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

This factsheet presents information on deaths due to hazardous substances in New Zealand from 2008–19. The data comes from the National Coronial Information System (NCIS) and only include deaths where the coroner has completed the investigation.

Key facts

There were 10 hazardous substance-related deaths reported to the coroner in 2019, and eight in 2018. The rate continues to decrease over time, although the number of deaths fluctuated year-to-year, since 2008.

Since 2008–12, the number of deaths for males have been consistently higher than for females.

Approximately 40% of the deaths occurred in the 15–34 year age group, while there were no deaths for children under five years old.

Butane and other hydrocarbons were the most common cause of death for ages 15–24 and carbon monoxide poisoning for ages 25–74 in 2008–19.

The percentage of butane and other hydrocarbons deaths in ages 15–24 has decreased by 73% from 2008–13 to 2014–19.

The hazardous substances mortality rate for Māori has decreased from 2008 onwards, while the rate for non-Māori has remained unchanged.

Deaths from hazardous substances is an important public health problem

Every year, people in New Zealand continue to die from exposure to hazardous substances. 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).

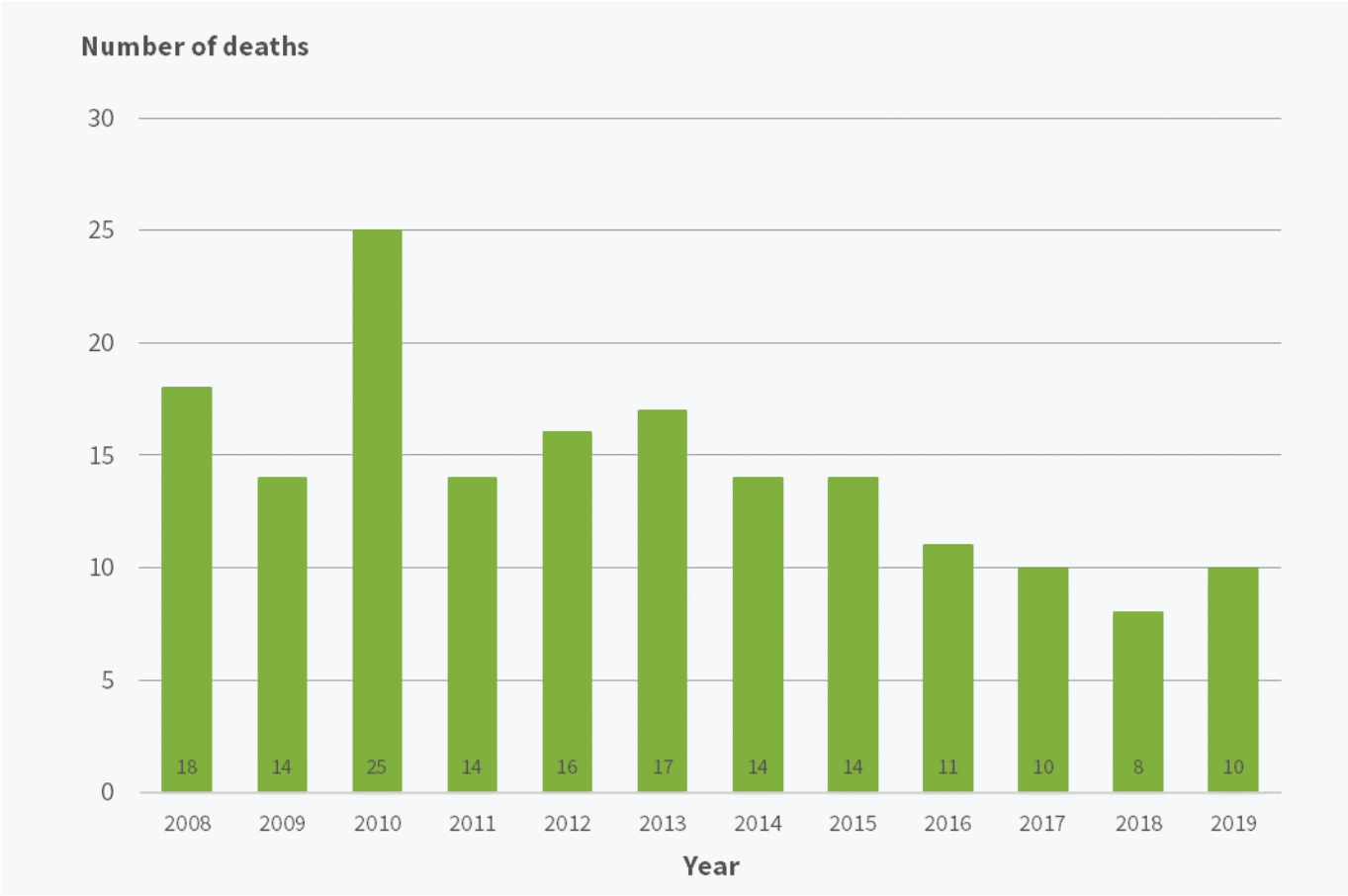
This factsheet reports on deaths from hazardous substances exposures in the New Zealand NCIS between 2008 to 2019. It includes data on substances covered under the Hazardous Substances and New Organisms (HSNO) Act 1996 and Health Act 1956.

