



# Hazardous substances notifications

This factsheet presents a national indicator, which allows us to monitor injuries from hazardous substances.

## Key facts



In 2019, there were a total of 98 hazardous substance notifications. This is a 30% decrease from 2018 (140 notifications).



Children under the age of five years had the highest notification rate in 2018 and 2019.



In 2019, most notifications involved household chemicals, which was the most common cause of injury for children under five years old. This was the same in 2018.



More than half (59%) of the notifications were males in 2014–19.



From 2014–19, ingestion was the most common route of exposure for children under five years. For adults, their most common route of exposure was inhalation.



The highest hazardous substances injury notification rates occurred in the most deprived areas (NZDep 2018 quintile 5) in 2014–19.



From 2014–19, most notifications were injuries that occurred in the home.

## Injury from hazardous substances is an important public health problem

A hazardous substance is anything that can explode, catch fire, oxidise, corrode or be toxic to humans, as defined in the Hazardous Substances and New Organisms Act 1996. This definition does not include medicines in finished dose form, alcohol other than industrial alcohol, or radioactive materials. Exposure usually occurs through inhalation, skin contact or ingestion. Adverse health effects can be acute (short term) or chronic (long term). Typical acute health effects include headaches, nausea or vomiting and skin corrosion, while chronic health effects include asthma, dermatitis, nerve damage or cancer (Worksafe 2017).

Injuries from hazardous substances are largely preventable. Most New Zealanders use hazardous substances every day at home and work. However, some population groups are at much higher risk from exposure to a hazardous substance that results in injury, particularly children under five years old. This is because their hand-to-mouth and play behaviour, lack of knowledge, and curiosity can further magnify their exposures (Landrigan et al 2004).

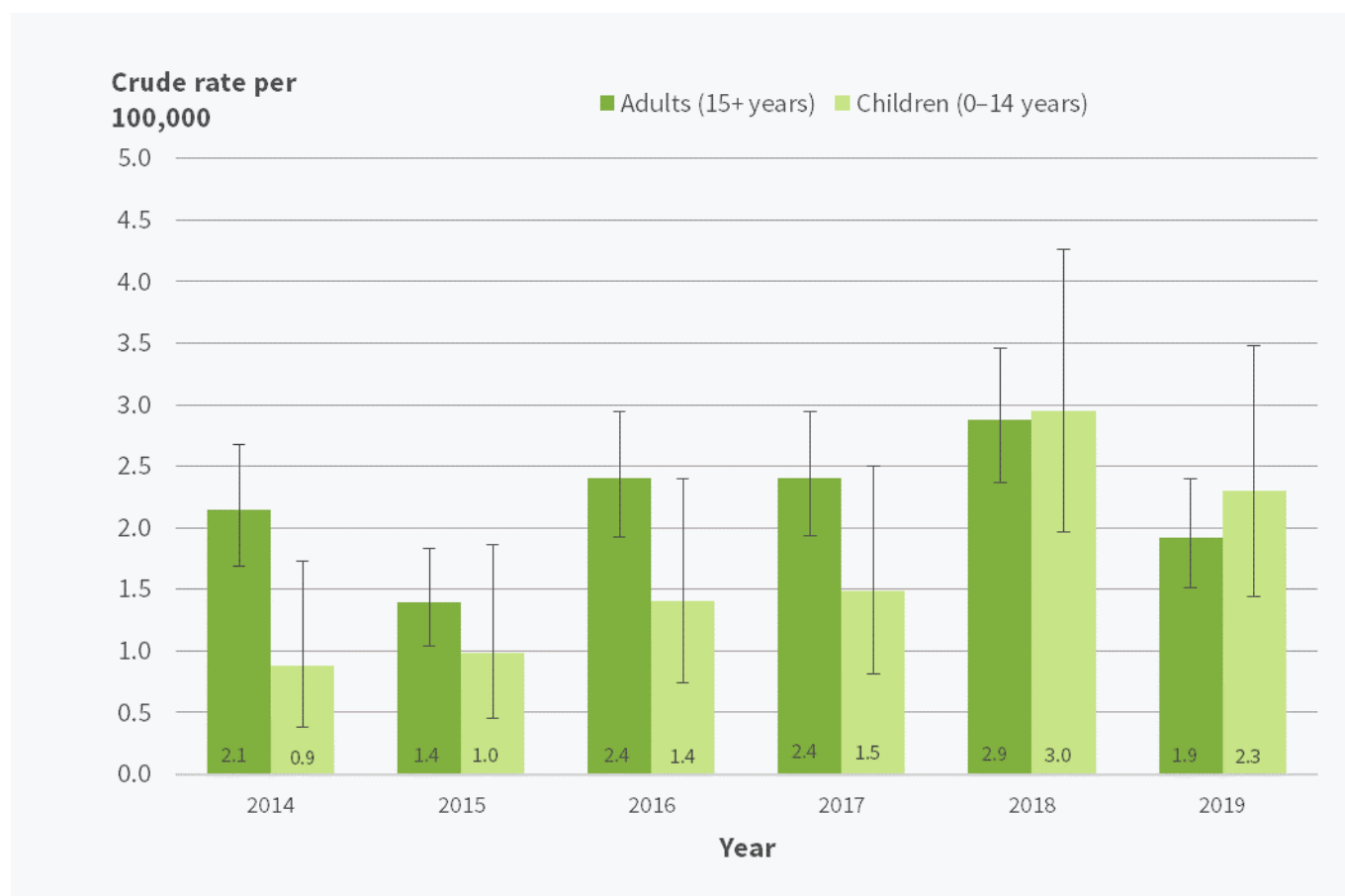
This factsheet reports on hazardous substance injury notifications from the Hazardous Substances Disease and Injury Reporting Tool (HSDIRT). As well as HSNO Act notifications, some Health Act 1956 notifications are included. This covers poisoning arising from chemical contamination of the environment and includes non-HSNO act notifications such as carbon monoxide poisoning, cyanotoxin (also known as blue-green algae or cyanobacteria) poisoning, and agrichemical spraydrift notifications. Agrichemical spraydrift notifications may also be notified under the HSNO Act as specific agrichemical notifications.

