Austin Health

VICTORIAN POISONS INFORMATION CENTRE

ANNUAL REPORT 2018

Victorian Poisons Information Centre

13 11 26

Emergency Department
Austin Hospital
Heidelberg 3084

www.austin.org.au/poisons
www.facebook.com/vpic.131126/

Table of Contents

Introduction 3

Hours of Operation 3

Personnel 3

Clinical Governance Activities 4

Poisoning Prevention Activities 5

Toxicovigilance Activities 5

Publications and International Conference Presentations 7

Other Conference and Meeting Attendances 9

Other Activities 9

Key Performance Indicators 11
- Outreach education hours 11
- Number of papers published 12
- Number of toxicovigilance activities undertaken 13
- Calls referred to the Austin toxicology registrar, fellow, toxicologists, national roster toxicologists and mycologists 13
- Calls by hour of the day 14
- Calls by month of the year 15
- Complaints received 15

Calls to the Victorian Poisons Information Centre 16
- Call types 16
- Query types 17
- Person exposed 18
- Person calling 18
- Types of exposure 19
- Routes of exposure 19
- Location of exposure 20
- Patient disposition – neonates 20
- Patient disposition – infants 21
- Patient disposition – toddlers 21
- Patient disposition – children 21
- Patient disposition – adolescents 22
- Patient disposition – adults 22
- Patient disposition – elderly 22
- Symptom severity at the time of the call 23
- Top ten exposure substances 23
- Exposures to non-medicine, non-drug products 24
- Exposures to medicines and drugs 33

Introduction

The Victorian Poisons Information Centre (VPIC) commenced operation in 1962. It was located at the Royal Children's Hospital, Melbourne from 1976 to 2008. In August 2008, the centre moved to the Austin Hospital, to co-locate and integrate with the Austin Hospital Clinical Toxicology Service (AHCTS). VPIC is located in the Austin Hospital Emergency Department, and is directed administratively as part of the Austin Hospital Pharmacy Department.

VPIC provides members of the Victorian public with:

- risk assessment, first aid, and management advice in the event of poisoning or suspected poisoning involving: accidental/unintentional exposures that include therapeutic errors and occupational workplace exposures; deliberate self poisonings; envenomations; toxic hazard situations
- advice regarding the need for medical assessment
- information, advice and resources about prevention of poisoning
- referral to other information sources or agencies if appropriate
- selected drug information.

VPIC provides health professionals with:

- a risk assessment in the event of poisoning or suspected poisoning involving: accidental/unintentional exposures that include therapeutic errors and occupational workplace exposures; deliberate self poisonings; envenomations; toxic hazard situations
- information about the potential toxic effects from an exposure
- initial and ongoing management advice
- information on formulation of products
- referral to other information sources or agencies if appropriate
- referral to a member of the supporting medical toxicology team (registrar, fellow or consultant) for complicated and/or severe cases, following agreed escalation protocols
- information and data about trends in poisonings (toxicovigilance).

VPIC aims to prevent unnecessary visits to general practitioners and hospitals and unnecessary ambulance callouts, and to ensure patients who are poisoned or envenomed receive the most appropriate treatment promptly.

The VPIC telephone number is **13 11 26**. This number can be used Australia-wide for the cost of a local call (excluding mobile phones).

Hours of Operation

VPIC operates Monday to Friday (0800 to 2130 hours), and Saturday and Sunday (0800 to 2100 hours), ie 93.5 hours per week. Outside these times, calls are diverted to the New South Wales (NSW) Poisons Information Centre. Overnight shifts (12 midnight to 0600 hours) are shared between the four Australian PICs (NSW, Queensland, Western Australia and Victoria). Only one PIC operates overnight, taking all the calls from across Australia while the other three PICs are closed. VPIC currently works the overnight shifts every Tuesday and every second Sunday, plus the occasional additional shift that other PICs cannot accommodate.

Personnel

Director of Austin Health Pharmacy and the VPIC

Kent Garrett B. Pharm., Grad. Dip. Hosp. Pharm.

Manager, VPIC
Jeff Robinson B. Pharm., FSHP, Grad. Dip. Hosp. Pharm.

Medical Director of VPIC
Dr Shaun Greene MBChB, MSc (Medical Toxicology), FACEM, FACMT

Specialists in Poisons Information (SPIs)
Janet Browning B. Pharm., Dip. Hosp. Pharm.
Mark Colbridge B. Sc (Hons)
Dr Dawson MacLeod B. Pharm., Grad. Dip. Biotech., Grad. Cert. Clin. Tox., PhD
Hamish McCracken B. Pharm., Grad. Dip. Psych.
Christine McKenzie B. Pharm., Grad. Cert. E-Health Comm., Grad. Cert. Clin. Tox.
Jeff Robinson B. Pharm., FSHP, Grad. Dip. Hosp. Pharm.

Toxicology Fellow in Training
Dr Joe-Anthony Rotella MBBS, BSc, AFRACMA, FACEM (from September 2017)

On-Call Clinical Toxicologists
The following clinical toxicologists shared the VPIC on-call responsibilities during 2018:
Dr. Dino Druda B. Med. Sc (Hons), MBBS, MRCP (UK), FACEM, Grad. Cert. Clin. Tox. (Monash Health)
Professor Andis Graudins MBBS, PhD, FACEM, FACMT (Monash Health)
Dr. Shaun Greene MBChB, MSc (Medical Toxicology), FACEM, FACMT (AHCTS)
Dr. Zeff Koutsogiannis MBBS, FACEM, Grad. Cert. Clin. Tox. (AHCTS)
Dr. Hweemin Lee MBBS, FACEM, Dip. Tox (Monash Health)
Dr. Anselm Wong MBBS, FACEM, Dip. Tox, FACMT (AHCTS)

AHCTS is comprised of a toxicology registrar (six month rotation) and three toxicology consultants (Dr. Shaun Greene; Dr. Zeff Koutsogiannis; Dr. Anselm Wong). In July 2014, a shared AHCTS/Monash Health on-call toxicology service (VAMPIRE) commenced. There are currently three clinical toxicologists from Monash Health (Professor Andis Graudins, Dr. Dino Druda and Dr. Hweemin Lee) who provide, with the AHCTS toxicologists, a specialised management and advice service for toxicology/toxinology admissions at Austin Health and Monash Health, and other Victorian hospitals via VPIC call referral.

VPIC staff enjoy a close day-to-day working relationship with the AHCTS team. VPIC SPIs have ready access to the toxicology registrar, toxicology fellow or the on-call consultant in complicated and/or severe poisoning cases meeting case escalation criteria. In addition, a range of external consultants (clinical pharmacologists and mycologists) are available to VPIC staff to provide specialist advice in these areas if needed.

Additionally, Drs. Greene, Koutsogiannis, Druda, Wong and Professor Graudins continued their participation in the national toxicology on-call roster.

Clinical Governance Activities

Clinical governance has been defined as the framework through which health care organisations are accountable for continuously improving the quality of their services and safeguarding high standards of care by creating an environment in which excellence in clinical care will flourish.

The following clinical governance activities were undertaken during 2018:

- Internal review of all VPIC calls by a second VPIC staff member.
- Review of all VPIC potentially 'critical incident' calls by the Toxicology Registrar, ie all calls received from hospitals, general practitioners and ambulances. The Registrar provides feedback as appropriate, and the call review forms part of the Registrar's training.
- Reports of all shared-service cases and VPIC calls referred to the registrar, fellow or on-call toxicologist were emailed to VPIC, AHCTS and Monash Health Toxicology staff, with follow-up reports if appropriate.
- All currently active VPIC cases were circulated to the national toxicology/PIC email distribution list by the VAMPIRE consultant. This ensured that the clinical toxicologist on-call nationally overnight was aware of the Victorian cases and the local advice that had been given, with improved continuity of patient care and governance.
- Next day follow-up of any Victorian cases that were referred to the national roster toxicologist overnight. If appropriate, follow-up reports of these cases were emailed to VPIC, AHCTS, Monash Health Toxicology staff and the national toxicology/PIC email distribution list.
- Ongoing involvement in regular VPIC/AHCTS educational activities, eg Global Educational Toxicology Uniting Project (GETUP) videoconferencing with the PICs in Fiji and Fresno, California; a half-day Toxicology Forum in August; case discussions including morbidity and mortality review, teaching sessions and Toxicology Journal Club held every Wednesday.
- Ongoing review of VPIC/AHCTS policies, procedures, protocols, clinical guidelines and position statements, including the guidelines for SPI call referral to the on-call toxicologist. These reviews are performed every two to three years or earlier if indicated.
- Ongoing broader staff education via attendance at TAPNA (Toxicology and Poisons Network Australasia) meetings in Brisbane, Sydney and Newcastle and international conference attendances (EAPCCT Conference, Bucharest; NACCT Conference, Chicago; APAMT Conference, Bali).
- Annual Austin Health Performance Review and Development (PRD) for all VPIC staff.

Poisoning Prevention Activities

The following poisoning prevention activities were undertaken during 2018:

- Printed material (pamphlets, telephone stickers, posters, information sheets) and fridge magnets were supplied to childcare centres, kindergartens, local councils, Maternal and Child Health Centres, GP surgeries etc throughout the year.
- VPIC continued the arrangement with the Victorian Department of Education and Training (DET) whereby DET includes the VPIC pamphlet in information packs provided to Victorian families.
- In May, Jeff Robinson liaised with the mycologists at the Royal Botanic Gardens, Melbourne and the Media Unit of the Victorian Department of Health and Human Services (DHHS) to release a Chief Health Officer Advisory and ABC Radio interview about 'Poisonous mushrooms growing in Melbourne.'
- Seasonal poisoning prevention messages were posted on the VPIC Facebook page www.facebook.com/vpic.131126/

Toxicovigilance Activities

Toxicovigilance is the active process of identifying and evaluating toxic risks, and evaluating the measures taken to reduce or eliminate them. It involves the analysis of PIC data to identify if

there are specific circumstances or agents giving rise to poisoning, or certain populations or locations suffering a higher incidence of poisoning or the need for public education and restrictions on the availability of certain products. Toxicovigilance may lead to PIC safety alerts in cases of sentinel events. Toxicovigilance can also reveal whether there is an emerging toxicological problem resulting from, for example, the reformulation of a product or a change to its packaging or labelling or the availability of a new drug of abuse.

To support toxicovigilance activities, VPIC has developed collaborative links with: the other Australian PICs; public health agencies such as the Victorian DHHS Environmental Health Unit; the Victorian Institute of Forensic Medicine (VIFM); regulatory authorities such as the Therapeutics Goods Administration (TGA); medication safety bodies; child safety groups, eg Kidsafe.

