



Public Health
England



National Poisons
Information Service

National Poisons Information Service

Report 2014/15



The National Poisons Information Service is commissioned by Public Health England on behalf of the UK health departments

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The main role of the National Poisons Information Service (NPIS) is to advise NHS healthcare professionals on the diagnosis, treatment and care of poisoned patients across the UK. Poisoning is an extremely common cause of hospital admissions in the NHS, being similar in number to admissions for myocardial infarction. NPIS advice ensures that healthcare staff have access to up-to-date information about treating poisoned patients and that patients without significant poisoning are not treated in hospital, thus reducing unnecessary use of NHS resources. The major workload of the NPIS is to advise hospital emergency departments, but minor injuries units and primary care services are also significant users of the service – the latter to a large extent involving NHS advice services (NHS 111, NHS 24 and NHS Direct).

NPIS units at 31 March 2015

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hosted by Sandwell and West Birmingham Hospitals NHS Trust

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NPIS Edinburgh Unit

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Front cover

Novel psychoactive substance packets © Lindsay Gordon, NPIS Edinburgh

Foreword

Each day in the UK, hundreds of people seek advice from a healthcare professional following exposure to a drug or chemical. This may result from accidental ingestions, errors in the dosing of medicines, recreational drug use, drug overdose, or environmental or occupational exposures. Because the numbers of substances involved are substantial, healthcare professionals need access to accurate information about their toxicity and how exposures should be managed. The role of the National Poisons Information Service (NPIS) is to provide this advice on a 24 hours a day basis through a telephone advice service and the internet database TOXBASE®.

The accurate and evidence-based advice provided by the NPIS improves the quality of care of patients at risk of toxicity and, for a large proportion of cases referred, the NPIS provides reassurance that an exposure is unlikely to cause adverse health effects. This avoids the need for hospital referral or admission for tens of thousands of patients every year, reducing the workloads of general practitioners and emergency departments in particular.

The NPIS is commissioned by Public Health England on behalf of the English Department of Health, the Scottish Government, the Welsh Government and the Northern Ireland Department of Health. The NPIS also

provides services to the Republic of Ireland and these are commissioned by Beaumont Hospital, Dublin, on behalf of the Irish Government. The services are provided by four NHS hospitals located in Edinburgh, Birmingham, Cardiff and Newcastle that work together to deliver a fully integrated service.

The NPIS publishes an annual report each year as a statement of its activity, accountability and governance. This year's report demonstrates the volume and quality of work provided and its value as a 24 hour frontline consultant-led clinical service to the many NHS healthcare professionals who use it. It also provides information on current issues of interest, demonstrating the public health value of NPIS data. This year's topics range from drugs of misuse including new psychoactive substances, carbon monoxide, pesticides and dinitrophenol to electronic cigarettes, reed diffusers and automatic dishwashing tablets.

This year's achievements have been made despite ongoing funding pressures and consequent staff reductions. The high quality of the user feedback in the face of these pressures is a particular credit to our staff. Such funding pressures are expected to continue in the coming year.

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Executive Summary

Background

The National Poisons Information Service (NPIS) is commissioned to provide information and advice for NHS healthcare professionals to support the management of patients with suspected poisoning. This is a common presentation, with approximately 170,000 people admitted to hospitals in the UK each year. Many more are discharged from emergency departments or managed in primary care, including by NHS advice services such as NHS 111, NHS 24 and NHS Direct.

The NPIS provides information and evidence-based management advice about individual substances through its online database TOXBASE® * and its 24 hour telephone advice service, staffed by information scientists and supported by a rota of consultant clinical toxicologists. The availability of this expertise avoids unnecessary hospital referrals and admissions for patients at low risk of harm, while improving the quality of treatment and shortening hospital stay for those with clinical toxicity.

The NPIS also incorporates the UK Teratology Information Service (UKTIS), the national source of information and advice about exposures to drugs and chemicals during pregnancy.

Activity

Excluding educational sessions and those from the NPIS and associated poisons centres, there were just under 580,000 TOXBASE user sessions and 1.6 million separate product accesses during 2014/15, increases of 0.5% and 4.7%, respectively, on the equivalent figures for the previous year. The most frequent users were hospital departments (65%) and NHS 111, NHS 24 and NHS Direct staff (13%).

The total numbers of telephone enquiries during 2014/15 reduced to around 48,000, a decrease of 9.5% on the previous year, with NHS 111, NHS 24 and NHS Direct staff (34.1%), hospitals (28.6%) and primary care professionals (22.4%) the most frequent users. There

were just over 2,000 enquiries referred to an NPIS consultant, a decrease of 12.3% on 2013/14; 90.5% of these came from hospital staff.

Telephone enquiries included around 2,500 exposures to drugs and chemicals during pregnancy referred to UKTIS, a reduction of 12.8% compared to the previous year. The number of downloads of detailed pregnancy information from TOXBASE also decreased by 11.9% to 57,000. However, 160,000 UKTIS monograph summaries were downloaded, an increase of 31.4% on 2013/14; in addition, patient information pages on the new UKTIS public facing website '*bumps*' were accessed on over 220,000 occasions in its first year.

It is essential to update the approximately 17,000 product entries in TOXBASE regularly. During 2014/15 NPIS and UKTIS staff wrote or revised over 4,100 entries.

It is important for the NPIS to have access to information about the content and toxicity of consumer products, especially in view of impending EU chemicals legislation; this is provided by the NPIS Product Data Centre. During 2014/15 over 23,000 safety data sheets (SDS) were added to the Centre, which now contains SDS for 140,000 different products.

Quality

Quality assurance exercises, conducted by questionnaire, continue to demonstrate high user satisfaction with the services provided by the NPIS. The proportion of respondents scoring services as five or six out of six was 94% for the TOXBASE website, 97% for the telephone poisons information service, and 96% for the UKTIS telephone service.

Surveillance

The development of a fully integrated service, with clinical information collected by the four NPIS units held on a common database, allows the NPIS to provide UK-wide information on referrals to the service. This is of great value for public health surveillance of poisoning. Examples of work done during 2014/15 are summarised below.

* TOXBASE is a registered trademark of the UK National Poisons Information Service.

Drugs of misuse

During 2014/15 the NPIS changed the way that telephone enquiries about drugs of misuse were recorded, to include all calls relating to use of any substance, including licensed medicines, described as 'recreational'. There were 1,722 telephone enquiries received relating to 286 different drugs or branded products, constituting 3.7% of telephone activity, as well as almost 70,000 TOXBASE accesses to 598 different drugs, products or synonyms. The increasing activity relating to branded products, where the chemical content may not be available, is a growing challenge for the NPIS. For the 61 specific substances reported on last year, there was a 3.5% overall increase in telephone calls and a 6.7% increase in TOXBASE accesses. For individual drug groups, the largest increases in telephone enquiries and TOXBASE accesses (around 140% and 150%, respectively) were seen for synthetic cannabinoid receptor agonists, where exposure often involved use of a branded product.

Carbon monoxide

During the year the NPIS received 479 enquiries about carbon monoxide involving at least 682 individuals. Exposure was in the home in 84% of cases and, when the source was known, faulty boilers or appliances were implicated in 62% of these. The carboxyhaemoglobin concentration had been measured in only 25% of potentially exposed individuals and was 3% or higher (suggesting recent exposure to carbon monoxide in a non-smoker) in only 18% of these. Twelve patients had severe poisoning, four of whom are known to have died. Ten of the twelve severely poisoned patients were exposed during a domestic house fire.

Household chemicals

The NPIS has continued to monitor enquiries about people exposed to liquid detergent capsules and assessed the effects of the voluntary 'Product Stewardship Programme' coordinated by the International Association for Soaps, Detergents and Maintenance Products. Comparing data for the calendar years 2012 and 2014, before and after the institution of the programme, there was no significant reduction in the

absolute number of enquiries or exposures reported to the NPIS, but the exposures reported per million units sold fell from 0.47 to 0.35.

Retrospective analysis of NPIS enquiries relating to soluble film dishwashing tablets found 385 enquiries over the seven years from 2008 to 2014, most involving ingestion (96%) and children under five years old (93%). Reported clinical effects included vomiting, coughing and rash, as well as conjunctivitis from eye contact. No cases of severe toxicity were reported.

During 2014 the NPIS received 257 enquiries about 243 patients exposed to the contents of reed diffusers, an increase over last year. These also largely involved ingestion and children under five years. There were two reported patients with moderate poisoning; their clinical features included vomiting, drowsiness, ataxia and seizures. No cases of severe poisoning were reported.

2,4-dinitrophenol

In last year's annual report the NPIS highlighted the increasing frequency of toxicity that had been reported to the service in 2012 and 2013 after exposure to 2,4-dinitrophenol (DNP). This was of particular concern because of the high case fatality. DNP is a synthetic industrial chemical that uncouples oxidative phosphorylation and is sometimes used as a supplement for weight loss and 'fat burning'. The report also highlighted the actions taken in response by the chief medical officers, Food Standards Agency, police and local authorities to educate potential users to the dangers and to restrict sales where possible and reported a subsequent reduction in further reported cases in the first quarter of 2014.

During 2014/15, however, the number of enquiries about toxicity related to DNP exposure has increased, with a further 13 cases reported to the NPIS during the year, one of whom is known to have died. This suggests that the effect of actions taken previously in reducing case numbers has been temporary and further steps are now required to limit exposure to this highly toxic chemical.

Pesticides

The NPIS has reported on pesticide and biocide exposures in the UK on behalf of the Department for Environment, Food and Rural Affairs since 2004 using accesses to 1,800 different TOXBASE entries and calls to the NPIS telephone service.

During 2014/15 the NPIS collated information on 1,114 exposures detected during the year, most (88%) being unintentional acute exposures. Most of the cases were not associated with toxicity, but there were ten cases (0.9%) with severe toxicity and three deaths were reported which followed intentional ingestions of paraquat, diquat and dichlorvos.

Electronic cigarettes

Monitoring enquiries about exposures to electronic cigarettes and their refills is important because of their increasing use and the potentially toxic amounts of nicotine they contain. The NPIS received 241 telephone enquiries about e-cigarettes or refill solutions during 2014/15, an increase of 18% compared with 2013/14.

A quarter of these involved children under five years and, overall, 85% of exposures were accidental. Of fifteen reported cases of eye contact, nine occurred when the liquid was mistaken for eye drops and conjunctivitis was the predominant feature. Of all patients exposed, most (133) had no features of toxicity, but there were seven patients with moderate toxicity and one with severe toxicity. Clinical features associated with ingestion included irritation of the oral cavity, anxiety, nausea, vomiting, dizziness and changes in heart rate. These data emphasise the need for safe storage and packaging of these products, an issue being addressed by the planned implementation of the EU Tobacco Products Directive in 2016.

Education and Research

NPIS staff continue to be active in education and research, with 64 contributions to the scientific literature published during 2014/15, including 25 peer-reviewed scientific papers and one major clinical toxicology textbook.

1 Introduction

This report provides statistical information on the work of the National Poisons Information Service (NPIS) and shows how different elements of the service work together. It also provides examples of NPIS activity and the value of data collected by the NPIS units, with recreational drugs, household products, carbon monoxide poisoning, 2,4-dinitrophenol, pesticides and electronic cigarettes highlighted this year.

The NPIS is a network of dedicated units that is commissioned by Public Health England (PHE) on behalf of the UK health departments. All the NPIS units are linked to clinical treatment facilities within UK teaching hospitals.

The NPIS has provided information to healthcare workers in the UK by telephone since 1963. The poisons information database TOXBASE®* (www.toxbase.org) was developed in 1982; in 1999, it was transferred to the internet and adopted as the first-line information source for healthcare professionals in the UK. While the structure of the NPIS has changed over the years, its focus has always been to assist colleagues throughout the NHS to manage poisoned patients. The information and advice provided by the NPIS are updated regularly and based on published literature, experience from NPIS telephone enquiry data, and direct clinical experience of treating poisoned patients in NPIS-linked clinical departments.

In 1995, the UK Teratology Information Service (UKTIS) moved to Newcastle to become an integral component of NPIS activities. This report demonstrates the importance of UKTIS both for supporting women of child-bearing age, and their healthcare providers, and for collecting new information on the potential effects of exposure to drugs and chemicals during pregnancy, including the therapeutic use of medicines.

Poisoning continues to be an important public health issue in the UK. It accounts for around 170,000 NHS hospital admissions in the UK each year, a considerable workload for health service staff, especially in hospital

emergency departments and medical admissions units. The majority of poisoning in adults is related to self-harm, while unintentional poisoning is common in children.

Many thousands of different agents can be involved, making it very difficult for NHS staff to keep up to date on diagnosis and management, especially when new or unfamiliar agents are involved. In addition, around 40% of adults who poison themselves take alcohol at the same time, which complicates clinical assessment and management. Most hospitals do not have specialist clinical toxicology services, therefore access 24 hours a day to high quality information and clinical advice about poisoning is essential to treat these patients.

A further current issue is the emergence of new drugs of misuse that present a particular challenge (see Section 6.1). The pattern of prescription drugs taken in poisoning has also changed. For example, newer antidepressants and antipsychotic drugs are increasingly involved, as the use of older and sometimes more toxic agents declines.

Hospital admission data, illustrated by NHS hospital episode statistics, do not reflect the very many poisoned patients who present to emergency departments across the UK but are discharged directly without admission. Nor do these data reflect the very large number of enquiries about suspected or actual poisoning received by the NHS advice services (NHS 111 in England, NHS 24 in Scotland and NHS Direct in Wales). The NPIS provides advice to emergency departments and NHS public access helplines to help their staff decide which patients need admitting to hospital and which can be managed safely at home. In this way NPIS information directly supports appropriate triage, referral, assessment and treatment of patients at all levels of the NHS.

The majority of people who die from poisoning do so before healthcare assistance is summoned. Nevertheless, there are still opportunities to improve care for patients with severe poisoning who do survive to hospital admission, reducing morbidity or mortality.

A key component of the services provided by the NPIS is obtaining information from treating clinicians on the

* TOXBASE is a registered trademark of the UK National Poisons Information Service.

effects and ultimate outcomes of cases of severe or unusual poisoning – this assists in providing current and accurate advice. The NPIS is trying to improve collaboration with users to improve feedback.

The NPIS is funded primarily through 'government grant in aid' from the UK health departments, but receives some contract income for providing services in other territories and research income for specific projects.

2 Structure of the NPIS

The NPIS provides a 24 hour, 365 days a year, consultant-supported clinical toxicology advice service to assist healthcare workers in their diagnosis and management of poisoned patients, including those exposed in industrial chemical incidents.

The four NPIS units are currently based within NHS teaching hospitals (two in England and one each in Scotland and Wales). Three of the units (Birmingham, Cardiff and Newcastle) respond to telephone enquiries 24 hours a day based upon a national rota; the Edinburgh unit takes telephone enquiries during the working day while focusing on editing and production of the TOXBASE database. The four units also take telephone calls about chemical incidents and forward this information to the Centre for Radiation, Chemical and Environmental Hazards (CRCE) of Public Health England (PHE).

The service has 24 hour consultant clinical toxicologist support from NHS consultant staff in all four NPIS units and colleagues in two other NHS hospitals (Guy's and St Thomas' NHS Foundation Trust and York Hospitals NHS Foundation Trust). NPIS consultant clinical staff also provide specialist services in clinical toxicology in their own hospitals.

Consultant staff, in NPIS units and also in geographically separate acute hospitals, are available to assist colleagues in the management of more seriously unwell patients. The availability of this expertise is important for UK resilience. Because the NPIS receives many enquiries about children and from emergency departments, it has formalised existing support from consultants in paediatrics and emergency medicine.

The primary source of information provided by the NPIS is through its online database, TOXBASE (www.toxbase.org), which is available without charge to all UK NHS healthcare units who register for it, including hospital departments, primary care practices and NHS advice services – NHS 111, NHS 24 and NHS Direct. It is written to provide the majority of information required for the safe management of poisoned patients; however, it cannot provide all the answers for individual patients or complex cases and healthcare workers are encouraged to discuss more complex cases with the NPIS. To this

BOX 2.1 BT Cloud telephone system

Since June 2012, enquiries to the NPIS have been delivered by the BT Cloud telephone system. This is a significant improvement over the Inbound Architect (IA) system that was used previously. The IA system routed enquiries to specific units according to the national telephone rota, whereas the BT Cloud system can deliver enquiries to any appropriately skilled NPIS staff member who is logged into the system, irrespective of location.

BT Cloud has been designed to accommodate all services provided by the NPIS (ie poisons, teratology and chemical) and the NPIS national rota. The main advantages of the BT Cloud system are improved functionality, increased resilience and more efficient cooperative working between the NPIS units across the UK. Enquiries can be transferred, conference calls established, and real-time reporting facilities made available. NPIS specialists in poisons information and consultants can log in remotely, allowing rapid upscaling of telephone staffing if this is needed.

Issues such as NPIS reporting needs and further improvements in the disaster recovery system are currently being addressed.

end, the NPIS provides a 24 hour telephone information service for healthcare professionals using a single national telephone number (0844 892 0111) for when such further advice or information is needed. NPIS activity is reflected in TOXBASE sessions, TOXBASE accesses and telephone enquiries.

When first received (Figure 2.1), telephone enquiries are managed by specialists in poisons information (SPIs). SPIs may have a scientific, nursing or pharmacy background, are qualified to degree level and usually also hold postgraduate qualifications in toxicology. In deciding the severity of each case the SPIs use the WHO/IPCS/EC/EAPCCT poisoning severity score (PSS) to determine the severity of each case, with a PSS score of 1 being minor, 2 moderate and 3 severe*. Enquiries about complex or severe cases are referred on to NPIS consultant staff on a 24 hours a day basis.

* Persson HE et al. Poisoning severity score. Grading of acute poisoning. J Toxicol Clin Toxicol 1998; 36: 205–13.

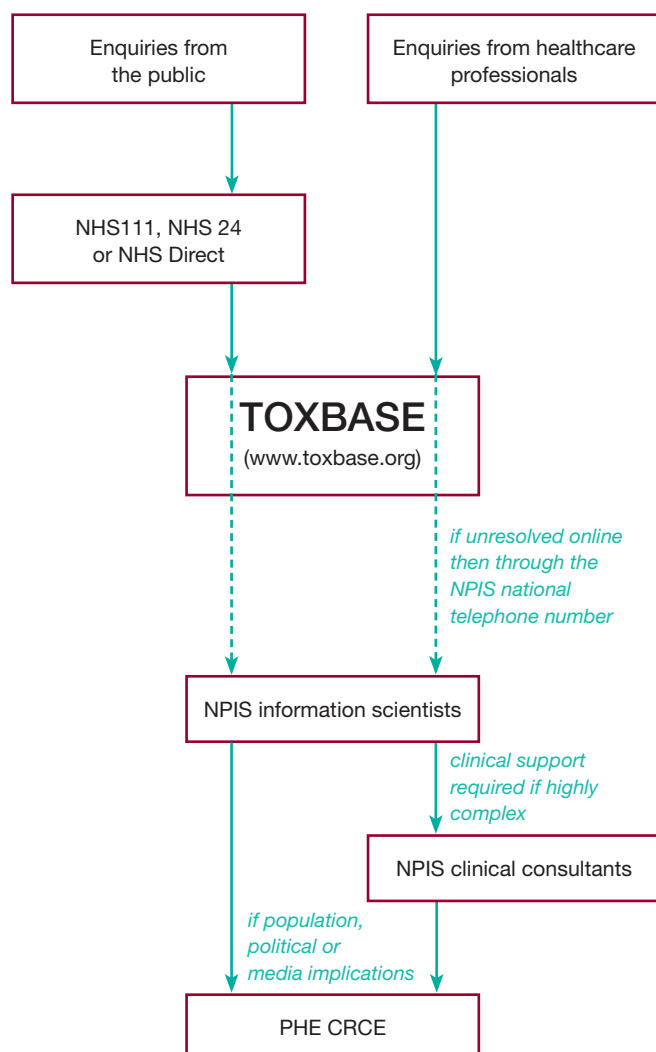


FIGURE 2.1 How poisons enquiries are answered

Audio recordings of all NPIS telephone enquiries are now retained for governance purposes and clinical data are logged within a specially designed national database, the UK Poisons Information Database (UKPID). Data are uploaded on to a central server, allowing access by other NPIS units that may be involved in managing a particular patient. This also allows easy collation of activity data and surveillance of the patterns of enquiries received. The clinical information can help the treatment of subsequent similar cases. Data from UKPID can be used to support UK pharmaceutical licensing decisions by the Medicines and Healthcare Products Regulatory Agency, and for studying the epidemiology of poisoning as reported to the NPIS.

