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Non-occupational/unknown source of lead absorption notifications

This report presents data on non-occupational lead absorption notifications and notifications with unknown lead sources entered into the Hazardous Substances Disease and Injury Reporting Tool (HSDIRT) from 2014–2022.

Headline

Non-occupational lead absorption notifications have roughly doubled since the introduction of the new notifiable threshold in 2021.

Key facts

Lead-based paint is the most common source of exposure, accounting for 30% of notifications since 2014.

Adult males in all 10-year age groups have considerably higher rates of lead absorption than females of the same age in 2021–22.

Notification rates in Hawkes Bay, Taranaki and MidCentral public health units were roughly double the national rate in 2021–22.

Lead absorption investigation guidelines

Although no safe level of exposure to lead has been found, the blood lead levels required to be notified in New Zealand are lead absorption equal to or in excess of 0.24 µmol/L. At and above this level, public health intervention is required for children and non-occupationally exposed adults.

Public health intervention and investigation of sources and pathways is dependent on the blood lead level of the individual as set by the Ministry of Health (2021):

Blood lead level	Guidelines
0.24–0.48 µmol/L	Investigate sources particularly for children and pregnant women.
0.48–0.71 µmol/L	Investigate sources for all cases
0.72–0.95 µmol/L	Investigate sources for all cases. Notify child's general practitioner.
0.96–2.16 µmol/L	Investigate sources with spot tests and laboratory analysis of appropriate environmental samples
≥2.17 µmol/L	Investigate sources with spot tests and laboratory analysis of appropriate environmental sources Children (0–14 years), arrange an urgent paediatric assessment. Adults (15+ years), refer to a physician if BLL ≥3.4 µmol/L.

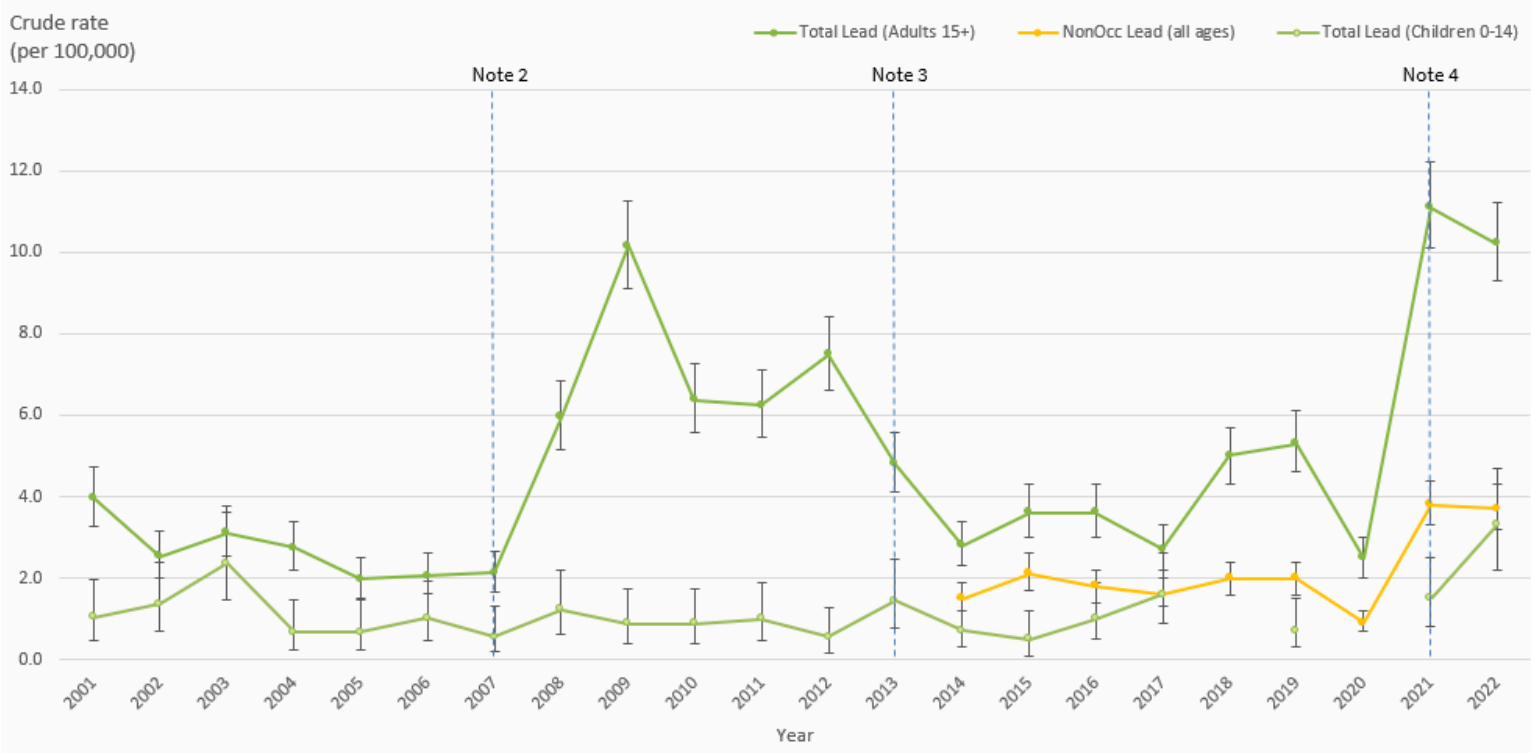
This report presents lead absorption notifications based on a notification threshold of ≥0.48 µmol/L up until 9 April 2021 and ≥0.24 µmol/L thereafter. Information on the health risks of lead absorption for adults and children can be found on the Ministry of Health website.