The following toxicovigilance activities were undertaken during 2018:

- In January, VPIC call data pertaining to plant exposures (2016 and 2017) was provided to a plant researcher in preparation for an ABC Radio interview.
- In January, VPIC call data pertaining to pregabalin exposures (2017) was provided to Dr D. Liew, Austin Health Rheumatologist, for a conference presentation re adverse events with increased access to pregabalin.
- In February, VPIC call data pertaining to Lye water exposures (2016 and 2017) was provided to Dr. Carolyn Lewis, South Australian Health Department.
- In March, VPIC call data pertaining to mushroom exposures was provided to the Food Safety Authority for their wild mushroom media release ahead of the autumn growing season.
- In May, VPIC call data pertaining to mushroom exposures was provided to the Victorian DHHS prior to the release of a Chief Health Officer Advisory 'Poisonous mushrooms growing in Melbourne.'
- In June, VPIC call data pertaining to amyl nitrite and other volatile nitrite exposures (2005 to 2017) was provided to Rose Cairns, NSW Poisons Information Centre, as part of a national study of these products and for a re-scheduling submission to TGA.
- In June, VPIC call data pertaining to opioids (2011 to 2017) was provided to researchers at the National Drug and Alcohol Research Centre (NDARC) as part of their national opioid research work.
- In July, VPIC call data pertaining to teeth whitening products (2017) was provided to the Australian Dental Association for their public education and advocacy campaign about the risks associated with these do-it-yourself products.
- In August, VPIC call data pertaining to pregabalin deliberate self poisoning (2015 to 2018) was provided to Dr Malcolm Dobbin, Public Health Physician, DHHS.
- In August, VPIC call data pertaining to naphthalene mothball exposures (2014 to 2017) was provided to Dr James Pitt, Victorian Clinical Genetics Service, Murdoch Children's Research Institute.
- In September, VPIC call data pertaining to paediatric disc/button battery exposures (2018) was provided to Jason Chambers, General Manager of Kidsafe Victoria.
- In October, VPIC call data pertaining to amyl nitrite and other volatile nitrite exposures in 2018 (to date) was provided to Jared Brown, NSW Poisons Information Centre, as part of a national study of these products and for a re-scheduling submission to TGA.
- In November, VPIC call data pertaining to disc/button battery exposures (June 2017 to October 2018) was provided to Jared Brown, NSW Poisons Information Centre, as part of an ongoing national PIC study of these products.

Publications and International Conference Presentations

The following publications and international conference presentations were achieved during 2018:

- Meek R, Graudins A, Anthony S. Antiemetic treatment in the emergency department: Patient opinions and expectations. Emerg Med Australas 2018; 30(1): 36-41.
- Cooper I, Landersdorfer CB, St John AG, Graudins A. The pharmacokinetics of intranasal droperidol in volunteers characterised via population modelling. SAGE Open Medicine 2018; 6: 1-9.
- Arbabian H, Lee HM, Graudins A. Elderly patients with suspected chronic digoxin toxicity: A comparison of clinical characteristics of patients receiving and not receiving digoxin-Fab. Emerg Med Australas 2018; 30(2): 242-8.
- Wong A. Chapters on Tricyclic Antidepressants, Anticholinergic Poisoning and Cholinergic Poisoning written for Fleisher and Ludwig's 5-Minute Pediatric Emergency Medicine Consult 2nd edition, Lippincott Williams and Wilkins 2018.
- Wong A, Sivilotti MLA, Gunja N, McNulty R, Graudins A. Accuracy of the paracetamol-aminotransferase product to predict hepatotoxicity in paracetamol overdose treated with a 2-bag acetylcysteine regimen. Clin Tox 2018; 56(3): 182-8.
- Wong A, Gunja N, McNulty R, Graudins A. Analysis of an 8-hour acetylcysteine infusion protocol for repeated supratherapeutic ingestion (RSTI) of paracetamol. Clin Tox 2018; 56(3): 199-203.
- Wong A, Tong RLK, Ryan L, Crozier T, Graudins A. The use of sustained low efficiency dialysis (SLED) in massive paracetamol overdose. Clin Tox 2018; 56(3): 229-31.
- Wong A, Landersdorfer C, Graudins A. In reply. Euro J Clin Pharm 2018; 74(2): 253.
- Wong A, Greene SL. Successful treatment of *Nerium oleander* toxicity with titrated Digoxin Fab antibody dosing. Clin Tox 2018; 56(7): 678-80.
- Wong A, Cheung B, Nejad C, Gantier M, Graudins A. Hepatotoxicity after paracetamol overdose in a patient with cystic fibrosis despite early acetylcysteine and utility of microRNA to predict hepatotoxicity. Clin Tox DOI: 10.1080/15563650.2018.1454596.
- Wong A, Lee C, Lee J. Agomelatine overdose and related toxicity. Toxicology Communications 2018; 2(1): 62-5.
- Craig S, Graudins A, Dalziel SR, Ve Powell C, Babl FE. A primer for clinical researchers in the emergency department: Part 6. Measuring what matters: Core outcome sets in emergency medicine research. Emerg Med Australas 2018 DOI:10.1111/1742-6723.12970.
- Lee J, Pilgrim J, Gerostamoulos D, Robinson J, Wong A. Increasing rates of quetiapine overdose, misuse and mortality in Victoria, Australia. Drug and Alcohol Dependence 2018; 187: 95-9.
- Rotella JA. Improved assessment of chest pain trial (IMPACT): assessing patients with possible acute coronary syndrome. MJA 2018; 208(5): 234.
- Huynh A, Cairns R, Brown JA, Lynch AML, Robinson J, Wylie C, Buckley NA, Dawson AH. Patterns of poisoning exposure at different ages: the 2015 annual report of the Australian Poisons Information Centres. Med J Aust 2018; 209(2): 74-9.
- Druda DF, Gone S, Graudins A. Deliberate self-poisoning with a lethal dose of pentobarbital with confirmatory serum drug concentrations: Survival after cardiac arrest with supportive care. J Med Tox 2018 DOI: 10.1007/s13181-018-0675-3.
- Wong A, McNulty R, Taylor DM, Sivilotti MLA, Greene SL, Gunja N, Koutsogiannis Z, Graudins A. The NACSTOP trial: A multicentre, cluster-controlled trial of early cessation of acetylcysteine in acetaminophen overdose. Hepatology 2018 DOI: 10.1002/hep.30224.

- Ling SL, Taylor DM, Robinson J. Workplace chemical and toxin exposures reported to a Poisons Information Centre: a diverse range causing variable morbidity. Eur J Emerg Med 2018; 25(2): 134-9.
- Meek R, Mee MJ, Egerton-Warburton D, Graudins A, Meyer A, Pouryahya P, Blecher GE, Fahey J, Crow S. Randomized placebo-controlled trial of droperidol and ondansetron for adult emergency department patients with nausea. Academic Emerg Med 2018 DOI: 10.1111/acem.13650.
- Wylie C, Heffernan A, Brown JA, Cairns R, Lynch AM, Robinson J. Exposures to e-cigarettes and their refills: calls to Australian Poisons Information Centres 2009-2016. MJA 2018 DOI: 10.5694/mja2.12032.
- Wong O, Wong A, Greene SL, Graudins A. Prolonged coma resulting from massive levothyroxine overdose and the utility of N-terminal prohormone brain natriuretic peptide (NT-proBNP). Clin Tox 2018. Epub early online DOI:10.1080/15563650.2018.1533639.
- Wong A, Homer N, Dear JW, Choy KW, Doery J, Graudins A. Paracetamol metabolite concentrations following low risk overdose treated with an abbreviated 12 hour versus 20 hour acetylcysteine infusion Clin Tox 2018. Epub early online DOI:10.1080/15563650.2018.1517881.
- Cairns R, Brown JAB, Lachireddy K, Wylie C, Robinson J, Dawson AH, Buckley NA. Button battery exposures in Australian Children: a prospective observational study highlighting the role of poisons information centres. Clin Tox 2018. Epub early online DOI:10.1080/15563650.2018.1537492.
- Schwartz GD, Harding AM, Donaldson SR, Greene SL. Modifying emergency department electronic prescribing for outpatient opioid analgesia. Emerg Med Australas 2018 DOI:10.1111/1742-6723.13192.
- Taylor L, Graudins A. Extended-release quetiapine overdose is associated with delayed onset of toxicity compared to immediate-release quetiapine overdose. Emerg Med Australas 2018 DOI:10.1111/1742-6723.13205.
- Ryan W, Wong A, Graudins A. Analysis of beta blocker and calcium channel blocker overdoses treated with high-dose insulin euglycaemia therapy and/or catecholamine infusion. ACMT Annual Scientific Meeting, Washington, April.
- Lee J, Wong A. Agomelatine-related toxicity reported to the Victorian Poisons Information Centre. EAPCCT Conference, Bucharest, May.
- Wong A, Homer N, Dear JW, Weng Choy K, Doery J, Graudins A. Investigation of paracetamol metabolites to compare efficacy of acetylcysteine regimens in paracetamol overdose. EAPCCT Conference, Bucharest, May.
- Wong A, Taylor DM, Sivilotti MLA, McNulty R, Greene SL, Koutsogiannis Z, Gunja N, Graudins A. The NACSTOP trial: a multicentre, cluster, controlled trial investigating the early cessation of N-acetylcysteine in paracetamol overdose. EAPCCT Conference, Bucharest, May.
- Lien-Kien Tong R, Graudins A. Refractory bradycardia and heart rate-dependent hypotension following verapamil and telmisartan overdose responding to emergency transvenous cardiac pacing. EAPCCT Conference, Bucharest, May.
- Wong A, Nejad C, Gantier MP, Weng Choy K, Doery J, Graudins A. The potential utility of microRNA for comparing efficacy of acetylcysteine regimens in paracetamol overdose. EAPCCT Conference, Bucharest, May.
- Anselm Wong was a finalist for the Young Investigator Award at the EAPCCT Conference, Bucharest, May.

- Roberts D, Wong A, Vlad I, Brown J, Nguyen E, Dawson A. Development of national consensus recommendations for the management of colchicine poisoning by Poisons Information Centres. NACCT Congress, Chicago, October.
- McMaster C, Liew DFL, Joules E, Robinson J, Greene SL, Buchanan RRC, Frauman AG. Normalised toxicity to pregabalin did not increase with changes in approval mechanism and use in Australia. Annual European Congress of Rheumatology Conference, Amsterdam, June.
- Wong A. Mobile app use for toxicovigilance and education. APAMT Annual Scientific Congress, Bali, November.
- Wong A. The utility of droperidol for the treatment of cannabinoid hyperemesis syndrome. APAMT Annual Scientific Congress, Bali, November.

Other Conference and Meeting Attendances

The following conferences and meetings were also attended during 2018:

- As part of the Global Educational Toxicology Uniting Project (GETUP), VPIC/AHCTS staff participated in several videoconferences with the PICs in Fiji and California.
- In February and December, VPIC, AHCTS and Monash Health staff attended and presented at a half-day clinical meeting held at the Austin Hospital.
- In March, VPIC, AHCTS and Monash Health staff visited the Victoria Police Forensic Centre in Melbourne.
- VPIC, AHCTS and Monash Health staff attended and presented at the half-day Toxicology Forum held at the Austin Hospital in August.
- VPIC and AHCTS staff attended and presented at the three national PIC/Toxicology Clinical Meetings (TAPNA), held in March (Brisbane), May (Sydney) and Newcastle (August).
- Anselm Wong won awards for the Best Poster and the Best Original Research Presentation at the TAPNA Conference held in Sydney in May.
- In October, AHCTS and Monash Health staff attended and presented at the Monash Health MTP Research Week and the Austin Health ResearchFest.
- In November, AHCTS staff attended and presented at the ACEM Annual Scientific Meeting held in Perth.