In Northern Ireland, the Regional Medicines and Poison Information Service in Belfast provides a daytime poisons information service. Out-of-hours enquiries from healthcare professionals are referred to the NPIS. The NPIS is also contracted to provide poisons information for users in the Republic of Ireland by providing TOXBASE access to major hospital emergency departments and to the National Poisons Information Centre in Dublin. Again, out-of-hours telephone support is provided by the NPIS.

Information on the potential toxicity of drugs and chemicals in pregnancy is provided by the UK Teratology Information Service (UKTIS), both by telephone and on TOXBASE. UKTIS (previously the National Teratology Information Service, NTIS) was established as part of NPIS Newcastle in 1995.

The NPIS maintains a consistent approach, irrespective of the NPIS unit answering an enquiry, through a formal UK-wide strategic framework for governance, agreeing clinical advice and supporting the management of the service.

Commissioning issues are dealt with by the PHE NPIS Commissioning Group, which meets at least quarterly. Clinical issues, including clinical governance, are discussed by the NPIS Clinical Standards Group, which also meets at least quarterly. These meetings are attended by a representative of the commissioner, a senior clinician from each of the four units and a senior specialist in poisons information from the service. Invitations are also sent to representatives of the National Poisons Information Centre in Dublin. Other senior NPIS staff are invited to attend as observers on a rotational basis. Operating procedures are updated frequently and made available to NPIS staff on TOXBASE.

To ensure a common and evidence-based approach to the clinical management of poisoning, all NPIS clinical and information staff are invited to attend continuing professional development (CPD) meetings which deal with new data and important clinical issues. These occur up to four times a year and are hosted by all the NPIS units in turn.

There are regular teleconferences of the TOXBASE Editing Group, with representation from each unit, to ensure consistent and nationally agreed database content (see Box 2.2). The National Poisons Information Centre in Dublin and the Northern Ireland Regional

Medicines and Poison Information Service also contribute to TOXBASE development and review. The UKPID User Group meets regularly to discuss issues relating to this IT platform.

BOX 2.2 TOXBASE editing

TOXBASE is produced and maintained by the NPIS, within an audit framework of user feedback and clinical governance. TOXBASE has seen continued growth in usage since its internet launch in 1999, and deals with over 90% of all enquiries to the NPIS from the UK (the total for 2014/15 being in excess of 628,000). Since 1999, UK health policy has been that TOXBASE should be the first (and often only) point of information for poisons enquiries.

Therefore it is essential that the information it contains is kept as up to date and relevant as possible. Keeping the monographs up to date forms a very substantial workload that is shared by all the NPIS units. Revising TOXBASE entries is a complicated process involving a comprehensive literature search together with information from case-based experience to develop clinical advice through a robust, defensible editing process, inclusive of explicit clinical governance processes.

All TOXBASE entries are peer reviewed before publication and key entries, eg for highly toxic agents, are agreed at a national level before being published on TOXBASE.

The NPIS TOXBASE Editing Group includes representatives of clinical and information staff from all four NPIS units, representatives from related poisons centres and a public health physician or scientist from the PHE Centre for Radiation, Chemical and Environmental Hazards. It meets four times a year by web/teleconference to agree policy for TOXBASE development, discuss the format of TOXBASE monographs and agree and prioritise work programmes.

Areas of clinical controversy or uncertainty are discussed at the TOXBASE Editing Group and/or by the NPIS directors at the quarterly NPIS Clinical Standards Group meetings, as appropriate. Monthly literature reviews are circulated as *Current Awareness in Clinical Toxicology* (see Section 3.4) to assist in updating TOXBASE.

The NPIS aims to review each of the approximately 17,000 entries on TOXBASE at least every four years, requiring review of over 4,000 entries in a typical year. During 2014/15, 4,092 entries were added or edited.

An important component in the review process of TOXBASE entries is user feedback from a variety of sources, eg the TOXBASE quality assurance forms (see Section 5.2), questionnaires on TOXBASE for new and unusual products, responses to follow up on cases of interest, or by email, letter or telephone. Users may also raise queries on existing entries or provide clinical data. Any issues specific to entries are dealt with as they arise or discussed at the TOXBASE Editing Group and/or NPIS Clinical Standards Group meetings.

3 NPIS Activities in 2014/15

3.1 Overall Service Profile

Direct use of TOXBASE by healthcare professionals continued to rise in 2014/15, as reflected by increased TOXBASE user sessions and product accesses. This allowed NPIS staff time to focus on core NPIS activities including answering the more complex poison information enquiries, producing and revising TOXBASE monographs, following up calls of interest and carrying out research projects.

The total number of TOXBASE user sessions (defined as one logon to the TOXBASE site during which the user may access one or more products several times) was 628,740. This is an increase of 2.1% on the number of sessions in 2013/14 (Figure 3.1).

Figure 3.1 also shows that consultant referrals have been increasing in number since the unified service began in 2006. In 2012/13 and 2013/14 large increases in consultant referrals were seen. These coincided with major changes to the treatment of paracetamol overdoses in the UK; thus although the number of consultant referrals in 2014/15 (2,048) is lower than that

in 2013/14, disregarding the paracetamol enquiries, the overall trend remains upward.

By mid-2014, the UK population had increased by 3.7% from mid-2010. Table 3.1 demonstrates that the increase in the rate at which healthcare professionals access TOXBASE per head of population has far exceeded the rate at which the UK population has grown. TOXBASE user sessions per head of population have increased by 20.0% over the last four years.

There were 45,335 sessions by international users and users from the NPIS units, the Northern Ireland Regional Medicines and Poison Information Service and the National Poison Information Centre, Dublin. In addition, there were 4,641 educational user sessions, of which the majority were due to use of the NPIS e-learning website (see Section 6.9). These have all been excluded from further detailed analyses because the poison units may also access TOXBASE for training/educational purposes, and to access operating procedures or for monograph-writing purposes (NPIS units only). Therefore a total of 578,764 user sessions originating in England, Northern

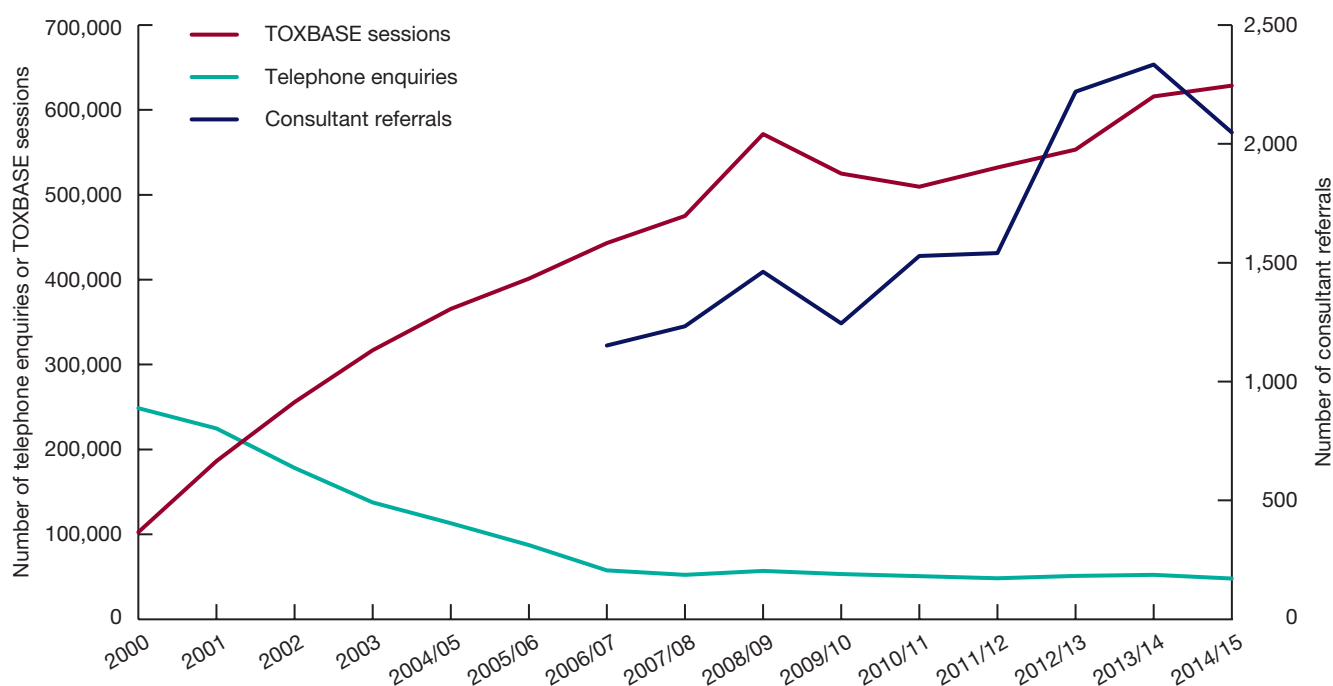


FIGURE 3.1 Telephone enquiries, TOXBASE sessions and consultant referrals from 2000 to 2014/15 (data for 2000–2003 by calendar year, subsequent data by financial year)

TABLE 3.1 Country of origin of TOXBASE user sessions together with rate of enquiry per 100,000 population in 2010/11 and 2014/15

Country	2010/11		2014/15	
	Number	Rate per 100,000 population*	Number	Rate per 100,000 population†
England	376,657	721.1	480,613	884.8
Northern Ireland	10,620	590.2	13,441	730.3
Scotland	49,807	953.8	56,371	1,054.1
Wales	28,027	932.2	28,339	916.5
UK	465,111	747.0	578,764	896.0

* Based on mid-2010 population estimates, viewed June 2011 (www.statistics.gov.uk/statbase/Product.asp?vlnk=15106) (UK total = 62,261,300)

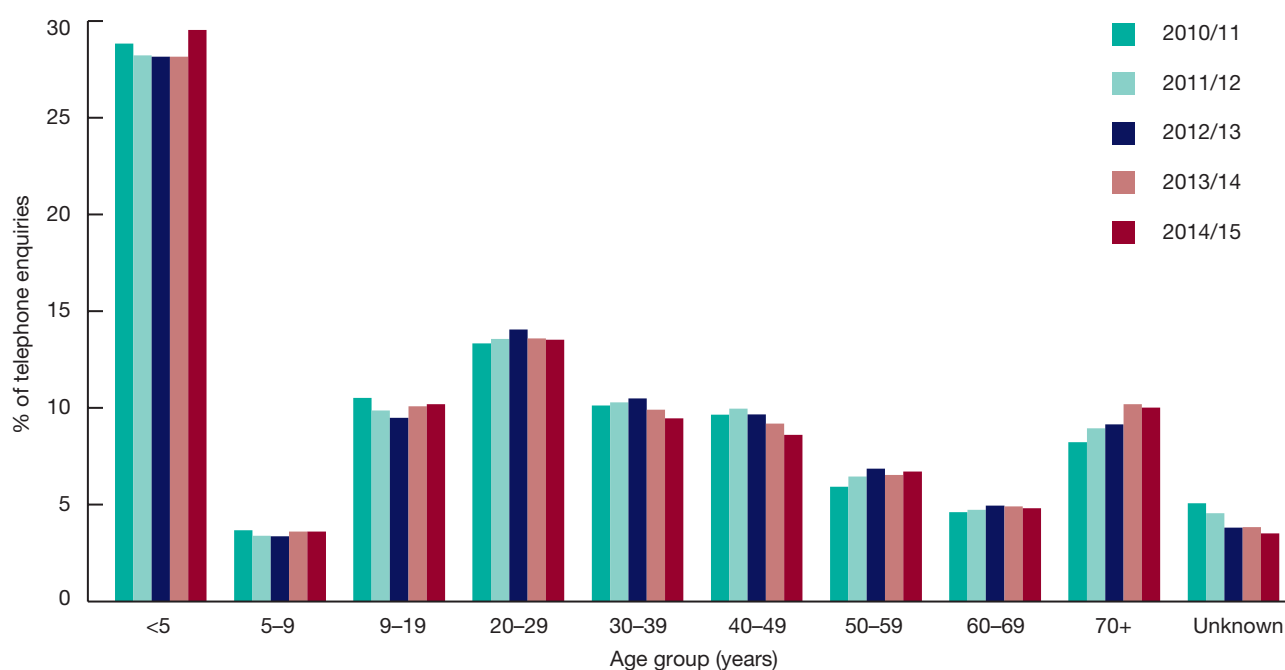
† Based on mid-2014 population estimates, viewed June 2015 (www.ons.gov.uk/ons/rel/pop-estimate/population-estimates-for-uk--england-and-wales--scotland-and-northern-ireland/mid-2014/stb---mid-2014-uk-population-estimates.html) (UK total = 64,596,800)

Ireland, Scotland and Wales have been analysed further in this report.

The total number of user sessions originating in the UK has increased marginally on the 2013/14 figure – up by 0.5%. As in previous years, hospital departments were responsible for the majority (65%) of TOXBASE sessions in 2014/15. Of these sessions, the majority originated in hospital emergency departments (322,474 or 85.9%).

There were 1,858,979 individual product accesses in 2014/15. Applying the same criteria as for session data gives a total of 1,599,458 product accesses from UK-based, non-poisons-centre users. This represents an increase of 4.7% on the 2013/14 figure.

As in previous years, the increase in TOXBASE use corresponds with a decrease in the number of telephone enquiries received by the service. In 2014/15 there were

**FIGURE 3.2** Age of poisoned patients as reported in telephone enquiries in 2014/15

47,863 telephone enquiries answered by the NPIS. Of these enquiries, 46,711 were related to patients, a decrease of 9.5% on 2013/14. However, Figure 3.1 shows that overall the number of telephone enquiries received has remained constant since 2006/07, ie the number of telephone enquiries received each year for the last nine years is around 20% of that received in 2000.

The telephone enquiry data show that the demographics of poisoning in the UK have not changed substantially in the last five years: every year around 30% of all enquiries are about patients under the age of five years (Figure 3.2). The majority of enquiries, on average 50.1% of all enquiries each year, relate to exposures that occurred accidentally (on average, 21.5% of all enquiries received each year relate to exposures that occurred intentionally). The vast majority of exposures occur in a domestic setting – on average, 88.6% of all enquiries each year.

The way in which users access services provided by the NPIS has changed. Figure 3.3 shows a decline in the number of TOXBASE sessions from NHS 111, NHS 24 and NHS Direct users. This drop in TOXBASE sessions corresponds with an increase in the number of telephone enquiries from NHS 111, NHS 24 and NHS Direct users in 2014/15, when compared with 2010/11 (Figure 3.3, see Section 6.9 for discussion). Indeed NHS 111, NHS 24 and NHS Direct users exceeded hospital users

as the type of user that telephoned the service most in 2014/15 (Figure 3.4).

Nurses appear slightly more likely to telephone the service (Figure 3.5), but this may reflect the increase in telephone enquiries received from NHS 111, NHS 24 and NHS Direct as these services are predominantly staffed by nurses.

Of particular note is the changing use of NPIS services by GPs. In previous years, primary care users have preferred to telephone the service rather than access TOXBASE. However, there has been a 3.8% increase in primary care TOXBASE user sessions in 2014/15 compared to 2010/11. This increase corresponds with a drop of 7.1% in the number of telephone enquiries over the same period (Figure 3.6). This may suggest GPs are becoming more familiar with TOXBASE.

NPIS telephone enquiry data demonstrate the value of the NPIS in preventing unnecessary hospital admission and validates its role as a frontline service. For example, in 2014/15 the NPIS answered 15,941 telephone enquiries from NHS 111, NHS 24 and NHS Direct. Through NPIS involvement, hospital admission or a GP referral was avoided in 8,886 (55.7%) patients, representing a significant saving to the NHS.

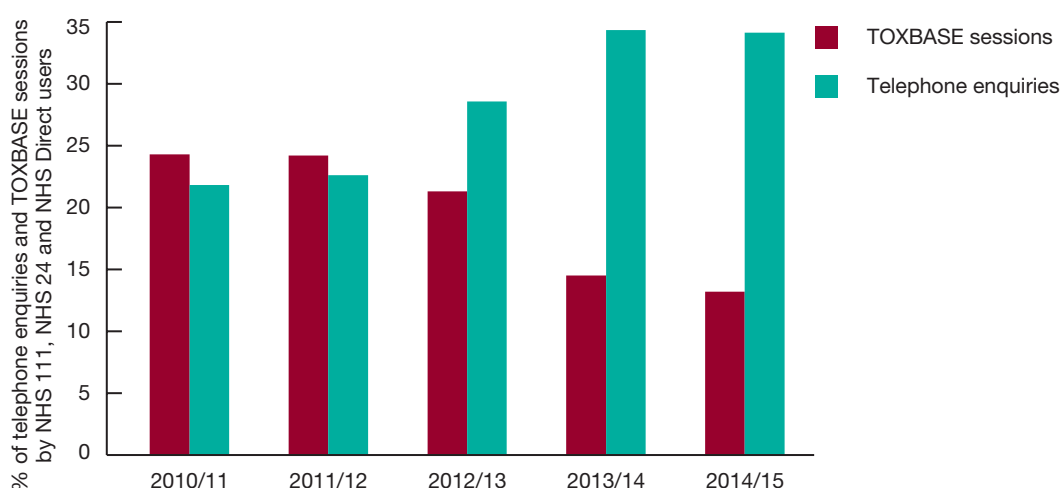


FIGURE 3.3 Telephone enquiries and TOXBASE sessions by NHS 111, NHS 24 and NHS Direct users

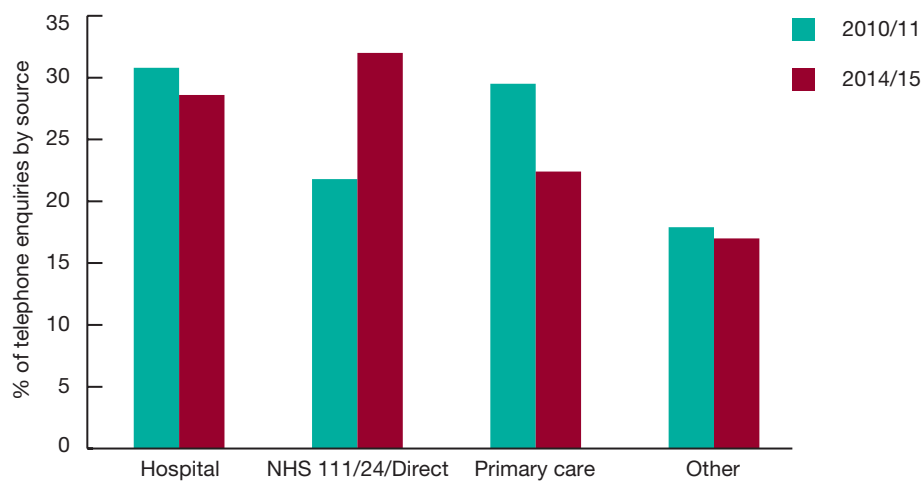


FIGURE 3.4 Telephone enquiries by source of user in 2010/11 and 2014/15

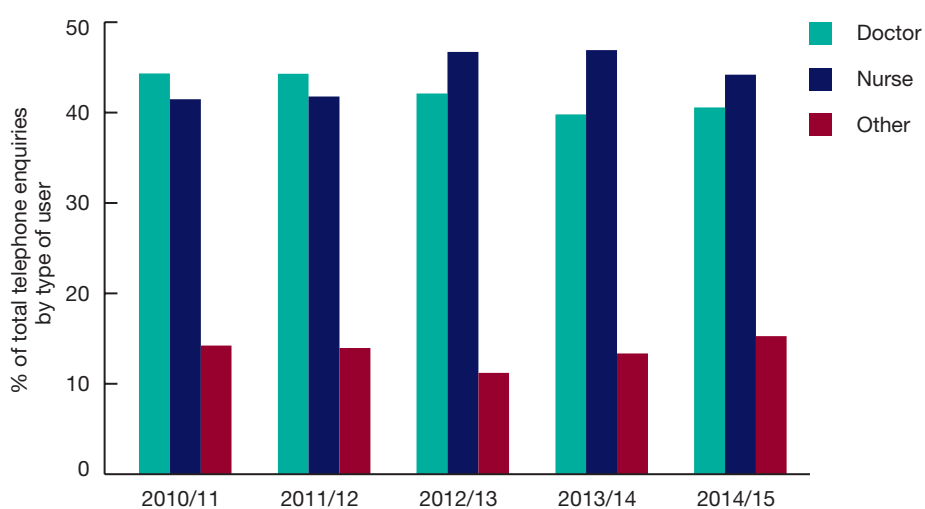


FIGURE 3.5 Telephone enquiries by type of user from 2010/11 to 2014/15

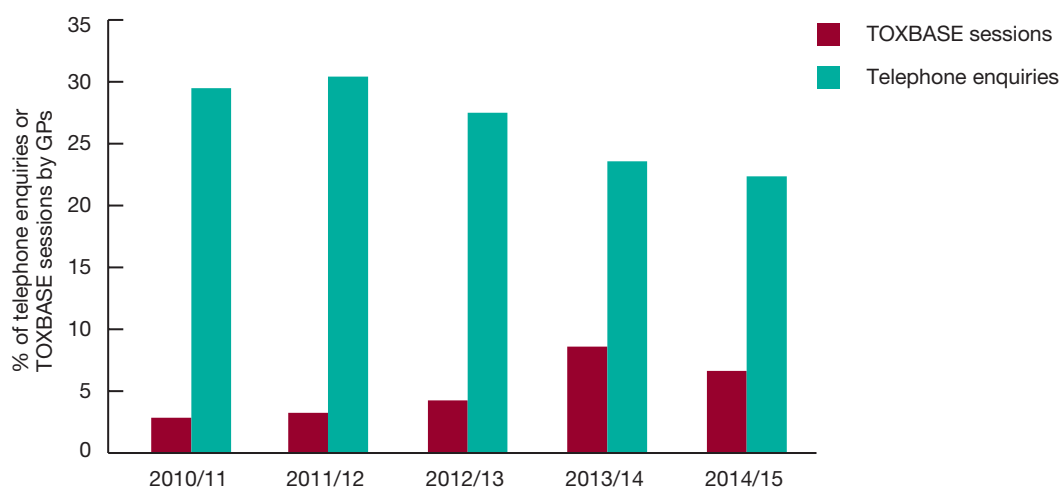


FIGURE 3.6 Telephone enquiries and TOXBASE sessions by GPs from 2010/11 to 2014/15

3.2 Consultant Referrals

Background

The NPIS has operated a national consultant clinical toxicology on-call rota for the UK and the Republic of Ireland since May 2005. Thirteen consultant clinical toxicologists from the four NPIS units and three consultants from hospitals in York and London contribute to out-of-hours cover (weekdays 18:00–09:00 hours, weekends and public holidays).

