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

Related indicators

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# Unintentional hazardous substances-related hospitalisations

This factsheet 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 to 2021.

Petrol and diesel were the most common hazardous substances, causing the majority of hospitalisation relating to flammable materials, smoke and flames, and organic solvents/hydrocarbons, in 2020–2021

Household cleaning products and bleach were the most common substances implicated within X49, other and unspecified chemicals and noxious substances, in 2020–2021.

Children aged 0–4 years continue to have roughly three times the hospitalisation rate of the rest of the population.

Males have consistently had 2–3 times the hospitalisation rate of females, since 2001.

Fireworks resulted in 38 hospitalisations in 2020-2021.

District

West Coast, Whanganui and Taranaki districts had high hospitalisation rates compared to the national rate in 2019–2021.

## There are many chemicals used at home

Acute health effects:

*headache*

*nausea and vomiting*

*skin corrosion*

*burns*

## 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 exposure to hazardous substances. 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

For more information on this topic visit the EHINZ website or see the metadata on this factsheet.

## Petrol and diesel injuries are common and often result in multi-day hospital stays

From 2020–2021, eight different e-codes, involving 1088 hospitalisation events are reported here. The most common hazardous substances involved for each e-code are presented in Figure 1 below[1]. Cases have also been grouped as day cases, suggesting the injury may have been less severe and may have only required observation or minor treatment, and multi-day cases (individuals in hospital for extended periods)[2].

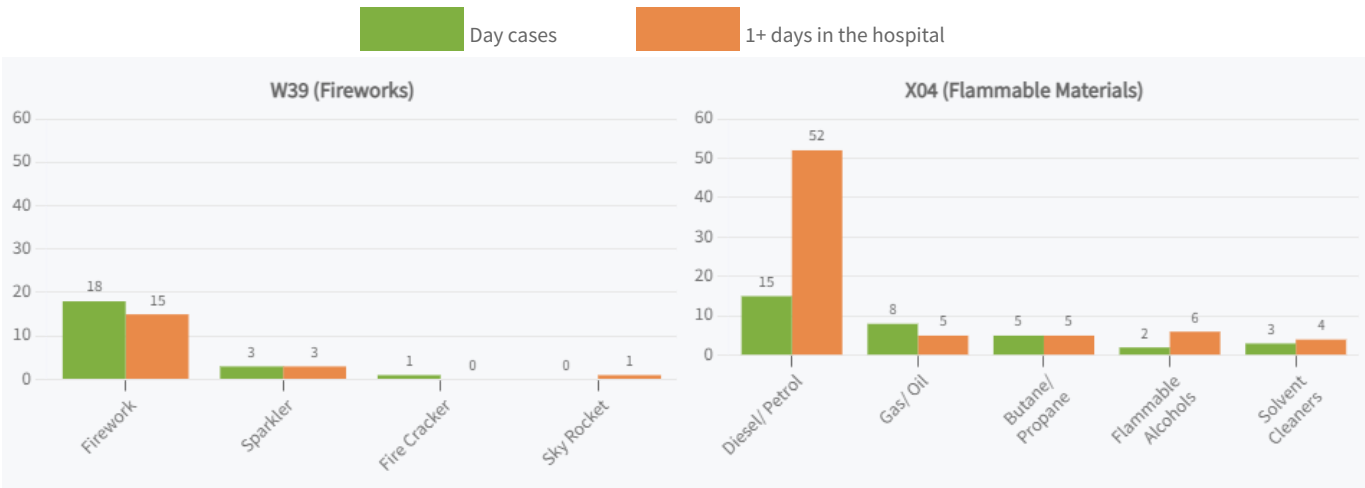
There are several notable findings (Figure 1):

1. Petrol and diesel are the most common hazardous substances causing injury for e-codes X04, X08 and X46 with 111 hospitalisations recorded. Two-thirds of these injuries resulted in multi-day stays in hospital.

2. E-code X49 made up roughly half of all cases in 2020–2021. Within this category, hospitalisations were most commonly caused by cleaning agents, including household products (98 injuries), bleach (49 injuries), laundry and dishwashing chemicals (23 injuries), and unspecified alkali cleaning agents (23 injuries).

