

Unintentional hazardous substances-related hospitalisations

This factsheet presents information on hospital discharge events from unintentional hazardous substances-related injuries in New Zealand. This factsheet uses data from the National Minimum Dataset from 2001 to 2020.

Key facts



In 2020, there were 419 unintentional hazardous substances-related hospitalisations. The rate has fallen since 2001, and this was driven primarily by decreasing rates among males.



Children under five years have had the highest hospitalisation rate every year since 2001.



Children under five years have the highest hospitalisation rates for 'Other and unspecified chemicals and noxious substances', 'Organic solvents and halogenated hydrocarbons and their vapours' and 'Pesticides'.



The hospitalisation rates for 'Exposure to ignition of highly flammable material' in the 15–24 year age group has dropped by 72.5% between 2001–05 and 2016–20.



The top three substances/substance categories resulting in hospitalisation in 2020 were chemical and noxious substances, petrol, corrosive substances and other gases.



Māori had a higher hospitalisation rate than non-Māori in 2020.



People living in the most deprived areas (NZDep 2018 quintile 5) have a higher hospitalisation rate than those in the least deprived areas in 2020.



The West Coast District Health Board had the highest hazardous substances-related hospitalisation rate in the last ten years.

Injuries due to hazardous substances-related exposure is an important public health problem

Each year, many people in New Zealand are injured from exposures to hazardous substances¹, which are often preventable (World Health Organisation 2004). Chemical contamination of the environment can harm people's health and the environment. For example, misusing pesticides and aerial spraying with insecticides

¹ Refer to metadata for the definition of hazardous substances.

can damage the ecosystem. Hazardous substances can be widely and unsafely used, such as petrol being inappropriately stored in unlabelled drinking water bottles. Industrial workers may poorly handle large volumes of chemicals, which can be extremely dangerous. A growing number of chemicals are used around the home. If they are not used or stored properly, this could lead to hazardous substances-related injuries.

Acute health effects from exposure to a hazardous substance are diverse and include headache, nausea and vomiting, skin corrosion and burns. Chronic health effects include asthma, dermatitis, nerve damage, and cancer (MBIE 2013).

This factsheet reports on unintentional hazardous substances hospital discharge events in New Zealand from 2001 to 2020. It includes substances covered by the Hazardous Substances and New Organisms Act 1996 and the Health Act's "poisoning arising from chemical contamination of the environment".

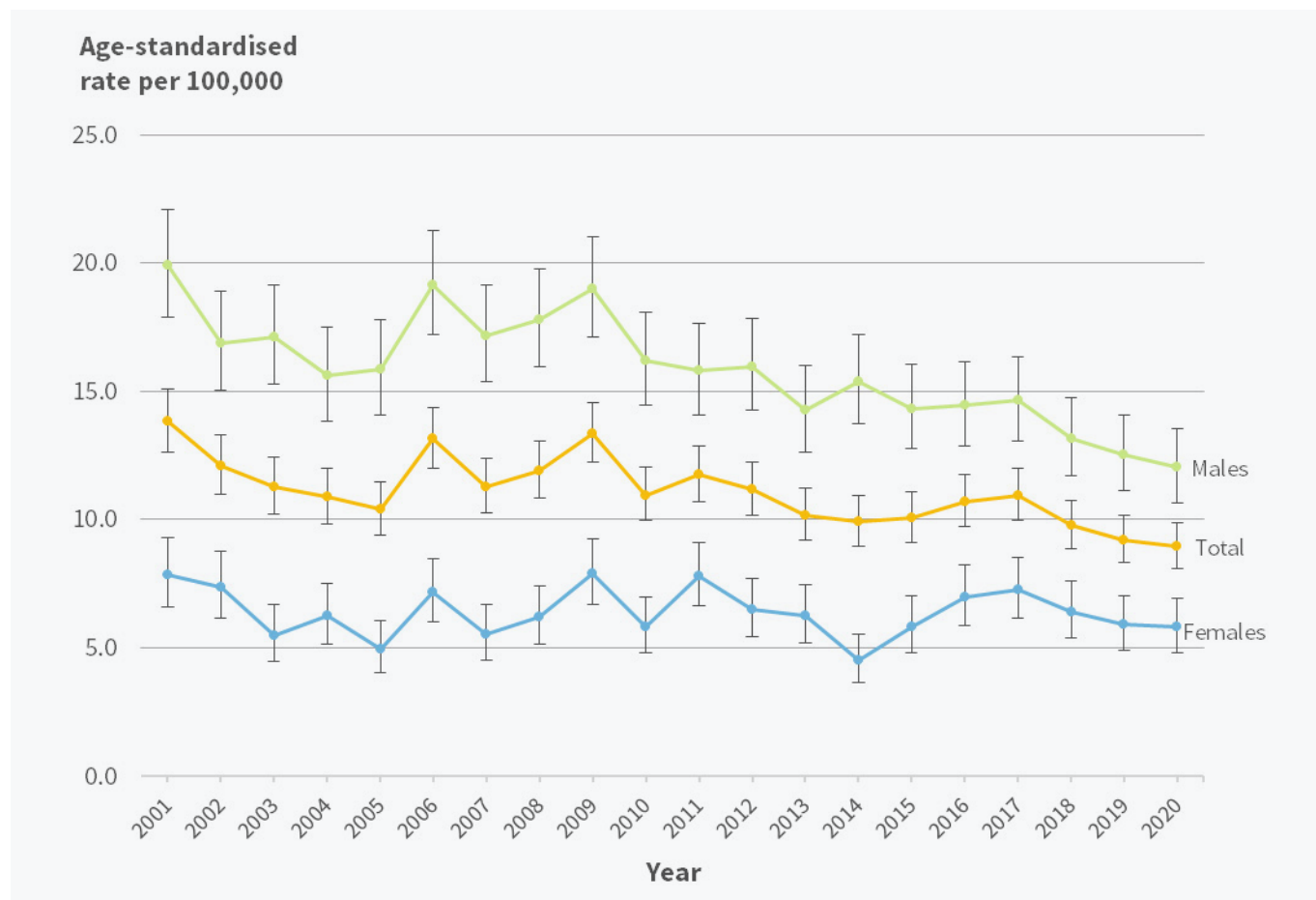
For more information, see [metadata](#) for ICD-10 codes that are covered in this analysis.

Unintentional hazardous substances-related hospitalisation rates have decreased since 2001

In 2020, there were 419 hospitalisations for unintentional hazardous substances-related injuries out of a total of 678 hazardous substances-related hospitalisations.

The age-standardised rate for unintentional hazardous substances-related injuries decreased significantly from 13.8 per 100,000 (503 hospitalisations) in 2001 to 8.9 per 100,000 (419 hospitalisations) in 2020. This drop was primarily driven by a decrease in the rate for males. The rate for males was at least twice the rate for females since 2001. The male hospitalisation rate has dropped by 39.7% between 2001 and 2020 (19.8 and 12.0 per 100,000, respectively). The rate for females decreased from 2001 to 2014 but increased somewhat in 2017, and remained relatively stable after that (Figure 1).