All staff on the rota are involved in the care of poisoned patients in their own local NHS hospitals. A nationally agreed protocol is used to determine when specialists in poisons information should refer enquiries to a consultant. The national consultant rota is managed from NPIS Edinburgh.

For daytime cover, units make local arrangements and may be supported by consultants, academic clinical staff and specialist registrars (SpRs) who are not on the UK NPIS consultant toxicologist rota, but all enquiries are answered under the supervision of NPIS consultants.

NPIS Edinburgh also provides consultant support for enquiries from Northern Ireland during the working week. Units provide cross-cover in emergencies and occasionally support colleagues in other units during the working week.

Details of all telephone calls to the NPIS are stored on the UKPID central server and sent to the relevant consultant for local or national audit and checking. In addition, consultants keep contemporaneous local records of advice given, which are added to the records by the NPIS unit that took the original call.

Consultant referrals

There were 2,048 referrals made to NPIS consultants (daytime and out-of-hours) in 2014/15, a decrease of 12.3% on 2013/14 (Figure 3.1). Figure 3.7 shows the number of referrals by month over the past three years.

The distribution of these referrals by day of the week is shown in Figure 3.8. The median number of referrals per day was 5 (interquartile range, IQR, 3–7), with fewer referrals at the weekend. Referrals by country are shown

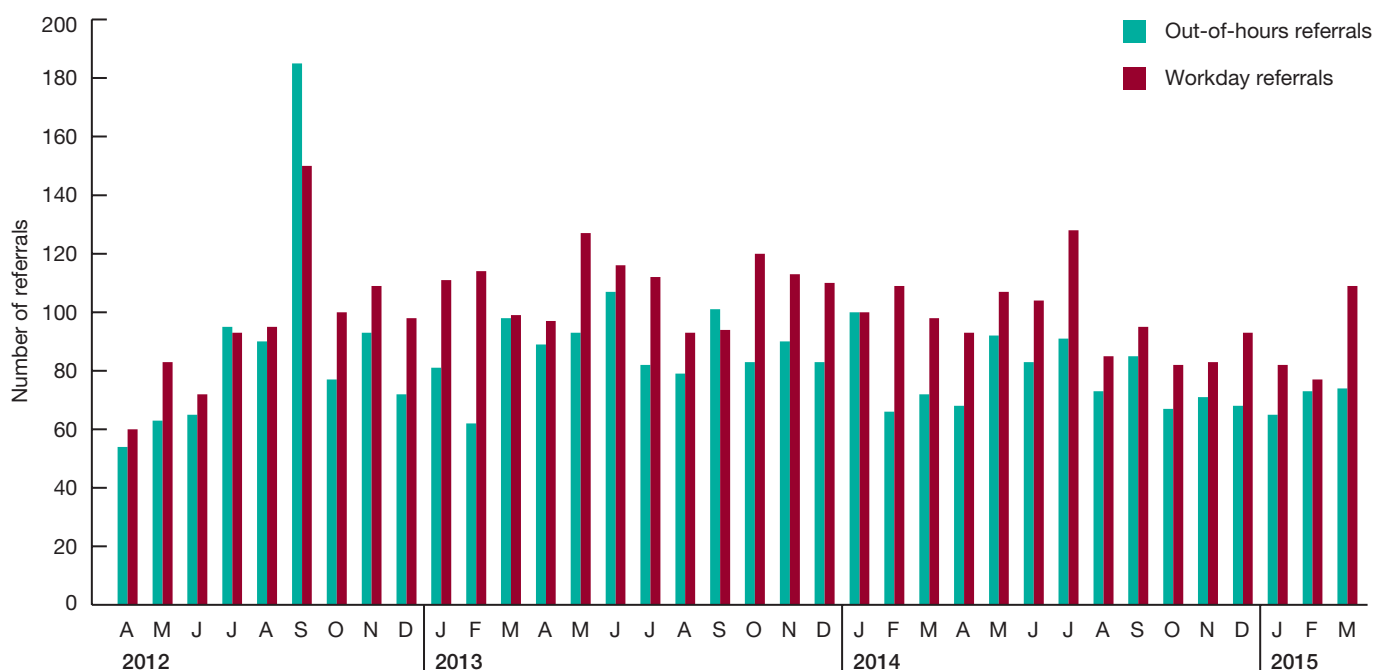


FIGURE 3.7 Monthly NPIS consultant referrals (given as out-of-hours and workday referrals) from April 2012 to March 2015 (Note: The spike in enquiries received by the NPIS in September 2012 was a result of changes made to NPIS advice on paracetamol poisoning following recommendations issued by the Commission on Human Medicines)

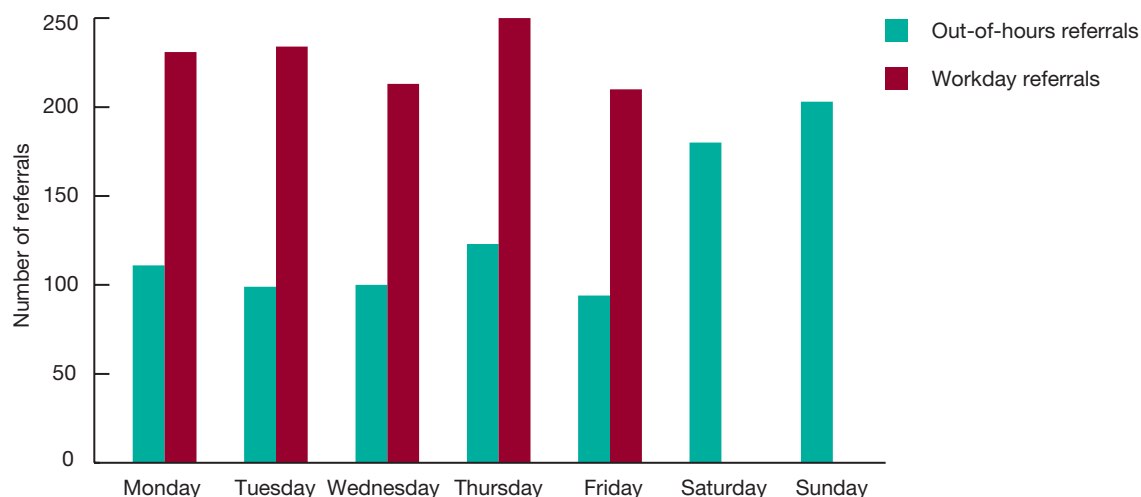


FIGURE 3.8 NPIS consultant referrals by day of the week (given as out-of-hours and workday referrals) in 2014/15

TABLE 3.2 NPIS consultant referrals by country in 2014/15, with 2013/14 percentage values for comparison

Country	2014/15			
	Number of referrals	Rate per 100,000 population*	% in 2014/15	% in 2013/14
England	1,594	2.9	77.8	79.6
Northern Ireland	26	1.4	1.3	1.4
Scotland	248	4.6	12.1	12.2
Wales	123	4.0	6.0	5.1
Republic of Ireland	42	–	2.1	1.3
Other and unknown	15	–	0.7	0.5
Total	2,048	–	–	–

* Based on mid-2014 population estimates, viewed June 2015 (www.ons.gov.uk/ons/rel/pop-estimate/population-estimates-for-uk--england-and-wales--scotland-and-northern-ireland/mid-2014/stb---mid-2014-uk-population-estimates.html) (UK total = 64,596,800)

in Table 3.2. The great majority of consultant referrals came from calls originating in hospitals (1,854 or 90.5%: Table 3.3), with calls from GPs/primary care being the next most common source (120 or 5.6%). There was a continuing decrease in the proportion of consultant referrals following calls from NHS 111, NHS 24 and NHS Direct, down from 5.9% of referrals in 2012/13 and 1.9% in 2013/14 to 1.1% in 2014/15.

The enquiries

Table 3.4 shows the most common types of products involved in referrals to consultants. Heading the list are paracetamol-containing products, drugs of misuse, toxic alcohols or glycols (eg ethylene glycol, methanol and

antifreeze) and digoxin. For 145 referrals, the product taken (if any) was unknown and help with diagnosis was required. Ethanol was reported to be involved in 129 consultant referrals.

Feedback into NPIS services

Analysis of the consultant referrals is used to improve the services offered by the NPIS. Outcomes include additions and changes to TOXBASE entries that reflect user needs.

Issues highlighted by difficult or complex calls are discussed further among NPIS staff by email or telephone, at regular TOXBASE editing meetings or at the NPIS CPD meetings.

TABLE 3.3 NPIS consultant referrals from hospitals by department in 2014/15

Source	Number of referrals	% of total (2,048)
Emergency departments	875	42.7
Intensive care units	325	15.8
Other hospital units	162	7.9
Paediatrics	180	8.8
General medicine	120	5.9
Admission/assessment units	78	3.8
Unspecified hospital units	52	2.5
Medicines information and pharmacy	27	1.3
Surgical	18	0.9
Psychiatric units	15	0.7
Minor injuries units	2	0.1
Total	1,854	

TABLE 3.4 Agents commonly involved in NPIS consultant referrals in 2014/15

Rank	Agent	Number of referrals
1	Paracetamol (including 74 co-codamol)	433
2	Drugs of misuse	201
3	Drug/substance unknown	145
4	Ethylene glycol, methanol and antifreeze	92
5	Digoxin	69
6	Bites and stings	66
7	Ibuprofen	59
8=	Iron	56
8=	Venlafaxine	56
9	Citalopram	53
10	Propranolol	50

Conclusions

The NPIS national out-of-hours on-call consultant rota continues to work well. Frequent contact by email and telephone – together with regular educational meetings – helps to ensure consistency of advice and patient care. Information gleaned from analysis of the

enquiries has assisted in identifying toxicological and methodological problems, improving the clarity of TOXBASE entries and informing the need for research in a number of areas.

3.3 NPIS Product Data Centre

In order for the NPIS to provide accurate advice on the treatment and management of patients exposed to consumer products, reliable information on the composition of these products is necessary. Manufacturers' product safety datasheets (SDS) also provide information for updating TOXBASE, enabling end users to obtain specific advice on many common products.

NPIS Birmingham has the responsibility of coordinating the NPIS Product Data Centre and liaising with manufacturers to ensure that the data held are comprehensive and up to date. In 2014/15, 23,147 SDS were added to the Centre which now holds some 140,000 current SDS. The database is indexed by product name, manufacturer, date of the SDS and the accession date for the SDS to the database. Where these fields are insufficient, the database is also fully text searchable, which enables searches to be made on any other criteria, eg active ingredients or use.

3.4 NPIS Literature Database and Current Awareness in Clinical Toxicology

To ensure that NPIS staff are equipped to answer enquiries on all aspects of human toxicology and that TOXBASE is kept up to date, access to current scientific literature is essential. All NPIS staff have 24 hours a day access to the NPIS Literature Database, which was created by and is maintained by NPIS Birmingham. The database currently contains 107,517 citations on all aspects of clinical, occupational and environmental toxicology. In 2014/15, some 7,856 references were added to the database, which is fully searchable using keywords, authors, journals and text words. Citations are selected using searches specially developed for the purpose run against Medline, Embase and Science

Direct. In addition, the tables of contents of key journals are scanned for suitable papers on publication.

With the assistance of the other NPIS units, NPIS Birmingham also produces *Current Awareness in Clinical Toxicology* each month. Each issue lists around 400 citations, with some 15–20 key papers highlighted because of their importance to the clinical management of poisoning and the updating of TOXBASE. *Current Awareness* is distributed by the international clinical toxicological societies to all poisons units worldwide.

The underlying database, including monthly updates, is provided to all NPIS staff for inclusion in their personal citation manager (Reference Manager™ or End Note™).

3.5 NPIS Website (www.npis.org)

This website is focused primarily on providing information to members of the public. It contains information on the structure and function of the NPIS, details of the range of services provided to healthcare professionals on all aspects of poisoning and links to affiliated organisations and relevant websites. Visitors to the website can also download NPIS publications including annual reports back to 2004.

The website has been created and is maintained by NPIS Birmingham with collaboration from the other units. The website is updated continuously, particularly with the data in each annual report.

Between April 2014 and March 2015 the site had over 40,000 visitors and over 75,000 page views. The most popular documents downloaded were the low toxicity poster and the last two NPIS annual reports.

3.6 TOXBASE App for Smart Phones

The TOXBASE app has been available for iPhone and iPad since October 2012 and for Android devices since May 2013. Developed in response to advancing technology and user feedback, the TOXBASE app offers greater user mobility and – for the first time – off-line availability of TOXBASE information.

The app is available to individual healthcare professionals by paid annual subscription. Those who validate their registration through an NHS or PHE email address gain access to a full version of the app tailored for UK NHS users. Users from outside the UK NHS and PHE gain access to a 'global' version of the app which contains more than 1,000 key TOXBASE entries considered by the NPIS to be most useful to those seeking poisons information from around the world. Monies from the small fee are used to fund development and hosting costs.

As of 31 March 2015, 48% of all 458 subscribers were doctors, while ambulance service personnel of all grades represented an additional 36% of users; 29% of users were based in hospital emergency departments. Around 20% of subscribers were located outside the UK. In addition, all NPIS physicians and specialists in poisons information have access to the app to support their NPIS duties and increase service resilience in case of local or national failures of internet access.

In 2015 the TOXBASE app will be relaunched. The redeveloped app will be free to NHS and PHE users, and it will continue to be available by paid subscription for other users. It will feature a new, searchable section on antidotes (Figure 3.9).

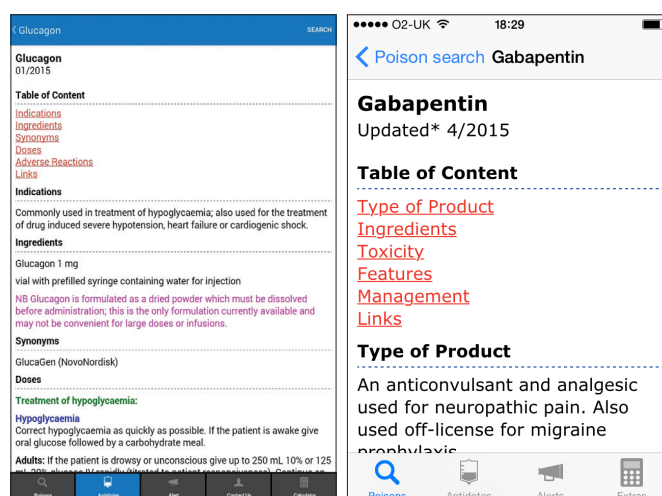


FIGURE 3.9 TOXBASE app screenshots from iPhone and Android devices

4 UKTIS Activities in 2014/15

4.1 Overall Service Profile

UKTIS is commissioned by PHE to conduct surveillance and to provide evidence-based information and advice to UK healthcare professionals on the effects on the fetus of medicines, poisonings and chemical exposures in pregnancy. Established in 1983 as a telephone advisory service, provision of detailed information about specific exposures during pregnancy through the internet now predominates.

UKTIS is one of a network of international teratology information services and a founder member of the European Network of Teratology Information Services (ENTIS). International collaboration between UKTIS, other ENTIS centres, Motherisk (Canada) and the Organisation of Teratology Information Specialists (USA) has demonstrated the value of combining individually small datasets, which provide an important source of information to inform clinical practice and policy.

UKTIS provides information on request to official organisations such as the Medicines and Healthcare Products Regulatory Agency, the Commission for Human Medicines, the European Medicines Agency, and the British National Formulary and Neonatal Formulary. Expertise among UKTIS staff is reflected in their involvement in national expert committees, international special interest groups and international collaborative research studies, and their ongoing contribution to educational and academic meetings.

During 2014/15 UKTIS launched a dedicated public facing website '*bumps – best use of medicines in pregnancy*' (medicinesinpregnancy.org) (Figure 4.1) and moved to direct public engagement through social media platforms such as Facebook and Twitter. '*bumps*' offers patient information and an online facility for women to report pregnancy exposures and outcomes directly to UKTIS.

Information provision

UKTIS delivered information and advice in response to over 440,000 requests during 2014/15, a 132% increase on 2013/14. These comprised 2,529 telephone enquiries, 56,799 scientific monograph downloads from TOXBASE (www.toxbase.org), 160,351 monograph

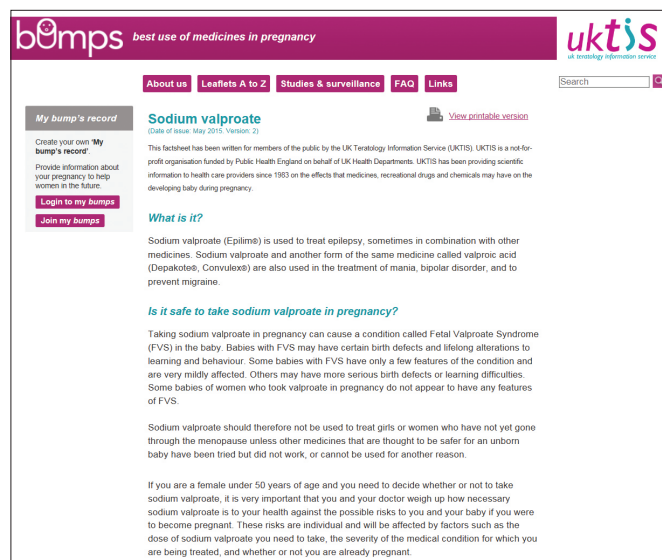


FIGURE 4.1 Online view of *bumps* information leaflet on sodium valproate

abstract accesses from the UKTIS website (uktis.org) and 221,053 *bumps* patient information page views (see Box 4.1).

By the end of 2014/15, 143 links to 92 unique information pages were available on *bumps*. Resource to enable leaflets to be written over 2014/15 has been obtained exclusively through research and other funding options. Monthly hits to the website exceeded 9,000 in March 2015, 78% of which were directed at the information leaflets. Feedback from users about the website has been encouraging.