## Children are at higher risk from exposures to hazardous substances

There were 98 hazardous substance notifications in 2019, 76 of which were adults (15 years and over, 1.9 per 100,000), and 22 were children (0 to 14 years, 2.3 per 100,000) (Figure 1). The total notifications in 2019 decreased by 30% from 2018 where there were 112 hazardous substance notifications for adults and 28 notifications for children.

For adults, there was a decrease in the hazardous substances notification rate between 2018 and 2019. Whereas for children, there has been an increase between the rates from 2017 to 2018.

**Figure 1: Hazardous substances notification rate, 2014–2019 (crude rate per 100,000)**



**Note:** Cases where age was unknown or not entered have been excluded from the above graph. Total cases in 2019 is 101.

**Source:** Hazardous Substances Disease and Injury Reporting Tool (HSDIRT).

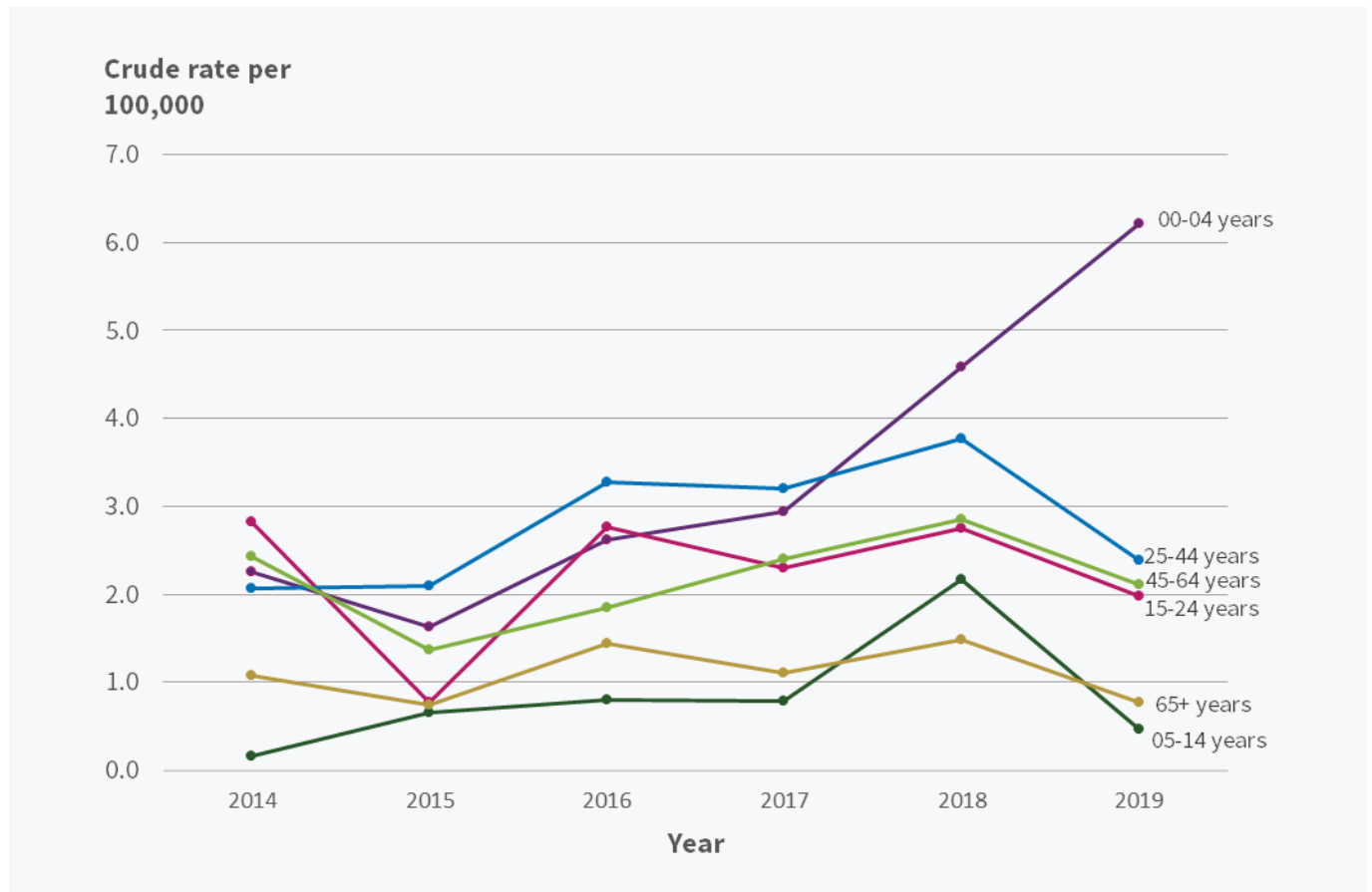
## Children under the age of five years have the highest notification rate

In 2019, the highest notification rate was for the 00–04 years age group (6.2 per 100,000; 19 notifications), and the rate was 2.6 times that for the 25–44 years age group (2.4 per 100,000; 31 notifications).

The rates for children under five years old are increasing and have not decreased in the past five years (Figure 2). The high rate for this age group is of concern because injuries from hazardous substances are largely preventable.

In the six years, 2014–2019, the 25–44 years age group had the highest notification rate in 2015, 2016 and 2017.

