Lead absorption notifications in New Zealand

HIGHLIGHTS:

- **Lead absorption is an important public health problem and is a notifiable disease in New Zealand.**
- **Young children are at greater health risk than adults.**
- **The number of lead notifications decreased in 2015 compared to 2014.**
- **There were 37 (31%) lead notifications where occupation was recorded as the source of exposure in 2015 compared with 56 (43%) notifications in 2014.**
- **In 2015, there were 87 lead notifications from non-occupational or unknown exposures, six of which were for children under 15 years old.**
- **In 2014, there were 79 lead notifications from non-occupational or unknown exposures, eight of which were children under 15 years old.**
- **In 2014 and 2015, lead-based paint was the most common source of non-occupational or unknown lead exposure for both children and adults.**

Lead absorption is an important under-recognised public health issue

Lead absorption is an important, and under-recognised, public health issue. The World Health Organization (WHO) ranks lead among 10 chemicals of major public health concern. Lead poisoning accounts for about 0.6 percent of the global burden of disease and is one of the most common childhood diseases of toxic environmental origin (WHO, 2010). Young children are at greater health risk than adults. Their behaviour and physiology make them more susceptible to exposure and absorbing lead. When lead is ingested or inhaled, it travels to the bloodstream where it accumulates in tissues such as bones and teeth, from which it may be released back into the bloodstream (Ministry of Health, 2012).

In New Zealand, lead absorption is a notifiable disease if the whole blood lead level is greater than or equal to 0.48 micromoles per litre (µmol/l). At this level, public health interventions are required for children and non-occupationally exposed adults (Ministry of Health, 2012).

An electronic reporting system, the Hazardous Substances Disease and Injury Reporting Tool (HSDIRT), was designed for general practitioners (GPs) to notify cases of disease and injury related to lead and other hazardous substances. The HSDIRT has operated throughout New Zealand since late 2013 and has replaced the EpiSurv surveillance system for lead since January 2014.

The number of lead notifications decreased in 2015 compared to 2014

There were 121 notifications of lead absorption in 2015 (2.6 per 100,000 population) compared with 130 notifications in 2014 (2.9 per 100,000 population) (Figure 1).

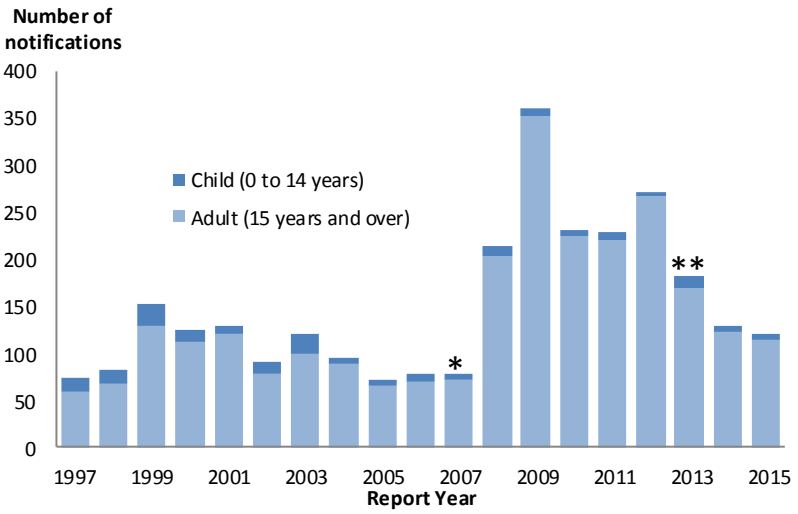
Note:

*In 2007, direct laboratory notification was introduced, the non-occupational notifiable blood lead level was lowered from 0.72 to 0.48µmol/L and enhanced occupational screening was introduced in the Auckland region.

** In 2013, the HSDIRT was rolled out to all health districts. Repeat blood lead level tests taken within a year of the original test have been excluded from the data unless further public health investigation has resulted.

Sources: Institute of Environmental Science and Research (1997-2013) and HSDIRT (2013-2015).

Figure 1: Number of lead notifications in children and adults by year, 1997-2015



Lead absorption notifications in New Zealand

Males were the most affected

In 2015, 84 percent (102/121) of all lead notifications were males, and the most common age groups were 45-64 years (56 notifications), followed by 25-44 years (33 notifications) (Table 1). The most common ethnic group was European/Other with 85 notifications.

In 2014, 82 percent (106/130) of all lead notifications were males, and the most common age groups were 45-64 years (58 notifications) and 25-44 years (38 notifications) (Table 1). The most common ethnic group was European/Other with 95 notifications.

