National Hazardous Substances and Lead Notifications

January – December 2013

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cphr | hsss Hazardous Substances Surveillance System

Contents

Hazardous Substances and Lead notifications

Key Findings

1. 180 lead notifications
    - Mostly males (80%)
    - Occupational lead exposure
        - 81 occupational lead cases
        - 12 cases had a blood lead level ≥1.5 µmol/l. There were no cases reported above the 2.4 µmol/l suspension level
        - Most common occupations were painter/decorator, scrap metal worker, and foundry worker
        - One case required hospital admission
    - Non-occupation lead exposure
        - More than half (55%) are from non-occupational lead exposures
        - The highest blood lead level recorded was 5.5 µmol/l. Source of exposure was ayurvedic medicine
        - 13 notifications for children under 15 years old
        - Lead based paint and indoor rifle range were the most common source of lead exposure for adults

2. 63 hazardous substances notifications
    - Mostly males (70%)
    - Most common substance categories were household and industrial chemicals
    - Household agents were the most common cause of poisoning among children less than five years old
    - Six cases required hospital admission including a one year old child
    - 41 percent of injuries occurred in the workplace

3. Six poisoning arising from chemical contamination of the environment notifications
    - Two notifications involved in a single methamphetamine-related event. Both cases required hospital admission for unintentional poisoning

1. Introduction

The new 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 hazardous substances exposure. Notification is required under the Hazardous Substances and New Organisms (HSNO) and Health Acts. The HSDIRT is a short electronic form linked to a Patient Management System.

Following a pilot in one region, development of online resources and training of public health unit (PHU) staff, a phased roll out across PHUs occurred in 2013. A national communications strategy was also implemented to raise awareness about hazardous substances notifications.

Since November 2013 the HSDIRT is operating in all health districts of New Zealand.

2. Methods

2.1 Notifications included

This report records cases entered into the HSDIRT and EpiSurv. Notified cases are:

- Injuries and diseases due to hazardous substances (Hazardous Substances and New Organisms Act 1996)
- Lead absorption where blood lead level is greater than or equal to 0.48µmol/l (Health Act 1956) [1], and
- Poisoning arising from chemical contamination of the environment (Health Act 1956)

2.2 Time period and HSDIRT implementation

This report includes data from 1 January 2013 to 31 December 2013.

Implementation of the HSDIRT occurred on:

- 1 February: Regional Public Health
- 6 June: Taranaki and Waikato
- 24 June: Nelson-Marlborough, MidCentral, and Tairawhiti
- 1 July: Hawke's Bay, Community and Public Health, and Public Health South
- 15 July: Toi Te Ora
- 1 November: Auckland Regional Public Health Service
- 20 November: Northland

All notifications, from these dates on were entered into the HSDIRT. Notifications made prior to the implementation of the HSDIRT were completed in EpiSurv and have been included in this report.

2.3 Data checking

Notification data supplied by the PHUs via the HSDIRT have been checked by CPHR. Where an error or duplicate was suspected this was discussed with the PHU and a decision made regarding inclusion or removal of the notification from the analysis.

[1] Lead absorption can also be notified under the HSNO Act

2.4 Standard procedure regarding repeat lead levels

As stated in the Ministry of Health's Environmental Health Circular Letter April 2013, where a person has had a repeat blood lead level taken within 12 months of the original test, the repeat blood test is not included as a second notification unless further investigation or public health action has resulted.

