Appendix

**This appendix was part of the submitted manuscript and has been peer reviewed.
It is posted as supplied by the authors.**

Table 1. PIC databases: key fields for call types

Call types			
NSW	**QLD**	**WA**	**VIC**
Exposure	Exposure	Case	Exposure
Queries	Queries	Request: Information on non-pharmaceutical agents Request: information on non-pharmaceutical agents in pregnancy & lactation Request: Information on pharmaceutical and other medicinal agents Request: Information on pharmaceutical and other medicinal agents in pregnancy & lactation Request: For printed material Request: Information for education Request: Other Incident	Queries
Unknown	Complaints Number Check Praise Unknown	Other Other: Hoax	Hoax
Recall			Recall

Note: Items in the same row were harmonised to the NSW category.

Table 2. PIC databases: key fields for exposure circumstances

Exposure circumstances			
NSW	**QLD**	**WA**	**VIC**
Unintentional	Accidental	Unintentional Unintentional: Accidental Unintentional: Medication error Unintentional: Fire Unintentional: Misuse Unintentional: Transport accident Unintentional: Unknown Unknown Unintentional: Other	Accidental Unintentional accidental Unintentional other
Adverse reaction	Adverse reaction	Adverse Reaction Adverse Reaction: Drug Adverse Reaction: Food Adverse Reaction: Other	Adverse reaction
deliberate-self poisoning	deliberate-self poisoning	Intentional: Suicide	Intentional deliberate self-poisoning
Environmental	Environmental	Unintentional: Environmental	Unintentional environmental
Food poisoning	Food poisoning	Unintentional: Food poisoning	Unintentional food poisoning
Intentional: other	Intentional other Intentional: other	Intentional Intentional: Malicious/criminal Intentional: Misuse Intentional: Other Intentional: Unknown	Intentional Intentional misuse Intentional other
Pregnancy*	Pregnancy/breastfeeding*		
recreational	recreational	Intentional: Abuse	Intentional recreational abuse
Medication Error	Medication Error	Unintentional: Medication error	Medication Error Unintentional medication error
Unknown			
Work place	Work place	Unintentional: Occupational	Unintentional workplace Workplace acute
Other	Other	Other	Other
	Drug Information* Poisons Information*		

Note: Items in the same row were harmonized to NSW category. * Changed to queries call type.

Table 3. PIC databases: key fields for recommended management setting

Recommended management setting			
NSW	**QLD**	**WA**	**VIC**
At GP Surgery	Not applicable	Health centre = GP or Nursing post	At GP surgery
GP Refer	Not applicable	Health institution Health institution: Health centre	GP refer
Stay at Home	First aid Reassurance Symptoms possible	Location of poisoning	Stay at home
Hospital Refer	Dr/Hospital	Hospital During transportation	Hospital refer
In Hospital	Toxicologist contacted Management details		In hospital
Other	Other Vet	Other Specialised unit	Other
		Health institution: Inpatient facility* Inpatient facility: secondary* Inpatient facility: tertiary (university teaching hospital)*	
Unknown		Unknown	

Note: Items in the same row were harmonized to NSW category. * Category changed to "Hospital Refer" if call originated from a non-hospital location otherwise category changed to "In hospital".

Table 4. Call volume by state (re-calls included)

State	Number of calls (proportion of calls)	Calls per 100 000 population per year
Australian Capital Territory	3183 (1.6%)	814.6
New South Wales	67 247 (32.8%)	882.7
Northern Territory	1792 (0.9%)	732.6
Queensland	40 273 (19.7%)	842.6
South Australia	16445 (8.0%)	968.2
Tasmania	3413 (1.7%)	660.6
Unknown	3937 (1.9%)	Not applicable
Western Australia	22 225 (10.8%)	857.6
Victoria	46 243 (22.6%)	778.7
International	148 (0.1%)	Not applicable
Total	204 906 (100%)	861.6

Table 5. Query types: general information calls (re-calls excluded)