Other Activities

The following additional activities were undertaken during 2018:

- VPIC/AHCTS educational activities continued to be held every Wednesday, eg teaching sessions, ward round, case discussions including morbidity and mortality review, Toxicology Journal Club.
- Review of VPIC/AHCTS clinical guidelines, policies, procedures, protocols and position statements was ongoing. Abridged versions of clinical guidelines were placed on the Austin Health intranet (Hub).
- Regular poisoning prevention and other postings were made on the VPIC Facebook page www.facebook.com/vpic.131126/
- New Austin Health Toxicology Guidelines were added to the Clinicians' Health Channel, making them available to all public hospital clinicians in Victoria.
- The process of updating drug names in the VPIC database, clinical guidelines etc to reflect the International Harmonisation of Ingredient Names (IHIN) adopted by TGA was ongoing.
- The process of culling hard-copy references and uploading them into the ToxLibrary was ongoing.

- Ongoing update of the VPIC Policy and Procedure Manual and the VPIC Training Manual.
- During 2018, Jeff Robinson continued as Chairman of the Victorian DHHS Reference and Evaluation Group for the Clinicians' Health Channel.
- During 2018, Jeff Robinson continued his membership of the Health Direct Australia Poisons Information Centre Service Improvement and Development Committee (SIDC).
- Shaun Greene, Jeff Robinson and Anselm Wong continued their membership of the Royal Children's Hospital Toxicology Committee, to assist in the review of the RCH toxicology clinical practice guidelines. The Toxicology Fellow, Dr Joe-Anthony Rotella, joined the Committee in July 2018.
- Zeff Koutsogiannis and Dawson MacLeod continued their memberships of the Expert Writing Group convened to write the new edition of Therapeutics Guidelines: Toxicology and Wilderness.
- Monthly VPIC call data continued to be provided to the Monash University group that is evaluating the DHHS 'Ambulances are for Emergencies' campaign.
- Anselm Wong was awarded a National Health and Medical Research Council (NHMRC) Early Career Fellowship.
- Anselm Wong won the 2017 ACMT Outstanding Service Recognition Award (awarded in 2018).
- Anselm Wong won the Monash University Postgraduate Publication Award for 2018.
- Anselm Wong won the ACEM International Development Fund Grant Award for 2018 for the GETUP project.
- Anselm Wong won the Clinical Toxicology Top Journal Reviewer Award for 2018.
- Anselm Wong was the main research supervisor for two MDRP University of Melbourne MD course students. In 2017-2018: Title - Treatment of Cannabis Hyperemesis Syndrome. Student - Carl Lee. In 2018-2019: Title - Comparison of liver transplant referral criteria for paracetamol overdose. Student - Joyce Xu.
- In January, VPIC's 2017 Annual Report featured in an Austin Health iNews article.
- In January, Dr Jacqueline Maplesden, an Emergency Physician from St. Vincent's Public Hospital in Melbourne, commenced a six month sabbatical leave at VPIC/AHCTS.
- In February, information sheets for members of the public, available on the VPIC website www.austin.org.au/poisons, were updated.
- In February, Jeff Robinson was interviewed by a Herald Sun newspaper journalist about VPIC's 2017 Annual Report, with particular emphasis on the 20% increase in therapeutic error calls between 2015 and 2017. The article was published on 21st February.
- In February, Jeff Robinson worked with the Austin Health Clinical Costing Unit to determine the average cost of a call to VPIC.
- In April, Jeff Robinson was interviewed by a Herald Sun newspaper journalist about the findings in the paper: Lee J, Pilgrim J, Gerostamoulos D, Robinson J, Wong A. Increasing rates of quetiapine overdose, misuse and mortality in Victoria, Australia. Drug and Alcohol Dependence 2018; 187: 95-9. The article was published on 25th May.
- On 25th May, the Austin Hospital issued a media release and Jeff Robinson was interviewed on Radio 3AW about the findings in the paper: Lee J, Pilgrim J, Gerostamoulos D, Robinson J, Wong A. Increasing rates of quetiapine overdose, misuse and mortality in Victoria, Australia. Drug and Alcohol Dependence 2018; 187: 95-9.
- On 4th June, Jeff Robinson was interviewed on ABC Radio about the findings in the paper: Lee J, Pilgrim J, Gerostamoulos D, Robinson J, Wong A. Increasing rates of quetiapine overdose, misuse and mortality in Victoria, Australia. Drug and Alcohol Dependence 2018; 187: 95-9.

- In May, an updated submission was presented to DHHS requesting a budget increase to allow additional VPIC staffing.
- In May, Zeff Koutsogiannis was elected to the TAPNA Council.
- In June, Jeff Robinson reviewed the chapter 'Drug and Poison Information Sources and Typical Guidance and Management of Acute Drug Toxicity' for the textbook The Encyclopaedia of Pharmacy Practice and Clinical Pharmacy.
- In June, Jeff Robinson was interviewed on Radio 3AW about the potential problems associated with purchasing medicines such as weight-loss agents over the Internet.
- In June, the AHCTS Toxicology Registrar Handbook underwent a major review and update.
- In June and July, Jeff Robinson and Joe-Anthony Rotella prepared material for the paediatric toxicology blog 'Don't forget the bubbles'.
- In July, Jeff Robinson submitted comments to the draft Australian Standard AS 5205 – Australian Health Contact Centres.
- In August, Jeff Robinson submitted comments to the White Paper produced by Gail Greatorex of Product Safety Solutions: 'Consumer Product Safety in Australia. Challenges for Practitioners and Business Managers'.
- In August, Jeff Robinson contributed to an article in the magazine House of Wellness about the first aid for bites and stings.
- In October, Jeff Robinson spoke at a Toxicology Seminar organised by Dandenong Police.
- In October, Jeff Robinson, Shaun Greene and Andis Graudins attended a Safer Care Victoria meeting to discuss the Victorian Snakebite Management Guidelines.
- In October, Christine McKenzie and Janet Browning undertook the annual review of the Victorian Therapeutic Advisory Group's Register of Emergency and Life Savings Medicines. The Register is a list of the stock holdings of antidotes and antivenoms kept in Victorian Hospitals, plus initial dosing instructions and hospital contact details.
- In October, Anselm Wong won the CEO's Award for Clinical Research at the Austin Health ResearchFest.
- In November, Jeff Robinson was interviewed by a Herald Sun newspaper journalist about spider bite calls made to VPIC. The article was published on 9th December.
- In December, Jeff Robinson reviewed the following monographs produced by the Better Health Channel, Victorian DHHS: Chemicals in the Home; Mushroom Poisoning; Poisoning and Child Safety.
- In December, Jeff Robinson assisted Kidsafe Victoria in the development of an on-line learning module for Maternal and Child Health nurses.
- In December, the Austin Health Toxicology Guidelines became available via Apple and Android Apps.
- VPIC and AHCTS operations were shown to many visitors, including Austin Hospital pharmacy interns, overseas and interstate pharmacists, staff from other Australian PICs and overseas medical staff.

Key Performance Indicators

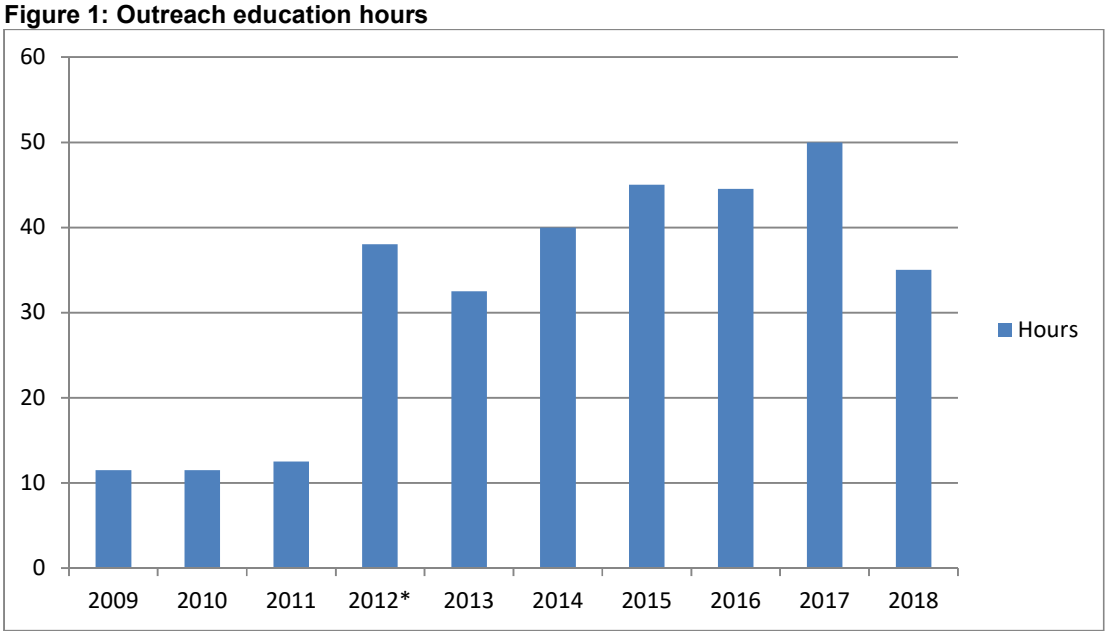
Outreach education hours

A total of 35 outreach education hours were delivered during 2018, see Figure 1 below. This was a slight decrease compared to 2017. Highlights included:

- Presentations at the national PIC/Toxicology Clinical Meetings (TAPNA), held in Brisbane in March and Sydney in May.
- 'Toxicology Update' presented to medical and nursing staff at several regional centres, including Bendigo and Heathcote.

- Half-day Toxicology Forum held at the Austin Hospital in August.
- Several toxicology skills training sessions delivered to FACEM trainees at the ACEM College.
- 'Envenomation Update' presented at the ACEM Seminar in Melbourne in July.
- Presentations to ED registrars and FACEM Trainees at the Austin Hospital.
- Presentations to undergraduate medical and pharmacy students, trainee paramedics, emergency nurse practitioners and rural general practitioners.