**Figure 2: Hazardous substances notification rate, by age group, 2014–2019 (crude rate per 100,000)**

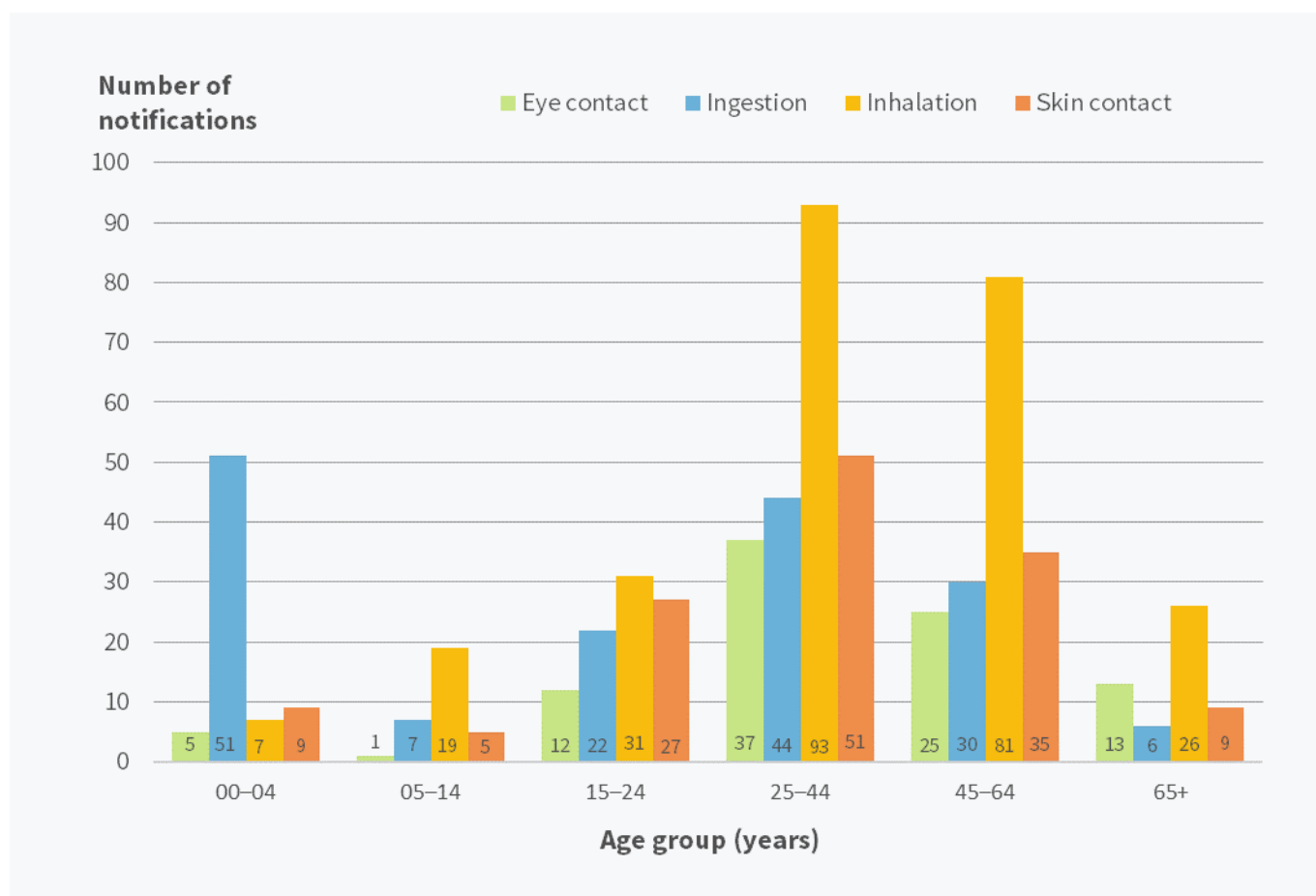


**Source:** Hazardous Substances Disease and Injury Reporting Tool (HSDIRT).

## Ingestion is the most common route of exposure for children under the age of five

From 2014 to 2019, the most common route of exposure for children under five years was ingestion (51 out of 72 notifications). This finding is most likely related to the explorative nature of children in this age group, along with mobility, curiosity, and a desire to put things in their mouths (McKenzie et al 2010). Whereas for other age groups, their most common route of exposure was inhalation (Figure 3).

**Figure 3: Number of notifications, by exposure route and age group, 2014–19**



**Note:** More than one exposure route can be recorded for a single notification. Therefore, the total can add to more than the number of notification.