3. Results

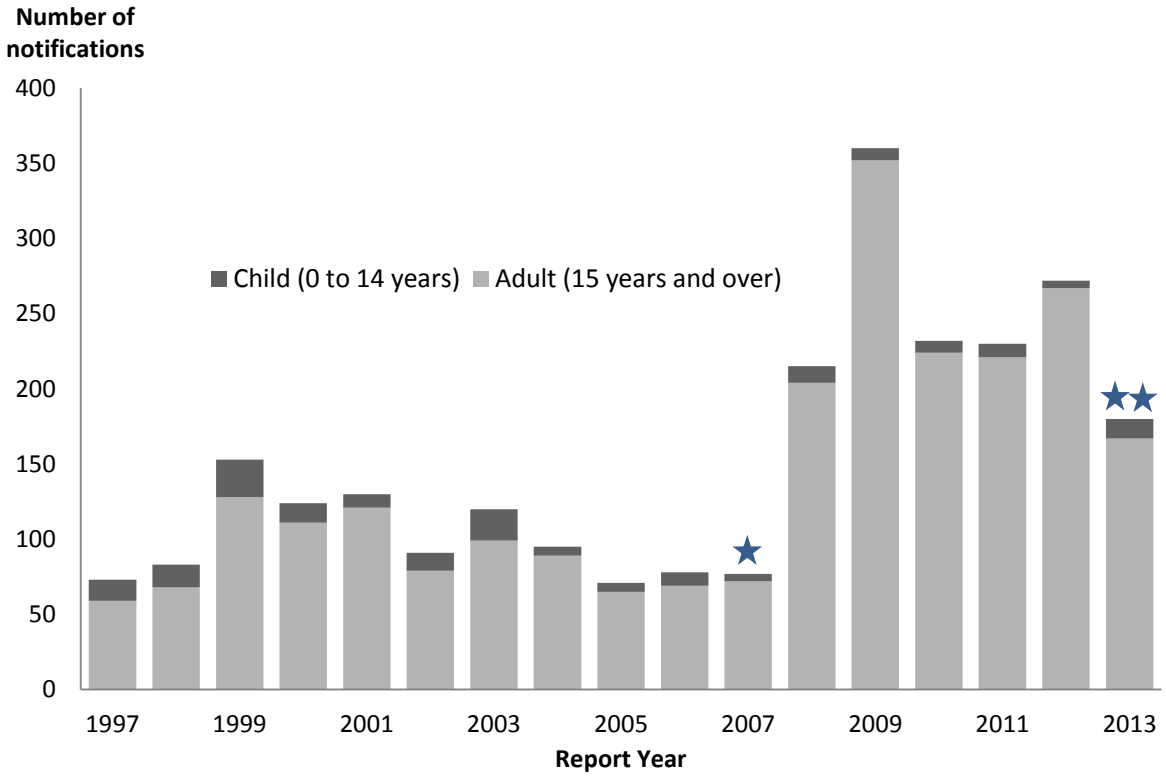
3.1 Total number of notifications

There were a total of 249 notifications in 2013. These included 180 lead notifications, 63 hazardous substances notifications, and six cases of poisoning arising from chemical contamination of the environment.

3.2 Lead absorption notifications

There were 180 notifications of lead absorption in 2013 (4.0 per 100 000 population) compared with 272 cases in 2012 (6.1 per 100 000 population) (Figure 1). The removal of blood lead level tests taken within 12 months of the original test may have contributed to the reduction of lead notifications in 2013.

Figure 1: Lead notifications in children and adults by year, 1997 - 2013



***** 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 investigation has resulted.

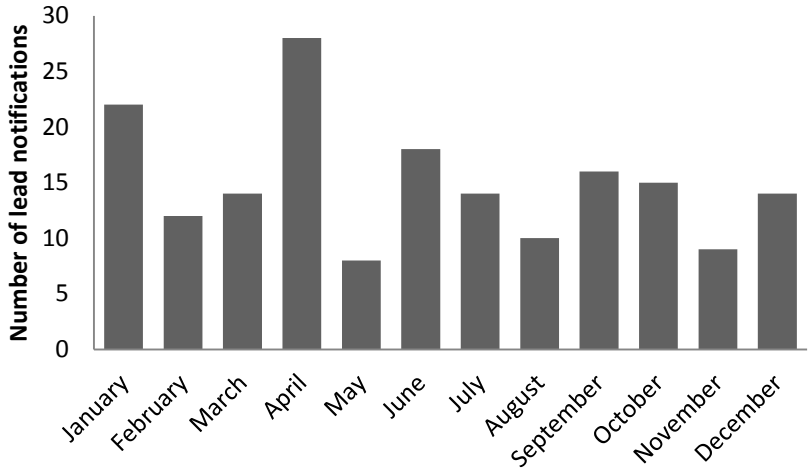
Over 80 percent of all lead notifications were males and the most common age ranges were 45-64 and 25-44 years (Table 1). The most common ethnic group was European/Other.