Figure 1: Outreach education hours

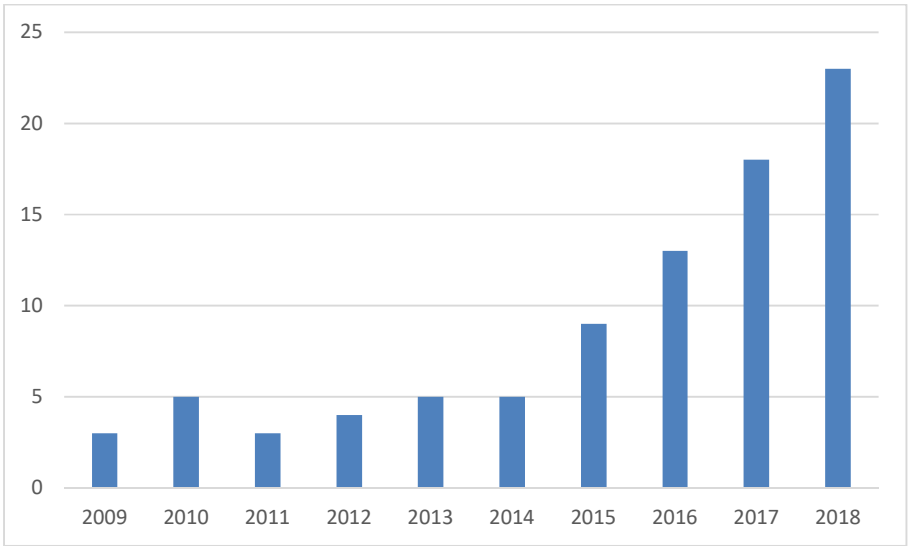


* From 2012, ongoing additional Victorian DHHS funding to support Outreach Education has seen a significant increase over previous years.

Number of papers published

A total of 23 papers were published during 2018, see Figure 2. This was a significant increase over recent years.

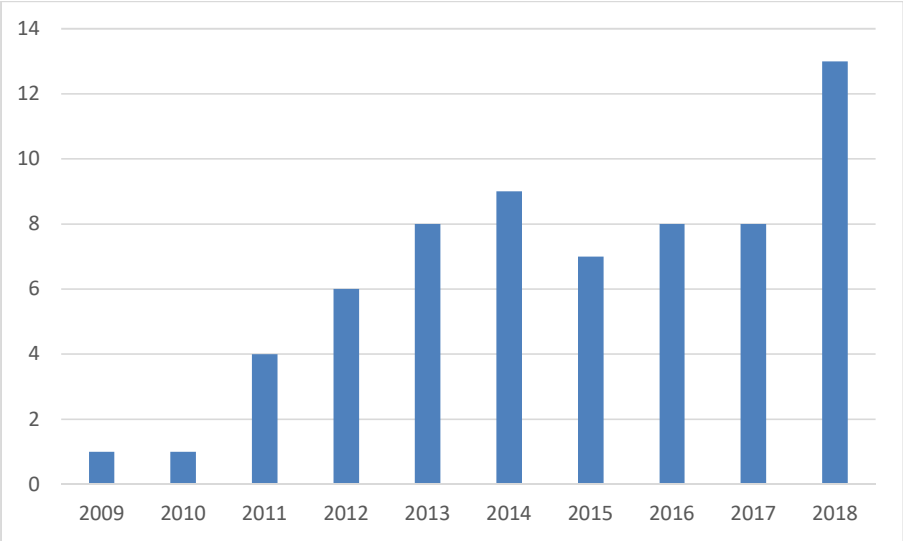
Figure 2: Number of papers published



Number of toxicovigilance activities undertaken

A total of 13 toxicovigilance activities were undertaken during 2018, a significant increase compared to recent years. See Figure 3 below.

Figure 3: Number of toxicovigilance activities undertaken

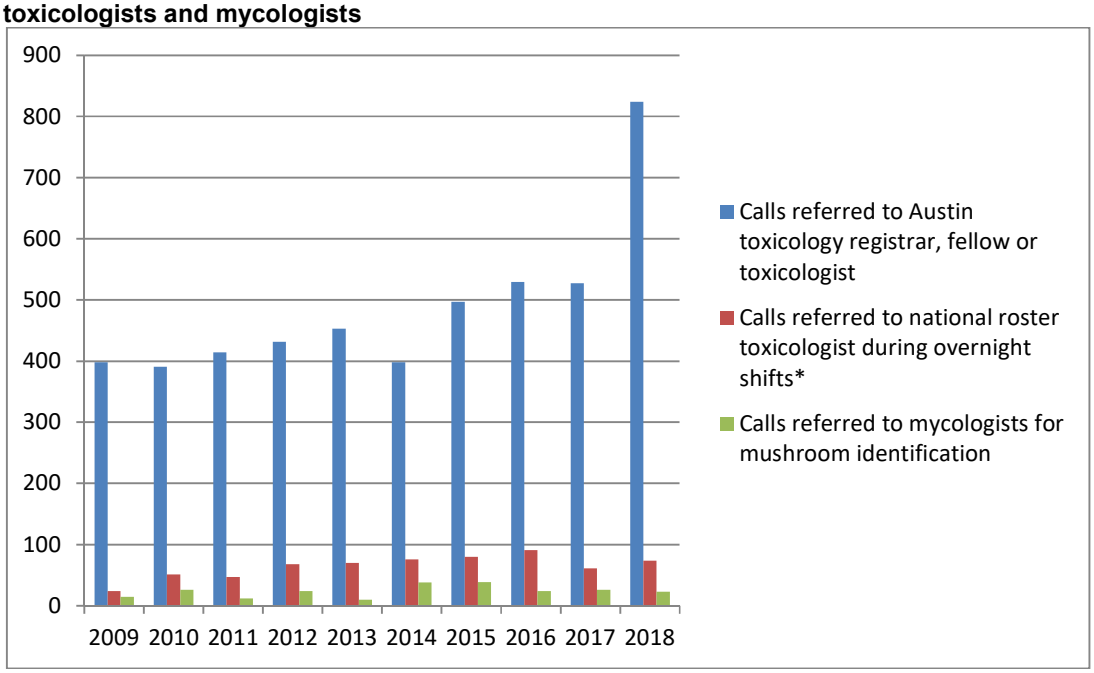


Calls referred to the Austin toxicology registrar, fellow, toxicologists, national roster toxicologists and mycologists

VPIC staff follow escalation protocols to refer complicated and/or severe poisoning or envenoming cases to the toxicology registrar, fellow or on-call toxicologist for management advice. On-call staff must be readily contactable and must respond promptly, within 10 to 15 minutes, to the health professional who contacted VPIC. When working an overnight shift, such calls are referred to the national roster clinical toxicologist. During normal operating hours in 2018, 824 calls were referred to the Austin Hospital toxicology registrar, fellow or on-call toxicologist (2.1% of the 38,565 total calls answered during normal operating hours). This was a higher referral rate than in previous years as part of a deliberate strategy to increase the case management experiences of the toxicology registrar and fellow. In the 76 overnight shifts worked by VPIC during 2018, 74 calls were referred to the national roster clinical toxicologist (2.3% of the 3,149 overnight shift calls). See Figure 4.

VPIC and the senior mycologists at the Royal Botanic Gardens, Melbourne, have an ongoing service agreement whereby calls to VPIC that involve ingestion of a potentially toxic mushroom are referred to the on-call mycologist for identification of the mushroom/s involved (23 such cases in 2018, a slight decrease compared to 2017). Mushroom identification may involve emailing photos or couriering specimens to the mycologists.

Figure 4. Calls referred to Austin toxicology registrar, fellow, toxicologists, national roster toxicologists and mycologists

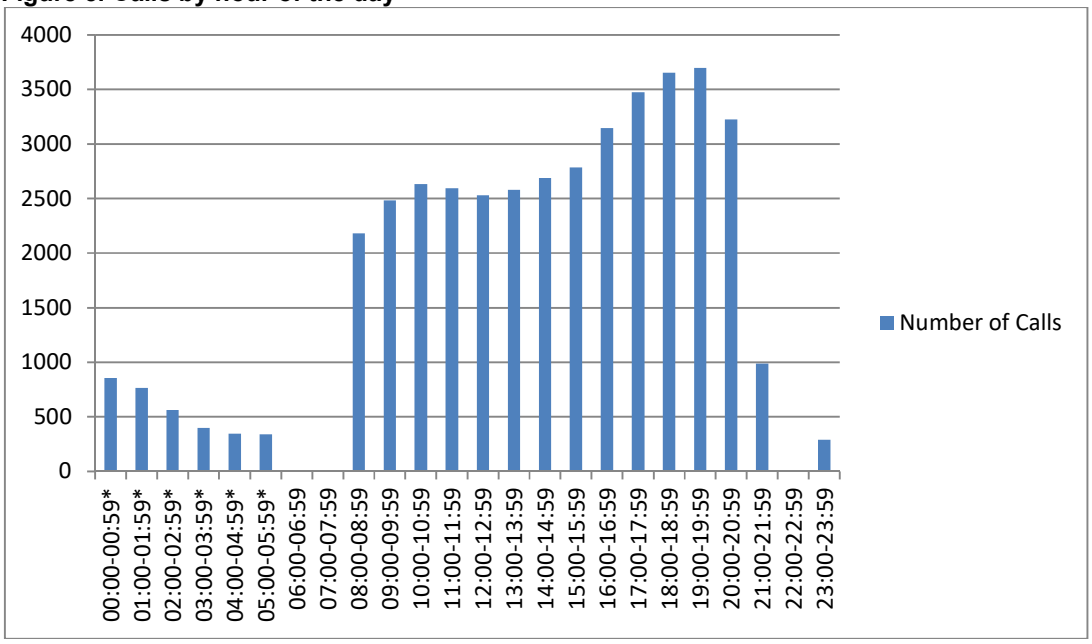


* VPIC worked 25 overnight shifts in 2009. This increased to 52 shifts in 2010, 54 shifts in 2011, 56 shifts in 2012, 66 shifts in 2013, 67 shifts in 2014, 70 shifts in 2015, 79 shifts in 2016, 79 shifts in 2017 and 76 shifts in 2018.

Calls by hour of the day

As in previous years, most calls were received between 1600 and 2000 hours, with the period between 1800 and 2000 hours being the busiest, see Figure 5 below.