Medicines in finished dose form, alcohol when classified as a food item, chemical toxins associated with food (food poisoning), and radioactive materials are excluded as these are covered by different legislation. Carbon monoxide from car exhaust fumes (ie, intentional poisoning) and manufactured items (eg, button batteries) are also outside of the legislation and therefore excluded. Only closed cases on the NCIS were included in this analysis.

The number of hazardous substances-related deaths fluctuated year-to-year

There were 10 hazardous substances-related deaths reported to the coroner in 2019 and eight in 2018. The number of deaths fluctuated year-to-year, from 18 deaths in 2008 to 10 deaths in 2019 (Figure 1).

Figure 1: Number of hazardous substances-related deaths by year, 2008–19

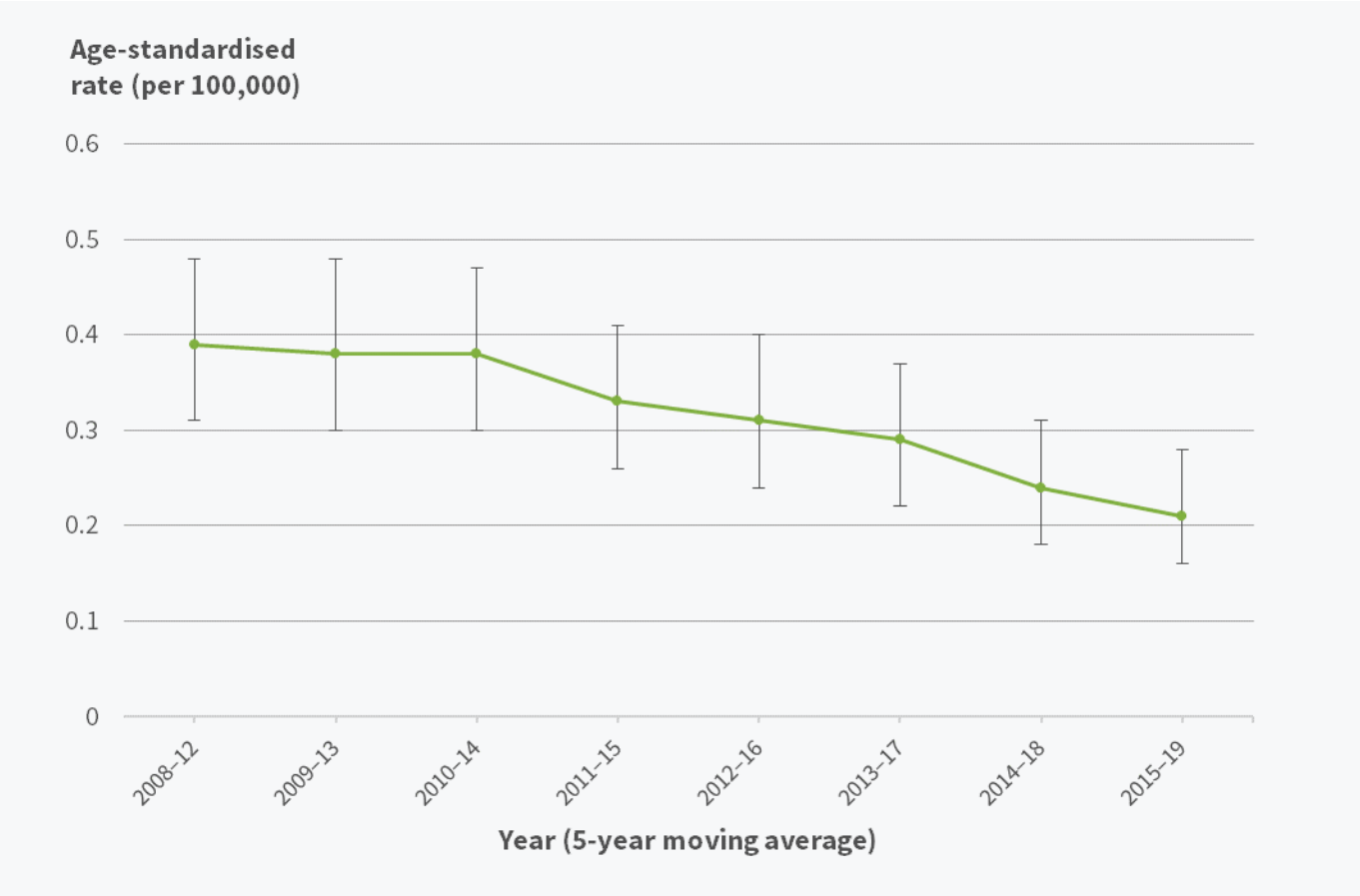


Source: National Coronial Information System (2021).

The hazardous substances-related mortality rate in the 2015–19 period was half the rate of the 2008–12 period

The age-standardised mortality rates from hazardous substances have halved between 2008–12 (0.4 deaths per 100,000) and 2015–19 (0.2 deaths per 100,000) (Figure 2).

Figure 2: Hazardous substances-related mortality rate, 2008–19 (Age-standardised rate per 100,000)