3. Fireworks and carbon monoxide gas both resulted in a large number of hospitalisations, 38[3] and 37, respectively.

Figure 1 Hazardous substances causing hospitalisations, by e-code and length of stay, 2020–2021




**Note 1:** E-code X58 has not been presented due to low counts and a lack of common substances within the category.

**Note 2:** There are other factors which can influence length of stay aside from severity of the injury including pre-existing conditions and social circumstances.

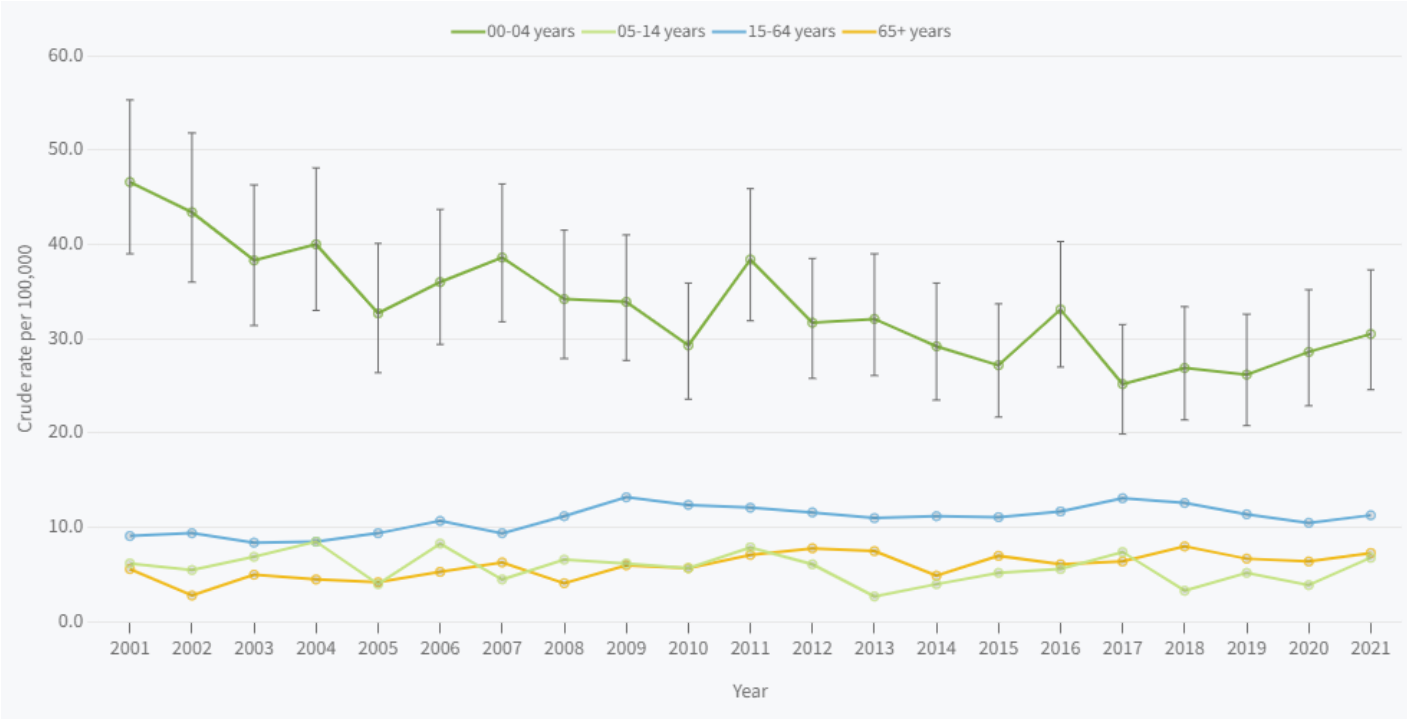
**Note 3:** Fireworks cases were recorded using both the W39 and X08 e-codes.

