically apply exposure assessment rules developed from the scientific literature and expert opinion. The NZCS included either 44 or 54 agents (they report inconsistently) classified as IARC Group 1 or 2A.

The NZCS was carried out in collaboration with the OccIDEAS team and Research NZ and comprised two surveys using the same questionnaire with a combined total of 4,051 workers aged ≥18 years. The data were weighted so that the overall sample was representative of the population based on age, gender, risk group of occupation, and industry, according to Statistics New Zealand population counts from the 2018 Census.[2] Further details on sampling can be found in the Appendix below.

Widespread Exposure, highest in Māori, Pasifika, and Men

The findings of the NZCS suggest that 58% of workers in this sample are exposed to at least one cancer-causing agent at work at any level. Almost one in three workers are exposed to a work-related carcinogen at a high level and almost one in four are exposed to five or more carcinogens at any level.

The top 10 most common cancer-causing substances and exposures across all industries are benzene (30%), solar UV (27%), ocular UV (exposure to the eyes;26%), diesel engine exhaust (24%), environmental tobacco smoke (15%), styrene (12%), crystalline silica (10%), shiftwork (9%), wood dust (8%), and other polycyclic aromatic hydrocarbons (8%). The main tasks associated with benzene exposure are fuelling vehicles and equipment with petrol, using petrol and other solvents to clean hands, and using solvent-based paints. The industries with the highest prevalence of exposure to at least one carcinogen were ‘Mining’, ‘Electricity, Gas, Water and Waste Services’, ‘Construction’, ‘Transport, Postal and Warehousing’, and ‘Agriculture, Forestry and Fishing’; workers in the last industry group were exposed to the highest average number of carcinogens at any level. The occupations exposed to the highest average number of carcinogens were construction workers, farmers, and emergency workers.

The survey also reported that the distribution of exposure to carcinogens differ by gender and ethnicity; in particular, the survey reports that Māori and Pacific workers and men are the most likely to be exposed to at least one carcinogen at any level.

It is not clear how many workers were approached to produce the final sample of 4,051. Māori and Pasifika are under-represented in comparison to their population numbers when it would have been better to oversample these ethicities in order to provide more stable estimates of exposure. It seems likely that the sample does not reflect the occupational distribution of Māori, which we know is different from that of non-Māori.[3]

What is to be done?

Despite these deficits, the NZCS report provides evidence that a large number of workers are exposed to high levels of at least one carcinogen at work and that the prevalence of exposure to multiple (>5) carcinogens is similarly unacceptably high. More usefully, the findings suggest that preventive efforts should start with the most common carcinogens and the identified high-risk industries and occupations. For example, although efforts to reduce exposure to respirable crystalline silica (RCS) have rightly been focused on the engineered stone-benchtop industry, the survey suggests that 44% of the construction

industry are exposed to RCS. The data collected in the NZCS will be very useful as a starting point toward establishing exposure prevalence in a range of specific industries and the development of comprehensive carcinogen profiles, including details on circumstances of exposure and use of exposure-control measures.

The NZCS is part of WorkSafe's Carcinogens and Airborne Risks Programme, which is one of its priority areas. This focus on work-related health is one of the priority areas with the biggest impact to reduce harm in the *Health and Safety at Work Strategy 2018-2028*. It is crucial that work-related health remains at the forefront despite shifting Government funding priorities. The survey is an important step to improve the collection of data on harmful work-related exposures, which are sorely lacking in Aotearoa. The collection of quality data and the generation of insights from these data are also priorities of the Strategy. However, data alone are not sufficient; it is vitally important that the information is used for *action*. There are too many historical examples of New Zealand being slower than other countries to act where sufficient evidence exists. For instance, we were the last country in the world to halt the production of the toxic dioxin-contaminated phenoxy herbicide, 2,4,5-T, in 1987 and, as late as 1986, it was still being argued that there were "no substantiated evidence that the manufacture of these pesticides has had any ill-effect on the health of the residents of New Plymouth".[4] The importation of asbestos-containing products was banned only in 2016.[5] The failure to take steps to limit the widespread use of the weed-killer glyphosate, the most commonly reported pesticide from the NZCS, can be added to this unenviable list.[6]

