Information topic	Details
Indicator name	**Occupational lead absorption notifications in New Zealand**
Domain and topic	Hazardous Substances domain: Occupational lead absorption notifications
Indicator definition and units	The number and rate occupational lead absorption notifications entered into the HSDIRT reporting tool in New Zealand, where the blood lead level is greater than or equal to 0.48µmol/l before 09/04/2021 and greater than or equal to 0.24µmol/l from 09/04/2021 onwards.
Data source	The Hazardous Substances Disease and Injury Reporting Tool (HSDIRT). 2013 – present. Episurv: 2001 – 2013.
Numerator	Number of occupational lead absorption notifications.
Denominator	Population estimates (2018 and prior) and projections (after 2018) from Statistics New Zealand and the 2018 denominator population by NZDep2018 deciles, age group and sex has been used.
Methodology	Due to the health effects associated with lead exposure, lead absorption is a notifiable condition if the blood levels are greater than or equal to 0.24µmol/l as of 09/04/2021. GPs or local Public Health Units notify cases of hazardous substance exposures, including lead, to the HSDIRT which is administered by Environmental Health Intelligence NZ. The date of lead notifications is approximated using the lab lead results date. In the event this is not available, the date of assessment recorded by the PHU is used for analysis. If both dates are not available, then the created date of the HSDIRT notification is used. Lead notifications are classified as occupational if “Exposure Place” is recorded as “WORKPLACE” or if the “Exposure Lead Source” is recorded as “OCCUPATIONAL”. Lead notifications classified as unknown have not been classified as either occupational or non-occupational. Occupations have been grouped into 20 separate career groups which can be found in Appendix 1. Where a person has had a repeat blood lead level taken within 366 days of the original test, the repeat blood test is not included as a second notification unless

	further investigation or public health action has resulted. NHI number is used to identify individuals with repeat tests. A lead level must be provided for the case to be included in the analysis. Prioritised ethnic group has been used, in the following prioritisation order: Māori, Pacific peoples, Asian, European/Other. Crude rates are suppressed for counts less than 5 or populations less than 30, due to unreliability of the estimate with small numbers. Age-standardised rates are suppressed for overall counts less than 20, or if any age-band of the calculation has a population less than 30, due to unreliability of the estimate with small numbers (Ahmad et al 2001). **Confidence intervals** 95% confidence intervals were calculated based on the methodology outlined in APHO (2008). Confidence intervals are presented as error bars on graphs.
Time period and time scale	The HSDIRT was rolled out progressively to all districts throughout 2013; therefore 2013 data were not complete. Consequently, notification data is reported from 2014 onwards. For the national time series, 2013 notifications are a combination of EpiSurv and HSDIRT data.
Population coverage	All adults aged 15+ years in New Zealand.
Spatial Coverage	National
Measures of frequency	Results are presented by year, sex, age group, median blood lead levels, ethnic group, occupation, NZDep2018 (Atkinson et al 2021), and PHUs.
Limitations of indicator	Lead absorption is challenging to detect based on symptoms alone as many cases are asymptomatic and will therefore not be seen by a doctor and/or have a blood lead test. In some instances, a blood lead test will occur because of awareness of the person's occupation.
Limitations of data source	This data source, only includes cases that were notified and will be underestimating the total burden of disease and injury caused by lead exposures. Also, a case will not be included in the analysis if the GP is unaware of the tool and does not use it to notify cases to the Public Health Service or the laboratory does not directly notify the blood lead result to EpiSurv.
Created by	Environmental Health Intelligence NZ, Massey University, Wellington.

Related indicators	Hazardous substances notifications in New Zealand Non-occupational lead absorption notifications in New Zealand Hazardous substances-related deaths reported to the coroner in New Zealand Hazardous substances-related deaths registered in New Zealand Unintentional hazardous substances-related hospitalisations Unintentional hazardous substances exposures in children (0–14 years)
For more information	HSDIRT notification tool. https://www.ehinz.ac.nz/indicators/hazardous-substances/resources-for-health-professionals/
References	Ahmad, O.B, Boschi-Pinto, Lopez, et al. 2001. *Age Standardization of Rates: A New WHO Standard (Technical Report).* GPE Discussion Paper Series: No. 31. Geneva: World Health Organization. Atkinson J, Salmond C, Crampton P. 2021. NZDep2018 analysis of Census 2018 variables. Wellington: Department of Public Health, University of Otago, Wellington. URL: https://www.otago.ac.nz/wellington/departments/publichealth/otago830998.html APHO. 2008. *Technical Briefing 3: Commonly used public health statistics and their confidence intervals.* York, UK: Association of Public Health Observatories.

Appendix 1: Occupational groupings

Category	Description
Painting	Any individual classified as a painter
Sandblasting	While some of these individuals may work in construction or as painters, it has not been specified in the occupation field.
Construction (non-painter)	Any workers in the construction sector that are not painters (builder, brick layer, carpenter, plumber etc).
Smelting/Metal working	Anything that isn't metal recycling (extrusion, foundry, smelting, welding etc).
Metal recycling	Specify metal recycling, scrap metal industries
Battery manufacturing/recycling	Small category but specifically individuals working in the manufacturing or recycling of batteries
Automotive repair	Mechanics, radiator repairers, panel beaters, diesel mechanics etc.
Engineer/technician (non-automotive)	Specified as an engineer in a field other than automotive.
Factory worker (other/unspecified)	Specified as a factory worker (e.g., forklift operator or labourer in a factory).
Lead-light/window/stained glass worker	Specified as a lead light worker, glass fitter or glazier.
Firearms User	Specified as working with firearms, armoury, police, military, large pest control etc.
Sinker/figurine manufacturing	Very small category. Individuals make figurines, sinkers and diving weights.
Artist (non-painter)	Classified as an artist other than painters (ceramicists, pottery, drawing with lead based pencils etc). Includes printing and picture framing work.
Mining/oil and gas	Specified as working in the mining sector or working directly with oil or gas (petrol stations, oil refineries, gas bottle servicing etc)
Office Worker	Careers that don't fall into other categories that would be considered office jobs (accountant, IT, HR, radio presenter, dispatch operator etc).
Health sector	All healthcare workers (GPs, pharmacists, nurses, psychologists, dentists etc).
Hospitality	Individuals working in the food sector (chefs, fast food, catering, baristas etc)
Other	These are specified careers in an industry that don't fall into any of the above categories
Insufficient detail	These positions are too vague to know which industry or sector they work in (consultant, self-employed, technician, researcher, sales, manager, scientist etc). These could be investigated further and then re-classified.
Unknown	These either aren't jobs (unemployed, retired, beneficiary, home maker, student) or are just not recorded (unknown, not stated etc).
Shouldn't be included (child)	Under "Occupation" these have been listed as children (infant, child under X, primary school student etc). "Student" should be classified as "Unknown" as they may be old enough to be working. These cases should not be classified as "Occupational exposures".