Hazardous substances-related deaths registered in New Zealand

This factsheet presents information on deaths from hazardous substance exposures in New Zealand. The data comes from the mortality collection for deaths registered in New Zealand in 2001–18.

Key facts

In 2018, there were 40 hazardous substances-related deaths in New Zealand. Mortality rates have reduced by 70% between 2001–04 (2.8 deaths per 100,000) and 2015–18 (0.8 deaths per 100,000).

Mortality rates have decreased by over 60% from 2001–18 for European/Other and Māori ethnic groups. No change in rates has been recorded for Pacific Peoples over this time.

From 2001–18, unintentional deaths made up over a third of all hazardous substance-related deaths for Māori and Pacific Peoples, far higher than in European/Other and Asian ethnic groups (7% and 4% respectively).

From 2001–18 carbon monoxide accounted for 78% of all hazardous substance-related deaths. However, gases, fumes and other vapours are the only category that caused substantially more deaths in the 2010's than in the 2000's.

Intentional hazardous substance mortality rates in 2015–18 (0.7 per 100,000) were almost four times lower than in 2001–04 (2.6 per 100,000) while unintentional rates have remained at between 0.1–0.2 deaths per 100,000.

Deaths due to hazardous substances exposure is an important public health problem

Each year, people in New Zealand continue to be injured or die from exposures to hazardous substances. Poisoning arising from chemical contamination of the environment can cause an adverse impact on people's health and the environment (Ministry of Health 2019). For example, misuse of pesticides leads to damage to the ecosystem and aerial spraying with insecticide. A growing number of chemicals are used in the home and surrounding domestic environment, which could be fatal due to human carelessness, negligence, and ignorance, all of which could be preventable (World Health Organisation 2004). Common exposures include inhalation of carbon monoxide, huffing of butane, and exposure to pesticides, solvents, cleaning agents and paints. These deaths are often preventable (Environmental Protection Authority 2013).

Hazardous substance mortality rates dropped by 70% since 2001–04

In 2018, there were 40 hazardous substance-related deaths within New Zealand. The number of deaths has been similar since 2011. From 2001–04 to 2015–18, mortality rates have decreased by approximately 70% (2.8 per 100,000 compared to 0.8 per 100,000) (Figure 1). This decline appears to stem from a decline in intentional deaths, as seen in Figure 5.

Since 2001–04, mortality rates among males have consistently been three or more times greater than the rates for females in the same time period.

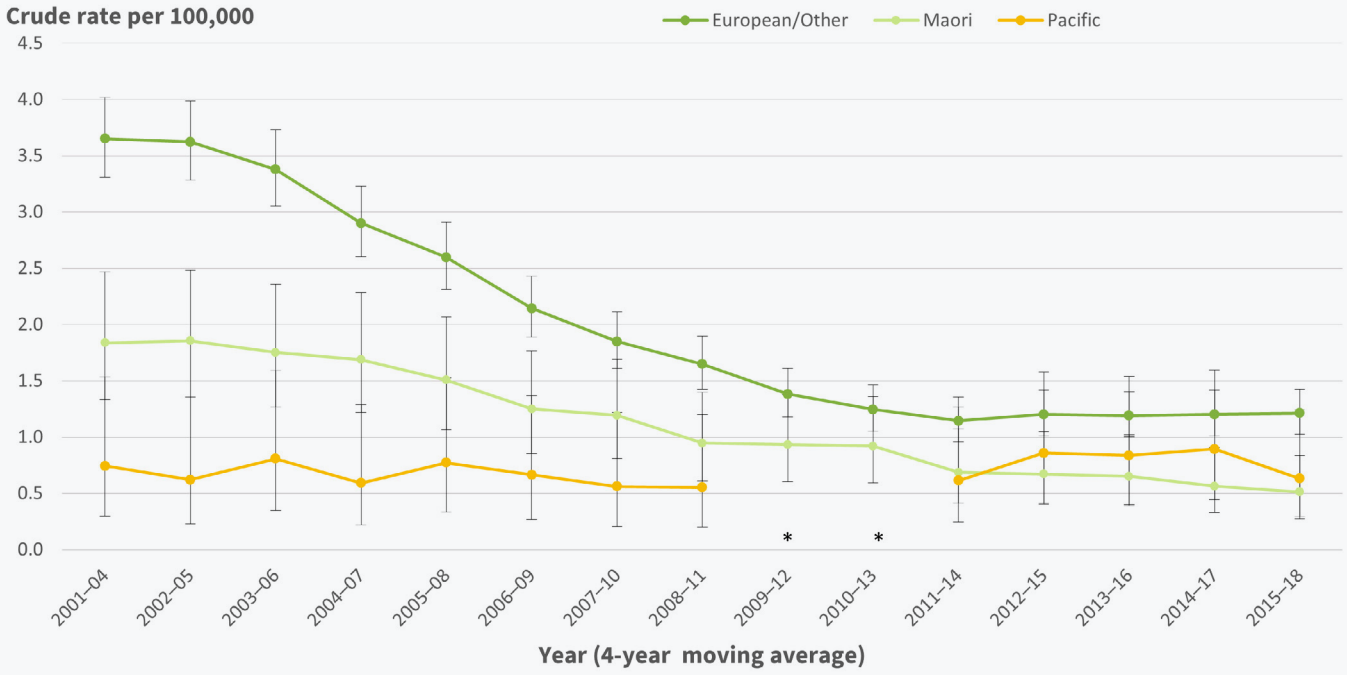
Figure 1: Hazardous substances-related mortality rate, by sex, 2001–18