National telephone enquiry line

UKTIS has increasingly encouraged users to access information on the websites, with the telephone service being reserved for more complex cases. Telephone enquiries from across the UK have gradually decreased, from 4,844 in 2006/07 to 2,529 in 2014/15. The enquiries received, however, are of increasing complexity, eg there has been an increase in the proportion of enquiries involving exposure to more than one substance, from 46% in 2013/14 to 68% in 2014/15.

GPs, hospital pharmacists and hospital enquirers are the commonest users of the telephone advisory service. As in previous years, around half of telephone enquiries

BOX 4.1 UKTIS information provision online

1 UKTIS scientific monographs

There are currently about 350 detailed and fully referenced clinically focused scientific reviews available to registered healthcare professionals on TOXBASE (www.toxbase.org), the NPIS clinical toxicology database. UKTIS aims to update these documents over a four to five year cycle, or sooner should new information that changes or impacts on clinical practice become available

2 UKTIS scientific monograph abstracts

Summaries of the detailed scientific monographs have been openly accessible on the UKTIS website (uktis.org) since 2012. These provide a brief overview but do not include the detailed and fully referenced review of the available evidence provided in the full UKTIS scientific monographs on TOXBASE

3 *bumps* patient information leaflets

In April 2014 UKTIS launched patient information leaflets on the *bumps* website (medicinesinpregnancy.org). This information is openly accessible and provides lay summaries of UKTIS scientific monographs (Figure 4.1)

were about women who were already pregnant and a third were requests for preprescription or preconceptional advice (Figure 4.2). The vast majority of calls (88.4%) involved a therapeutic exposure, with overdose, poisoning and recreational drug exposure together accounting for 9%. Complementary medicines (0.3%), occupational (1.3%) and environmental (1.3%) exposure enquiries to UKTIS remain relatively infrequent.

Table 4.1 highlights the difference in the ten exposures most commonly downloaded by registered TOXBASE users (healthcare providers), and global internet users with unrestricted access to UKTIS monograph abstracts on the UKTIS website and to *bumps* lay information leaflets on medicinesinpregnancy.org. Despite *bumps* having only been launched in April last year, and the site gradually populated with new information over 2014/15, leaflet views far exceed those for UKTIS monograph abstracts and suggest that demand for openly available patient information on exposures in pregnancy is high.

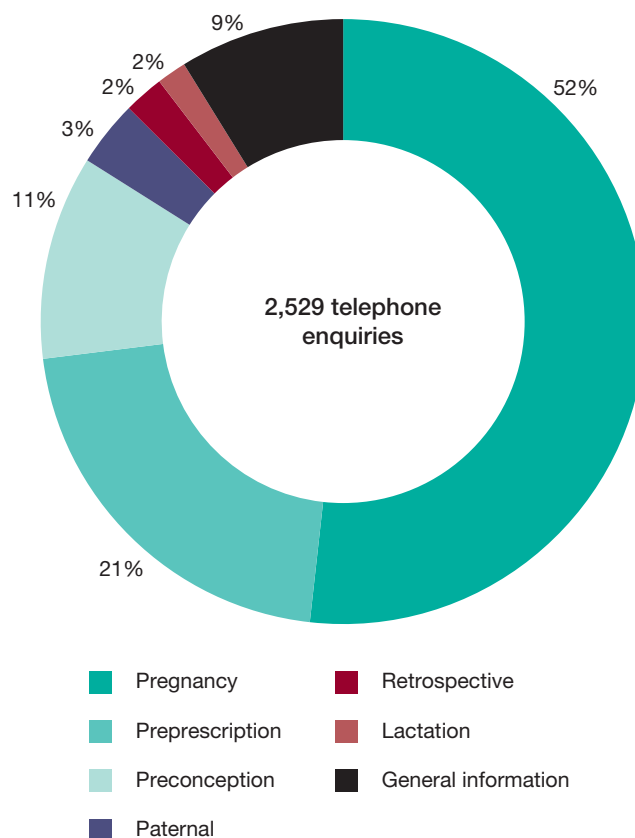


FIGURE 4.2 Nature of telephone enquiries to UKTIS in 2014/15

While the total number of monograph abstracts accessed on uktis.org has increased by 32% to over 160,000 during 2014/15, the number of monographs downloaded from TOXBASE has decreased slightly from last year. This may in part reflect preferential use of the openly accessible *bumps* patient information leaflets by healthcare professionals (Figure 4.3).

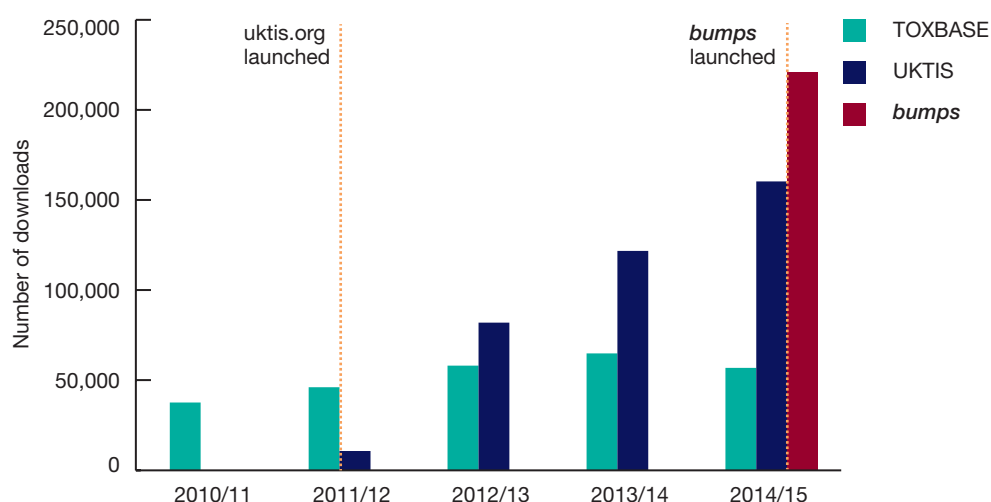
4.2 Surveillance and Research

UKTIS holds a national pregnancy exposure registry to enable teratogen surveillance. Details of pregnancy outcome are obtained from the healthcare professionals who sought advice by telephone about exposure(s) in pregnancy.

During 2014/15 UKTIS staff members were involved in several surveillance and research studies. These included international collaborative studies on TNF- α inhibitor and mirtazepine exposure in pregnancy, and a

TABLE 4.1 Top ten types of most requested pregnancy-related information online in 2014/15

	TOXBASE (www.toxbase.org)	Number of accesses	UKTIS (uktis.org)	Number of accesses	<i>bumps</i> (medicinesinpregnancy.org)	Number of accesses
	Type of access					
Rank	Registered healthcare professionals		Open		Open	
1	Nausea and vomiting	1,850	Gentamicin	4,123	Constipation	31,464
2	Codeine	1,210	Trimethoprim	3,201	Amoxicillin	22,831
3	Corticosteroids	987	Propranolol	3,087	Metronidazole	20,471
4	Paracetamol overdose	945	Diazepam	2,352	Paracetamol	17,459
5	SSRIs	919	Doxycycline	2,168	Threadworms	17,142
6	Sertraline	897	Clarithromycin	2,047	Ibuprofen	16,288
7	Ibuprofen	884	Formaldehyde	2,021	Aspirin	15,806
8	Pain relief	837	Diclofenac	1,887	Clotrimazole	14,224
9	Citalopram	773	Co-amoxiclav	1,716	Head lice	13,568
10	Antibiotics	753	Metoprolol	1,469	Cetirizine	13,238
Total		56,799		160,351		221,053

FIGURE 4.3 Full monograph (www.toxbase.org), monograph summary (uktis.org) and *bumps* leaflets downloads (medicinesinpregnancy.org) showing UKTIS information provision and user access from 2010/11 to 2014/15

review of therapies used in the treatment of hyperemesis gravidarum (severe pregnancy sickness) funded by the National Institute for Health Research Health Technology Assessment Programme. The EU Innovative Medicines Initiative funded PROTECT Pregnancy Study, examining the value of direct reporting of exposures and pregnancy outcome by pregnant women is now complete. Two studies investigating the risk of neurodevelopmental effects with in-utero exposure to antiepileptic drugs,

in collaboration with Bath University, the UK Epilepsy Register and the Liverpool Neurodevelopment Group are ongoing.

During 2014/15 UKTIS staff co-authored two chapters on poisoning and recreational substance use in pregnancy in the third edition of *Drugs During Pregnancy and Lactation* (C Schaefer, Ed), a designated essential information resource for medicines information centres in the UK.

4.3 Service Development

Considerable time has been invested in the development of an online reporting tool for pregnant women. From April 2015, women have been able to provide information directly to UKTIS by creating a secure password-protected unique '*my bumps record*'. Email prompts encourage women to update their record in 'real-time' throughout the pregnancy and, where a liveborn infant is recorded, to provide information at yearly intervals about the child's health and development.

It is hoped that information collected in this way will supplement that currently provided to UKTIS by healthcare professionals and offer a means of enhanced surveillance, in particular for signals suggestive of longer term effects of a medicine on behaviour or learning ability. Importantly, this online reporting facility will support international data collection and offer immediately available infrastructure to support national or even global surveillance during future pandemics or national UK vaccination programmes where real-time data collection and analysis are critical to inform public health policy and clinical practice.

5 Clinical Governance

Patient safety is the most important consideration for the NPIS. The service has rigorous clinical governance mechanisms in place to ensure that safety and quality are reviewed regularly and that standards are maintained and improved. There are also processes in place for the investigation of incidents when things may have gone wrong. The quality of services provided by the NPIS are based on appropriate staff training and professional development, detailed operational procedures which are common for all NPIS units, access to the best possible information sources and continuous availability of more experienced staff. There is also a regular programme of quality assurance and audit. A summary of the key features of the NPIS clinical governance arrangements is shown in Box 5.1.

BOX 5.1 Key features of NPIS clinical governance

Appropriate induction, training and appraisal of all staff

Nationally organised continuous professional development with discussion of issues of concern, ensuring consistency of approach

Access to high quality information sources

Early peer review of enquiry answers and a programme of enquiry audit

Continuous support from senior staff including 24 hour availability of a consultant clinical toxicologist

Detailed and regularly updated national operational policies

Reporting and review of critical incidents, complaints and near misses so that lessons can be learned and shared throughout the service

Regular quality assurance exercises encompassing all aspects of NPIS work

without fear of recrimination. These are reviewed initially by the director of the originating unit and those with possible relevance to all NPIS units are reviewed at a national level at the Clinical Standards Group, where recommendations for further actions are made. If urgent changes are required, mechanisms are available for rapid discussion among the NPIS units and early national implementation of required changes.

During this reporting year, there were 16 critical events reported and discussed nationally. Seven of these were related to TOXBASE guidance, where this had been questioned by users or where review had been prompted by the release of national guidance. In five cases the TOXBASE entry was adjusted; in three of these, the original advice was considered accurate but small changes were made to make it clearer to users. In two cases, small changes to management advice were made in the light of recent clinical experience. In the other two cases, the entries were considered accurate and no changes were required. There were four critical incidents concerning TOXBASE functionality. These included two temporary outages, both of which were resolved rapidly, one incident involving the function of a dose calculator which was corrected and the other relating to the security of data on TOXBASE, which resulted in further steps being taken to ensure the database is better protected. There have been five incidents of failure of NPIS telephone lines, in all cases due to malfunctioning of the BT Cloud system at the level of the provider. In view of these persisting, occasional problems with BT Cloud, guidance for managers on how to respond to such incidents was revised during the year.

5.1 Analysis of Critical Events

The NPIS reviews all critical incidents in a process shared across the service so that lessons learned can be communicated to relevant staff irrespective of where they work. All NPIS staff are encouraged to report critical events, complaints, adverse comments or near misses

5.2 Quality Assurance Exercises

Telephone enquiry service

The NPIS units have performed an annual stakeholder quality assurance exercise since 2002 to gauge user satisfaction, service performance and user requirements, and to identify areas for improvement. This report details the results of the 2014/15 national quality assurance questionnaire exercise that was conducted in accordance with PHE contractual arrangements.

A random sample of telephone enquiries was chosen using the same methodology for each unit. The sample size aims to survey at least 5% of telephone enquiries received by the Cardiff, Newcastle and Birmingham units. Edinburgh is not open 24 hours a day and therefore takes fewer telephone enquiries, so is required to survey a larger proportion of enquiries (10%) in order to achieve a suitable sample size.

Between 1 April 2014 and 31 March 2015, the four NPIS units answered 46,711 patient-specific telephone enquiries, compared to 52,031 in 2013/14. A total of 2,963 questionnaires were posted, involving 6.3% of these enquiries. The NPIS received 789 responses, representing 1.7% of telephone enquiries and a response rate of 26.6%, which is lower than the previous year (33.8%) but typical of surveys of this type.

General practitioners (GPs) remain the most frequent survey respondents, representing 33.3% of all responses. The proportion of respondents checking TOXBASE before telephoning the service has steadily increased from 37.5% in 2012/13 and 46.8% in 2013/14 to 48.4% during 2014/15.

Those who made their telephone enquiry after checking TOXBASE were asked why they contacted the NPIS. The most common reason given (51.2%) was because TOXBASE provided insufficient information to answer their specific question, consistent with NPIS advice that a telephone enquiry should be made under these circumstances. This percentage has varied little recently (52.7% in 2013/14). Other commonly cited reasons were: special circumstances for their call (36.3% vs 30.2% in 2013/14), inability to interpret the information on TOXBASE (8.1% vs 9.9% in 2013/14), because of a local protocol to call (4.0% vs 3.3% in 2013/14), or TOXBASE seemed to contradict other information they had (1.1% vs 3.2% in 2013/14).

The reasons identified for not accessing TOXBASE before telephoning the NPIS are presented in Table 5.1. The numbers giving their reason as not knowing about TOXBASE has decreased, with this response most commonly received from GPs. Of the responding GPs, the proportion not being aware of the availability of

TABLE 5.1 Reasons why telephone enquirers did not consult TOXBASE first, from 2012/13 to 2014/15

Reason	% of respondents		
	2012/13	2013/14	2014/15
I don't know what TOXBASE is	26.3	27.6	18.2
We don't have it in our department	18.5	22.1	23.9
It was in part of the department that we didn't have access to	4.3	3.0	3.0
We couldn't get logged on/the connection wasn't working	12.5	13.1	17.2
We've not been trained to use it yet	12.3	9.7	11.1
Other	26.0	24.4	26.6

TOXBASE online was 20.9% in 2014/15, a reduction from 25.5% in 2013/14. There were no important changes identified regarding the remaining designations in this group.

There was a slight increase in the proportion reporting access difficulties to TOXBASE within the respondents' departments. The number of people reporting that they have not been trained to use TOXBASE has changed little. Those who indicated they had experienced difficulty logging on to TOXBASE has risen slightly in the past two years from 12.5% in 2012/13 and 13.1% in 2013/14 to 17.2% in 2014/15.

To assess the quality of the service as perceived by users, respondents were asked to what extent they agreed or disagreed with a series of statements relating to the particular enquiry they made to the NPIS. The responses demonstrated a high degree of satisfaction in the way the NPIS dealt with their enquiries (Table 5.2).

Excellent feedback (over 95%) was obtained for questions relating to the politeness of the staff, promptness of enquiry handling, confidence in the advice and speed of information delivery. The lowest satisfaction score (91.1%) related to the time taken to answer the telephone.

Users were asked to indicate their overall satisfaction with the service they received from the NPIS using a scale of one to six, with one indicating a very poor and

TABLE 5.2 Summary of satisfaction scores, from 2012/13 to 2014/15

Question	Satisfaction score (%)*		
	2012/13	2013/14	2014/15
The person I spoke to was polite and pleasant	98.9	99.4	98.3
Once my call was answered by a specialist in poisons information the enquiry was dealt with promptly	96.0	98.2	97.1
The information was given to me at an appropriate speed	97.2	97.1	96.7
I had confidence in the reply I was given	96.7	97.5	95.2
The reply from NPIS was relevant and useful	96.2	97.1	94.9
I was given an appropriate amount of information for my needs	96.2	96.2	94.6
My telephone call was answered without delay by a specialist in poisons information	91.5	90.4	91.1

* Satisfaction score is the proportion of respondents who agree 'completely' (6) or 'a lot' (5) (excluding non-respondents)

six an excellent service. The overall satisfaction with the telephone enquiry service remains very high, with 97.2% of respondents giving a score of five or six, excluding non-respondents (Figure 5.1). This maintains the high user satisfaction demonstrated in earlier years (97.6% in 2013/14 and 96.2% in 2012/13). There were no important differences in the overall satisfaction scores between the units (Figure 5.2).

Summary

Respondents continue to have a very high level of satisfaction with the service, both overall and for each of the specific issues enquired about.

Satisfaction was slightly less relating to time taken to answer the telephone.

As in previous years, the low response rate may introduce a bias, which could be in either direction.

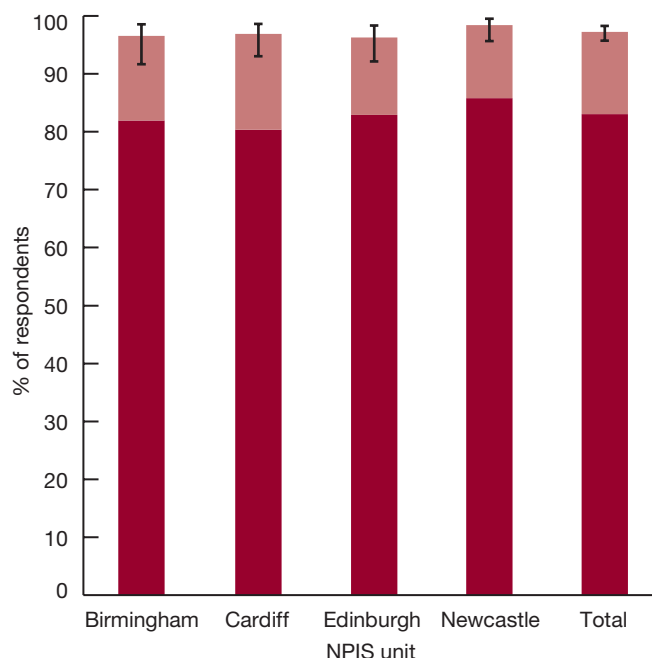


FIGURE 5.1 Overall quality scores (with 95% confidence intervals) in 2014/15 for the four NPIS units, expressed as a proportion of respondents scoring 5 (■) or 6 (■) out of a possible 6. Non-respondents are excluded from the denominator

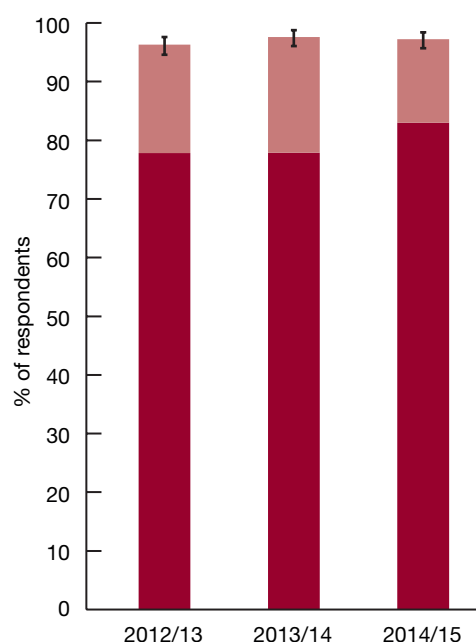


FIGURE 5.2 Overall quality scores (with 95% confidence intervals) for the four NPIS units, expressed as a proportion of respondents scoring 5 (■) or 6 (■) out of a possible 6. Non-respondents are excluded from the denominator

TOXBASE

Formal quality assurance from TOXBASE users is obtained using an online questionnaire. A selection of users are automatically asked to complete and submit short quality assurance forms during their online session. To achieve a reasonable return rate invitations are set to be generated between every five to fifteen database logins; this number is varied throughout the year to avoid user fatigue.

A total of 749 returns were received between 1 April 2014 and 31 March 2015. Users were asked their current designation: 13% were hospital consultants, 10% GPs and 27% other grade doctors; 21% were nurses, 13% NHS 111, NHS 24 and NHS Direct staff, 8% pharmacists and 6% ambulance staff/paramedics. Other respondents included biomedical scientists.

