Analysis of consumer product related calls to the NSW Poisons Information Centre

June 2014 to May 2015

March 2016

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1. Background

The Australian Competition and Consumer Commission (ACCC) administers national product safety regulations under the *Competition and Consumer Act 2010* (CCA) and monitors the safety of general consumer products. The ACCC also educates suppliers and consumers about regulations, emerging issues, and the safe use of products to minimise the risk of injuries.

The ACCC consumer product safety area obtains injury and hospital admissions data from various sources to identify emerging hazards and products that may not meet the level of safety expected in the community.

Hazards associated with chemical based consumer goods continue to be subject to scrutiny because of both the frequency of exposures and the potential severity of injuries. Poisoning or injury from exposure to chemicals is a major cause of accidental death and injury to Australian children under 5 years of age[1]. There is growing community concern about the safety of chemicals and the consequences of both short and long-term exposure to hazardous chemicals.

Calls made to poisons information centres are a valuable source of data that can help identify contemporary risk factors and inform risk management strategies that may be adopted by suppliers or users of products as well as government and community organisations.

The ACCC obtained and analysed de-identified data from the NSW Poisons Information Centre (NSW PIC) about calls they received over a one-year period from June 2014 to May 2015.

The purpose of this project was to identify common factors in consumer product related chemical exposures and poisonings, to enable work with other stakeholders in developing and implementing modest but practical interventions that may reduce the prevalence and/or severity of such incidents.

The ACCC acknowledges and thanks the NSW PIC for their valuable assistance.

2. Poisonings

Although medicines are the most common source of poisons exposure overall (excluding young children), household products such as all-purpose/hard surface cleaner, bleach, hand dishwashing detergent and domestic insecticides are also significant sources of chemical exposure. In 2009-2010 in Australia, there were over 2500 hospitalisations due to poisoning[2]. The rate of hospitalisation for poisoning is highest for children aged two years and the most commonplace for children to be exposed to poisons is in and around the home.

In the UK, 5100 children under 5 years old were admitted to hospital due to accidental poisoning in 2012-13.[3] This was associated with a mean cost of over £2500 per child (includes cost on the national health system and family) where the length of hospital stay was 2 days or more.[4]

The majority of poisoning cases referred to hospital are monitored in the emergency department for short periods and not be admitted.[5] These cases would not be included in hospitalisation statistics.

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1 Australian Institute of Health and Welfare, *Hospital separations due to injury and poisoning, Australia 2009-10,* Australian Institute of Health and Welfare, Canberra, 2012, viewed 6 November 2015, http://www.aihw.gov.au/WorkArea/DownloadAsset.aspx?id=60129542180

2 Australian Institute of Health and Welfare, *Hospital separations due to injury and poisoning, Australia 2009-10,* Australian Institute of Health and Welfare, Canberra, 2012, viewed 6 November 2015, http://www.aihw.gov.au/WorkArea/DownloadAsset.aspx?id=60129542180

3 Cooper *et al*, 2016, The short-term cost of falls, poisonings an scales occurring at home in children under 5 years old in England: multicentre longitudinal study, BMJ Publishing Group Ltd, viewed 5 February 2016, http://injuryprevention.bmj.com/content/early/2016/01/29/injuryprev-2015-041808.abstract?papetoc

4 ibid

5 Acting Manager, NSW Poisons Information Centre, NSW 2016

3. Poisons Information Centre data

In Australia, the Standard for the Uniform Scheduling of Medicines and Poisons (Poisons Standard) controls how medicines and poisons are made available to consumers. The Poisons Standard classifies substances into nine different Schedules, which reflect factors such as the need for the substance, the degree of risk presented by the substance and the degree of control to be exercised over the availability of the substance. Certain scheduled poisons are required to meet strict container and labelling requirements such as child resistant closures, first aid instructions and the national PIC telephone number (Australia 13 11 26).[6]

The data collected by the NSW PIC represents approximately half of Australia's poisons related calls because they receive calls from NSW, Tasmania and the ACT on a near full time basis, and from all around Australia after hours as part of the national PIC roster. While the NSW PIC recorded almost 90,000 poisons exposures in one year, 60 per cent of these relate to medicine exposures. Each record relates to an incident of exposure, but not necessarily an injury or case of poisoning.