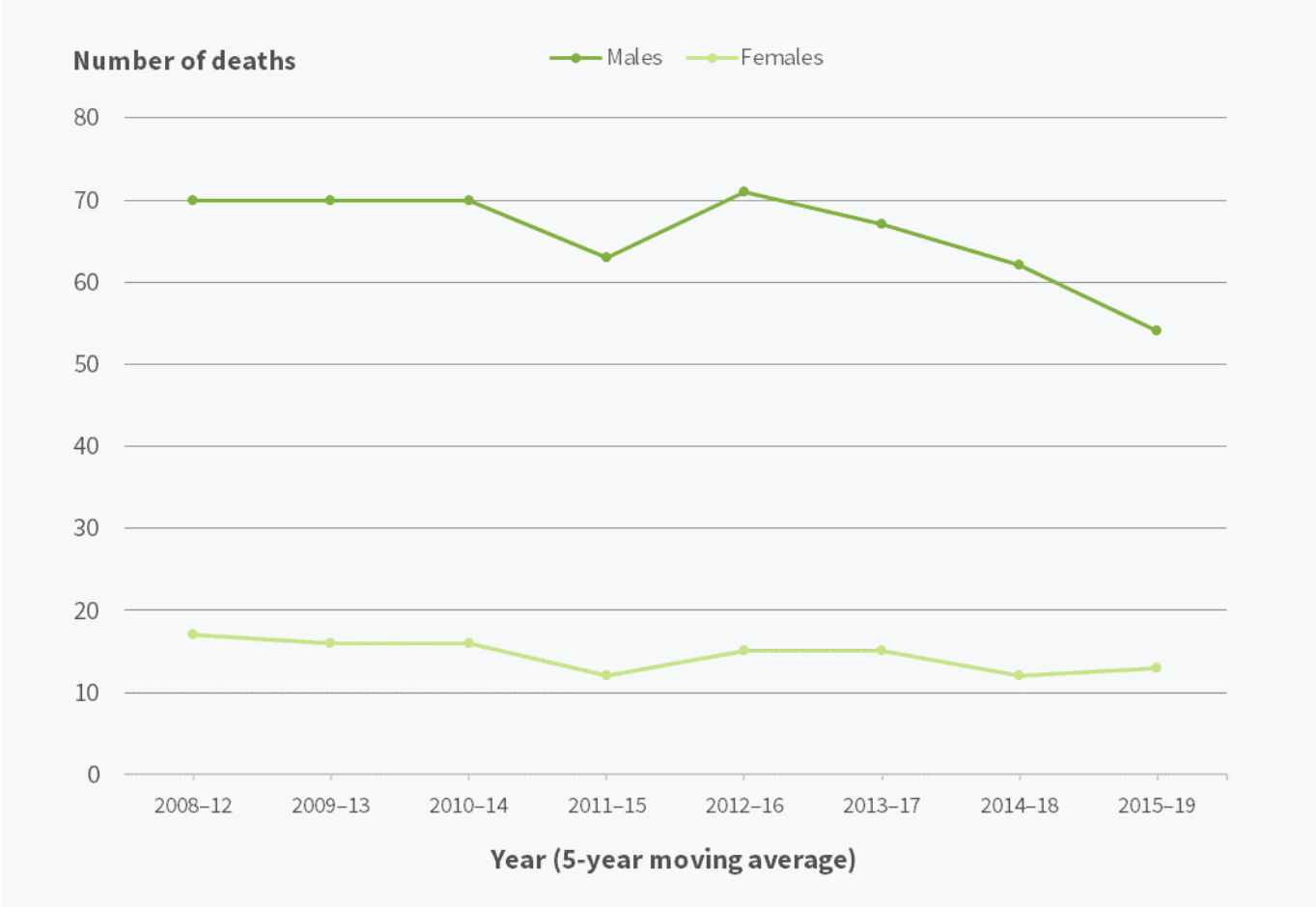
Note: 95% confidence intervals have been presented as error bars. See Metadata for more information on how to interpret this graph.
Source: National Coronial Information System (2021).

Since 2008–12, the number of deaths for males have been consistently higher than for females

The number of hazardous substance-related deaths have been consistently higher for males than females since 2008–12 (Figure 3).

The number of deaths for males have decreased from 70 in 2008–12 to 54 in 2015–19, while the deaths for females have stayed relatively stable during this period.