On type of enquiry, 54% users reported that they primarily used TOXBASE for 'routine enquiries', 27% for a 'triage decision' and 18% for 'complex enquiries'. On frequency of use, 43% reported using TOXBASE weekly, 23% daily and 34% only occasionally.

Users were asked to grade a series of statements on a scale of one to six where one = disagree completely and six = agree completely. Satisfaction scores were high (Table 5.3).

TABLE 5.3 Summary of user satisfaction scores

Rank	Question	Satisfaction score (%)*
1	I had confidence in the information for my query	94.5
2	The information was sufficient for managing this case	89.1
3	Logging on to the database was easy	86.8

* Satisfaction score is the proportion of respondents who agree 'completely' (6) or 'a lot' (5)

When asked to indicate their overall satisfaction with TOXBASE on a scale of one to six where one = poor and six = excellent, 700 (93.5%) scored either five or six.

TOXBASE user feedback and service improvements

An important component in the review process of TOXBASE entries is feedback from the database users.

Feedback may be received from a variety of sources including TOXBASE quality assurance forms, questionnaires linked to products of interest, responses to follow up on cases of interest, or by email, letter or telephone. Users may raise queries or provide clinical data. Issues specific to entries are dealt with as they arise or may be collated for discussion at the TOXBASE Editing Group or Clinical Standards Group meetings.

Responses to user queries were made if contact details were provided; however, these are not routinely provided.

TOXBASE quality assurance forms: free text comments

Of the 749 returns, 118 (15.8%) included free text comments. The free text comments can be grouped as shown in Table 5.4; Box 5.2 gives examples of positive comments about TOXBASE from the returns.

TABLE 5.4 Summary of free text comments on TOXBASE from the quality assurance returns

Type of comment	Number (% value)
Positive comments	50 (42.4%)
Suggestions	28 (23.7%)
Information technology	10 (8.5%)
General	10 (8.5%)
Negative comments	8 (6.8%)
Specific issues	7 (5.9%)
Other services	5 (4.2%)

The eight negative comments referred to issues around the search facility, website style and the complexity of the paracetamol guidance. The NPIS is in the process of improving its search facility in response to comments received. The presentation of information, particularly for paracetamol, is always under review, with improvements undertaken as necessary.

BOX 5.2 Examples of positive comments about TOXBASE from the quality assurance returns

'We all find TOXBASE a very valuable part of our day. It is set out in an easy and manageable order. Thank you for this service.'

Nurse

'Thank you for all the help! Much appreciated and very relied upon.'

Hospital consultant

'The database has been a mainstay for toxicology medicines information and remains so.'

Hospital pharmacist

'TOXBASE is a really useful resource for our nurse led minor injuries unit and saves time and gives us enough information to treat and reassure our patients.'

Nurse

'Brilliant resource – I have always found the information I needed here.'

Pharmacist

'Fantastic resource – where else can I find all of this information freely accessible and accurate. Great service. Thank you.'

Junior hospital doctor

Questionnaire for products of NPIS interest

Between 1 April 2014 and 31 March 2015, 50 online questionnaires that related to products of NPIS interest on TOXBASE were completed by users (40 in 2013/14). The NPIS adds the questionnaire to a range of products of interest, which include new products (eg black triangle drugs), uncommon agents and novel treatments such as the use of intravenous lipid emulsion for cardiotoxicity unresponsive to standard treatments. The feedback received from users can be very useful for keeping entries up to date.

The most common category of agent reported was pharmaceutical products (18 exposures). Those reported were finasteride (2), orlistat (2), quetiapine (2), trospium chloride (2), adalimumab (1), anastrozole (1), dalteparin (1), humira (1), Calpol Infant (1), letrozole (1), mesalazine (1), montelukast (1), pimobendan (1) and rivotril (1). Most pharmaceutical exposures reported no features of toxicity (12) or minor symptoms (4 exposures: orlistat (1), Calpol Infant (1), trospium chloride (1) and mesalazine (1), all producing gastrointestinal disturbance). The exceptions were

two intentional overdoses of quetiapine. These patients experienced cardiac abnormalities and CNS depression.

Novel psychoactive substances (NPS) reported (13 exposures) were 2C-B (1), 4,4-DMAR (1), BK-2C-b (1), DMT (1) mephedrone (4), NBOMe compounds (1) and synthetic cannabinoid receptor antagonists (4). All patients exposed to NPS products were symptomatic with common features reported including tachycardia (4), hallucinations (4), palpitations (3), abnormal movements (3), dizziness (3), paranoia/anxiety (3), vomiting (2), CNS depression (2), pyrexia (2), sweating (2) and agitation (2). Following injection of 4,4-DMAR a male patient developed dizziness and rigors leading to collapse. The patient subsequently developed jaundice and rhabdomyolysis but recovered with supportive care.

Twelve household product exposures were reported, all were with liquid detergent capsules and occurred in children aged under five years old. Three patients reported no symptoms. Vomiting occurred in four patients. Two patients had conjunctival irritation following eye contact. Other symptoms reported included abdominal pain (1), swollen lips (1), retching (1), sore throat (1) and skin irritation (1).

Three exposures to weight loss products were reported – raspberry ketone (2) and forskolin (1). The patient exposed to forskolin ingested 30 tablets and developed dry mouth, diarrhoea and dyspepsia with an exacerbation of her pre-existing gastric acid reflux. One patient exposed to raspberry ketone reported palpitations and chest tightness; the other reported abdominal cramps and dizziness.

Other categories reported were: 'other' (2) (Vital Oxide, ethidium bromide), drug of misuse (1) (cocaine), and veterinary (1) (propentofylline).

As randomised controlled trial data are not easily obtained on the management of poisoned patients, a body of evidence on individual patients is a particularly valuable source of clinical evidence for the NPIS. We therefore request all users to feedback information to the NPIS using the electronic forms provided within TOXBASE, or by email, letter or telephone.

UKTIS

Formal feedback on the UK Teratology Information Service is sought from a random sample of telephone enquirers, with questionnaires sent out between one and four weeks after the enquiry. During 2014/15 there were 350 enquiries (14% of the total enquiries) selected for quality assurance monitoring in this way.

As of May 2015, 95 (27%) of these forms had been returned, from a range of enquirers including GPs (59), pharmacists (11), hospital consultants (7), junior hospital doctors (4), nurses (7) and 'other' service users (6). The occupation of one responder was not reported.

Of the 95 responders, 6% had used the service more than five times, 56% had used the service between one and five times previously and 38% were first-time enquirers.

Enquirer satisfaction scores for 2014/15 demonstrated an improvement in nearly all areas, with 100% of responders indicating that they would use the service again and 96% reporting a high overall degree of satisfaction (see Table 5.5 and Box 5.3). Satisfaction scores were lower, however, for the speed of information delivery, which will be a focus for staff training in 2015/16.

TABLE 5.5 Summary of UKTIS telephone enquirer satisfaction scores

Question	Satisfaction score (%)*
Did you find it easy to contact UKTIS	99
The reply from UKTIS was relevant and useful (agree)	97
Once I got through, the enquiry took a long time to be dealt with (disagree)	82
The information was given to me too quickly (disagree)	68
The person I spoke to was polite and pleasant (agree)	98
The information was sufficient for my needs (agree)	91
I had confidence in the reply I was given (agree)	93
Was the information received was detailed enough	98
Will you use the service again	100
Overall satisfaction with the service	96

* Satisfaction score is the proportion of respondents who scored 5 and 6 (in agreement) or 1 and 2 (in disagreement)

BOX 5.3 Informal spontaneous feedback on *bumps* (medicinesinpregnancy.org)

'Wish I had read *bumps* when I was pregnant, it is really good to have the available evidence to hand.'

Member of the public

'This website is brilliant! I've been wanting this for 20 years!'

Healthcare provider

'A fabulous write up from @medsinpregnancy about sodium valproate'

Patient support group member, Twitter

'I have used a lot of your leaflets for patients, they are very helpful to support conversations about drugs in pregnancy. Great site and extremely beneficial to patient care. The more you do, the better!' *Pharmacist*

'We very much welcome the service user leaflets about medication in pregnancy on the *bumps* website – a much needed resource.'

Consultant psychiatrist

'Thanks for this – I have been looking for a website to safely tell whether a medicine is okay for a pregnant patient. It is better than the BNF for this. Please could you also start doing safe for breastfeeding section too. Thanks.'

NHS doctor

5.3 Training and Continuing Professional Development

Continuing professional development (CPD) is an essential component of the clinical governance structure of the NPIS. A national CPD programme ensures that all staff are equipped with the necessary knowledge and expertise to provide accurate, evidence-based advice on all aspects of poisoning.

Training for scientific staff

Scientific staff within each unit come from a range of both clinical and non-clinical backgrounds. Each unit provides structured in-house training and assessment, following a nationally agreed curriculum, covering all aspects of clinical toxicology from the mechanisms of toxicity to the management of poisoned patients. Additional training in communication skills also equips scientific staff with the necessary skills to deal with healthcare professionals

contacting the NPIS for advice. A postgraduate qualification in toxicology may also be completed, if not already done so, to further enhance knowledge and expertise.

Continuing professional development

The NPIS CPD programme consists of four meetings each year, hosted by each of the NPIS units in the UK. An NPIS consultant, appointed by the directors every three years as CPD lead, is responsible for coordinating the rolling programme of CPD meetings. Additionally, a member of scientific staff is also appointed on a two-year basis to ensure scientific staff are well represented in the educational programme. Consultant attendance is monitored as part of performance assessment.

The meetings within the CPD programme serve a number of purposes. Principally, they ensure that NPIS clinicians and scientists remain up to date with the latest developments within clinical toxicology, including both new poisons (eg novel psychoactive substances) and emerging treatments for common poisons. However, the CPD meetings also provide a critical role in educating NPIS staff regarding developments within the service as a whole, a forum in which to discuss recent challenging cases, and an opportunity for new research proposals to be debated. The meetings provide an ideal opportunity for those less experienced in presenting cases to do so in an encouraging environment. Finally, these meetings offer the chance for face-to-face contact between scientific and medical staff who may previously have only had contact on the phone, out-of-hours, to discuss enquiries. A sample CPD programme is shown in Figure 5.3.

NPIS staff within each unit are encouraged to participate in research and submit papers to peer-reviewed journals and national and international congresses and scientific meetings such as the British Toxicology Society and the European Association of Poisons Centres and Clinical Toxicologists. Details of publications and presentations produced in the year are provided in Appendix B.

NPIS CPD meeting, Newcastle

6th November 2014

Research Beehive, Newcastle University

10.00 *Registration and Coffee*

Morning session chair: Professor Simon Thomas

10.30 Recreational drugs – the inside story *Janice Pettie
Jonathan Wraight*

11.10 Whole bowel irrigation update *Ruben Thanacoody*

11.50 Have prevention strategies had an impact on exposure to liquid detergent capsules? *Allister Vale
Rachel Day*

How common are exposures to soluble film dishwashing products?

12.10 The follies of foraging *Elaine Donohue*

12.30 *Lunch*

Afternoon session chair: Dr Simon Hill

1.30 Chronic paracetamol therapeutic excess *Simon Thomas*

2.00 A recent NPIS case *Simon Hill
Talan Parnell*

2.20 An assessment of TOXBASE interpretation by junior ED and paediatric staff *Mark Anderson*

2.50 Self-poisoning in the elderly: a 10-year study *Emma Morrison*

3.15 *Feedback and close*

FIGURE 5.3 Sample CPD programme

6 Areas of Interest in 2014/15

6.1 Drugs of Misuse including Novel Psychoactive Substances

According to the 2013/14 British Crime Survey for England and Wales, about 1 in 11 (8.8%) adults aged between 16 and 59 had taken an illicit drug in the last year, with that value more than doubled (18.9%) for 16–24 year olds¹. Such drug use can sometimes be associated with significant toxicity, eg there were 1,957 deaths registered nationally as due to drug misuse in 2013². Clinical management advice about toxicity caused by recreational drug misuse is a significant workload for the NPIS. This has been intensified by the emergence of newer drugs, termed novel psychoactive substances (NPS). It is an increasing challenge for the NPIS to identify the substances being used and characterise their toxicity.

Changes to NPIS toxicosurveillance for drugs of misuse

In previous years the NPIS provided data on telephone enquiries about a range of specified drugs potentially subject to misuse, of which there were 61 in 2013/14. Although valuable for monitoring toxicity associated with these substances, this approach was not comprehensive in describing all recreational drug use. For example, misuse of prescription medicines was not always captured. In addition, an important problem that is encountered increasingly frequently is the use of branded products. These are difficult to classify in this way because their chemical constituents are sometimes unknown and may change over time. For example, the product 'Black Mamba' initially contained a natural product called Damiana but latterly has contained various synthetic cannabinoid receptor agonists when analysed³.

To address these problems and provide a better mechanism for toxicosurveillance of drug misuse, the NPIS changed the way telephone enquiries about drugs of misuse were recorded during 2014/15. The data reported here now include all calls relating to use of any substance, including licensed medicines, described as 'recreational' during the telephone enquiry, as well as all enquiries about substances regarded as drugs of misuse. These changes will allow better detection and monitoring of emerging new substances that are causing clinical harm and facilitate more frequent data review and data

provision to other agencies. Consequently, the telephone enquiry data presented here for 2014/15 are not directly comparable to those published previously.

As it is not possible to distinguish TOXBASE accesses related to recreational use from those related to suicidal intent or therapeutic errors, the NPIS will continue to report all TOXBASE accesses relating to drugs of misuse, although for licensed medicines, such as methadone or barbiturates, some accesses will not be related to recreational use.

Enquiry numbers

During 2014/15, the NPIS received 1,722 telephone enquiries relating to 286 different drugs of misuse, including branded products, constituting 3.7% of all NPIS telephone enquiries. These included 1,609 enquiries about the 61 substances reported on for 2013/14, a 3.0% increase on the number last year. The mean age of patients subject to a drug of misuse telephone enquiry was 27 years and 70% were male. Stimulants, including 3,4-methylenedioxymethamphetamine (MDMA or 'ecstasy'), branded products and opioids were the substances most commonly encountered (Figure 6.1). Telephone calls to the NPIS regarding drugs of misuse were most often concerned with exposures to branded products, with 391 calls involving 103 different products (Table 6.1). The most common of these are shown in Table 6.2 with their chemical constituents, according to recent product analysis (while acknowledging that this may change by time and place)³.

Over the year there were 69,537 TOXBASE accesses related to 598 different drugs of misuse, including branded products, representing 4.35% of all TOXBASE accesses. When comparing activity for the 61 substances reported for 2013/14, the 62,387 TOXBASE accesses represented a 6.7% increase in activity over the previous year. As found with the telephone enquiry data, the most commonly accessed TOXBASE entries were for stimulants including MDMA, with information also commonly sought for opioids, cannabis and branded products (see Figure 6.1 and Table 6.1). The most common branded products are detailed in Table 6.2 with their chemical constituents, according to recent product analysis³. As found with telephone enquiries, the majority

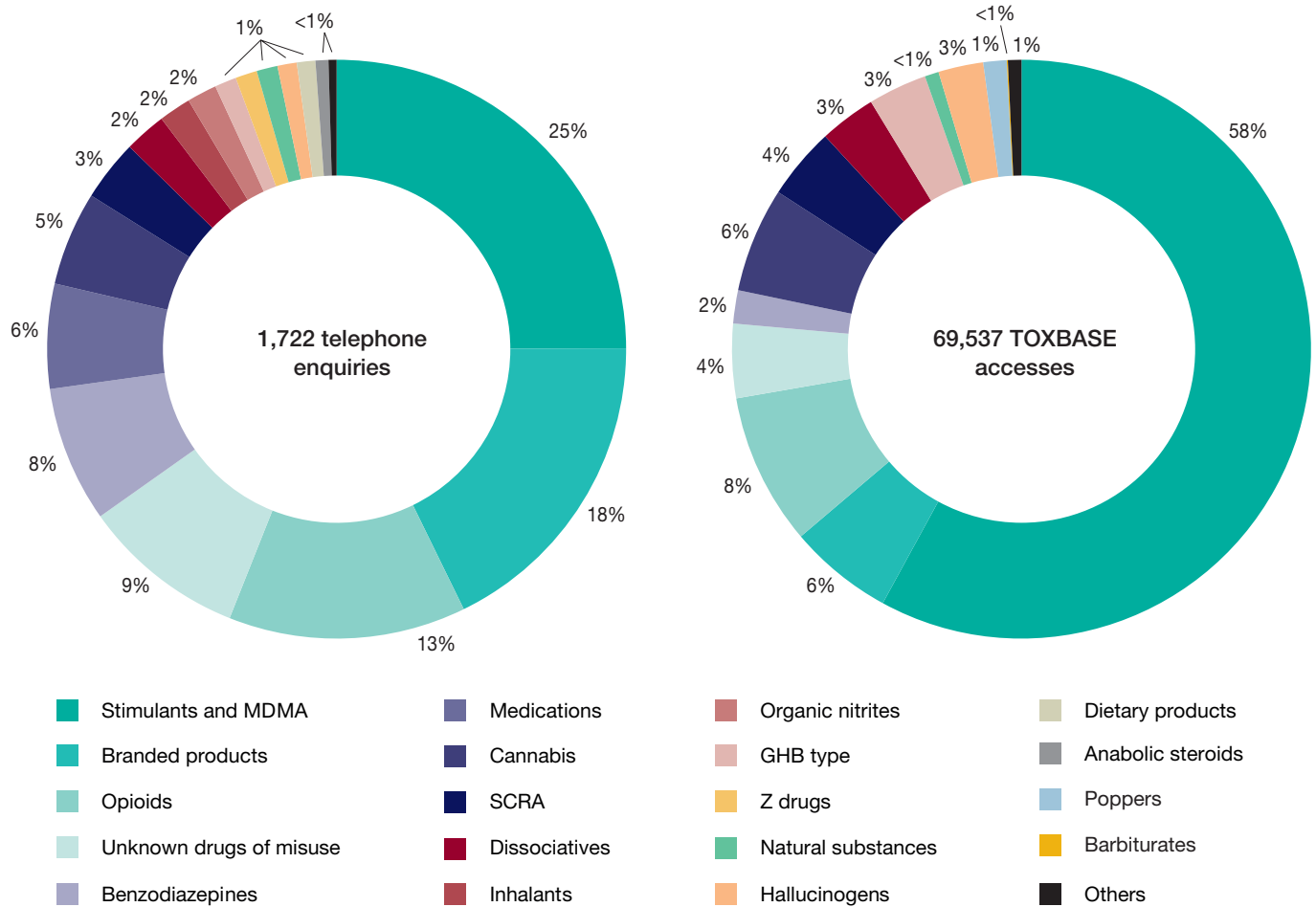


FIGURE 6.1 Drugs of misuse categories involved in telephone enquiries and TOXBASE accesses in 2014/15

of branded product accesses related to products thought to contain synthetic cannabinoid receptor agonists.

Synthetic cannabinoid receptor agonists

Although not analytically confirmed, 380 telephone enquiries were assessed as relating to branded products containing synthetic cannabinoid receptor agonists (SCRA). Enquiries about these rarely referred to specific chemical names, with just two telephone enquiries about 5F-AKB-48 and none about any other specific chemical. There were 74 telephone enquiries where the callers reported SCRA exposure but where the specific chemical involved could not be identified. When enquiries on synthetic cannabinoids and branded products thought to contain these agents were combined, there was a 144% increase in telephone enquiry activity over the previous year.