Figure 5. Calls by hour of the day

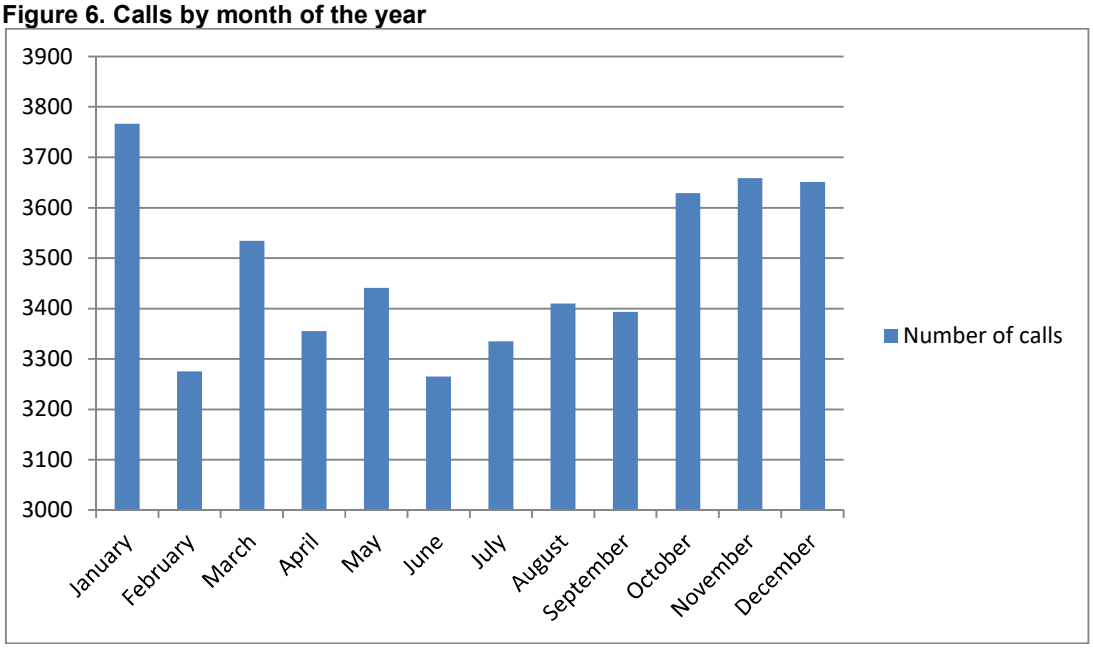


* As VPIC works just six or seven national overnight shifts per month, the overnight call numbers (12 midnight to 0600 hours) are much lower than daytime numbers.

Calls by month of the year

VPIC call numbers always taper off over the winter months, see Figure 6 below. This is most likely due to more limited outdoor activity during these months. Call numbers relating to outdoor activities, eg bites, stings and envenomations, increase during the warmer months.

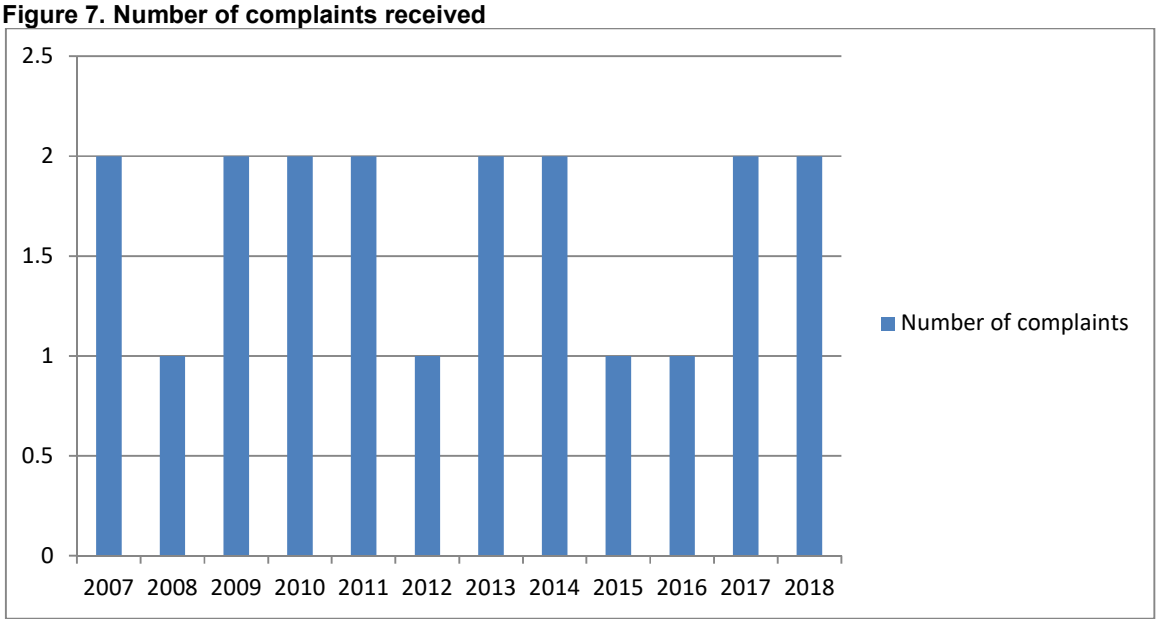
Figure 6. Calls by month of the year



Complaints received

Just two complaints about the VPIC service were received during 2018. Both were handled according to the VPIC complaints investigation procedure.

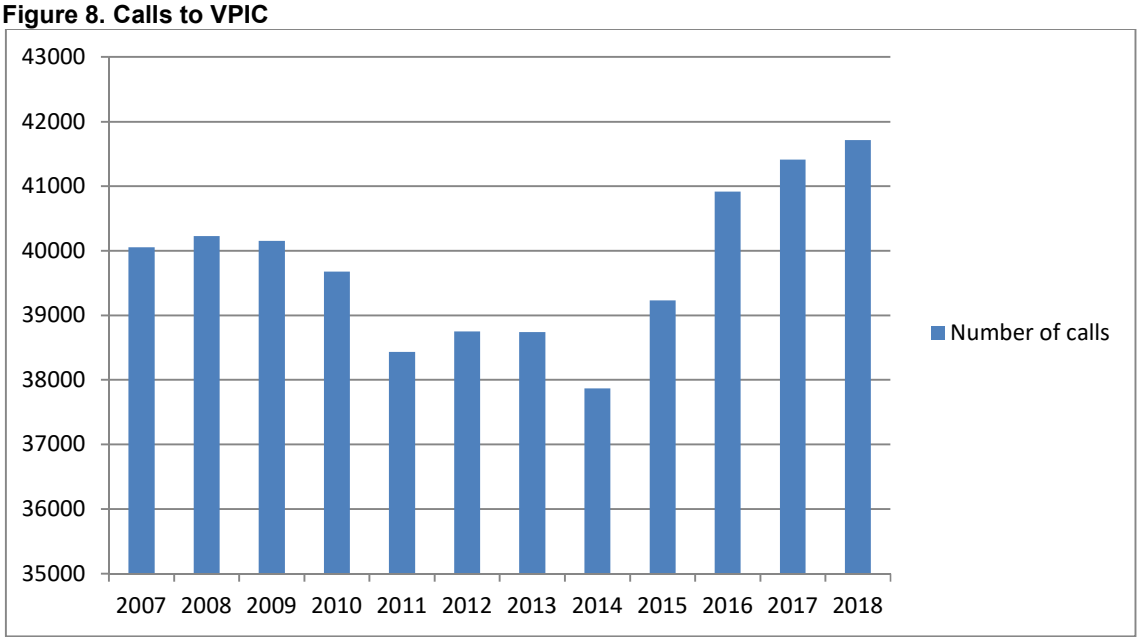
Figure 7. Number of complaints received



Calls to VPIC

VPIC received 41,714 calls in 2018, an average of 114 calls per day. This was slightly above 2017 (41,410 calls, average 113 calls per day), 2016 (40,919 calls, average 112 calls per day), 2015 (39,230 calls, average 107 calls per day) and 2014 (37,866 calls, average 104 calls per day). The steadily increasing call numbers, in the absence of extra funding for additional staff, have caused considerable workload pressures on VPIC staff. The 2018 total includes 3,149 calls answered by VPIC during 76 overnight shifts (New South Wales 977, Victoria 815, Western Australia 404, Queensland 634, South Australia 173, Tasmania 58, Australian Capital Territory 58, Northern Territory 30). Seventy four of these overnight calls were referred to the national roster toxicologist.

Figure 8. Calls to VPIC



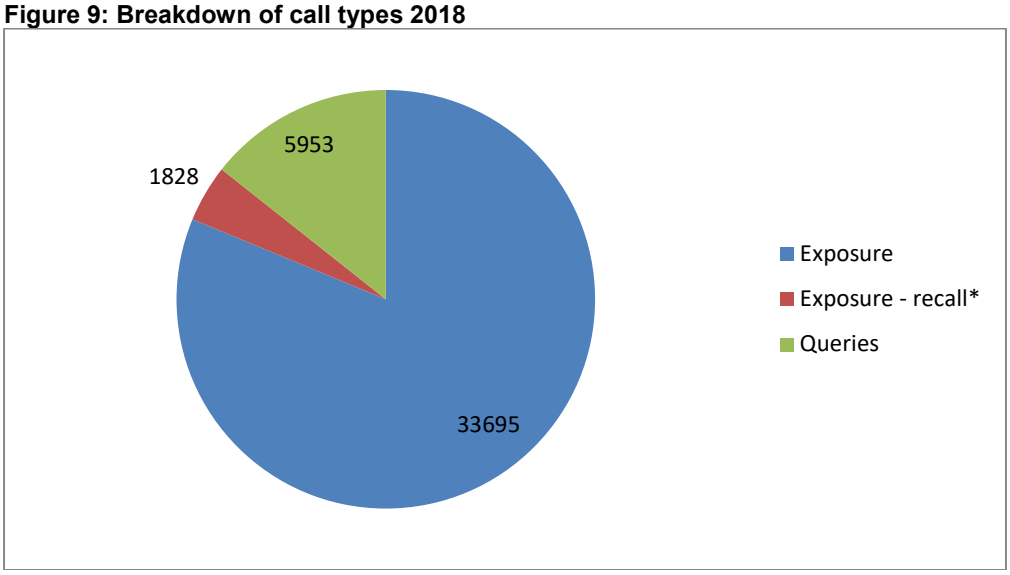
Call types (Figure 9)

Most calls involved an exposure. Approximately one-in-seven calls were queries.

Call type	Number of calls	%
Exposure to a poison	33,695	81
Exposure to a poison - recall*	1,828	4
Queries	5,953	14
Queries - recall*	223	<1
Hoax	15	<1
Total	41,714	100

* A recall is a second or subsequent call about a particular exposure or query.

Figure 9: Breakdown of call types 2018



* A recall is a second or subsequent call about a particular exposure or query.

Query types

The types of queries received are shown below.