Figure 1: Unintentional hazardous substances-related hospitalisations, by sex, 2001–20



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

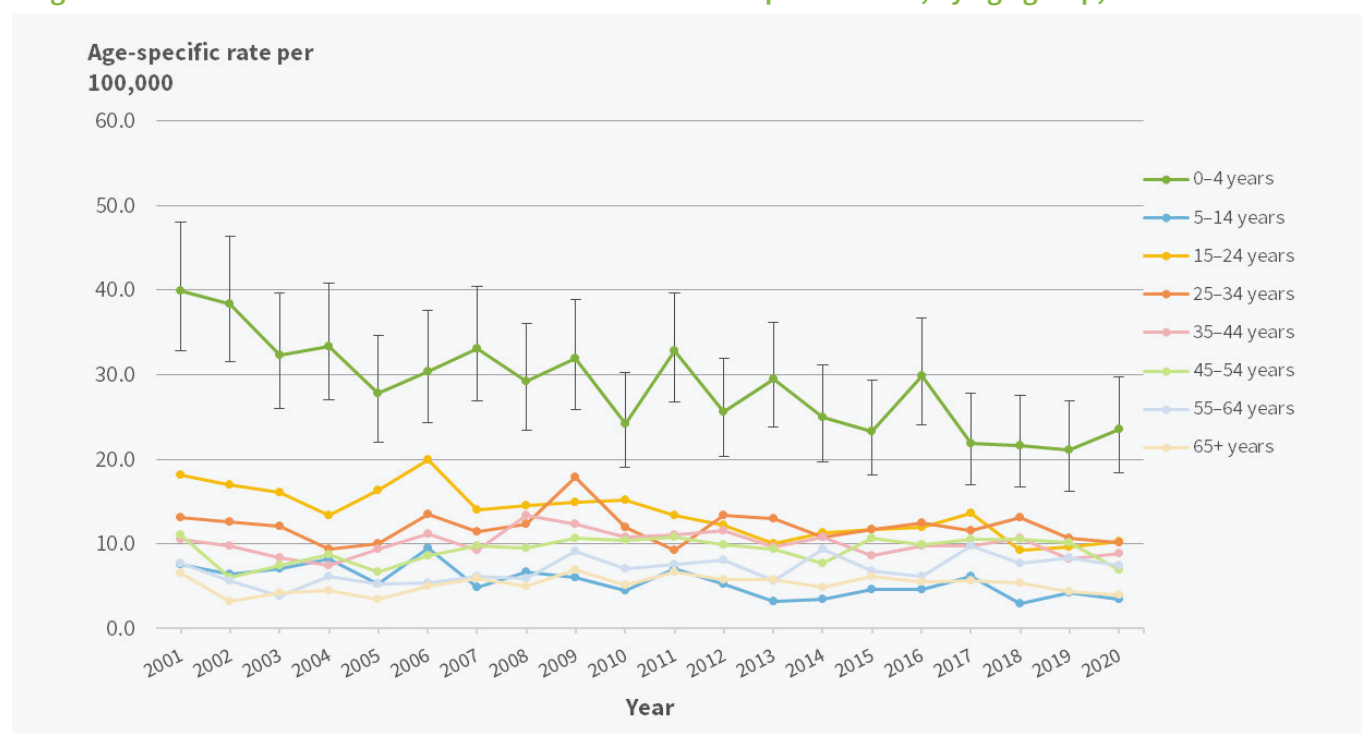
Source: National Minimum Dataset, Ministry of Health 2021.

Children under five years continued to have the highest hospitalisation rates since 2001

In 2020, the hospitalisation rate continued to be the highest for children under five years at 23.6 per 100,000 (72 hospitalisations), despite a statistically significant decreasing trend since 2001 (Figure 2). Several factors likely contribute to the risk of exposure in this age group. These include:

- the appeal to children of the colour, shape, taste, smell or presentation of some chemical products
- a large amount of time spent in the home
- newfound mobility
- an inability to recognise potential danger and
- desire to put things in their mouths (Kamboj et al 2019).

Figure 2: Unintentional hazardous substances-related hospitalisations, by age group, 2001–20



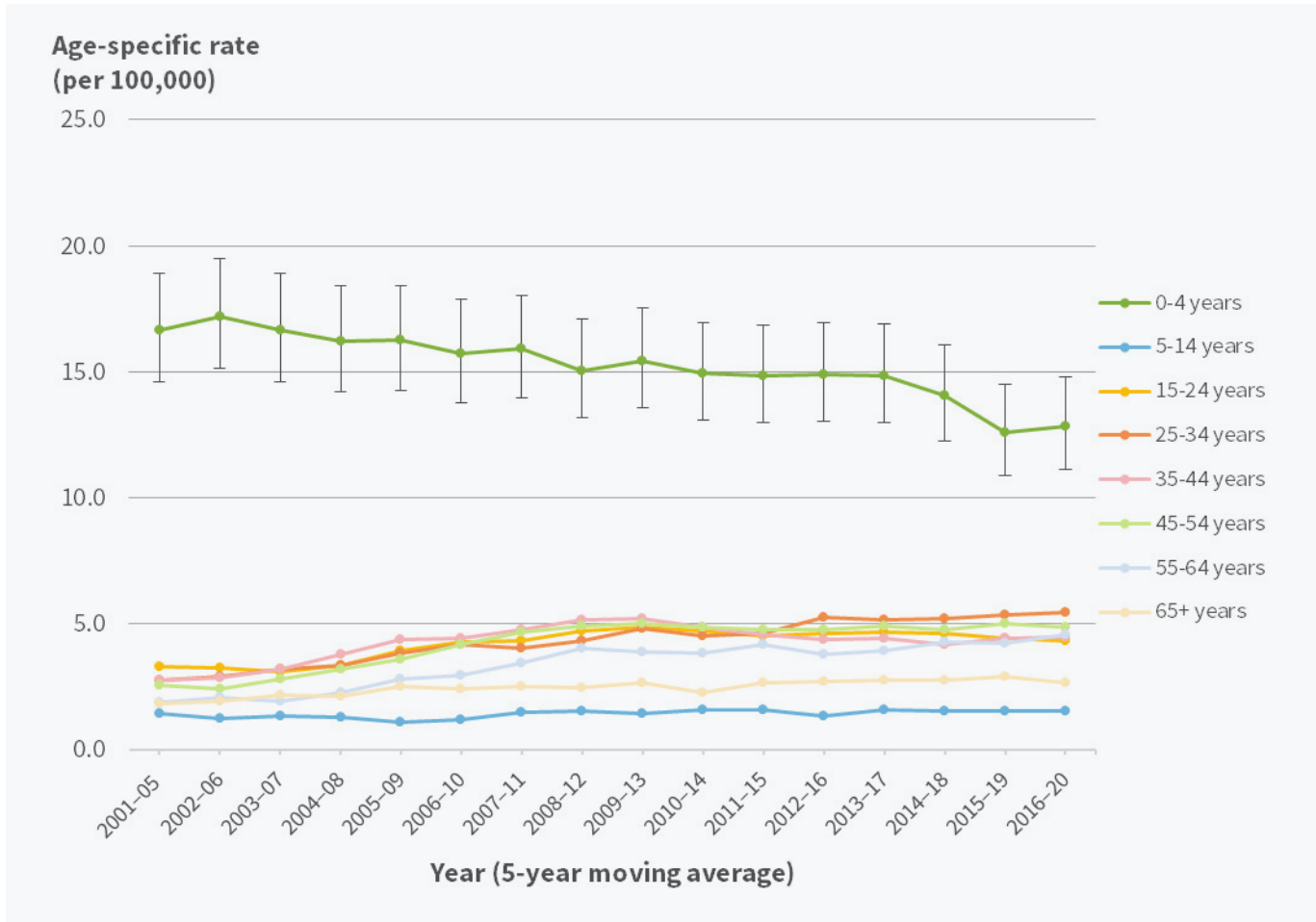
Note: 95% confidence intervals have been presented as error bars. See Metadata for more information on how to interpret this graph.

Source: National Minimum Dataset, Ministry of Health 2021.

Children in the 0–4 year age group have the highest hospitalisation rates for ‘Other and unspecified chemicals and noxious substances’, ‘Organic solvents and halogenated hydrocarbons and their vapours’ and ‘Pesticides’

There were marked differences in the age-specific rates in the hazardous substances-related hospitalisations during the period of 2001–20. Children in the 0–4 year age group have the highest hospitalisation rates caused by ‘Other and unspecified chemicals and noxious substances’ since 2001–05 (Figure 3a). The hospitalisation rates for this age group decreased between 2001–05 and 2016–20.