Note: 95% confidence intervals have been presented as error bars. See Metadata for more information on how to interpret this graph.
Source: New Zealand Mortality Collection, Ministry of Health (2021).

Mortality rates for Pacific Peoples haven't changed over time

From 2001–18, the European/Other ethnic group has consistently experienced the highest rates of hazardous substance mortality (Figure 2). From 2001–04 to 2015–18, mortality rates for European/Other and Māori ethnic groups decreased by over 60%. Over the same time, rates among Pacific Peoples have not changed substantially.

Figure 2: Hazardous substances-related mortality rates, by prioritised ethnicity, 2001–18



Note: 95% confidence intervals have been presented as error bars. Asian rates have been suppressed due to low counts.
* The rate is suppressed as it is an unreliable estimate based on small numbers. See Metadata for more information on how to interpret this graph.
Source: New Zealand Mortality Collection, Ministry of Health (2021).

When considering cause of death it is also important to consider intent. Hazardous substance deaths are broken down into three categories; intentional, unintentional and unknown. From 2001–18, Māori and Pacific Peoples had higher proportions of unintentional deaths compared to European/Other and Asians (Table 1).

Table 1: Number and percentage of hazardous substances-related deaths, by ethnicity and intent, 2001–18.

Ethnicity (prioritised)	Intentional Deaths	Unintentional Deaths	Proportion of deaths that were unintentional
Māori	76	50	40%
Pacific	20	11	35%
European/Other	1008	75	7%
Asian	26	1	4%
Total	**1130**	**137**	**11%**