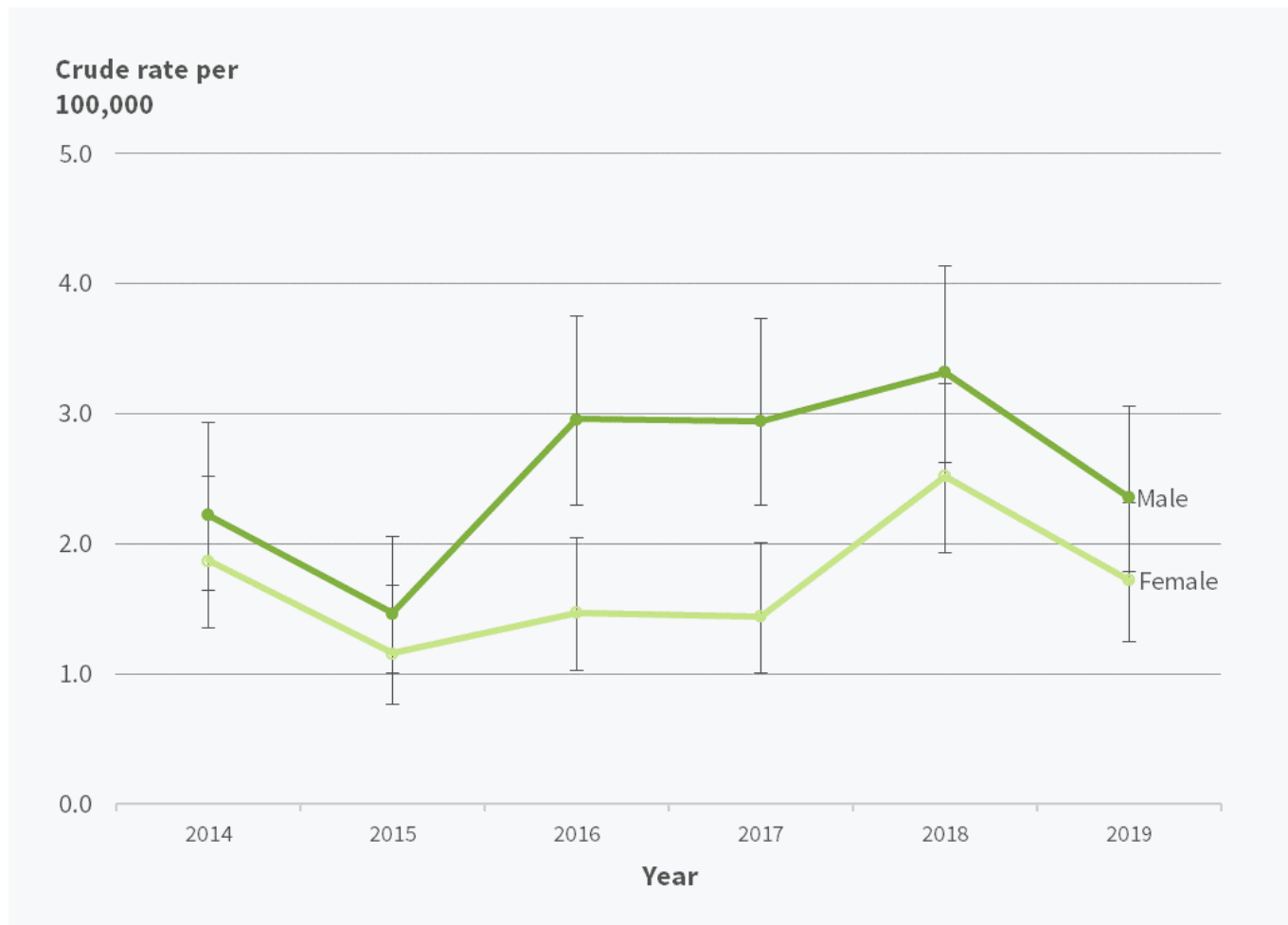
**Source:** Hazardous Substances Disease and Injury Reporting Tool (HSDIRT).

## More than half of notifications were males

In 2019, there was no difference in hazardous substances notification rate between males (2.4 per 100,000; 57 notifications) and females (1.7 per 100,000; 43 notifications) (Figure 4).

From 2014–2019, the majority (59%) of all hazardous substances notifications were males (355 notifications).

**Figure 4: Hazardous substances notification rate, by sex, 2014–2019 (crude rate per 100,000)**



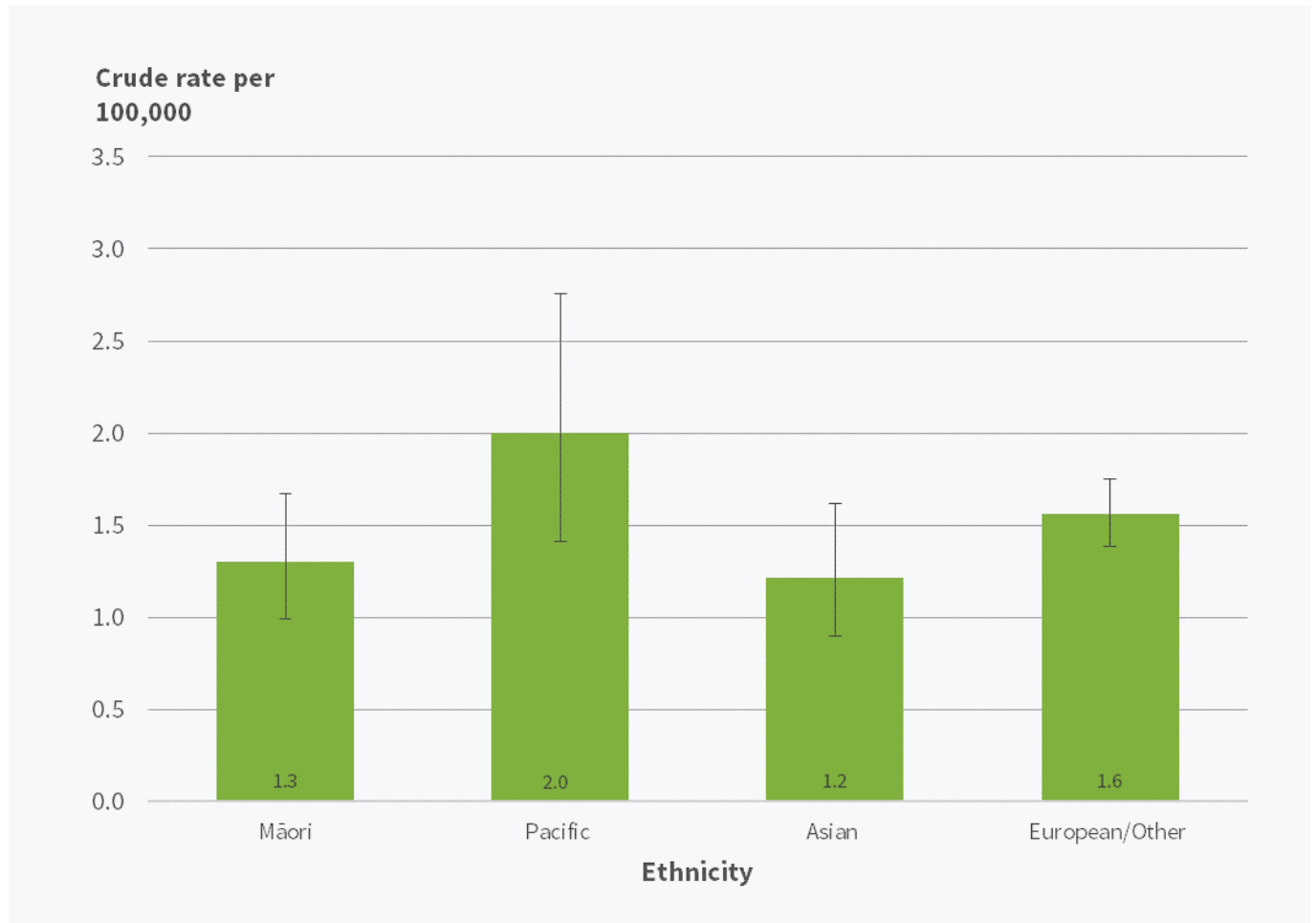
**Source:** Hazardous Substances Disease and Injury Reporting Tool (HSDIRT).