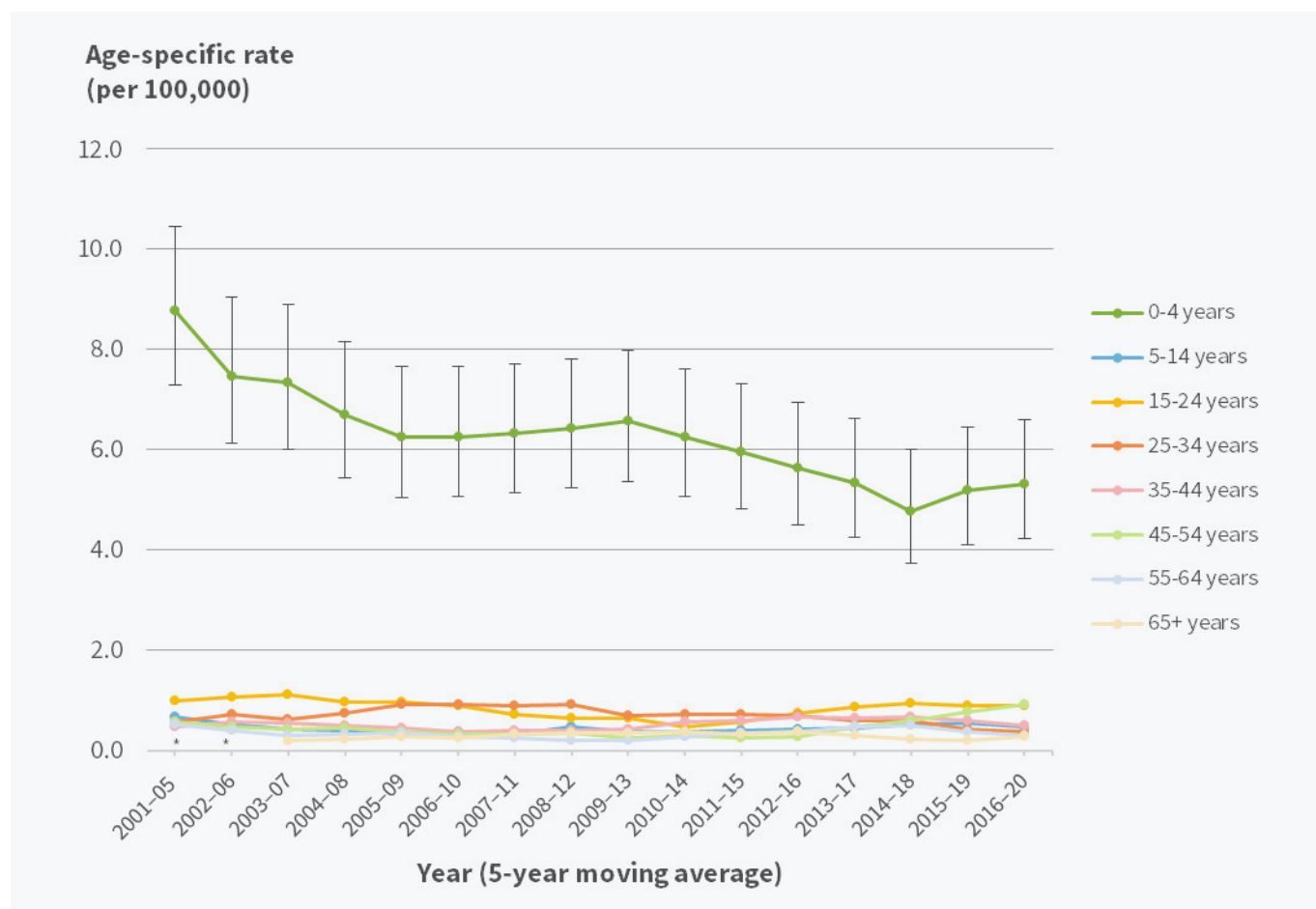
Figure 3a: Unintentional hospitalisation for ‘Other and unspecified chemicals and noxious substances’ (ICD 10=X49), by age group, 2001–20



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 2021.

Children in the 0–4 year age group are disproportionately affected by injuries from ‘Organic solvents and halogenated hydrocarbons and their vapours’. In 2016–20, they had a rate of 5.3 per 100,000 (81 hospitalisations) (Figure 3b). The rate for this age group decreased between 2001–05 and 2016–20, but the rate for other age groups remained stable between these periods.

Figure 3b: Unintentional hospitalisation for ‘Organic solvents and halogenated hydrocarbons and their vapours’ (ICD=X46), by age group, 2001–20



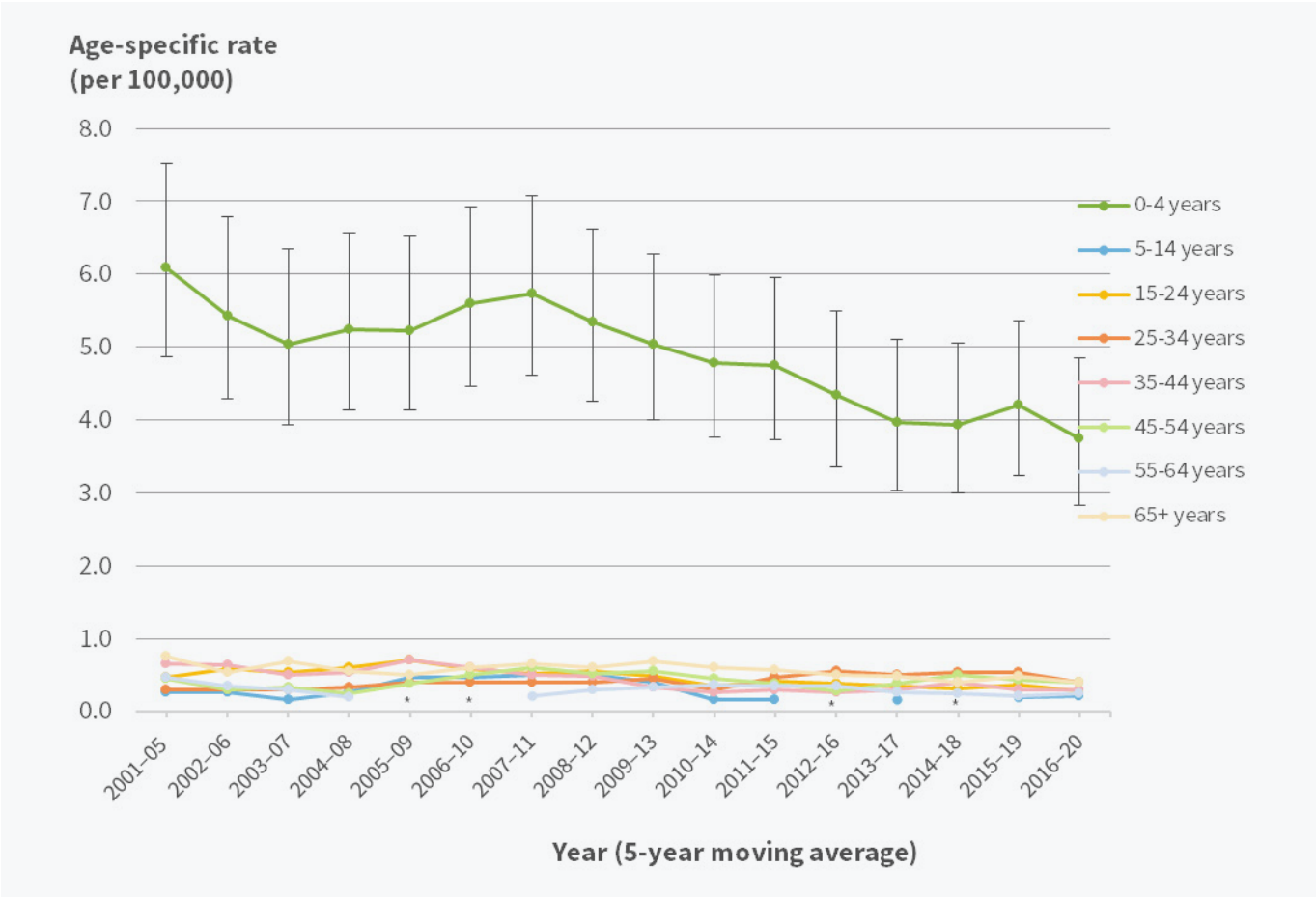
Note 1: *The rate is suppressed due to an unreliable estimate with small numbers. See Metadata for more information on how to interpret this table.