Table 1: Demographics of lead notifications, 2013

Gender	Female	30
	Male	150
	Total	**180**
Ethnicity	Māori	13
	Pacific	6
	Asian	7
	European/Other	137
	Unknown	17
	Total	**180**
Age Group (years)	0-4	7
	5-14	6
	15-24	12
	25-44	58
	45-64	80
	65+	17
	Total	**180**

April had the highest number of lead notifications (n=28) for 2013 followed by 22 notifications in January (Figure 2). There was no evidence of a seasonal trend.

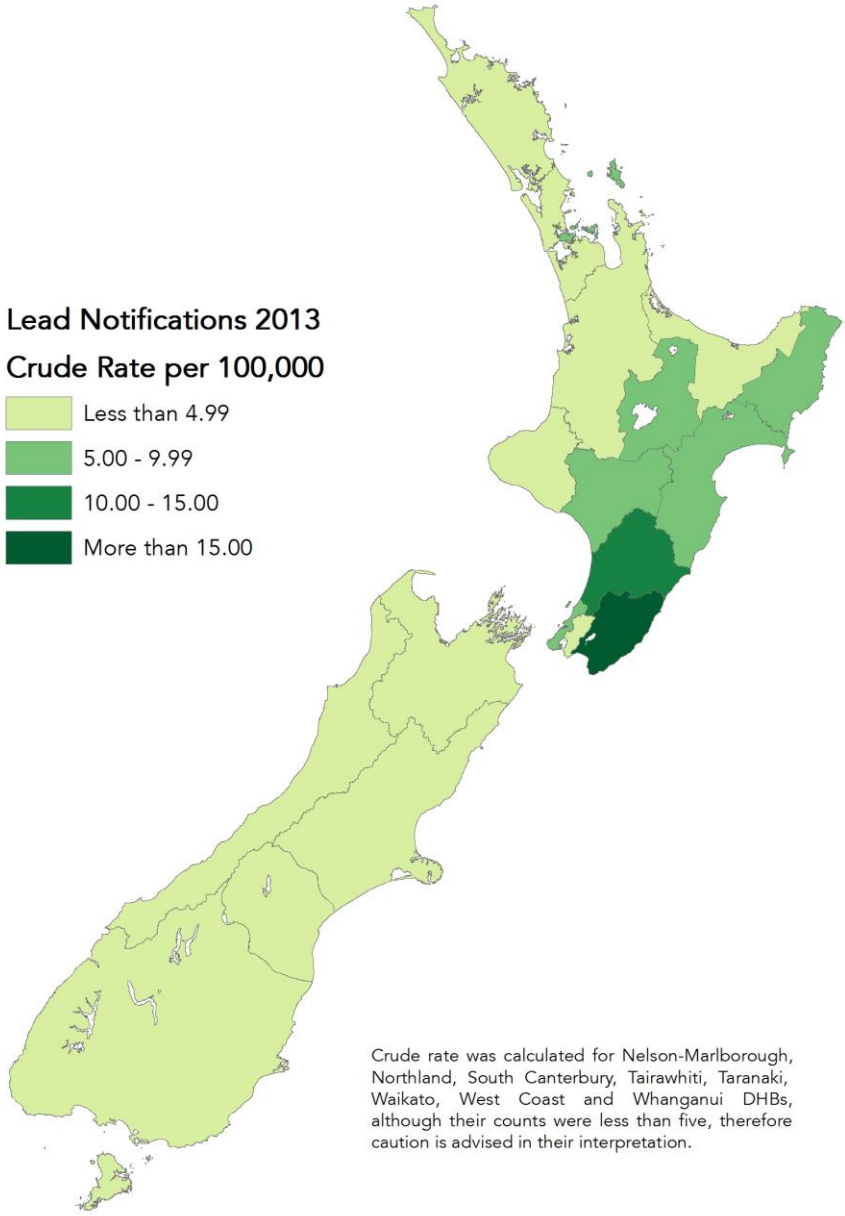
Figure 2: Lead notifications by month, January –December 2013