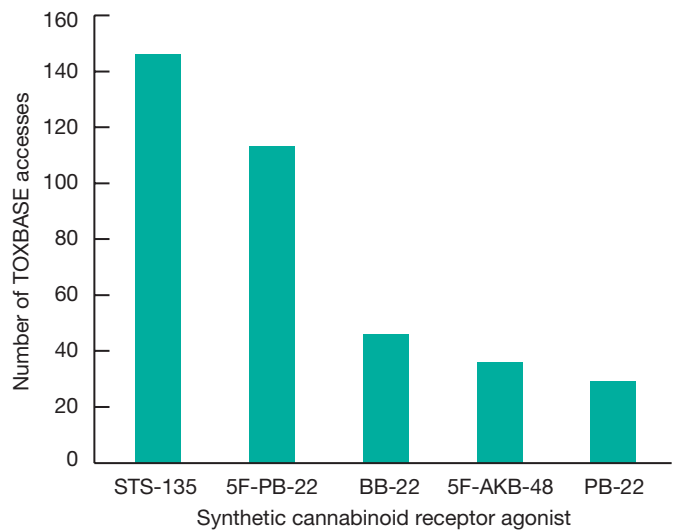


FIGURE 6.2 Most common synthetic cannabinoid receptor agonists accessed on TOXBASE in 2014/15 according to chemical name

TABLE 6.1 Top ten drugs of misuse for telephone enquiries and TOXBASE accesses

Rank	Telephone enquiries			TOXBASE accesses		
	Substance	Number in 2014/15	% change from 2013/14	Substance	Number in 2014/15	% change from 2013/14
1	Branded products*	391	n/a*	MDMA	9,972	70.2
2	Legal high (unknown)	204	21.4	Cocaine	8,564	-3.7
3	Cocaine	164	-16.3	Mephedrone	6,622	-6.2
4	MDMA	122	-21.8	Heroin	5,221	7.4
5	Heroin	118	7.27	Amphetamines	4,813	-6.1
6	Cannabis	117	-13.9	Cannabis	3,707	5.1
7	Amphetamines	86	-19.6	Branded products*	3,699	n/a*
8	Mephedrone	85	30.7	Legal high (unknown)	2,620	10
9	Methadone	76	-8.4	Spice/synthetic cannabinoids*	2,544	7.5
10	Spice/synthetic cannabinoids*	74	-60.2	Methadone	2,615	-6.9

* Spice/synthetic cannabinoid data previously included branded products but these are now reported independently. 380 of the calls about branded products were thought to contain synthetic cannabinoid receptor agonists

TABLE 6.2 Branded products most commonly involved in telephone enquiries and TOXBASE accesses and analytically confirmed contents of products with the same name at the same time by WEDINOS

Products	Telephone enquiries	TOXBASE accesses	Analytically confirmed content (WEDINOS)
Black Mamba	47	450	AM2201, 5F-AKB48, 5F-PB-22
Pandora's Box Herbal Incense	40	356	5F-PB-22, 5F-AKB48
Cherry Bomb	27	n/a	5F-PB-22, 5F-AKB48
Happy Joker	17	n/a	5F-PB-22, 5F-AKB48
Ching	16	n/a	Ethylphenidate
Exodus	16	364	5F-PB-22, 5F-AKB48, ADBICA, AB-CHMINACA
Clockwork Orange	15	285	5F-PB-22, 5F-AKB48, BB-22, JWH-098
China White	14	n/a	Methiopropamine, benzocaine
Exodus Damnation	3	174	5F-PB-22, 5F-AKB48
Sweet leaf herbal blend	3	103	MMB CHMINACA
Burst	2	117	Ethylphenidate

n/a – full year TOXBASE data not available. We acknowledge that the content of branded products may change over time and by place

There were 1,959 TOXBASE accesses to the generic SCRA webpage during 2014/15, as well as accesses to 66 different specific synthetic cannabinoid pages, the most common of which are shown in Figure 6.2. Including branded products, TOXBASE accesses related to synthetic cannabinoids have increased by 151% in the last year.

Unspecified drugs

Telephone enquiries about unspecified drugs, including so-called 'legal highs', were also common, with 204 enquiries in 2014/15, a 21.4% increase compared with last year. TOXBASE accesses for unknown substances, such as 'legal highs' and 'research chemicals' were also increased by 10.0% compared with last year.

Stimulants

The year 2014/15 saw a 70% increase in TOXBASE activity relating to MDMA ('ecstasy'), although conversely telephone enquiries reduced by 22% over the same period. The reasons for these changes are unclear and are not related to changes in methodology of data collection.

Telephone enquiries and TOXBASE accesses for amphetamine were reduced this year (by 20% and 6%, respectively), although activity related to methamphetamine continued to increase, by 17% for telephone calls and 13% for TOXBASE accesses. There has been an increase in telephone enquiries for mephedrone by 31%, although accompanied by a reduction in TOXBASE accesses of 6%. Enquiries relating to cocaine were reduced by 16% and TOXBASE accesses reduced by nearly 4%.

The NPIS has also recently noted activity related to ethylphenidate (19 calls and 568 TOXBASE accesses) and 4,4-DMAR (no telephone enquiries but 26 TOXBASE accesses). Enquiries about paramethoxyamphetamine (PMA) and paramethoxymethamphetamine (PMMA) are of ongoing concern, because of the recent increase in registered fatalities²; together these drugs were involved in four telephone enquiries and 358 TOXBASE accesses during the year.

Opioids

NPIS activity for opioids remains dominated by heroin and methadone. Compared to last year, heroin telephone enquiries and TOXBASE accesses increased by 7.3% and 7.4%, respectively. Methadone telephone enquiries and TOXBASE accesses were slightly reduced, by 8.4% and 6.9%, respectively. Because of their emergence elsewhere in Europe, the NPIS has been monitoring enquiries for novel opioid compounds; there have been 58 TOXBASE accesses and a single telephone enquiry about desomorphine ('Krokodil'), a single TOXBASE access and no telephone enquiries relating to MT-45 and no telephone enquiries or TOXBASE accesses about novel fentanyl.

Benzodiazepines

Advice about toxicity relating to recreational use of benzodiazepines remains an important component of NPIS activity, with 174 telephone enquiries and 1,174 TOXBASE accesses during the reporting year. These included telephone enquiries about the unlicensed substances etizolam (11 calls) and flubromazepam (14) and about diazepam preparations purchased on the internet such as 'MSJ' (7).

Dissociative drugs

There were 16 telephone enquiries and 1,997 TOXBASE accesses related to dissociative drug exposure during 2014/15, with the agents most commonly involved being methoxphenidine for telephone enquiries and ketamine for TOXBASE accesses. The latter, however, represents a 51% reduction for ketamine since last year, from 3,576 to 1,754 accesses.

Severe cases

The NPIS received 145 calls about drug misuse that were classified as severe based on clinical features at the time of enquiry or follow up (where available) according to the poisoning severity score (PSS). The substances most commonly involved were unknown drugs, cocaine and MDMA (Table 6.3). It should be noted that these data include cases with multiple drug exposures and the substance listed may not be the primary cause of severe toxicity. It should be further noted that clinicians

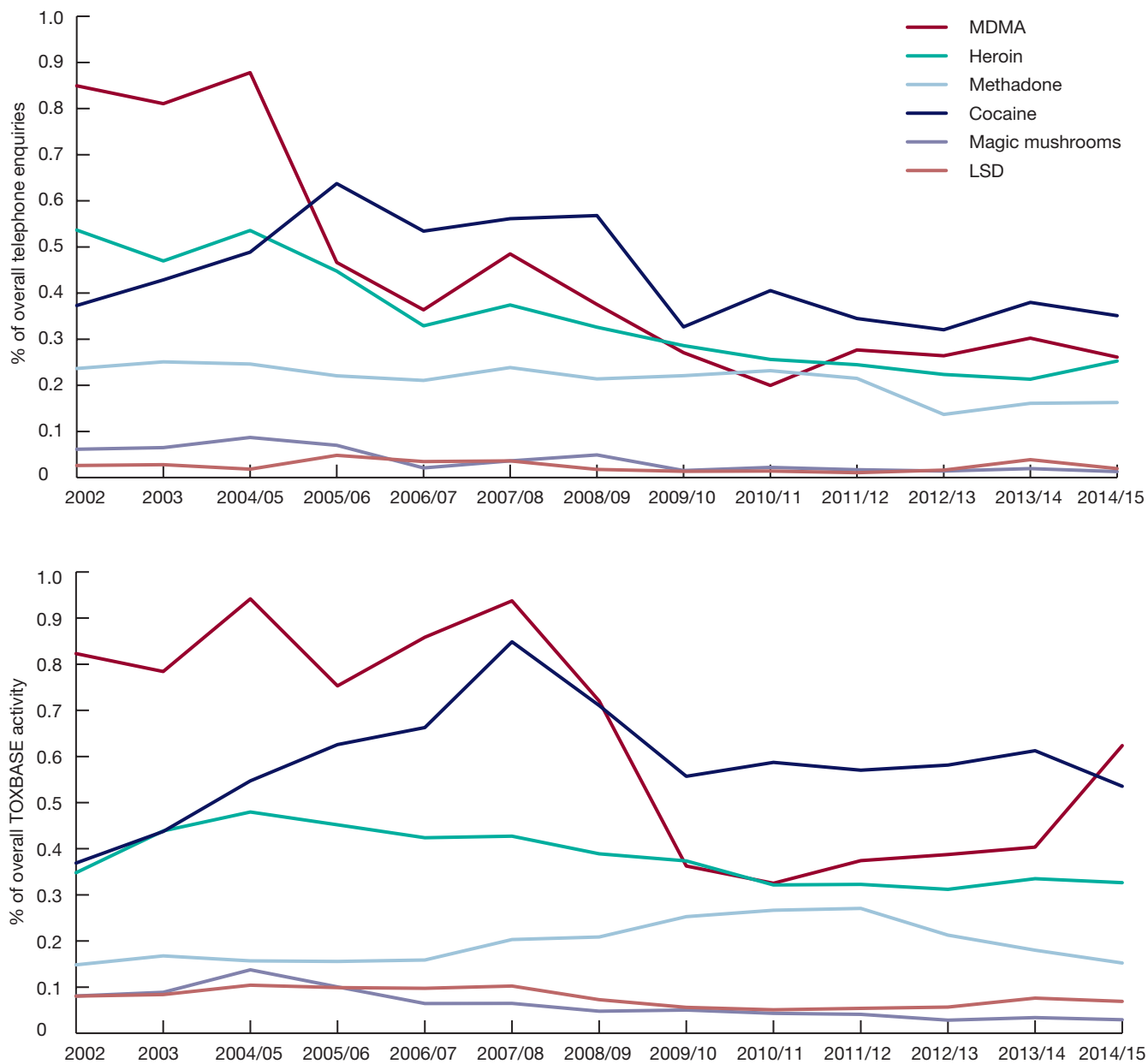


FIGURE 6.3 Proportion of telephone enquiries (above) and TOXBASE accesses (below) relating to selected class A drugs of misuse (data for 2002 and 2003 by calendar year, subsequent data by financial year)

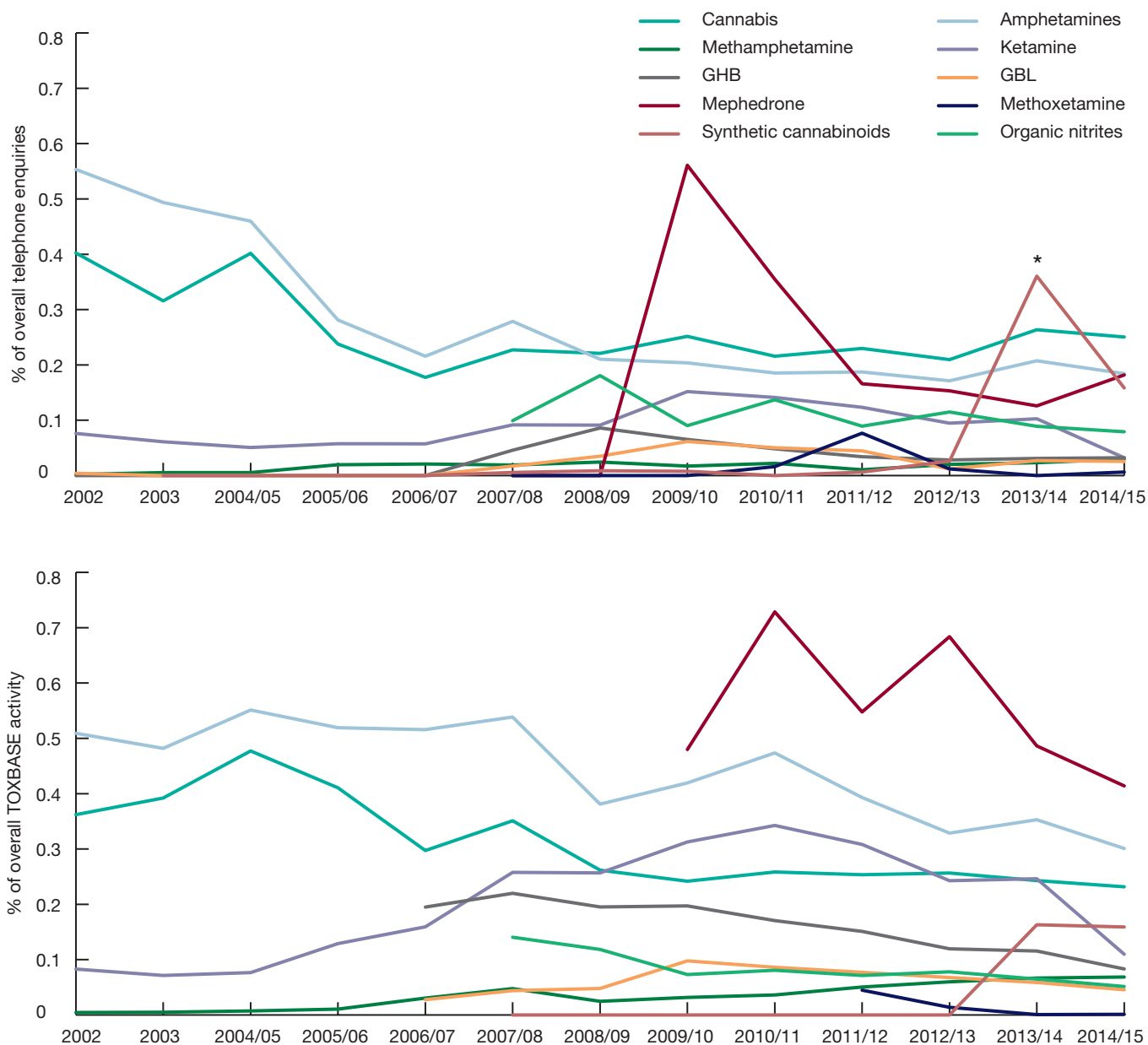


FIGURE 6.4 Proportion of telephone enquiries (above) and TOXBASE accesses (below) relating to selected drugs of misuse other than class A drugs (data for 2002 and 2003 by calendar year, subsequent data by financial year)

* Note: the apparent decline in synthetic cannabinoid telephone activity is related to methodological changes such that branded products are no longer included in the synthetic cannabinoid data

TABLE 6.3 Most common drugs of misuse involved in telephone enquiries when toxicity was classified as 'severe'

Substance	Number of telephone enquiries		Severe as % of total
	Severe	Total	
Cocaine	25	164	15.2
MDMA	17	122	13.9
Cannabis	12	117	10.3
Heroin	10	118	8.5
Methadone	9	76	11.8
Mephedrone	9	85	10.6
Unknown drug	27	204	13.2

are less likely to call the NPIS when dealing with exposures to substances with which they are familiar, such as opioids.

Annual trends

Annual trends in NPIS activity associated with important drugs of misuse are shown in Figures 6.3 and 6.4. Because of increasing awareness and use of TOXBASE and reduced reliance upon telephone advice, the overall NPIS activity has evolved so that there has been an increasing proportion of enquiries through TOXBASE accesses and fewer telephone enquiries. These longer term data are therefore presented as proportions of the total NPIS telephone and TOXBASE activity.

TABLE 6.4 Reports provided relating to drugs of misuse using NPIS data

Subject of report	Provided to	Date
Synthetic cannabinoid receptor agonists	EMCDDA	April 2014
Methoxetamine, AH 7921, 25I NBOMe and MDPV	EMCDDA	April 2014
4,4-DMAR	DEWS	July 2014
Third-generation synthetic cannabinoid receptor agonists	DST	August 2014
MT-45, methaqualone analogues, diphenidine and methoxphenidine	DST	August 2014
Diversion and illicit supply of pregabalin, gabapentin, quetiapine, mirtazapine and memantine, including recreational use	ACMD	November 2014

Data provision

During the year the NPIS has provided statistical data on request to the Home Office Drug Strategy Team (DST), the UK Focal Point on Drugs Early Warning System (DEWS), the Advisory Council on Misuse of Drugs (ACMD) and the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA), as detailed in Table 6.4.

6.2 Carbon Monoxide

The NPIS receives clinical information about potential carbon monoxide (CO) exposures from two main sources.

Firstly, doctors and other healthcare workers telephone the NPIS directly for specific advice on patients under their care whom they consider may have been exposed to CO. During 2014/15 there were 401 telephone enquiries made directly to the NPIS regarding suspected or confirmed CO exposures.

Secondly, if contact details are supplied, an 'urgent alert' email is generated when TOXBASE is accessed for 'special interest' chemicals, which include CO. NPIS staff then telephone the TOXBASE user to obtain patient-specific details. A further 78 enquiries involving individuals potentially exposed to CO resulted from TOXBASE-generated urgent alert emails.

Most enquiries (400 of 479 or 84%) involved suspected CO exposure at home, compared to just 29 (6%) occurring in the workplace, 26 (5%) reported in a public area and 2 (0.4%) exposures in a nursing home. The location of exposure was unclear in 22 (5%) cases. The suspected source of CO in the domestic setting was known in 356 (89%) enquiries (Figure 6.5); faulty boilers or appliances were implicated most often (accounting for 222 out of 356 enquiries).

These 479 enquiries involved at least 682 individuals (in some cases the total number of individuals exposed was not known). The maximum number of individuals exposed in a single incident was eight, and this was due to a faulty domestic boiler.

The poisoning severity score (PSS) was known in 642 of 682 patients: 609 patients had a PSS of 0 or 1

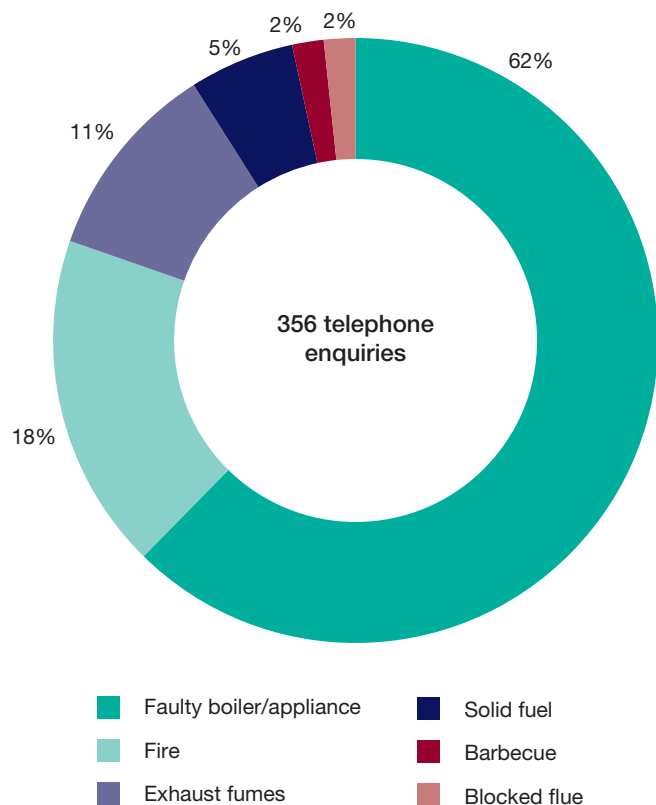


FIGURE 6.5 Sources of carbon monoxide exposure in the domestic setting

(minor toxicity), 21 had PSS 2 (moderate toxicity) and 12 were graded PSS 3 (severe toxicity). Two patients were deceased at the time of the enquiry and two patients with PSS 3 died subsequently. Of the 12 patients with PSS 3, 10 had been exposed to CO during a domestic fire, so thermal injury may have also contributed to their features.

Carboxyhaemoglobin concentrations were known only in 171 of the 682 patients and in 121 the carboxyhaemoglobin concentration was $\geq 3\%$ (suggesting recent exposure to carbon monoxide in a non-smoker). Overall the median (IQR) carboxyhaemoglobin concentration was 6.1 (2.5 to 15.6)%. The median (IQR) carboxyhaemoglobin concentration in each PSS group is shown in Table 6.5.