Query type	Number of calls including recalls	%
Drug information: adverse drug reaction	236	4
Drug information: pregnancy	219	4
Drug information: breastfeeding	233	4
Drug information: missed dose	941	15
Drug information: dosage	324	5
Drug information: interactions	468	8
Drug information: refusing dose	92	1
Drug information: other	805	13
Medical	304	5
Request for pamphlets, stickers, fridge magnets etc	40	<1
PIC phone number check	84	1
Manufacturer	426	7
Request for Safety Data Sheet (SDS)	78	1
Wrong number	542	9
National Poisons Register (NPR) referral	25	<1
Complaint or compliment	10	<1
Product recall or safety alert	16	<1
Poisons information: other	1,041	17
Other queries	292	5
Total	6,176	100

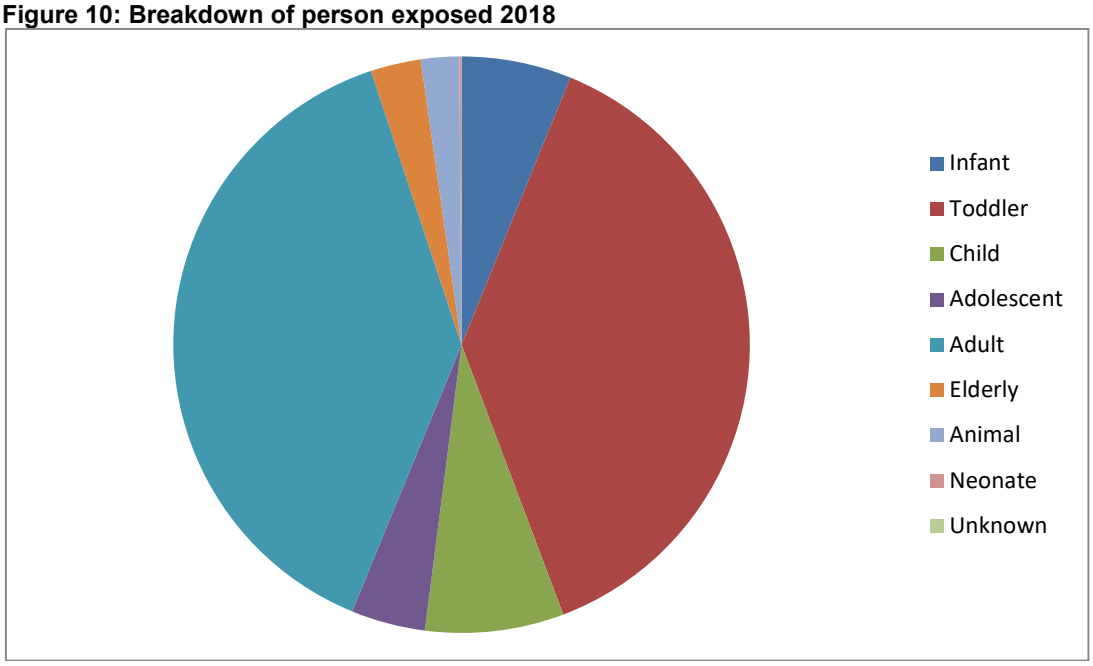
Person exposed (Figure 10)

The majority of calls about exposure to a poison involved toddlers and adults.

Person exposed	Number of calls including recalls	%
Neonate (0 to 4 weeks)	41	<1
Infant (4 weeks to 1 year)	2,186	6
Toddler (1 to 4 years)	13,537	38
Child (5 to 14 years)	2,763	8
Adolescent (15 to 19 years)	1,479	4
Adult (20 to 74 years)	13,752	39
Elderly (>75 years)	996	3
Unknown	2	<1
Animal*	767	2
Total	35,523	100

* Callers phoning about an exposure involving an animal were referred to their vet

Figure 10: Breakdown of person exposed 2018



Person calling (animal exposures excluded)

The majority of calls about exposure to a poison were received from parents.

Person calling	Number of calls including recalls	%
Family member: parent	14,686	42
Family member: spouse or partner	847	2
Family member: grandparent	455	1
Family member: other	1,268	4
Self	7,194	21
Doctor	5,207	15
Nurse	1,340	4
Carer	1,656	5

Friend	492	1
Ambulance: officer	560	2
Ambulance: communications or despatch	431	1
Pharmacist	192	<1
Counsellor, eg Lifeline, Suicide Help Line etc	111	<1
Teacher or educational worker	138	<1
Police	16	<1
Veterinary personnel	69	<1
Other health professional, eg dentist, psychologist, social worker, optometrist	44	<1
Medical receptionist	13	<1
Other, eg fire brigade, media, prison officer etc	37	<1
Total	34,756	100

Types of exposure (animal exposures excluded)

The majority of calls about exposure to a poison involved unintentional accidental exposures.

Types of exposure	**Number of calls including recalls**	**%**
Unintentional accidental	21,061	61
Unintentional therapeutic error	6,557	19
Unintentional workplace	835	2
Unintentional food poisoning	52	<1
Unintentional environmental	11	<1
Unintentional other	23	<1
Adverse reaction	251	<1
Intentional deliberate self poisoning	4,675	13
Intentional misuse	389	1
Intentional recreational abuse	416	1
Intentional other	414	1
Other	72	<1
Total	34,756	100

Routes of exposure (animal exposures excluded)

The majority of calls about exposure to a poison involved ingestion.

Route of exposure	**Number of calls including recalls**	**%**
Ingestion	34,025	79
Ocular	1,954	5
Inhalation	1,837	4
Dermal	1,641	4
Bite/sting	892	2
Injection	501	1
Buccal/sublingual/oral	2,185	5

mucosal		
Nasal	127	<1
Aural	38	<1
Vaginal	25	<1
Rectal	54	<1
Other/unknown	23	<1
Total	43,302*	100

* The number of routes of exposures is greater than the person exposed, person calling and types of exposure numbers because a call sometimes has more than one exposure route, eg household items sprayed into the mouth, face and eyes.

Location of exposure (animal exposures excluded)

Over 90% of exposures occurred at home.

Location of exposure	Number of calls including recalls	%
Home and surroundings	30,593	88
Nursing home/aged care facility	290	<1
CRU/group home/supported accommodation	1,619	5
Child care centre	112	<1
Workplace: office	32	<1
Workplace: factory	84	<1
Workplace: farm/agricultural	185	<1
Workplace: construction site	77	<1
Workplace: retail outlet	34	<1
Workplace: hospitality	64	<1
Workplace: garage/workshop	51	<1
Workplace: laboratory	24	<1
Workplace: minesite	14	<1
Workplace: other	266	1
Education facility	330	1
Entertainment venue	83	<1
Open space, eg park, beach	484	1
Medical facility: hospital	167	<1
Medical facility: non-hospital	85	<1
Prison, detention facility	63	<1
Restaurant/food service	20	<1
Other/unknown	79	<1
Total	34,756	100

Patient disposition – neonates (0 to 4 weeks)

The majority of neonates exposed to a poison required no referral.

Patient disposition	Number of calls including recalls	%
No referral required	36	88
Hospital refer	0	0
In hospital	4	10
GP refer	0	0

At GP surgery	1	2
Call ambulance	0	0
Other	0	0
Total	41	100

Patient disposition – infants (4 weeks to 1 year)

The majority of infants exposed to a poison required no referral.

Patient disposition	Number of calls including recalls	%
No referral required	2,001	92
Hospital refer	32	2
In hospital	105	5
GP refer	9	<1
At GP surgery	26	1
Call ambulance	0	0
Other	13	<1
Total	2,186	100

Patient disposition – toddlers (1 to 4 years)

The majority of infants exposed to a poison required no referral.

Patient disposition	Number of calls including recalls	%
No referral required	12,015	89
Hospital refer	395	3
In hospital	754	6
GP refer	51	<1
At GP surgery	142	1
Call ambulance	7	<1
Other	173	1
Total	13,537	100

Patient disposition – children (5 to 14 years)

The majority of children exposed to a poison required no referral.

Patient disposition	Number of calls including recalls	%
No referral required	1,995	72
Hospital refer	189	7
In hospital	392	14
GP refer	55	2
At GP surgery	40	1
Call ambulance	4	<1
Other	88	3
Total	2,763	100

Patient disposition – adolescents (15 to 19 years)

The majority of adolescents exposed to a poison were already in hospital.

Patient disposition	Number of calls including recalls	%
No referral required	328	22
Hospital refer	238	16
In hospital	774	52
GP refer	53	4
At GP surgery	27	2
Call ambulance	11	<1
Other	48	3
Total	1,479	100

Patient disposition – adults (20 to 74 years)

The majority of adults exposed to a poison required no referral.

Patient disposition	Number of calls including recalls	%
No referral required	6,773	49
Hospital refer	1,360	10
In hospital	3,950	29
GP refer	580	4
At GP surgery	389	3
Call ambulance	63	<1
Other	637	5
Total	13,752	100

Patient disposition – elderly (>75 years)

The majority of elderly people exposed to a poison required no referral.

Patient disposition	Number of calls including recalls	%
No referral required	628	63
Hospital refer	64	6
In hospital	181	18
GP refer	41	4
At GP surgery	17	2
Call ambulance	3	<1
Other	62	6
Total	996	100

Symptom severity at the time of the call (animal exposures excluded)

The majority of human exposures were asymptomatic at the time of the call to VPIC.

Poisoning severity score*	Number of calls including recalls	%
None	26,264	76
Minor	7,722	22
Moderate	569	2
Severe	199	<1
Fatal	2	<1
Total	34,756	100

* Symptom severity scoring is based on the Poisoning Severity Score. Persson HE, Sjoberg GK, Haines JA, Pronczuk de Garbino J. Poisoning severity score. Clin Tox 1998; 36(3): 205-13.

Top ten exposure substances

VPIC's top ten exposure substances during 2018 are shown below.*

Substance	Number of calls including recalls
Paracetamol	2,718
Ibuprofen	1,326
Quetiapine	847
Diazepam	612
Topical antiseptics, handsanitisers	600
Bleach (hypochlorite based)	552
Silica gel dessicant	456
Toilet bowl cleaner/deodoriser: cage/disc type	424
Detergent: hand dish	408
Cleaner: all purpose/hard surface	401

*These are not necessarily the most toxic, but rather may be the most accessible.

Exposures to non-medicine, non-drug products

Substance/product	Number of calls including recalls (all routes of exposure)
HOME PRODUCTS	
Adhesives, glues, cements, pastes	
Cyanoacrylates	138
Epoxy resins	23
Model glues, cements	10
Non-toxic glues, pastes	34
Adhesive, glue, cement, paste: other/unknown	46
Art, craft, hobby, writing products	
Chalk	23
Correction fluid	5
Crayon	15
Paint: artists' paints, non-water colour	3
Paints: artists' paints, water colours	32
Paper/cardboard	34
Pencil	19
Pens/ink (including stamp pad ink, textas)	194
Printer ink/cartridge	7
Art, craft, hobby, writing products: other/unknown	29
Batteries	
Automotive/aircraft/marine	14
Disc/button	89
Mobile phone	4
Penlight/flashlight/dry cell (AA, AAA etc)	124
Battery: other/unknown	8
Cleaners, bleaches, detergents etc	
Bleach (hypochlorite based)	552
Bleach: other/unknown	15
CD/DVD cleaner	2
Cleaner: all purpose/hard surface	401
Cleaner: ammonia based	9
Cleaner: baby bottle	11
Cleaner: bathroom/shower/tile	92
Cleaner: carpet	59
Cleaner: drain	105
Cleaner: floor	87
Cleaner: glass/window	99
Cleaner: industrial	121
Cleaner: leather/vinyl/upholstery	10
Cleaner: nappy	10