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 2021.

Children in the 0–4 year age group are also more at risk from ‘Pesticides’ injuries, they have the highest hospitalisation rates than other age groups, despite a statistically significant general downward trend since 2001-05 (Figure 3c).

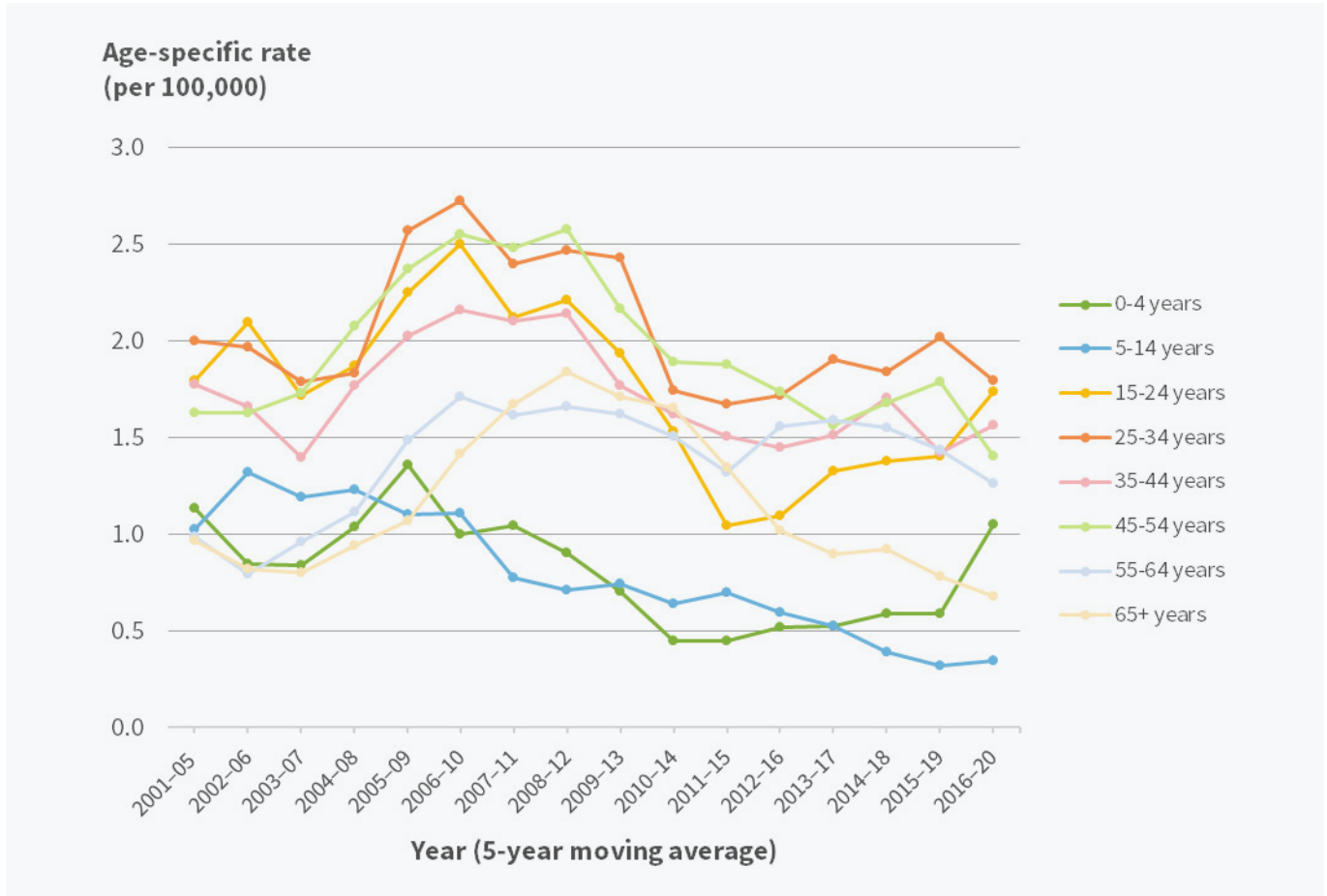
Figure 3c: Unintentional hospitalisation for ‘Pesticides’ (ICD 10=X48), by age group, 2001–20



Note 1: *The rate is suppressed due to an unreliable estimate with small numbers. See Metadata for more information on how to interpret this table.
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 2021.

The hospitalisation rates from exposure to ‘Other gases and vapours’ in the 0–4 year and 15–24 year age groups have decreased from 2001–05 to 2011–15, and had a steady increase after that (Figure 3d). Whereas in the 5–14 year age group, the rate has more than halved between 2001–05 (1.0 per 100,000) and 2016–20 (0.3 per 100,000). The rate for the 65+ year age group was also decreased during this period.

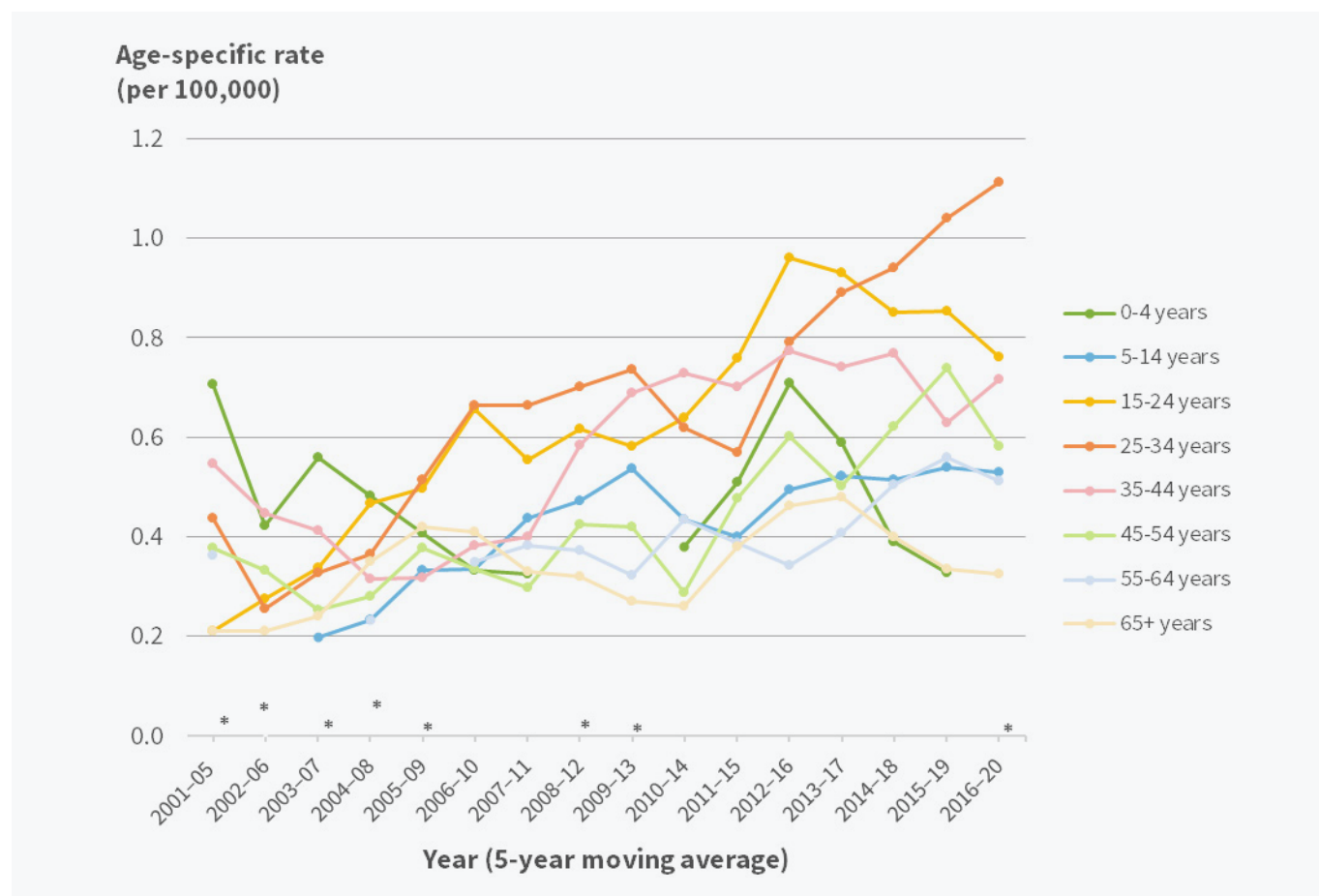
Figure 3d: Unintentional hospitalisation for ‘Other gases and vapours’ (ICD 10=X47), by age group, 2001–20



