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ehinz
Environmental Health Intelligence New Zealand
Rapu Mātauranga Hauora mo te Taiao – Aotearoa

Hazardous substances domain

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Unintentional hazardous substances-related hospitalisations

This report presents information on hospital discharge events from unintentional hazardous substances-related injuries in Aotearoa New Zealand. This factsheet uses data from the National Minimum Dataset (NMDS) from 2001–2022.

Headline

Children aged 0–4 years continue to experience three times the hazardous substances-related hospitalisation rate of the next most affected age group.

Key facts

Cleaning products are the most common hazardous substances causing hospitalisation in the 0–4 year age group (62/180 notifications), but substances differ across ethnic groups.

Males in all 10-year age groups from 15–64 experience at least double the hospitalisation rate of females of the same age.

Petrol, diesel and accelerants (114 notifications) and cleaning products (108 notifications) were the most common substances causing hospitalisation in the 15–64 year age group.

There are many chemicals used at home

Acute health effects:

headache

nausea and vomiting

skin corrosion

These can lead to long-term injuries

Chronic health effects:

asthma

dermatitis

nerve damage

cancer

Source: Ministry of Business, Innovation & Employment 2013

Hazardous substances-related injuries are a public health problem

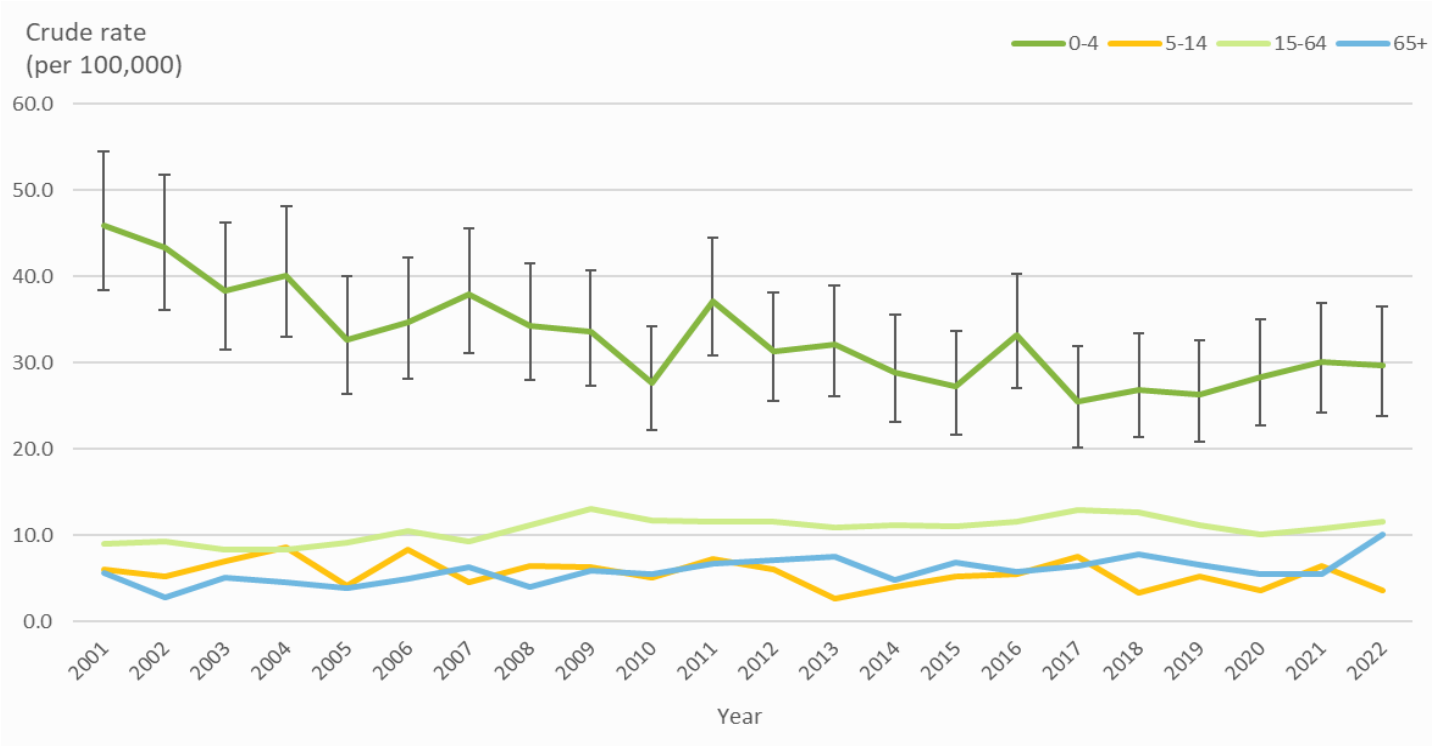
Each year, many people in New Zealand are injured from hazardous substance exposures. Chemical contamination of the environment can harm people's health and the environment. The following external cause codes (e-codes) were analysed from the NMDS:

- **W39:** Fireworks
- **X04:** Exposure to ignition of highly flammable material
- **X08:** Exposure to other specified smoke, fire and flames
- **X46:** Organic solvents and halogenated hydrocarbons and their vapours
- **X47:** Other gases and vapours
- **X48:** Pesticides
- **X49:** Other and unspecified chemicals and noxious substances
- **X58:** Accidental poisoning to other specified factors

Children aged 0–4 years continue to experience the highest hospitalisation rates

From 2001–22, hospitalisation rates for children 0–4 years were consistently 3–4 times greater than other age groups (Figure 1). This was similar across ethnic groups, with rates for Māori, Pacific Peoples and European/Other children, 0–4 years, being high compared to older age groups.

Figure 1: Hazardous substances-related hospitalisation rates, by age, 2001–22



Note: Multiple overlapping confidence intervals for this graph have not been included for display purposes. See the Metadata for more information.

These results go against some research, which suggested that lockdowns reduced the use of emergency care facilities (Duncanson et al 2021). However, there is also some evidence that prolonged time spent in the home may have increased hazardous substance injuries in children (Palmer and Teague 2021, Zaidane et al 2022). Neither of these changes among children were observed in our results.

There were 180 notifications relating to children aged 0–4 years in 2021–22. Notification rates were similar across ethnic groups except for Asian children who had lower rates:

- Māori (37.8 per 100,000, 95% CI: 29.1–28.3)
- Pacific (40.5 per 100,000, 95% CI: 25.7–60.7)
- European/Other (28.5 per 100,000, 95% CI: 22.4–35.8)
- Asian (16.2 per 100,000, 95% CI: 9.8–25.3).

Table 1 outlines the four most common substance groups reported for each ethnic group. Notable differences include:

- **Vape/nicotine products** disproportionately impacted Māori children, who accounted for 11 out of 16 hospitalisations.
- **Household cleaning products** (which includes drain cleaners, laundry powders, dishwashing liquids, bleach etc) were the most common cause of hospitalisation.
- **Agrichemicals** (includes pesticide, insecticide, herbicide etc) hospitalisations were common for Asian children and among European/Other children.

Table 1: Top 4 hazardous substance groups causing child, 0–4 years, hospitalisations, by ethnic group, 2021–22.