Notification rates for children and adults double due to the new notifiable level

Non-occupational lead notification rates doubled in 2021 (3.8 per 100,000) and remained high in 2022 (3.7 per 100,000) (Figure 1). This increase was driven by adult notifications, with roughly 60% having blood lead levels of 0.24–0.47 µmol/L (Figure 2a).

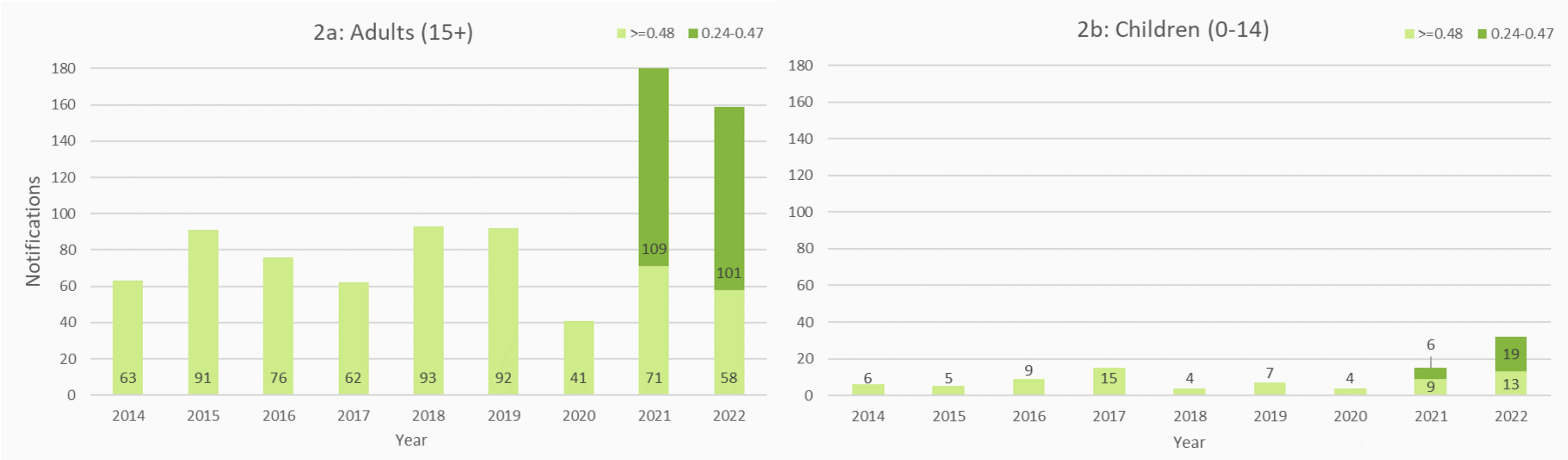
Child notification rates doubled from 2021 (1.5 per 100,000) to 2022 (3.3 per 100,000). Roughly 60% of these notifications were also within the new notifiable range (Figure 2b). It should be noted that while children have low notification rates relative to adults, they should be considered high risk due to leads impact on cognitive and neurobehavioral development (Ministry of Health 2021).

Figure 1: Non-occupational lead absorption notification rates, and total rates by age, 2001–22



Note 1: 95% confidence intervals have been presented as error bars. Missing rates have been suppressed due to unreliable estimates based on small numbers. See metadata for more information.
Note 2: In 2007 direct laboratory notifications were introduced and the notifiable range was reduced to 0.48 µmol/L.
Note 3: Over the course of 2013, HSDIRT was introduced to districts (formerly district health boards) across New Zealand. Data from HSDIRT is presented from 2014 onwards.
Note 4: On 9 April 2021, the notifiable range was reduced to 0.24 µmol/L.
Source: Hazardous Substances Disease and Injury Reporting Tool (HSDIRT) 2023.