3.2.1 Spatial distribution of lead absorption notifications

The highest lead notification rate was for Wairarapa DHB (24.6 per 100,000 population), followed by MidCentral (13.5 per 100,000) (Figure 3). In the previous year, the two DHBs with the highest rates of lead poisoning were Wairarapa (17.2 per 100,000) and Whanganui (16.0 per 100,000).

Figure 3: Crude rates per 100,000 population of lead notifications by DHB, 2013

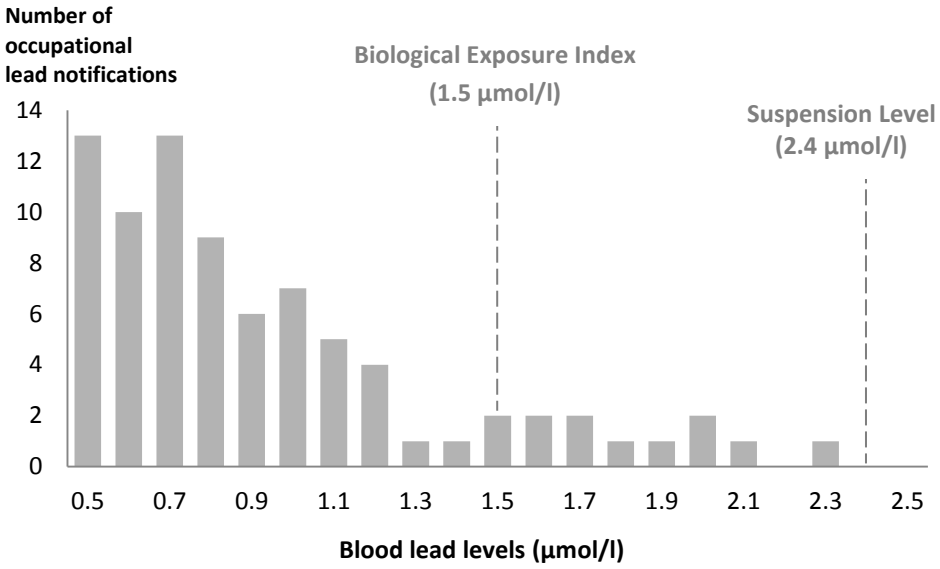


Sources: Institute of Environmental Science and Research (2013) and Hazardous Substances Disease and Injury Reporting Tool (2013).

3.2.2 Lead notifications where source of exposure is occupational

There were 81 lead absorption notifications where occupation was recorded as the source of exposure. The blood lead levels of relevance are 1.5 µmol/l (the Biological Exposure Index) and 2.4 µmol/l (the suspension level) (Figure 4).

Figure 4: Blood lead levels, occupational, 2013



There were 12 cases with a blood lead level of ≥1.5 µmol/l including three scrap metal workers from the same workplace.

There were no occupationally-related cases reported above the suspension level (2.4 µmol/l) with the highest blood lead level recorded being 2.3 µmol/l.

The most common occupations were painter/decorator (17 cases), scrap metal worker (9 cases), and foundry worker (5 cases) (Table 2).

Table 2: Number of lead notifications, by occupation, 2013

Occupation	Number of cases
Painter/ Decorator	17
Scrap Metal Worker	9
Foundry worker	5
Boat builder	3
Lead Lighter	3
Tiler	3
Builder	2
Furniture Maker	2
Retired/Semi-retired	2
Artist	1
Engineer	1
Farmer	1
Joiner	1
Labourer	1
Molding and casting worker	1
Factory Worker	1
Radiator Repair	1
Property manager	1
Window and door recycler	1
Shooting gallery worker	1
Technician	1
Truck Driver	1
Welder	1
Unknown	21
Total	**81**

One of the 81 cases required hospital admission. The case had a blood lead level of 0.9 µmol/l.