According to the NSW PIC estimates, the total incidence of exposures to a particular substance nationally would be more than twice that of what is recorded. This is because the NSW PIC collects daytime data for one third of the population and most accidental exposures occur during the day. The other PIC in Perth, Queensland and Victoria collect data for the remaining two thirds of the population for exposures between 8:30am to 9:30pm.

When the NSW PIC receives a call they make a judgement about how serious the incident is and whether the victim should go to hospital or see a doctor. For each call, they record details about the person, the substance they have been exposed to and the course of action recommended.

The ACCC obtained the most current data available from the NSW PIC for calls they received from 1 June 2014 to 31 May 2015. The data was edited to remove duplicate information about single cases and calls relating to medicine exposures, bites and stings.

This data was analysed from different perspectives to identify product hazards associated with certain age groups, products from which exposure may lead to a higher rate of injury, and other aspects such as the route, reason, location or circumstances of the exposure.

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[6] Department of Health, *Poisons Standard July 2015*, Department of Health, Canberra, 2015, viewed 16 November 2015, https://www.comlaw.gov.au/Details/F2015L00844/Download

4. Products with high frequency of exposure or potential for injury

The products associated with exposures vary with different ages; however, the overall number of exposures across the whole population provides valuable insights. All-purpose cleaning products, bleaches, hand dishwashing detergents and domestic insecticides are a major source of exposure to potentially harmful chemicals across all age groups. Table 1 lists the substances with the highest frequency of exposure leading to calls to the NSW PIC, most of which are household goods.

Ingestion is the most common route of chemical exposure, particularly for young children. This is followed by ocular and dermal exposures and exposure by inhalation. Calls relate to exposures that result in a wide range of symptoms including internal symptoms, skin reactions and burns. Treatment advice is able to be more exact when product formulations are known.

As well as contributing to health and safety outcomes Poisons Information Centres aim to reduce the pressure on hospitals from unnecessary emergency presentations.[7] However, there are still cases where people attend hospital and the treating doctor or nurse calls a Poisons Information Centre. All these calls represent unnecessary chemical exposures, which cause significant concern to families and place a burden on the Poisons Information Centres and hospital emergency departments.

Table 1 Products with the highest frequency of exposure across all ages

All	**#**
Cleaner: All-purpose/hard surface	1 373
Bleach: Hypochlorite based	1 129
Detergents: Hand-dish	1 030
Pyrethrins/pyrethroids	938
Desiccant: Silica gel	900
Cleaner: Toilet bowl (cage/rim type)	835
Hand Sanitiser	795
Cyalume light sticks/glow toys	701
Detergents: Laundry	627
Disinfectant	590
Eucalyptus oil	533
Detergents: Automatic dishwasher	531
Soap	508
Foreign body	500
Air freshener / room deodoriser	456
Nail polish remover	410
Veterinary: Internal medicines	409
Petrol	377

[7] Queensland Health, *Practice Standards for Australian Poisons Information Centres 2014*, Queensland Health, viewed 18 March 2016, https://www.health.qld.gov.au/poisonsinformationcentre/docs/poison-prac-standards.pdf

4.1. Exposure of different age groups

Table 2 lists the substances that different age groups are most frequently exposed to. The different product profiles reflect what these groups may have access to but also what kind of activities they are often engaged in that involve the use of chemicals.

4.1.1. Neonates (0-4 weeks)

Although the frequency of reported exposures to chemicals is very low, neonates are generally exposed to substances while in use by a parent or carer, such as hand sanitiser, eucalyptus oil and pens/ink or through contact with an object exposed to the substance such as detergent used to clean baby bottles.