Figure 2a, 2b: Non-occupational lead absorption notifications, adults (15+) and children (0–14), 2014–22



Source: Hazardous Substances Disease and Injury Reporting Tool (HSDIRT) 2023.

Lead-based paint and rifle ranges are the most common non-occupational lead sources

Lead-based paint has consistently been the most common, known non-occupational source of lead (282 notifications) followed by Indoor rifle ranges (144 notifications) in 2014–22 (Table 1). Traditional medicines and cosmetics continue to be the cause of many higher range BLL's. Of the 25 notifications since 2014 resulting from this exposure source, the median BLL was 1.70 µmol/L.

Table 1: Median blood lead level and interquartile range, by exposure source, 2014–22

Exposure source	Notifications	Median blood lead level, µmol/L (Interquartile range)
Lead based paint	282	0.68 (0.51–1.00)
Indoor rifle range	144	0.60 (0.50–0.77)
Bullet/sinker manufacture	58	0.60 (0.49–0.79)
Pica	33	0.54 (0.33–0.97)
Traditional medicine or cosmetic	25	1.70 (0.57–4.38)
Other sources	99	0.62 (0.47–0.82)
Unknown source	381	0.60 (0.40–0.89)
Total*	**954**	**-**

Note: * Some notifications involve more than one lead source meaning the total can be less than the sum of the sources.
Source: Hazardous Substances Disease and Injury Reporting Tool (HSDIRT) 2023.

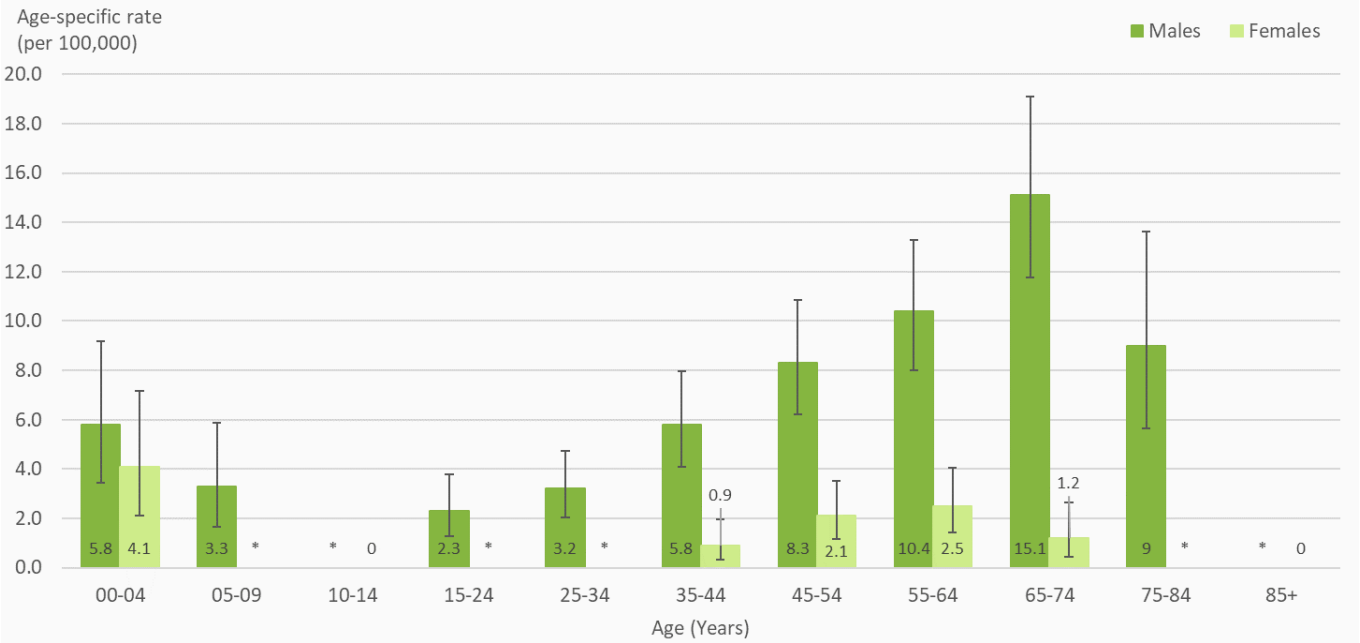
Some key points relating to individual sources from 2014–22 include:

- Indoor rifle ranges and bullet/sinker manufacturing notifications are primarily European/Other males (139/144 and 56/58 notifications respectively).
- Traditional medicines/cosmetics mainly affect Asian individuals (22/25 notifications).
- Indoor rifle ranges account for half of all notifications in Hawkes Bay and Taranaki.