There were two occupational lead absorption outbreaks reported in EpiSurv.

Of the 81 occupational lead notifications, 38 were recorded as being enrolled in a workplace monitoring programme, 22 unknown, and 21 not enrolled.

PHU Action

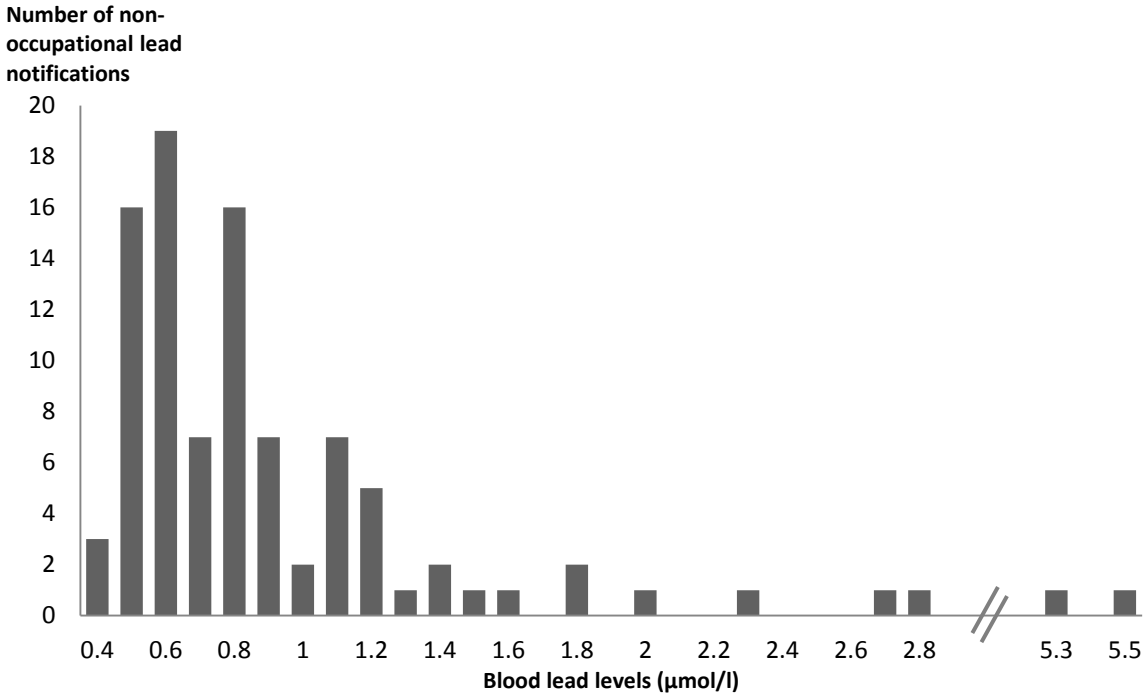
Investigation was recorded as being complete in 25 notifications, investigation underway in two cases, and no further investigation in five cases. No cases were recorded as being referred to another agency e.g. WorkSafe NZ.

Information regarding PHU action was not available for the remaining cases that were in EpiSurv.

3.2.3 Lead notifications where source of exposure is non-occupational or unknown

There were 99 lead absorption notifications where a non-occupational source of exposure was recorded. The highest blood lead level recorded was 5.5 µmol/l (Figure 5). The source of lead exposure was ayurvedic medicine. The second highest blood lead level recorded was 5.3 µmol/l. The source of exposure was unknown.

Figure 5: Blood lead levels, non-occupational, 2013



Children (0 -14 years)

Of the 99 lead absorption notifications, 13 were children under the age of 15 years (Table 3). All seven children under the age of five had blood lead level concentrations in the 0-48 – 0.71 µmol/l category.