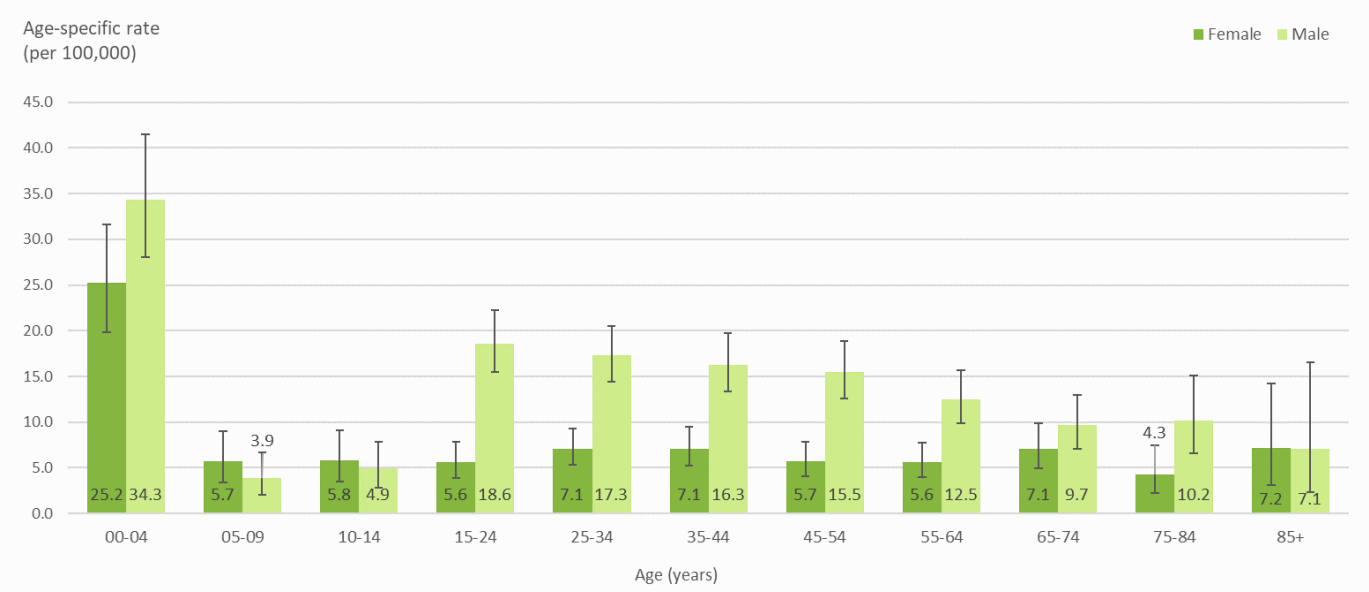
Ranking	Māori	Pacific	Asian	European/Other
1st	Cleaning products (16)	Cleaning products (9)	Agrichemicals (7)	Cleaning products (32)
2nd	Vapes/nicotine (11)	Agrichemicals (3)	Cleaning products (5)	Agrichemicals (18)
3rd	Essential oil/diffusers (7)	Vapes/nicotine (2)	Essential oil/diffusers (1)	Essential oil/diffusers (3)
4th	Agrichemicals (5)	Fireworks (2)	Petrol/diesel (1)	Vapes/nicotine (3)
	Petrol/diesel (5)			
***Total**	**64**	**23**	**19**	**74**

Note: Totals include all notifications in 2021–22 , not just the top four listed here.

Working age male hospitalisation rates are double females in the same age group

Notification rates were similar between males and females in the 0–14 and 65+ year age bands in 2021–22. However, males in every 10-year age band from 15–64 have at least double the notification rates as females in the same age group (Figure 2). This has been consistent over time with male hospitalisations being double that of 15–64 year-old females.

Figure 2: Hazardous substances-related hospitalisation rates, by age and sex, 2021–22



Note: 95% confidence intervals have been presented as error bars. See Metadata for more information.

In the 15–64 year age range, males and females are affected by similar substances (Table 2). Some key points about the most common substances affecting this age group include:

- Petrol/diesel and accelerants result in a high proportion of multi-day stays in hospital while also being the most common substance group causing injury.
- Cleaning products are another common cause of hospitalisations[1].

[1] Cleaning products cannot be broken down by household and industrial products as the information often is not available.

Table 2: Top 5 hazardous substance groups causing adult, 15–64 years, hospitalisations, by sex, 2021–22.