4.1.2. Infants (4 weeks – 1 year) and toddlers (1-4 years)

The highest frequency of exposure for infants and toddlers is associated with substances found near ground level such as toilet bowl cleaners, all-purpose/hard surface cleaner and detergents, which they will put in their mouths or ingest. Items left around the home or accessed from handbags are also a source of exposures, for example, hand sanitisers, desiccants, pens/ink and cigarettes/tobacco products. Household cleaning products are a major source of chemical exposure and may be accessed by infants and toddlers while they are in use or if they are not stored securely.

4.1.3. Children (5-14 years)

Children are most frequently exposed to chemicals in products such as glow sticks, all-purpose/hard surface cleaner, freezer/cold packs and domestic insecticides. The number of exposures to chemicals in consumer products for children is lower than in the toddler age category. Although children have greater mobility and dexterity than toddlers, they are mostly past the age of exploring objects by mouthing them.

4.1.4. Adolescents (15-19 years)

Potential self-harm and misuse of chemicals is apparent in chemical exposures of adolescents (Table 2). There are a number of calls relating to exposure to bleach, deodorants/antiperspirants and petrol. Exposure to petrol is likely to be indicative of siphoning. High risk taking behaviour is typically associated with this age category.

4.1.5. Adults (20-74 years)

Adults are most frequently exposed to chemicals in the course of cleaning and maintenance of the home, but also in the workplace (Table 2). These chemicals include bleach, pesticides (the majority being domestic insecticides), all-purpose/hard surface cleaner, hand dishwashing detergent, and oven/grill cleaner.

4.1.6. Elderly (>75 years)

Frequency of exposure to chemicals for the elderly is highest for denture cleaning agent, eucalyptus oil, bleach and domestic insecticides. This age group is more likely to use denture cleaner and there is a higher probability of mistaking it for drinking water if stored in a glass next to the bed. In addition, if the denture cleaner is in tablet form, it may be mistaken for a medication and ingested in error. In the case of eucalyptus oil, the product may be mistaken for a conventional medicine, such as cough syrup.

4.2. All age groups

Across all age groups exposure to some products leads to a high rate of adverse reactions, such as depilatories, hair colours and domestic insecticides (Table 3). In terms of accidental exposure, all-purpose cleaner/hard surface, hand dishwashing detergents and bleach are associated with the highest frequency of calls (Table 3). Exposure to chemicals because of therapeutic error is highest for veterinary internal medicines, eucalyptus oil, essential oils and denture cleaning agent (Table 3). A number of factors such as potential similarities in product packaging with conventional medicine, impaired eyesight or failure to read the instructions for use are likely to contribute to therapeutic error. In the work place unspecified chemicals, oven/grill cleaner, miscellaneous cleaners and bleach are associated with the highest frequency of calls (Table 3).