## Pacific people had the highest hazardous substance notification rate in 2014–19

In 2019, Asian people had the highest rate of hazardous substances injury notifications (2.0 per 100,000; 15 notifications), followed by Pacific people with 1.8 per 100,000 (6 notifications).

When the data was pooled for the six-year period from 2014–19, Pacific people had the highest notification rate (2.0 per 100,000; 37 notifications) (Figure 5).

**Figure 5: Hazardous substances notifications rate, by ethnicity (prioritised), 2014–19 (crude rate per 100,000)**



**Source:** Hazardous Substances Disease and Injury Reporting Tool (HSDIRT).

## ‘Household chemicals’ were the most commonly notified substance category in 2019

Most hazardous substances injury notifications in 2019 fell under the HSNO Act (86 out of 101 notifications). The most commonly identified substance was bleach/sodium hypochlorite (10 notifications) followed by cleaning agent (9 notifications), and drain cleaner (4 notifications) (Table 1).

Household chemicals were the most notified substance for notifications involving children under five years old (12 out of 19 notifications).

Essential oils such as from a reed or other diffuser and fragrance oil were the most common substance ingested unintentionally by children under five years old (4 out of 19 notifications), followed by insecticide spray (3 notifications), and rodenticides (3 notifications). Two of the incidents involved storage of chemicals in an inappropriate container.

**Table 1: HSNO Act notifications, 2019**

Substance	Number of notifications
Bleach/Sodium hypochlorite	10
Cleaning agent	9
Drain cleaner	4
Rat poison	3
Insecticide spray	3
Ant poison	2
Brake fluid	2
Petrol	2
Antifreeze	2
Turpentine	2
Ethylene Glycol	2
Nitric oxide	2
Disinfectant	2
Mothball	1
Sodium fluoroacetate	1
Enamel paint	1
Essential oil	1
Exit Mould	1
Hair dye	1
Nail polish remover	1
Paint fumes	1
Chlorine	1
Herbicide	1
Methylated spirits	1
Vape liquid	1
Pinetarsol	1

Substance	Number of notifications
Oven cleaner	1
Aerosol air freshener	1
Car wash and wax	1
Fragrance oil	1
Metal cleaner	1
Diffuser oil	1
Chlorine tablet	1
Washing detergent	1
Reed diffuser	1
Weed/moss killer	1
Car break cleaner and degreaser	1
Paint stripper	1
Ammonium bifluoride	1
Spray paint	1
Methylated chloride	1
Sodium hydroxide	1
Solvent based paint	1
Ammonia	1
Sulphuric acid	1
Toluene	1
Methane gas	1
Oil based decking stain	1
Nitric dioxide	1
Car battery acid	1
Unknown	4
<b>Total</b>	<b>86</b>

Source: Hazardous Substances Disease and Injury Reporting Tool (HSDIRT).

Of the notifications that fell under the Health Act in 2019 (15 of 101 notifications) the most commonly identified substance was carbon monoxide (Table 2).

**Table 2: Health Act notifications, 2019**

Substance	Number of notifications
Carbon monoxide	10
Fertiliser	2
Smoke	2
Cyanobacteria toxin	1
<b>Total</b>	<b>15</b>

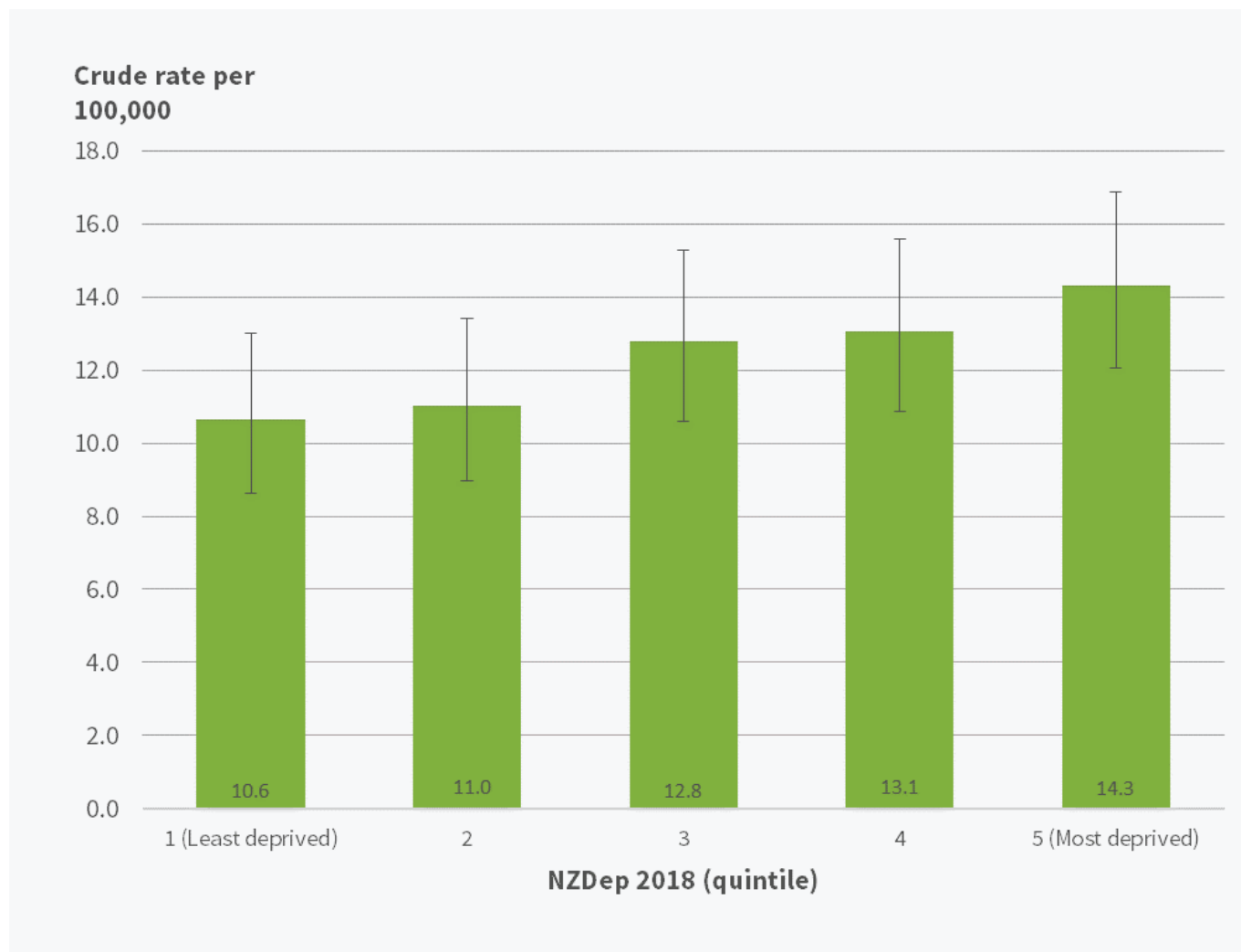
Source: Hazardous Substances Disease and Injury Reporting Tool (HSDIRT).