Source: National Minimum Dataset, Ministry of Health 2021.

For people aged 5–34 years, there was a statistically significant increase in the hospitalisation rate from ‘Exposure to other specified smoke, fire and flames’ between 2001–05 to 2016–20 (Figure 3e). The rate rose substantially in the 25–34 year age group, from 0.4 per 100,000 (12 hospitalisations) in 2001–05 to 1.1 per 100,000 (39 hospitalisations) in 2016–20.

Figure 3e: Unintentional hospitalisation for ‘Exposure to other specified smoke, fire and flames’ (ICD 10=X08), by age group, 2001–20

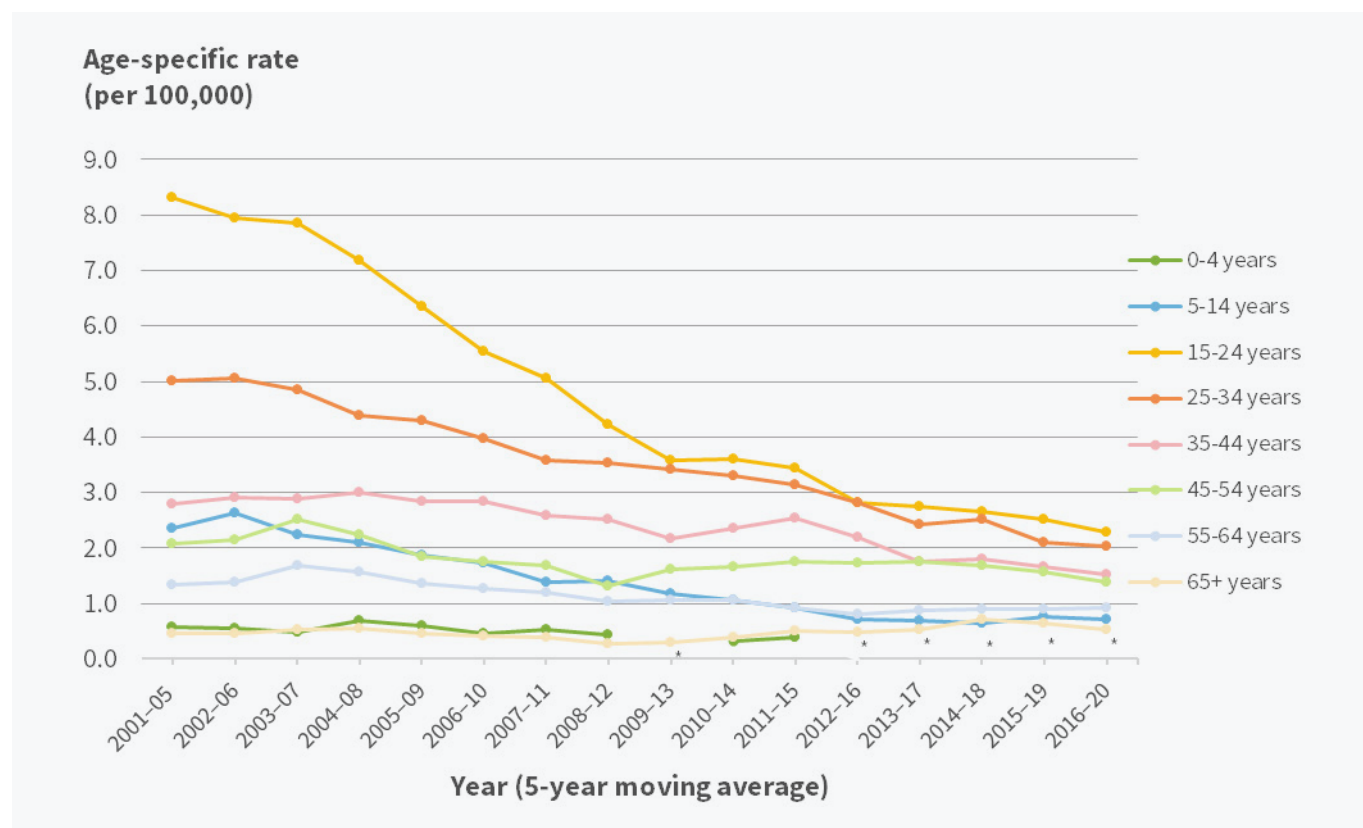


Note 1: *The rate is suppressed due to an unreliable estimate with small numbers. See Metadata for more information on how to interpret this table.
Source: National Minimum Dataset, Ministry of Health 2021.

A substantial drop in the hospitalisation rates for ‘Exposure to ignition of highly flammable material’ in the 15–24 year age group

The hospitalisation rate from ‘Exposure to ignition of highly flammable material’ between the 15–24 year age group and other age groups have narrowed dramatically over the past 20 years. The rate for the 15–24 year age group has statistically significantly dropped by 72.6% between 2001–05 and 2016–20 (8.4 and 2.3 per 100,000, respectively) (Figure 3f). The hospitalisation rate gap between the 25–34 year age group and other age groups also narrowed during this period.

Figure 3f: Unintentional hospitalisation for ‘Exposure to ignition of highly flammable material’ (ICD 10=X04), by age group, 2001–20