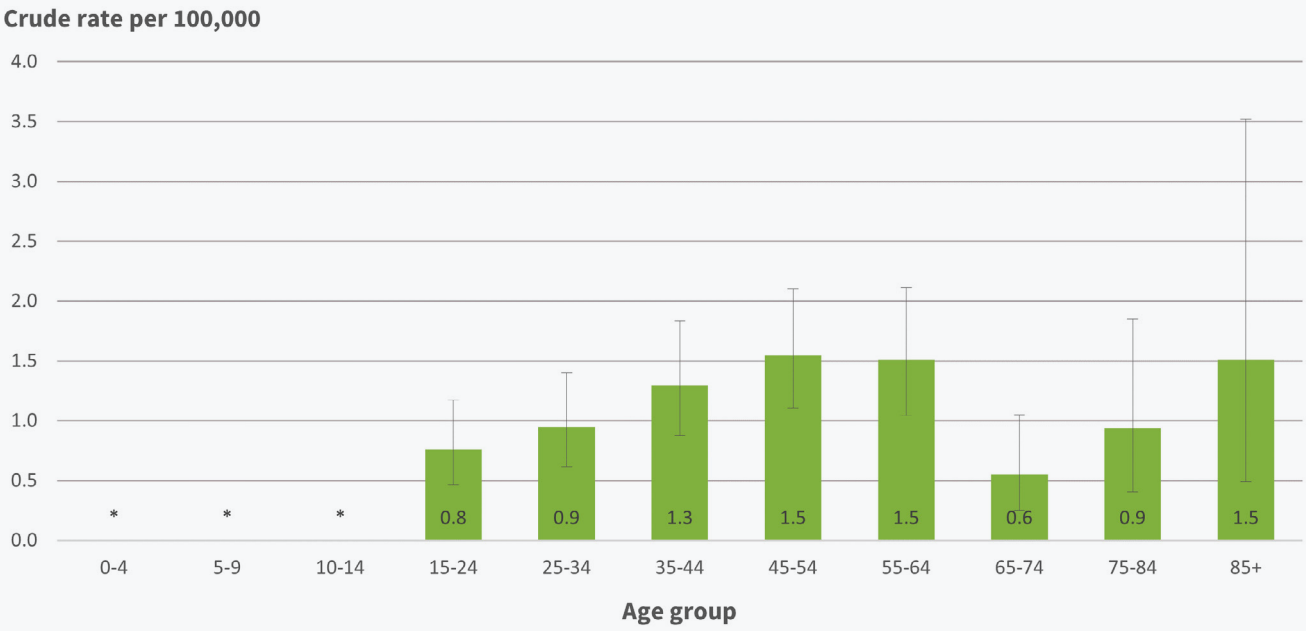
Source: New Zealand Mortality Collection, Ministry of Health (2021).

Refer to **page 7** for further information and breakdown of intentional and unintentional hazardous substance deaths.

Mortality rates similar for all adult age groups

From 2015–18, mortality rates were similar across different age groups (Figure 3). However, rates were not calculated for any group under 15 years of age due to low counts.

Figure 3: Hazardous substances-related mortality rates, by age group, 2015–18



Carbon Monoxide	2	1	0	10	19	23	34	25	5	6	5
Gases, fumes & other vapours	0	0	1	9	4	3	3	7	3	1	0

Note: 95% confidence intervals have been presented as error bars.
* The rate is suppressed as it is an unreliable estimate based on small numbers. See Metadata for more information on how to interpret this graph.
Source: New Zealand Mortality Collection, Ministry of Health (2021).

From 2015–18, carbon monoxide poisoning was the leading cause of hazardous substance-related deaths in all age groups 25 years and older, causing roughly four times as many deaths as the next most prevalent hazardous substance category; gases, fumes and other vapours.