Older adult males experience high notification rates

Adult males, 15+ years, in all age groups had higher notification rates than females in the same age group in 2021–22 (Figure 3). This has been consistent since 2014. Males aged 65–74 years had particularly high rates (15.1 per 100,000). These individuals were primarily exposed through lead-based paint, rifle ranges and bullet/sinker manufacturing (17, 16 and 10 notifications respectively).

Figure 3: Non-occupational lead absorption notification rates, by age and sex, 2021–22



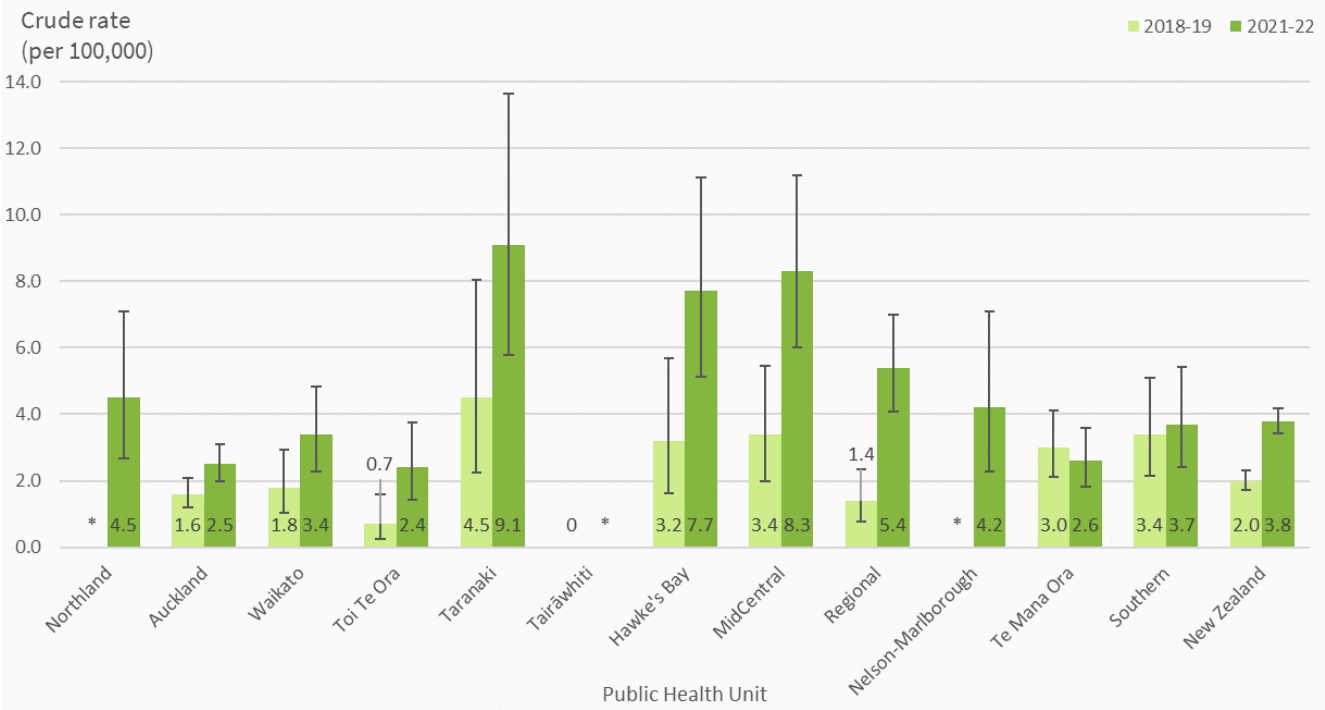
Notes: *The rate is suppressed as it is an unreliable estimate based on small numbers.
95% confidence intervals have been presented as error bars. See Metadata for more information.
Source: Hazardous Substances Disease and Injury Reporting Tool (HSDIRT) 2023.

Central North Island public health units experienced high notification rates

In 2021–22, Hawke's Bay, Taranaki and MidCentral public health units experienced notification rates of 7.7–9.1 per 100,000, roughly double the national rate of 3.8 per 100,000 (Figure 4). Rates in each of these regions have more than doubled from 2018–19, as have multiple other public health units around the country. Notification rates from 2020 have not been included due to a marked drop, potentially due to the COVID-19 pandemic.