In conclusion, in 2014/15 at least 682 individuals were potentially exposed to CO. However, a carboxyhaemoglobin concentration measurement was

TABLE 6.5 Median (IQR) carboxyhaemoglobin concentration [COHb%] in each poisoning severity score (PSS) group

PSS	Number of patients	Median (IQR) [COHb%]
0	253	5.0 (2.3 to 10.0)
1	356	6.0 (2.3 to 15.0)
2	21	23.0 (6.2 to 33.0)
3	12	23.0 (18.0 to 38.0)

only available for 25% of potentially exposed individuals (and was $\geq 3\%$ in only 18%), the suspected diagnosis could not be confirmed for the majority of patients at the time of the enquiry. Doctors and other healthcare workers are encouraged to confirm the diagnosis of CO exposure immediately on the patient's presentation.

6.3 Household Products

Liquid laundry detergent capsules

Liquid laundry detergent capsules (also called single-use detergent sacs or laundry pods) have become an increasingly popular household product over the last decade. The capsules are a pouch of concentrated liquid laundry detergent in a water-soluble polyvinyl alcohol membrane that can be placed directly in washing machines. In Europe, these liquid detergents most commonly contain anionic surfactants (20–35% per capsule), non-ionic surfactants (10–20%), propylene glycol (8–20%) and ethanol (2–5%), and have a pH of 7–9.

Since 2001, more than 7 billion capsules have been sold in the UK; currently, more than 1 billion are sold in the UK annually. They are easy to use, providing the exact unit dose of detergent for a wash and are placed directly into the washing machine. These products do not require unwrapping from an outer packet, are generally colourful in appearance and are possibly not perceived to be potentially harmful by parents of small children. These capsules can release their contents prematurely when they come into contact with moisture.

As a result, a substantial number of exposures to laundry liquid detergent capsules, predominantly involving

children under five years of age, have been reported to the NPIS in recent years^{4,5}. Based on NPIS experience of more than 2,500 exposures (96% of which occurred in children), it is apparent that although the majority of patients remain asymptomatic or suffer only minor features – poisoning severity score (PSS) of 1 – a small proportion develop features such as CNS depression, stridor, pulmonary aspiration and/or airway burns following ingestion, and conjunctivitis leading to corneal ulceration from eye exposure^{4,5}.

The potential toxicity of these laundry detergent capsules led European manufacturers to introduce a voluntary 'Product Stewardship Programme' in December 2012, which was coordinated by the International Association for Soaps, Detergents and Maintenance Products (AISE).

This initiative required safety measures to be implemented to reduce the visibility of, and restrict access to, the capsules by small children. Such measures involved: modification of the outer packaging design; obscuring the visibility of the capsules inside; and altering the packets to become more 'child-resistant'⁶. Other measures were aimed at providing information to consumers and improving communication regarding the

safe use and storage of these products through inclusion of safe-use icons/patches on the outer packaging and advertising campaigns.

The NPIS has monitored the impact of this programme, which was implemented in the UK over several months during the first half of 2013. The number of enquiries and exposures reported to the NPIS was compared for the years 2012 and 2014. There was no significant reduction in the absolute number of enquiries (433 vs 412) or exposures (422 vs 404) reported to the NPIS (Figure 6.6). However, taking into account sales volumes, there were 0.35 exposures reported per million units sold in 2014, significantly fewer than the number of exposures reported per million units sold (0.47 per million) in 2012 ($p = 0.0044$).

In accordance with European regulations on classification, labelling and packaging of substances and mixtures, manufacturers introduced further preventive measures in 2015. These include making the capsule horrible to taste (encouraging children to spit them out), strengthening the capsule to better resist water and high pressures, and the addition of written warnings on the actual capsule itself (Figure 6.7).

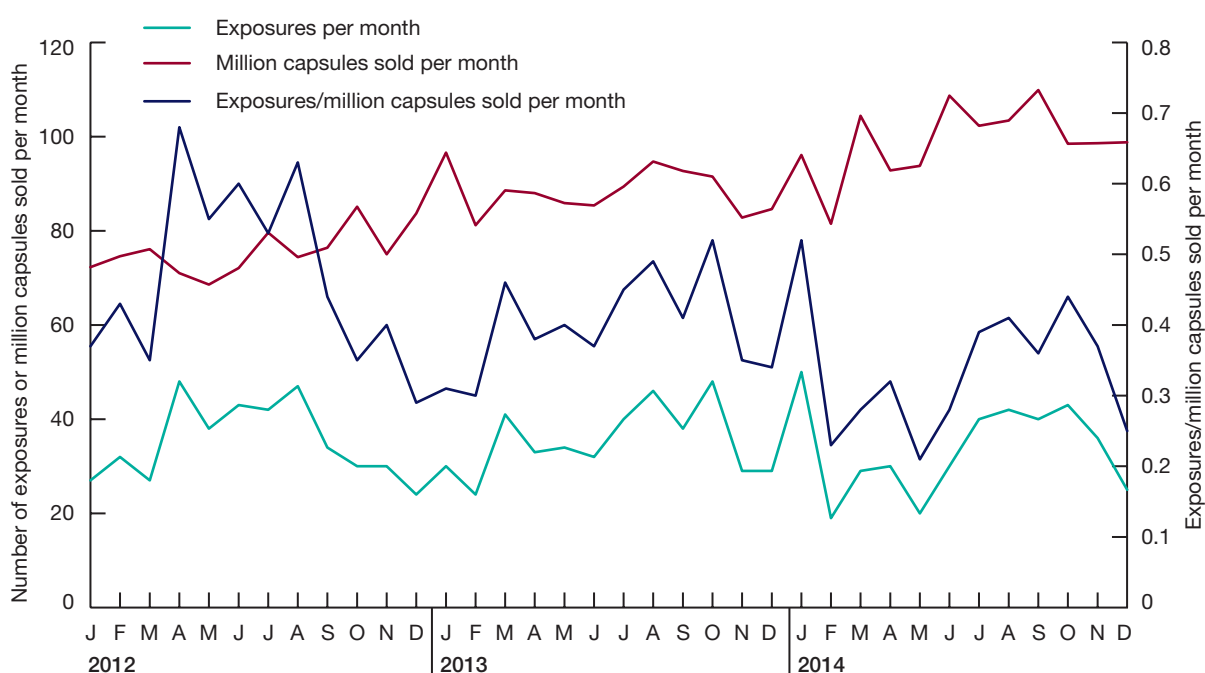


FIGURE 6.6 Liquid laundry detergent capsules exposures reported to the NPIS and UK sales data reported to AISE from 2012 to 2014

The NPIS will continue to monitor exposures to these very popular household products.



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FIGURE 6.7 New labelling on a soluble film liquid laundry detergent capsule

Soluble film automatic dishwashing tablets

The use of water-soluble films is not restricted to liquid laundry products as it has been extended to other household applications such as automatic dishwashing tablets and floor cleaning capsules.

'Traditional' tablets used in automatic dishwashing machines were contained within an external wrapper which required removal prior to loading the enclosed tablet into the machine (Figure 6.8). Soluble film dishwashing tablets have been available in the UK since 2005, and in recent years their popularity and use has increased. These types of products have a diverse appearance; some consist only of a powder, while others can also contain a liquid and/or a gel component. Similarly, their composition can vary greatly from one manufacturer to another, but most commonly they contain a source of hydrogen peroxide (sodium percarbonate), sodium tripolyphosphate, non-ionic surfactants and enzymes.



FIGURE 6.8 Traditional (left) and soluble film (right) automatic dishwashing tablets

The NPIS has analysed retrospectively enquiries relating to soluble film dishwashing tablets from January 2008 to December 2014. There were 385 enquiries relating to 382 patients over the study period. The majority of exposures involved children under five years old (355 of 382 or 92.9%), five were children of unknown age, four were between the ages of 8 and 16 years, and 18 cases involved adult patients. Ingestion alone accounted for 96.3% of all exposures and there were five cases where ingestion and skin contact occurred concurrently (1.3%). There were also seven patients exposed by eye contact and two patients by skin contact.

The poisoning severity score (PSS) was known in 376 of the 382 exposures. The majority of patients (66.5%) had not developed symptoms by the time the enquiry was made to the NPIS. In 125 exposures (33.2%) the symptoms were graded as minor and only in one case as moderate toxicity. No patient developed severe features of toxicity.

Vomiting was reported most commonly following ingestion and occurred in around a quarter of cases (99). Nausea (7) and coughing (6) were also present and three patients developed a rash; other minor features occurred in only one or two patients. There were seven cases of eye contact, of which six of the patients were adults. Two patients remained asymptomatic, while the others developed conjunctivitis (2), abnormal vision (2) or eye pain (1). One of the two skin exposure cases developed minor irritation in the mouth where the tablet was thought to have made contact with the oral mucosa without being ingested.

6.4 Reed Diffusers

Reed diffusers are popular household air fresheners and comprise vessels or jars made of glass, containing fragrance liquid and 'wicking' reeds, which act to diffuse the scent of the liquid. In addition to essential oils, the liquid commonly contains glycol ethers (propylene glycol monobutyl ether, dipropylene glycol monomethyl ether, dipropylene glycol n-butyl ether and dipropylene glycol methyl ether acetate); other ingredients and/or alternatives are 3-methoxy-3-methyl-1-butanol, petroleum distillates, ethanol and isopropanol.

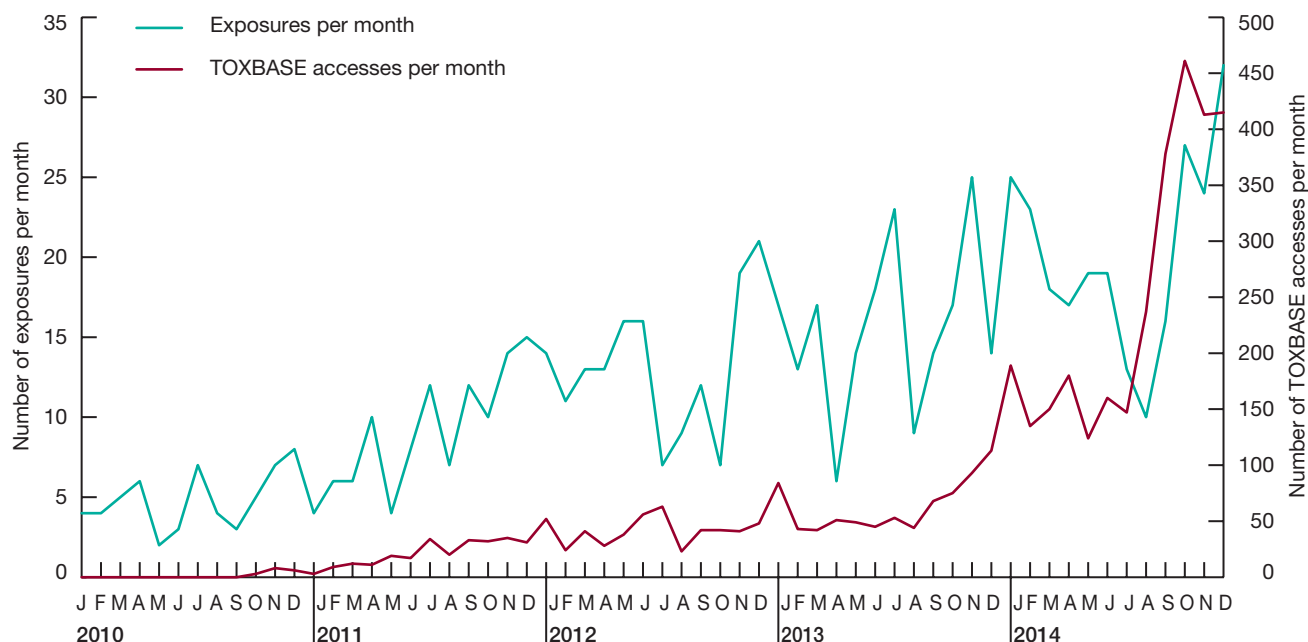


FIGURE 6.9 Monthly TOXBASE accesses on reed diffusers and exposures reported to the NPIS from 2010 to 2014

In 2014 the NPIS received 257 telephone enquiries relating to 243 patients. This was an increase on the number of enquiries and exposures reported in previous years. The increase in the number of enquiries during the winter months may be due to an increase in sales of reed diffusers with seasonal fragrances. In addition, there has also been a substantial increase in TOXBASE accesses over recent years (Figure 6.9).

As reported previously for the period 2010 to 2013⁷, ingestion alone (94.7%) was again the main route of exposure in 2014 and the majority of patients were children under five years of age (95.0%). Nearly a third of all enquiries involved exposure to a reed diffuser containing propylene glycol monobutyl ether, petroleum distillates, essential oils and fragrances.

The poisoning severity score (PSS) was known in 241 of 243 patients. No features (PSS 0) were present in 194 (80.0%) patients and in 45 (18.5%) the features present were minor (PSS 1). Two patients were graded PSS 2 (moderate features) and their features included vomiting, drowsiness, ataxia and seizures. The data for ingestion are similar to those reported for earlier years (Table 6.6).

TABLE 6.6 Poisoning severity score (PSS) following exposure to reed diffusers by ingestion

PSS	2010–2013 Number of patients (%)	2014 Number of patients (%)
0	385 (80.9)	187 (81.3)
1	80 (16.8)	39 (17.0)
2	9 (1.9)	2 (0.9)
3	0 (0.0)	0 (0.0)
Unknown	2 (0.4)	2 (0.9)
Total	476	230

Experimentally, dipropylene glycol monomethyl ether causes CNS, respiratory and cardiac toxicity and dipropylene glycol n-butyl ether produces CNS toxicity. The oral LD₅₀ of propylene glycol monobutyl ether has been reported to be 4.0 mL/kg and a single application to the eye can cause transient corneal opacity. In the case of dipropylene glycol methyl ether acetate, animals died when administered 10 mL/kg.

Exposure to 3-methoxy-3-methyl-1-butanol has caused CNS toxicity and oesophageal injury in children. Ingestion of petroleum distillates may cause vomiting, diarrhoea and abdominal pain; aspiration may result in chemical

pneumonitis. The ingestion of ethanol and/or isopropanol can also induce CNS depression. The features of essential oil ingestion include dysaesthesia inside the mouth, nausea, vomiting, tachycardia, drowsiness and, in severe cases, convulsions and coma. Hence the chemicals present in reed diffusers are potentially very toxic, especially as they are often present in high concentrations. For example, essential oils are present in concentrations up to 30% w/w, dipropylene glycol monomethyl ether is present up to a concentration of 90% w/w, propylene glycol monobutyl ether up to 60% w/w and the ethanol concentration is higher than 50% w/w in some formulations.

Despite the presence of chemicals known to cause CNS, respiratory, cardiac and ophthalmic toxicity, no exposures in 2014 (as in 2010–2013⁷) resulted in severe symptoms (PSS 3). Thus, we believe that the reason that the majority of children remain asymptomatic after reed diffuser exposure is because they do not ingest, or expose their eyes and skin to, sufficient quantities to elicit symptoms.

6.5 2,4-dinitrophenol

Last year NPIS reported a steep rise in telephone enquiries and TOXBASE user sessions relating to 2,4-dinitrophenol (DNP), a synthetic industrial chemical. Although not licensed as a medicine, some websites promote DNP as a supplement for weight loss and 'fat burning'. These increases in enquiry numbers, which occurred in spite of warnings made by the Food Standards Agency in November 2012 (FSA), were of concern because of the severe toxicity that DNP can cause, especially with higher doses.

DNP acts by uncoupling oxidative phosphorylation, causing energy to be released as heat and this can cause damage to cells. Features of toxicity include high fever, gastrointestinal disturbances, chest and abdominal pain, headache confusion and convulsions, progressing to multi-organ failure. There is no specific antidote and deaths may occur in spite of optimal medical care. Five of the cases previously reported to the NPIS resulted in fatality, with four of these occurring after acute overdose.

In response to the increasing numbers of cases of toxicity reported by the NPIS, the FSA issued further warnings

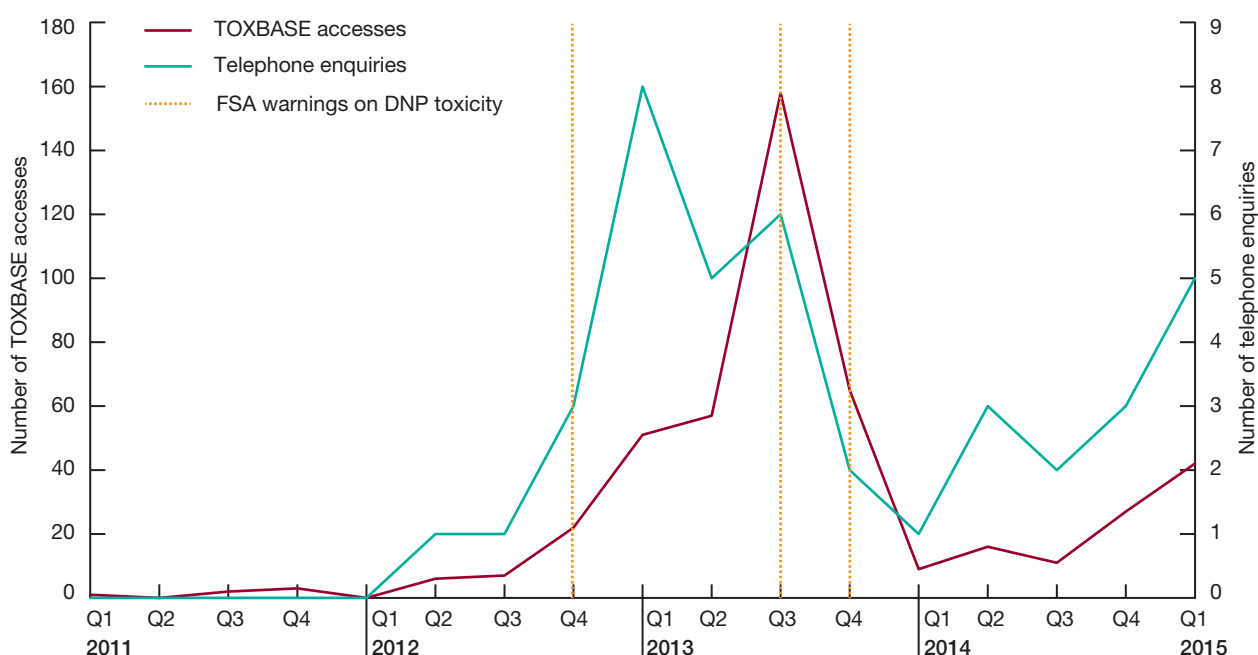


FIGURE 6.10 Quarterly numbers of telephone enquiries and TOXBASE accesses on 2,4-dinitrophenol, from January 2011 to March 2015

about DNP in August and October 2013 and worked with the police and local authorities to restrict the illegal sale of the chemical, focusing on internet sales. Educational work was also carried out, targeting places where DNP might be sold, such as gyms. The chief medical officers wrote to general practitioners and accident and emergency departments to brief them about DNP and its hazards in August 2013.

Following these actions, only one case of DNP toxicity was reported to the NPIS in the first quarter of 2014, but a recommendation was made in last year's annual report that the NPIS should continue to monitor and report on enquiries relating to DNP.

During the 2014/15 reporting year there were 13 further cases of DNP toxicity referred to the NPIS in telephone enquiries. One of these is known to have died. Over the same period there were 96 TOXBASE accesses. Although quarterly rates of cases reported in telephone enquiries and TOXBASE accesses fell substantially in late 2013 and early 2014, there have subsequently been increases in telephone and TOXBASE activity relating to DNP (Figure 6.10).

Since July 2012, the NPIS has included DNP among the substances subject to an early alerting procedure. This means that an email is generated to the duty NPIS scientists should a healthcare professional access the TOXBASE entry for DNP and indicate that this is for management of a specific patient. The NPIS scientist would then attempt to contact the healthcare professional to obtain further information and provide management support. The record of this would be included in the NPIS telephone enquiry statistics, which could potentially increase the numbers. However, of 51 cases reported since July 2012, only 12 were prompted by early alerting.

The NPIS data suggest that there was a reduction in cases of DNP toxicity presenting to healthcare professionals following actions taken in late 2013. This effect, however, has not been sustained. Ongoing actions are needed by responsible agencies to reduce the occurrence of DNP poisoning and the NPIS will continue to monitor the situation and provide data as needed.

6.6 Pesticides

Currently, 1,800 TOXBASE entries for pesticides and biocides are being tracked as part of an ongoing surveillance study that started in 2004 and is funded by the Department for Environment, Food and Rural Affairs. This number tracked is reduced from 2,100 in the year 2013/14 owing to the removal of 300 products from TOXBASE that had been discontinued for more than four years.