Table 2 Products with the highest frequency of exposures for each age group

Neonate (0-4 weeks)	#	Infant (4 weeks – 1 year)	#	Toddler (1-4 years)	#	Children (5-14 years)	#
Hand Sanitiser	4	Cleaner: Toilet bowl (cage/rim type)	213	Cleaner: All-purpose/hard surface	815	Cyalume light sticks/glow toys	262
Cleaner: Baby bottle	3	Desiccant: Silica gel	120	Desiccant: Silica gel	646	Cleaner: All-purpose/hard surface	82
Eucalyptus oil	2	Foreign body	104	Detergents: Hand-dish	627	Freezer/cold packs	67
Pens/ink (inc stamp pad ink, textas)	2	Hand Sanitiser	98	Cleaner: Toilet bowl (cage/rim type)	605	Foreign body	58
Food additives	2	Cleaner: All-purpose/hard surface	90	Hand Sanitiser	548	Pyrethrins/pyrethroids	53
Cleaner: All-purpose/hard surface	1	Detergents: Automatic dishwasher	71	Detergents: Laundry	435	Desiccant: Silica gel	52
Detergents: Hand-dish	1	Pens/ink (inc stamp pad ink, textas)	69	Cyalume light sticks/glow toys	390	Detergents: Hand-dish	52
Detergents: Laundry	1	Cigarettes & tobacco products	64	Detergents: Automatic dishwasher	373	Bleach: Hypochlorite based	48
Soap	1	Detergents: Hand-dish	54	Soap	346	Air freshener / room deodoriser	48
Cleaner: Floor	1	Air freshener / room deodoriser	53	Bleach: Hypochlorite based	321	Desiccant: Other/unknown	41
Desiccant: Other/unknown	1	Soap	48	Disinfectant	283	Pens/ink (inc stamp pad ink, textas)	38
Paint: Other/unknown	1	Rodenticides: long acting anticoagulants	48	Air freshener / room deodoriser	275	Nail polish remover	37
Cosmetics: Cleanser, skin	1	Disinfectant	43	Nail polish remover	270	Disinfectant	36
Pre-wash stain remover	1	Detergents: Laundry	40	Foreign body	268	Eucalyptus oil	36
Tea tree oil	1	Paint: Other/unknown	39	Cleaner: Floor	243	Deodorants/anti-perspirants	35
Cleaner: Glass/window	1	Damp treatments	39	Perfume, cologne, aftershave	240	Hand Sanitiser	31
Bath oil/bubble bath/bath products	1	Baits: Other/unknown	37	Essential oils: Other/unknown	234	Detergents: Laundry	31
Talcum powder	1	Pesticide: Other/unknown	35	Pyrethrins/pyrethroids	227	Soap	31
Smoke/toxic products of combustion	1	Talcum powder	34	Pens/ink (inc stamp pad ink, textas)	219	Adhesive: Cyanoacrylates	31
Paint: Water-based house type	1			Eucalyptus oil	214		
				Rodenticides: long acting anticoagulants	214		

Adolescent (15-19 years)	#	**Adult (20-74 years)**	#	**Elderly (>75 years)**	#
Bleach: Hypochlorite based	56	Bleach: Hypochlorite based	640	Denture cleaning agent	32
Deodorants/anti-perspirants	28	Pyrethrins/pyrethroids	574	Eucalyptus oil	30
Petrol	20	Cleaner: All-purpose/hard surface	356	Bleach: Hypochlorite based	25
Chemicals: Other/unknown	18	Detergents: Hand-dish	268	Pyrethrins/pyrethroids	20
Cleaner: All-purpose/hard surface	17	Petrol	240	Detergents: Hand-dish	19
Cleaner: Oven/grill	14	Cleaner: Oven/grill	237	Soap	13
Disinfectant	14	Eucalyptus oil	216	Hand Sanitiser	12
Detergents: Laundry	14	Chemicals: Other/unknown	214	Batteries: Disc/button type	10
Hair colours	14	Glyphosate	214	Disinfectant	8
Eucalyptus oil	13	Disinfectant	206	Veterinary: Internal medicines	8
Pyrethrins/pyrethroids	12	Veterinary: Internal medicines	199	Glyphosate	8
Adhesive: Cyanoacrylates	12	Cleaner: Miscellaneous	180	Tea tree oil	6
Hydrocarbons: Other/unknown	10	Gas, fume, vapour: Other/unknown	162	Ethanol (Non-beverage)	6
Pool chlorine	9	Adhesive: Cyanoacrylates	150	Cleaner: All-purpose/hard surface	5
Nail polish remover	9	Pesticide: Other/unknown	142	Shampoo (non-medicated)	5
Detergents: Hand-dish	8	Pool chlorine	138	Desiccant: Other/unknown	4
Cleaner: Miscellaneous	8	Ethanol (Non-beverage)	128	Nail polish remover	4
Veterinary: Internal medicines	7	Herbicide Other/unknown	113	Detergents: Laundry	4
		Pool acid	113		