**Source:** National Minimum Dataset, Ministry of Health 2022

## Children, 0–4 years, consistently have disproportionately high hospitalisation rates

From 2001–2021, children, 0–4 years, have consistently been over-represented in hazardous substance hospitalisations (Figure 2). This difference has declined since 2001, however, children have experienced hospitalisation rates roughly triple that of the rest of the population over the past decade.

Figure 2 Hazardous substances-related hospitalisation rates, by age, 2001–2021



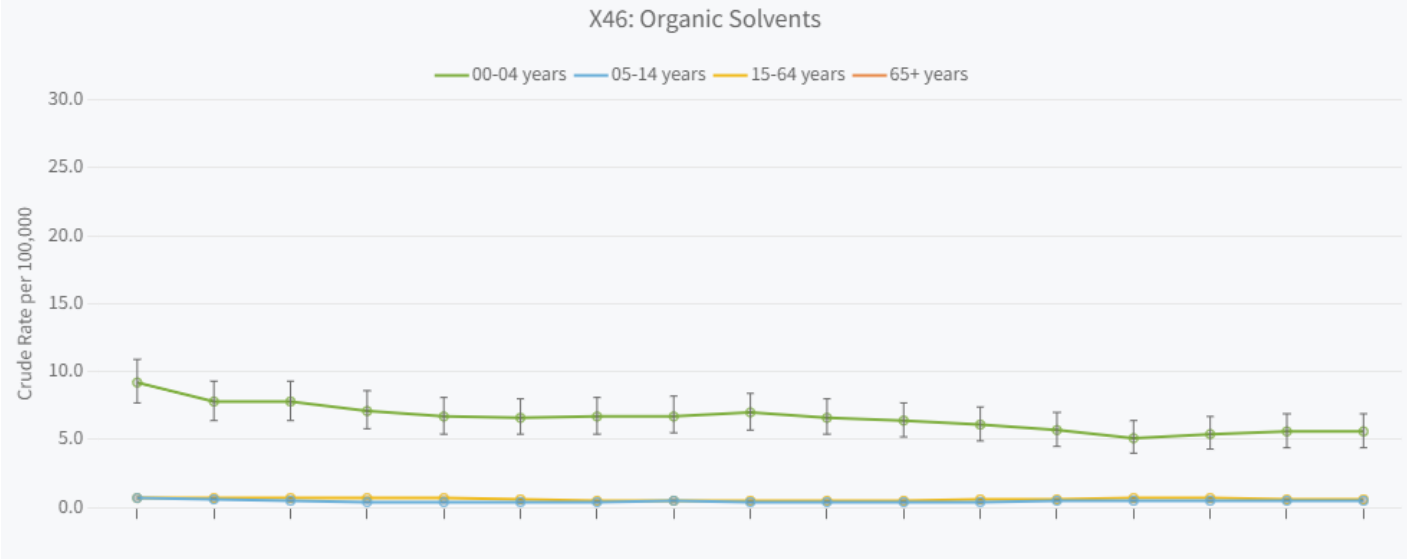

**Note 1:** 95% confidence intervals have been presented as error bars.

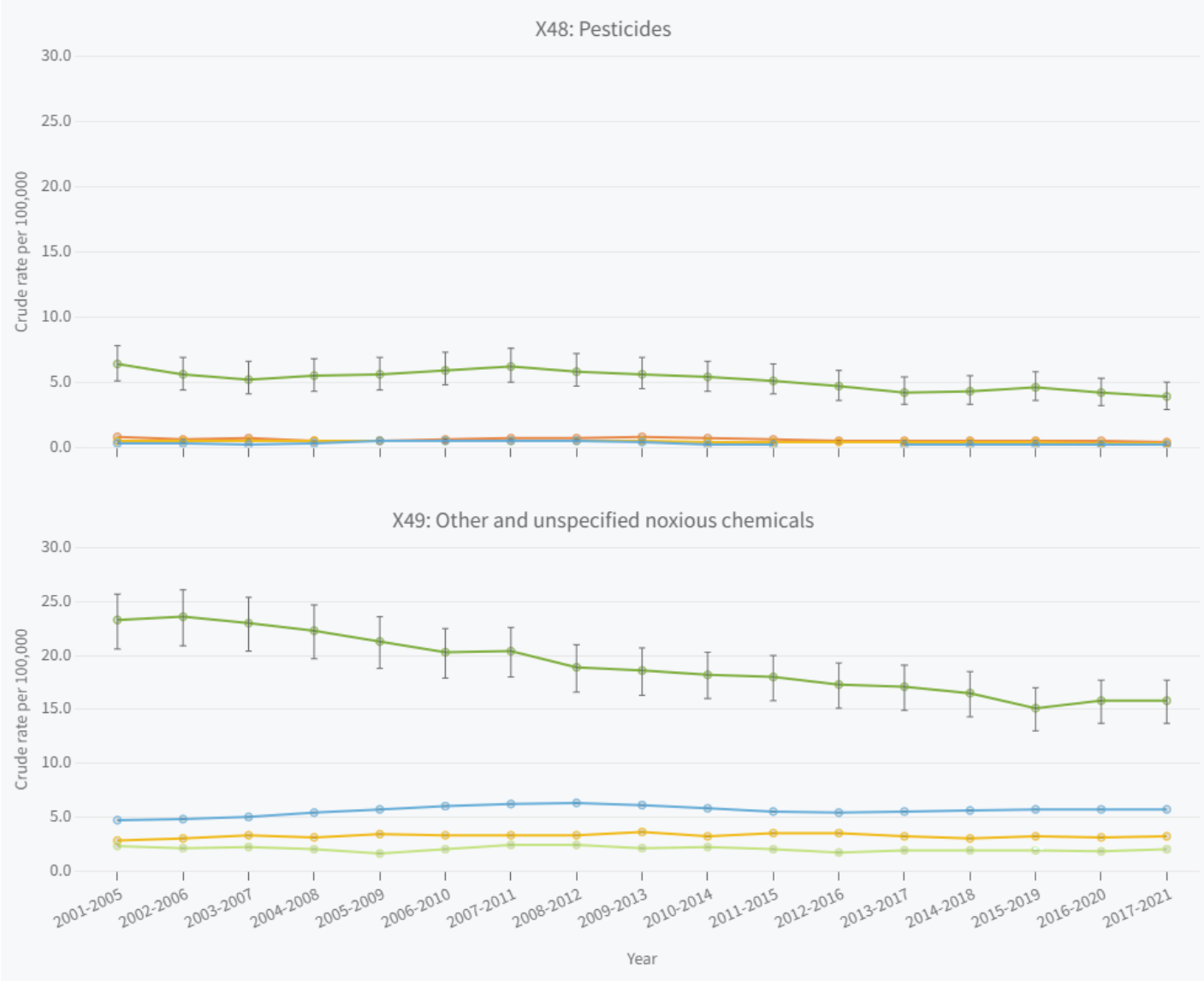
**Note 2:** Multiple overlapping confidence intervals for this graph have not been included for display purposes. See Metadata for more information on how to interpret this graph.

**Source:** National Minimum Dataset, Ministry of Health 2022

The decline in children's hospitalisation rates has been recorded in all three e-codes where children are most affected, X46, X48 and X49 (Figure 3). As with Figure 1 above, these e-codes relate predominantly to products which could be found in the home including various cleaning agents, pesticides and other common household chemicals. These are common health risks to young children within the home (BPAC 2014).

Figure 3 Hazardous substances-related hospitalisation rates, by e-code and age, 2001–2021






**Note 1:** 95% confidence intervals have been presented as error bars.

**Note 2:** Multiple overlapping confidence intervals for this graph have not been included for display purposes. See Metadata for more information on how to interpret this graph.

**Source:** National Minimum Dataset, Ministry of Health 2022

## Hospitalisation rates are commonly two to three times greater for males

From 2001–2021, hazardous substance hospitalisation rates have been relatively stable for both males (14.5–18.9 per 100,000) and females (5.6–9.8 per 100,000). As seen in Figure 4, hospitalisation rates for males are roughly 2–3 times the rates for females in the same year.