Query type	Number of queries	Proportion of total queries
Drug information	21 361	67.8%
Pregnancy/breastfeeding-related	*1893*	*6.0%*
Poisons Information	55 21	17.5%
Inappropriate/refer	2496	7.9%
Medical	878	2.8%
Prevention of poisoning/safety	714	2.3%
Adverse reaction	295	0.9%
Unknown	221	0.7%
Environmental	16	0.1%
Occupational	12	< 0.1%
Total	31 514	

Table 6. Caller identity for all calls to PICs (re-calls included)

Caller type	Number of callers	Proportion of callers
Family member	91 911	44.9%
Self	39 022	19.0%
Doctor	26 424	12.9%
Group home/carer	13 152	6.4%
Nurse	9563	4.7%
Lay	5593	2.7%
Ambulance	5197	2.5%
Friend	4817	2.4%
Unknown	3921	1.9%
Other medical professional, eg, psychologist, social worker	2047	1.0%
Other	1388	0.7%
Pharmacist	895	0.4%
Counselling service	705	0.3%
Veterinarian*	271	0.1%
Total	204 906	

* Veterinary calls made about humans; calls about animals were excluded.

Table 7. Exposure circumstances (re-calls excluded)

Exposure reason	Proportion of all exposures
Unintentional	105 817 (64.4%)
Medication error	29 739 (18.1%)
Deliberate-self poisoning	17 566 (10.7%)
Intentional: other	2836 (1.7%)
Adverse reaction	2658 (1.6%)
Work place	2584 (1.6%)
Recreational	1636 (1.0%)
Food poisoning	394 (0.2%)
Pregnancy	85 (0.1%)
Environmental	73 (< 0.1%)
Unknown	83 (< 0.1%)
Other	145 (< 0.1%)
Total	164 363

Circumstance definitions

- Unintentional: all unintentional exposures not specifically defined below.

- Medication error: An exposure resulting from a therapeutic intent involving a substance used incorrectly by mistake.

- Intentional: Other: an intended medication misuse or intended use outside of recommended/prescribed dosage, excludes recreational use.

- Occupational (work place exposure): an exposure that occurred while the victim was working, where the agent involved was part of the work process or the exposure was the result of the work process

- Environmental: a passive non occupational exposure resulting from contamination of air, water or soil.

- Deliberate self-harm: an exposure intended by the victim to cause self-harm.

- Recreational: a deliberate exposure to an agent on which the person is dependant, or in order to achieve a euphoriant or psychotropic effect

- Adverse drug reaction: a response to a drug which is noxious and unintended which occurs at doses normally used in humans for prophylaxis, diagnosis or therapy of disease

Table 8. Routes of exposure (re-calls excluded)

Route of exposure	Number (Proportion of total)
Ingestion	133 142 (81.0%)
Ocular	9585 (5.8%)
Dermal	8932 (5.4%)
Inhalation/nasal	8087 (4.9%)
Bite/sting	5492 (3.3%)
Unknown	3579 (2.2%)
Buccal/mucosal/sublingual	1756 (1.1%)
Parenteral	1812 (1.1%)
Aural	168 (0.1%)
Vaginal	59 (< 0.1%)
Rectal	59 (< 0.1%)
Total exposures	164 363

Note: Some calls have multiple routes of exposure.

Table 9. Recommended management setting for exposure calls (re-calls excluded)

Recommended management setting	Total number of calls	Proportion of total number of calls
Stay at home	110 836	67.4%
In hospital	26 620	16.2%
Referral to hospital	17 949	10.9%
Referral to GP	3814	2.3%
At GP surgery	1416	0.9%
Other	3560	2.2%
Unknown	168	0.1%
Total	164 363	

Table 10. Ten most common substances of exposure in neonates (0–4 weeks) (re-calls excluded)

Substance	Total	Proportion of all substances	Most common item within this category (expressed as a proportion of substance)
Gastrointestinal medication	40	17.3%	*
Paracetamol	25	10.8%	Not applicable
Household cleaning substance	15	6.5%	Disinfectant, 40.0%
Topical dermatological medicament	14	6.1%	*
Vitamin	13	5.6%	*
Cosmetic/personal care product/toiletries	10	4.3%	Bath products, 30.0%
Antimicrobial	9	3.9%	Penicillins, 44.4%
Air freshener/essential oil	9	3.9%	*
Hand sanitiser	8	3.5%	Not applicable
Vaccines/toxoids/antivenoms	7	3.0%	*