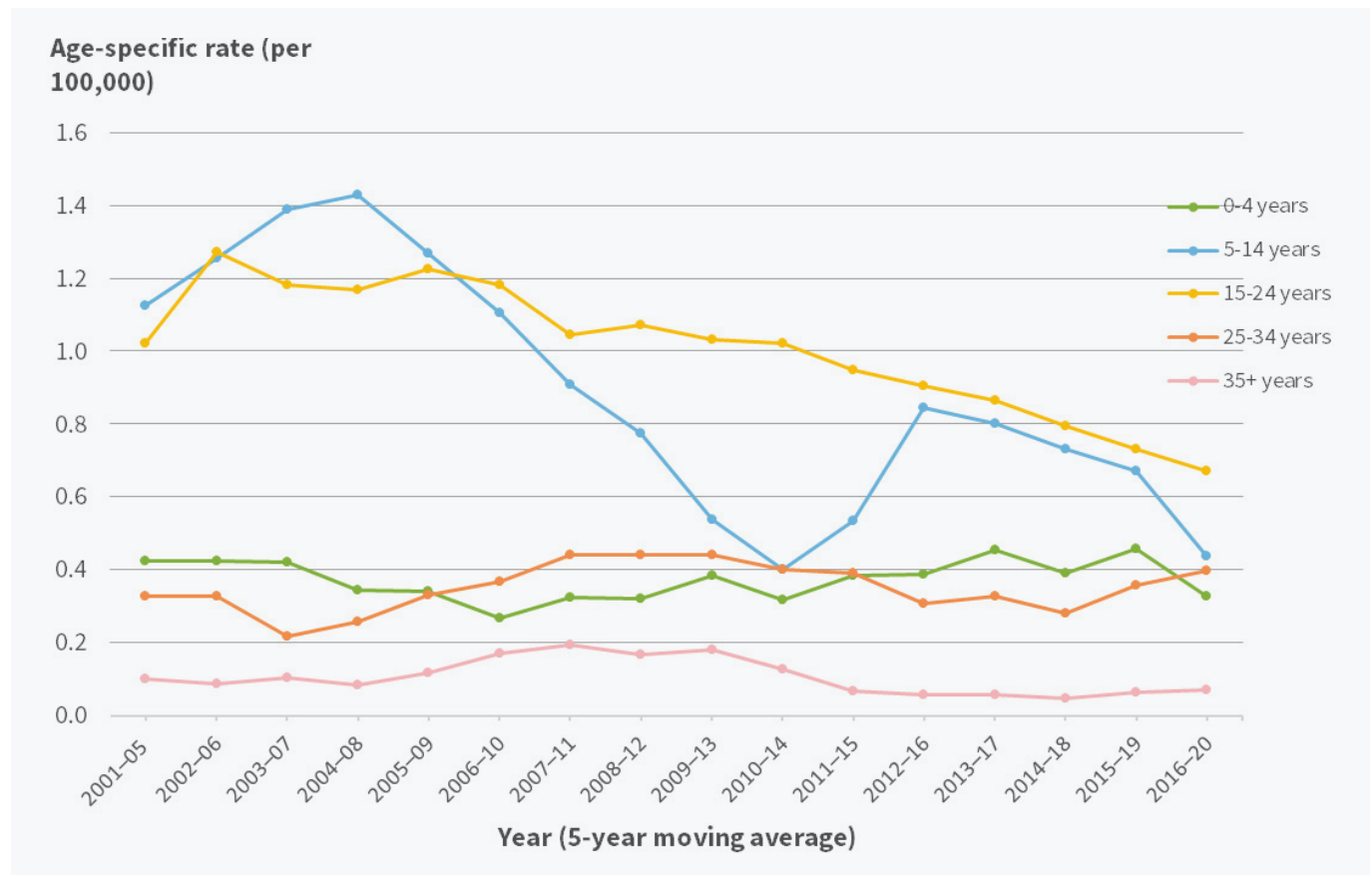
Note 1: *The rate is suppressed due to an unreliable estimate with small numbers. See Metadata for more information on how to interpret this table.

Source: National Minimum Dataset, Ministry of Health 2021.

A substantial drop in the hospitalisation rates for fireworks injuries in the 5–14 year age group.

The hospitalisation rate from fireworks injuries in the 5–14 year age group decreased substantially from 2001–05 to 2010–14, but increased in 2012–16. The rate has steadily fallen since then (Figure 3g). The substantial drop in this age group may be due to raising the minimum age for purchasing fireworks to 18 years in 2007 (NZ Herald 2006). The rate for the 15–24 year age group also followed an overall steady downward trend from 2001–05 to 2016–20.

Figure 3g: Unintentional hospitalisation for ‘Discharge of fireworks’ (ICD 10=W39), by age group, 2001–20



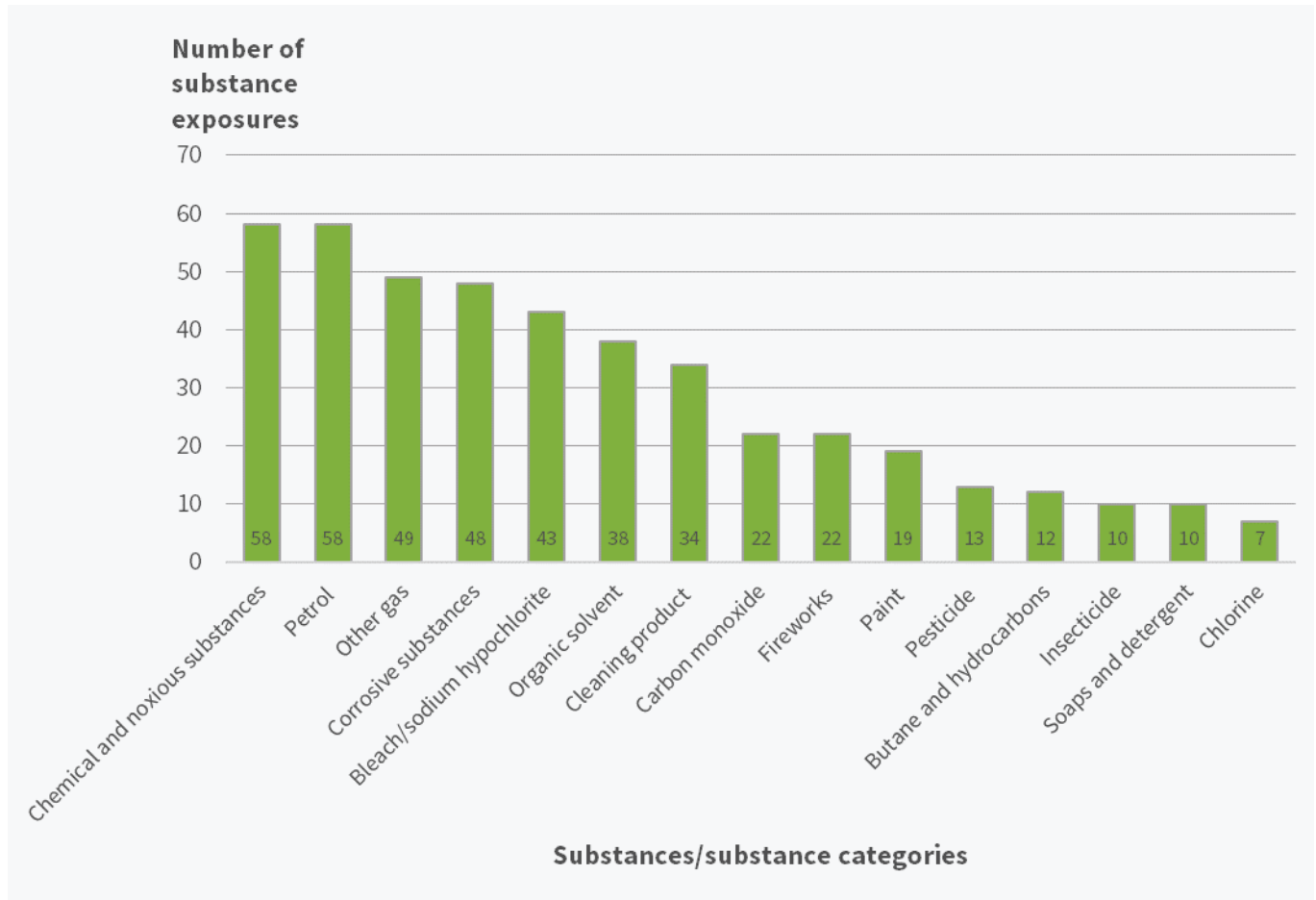
Note: People ages 35+ years were grouped as a single age group category due to small numbers of people hospitalised from firework injuries.

Source: National Minimum Dataset, Ministry of Health 2021.

The top three substances/substance categories resulting hospitalisation in 2020 were chemical and noxious substances, petrol, corrosive substances and other gases

In 2020, the top three substances/substance categories resulting in hospitalisations for unintentional hazardous substances exposures were chemical and noxious substances, petrol, corrosive substances and other gases (Figure 4).