Table 3: Blood lead level notifications for children 0-14 years old, 2013

	Children	
Blood lead levels	**0-4**	**5-14**
0.48 - 0.71	7	2
0.72 - 0.95		2
0.96 - 2.16		2
≥ 2.17		
Total	**7**	**6**

There were six cases in the 5-14 year age group, of which two, a 10-year old and an 11-year old had blood lead levels of 1.68 µmol/l and 1.3 µmol/l respectively. The 10-year-old had accidentally swallowed a lead fishing sinker while the 11-year old was part of a lead outbreak which involved one other case as a result of renovations on a pre-1970s house. A 3-year old (0.68 µmol/l) was also part of a lead outbreak involving two other cases. Source of lead exposure was lead based paint.

PICA was reported for two children – a 2-year old with a blood lead level of 0.59 µmol/l and a 12-year old with a blood lead level of 0.82 µmol/l.

Adults (15+ years)

Lead based paint (24 cases) was the most common source of lead exposure for adults followed by lead exposure from an indoor rifle range (17 cases) (Table 4).

Of the 31 cases with an unknown source, there were six cases which had occupations recorded where lead exposure may occur: a lead lighter, scrap metal worker, an engineer, a radiator fitter, and two painters. However, there was not enough information to confirm that they were workplace exposures.

Table 4: Sources of lead exposure for adults (15 years and over), 2013

Lead source	Count
Lead based paint	24
Indoor rifle range	17
Bullet/sinker manufacture	7
Traditional medicine or cosmetic	6
Car restoration and welding	1
Radiator repairer	1
Welding painted steel	1
Unknown	31
Total	**88**[a]

[a] More than one source of lead exposure can be selected for a single notification, therefore the total adds to more than the number of notifications.

PHU Action

Investigation was recorded as being complete in 10 notifications, investigation underway in three cases, and no further investigation in 11 cases. No cases were recorded as being referred to another agency e.g. WorkSafe NZ.

Information regarding PHU action was unavailable for the remaining cases in EpiSurv.

3.3 Hazardous substances notifications

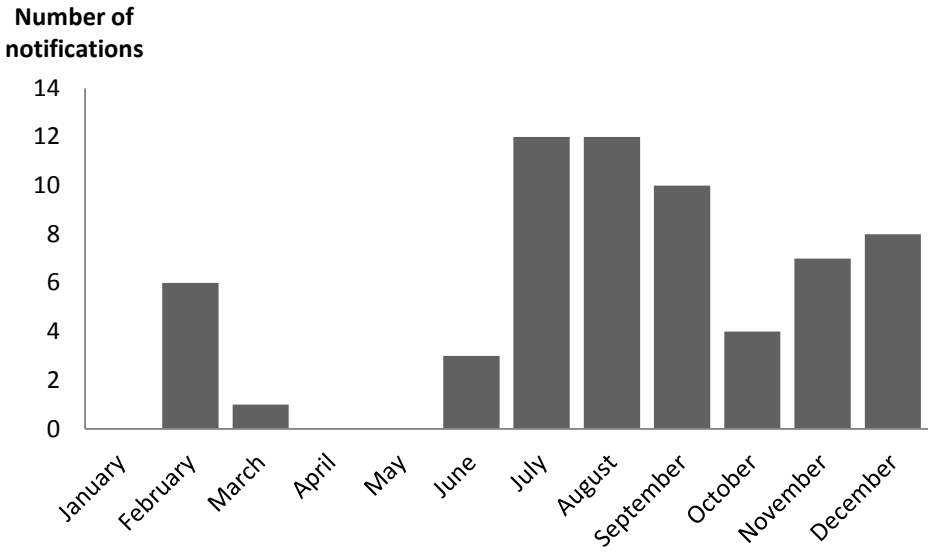
There were 63 notifications related to hazardous substances in 2013 (Table 5). This represents an average of about five notifications per month. Almost 70 percent of notifications were males and the most common age range was the 25-44 year age group (22 cases). The most common ethnic group was European/Other.