The use of the NZCS data should also form part of the wider push for the systematic collection of occupational-exposure data as part of an integrated surveillance system that includes population-level health outcomes and actual exposure measurements. This does not need to be a "*start from scratch*" solution; already available and routinely collected data could be further and better utilised. These recommendations are not new; indeed, they have fallen on deaf ears for decades.[7]

Even with the lack of precision around exactly who is exposed at all levels, the NZCS reinforces findings from previous studies that occupational exposures are not distributed equally across men and women[8] and Māori and non-Māori.[3] Indeed, it is increasingly clear that high-exposure work is more commonly done by Māori. Kia manawaroa (a call to action) is key to improving prevention and protection starting now and, as an immediate step ,we suggest that Te Aka Whai Ora (Māori Health Authority) are brought into the conversation about Māori-led solutions to reducing risk.

The targeted reduction of work-related carcinogens (and other exposures) is a key part of the solution; however, the ability to address work-related disease in New Zealand is markedly hampered by the lack of a dedicated public agency or service for occupational health. Such a service has long languished unattended in a jurisdictional gap between Government agencies: even though WorkSafe is the main health and safety regulator, it cannot provide health services as this is the responsibility of the Ministry of Health. This gap is a particular problem for work-related cancers that occur many years after exposure; the onus for monitoring the health of workers generally falls on the employer and there is no clear health-system pathway for workers with later-onset chronic health outcomes caused by their work magnifying inequities in access to health services and outcomes.

The time is over for burying our heads in the sand because we cannot immediately see the damaging impact of work-related carcinogens and other risks. We strongly recommend that appropriate moves are made towards setting up an Aotearoa Occupational Health Service,

with a focus on improving access to screening and healthcare for those at high risk of exposure.

What's new in this briefing?

- The New Zealand Carcinogens Survey is the first survey examining the prevalence of occupational carcinogens in the working population
- The findings suggest that 58% of workers in this sample are exposed to at least one cancer-causing agent at work at any level and almost one in four are exposed to five or more carcinogens at any level
- The most common carcinogens across all industries are benzene, solar UV, ocular UV, diesel engine exhaust, environmental tobacco smoke, styrene, crystalline silica, shiftwork, and wood dust
- The industries with the highest prevalence of exposure to at least one carcinogen are 'Mining', 'Electricity, Gas, Water and Waste Services', 'Construction', 'Transport, Postal and Warehousing', and 'Agriculture, Forestry and Fishing'
- The survey reports that Māori and Pacific workers and men are the most likely to be exposed to at least one carcinogen at any level.

Implications for public health

- The NZCS is an important step to improve the collection of data on harmful work-related exposures, which are sorely lacking in Aotearoa.
- It is vitally important that the information is used for *action*. The findings suggest that preventive efforts to reduce exposure should start with the most common carcinogens and the identified high-risk industries and occupations
- It is increasingly clear that high-exposure work is more commonly done by Māori. Kia manawaroa (a call to action) is key to improving prevention and protection starting now and, as an immediate step, we suggest that Te Aka Whai Ora (Māori Health Authority) are brought into the conversation about Māori-led solutions to reducing risk.
- Inequities in access to health services and outcomes are further magnified by the lack of a dedicated public agency or service for occupational health and we strongly recommend that appropriate moves are made towards setting up an Aotearoa Occupational Health Service

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Appendix: Further survey details

The NZCS was carried out in collaboration with the OccIDEAS team and Research NZ: 4,051 workers aged ≥18 years took part in two surveys using the same questionnaire. For the “Main” survey, 3,089 participants were selected from responses to the occupational free-text field on the General and Māori Electoral Rolls, sampled based on a list of potentially exposed occupations. For the “control” survey, 962 participants were selected from a private research company panel: a stratified random sample of workers across all occupations, without reference to potential for exposure to carcinogens. The report presents prevalence results from the two surveys combined with the aim of reporting exposure levels across the entire workforce.

The study sample comprised 75.2% NZ European, 10.8% Māori, 4.2% Pasifika, 9.7% Asian, and 7.2% Other. The data were weighted so that the overall sample was representative of the population based on age, gender, risk group of occupation, and industry, according to Statistics New Zealand population counts from the 2018 Census.[2]

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