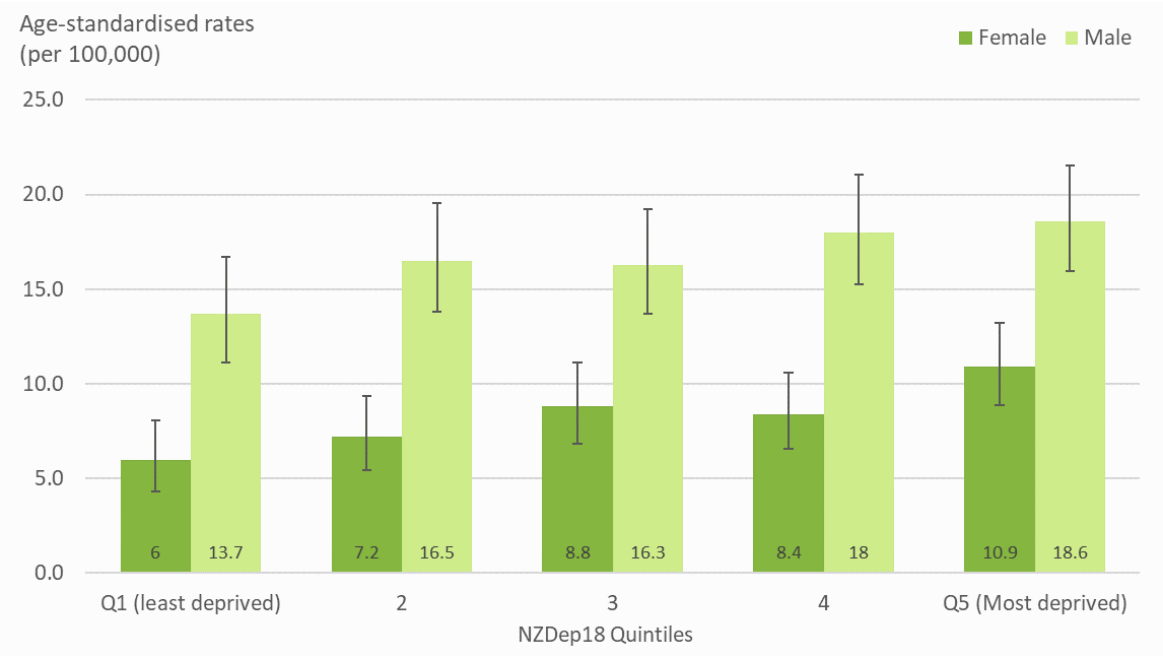
Ranking	Males	Females
1st	Petrol, diesel & accelerants 101 (61)	Cleaning products 44 (11)
2nd	Cleaning products 64 (29)	LPG, CO & other harmful gases 28 (11)
3rd	Concrete, paint & other construction materials 52 (28)	Petrol, diesel & accelerants 13 (7)
4th	LPG, CO & other harmful gases 48 (19)	Agrichemicals 12 (8)
5th	Fireworks & other explosives 43 (25)	Fireworks & other explosives 10 (5)
***Total**	**534**	**208**

Notes: * Totals include all notifications in 2021–22 , not just the top four listed here.
The number in brackets is the number of hospitalisations which resulted in multi-day stays.

Deprivation may affect hospitalisation rates in females

In 2021–22, the hazardous substance hospitalisation rate for females in the most deprived areas, NZDep2018 quintile 5 (10.6 per 100,000), is almost double the rate seen for females in the least deprived areas, NZDep2018 quintile 1 (6.0 per 100,000) (Figure 3). This disparity is less clear for males.

Figure 3: Hazardous substances-related hospitalisation rates, by sex and NZDep2018 quintiles, 2021–22.



Note: 95% confidence intervals have been presented as error bars. See Metadata for more information.

Data for this indicator

This indicator reports unintentional hazardous substances-related hospital discharges using data from 2001 onwards. This indicator is an analysis of the most recent data available from the National Minimum Dataset, provided to EHINZ by the Te Whatu Ora in September 2023. Data has been pooled to give sufficient numbers for analysis where appropriate.
For more information on the list of ICD-10 that are covered in this analysis, see metadata below.

REFERENCES

Duncanson M, Wheeler J, Jelleyman T, et al. 2021. Delayed access to care and late presentations in children during the COVID-19 pandemic New Zealand-wide lockdown: A New Zealand Paediatric Surveillance Unit study. *J Paediatr Child Health, 57: 1600-1604*. DOI: https://doi.org/10.1111/jpc.15551

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Zaidane I, Mekaoui N, Dakhama BS, et al. 2022. Impact of lockdown of Covid-19 pandemic on home injuries of children. *J. Emerg. Med. Trauma Acute Care, 2022(2).* DOI: https://doi.org/10.5339/jemtac.2022.9

Other related topics include:

Non-occupational lead absorption notifications

Occupational lead absorption notifications

Hazardous substances-related deaths reported to the coroner in New Zealand

Hazardous substances notifications

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Citation

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Further information

For descriptive information about the data Metadata Sheet

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