Figure 3: Number of hazardous substances-related deaths by sex, 2008–19

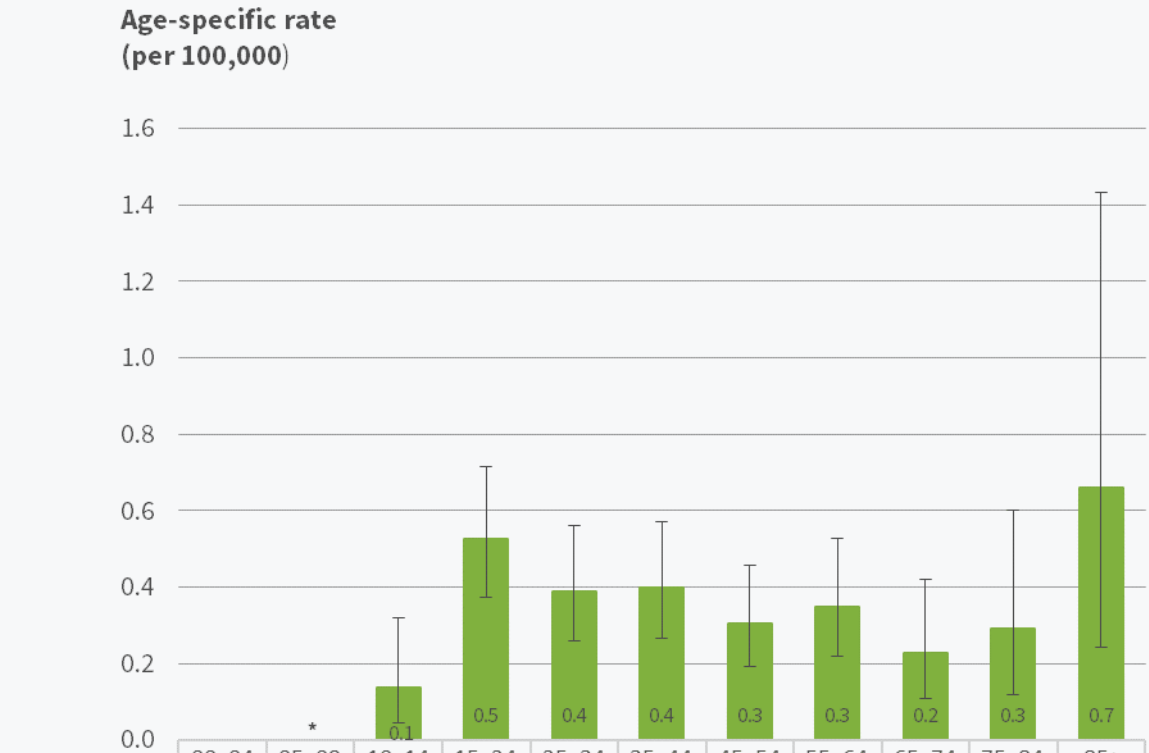


Source: National Coronial Information System (2021).

Approximately 40% of the hazardous substances-related deaths occurred in the 15–34 year age group, while there were no deaths for children under five years

In 2008–19, 39.8% (68 out of 171 deaths) of hazardous substances-related deaths occurred in the 15–34 year age group, while there were no deaths reported to the coroner for children under five years (Figure 4).

Figure 4: Hazardous substances-related mortality rate, by age group, 2008–19 (Age-specific rate per 100,000)



	00–04	05–09	10–14	15–24	25–34	35–44	45–54	55–64	65–74	75–84	85+
Age-specific rate	0.0	*	0.1	0.5	0.4	0.4	0.3	0.3	0.2	0.3	0.7
Count	0	< 5	5	40	28	29	23	22	10	7	6

Note1: *The rate is suppressed due to an unreliable estimate with small numbers. See Metadata for more information on how to interpret this table.
Note2: 95% confidence intervals have been presented as error bars. See Metadata for more information on how to interpret this graph.
Source: National Coronial Information System (2021).

Poisoning from butane and other hydrocarbons is the leading cause of death in ages 15–24, while carbon monoxide poisoning affected ages 25–74 in 2008–19

In 2008–19, of the 40 deaths in the 15–24 year age group, 24 (60%) were related to inhaling butane gas and other hydrocarbons. This was the leading cause of death among young people aged 15–24 years.

Carbon monoxide poisoning was the most common cause of death for those aged 25–74 years in 2008–19 (Table 1a).