## The highest hazardous substances injury notification rates occurred in the most deprived areas

In 2014–19, there is an increasing rate of hazardous substance injury notifications with increasing NZDep Quintile levels (from least deprived to most deprived) (Figure 6).

**Figure 6: Hazardous substances notification rate, by NZ Deprivation 2018 quintile, 2014–19 (crude rate per 100,000)**

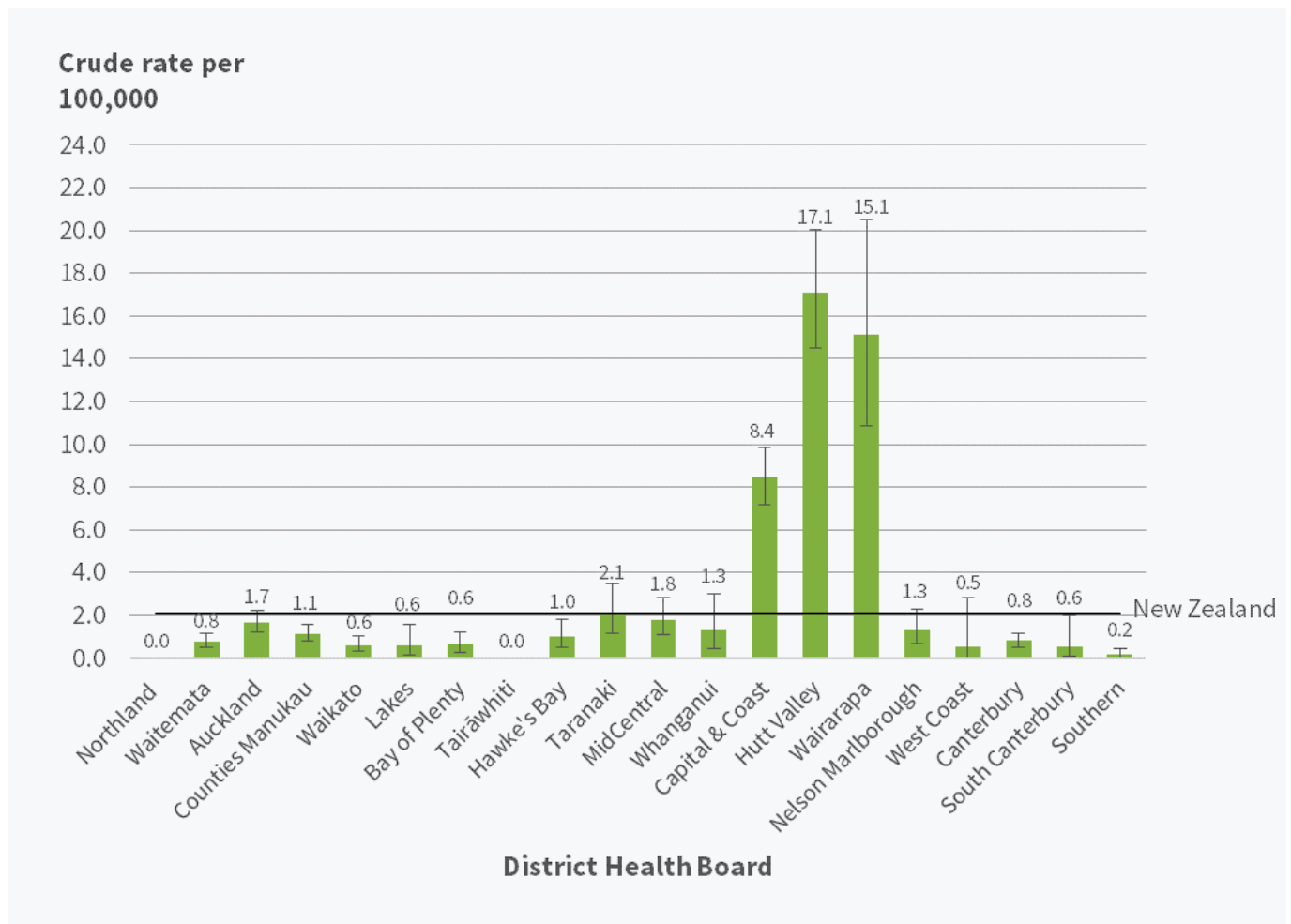


**Source:** Hazardous Substances Disease and Injury Reporting Tool (HSDIRT).

## Higher hazardous substances notifications rates in Hutt Valley, Wairarapa and Capital & Coast DHBs

From 2014–19, people living in the Hutt Valley, Wairarapa and Capital & Coast DHB had higher rates of hazardous substance notifications compared to other DHBs (Figure 7). This is most likely due to reporting bias rather than increased harm from hazardous substances given increased use of the HSDIRT in these areas. On the other hand, Northland and Tairāwhiti DHBs had the lowest notification rates.