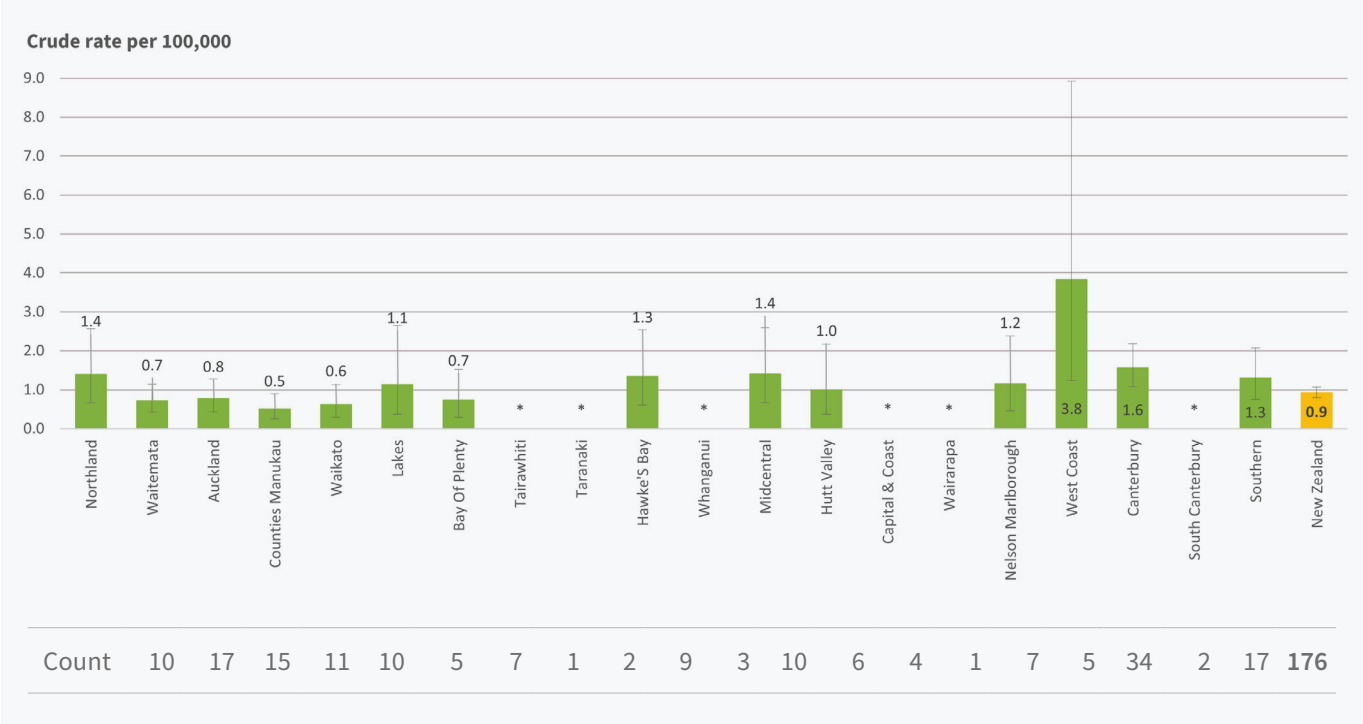
15–24 year olds were equally likely to die from carbon monoxide, and gases, fumes and vapours, which caused 10 and 9 deaths respectively over this four-year period.

Refer to **page 6** for a further breakdown of specific hazardous substance-related deaths.

Mortality rate was higher in West Coast DHB

From 2015–18, West Coast District Health Board (DHB) experienced a higher rate of hazardous substance mortality than the national rate (Figure 4). Over this four year period, Canterbury experienced the highest total number of deaths, 34 deaths, which is double the next highest regions in New Zealand, Waitematā and Southern DHBs.

Figure 4: Hazardous substance mortality rates, by DHB, 2015–18



Note: 95% confidence intervals have been presented as error bars.
* The rate is suppressed as it is an unreliable estimate based on small numbers. See Metadata for more information on how to interpret this graph.
Source: New Zealand Mortality Collection, Ministry of Health (2021).

Hazardous substance breakdown

Carbon monoxide accounted for 78% of hazardous substance deaths

Of the 1,284 hazardous substance related deaths recorded from 2001–18, the most common causes were carbon monoxide poisonings accounting for 78% of deaths, followed by gases, fumes and vapours accounting for 9% of deaths (Table 2). Of all the hazardous substance categories, gases, fumes and vapours deaths are the only category that increased substantially from the 2000's to the 2010's.

Table 2: Number of hazardous substances-related deaths, by category, 2001–18

Hazardous substance category	2001–09	2010 –18	Total
Carbon monoxide	727	280	1,007
Gases, fumes and vapours	55	66	121
Other toxic substances	30	14	44
Solvents, hydrocarbons and corrosive substances	22	19	41
Pesticides	19	16	35
Inorganic substances	0	1	1
Unclassified	34	1	35
Total	**887**	**397**	**1,284**

Source: New Zealand Mortality Collection, Ministry of Health (2021).