Table 3 Top 20 products for certain types of exposures across all ages*

Accidental	#	Therapeutic Error	#	Adverse reactions	#	Workplace	#
Cleaner: All-purpose/hard surface	1 282	Veterinary: Internal medicines	113	Depilatories	25	Chemicals: Other/unknown	71
Detergents: Hand-dish	1 011	Eucalyptus oil	95	Hair colours	20	Cleaner: Oven/grill	38
Bleach: Hypochlorite based	961	Essential oils: Other/unknown	16	Pyrethrins/pyrethroids	12	Cleaner: Miscellaneous	35
Desiccant: Silica gel	892	Denture cleaning agent	16	Eucalyptus oil	9	Bleach: Hypochlorite based	30
Pyrethrins/pyrethroids	882	Disinfectant	14	Food additives	9	Gas, fume, vapour: Other/unknown	24
Cleaner: Toilet bowl (cage/rim type)	830	Tea tree oil	14	Bleach: Hypochlorite based	7	Alkalis	24
Hand Sanitiser	763	Desiccant: Other/unknown	9	Cleaner: All-purpose/hard surface	7	Veterinary: Animal vaccines	17
Cyalume light sticks/glow toys	698	Veterinary: External medicines	8	Food allergy	7	Cleaner: All-purpose/hard surface	16
Detergents: Laundry	593	Adhesive: Cyanoacrylates	8	Toothpaste: fluoride based	5	Acids: Other/unknown	16
Disinfectant	522	Food additives	7	Essential oils: Other/unknown	4	Cleaner: Industrial - general	16
Detergents: Automatic dishwasher	514	Mouthwash: Ethanol based	5	Tea tree oil	4	Building/handyman products: Other/unknown	16
Soap	487	Hydrogen peroxide (not for medical use)	5	Clove oil	4	Detergents: Automatic dishwasher	15
Foreign body	484	Desiccant: Silica gel	4	Insect repellents	4	Disinfectant	14
Air freshener / room deodoriser	445	Pyrethrins/pyrethroids	4	Teeth whitening treatment	4	Herbicide Other/unknown	13
Eucalyptus oil	392	Mouthwash: Non-ethanol based	4	Detergents: Hand-dish	4	Cement, concrete, lime	12
Nail polish remover	387	Depilatories	4	Soap	3	Pyrethrins/pyrethroids	11
Pens/ink (inc stamp pad ink, textas)	351	Contact Lens Cleaning Products	4	Cosmetics: Cleanser, skin	3	Paint: Other/unknown	11
Petrol	333	Cleaner: Baby bottle	4			Petrol	10
Essential oils: Other/unknown	314	Ethanol (Non-beverage)	3			Pesticide: Other/unknown	9
						Glyphosate	9

** Excludes data on self-poisoning*

Table 4 lists products with the highest proportion of exposures where the person experienced symptoms. Exposure to cement, sodium hydroxide, industrial cleaner, pool chlorine, alkalis, acids (including hydrochloric and pool acid) and oven/grill cleaner account for the highest rate of calls. Reporting on symptomatic exposure can be a useful indicator for the potential severity of the injury; however, it is important to note that this is not necessarily the case for all exposures.

Table 4 Products with the highest rate of callers with symptoms related to the exposure

Percentage Related Symptomatic (with over 100 calls total)	%	**Percentage Related Symptomatic (with over 50 calls total)**	%
Pool chlorine	68.0	Cement, concrete, lime	78.4
Cleaner: Oven/grill	63.5	Sodium Hydroxide	76.9
Alkalis	62.8	Cleaner: Industrial - general	68.5
Acids: Other/unknown	61.5	Pool chlorine	68.0
Pool acid	60.9	Veterinary: Animal vaccines	67.1
Cleaner: Drain	52.5	Acids: Hydrochloric acid (not pool acid)	63.6
Petrol	52.0	Cleaner: Oven/grill	63.5
Hair colours	50.0	Alkalis	62.8
Plants: Oxalate	48.1	Acids: Other/unknown	61.5
Bleach: Hypochlorite based	44.9	Pool acid	60.9
Cyalume light sticks/glow toys	44.7	Carbon monoxide	59.2
Chemicals: Other/unknown	44.6	Hydrogen peroxide (not for medical use)	56.1
Adhesive: Cyanoacrylates	43.5	Diesel fuel	55.8
Pyrethrins/pyrethroids	43.3	Depilatories	55.1
Turpentine, mineral	43.0	Fire Extinguishers	54.4
Gas, fume, vapour: Other/unknown	42.3	Cleaner: Drain	52.5
Adhesive: Other/unknown	41.0	Petrol	52.0
Cleaner: Miscellaneous	40.9	Hair colours	50.0
Building/handyman products: Other/unknown	40.8	Smoke/toxic products of combustion	48.8