Figure 4: Top 15 substances/substance categories resulting in hospitalisation following unintentional exposures, 2020



Note 1: A person can be exposed to more than one substance. Therefore, the number of exposures can add to more than the total number of hospitalisations.
Note 2: Only top 15 substances/substance categories are listed.
Source: National Minimum Dataset, Ministry of Health 2021.

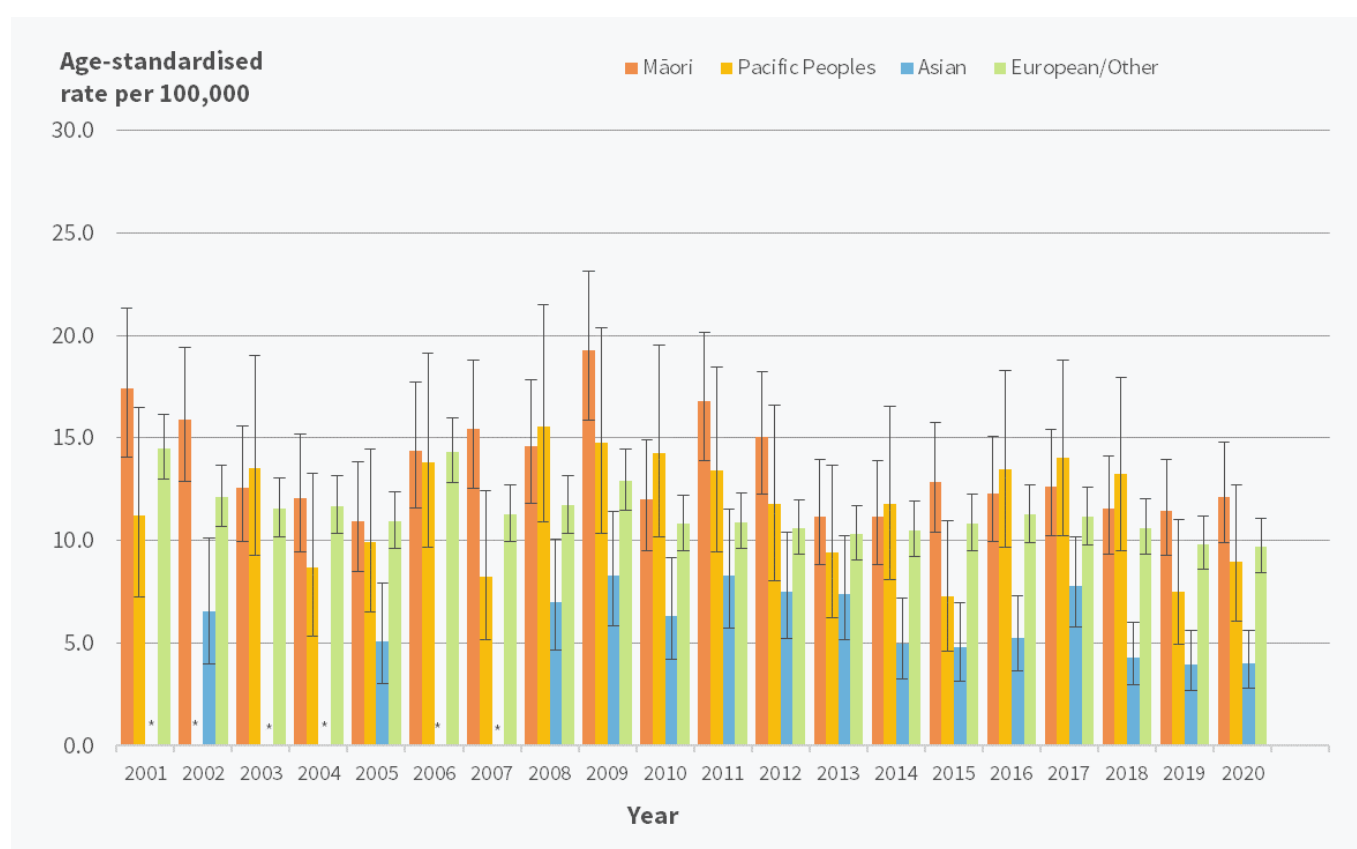
Māori had a higher hospitalisation rate than non-Māori in 2020

In 2020, the hospitalisation rate for hazardous substances-related injuries for Māori was 12.1 per 100,000 (101 hospitalisations), higher than the rate for non-Māori (8.2 per 100,000; 317 hospitalisations).

When the non-Māori data are further sub-divided into 'Pacific', 'Asian' and 'European/Other' ethnic groups, the rate for the European/Other group decreased between 2001 and 2020, but the rate for Māori has not changed during this period (Figure 5).

The rates for Asians were suppressed in 2001, 2003, 2004, 2006 and 2007 due to low numbers (<20) of hospitalisations. Asians had the lowest hospitalisation rate in 2001, 2005 and 2008 onwards.

Figure 5: Hospitalisations related to hazardous substances, by ethnicity, 2001–20 (age-standardised rate per 100,000)



Note 1: *The rate is suppressed due to an unreliable estimate with small numbers. See Metadata for more information on how to interpret this table.

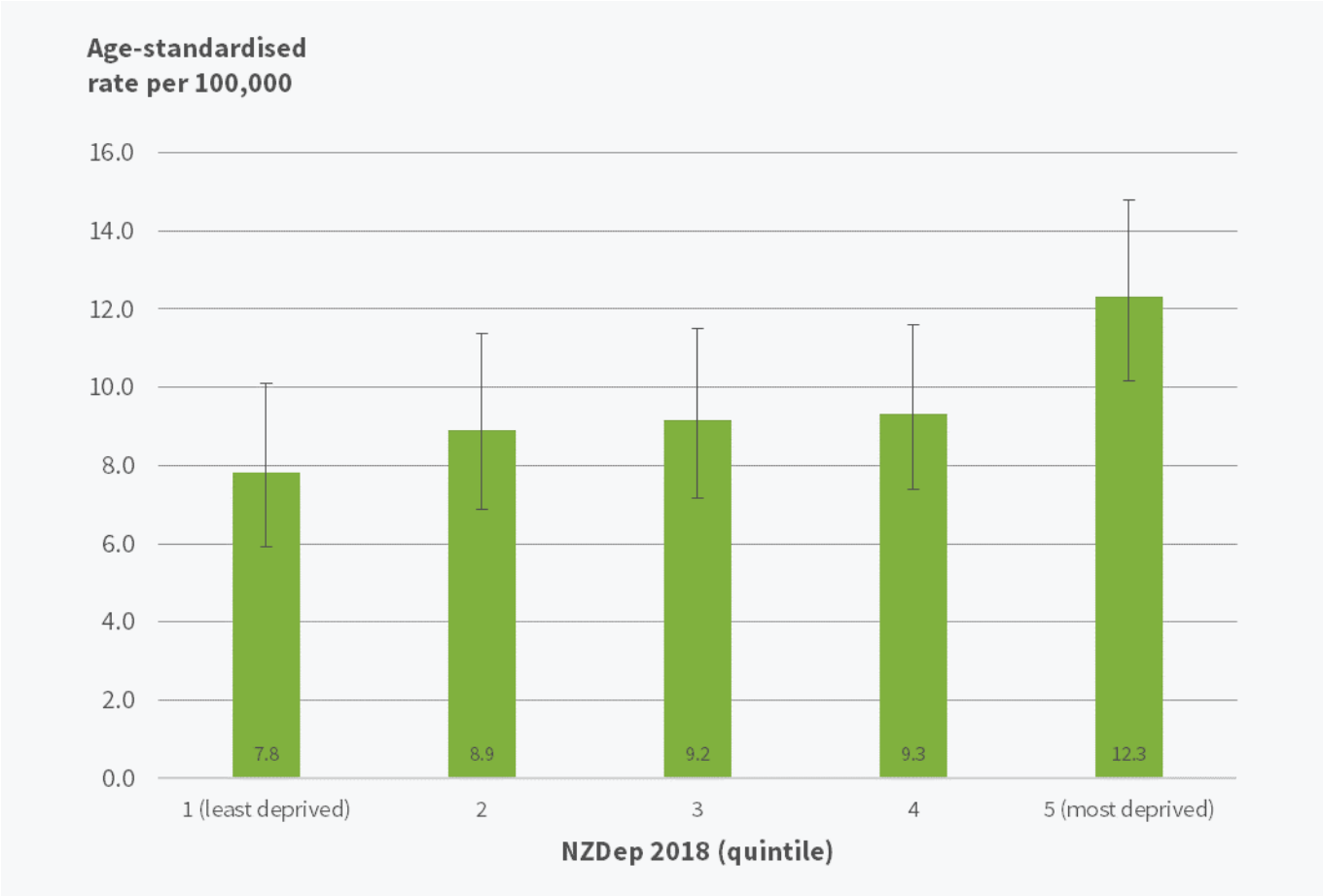
Note 2: 95% confidence intervals have been presented as error bars. See Metadata for more information on how to interpret this graph.