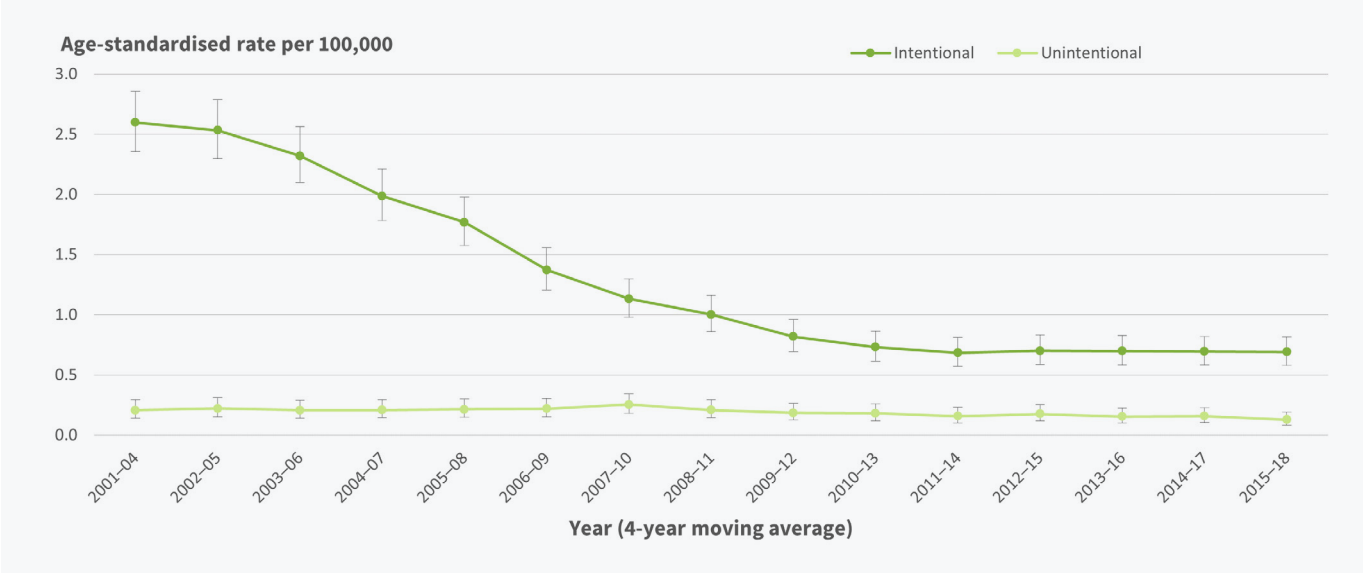
Intent:

Intentional hazardous substances-related death rates declined until early 2010's

Intentional deaths related to hazardous substances have seen a statistically significant decline from 2001–04 (2.6 per 100,000) to 2011–14 (0.7 per 100,000) (Figure 5). Since then, intentional rates have remained similar through to 2015–18. This trend was primarily influenced by deaths from carbon monoxide as seen in Figure 6.