Figure 4 Hazardous substances-related hospitalisation rates, by sex, 2001–2021


**Note:** 95% confidence intervals have been presented as error bars. See Metadata for more information on how to interpret this graph.

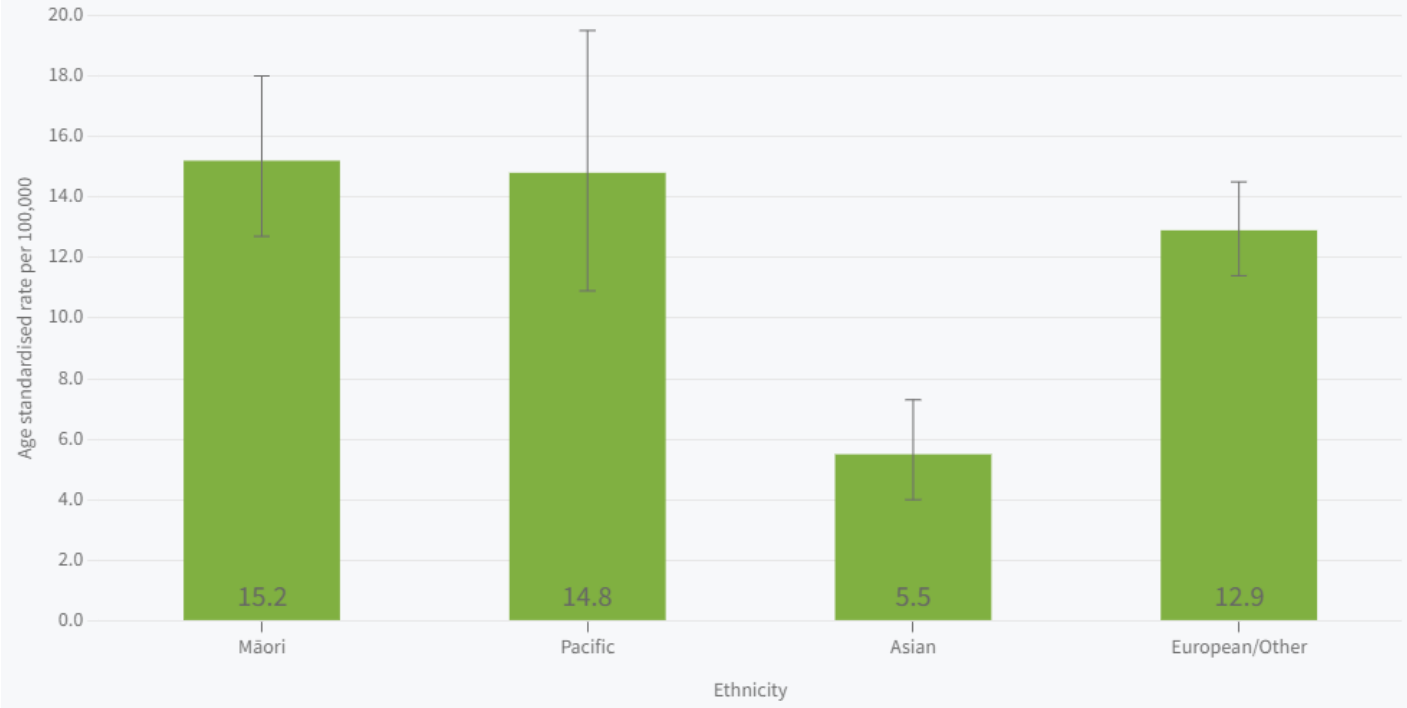
**Source:** National Minimum Dataset, Ministry of Health 2022

Figures 2 and 4 also suggest that COVID-19 restrictions and lockdowns have not significantly affected hazardous substance hospitalisation rates in the general population or for any specific age group. This is surprising with research suggesting that lockdowns reduced 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).

## Asians consistently have half the hospitalisation rate of all other ethnic groups

In 2021, hazardous substance hospitalisation rates for Asians (6.3 per 100,000) were roughly half that of all other ethnic groups (Figure 5). This has been a consistent trend since 2001 with rates for Māori, Pacific Peoples and European/Other all fluctuating between 10.2–17.2 per 100,000 over this time period.