Cleaner: oven	199
Cleaner: other/unknown	200
Detergent: anionic/non-ionic (not hand dish type)	14
Detergent: automatic dishwasher liquids	22
Detergent: automatic dishwasher powders/tablets	280
Detergent: automatic dishwasher rinse agents	105
Detergent: cationic (not disinfectants)	5
Detergent: hand dish	408
Detergent: laundry	360
Disinfectant	273
Fabric softener	39
Ironing aid/starch	6
Laundry additive	41
Pre-wash stain remover	115
Rust remover: other/unknown	13
Sugar soap (sodium carbonate)	9
Toilet bowl cleaner/deodoriser: cage/disc type	424
Toilet bowl cleaner: powder/liquid	66
Vaporiser cleaning tablet	22
Fire extinguishers	
BCF/halon	1
Dry powder	34
Food products, food poisoning	
Artificial sweeteners	2
Ciguatera	1
Dietary/nutritional/energy/workout supplements	111
Food additives	166
Food allergy	8
Food poisoning	40
Food recall/scare	1
Food spoilage	270
Garden products	
Fertiliser: household plant food	25
Fertiliser: outdoor	77
Soil/potting mix	56
Miscellaneous home products	
Air fresheners	122
Blu-tack	19
Bubble blowing solution	123
Charcoal	7

Christmas decorations	7
Cigarettes and tobacco products	145
Coins	29
Cyalume light sticks/glow necklaces	229
Desiccants: other/unknown (not silica gel)	42
Dyes: fabric	9
Dyes: food	5
Dyes: other/unknown	18
Fire starters	55
Foreign body	175
Fragrant oil/pot pourri oil	194
Freezer/cold packs	108
Glass	19
Incense	3
Magnet	12
Massage oil	14
Matches	10
Pet food	33
Plastic/polystyrene	117
Room deodoriser	39
Silica gel	456
Thermometer: mercury	32
Thermometer: non-mercury	5
Toys	278
Water crystals/gel beads/hydrogels	94
Household products: other/unknown	736
Photographic products	
Photographic chemicals	2
Photographic products: other/unknown	2
Polishes and waxes	
Polish/wax: car	3
Polish/wax: floor (includes waxes and sealers)	3
Polish/wax: furniture	23
Polish/wax: metal	8
Polish/wax: shoe/boot	6
Polish/wax: other/unknown	2
Swimming pool and aquarium products	
Aquarium products	28
Pool chlorine	49
Pool test kits/solutions	6
Pool products: other/unknown	26
BUILDING/HANDYMAN PRODUCTS	
Building products	
Asbestos	16

Asphalt/bitumen	7
Caulking compounds and construction putties	19
Cement/concrete/lime	58
Clay	2
Fibreglass	9
Insulation	2
Methyl ethyl ketone	10
Methyl ethyl ketone peroxide	8
Soldering flux	5
Building/handyman products: other/unknown	69
Paints and paint strippers	
Copper chrome arsenate (wood preservative)	15
Creosote (wood preservative)	1
Paints: oil-based	59
Paints: water-based house type	46
Paint strippers: methylene chloride based	14
Paint strippers: other/unknown	13
Paint thinner	25
Paints: other/unknown	93
Varnishes and lacquers	13
Wood stains	3
CAR/BOAT PRODUCTS	
Car products: antifreeze	28
Car products: brake fluid, transmission fluid etc	22
Car products: other/unknown	80
CHEMICALS	
Alcohols	
Alcohol ethanol (beverage)	308
Alcohol ethanol (non-beverage)	89
Alcohol: other/unknown	5
Isopropanol	27
Methanol	10
Essential oils	
Camphor	17
Clove oil	20
Eucalyptus oil	261
Tea tree oil	79
Essential oil: other/unknown	229
Fumes, gases, vapours	
Carbon dioxide	10
Carbon monoxide	89

Chlorine	7
Chlorine/chloramine gas (mixing household cleaning agents)	48
Helium	4
Hydrogen sulphide	10
Lacrimators (Mace spray, tear gas etc)	3
Methane and natural gas	98
Polymer fume fever	1
Propane and other simple asphyxiants	20
Smoke/toxic products of combustion	89
Fume/gas/vapour: other/unknown	59
General chemicals	
Acetone (not nail polish removers)	19
Acids: other/unknown	38
Alkalis (not cleaners)	38
Ammonia (not cleaners)	14
Borates (not insecticides)	77
Copper sulfate	15
Corrosives: other/unknown	8
Cyanide	1
Ethylene glycol and other glycols	44
Formaldehyde/formalin	28
Hydrochloric acid	65
Hydrofluoric acid	23
Hydrogen peroxide (non-medical)	31
Iodine (non-medical)	5
Isothiazolones (acticide, biocide, kathon, octhilinone etc)	6
Methylene chloride (not paint strippers)	2
Phenol and other phenolics	4
Potassium permanganate	7
Sulphur	7
Toluene diisocyanate	8
Chemicals: other/unknown	169
Heavy metals	
Aluminium	22
Cadmium	1
Chromium salts	1
Copper	9
Lead	57
Mercury (not thermometers)	18
Metal fume fever	9
Selenium	1
Heavy metals: other/unknown	13
Hydrocarbons	

Hydrocarbons: aliphatic	26
Hydrocarbons: aromatic	2
Hydrocarbons: halogenated	39
Hydrocarbons: other/unknown	4
Kerosene	9
Lamp oil	10
Lighter fluid	7
Oils: lubricating/engine/machine	87
Petrol	199
Shellite	2
Toluene/xylene	14
Turpentine, mineral	114
BITES AND STINGS	
Insects	
Ant	18
Bee	31
Caterpillar	10
Centipede/millipede	14
Mosquito	2
Scorpion	21
Tick	16
Wasp/hornet	42
Insect bites: other/unknown	62
Mammals	
Animal bite: dog/cat	4
Animal bite: other/unknown	20
Marine	
Blue-ringed octopus	1
Bluebottle	1
Fish stings: other/unknown	36
Jellyfish and other *Coelenterate* stings	18
Stingray	6
Marine bites/stings: other/unknown	20
Reptiles and amphibians	
Lizard	2
Snake	270
Spiders	
Redback spider	99
White-tailed spider	62
Spider bite: other/unknown	189
COSMETICS AND PERSONAL CARE PRODUCTS	
Cosmetics	
Antiperspirants	37
Baby oil	42

Baby wipes	15
Bath oil/bubble bath/bath preparations	121
Cleanser: skin	7
Creams/lotions/make-up	173
Deodorants	89
Depilatories	42
Lipstick/lip balms	45
Perfume/cologne/aftershave	139
Soap	280
Sunscreen/suntan products	99
Talc and other external powders	33
Cosmetics: other/unknown	42
Dental/oral care products	
Denture cleaning agents	36
Mouthwash: ethanol containing	32
Mouthwash: non-ethanol containing	30
Mouthwash: other/unknown	4
Teething gels	106
Toothache drops	5
Toothpaste with fluoride	88
Toothpaste without fluoride	8
Dental care products: other/unknown	16
Hair care products	
Hair colours (not peroxide)	43
Hair colours (peroxide)	29
Hair conditioner	17
Hair gel/mousse	6
Hair rinses, perms	4
Hair spray	13
Shampoo antidandruff: selenium based	3
Shampoo antidandruff: zinc pyrithione	3
Shampoo antidandruff: other	3
Shampoo non-medicated	97
Hair care: other	38
Nail products	
Nail hardeners	4
Nail polish	113
Nail polish remover	163
Nail primer	2
Nail products: other/unknown	22
PESTICIDES/HERBICIDES/FUNGICIDES	
Baits	
1080/monofluoroacetate	6
Rodenticides: anticoagulant (warfarin type)	24
Rodenticides: anticoagulant (long-acting)	252

Rodenticides: other/unknown	60
Baits: other/unknown	61
Carbamates	
Carbamates	4
Carbamates in combination with other pesticides	2
Chlorinated hydrocarbons	
Chlorinated hydrocarbons (endrin, dieldrin, heptachlor etc)	1
Fumigants	
Bromides	7
Phosphine	17
Fumigants: other	1
Fungicides	
Carbamate type	7
Copper type	11
Fungicides: other/unknown (non-medical)	14
Herbicides	
Glyphosate	192
Herbicides: carbamate type	1
Herbicides: chlorphenoxy type (2, 4 D; MCPA etc.)	26
Herbicides: protox inhibitor type (acifluorfen, oxyfluorfen etc)	1
Herbicides: pyridine type (clopyralid, triclopyr etc.)	27
Herbicides: triazine type (atrazine, simazine etc.)	5
Paraquat/diquat	19
Herbicides: other/unknown	61
Insecticides/pesticides	
Borates/boric acid pesticides	87
Insect coils	9
Insect repellants containing DEET	49
Insect repellants not containing DEET	28
Pyrethrins/pyrethroids	380
Rotenone	3
Snail/slug bait: iron edetate	6
Snail/slug bait: metaldehyde	21
Snail/slug bait: methiocarb	2
Pesticides: other/unknown	79

Moth repellents	
Naphthalene moth repellants	28
Organophosphates	
Organophosphates	28
Organophosphates in combination with other pesticides	1
PLANTS AND MUSHROOMS	
Mushrooms	226
Plants: amaryllidaceae	26
Plants: amygdalin/cyanogenic glycosides	98
Plants: anticholinergic	9
Plants: cactus	6
Plants: capsaicin	7
Plants: cardiac glycosides	33
Plants: daphne	2
Plants: dermatitis	35
Plants: dieffenbachia	1
Plants: euphorbiaceae	41
Plants: gastrointestinal irritants	66
Plants: grayanotoxins	1
Plants: lantana	3
Plants: non-toxic	96
Plants: oxalate	165
Plants: philodendron	2
Plants: solanine	52
Plants: stimulants	5
Plants: toxalbumins	1
Plants: toxicodendrol	2
Plants: other/unknown	166
VETERINARY PRODUCTS	
Veterinary: animal vaccines	70
Veterinary: external medicines	95
Veterinary: flea collars/insecticidal washes	12
Veterinary: heart worm preparations	7
Veterinary: internal medicines	271
MISCELLANEOUS NON-MEDICINE, NON-DRUG EXPOSURES	
Blue-green algae	13
Faeces/urine	86
Snail/slug	33

Exposures to medicines and drugs

Medicine/drug	Number of calls including recalls (all routes of exposure)
ANAESTHETICS	
Anaesthetics: inhalation	4
Anaesthetics: topical/local	42
Nitrous oxide	9
ANALGESICS	
Aspirin/narcotic combination analgesic	7
Aspirin/salicylates	232
Codeine	36
Fentanyl	10
Morphine	20
Oxycodone	312
Oxycodone/naloxone combination analgesic	92
Paracetamol	2,718
Paracetamol/caffeine combination	31
Paracetamol/ibuprofen combination	90
Paracetamol/metoclopramide	1
Paracetamol/narcotic combination	389
Tapentadol	47
Tramadol	190
Analgesics: narcotic other/unknown	8
Analgesics: non-narcotic other/unknown	5
ANTICHOLINERGICS	
Atropine	4
Benzatropine	30
Orphenadrine	12
Anticholinergic drugs: other/unknown	61
ANTICOAGULANTS and BLOOD PRODUCTS	
Apixaban	57
Blood products: other/unknown	1
Dabigatran	21
Heparin	3
Rivaroxaban	51
Warfarin	45
Anticoagulants: other/unknown	4
ANTIHISTAMINES	
Cetirizine	154
Dexchlorpheniramine	15
Fexofenadine	87
Loratadine	144
Pheniramine	7