Table 1a: Number of hazardous substances-related deaths, cause of death, 2008–19

Cause of death	Total
Carbon monoxide	55
Butane gas and other hydrocarbons	40
Ethylene glycol, antifreeze	13
Cyanide	11
Hydrogen sulphide	8
Other specified non-pharmaceutical chemical substance	6
Toluene	6
Paraquat	6
Alcohol, methanol	<5
Other insecticide	<5
Petrol, diesel, gasoline	<5
Other specified pesticide herbicide	<5
Unspecified fuel or solvent	<5
Organophosphate	<5
Disinfectant	<5
Lubricating oils, motor oil	<5
Paint, varnish, stain	<5
Chloroform	<5
Epoxies	<5
Plant food or fertiliser, plant hormones	<5
Sodium hydroxide, caustic soda	<5
Drain cleaners	<5
Total	**171**

Source: National Coronial Information System (2021).

The percentage of butane and other hydrocarbons deaths in ages 15–24 has decreased by 73% from 2008–13 to 2014–19

In 2008–13, 19 out of 29 deaths in the 15–24 year age group were related to inhaling butane gas and other hydrocarbons. This number of deaths has decreased by 73% from 19 in 2008–13 to five in 2014–19 (Table 1b). The decrease of deaths from butane and other hydrocarbons may be due to public health interventions such as restricting access at retail stores (Office of the Chief Coroner of New Zealand 2012).

Table 1b: Number of butane gas and other hydrocarbons deaths, by age group and years

Years	10–14	15–24	25–34	35+	Total
2008–13	<5	19	<5	<5	**27**
2014–19	<5	5	<5	<5	**13**

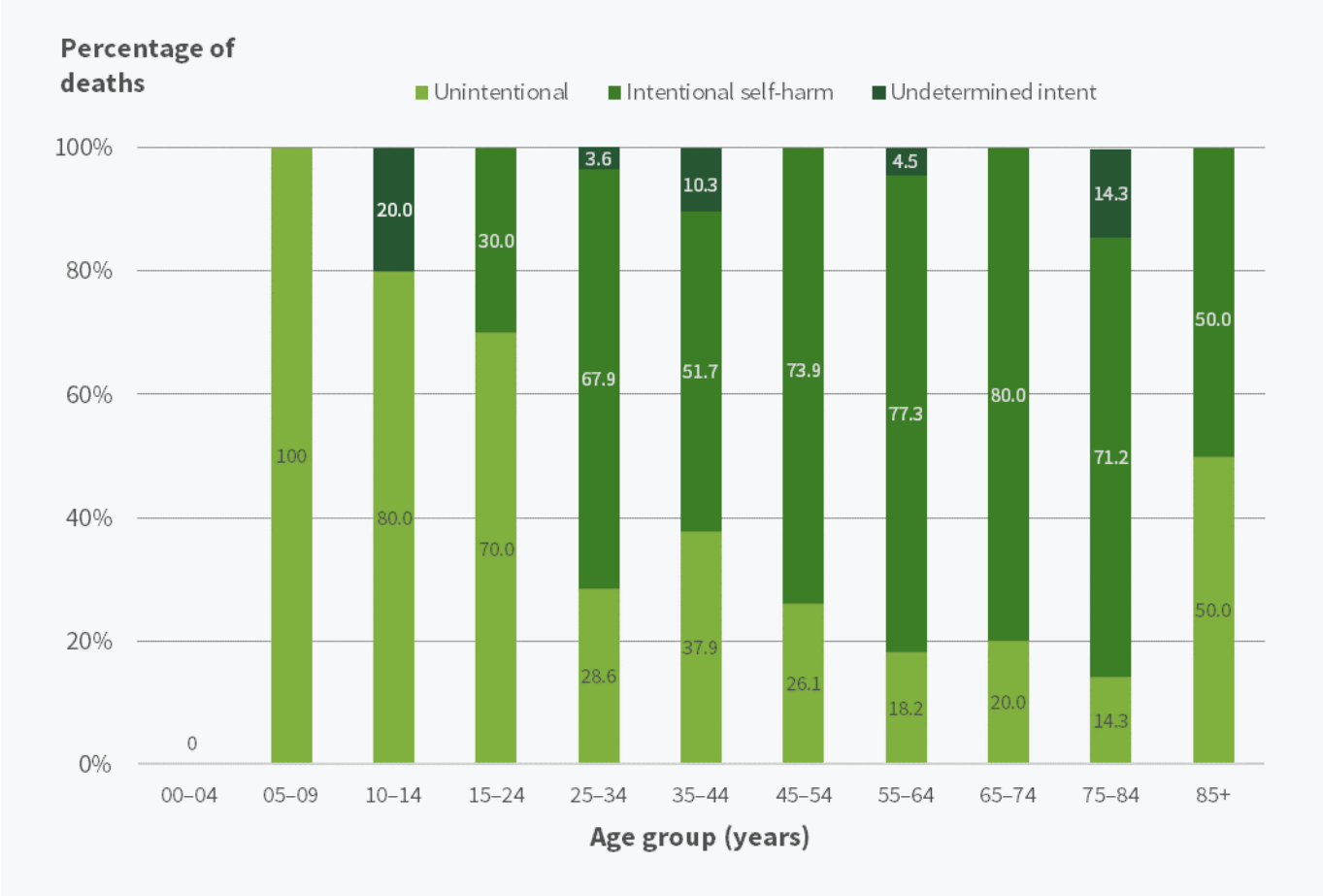
Source: National Coronial Information System (2021).