* Insufficient information to break down into further categories

Table 11. Ten most common exposure substances in infants (4 weeks to 1 year) (re-calls excluded)

Substance	Total	Proportion of all substances	Most common item within this category (expressed as a proportion of substance)
Household cleaning substance	2879	17.8%	Cleaner toilet bowl/cage, 24.8%[†]
Cosmetic/personal care product/toiletries	1076	6.6%	Soap, 14.5%
Paracetamol	1034	6.4%	Not applicable
Topical dermatological medicament	826	5.1%	Nappy rash preparation, 41.8%[†]
Plant	797	4.9%*	*
Pesticide	616	3.8%	Rodenticide, 48.9%
Non-steroidal anti-inflammatory drug	555	3.4%	Ibuprofen, 92.1%
Desiccant	499	3.1%	*
Air freshener/essential oil	494	3.0%	*
Foreign body	383	2.4%	*

* Insufficient information to break down into further categories.

† Western Australian PIC data not included.

Table 12. Ten most common exposure substances in toddlers (1–4 years) (re-calls excluded)

Substance	Total	Proportion of all substances	Most common item within this category (expressed as a proportion of substance)
Household cleaning substance	9555	15.3%	Cleaner: all-purpose/hard surface, 15.2%
Cosmetic/personal care product/toiletries	4571	7.3%	Soap, 16.3%
Paracetamol	3603	5.8%	Not applicable
Non-steroidal anti-inflammatory drug	3459	5.5%	Ibuprofen, 82.2%
Topical dermatological medicament	2278	3.6%	Nappy rash preparation, 29.3%[†]
Air freshener/essential oil	2096	3.3%	*
Pesticide	1927	3.1%	Pyrethrin/pyrethroids, 33.5%
Plant	1777	2.8%*	*
Antimicrobial	1605	2.6%	Penicillins, 36.0%
Vitamin	1595	2.5%	*

* Insufficient information to break down into further categories.

† Western Australian PIC data not included.

Table 13. Ten most common substances of exposure in children (5–14 years) (re-calls excluded)

Substance	Total	Proportion of all substances	Most common item within this category (expressed as a proportion of substance)
Paracetamol	987	6.8%	Not applicable
Bite/sting	799	5.5%	Spider, 36.8%
Non-steroidal anti-inflammatory Drug	776	5.4%	Ibuprofen, 80.7%
Household cleaning substance	698	4.8%	Bleach, 18.8%
Toys	627	4.3%	*
Antimicrobial	582	4.0%	Penicillins, 31.3%*
Cosmetic/personal care product/toiletries	506	3.5%	Soap, 14.3%
Plant	490	3.4%*	*
Antihistamine	477	3.3%	Loratadine, 37.3%
Antidepressant	399	2.8%	Selective serotonin reuptake inhibitor, 69.2% Fluoxetine, 27.8[†]

*insufficient information to break down into further categories.
† Victorian data not included (insufficient information on specific substance).

Table 14. Ten most common exposure substances in adolescents (15–19 years) (re-calls excluded)

Substance	Total	Proportion of all substances	Most common item within this category (expressed as a proportion of substance)
Paracetamol containing analgesic	1294	16.7%	Paracetamol, 83.3%
Antidepressant	1144	14.8%	Selective serotonin reuptake inhibitor, 69.5% Fluoxetine, 26.7%[†]
Non-steroidal anti-inflammatory drug	567	7.3%	Ibuprofen, 69.1%
Antipsychotic	487	6.3%	Quetiapine, 59.5%
Sedative	304	3.9%	Benzodiazepine, 70.7% Diazepam, 39.8%[†]
Household cleaning substance	302	3.9%	Bleach, 36.4%
Antihistamine	245	3.2%	Promethazine, 54.3%
Bite/sting	199	2.6%	Snake, 20.6%
Recreational street drug	191	2.5%	Ecstasy, 25.7%
Anticonvulsant	181	2.3%	Valproic acid, 34.3%

[†] Victorian data not included (insufficient information on specific substance).