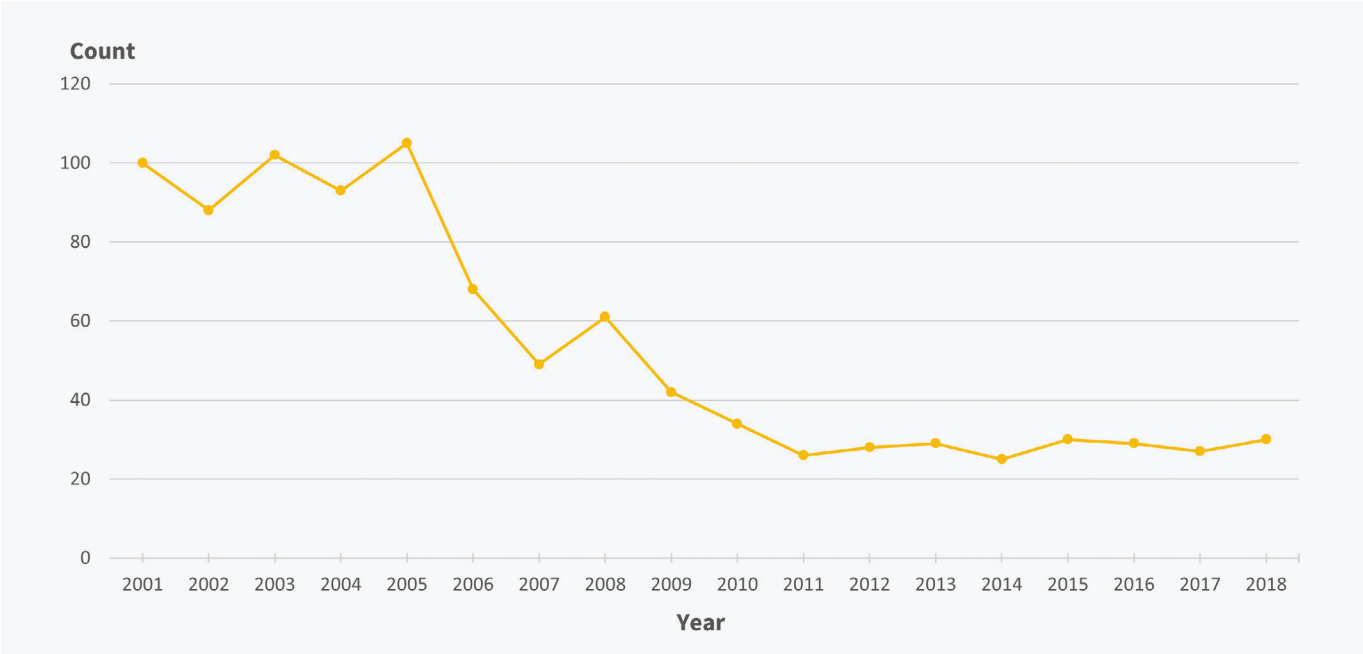
Unintentional death rates have remained largely the same over the past two decades. From 2001–18, over half (70 out of 137 deaths) of all unintentional hazardous substance deaths have been related to gases, fumes and other vapours.

Figure 5: Hazardous substances-related mortality rates, by intent, 2001–18



Note: 95% confidence intervals have been presented as error bars.
Source: New Zealand Mortality Collection, Ministry of Health (2021).

Figure 6: Intentional carbon monoxide deaths, 2001–18



Note: Only counts from intentional carbon monoxide poisonings are included in this graph. Both unintentional and unknown are excluded in these counts.
Source: New Zealand Mortality Collection, Ministry of Health (2021).

Data for this indicator

This indicator reports on hazardous substances-related deaths registered in New Zealand using data from 2001 onwards. This indicator is an analysis of the most recent data available from The Mortality Collection Dataset, provided to EHINZ by the Ministry of Health in August 2021. Data has been pooled to give sufficient numbers for analysis where appropriate.

This factsheet includes data covered by the Hazardous Substances and New Organisms Act 1996 and 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.

Crude rates presented in this factsheet do not take into account varying age distributions when comparing between populations.

Age-standardised rates presented in this factsheet take into account varying age distributions when comparing between populations.

References

Environmental Protection Authority. 2013. *Monitoring the Effectiveness of the Hazardous Substances and New Organisms Act 1996*. URL: **https://www.epa.govt.nz/assets/RecordsAPI/ac9ce4bf76/Monitoring-the-effectiveness-of-the-HSNO-Act-2013.pdf** (accessed November 2021)

Ministry of Health. 2019. *The Investigation and Surveillance of Poisoning and Hazardoussubstance Injuries - Guidelines for public health units*. URL: **https://www.health.govt.nz/system/files/documents/publications/investigation-surveillance-poisoning-hazardous-substance-injuries-guidelines-public-health-units-mar2019.pdf** (accessed November 2021)

World Health Organisation. 2004. Guidelines on the prevention of toxic exposures: education and public awareness activities. URL: **https://www.who.int/ipcs/features/prevention_guidelines.pdf** (Accessed 15 October 2021).

Other related topics include:

Hazardous substances notifications

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

Non-occupational/unknown source of lead absorption notifications

Occupational lead absorption notifications

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

Unintentional hazardous substances–related hospitalisations

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Further information

For descriptive information about the data Metadata Sheet

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