Unintentional exposures account for the majority of deaths in people under 25 years, while intentional self-harm is more common in older adults

When investigating hazardous substances-related deaths, intent is categorised as either intentional self-harm, unintentional, or undetermined by the coroner.

In 2008–19, among young people aged under 25 years, the majority of the hazardous substances deaths were listed as "unintentional" (33 out of 46 deaths, 72%). However, among adults aged 25–84 years, intentional self-harm contributed to most of the hazardous substance deaths (81 out of 119 deaths, 68%) (Figure 5).

Figure 5: Percentage of hazardous substances-related deaths, by intent and age group (years), 2008–19



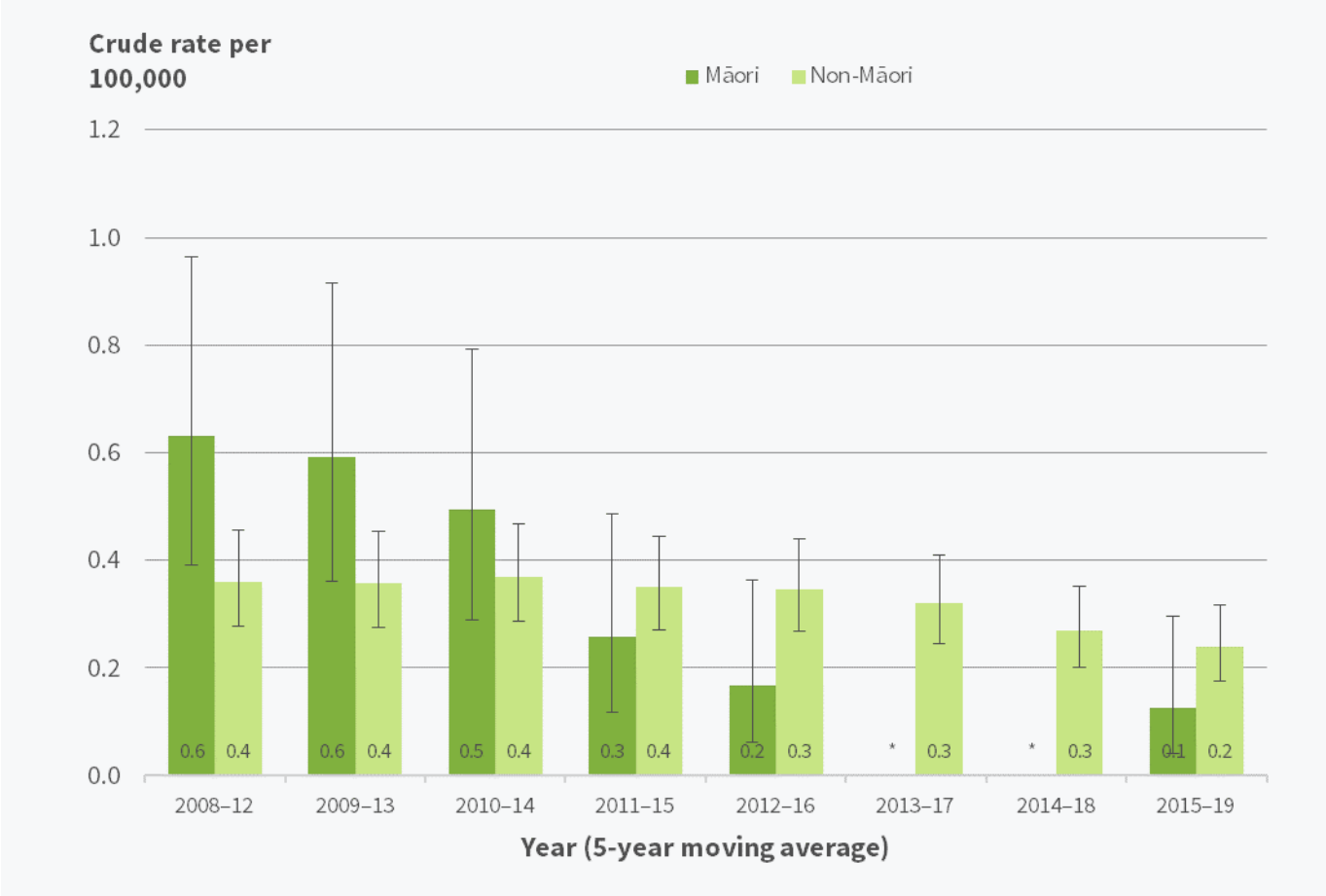
Source: National Coronial Information System(2021).

The hazardous substances-related mortality rate for Māori has decreased from 2008 onwards, while the rate for non- Māori has remained unchanged

The rate of hazardous substances-related deaths for Māori has decreased from 0.6 per 100,000 in 2008–12 to 0.1 per 100,000 in 2015–19. There was a higher than usual number of deaths (n=8 deaths) reported to the coroner in 2010, compared to all other years (<5 deaths). However, the rates for non-Māori have shown minimal change over the period.

Since 2008–12, there were no clear disparities in crude mortality rates from hazardous substances between Māori and non-Māori (Figure 6).

Figure 6: Hazardous substances-related death rates, by Māori/Non-Māori, 2008–19 (crude rate per 100,000)



Note1: *The rate is suppressed due to an unreliable estimate with small numbers. See Metadata for more information on how to interpret this table.
Note2: 95% confidence intervals have been presented as error bars. See Metadata for more information on how to interpret this graph.
Source: National Coronial Information System(2021).

Data for this indicator

The data presented in this factsheet were extracted from the National Coronial Information System (NCIS) on 19 July 2021. The dataset extracted contained every hazardous substances-related deaths reported to the New Zealand coroner between 1 January 2008 and 31 December 2019. This factsheet reports on deaths due to exposures to chemical or other substances, or other non-pharmaceutical chemical substances, and where the coronial investigation had concluded, and the case was closed on the NCIS.

The data have been pooled to give sufficient numbers for analysis where appropriate. Any updates or additions after this date (19 July 2021) are not reflected in this analysis.

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

Crude rates presented in this factsheet do not 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 August 2021)

Office of the Chief Coroner of New Zealand. 2012. Case Study from Recommendations Recap: volatile substance abuse-Butane-based substances from issue 2. URL: **https://www.drugfoundation.org.nz/assets/uploads/2012-uploads/Chief-Coroners-Report-Butane-Case-Study.pdf** (accessed October 2021)

Other related topics include:

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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