Promethazine	184
Antihistamines: other/unknown	40
ANTIMICROBIALS	
Antibiotics	
Aminoglycosides	4
Antibiotic combinations (Augmentin, Bactrim etc.)	59
Cephalosporins	111
Macrolides	49
Penicillins	198
Quinolones	3
Sulphonamides	1
Tetracyclines	47
Antibiotics: other/unknown	46
Antifungals	
Antifungal drugs (ketoconazole, fluconazole etc)	13
Antiparasitics/Anthelmintics	
Anthelmintics	112
Antianaerobes (metronidazole, tinidazole etc)	22
Antimalarials (not quinine, chloroquine)	1
Antitubercular drugs	1
Antivirals	
Antiviral drugs	46
ANTIMIGRAINE DRUGS	
Triptans (naratriptan, sumatriptan etc)	15
Migraine preparations: other/unknown	8
ASTHMA/RESPIRATORY DRUGS	
Anticholinergics (ipratropium, glycopyrronium, tiotropium, aclidinium, umeclidinium etc)	55
Bronchodilators (salbutamol, terbutaline, formoterol/eformoterol, salmeterol, indacaterol, vilanterol etc)	34
Leukotriene receptor antagonists (montelukast, zafirlukast etc)	26
Preventors	54
Theophylline and other xanthines	4
Asthma drugs: other/unknown	2
CARDIOVASCULAR DRUGS	
ACE inhibitor/diuretic combinations	14
ACE inhibitors	164

Adrenaline/epinephrine	62
Alpha blockers	73
Angina preparations	9
Angiotensin II antagonist/diuretic combinations	61
Angiotensin II antagonists	213
Antiarrhythmic agents	31
Antihypertensives: other (not diuretics)	25
Antiplatelet agents: other (clopidogrel, dipyridamole, ticagrelor etc)	60
Cardiac glycosides	60
Diuretics: other	118
Diuretics: potassium sparing	42
HMG CoA reductase inhibitors (statins)	212
Lipid lowering agents: fibrates (gemfibrozil, fenofibrate etc)	17
Lipid lowering agents: other	14
Nitrates	42
Prazosin	2
Vasodilators	23
Vasopressors	2
Cardiovascular drugs: other/unknown	10
Beta blockers	
Atenolol	61
Bisoprolol	23
Carvedilol	6
Labetalol	8
Metoprolol	137
Nebivolol	6
Pindolol	2
Propranolol	100
Sotalol	30
Beta blockers: other/unknown	53
Calcium antagonists	
Amlodipine	58
Diltiazem	35
Felodipine	6
Lercanidipine	21
Nifedipine	12
Verapamil	34
Calcium antagonists: other/unknown	47
Calcium antagonist/ACE inhibitor combinations	20
Calcium antagonist/angiotensin ll antagonist combinations	35
Calcium antagonist/angiotensin ll	8

antagonist/diuretic combinations	
Calcium antagonist/statin combinations	3
CENTRAL NERVOUS SYSTEM DRUGS	
Antidepressants	
Agomelatine	38
Amitriptyline	145
Citalopram	92
Clomipramine	9
Dosulepin/dothiepin	17
Doxepin	7
Duloxetine	106
Escitalopram	309
Fluoxetine	322
Fluvoxamine	36
Imipramine	2
Mianserin	2
Mirtazapine	257
Monoamine oxidase inhibitors	15
Nortriptyline	16
Paroxetine	55
Reboxetine	2
Sertraline	371
Selective serotonin reuptake inhibitors: other/unknown	5
Tricyclic antidepressants: other/unknown	32
Venlafaxine/desvenlafaxine	352
Vortioxetine	7
Antidepressants: other/unknown	11
Antiepileptics	
Carbamazepine	135
Gabapentin	45
Lamotrigine	130
Levetiracetam	61
Phenytoin	28
Pregabalin	328
Topiramate	71
Valproic acid	322
Antiepileptics: other/unknown	56
Antipsychotics	
Amisulpride	15
Aripiprazole	44
Asenapine	8
Brexpiprazole	5
Clozapine	35
Lurasidone	42
Olanzapine	273

Paliperidone	4
Phenothiazines (chlorpromazine, trifluoperazine etc)	114
Quetiapine	847
Risperidone	186
Ziprasidone	9
Antipsychotics: other/unknown	46
Benzodiazepines	
Alprazolam	99
Bromazepam	6
Clobazam	17
Clonazepam	157
Diazepam	612
Flunitrazepam	4
Lorazepam	107
Midazolam	3
Nitrazepam	30
Oxazepam	128
Temazepam	190
Benzodiazepines: other/unknown	19
CNS depressants - other	
Barbiturates	4
Chloral hydrate	1
Doxylamine	121
Hypnotic/sedative: over-the-counter	1
Melatonin	230
Zolpidem	66
Zopiclone	115
Hypnotic/sedative: other/unknown	17
CNS stimulants	
Amphetamines (for ADHD, not street drugs)	230
Caffeine	47
CNS – miscellaneous	
Antidementia agents (donepezil, galantamine, memantine, rivastigmine)	41
Antiparkinsonian agents	56
Atomoxetine	2
Baclofen	75
Cannabis, medicinal: cannabidiol	2
Cannabis, medicinal: other/unknown	2
Clonidine	176
Guanfacine	5
Lithium	143
CNS drugs: other/unknown	7

COUGH/COLD PREPARATIONS	
Antitussives	64
Cough/cold preparations with paracetamol	200
Cough/cold preparations without paracetamol/aspirin	172
Dextromethorphan	44
Pseudoephedrine	14
Throat lozenges with local anaesthetic	5
Throat lozenges without local anaesthetic	16
DRUGS USED IN ADDICTIVE DISORDERS	
Antismoking products (nicotine gum, lozenges, patches; e-cigarettes; varenicline)	100
Buprenorphine	33
Bupropion	6
Disulfiram	5
Methadone	46
Naltrexone	14
EAR PREPARATIONS	
Ear drops	54
Ear ointment	4
EYE PREPARATIONS	
Contact lens preparations	17
Eye drops: imidazoline-based	5
Eye drops: other/unknown	71
Eye ointment	3
GASTROINTESTINAL PREPARATIONS	
Antacids	74
Antidiarrhoeals: diphenoxylate/atropine	3
Antidiarrhoeals: loperamide	30
Antiemetics	144
Antispasmodics (hyoscine butylbromide etc)	31
Histamine H_2- antagonists (cimetidine, ranitidine etc.)	38
Laxatives	181
Proton pump inhibitors (omeprazole, pantoprazole, esomeprazole etc.)	289
Gastrointestinal preparations: other/unknown	79
METABOLISM	
Electrolytes/minerals	
Calcium salts	59
Fluoride	1
Iron (not multivitamins)	172
Potassium salts	26

Electrolytes: other/unknown	80
Vitamins	
Folic acid	32
Vitamin A	4
Vitamin B group	48
Vitamin C	64
Vitamin D	263
Vitamins compound with iron	155
Vitamins compound without iron	229
Vitamins: other	22
Other metabolic	
Androgenic and anabolic agents	5
Antihormones (tamoxifen, cyproterone, flutamide etc.)	25
Antithyroid preparations	14
Bisphosphonates	7
Corticosteroids	311
Diet aids/anorectics - over-the-counter	10
Diet aids/anorectics - prescription	53
Hypoglycaemics, injection: glucagon-like peptide 1 (GLP-1) analogues (exenatide)	15
Hypoglycaemics, oral: alpha glucosidase inhibitors (acarbose etc)	1
Hypoglycaemics, oral: biguanides (metformin)	138
Hypoglycaemics, oral: combination products (metformin/glibenclamide, metformin/rosiglitazone, metformin/sitagliptin etc)	28
Hypoglycaemics, oral: DPP-4 inhibitors (sitagliptin, vildagliptin etc)	18
Hypoglycaemics, oral: glitazones (pioglitazone, rosiglitazone etc)	3
Hypoglycaemics, oral: sodium-glucose co-transporter (SGLT) inhibitors (canagliflozin, dapagliflozin, empagliflozin etc)	25
Hypoglycaemics, oral: sulphonylureas (glibenclamide, gliclazide, glipizide etc)	46
Insulin	166
Oestrogens/progestogens (not oral contraceptives)	33
Oral contraceptives: oestrogen and progestogen	151
Oral contraceptives: progestogen only	26
Thyroxine/levothyroxine	155
Thyroid preparations: other/unknown	8
Hormones: other/unknown	8

Metabolic agents: other/unknown	2
NONSTEROIDAL ANTI-INFLAMMATORY DRUGS AND GOUT MEDICATIONS	
Allopurinol	30
Celecoxib	37
Colchicine	10
Diclofenac	158
Ibuprofen	1,326
Ibuprofen plus codeine	29
Indometacin	20
Ketoprofen	3
Ketorolac	1
Mefenamic acid	19
Meloxicam	39
Naproxen	71
Piroxicam	3
NSAIDs: other/unknown	12
NOSE PREPARATIONS	
Nose drops/sprays: imidazoline-based	37
Nose drops/sprays: other/unknown	17
Nasal preparations: other/unknown	6
STREET DRUGS	
Amphetamine and related drugs	105
Amyl nitrite and other volatile nitrites	14
Cannabinoids, synthetic (Spice, Kronic, K2, Jungle Fever, Northern Lights, Marley etc)	9
Cathinones (mephedrone, methylone etc)	1
Cocaine	28
Drink spiking	2
Ecstasy and other hallucinogenic amphetamines	54
Gamma hydroxybutyrate	32
Hallucinogenics: other/unknown	2
Heroin	23
Inhalant abuse (chroming)	13
Ketamine/methoxetamine	21
LSD	15
Marijuana	74
Street drugs: other/unknown	75
TOPICAL PREPARATIONS	
Acne preparations	15
Antipruritics (calamine lotion etc)	21
Capsaicin	11
Chest rubs	118
Hydrogen peroxide	9

Lice/scabies preparations	47
Liniments	126
Lotions, creams, ointments	1
Nappy rash products	283
Topical antibiotics	29
Topical antifungals	133
Topical antiseptics (handsanitisers etc)	600
Topical antivirals	3
Topical corticosteroids	187
Wart/corn preparations	22
Topical preparations: other/unknown	112
MISCELLANEOUS MEDICINE/DRUG CALLS	
Antineoplastics	24
Chloroquine/hydroxychloroquine	16
Diagnostic agents	7
Herbal preparations	192
Homeopathic preparations	46
Immunosuppressants	40
Methotrexate	39
Muscle relaxants: other	12
Unknown tablets/capsules	60
Urinary alkalinisers	1
Urinary antiseptics	6
Vaccines/toxoids/antivenoms	42
Vaporiser fluids and inhalants	180
Other over-the-counter-medicines	38
Other prescription medicines	86