Table 15. Ten most common substances of exposure in adults (20–74 years) (re-calls excluded)

Substance	Total	Proportion of all substances	Most common item within this category (expressed as a proportion of all substances)
Paracetamol containing analgesic	5548	9.5%	Paracetamol, 66.3%
Antidepressant	5254	7.0%	Selective serotonin reuptake inhibitor, 44.3% Sertraline, 14.4%[†]
Household cleaning substance	4922	6.6%	Bleach, 28.5%
Bite/sting	4183	5.6%	Spider, 45.7%
Sedative	4099	5.5%	Benzodiazepine, 88.0% Diazepam, 50.9%[†]
Antipsychotic	3944	5.3%	Quetiapine, 55.9%
Cardiovascular drug	3794	5.1%	β-Blocker, 23.5% Metoprolol, 7.9%[†]
Anticonvulsant	2501	3.3%	Valproate, 33.2%
Opioid analgesic	2500	3.3%	Oxycodone, 42.7%
Pesticide	2087	2.8%	Pyrethrin/pyrethroids, 59.3%
Non-steroidal anti-inflammatory drug	1726	2.3%	Ibuprofen, 47.3%

[†] Victorian data not included (insufficient information on specific substance).

Table 16. Ten most common exposure substances in older adults (older than 74 years) (re-calls excluded)

Substance	Total	Proportion of all substances	Most common item within this category (expressed as a proportion of all substances)
Cardiovascular drug	1008	23.6%	β-Blocker, 19.5% Metoprolol, 9.5%*
Paracetamol-containing analgesic	311	7.2%	Paracetamol, 89.7%
Anticoagulant	198	4.6%	Warfarin, 56.1%
Antidiabetic drug	176	4.1%	Metformin, 42.0%
Opioid analgesic	156	3.6%	Oxycodone, 40.4%
Household cleaning substance	145	3.4%	Bleach, 27.6%
Antimicrobial	137	3.2%	Penicillins, 22.6%
Antidepressant	120	2.8%	Mirtazapine, 39.2%
Sedative	116	2.7%	Benzodiazepine, 88.8% Temazepam, 31.0%[†]
Respiratory drug	107	2.5%	Tiotropium, 55.1%

† Victorian data not included (insufficient information on specific substance).

Table 17. Age group/sex differences for exposure circumstance (re-calls excluded)

Exposure circumstance	Female	Male	Unknown
Unintentional	47.8%	50.2%	2.0%
Child<15 years (n=75728)	44.9%	53.1%	2.0%
Adolescent (n=1765)	61.0%	37.8%	1.2%
Adult (n=27208)	54.7%	43.6%	1.7%
Older Adult (n=975)	61.1%	37.6%	1.2%
Unknown (n=141)	16.3%	12.8%	70.9%
Adverse reaction	62.9%	35.7%	1.3%
Child<15 years (n=312)	50.0%	47.8%	2.2%
Adolescent (n=120)	65.8%	34.2%	< 0.1%
Adult (n=2076)	64.9%	34.0%	1.1%
Older Adult (n=143)	62.9%	37.1%	< 0.1%
Unknown (n=7)	0.0%	14.3%	85.7%
Deliberate-self poisoning	65.3%	31.7%	3.1%
Child<15 years (n=1018)	82.5%	16.5%	1.0%
Adolescent (n=3313)	77.1%	21.4%	1.6%
Adult (n=13016)	61.3%	35.6%	3.2%
Older Adult (n=116)	55.2%	43.1%	1.7%
Unknown (n=103)	35.0%	4.9%	60.2%
Food poisoning	54.6%	42.6%	2.8%
Child<15 years (n=103)	37.9%	53.4%	8.7%
Adolescent (n=10)	50.0%	50.0%	< 0.1%
Adult (n=268)	59.7%	39.9%	0.4%
Older Adult (n=11)	90.9%	9.1%	0.0%
Unknown (n=2)	50.0%	< 0.1%	50.0%
Intentional (other)	49.9%	48.7%	1.4%
Child<15 years (n=355)	39.4%	57.7%	2.8%
Adolescent (n=285)	50.9%	48.8%	0.4%
Adult (n=2138)	51.4%	47.4%	1.2%
Older Adult (n=49)	55.1%	40.8%	4.1%
Unknown (n=9)	44.4%	33.3%	22.2%
Recreational	33.5%	64.7%	1.8%
Child<15 years (n=103)	30.1%	66.0%	3.9%
Adolescent (n=283)	38.5%	60.1%	1.4%
Adult (n=1246)	32.7%	65.9%	1.4%
Older Adult (n=0)	N/A	N/A	N/A