Table 1: Demographics of lead absorption notifications, 2014-2015

Age group (years)	2015				2014			
	Female	Male	Unknown	Total	Female	Male	Unknown	Total
00-04	6			6	2	2		4
05-14					1	2	1	4
15-24		9		9	2	10		12
25-44	7	26		33	4	34		38
45-64	3	52	1	56	10	48		58
65+	2	14		16	3	10		13
Unknown		1		1			1	1
Ethnicity								
Māori	1	4		5	1	7		8
Pacific	1			1		2		2
Asian		4		4	2	4		6
European/ Other	12	72	1	85	14	80	1	95
Unknown	4	22		26	5	13	1	19
Total	**18**	**102**	**1**	**121**	**22**	**106**	**2**	**130**

Sources HSDIRT (2015).

For occupational lead notifications, painters were the most exposed to lead

In 2015, there were 37 lead absorption notifications (31% of all lead notifications) where occupation was recorded as the source of exposure. Painter (17 notifications) was the most commonly reported occupation, followed by radiator repairer (5 notifications) (Table 2).

In comparison, there were 56 occupational lead notifications (43% of all lead notifications) in 2014. Painter (20 notifications) and metal worker (5 notifications) were the most commonly reported occupations (Table 3).

Table 2: Number of lead absorption notifications by occupation, 2015

Occupation	Notifications
Painter	17
Radiator repairer	5
Builder	3
Metal worker	3
Glazier	2
Sandblaster	2
Engineer	1
Port worker	1
Renovator	1
Machinery mechanic/ fitter	1
Cabinet maker	1
Unknown	1
Total	**38**

Table 3: Number of lead absorption notifications by occupation, 2014

Occupation	Notifications
Painter	20
Metal worker	5
Mechanic	4
Bricklayer	3
Artist / handyman	1
Builder	1
Factory hand - organ company	1
Fibreglass worker	1
Jeweller	1
Joiner	1
Lab technician	1
Mine worker	1
Construction	1
Panel beater	1
Radiator fitter	1
Store manager	1
Store man	1
Welder	1
Unknown	10
Total	**56**

Note:

- Cases can be recorded as both occupational and non-occupational. Those cases were included in both occupational and non-occupational/unknown cases analyses.
- More than one occupation can be reported for a single notification. Therefore the sum of notification for each occupation may be higher than the total notifications.

Source for Table 3&4: HSDIRT (2015)

Lead absorption notifications in New Zealand

Lead-based paint was the most common source of non-occupational/unknown lead exposure in both children and adults

In 2015, there were 87 lead absorption notifications with the setting recorded as non-occupational or unknown (Table 4). Lead-based paint (26 notifications) and indoor rifle ranges (20 notifications) were the most common sources of lead exposure.

There were six non-occupational/unknown lead notifications for children under 15 years old in 2015, five of which were exposed to lead-based paint at home.

In 2014, there were 79 non-occupational/unknown lead absorption notifications. Lead-based paint (23 notifications) and indoor rifle range (17 notifications) were the most common sources of lead exposure (Table 5).

There were eight non-occupational/unknown lead notifications for children under 15 years old in 2014, half of them were exposed to lead-based paint.

Table 4: Number of non-occupational/unknown lead notifications, by source of lead, 2015

Non-occupational/unknown lead sources	Notifications
Lead-based paint	26
Indoor rifle range	20
Bullet/sinker manufacturer	5
Pica	2
Close contact with people who were exposed to lead	2
Traditional medicine or cosmetic	2
Leadlighting	1
Bullet	1
Lead-based solder	1
Unknown/other	34
Total	**94**

Table 5: Number of non-occupational/unknown lead notifications, by source of lead, 2014

Non-work lead source	Notifications
Lead-based paint	23
Indoor rifle range	17
Bullet/sinker manufacture	8
Traditional medicine or cosmetic	3
Pica	3
Close contact with people who were exposed to lead	1
Outdoor shooting	1
Gunshot wound	1
Lead contaminated soil	1
Unknown/Other	30
Total	**88**

Note:

- Cases can be recorded as both occupational and non-occupational. Those cases were included in both occupational and non-occupational/unknown cases analyses.
- More than one source of lead can be reported for a single notification. Therefore the sum of notification for each source may be higher than the total notifications.

Source for Table 4 and Table 5: HSDIRT (2015)

Health effects of lead absorption

Notifications of lead are not a true reflection of the problem. A number of cases go undetected as there is often no symptoms at lower lead levels (Ministry of Health, 2012). There is no known safe blood lead level. However, it is known that, as the blood lead level increases, the range and severity of symptoms and effects also increases (WHO, 2014). Low level lead absorption can affect the development of the brain and nervous system in young children including the fetus. This is considered irreversible. In adults, lead can cause long-term harm such as increased risk of high blood pressure and kidney damage. Exposure of pregnant women to high levels of lead can cause miscarriage, stillbirth, premature birth, and low birth weight (WHO, 2014).

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