Table 5 lists those products where the highest proportion of people exposed to the product have attended or are referred to hospital. Attending hospital is an indicator of the potential for higher severity injuries. However, in some cases people may attend hospital without calling a Poisons Information Centre and subsequently be advised that treatment in hospital is not necessary.

Chemical exposures that are associated with more serious injury resulting in hospitalisation include carbon monoxide (usually from gas heaters, charcoal barbeques, burning charcoal indoors for heat and petrol generators), disc/button type batteries and cement. Sodium hydroxide (from drain and oven/grill cleaner), industrial cleaner, alkalis, hydrochloric acid, pool acid, hydrofluoric acid (mainly from wheel cleaning products), adhesives (particularly superglue) and pool chlorine are also associated with hospitalisation (Table 5). Exposures to superglue are typically ocular and are often due to the tube appearing like eye drops or ointment.

Table 5 Products with the highest rates of callers in hospital or referred to hospital

In hospital + hospital refer rate (with over 100 calls total)	%	In hospital + hospital refer rate (with over 50 calls total)	%
Batteries: Disc/button type	84.3	Carbon monoxide	88.7
Alkalis	57.7	Batteries: Disc/button type	84.3
Pool acid	45.1	Cement, concrete, lime	70.6
Acids: Other/unknown	44.4	Sodium Hydroxide	69.2
Pool chlorine	44.0	Cleaner: Industrial - general	63.0
Cleaner: Oven/grill	37.5	Alkalis	57.7
Cleaner: Drain	33.9	Acids: Hydrochloric acid (not pool acid)	54.5
Petrol	33.2	Alcohol: Other/unknown	48.8
Chemicals: Other/unknown	33.0	Veterinary: Animal vaccines	48.7
Car products, other/unknown	32.9	Pool acid	45.1
Adhesive: Cyanoacrylates	32.3	Acids: Other/unknown	44.4
Herbicide Other/unknown	30.9	Pool chlorine	44.0
Adhesive: Other/unknown	29.9	Herbicide: chlorophenoxy type (2, 4-D, MCPA etc.)	40.0
Bleach: Hypochlorite based	29.0	Fire Extinguishers	38.2
Cleaner: Miscellaneous	28.6	Cleaner: Oven/grill	37.5
Gas, fume, vapour: Other/unknown	28.4	Bleach: Other/unknown	37.3
Ethanol (Non-beverage)	28.1	Cleaner: Drain	33.9
Hydrocarbons: Other/unknown	27.9	Petrol	33.2
		Chemicals: Other/unknown	33.0

5. Conclusion

The analysis of calls to Poisons Information Centres indicates that injuries associated with chemical based consumer goods are a concern in Australia. This analysis helps identify the product types and age groups for which there is a high prevalence of exposures and/or a high proportion of injuries resulting from exposure. However, there are limitations with this data given outcome information and classification of the severity of injuries is unavailable.

This analysis will inform areas of future work for the ACCC aimed at reducing exposure to, or injury from, chemical based consumer products.

Future areas of work are likely to include:

- Educating consumers about the dangers of certain products, encouraging proper product selection, use and storage, and promoting strategies that prevent children gaining access to dangerous chemical based products.
- Talking to product manufacturers and suppliers to help them understand the common product related risk factors and incidents involving product failure and ensure they understand their obligations under the Australian Consumer Law.
- Collaboration with regulators that have responsibilities in this area including: state and territory health departments, the Australian Pesticides and Veterinary Medicines Authority, the Office of Chemical Safety and the Therapeutic Goods Administration, also non-government accident prevention organisations, such as Kidsafe.
- Undertaking further market surveys focusing on product categories and brands identified as posing the most risk to consumers.