Figure 5 Hazardous substances-related hospitalisation rates, by ethnicity, 2021



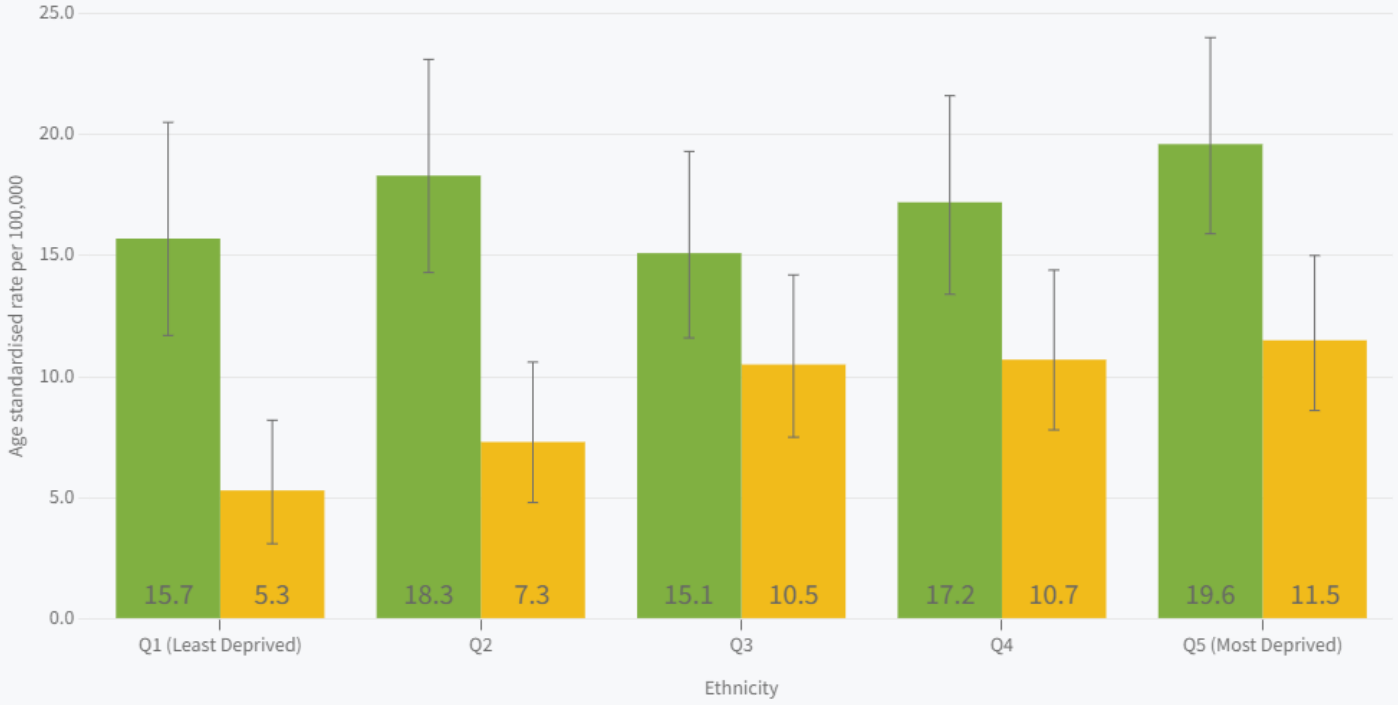

**Note:** 95% confidence intervals have been presented as error bars. See Metadata for more information on how to interpret this graph.

**Source:** National Minimum Dataset, Ministry of Health 2022

## Deprivation considerably affects hospitalisation rates for females

In 2021, hazardous substance hospitalisation rates for females in the most deprived areas, NZDep2018 quintile 5 (11.5 per 100,000), were more than double the rates seen for females in the least deprived areas, NZDep2018 quintile 1 (5.3 per 100,000) (Figure 6). There is no clear disparity seen for males.