**Figure 7: Hazardous substances notification rate, by District Health Board, 2014–19 (crude rate per 100,000)**

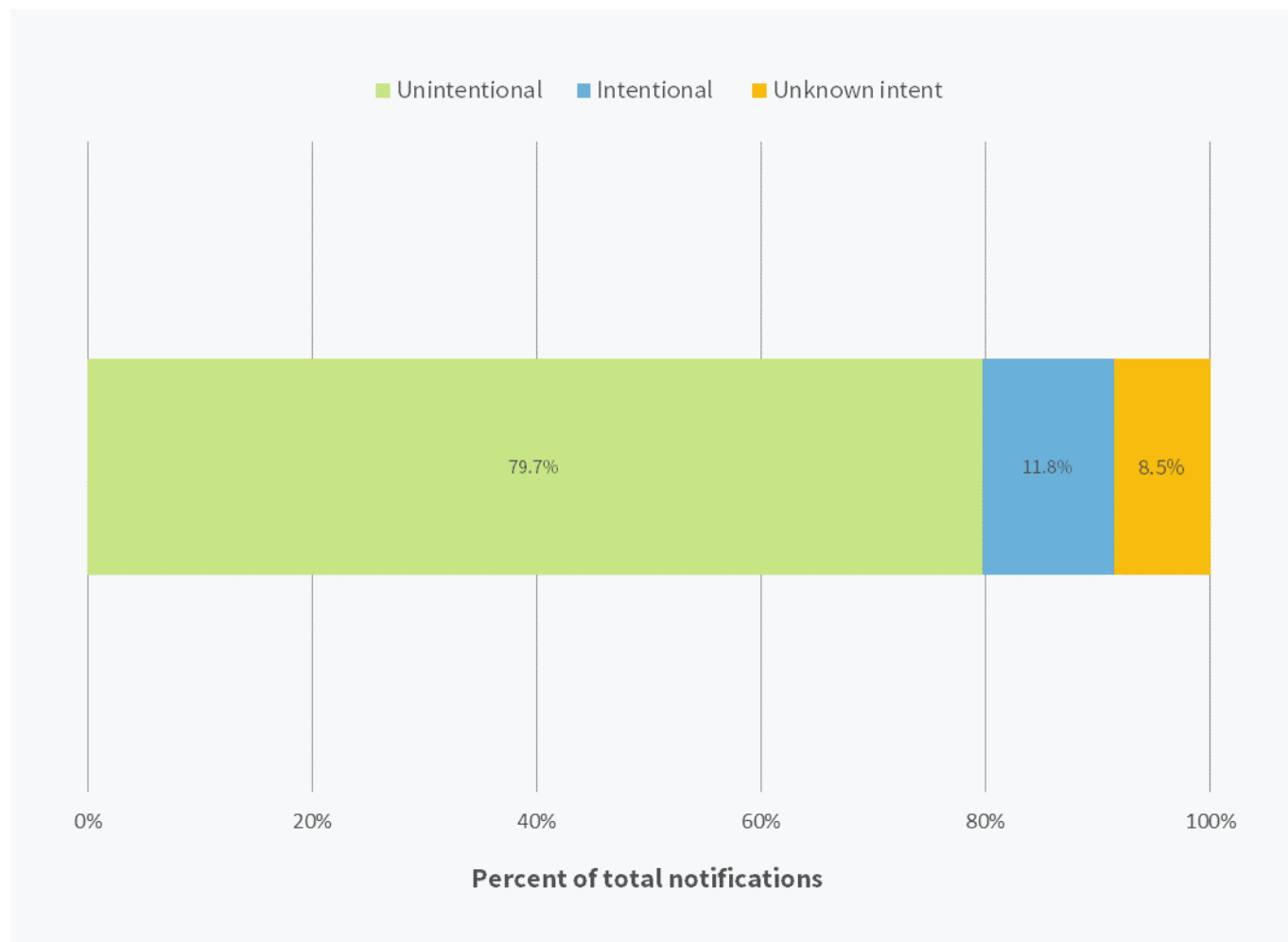


**Note:** The notification rate is influenced by the variable use of HSDIRT by DHB.  
**Source:** Hazardous Substances Disease and Injury Reporting Tool (HSDIRT).

## The majority of hazardous substance injuries notified in 2014–19 were unintentional

In the six-year period 2014–19, 79.7% of hazardous substance injury notification listed intent as “unintentional” (486 out of 610 notifications), 11.8% were “intentional” (72 notifications), and 8.5% were listed as “unknown intent” or left blank (52 notifications) (Figure 8).