Source: National Minimum Dataset, Ministry of Health 2021.

People living in the most deprived areas (NZDep 2018 quintile 5) have a higher hospitalisation rate than those in the least deprived areas in 2020

In 2020, the hazardous substances-related hospitalisation rate was higher in the most deprived areas (NZDep 2018) than in the least deprived areas (Figure 6).

Figure 6: Unintentional hazardous substances-related hospitalisations, by NZDep2018 quintiles, 2020 (age-standardised rate per 100,000)



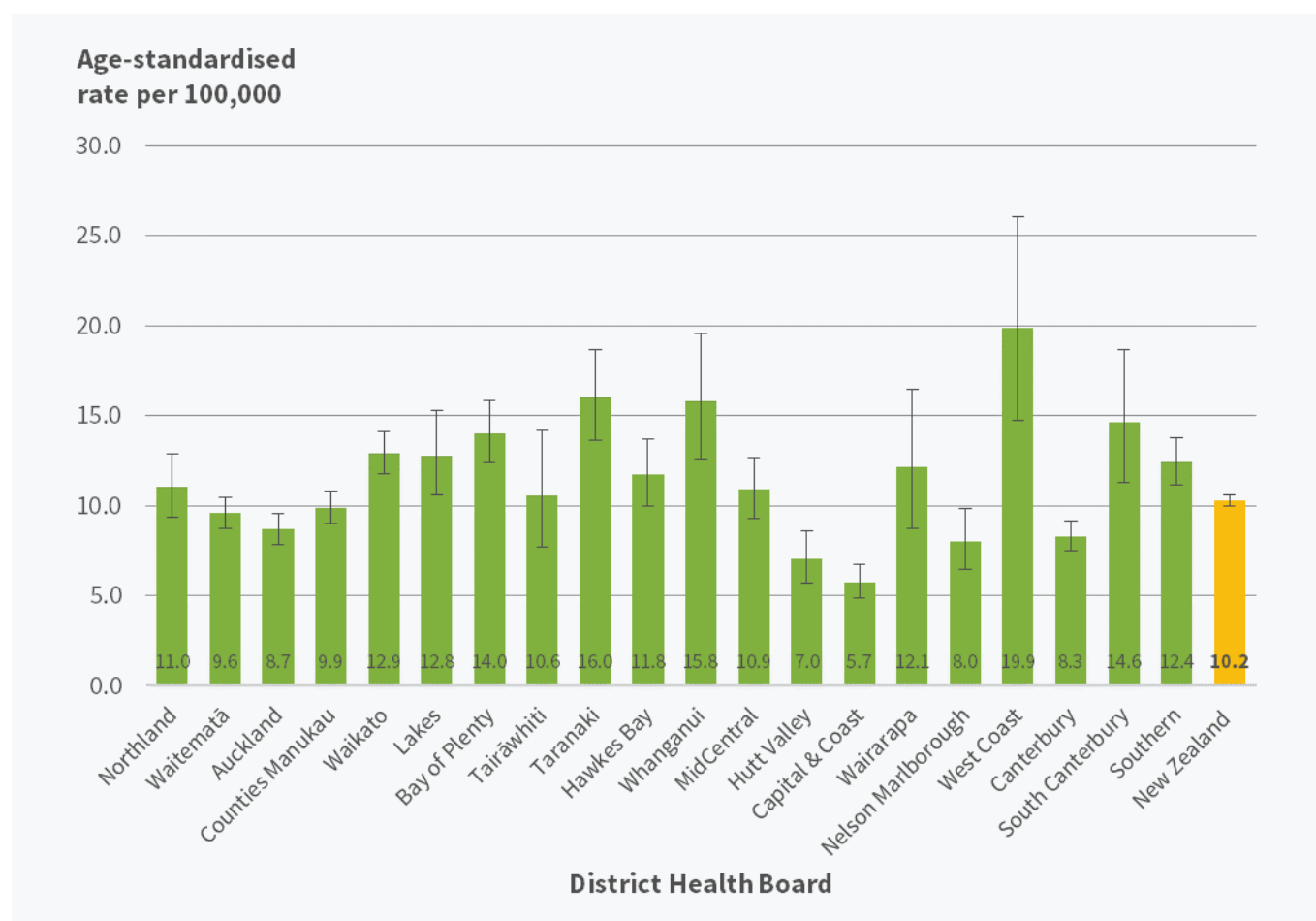
Note: 95% confidence intervals have been presented as error bars. See Metadata for more information on how to interpret this graph.
Source: National Minimum Dataset, Ministry of Health 2021.

West Coast District Health Board (DHB) had the highest rate of hazardous substances-related hospitalisations in the last ten years

In 2011–20, people living in the West Coast DHB had the highest rate of hazardous substances-related hospitalisations (19.9 per 100,000; 58 hospitalisations). The lowest rate was in the Capital & Coast DHB (5.7 per 100,000; 170 hospitalisations) (Figure 7).

Even though some DHBs with small populations such as West Coast and Whanganui have high rates of hospitalisation, the number of hospitalisations is small. This is in contrast to larger population regions such as Capital & Coast and Canterbury DHBs, which have many hospitalisations but low hospitalisation rates.

Figure 7: Unintentional hazardous substances-related hospitalisations, by DHB, 2011–20 (age-standardised rate per 100,000)



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 2021.

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 August 2021. 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.

References

Kamboj A, Spiller H A, Casavant M J, et al. 2019. Household cleaning product-related ocular exposures reported to the United States poison control centres. URL: <https://doi.org/10.1038/s41433-019-0691-9> (Accessed November 2021)

Ministry for Business, Innovation, and Employment. 2013. Work-related disease in New Zealand. Wellington. New Zealand.

World Health Organisation. 2004. Guidelines on the prevention of toxic exposures. URL: https://www.who.int/ipcs/features/prevention_guidelines.pdf (Accessed November 2021)

NZ Herald. 2006. Fireworks sales cut, age limit up to 18. URL: <https://www.nzherald.co.nz/nz/fireworks-sales-cut-age-limit-up-to-18/3RUHZNOQ5S5K23UZZMEQDY6L6Y/> (Accessed November 2021)

Other related topics include:

[Unintentional hazardous substances exposures in children \(0–14 years\)](#)

[Hazardous substances-related deaths reported to the coroner in New Zealand](#)

[Hazardous substances notifications](#)

Author

The author of this factsheet is Shunnie Xie

Citation

Environmental Health Intelligence. 2021. *Unintentional hazardous substances-related hospitalisations*. [Factsheet]. Wellington: Environmental Health Intelligence NZ, Massey University.

Further information

For descriptive information about the data