Figure 6 Hazardous substances-related hospitalisation rates, by sex and NZDep2018 quintiles, 2021.



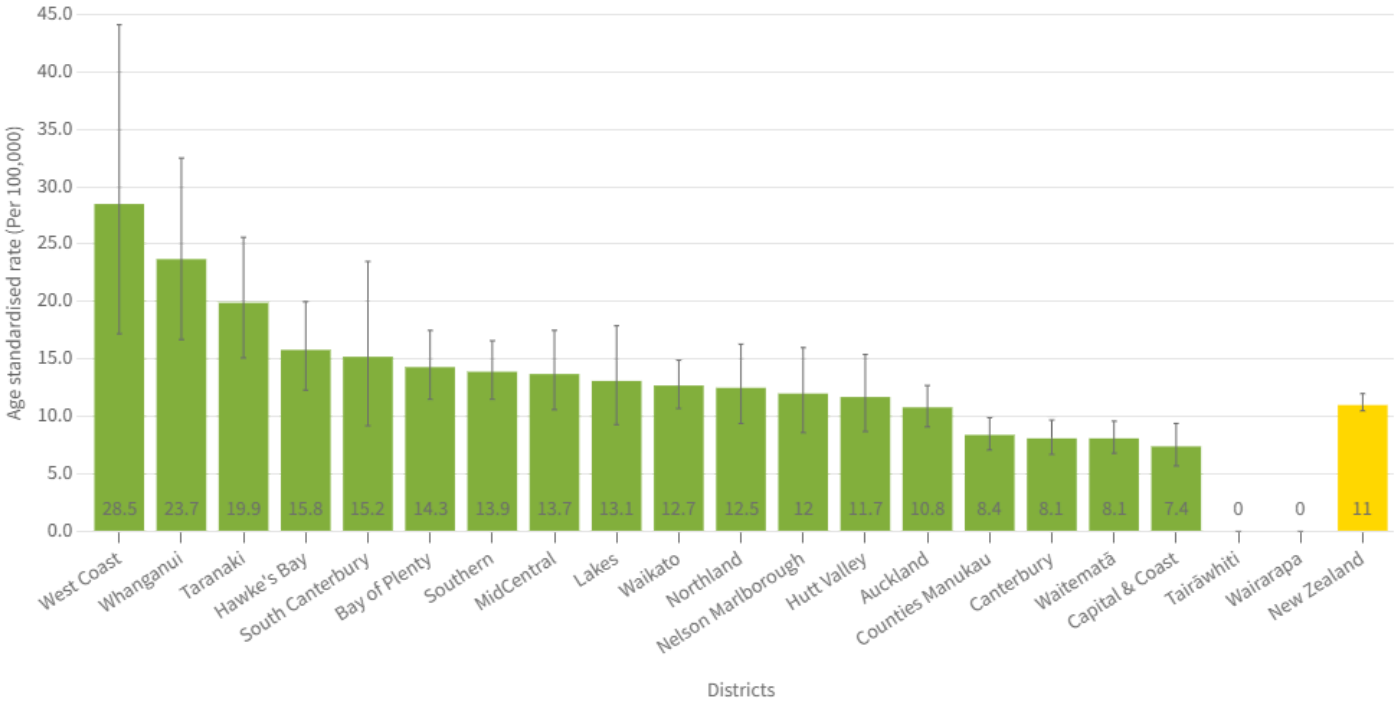

**Note:** 95% confidence intervals have been presented as error bars. See Metadata for more information on how to interpret this graph.