Table 5: Demographics of hazardous substances notifications, 2013

Gender	Female	20
	Male	43
	Total	**63**
Ethnicity	Maori	5
	Pacific	3
	Asian	4
	European/Other	40
	Unknown	9
	Total	**63**
Age Group	0-4	11
	5-14	1
	15-24	15
	25-44	22
	45-64	11
	65+	2
	Unknown	1
	Total	**63**

July and August had the highest number of notifications (12 cases) (Figure 6).

Figure 6: Number of hazardous substances notifications, by month, 2013



Over 80 percent of all notifications were unintentional poisonings and the most common substance categories were household chemicals (24/58) and industrial chemicals (18/58) (Table 6 and Table 7).

Table 6: Case assignment, intentional and unintentional exposure to hazardous substance and substance categories, 2013

Case Assignment	Definite case	9
	Possible case	27
	Probable case	18
	Not a case	5
	Insufficient info to assign case status	3
	Under investigation	1
	Total	**63**
Intent	Unintentional	48
	Intentional	6
	Unknown	4
	Total	**58**[a]
Substance category	Household chemical	24
	Industrial chemical	18
	Agrichemical	2
	Fireworks/Explosives	1
	Other	5
	Unknown	8
	Total	**58**[a]

a. The five notifications that are 'Not a case' have been excluded from the Intent and Substance category table.

Household agents were the most common cause of poisoning among children less than five years old. These included dishwashing powder, cleaners, disinfectant, hand sanitiser, isopropyl alcohol, and brake fluid. Household and industrial chemicals were the most common source of poisoning across all other age groups.

Six cases required hospital admission including a one year old child who accidentally ingested a household cleaner.

Table 7: Hazardous substances notifications, by substance category, 2013

Category	Substance	Number of notifications
Household chemical	paint	3
	dishwashing powder	2
	household cleaner	2
	bathroom cleaner	1
	bleach	1
	brake fluid	1
	car wash concentrate	1
	carpet cleaner	1
	clove oil	1
	disinfectant	1
	drain cleaner	1
	isopropyl alcohol	1
	laundry powder	1
	lighter fluid	1
	methylated spirits	1
	oven cleaner	1
	rat poison	1
	skin toner	1
	sugar soap	1
	unknown	1
	Total	**24**
Industrial chemical	1% chlorine solution	2
	asbestos	2
	petrol	2
	phosphoric acid	2
	acetone	1
	cement	1
	detergent	1
	epoxy glue	1
	paint stripper	1
	refrigerant liquid	1
	chromium	1
	isocyanate	1

	methyl bromide	1
	polyurethane	1
	hydrochloric acid	1
	sodium tripolyphosphate	1
	propylene glycol	1
	benzyl ammonium chloride	1
	unknown	1
	Total	**23**
Agrichemical	glyphosate	1
	hydrogen cyanamide	1
	Total	**2**
Fireworks/explosive	gas	1
	air compressor	1
	Total	**2**
Other	carbon monoxide	2
	"chlorine liberating solution"	1
	glow stick	1
	Total	**4**
Unknown	soldering flux	1
	unknown	6
	Total	**7**
Total notifications		**62**[a,b]

a. More than one substance can be selected for a single notification, therefore the total adds to more than the number of notifications.

b. The five notifications that are 'Not a case' have been excluded from this table.

Place of injury

A majority (48%) of injuries occurred in the home. The most common substances were cleaning agents and paint.

Injuries in the workplace contributed to 41 percent of all hazardous substances notifications.

Case status

Nine notifications were classified as 'definite cases', four of which occurred at the workplace.

There were 27 'possible cases' notified of which six cases were related to a single event (possible methyl bromide exposure).