It should be noted that a proportion of these increases relate to the new notifiable range in 2021–22. Compared to 60% of the national notifications having BLLs of 0.24–0.47 µmol/L, 40% of MidCentral, 50% of Hawke's Bay and 65% of Taranaki's notifications were in this range.

Figure 4: Non-occupational lead absorption notification rates, by PHU, 2018–19 and 2021–22



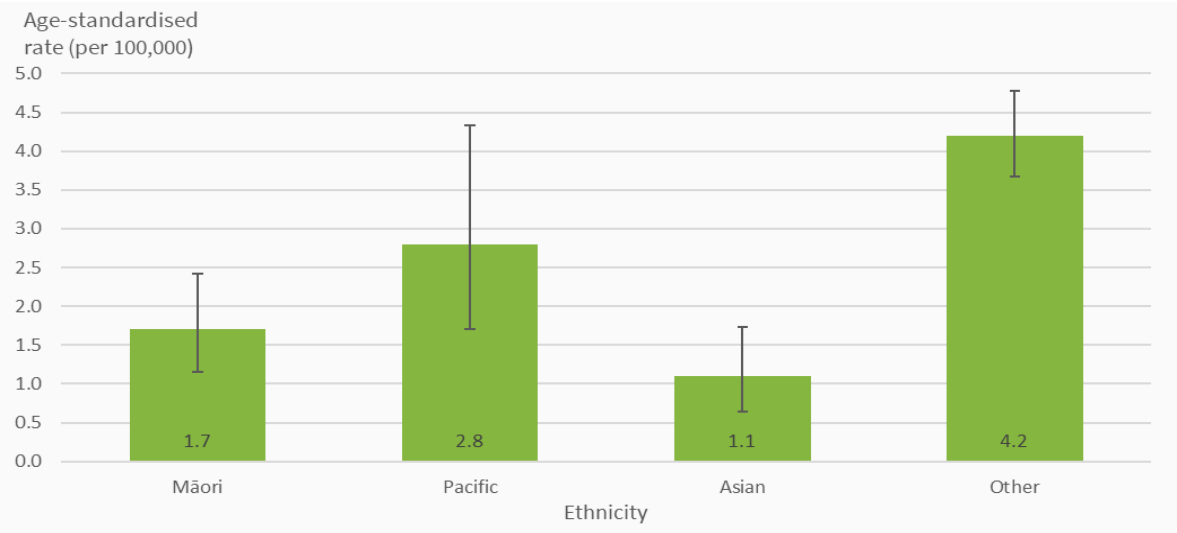
Notes: *The rate is suppressed as it is an unreliable estimate based on small numbers.
95% confidence intervals have been presented as error bars. See Metadata for more information.
Source: Hazardous Substances Disease and Injury Reporting Tool (HSDIRT) 2023.

Notification rates are high for European/Other individuals

Age-standardised rates for European/Other individuals (4.2 per 100,000) were high compared to Pacific Peoples (2.8 per 100,000) and more than double that of Māori and Asian Peoples in 2021–22 (Figure 5). Median BLL's were similar between ethnic groups ranging from 0.32 µmol/L for Pacific Peoples to 0.45 µmol/L for Māori. Of those aged 65+ years, 100 out of 103, were European/Other.

This differs from occupational lead notifications, where Pacific Peoples experience notification rates roughly triple any other ethnic group (EHINZ 2023).

Figure 5: Non-occupational lead notification rates, by ethnicity, 2021–2022



Note: 95% confidence intervals have been presented as error bars. See Metadata for more information.
Source: Hazardous Substances Disease and Injury Reporting Tool (HSDIRT) 2023.

DATA FOR THIS INDICATOR

This indicator reports HSDIRT non-occupational/unknown source lead absorption notifications from 2014 to 2022. The data were extracted from the HSDIRT system on 6 March 2023. Updates or additions made to HSDIRT after this date are not reflected in this factsheet.

Crude rates presented do not take into account varying age distributions when comparing between populations. Age-standardised rates presented take into account varying age distributions when comparing between populations.

REFERENCES

Ministry of Health. 2021. *The Environmental Case Management of Lead-exposed Persons.* Wellington: Ministry of Health. URL: https://www.health.govt.nz/publication/environmental-case-management-lead-exposed-persons (accessed 12 August 2023)

Environmental Health Intelligence NZ, 2023. *Occupational lead absorption notifications*. Wellington: Environmental Health Intelligence NZ, Massey University.

Other related topics include:

Occupational lead absorption notifications

Unintentional hazardous substances-related hospitalisations

Hazardous substances-related deaths registered in New Zealand

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

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Further information

For descriptive information about the data Metadata Sheet

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