**Source:** National Minimum Dataset, Ministry of Health 2022

## West Coast, Whanganui and Taranaki districts hospitalisation rates are high

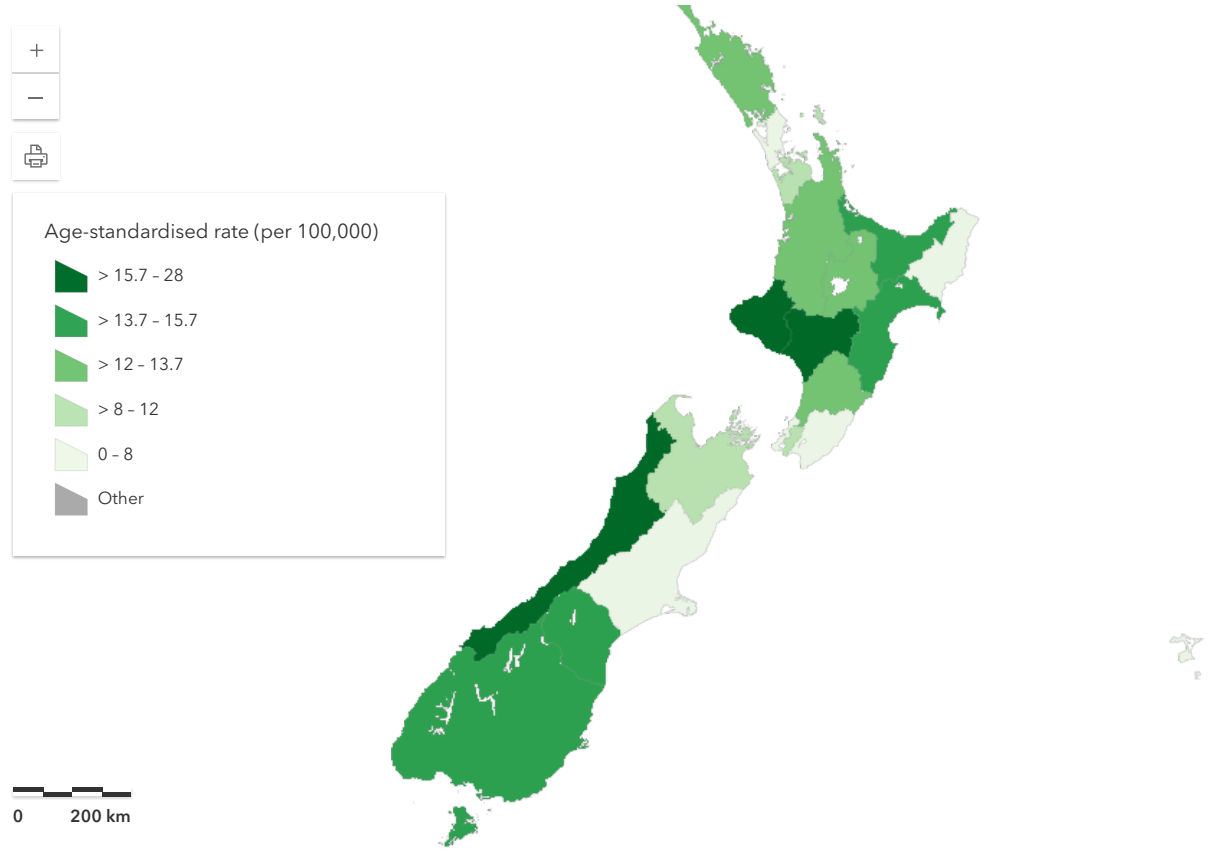
In 2019–2021, hazardous substance hospitalisation rates in West Coast, Whanganui and Taranaki district health boards (now known as districts), were roughly double the national rate (Figure 7).

Figure 7 Hazardous substances-related hospitalisation rates, by district, 2019–2021




**Note 1:** Missing rates have been suppressed due to being unreliable estimates based on small numbers.
**Note 2:** 95% confidence intervals have been presented as error bars. See Metadata for more information on how to interpret this graph.

**Source:** National Minimum Dataset, Ministry of Health, 2022

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Interactive regional dashboard

## 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 Ministry of Health in July 2022. 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 link below.

### 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-related deaths registered in New Zealand

Unintentional hazardous substances-related hospitalisations

Unintentional hazardous substances exposures in children (0–14 years)

## References

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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

**Previous factsheet(s):**
2021 2020 2019

**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-related deaths registered in New Zealand

Hazardous substances notifications

Unintentional hazardous substances exposures in children (0–14 years)



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**Further information**
For descriptive information about the data Metadata Sheet

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