Unknown (n=4)	25.0%	0.0%	75.0%
Medication Error	56.4%	42.1%	1.5%
Child<15 years (n=9849)	44.3%	54.0%	1.7%
Adolescent (n=809)	52.3%	47.0%	0.7%
Adult (n=16662)	62.4%	36.4%	1.3%
Older Adult (n=2354)	67.5%	31.7%	0.8%
Unknown (n=65)	18.5%	13.8%	67.7%
Occupational	28.4%	69.3%	2.2%
Child<15 years (n=23)	17.4%	78.3%	4.3%
Adolescent (n=86)	32.6%	67.4%	< 0.1%
Adult (n=2465)	28.5%	69.4%	2.1%
Older Adult (n=5)	< 0.1%	100.0%	< 0.1%
Unknown (n=5)	< 0.1%	< 0.1%	100.0%
Other/Unknown	53.1%	39.3%	7.6%
Child<15 years (n=182)	37.9%	51.1%	11.0%
Adolescent (n=74)	50.0%	47.3%	2.7%
Adult (n=829)	57.3%	37.4%	5.3%
Older Adult (n=23)	16.0%	4.0%	80.0%
Unknown (n=25)	73.9%	26.1%	< 0.1%
Total (n=164363)	51.1%	46.8%	2.0%

Table 18. Haddon's matrix for reducing the risk of deliberate self-poisoning by adolescents and adults (higher rates of self-harm)

	Host (person)	Agent	Environment (community)
Pre-event	• High risk identification and treat eg, Alcohol and substance use • Counselling services, conflict resolution and coping strategies	• Accessibility of medications • Restricted dispensing quantities • High risk medications	• Reduce inappropriate prescribing • Reduce access to high risk drugs eg, high level scheduling
Event	• Responsible service of alcohol • Age restriction on alcohol supply • Blister packaging	• Dose ingested • Intrinsic toxicity	• Proximity to people
Post-event	• Help-seeking behaviour • Health, age • Treat depression • Prehospital administration of charcoal • Substance dependence	• Availability of antidotes • Good supportive treatment	• Practice of first aid • Quality healthcare • Psychosocial interventions • Co-ordination between counselling services, PIC and emergency services • Proximity to care

Table 19. Haddon's matrix for reducing the risk of medication error exposures poisoning in older adults (medication errors, self-harm)

	Host (person)	Agent	Environment (community)
Pre-event	• High risk patient identification (eg, dementia, polypharmacy)	• Accessibility of toxic medicines • Rational prescribing • Webster pack	• Community supervision of dosing • Social enrichment
Event	• Visibility	• Reduce dose ingested • Intrinsic toxicity: prescribe low toxicity compounds • Increased legibility of generic drug names	• Community support and supervision • Medicines advice lines • Personal duress alarms • Medical alert bracelets
Post-event	• Help-seeking behaviour • Treat depression • Treat alcohol dependence	• Effectiveness of treatment • Availability of antidotes	• Practice of first aid • Appropriate care • Quality aged care • De-prescribing • Home medicines reviews • Access to poison

Table 20. Haddon's matrix for reducing the risk of unintentional poisoning in young children

	Host (person)	Agent	Environment (community)
Pre-event	• Pre-school and school education	• Lockable cabinets and safety latches • Child safe packaging • Disposal of unwanted medicines	• Safe homes • Educated siblings • Educated parents
Event	• Lack of sweeteners in product • Smaller pack size	• Clear labelling • Less attractive packaging • Bittering agents • Formulation changes (eg, colour, sugar content, odour)	• Seek appropriate advice
Post-event	• Individual feedback and education	• Appropriate first aid labelling and advice • Activated Charcoal • PIC number on packaging • Appropriate referral	• Public health reporting • Well-staffed PIC • Full registration of constituents