PHU Action

Six events were referred to WorkSafe NZ for further investigation. These included:

- six cases exposed to methyl bromide
- three cases from han hu enamel paint exposure
- two cases from chlorine inhalation at the workplace
- one case exposed to sodium tripolyphosphate, propylene glycol, and benzyl ammonium chloride
- one case from chromium exposure
- one case exposed to asbestos.

In total, investigation was listed as 'complete' in 13 cases; 'investigation underway' in one case; 'no further investigation' in 26 cases; and 14 cases were referred to WorkSafe NZ.

Information regarding PHU action was unavailable for the remaining cases in EpiSurv.

3.4 Poisoning arising from chemical contamination of the environment

There were six poisoning arising from chemical contamination of the environment cases reported in 2013. All were in the Auckland region. Three cases were female and three were male, ranging in age from 1 to 61 years. All cases were in the European or Other ethnic group. Of the six cases, four were hospitalised.

Where recorded, sources of exposure included chlorine powder which occurred at the workplace (1 case) and chemical fumes from an unknown source (1 case). Two cases did not have any information regarding exposure source.

There were two notifications involved in a single food poisoning event. Food sampling results tested positive for methamphetamine. Both cases were hospitalised for unintentional poisoning.

PHU Action

The two methamphetamine-related cases were referred to police for further investigation.

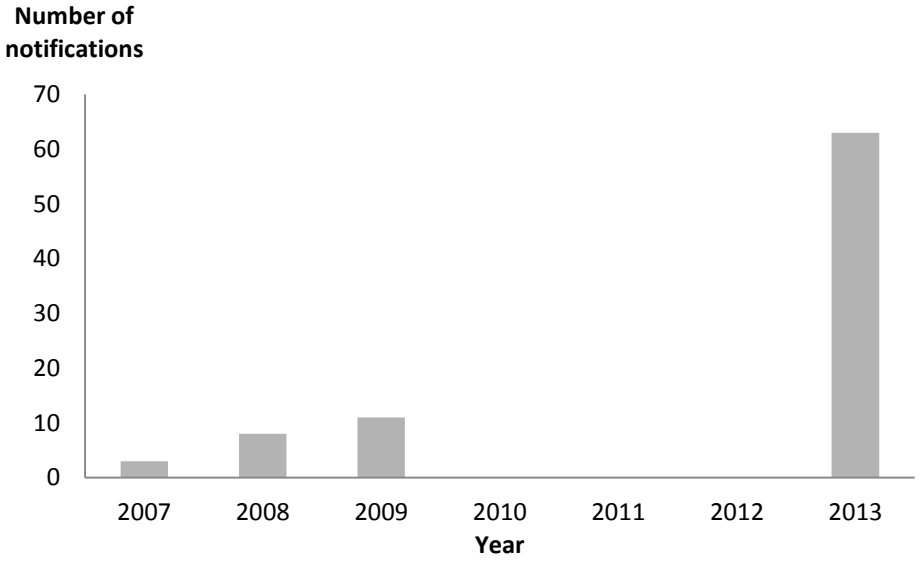
Information regarding PHU action was not available for the remaining four cases.

4. Identification of trends

The HSNO Act (amended in 2005) requires doctors, including general practitioners, to report hazardous substances injuries to the Medical Officer of Health. Despite this requirement, very few cases have been reported since this legislation came into effect.

Before the HSDIRT was introduced, there was an average of seven non-lead cases reported from 2007-2009. In 2013, there was a six-fold increase in non-lead notifications (Figure 7) even though notification data were for less than a complete year due to the progressive national roll out of the HSDIRT from 1 February 2013.

Figure 7: Number of hazardous substances (non-lead) notifications, 2007-2013



Note: Data from 2007 to 2009 was sourced from the Institute of Environmental Science and Research. Data for 2010 to 2012 were unavailable.

Number of GP notifications

Despite the increase in the number of notifications, it is difficult to determine how many of these were reported directly by GPs and how many by other doctors e.g. emergency department doctors. An additional data field has been added to the HSDIRT to identify the notification source.

Contact people

If you have questions regarding this report or suggestions for how data presentation can be improved please contact CPHR.

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