**Figure 8: Hazardous substances notifications, by intent, 2014–19 (% of total notifications)**

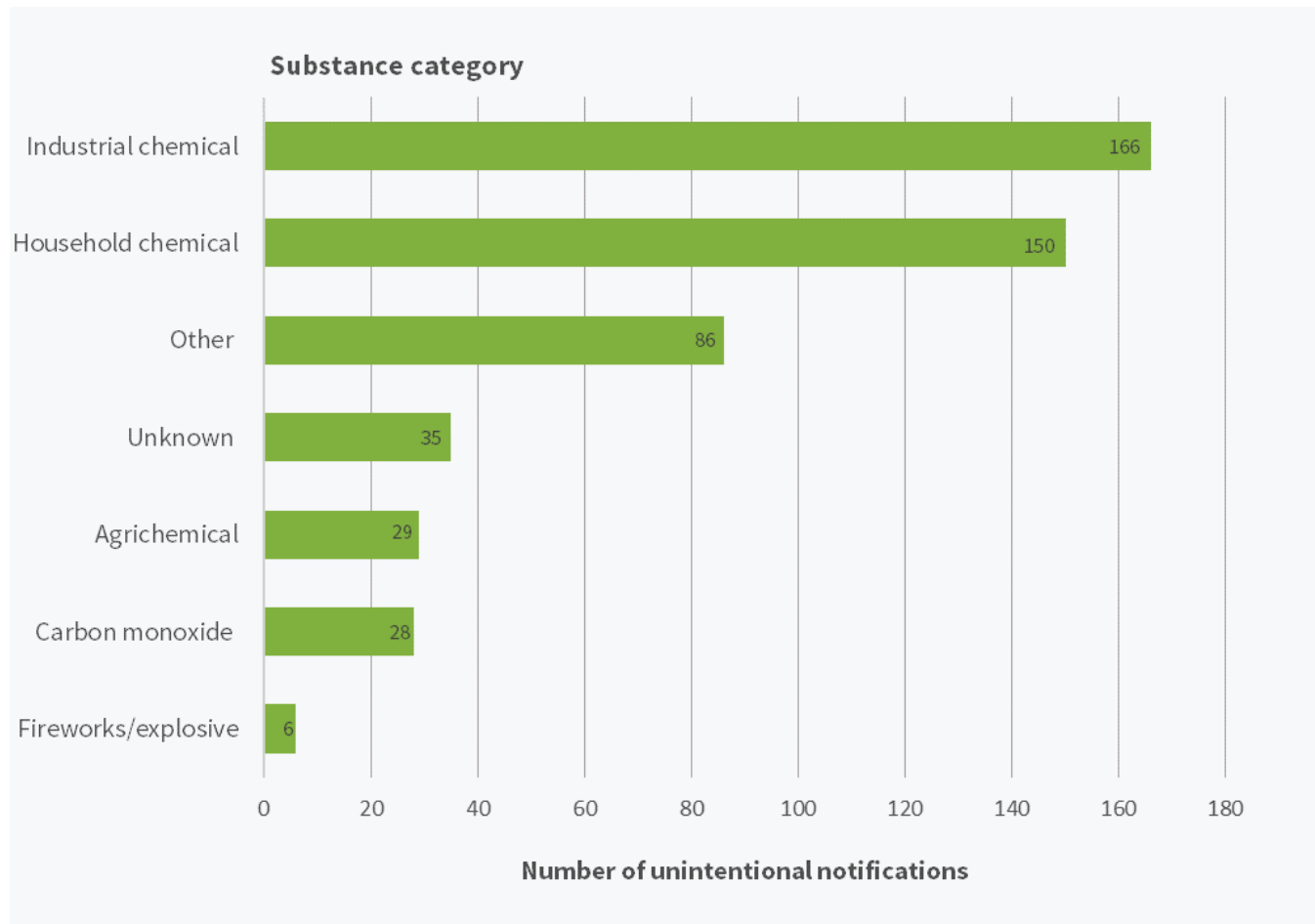


**Source:** Hazardous Substances Disease and Injury Reporting Tool (HSDIRT).

## Unintentional exposure to 'industrial chemicals' was the most common cause of notification in 2014–19

In 2014-19, the most common cause of unintentional notifications was industrial chemicals (166 out of 500 notifications), followed by household chemicals (150 notifications) (Table 3).

**Figure 9: Number of unintentional substances notifications, by substance category, 2014–19**



**Note:** More than one substance category can be reported for a single notification.

**Source:** Hazardous Substances Disease and Injury Reporting Tool (HSDIRT).

## The most commonly notified place of injury was the home in 2014–19

In 2014–19, 46.9% of hazardous substance injuries occurred in the home (288 notifications), followed by the workplace at 29.6% (182 notifications) (Table 3). Most notifications were in the 25–44 years age range (211 of 614 notifications) followed by 45–64 years (156 notifications). For children under five, most hazardous substance injuries occurred in the home (54 of 62 notifications), because that’s where they spend most of their time.

**Table 3: Number of hazardous substances notifications, by exposure place and age group, 2014–19**

Exposure place	00–04 years	05–14 years	15–24 years	25–44 years	45–64 years	65+ years	Unknown age	Total
Home	54	15	28	84	66	31	10	288
Workplace	1	0	33	81	57	3	7	182
Public place	1	1	6	7	8	3	1	27
School/Early childhood centre	0	12	2	1	0	0	0	15
Other	1	1	5	5	9	3	1	25
Unknown exposure place	5	3	13	33	16	7	0	77
<b>Total</b>	<b>62</b>	<b>32</b>	<b>87</b>	<b>211</b>	<b>156</b>	<b>47</b>	<b>19</b>	<b>614</b>

**Note:** More than one place of exposure can be reported for a single notification.

**Source:** Hazardous Substances Disease and Injury Reporting Tool (HSDIRT).

## Data for this indicator

This indicator reports HSDIRT hazardous substance injury notifications, not including lead, from 2014 to 2019. Data have sometimes been pooled to give sufficient numbers for analysis where appropriate.

95% confidence intervals have been presented as error bars on graphs. Unless otherwise stated, all differences mentioned in the text between two values are statistically significant at the 5% level or less.

## References

Landrigan PJ, Garg A, Kimmel CA et al. 2004. Children's health and the environment: public health issues and challenges for risk assessment. *Environmental health perspectives*, 112(2), 257-265.

McKenzie LB, Ahir N, Stolz U et al. 2010. Household cleaning product-related injuries treated in US emergency departments in 1990–2006. *Pediatrics*, 126(3), 509-516.

Worksafe – Mahi Humaru Aotearoa. 2017. *Information on Hazardous Substances*. <https://worksafe.govt.nz/topic-and-industry/hazardous-substances/about-hazardous-substances/>

## Other hazardous substances topics include:

[Health effects of hazardous substances](#)

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