Incident information is obtained in two ways:

- TOXBASE enquiries followed up by an online or postal questionnaire
- data collected from the NPIS telephone enquiry service

Enquiry numbers

During the year, there were 3,498 accesses to TOXBASE about pesticides of interest. From TOXBASE sessions, 10 electronic and 368 follow-up post or email questionnaires were returned. Information on a further 727 potential incidents was available from the NPIS telephone enquiry service. Cases involving animals or head lice treatment products, enquiry sessions from locations in the Republic of Ireland, identifiable duplicate sessions involving the same patient, and sessions that were later reported not to have involved a pesticide, were excluded from the analysis.

Overall, information was gathered on 1,105 potential exposures involving pesticides during 2014/15. There were 17 exposures that involved multiple patients, producing a further 26 potential exposures.

Of the 1,131 potential exposures available for analysis, there were 17 cases where symptoms were not thought on the balance of probabilities by the respondent or by NPIS Edinburgh to be related to the pesticide exposure because of, for example, a pre-existing illness or reasonable grounds to link symptoms to a concomitant infection.

These cases have been excluded, leaving a total of 1,114 exposures for further analysis. The results displayed below include both unintentional acute

(977 cases or 87.7%) or chronic (38 or 3.4%) exposures and deliberate self-harm exposures (DSH) (63 or 5.7%). The circumstances of exposure in 36 (3.2%) cases were unknown.

Severity of exposure

Most exposures were graded as poisoning severity score 0 (PSS 0) (616 cases or 55.3%) or PSS 1 (413 or 37.1%) by the NPIS. Smaller proportions were graded moderate (PSS 2: 33 or 3.0%), severe (PSS 3: 10 or 0.9%) and uncertain (39 or 3.5%). Three fatalities were reported as a result of a pesticide exposure in this period. Deaths followed intentional ingestion of paraquat, diquat and dichlorvos.

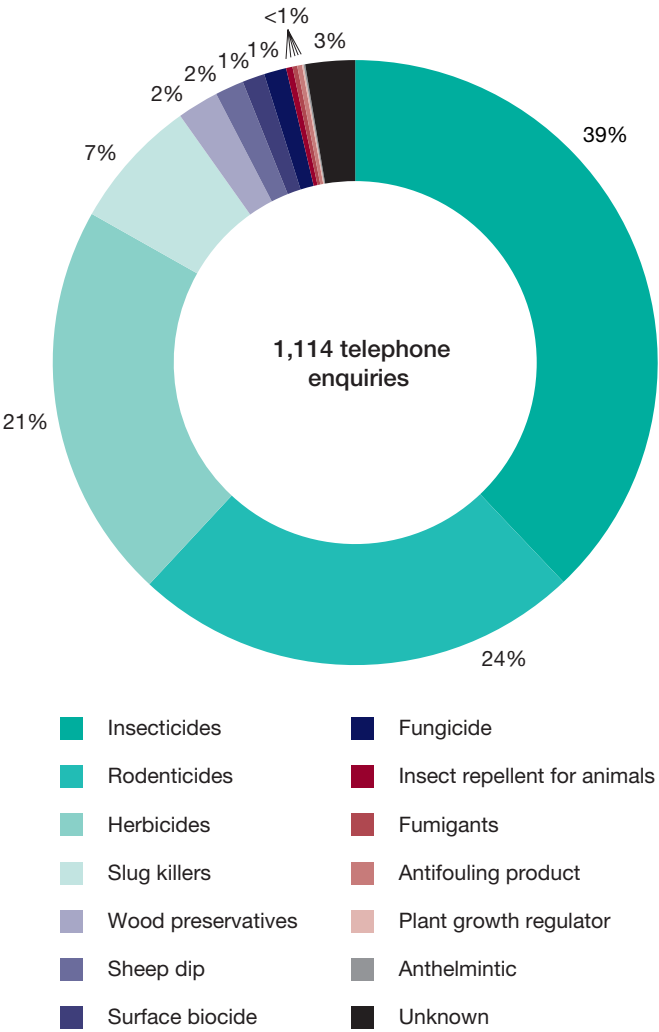


FIGURE 6.11 Pesticide exposures by class of product (as reported by respondent) in 2014/15

Agents of interest

The agents most commonly involved in exposures are shown in Table 6.7. In addition, there were 121 cases involving unknown rodenticides, 40 cases of unknown herbicides, 25 of unknown ant killers, 21 of unknown insecticides, 4 of unknown wood preservatives and 27 of unknown pesticides.

In 2014/15, patients potentially exposed to pesticide products comprised 547 adults (13 years or older) (49.1%) and 546 children (12 years or younger) (49.0%), with 21 of unknown age (1.9%). There were 587 (52.7%) male patients and 498 (44.7%) female patients, and 29 cases where the gender was not specified.

TABLE 6.7 Pesticides most frequently reported by respondents in suspected exposures during 2014/15 compared with 2013/14, ordered by rank in 2014/15

Ingredient	Number in 2013/14	Number in 2014/15
Glyphosate	106	113
Permethrin	114	107
Metaldehyde	68	79
Bromadiolone	65	67
Difenacoum	63	47
Bendiocarb	65	44
Tetramethrin	29	35
Diquat	31	34
Fipronil	22	27
Imidacloprid	26	23
Cypermethrin	26	22
Deltamethrin	23	20
Organophosphate (unspecified)	2	18
Moxidectin	22	18
Mecoprop-p	9	18
2,4-D	14	16
Ferrous sulphate	9	15
MCPA	15	15
Chlorpyrifos	3	14

The classes of product most commonly involved in exposures are shown in Figure 6.11. More than one type of product was involved in some incidents.

Exposures during pregnancy

There were 13 enquiries involving pregnant patients reported in 2014/15. All 13 exposures were unintentional and acute. None was severe. Five exposures were ranked as having poisoning severity score 1 (PSS 1, minor) and followed exposure to Ficom W (bendiocarb); imidacloprid; moxidectin; Raid Ant Powder (permethrin); Rentokil Fly, Wasp Killer (permethrin and tetramethrin) and an unidentified pesticide. Seven exposures were ranked PSS 0 (not at all poisoned), while in one case the severity was ranked as uncertain.

6.7 Electronic Cigarettes

The use of electronic nicotine delivery systems, including electronic cigarettes (or e-cigarettes), continues to increase within the UK and elsewhere. Electronic nicotine delivery systems, including e-cigarettes, deliver a vapour which is then inhaled. This is generally achieved by heating a liquid containing various concentrations of nicotine, with the inhaled vapour typically containing nicotine, propylene glycol and flavourings.

The contents of e-cigarettes and their liquid refills vary, but many contain substantial concentrations of nicotine, a highly toxic compound. Refill solutions contain larger quantities of fluid than individual e-cigarettes, sometimes substantially larger, and are potentially a greater acute hazard due to the larger volume that may be ingested, either accidentally or deliberately. Solutions that require dilution before use are also available and these contain greater concentrations than those typically found in e-cigarettes themselves.

The NPIS received 241 telephone enquiries concerning e-cigarettes and their refill solutions this year (Figure 6.12). This is more than the 204 received during the previous year, which in turn was greater than the total number of enquiries about these products received over the previous six years. Forty per cent of the enquiries originated in hospitals (Figure 6.13). Children aged under

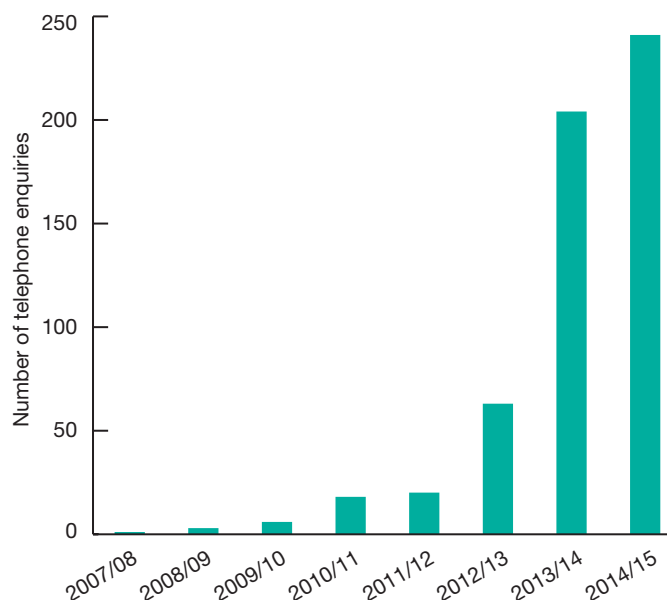


FIGURE 6.12 Telephone enquiries on e-cigarettes from 2007/08 to 2014/15

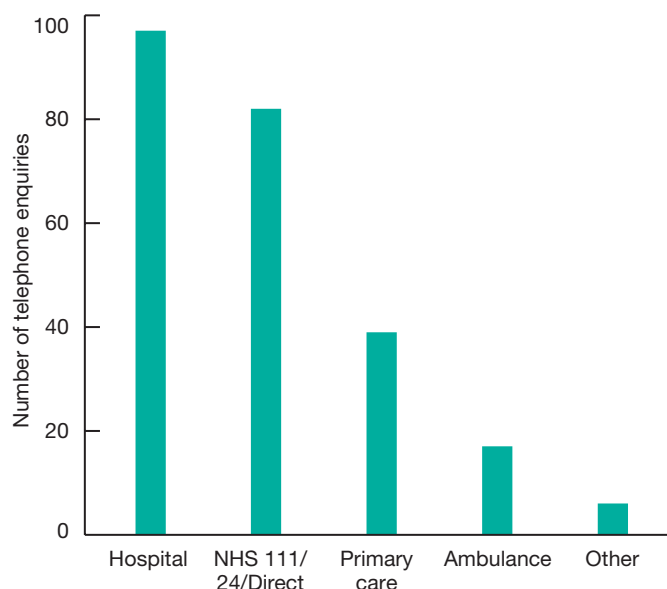


FIGURE 6.13 Telephone enquiries on e-cigarettes in 2014/15 by source

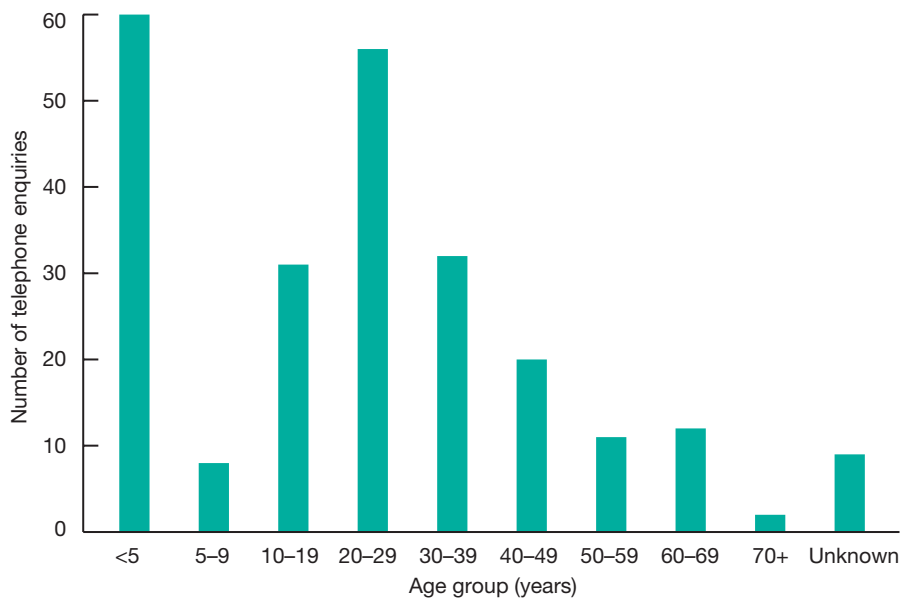


FIGURE 6.14 Age of patients involved in telephone enquiries on e-cigarettes in 2014/15

five years were involved in one-quarter of the enquiries (Figure 6.14). The majority of exposures (206 of 241) were accidental. Fourteen enquiries concerned intentional overdoses and the remainder of enquiries included adverse reactions to intended use, recreational abuse and ‘therapeutic errors’. Where the individual route of exposure was specified, ingestion was the most common, although multiple routes of exposure also occurred. In several cases ingestion of liquid occurred after attempting to inhale vapour from the e-cigarette. Nine of the fifteen enquiries involving the eye occurred when the liquid was mistaken for eye drops (Figure 6.15).

Where the clinical features were known at the time of the enquiry, 133 patients had no features of toxicity and 97 had features of only minor toxicity. Seven patients had moderate toxicity, and one exposure was associated with severe features. Features of toxicity included conjunctivitis, irritation of the oral cavity, anxiety, nausea, vomiting, dizziness and changes in heart rate.

It is of concern that so many of the exposures were accidental and occurred in young children. Similarly, over half the eye exposures occurred when e-cigarette products were mistaken for eye drops. The liquid in e-cigarettes and their refills contains toxic doses of nicotine and even small volumes can cause serious harm

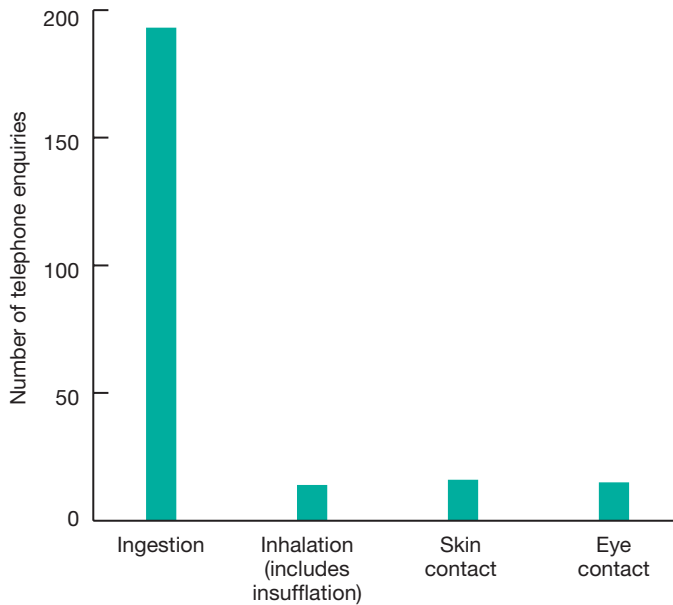


FIGURE 6.15 Telephone enquiries on e-cigarettes in 2014/15 by route of exposure

to a small child. Urgent consideration needs to be given to the safe storage and packaging of these products. To address some of these concerns, packaging and labelling regulations are currently being developed under the European Tobacco Products Directive for implementation in 2016.

6.8 NPIS in the Media

Over the past 12 months the NPIS has seldom been away from the headlines – and on a wide variety of topics. In early summer 2014 an NPIS authored paper, which appeared in the *Emergency Medicine Journal* on the diet drug DNP, was widely reported on by media. Within weeks writers at the popular ITV drama *Midsomer Murders* contacted the service for advice on a poisoning storyline they intended to use in a particularly grisly episode and in July the NPIS collaborated with the Forestry Commission to put snake attacks in context, after a woodland walker was bitten by an adder.

In September the BBC talked to the NPIS about the dangers of so-called ‘legal highs’ for a piece broadcast before students returned to university later that month. There were also media enquiries to the service in September about poisonings related to e-cigarettes. At the end of the month the NPIS issued its always popular mushroom picking warning press release. Once again the story was widely covered, in both print and broadcast media, and led to national stories in the *Guardian* and *Telegraph*, a particularly in-depth piece on BBC Scotland as well as a section within consumer show *Rip-Off Britain*.

The annual report was published in October and flagged with a press release which was again widely reported on in print media, which this time focused on reports of enquiries to the service linked to use of so-called ‘legal highs’.

In February PHE staff wrote to key staff at the big supermarkets asking them to consider moving daffodils away from edible foodstuffs, to avoid confusion among non-English shoppers. The letter quoted NPIS data and when word reached media the story went global. As well as extensive reporting in all the biggest UK media, it was reported in China, Canada, New Zealand and a number of Gulf States.

6.9 Education and Training for NPIS Users

Emergency medicine training

Since 2010 the NPIS and the Royal College of Emergency Medicine (RCEM) have provided joint CPD days providing a comprehensive update on the presentation and management of poisoned patients for consultants and trainees in emergency medicine. In 2014/15 there were sessions in London and Newcastle. These were attended by over 150 physicians and received excellent feedback – further sessions are planned for 2015/16.

TOXlearning – a clinical toxicology e-learning resource

A clinical toxicology e-learning resource was first developed by NPIS Edinburgh in 2005. It has been available to NHS healthcare workers across the UK in its current form (Figure 6.16) since December 2013 at www.toxlearning.co.uk.

The resource was initially designed to train new NHS 24 centre staff in Scotland, but has been developed over time to deliver a series of modules designed to improve knowledge of the clinical management of poisoned patients for doctors, nurses and pharmacists in hospitals and general practice, ambulance personnel, staff of NHS 111, NHS 24 and NHS Direct, and other healthcare professionals. TOXBASE users of all types and grades are advised to complete the ‘Using TOXBASE’ module (see Box 6.1).

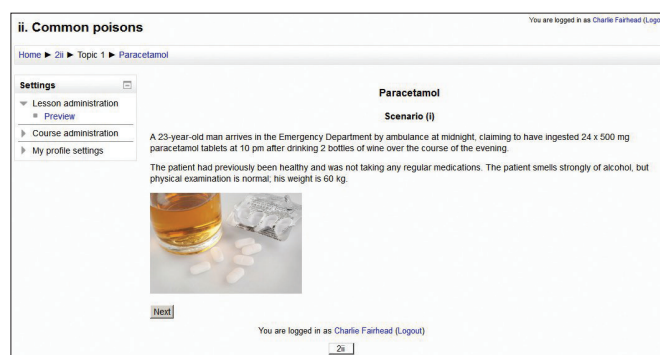


FIGURE 6.16 Common poisons screenshot from toxlearning.co.uk

BOX 6.1 Module details**Module 1 – Using TOXBASE**

This module, which represents 75 minutes of learning, is designed to assist new and existing TOXBASE users to use the database more effectively

Module 2 – Clinical management of the poisoned patient

This module, which represents 180 minutes of learning, includes units on:

- general aspects of poisoning
- problematic poisons
- common poisons
- drugs of misuse

Module 3 – Management of patients involved in chemical incidents

This module, which represents 210 minutes of learning, includes units on:

- decontamination and incident management
- factory and motor vehicle accidents
- leaks and contamination
- riots and potential deliberate release

The number of registered users has risen from 523 at 31 March 2014 to 1,997, an increase of 282%; 92% of users come from the UK. The top user types are ambulance paramedical staff (29%), nurses (26%), doctors (18%) and medical/nursing students (11%). The top workplaces are NHS 111, NHS 24 and NHS Direct (22%), ambulance services (21%), and hospital emergency departments (12%). The resource is used by between 40 and 60 users per week.

Registration and access are free; users can work through courses at their own pace, save their work, obtain their scores and print off their results for continuing professional development files.

NHS 111 training activities

During 2014/15, the NPIS answered 47,863 enquiries, of which 15,941 originated from NHS 111, NHS 24 and NHS Direct sites (NHS 111 = 14,904 or 31.9%; NHS 24

and NHS Direct = 1,037 or 2.2%), accounting for 34.1% of all NPIS enquiries. Due to this high demand, TOXBASE is constantly reviewed and revised with NHS 111 users in mind. However, audit of NHS 111 enquiries shows that telephone enquiries are still increasing in number.

In February 2015, senior NPIS staff, together with its commissioner, attended a scoping day with 18 NHS 111 providers and their senior managers/trainers to gain a better understanding as to why these measures were not having a bigger impact. The consensus was that NHS 111 did not provide any formal training in the answering of poisons-related enquiries or any training in the use of TOXBASE. Clinicians were therefore unable to access the information or interpret it in a safe manner. In the coming year further discussions will take place with the aim of ensuring NHS 111 staff receive comprehensive training in the use of TOXBASE and interpretation of its information.

6.10 References

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7 Conclusions

The NPIS has continued to provide high quality poisons information to healthcare professionals on a 24 hours a day basis, with excellent user feedback. The increasing trend for healthcare professionals to seek information from TOXBASE rather than by telephone has continued, although the service continues to handle almost a thousand telephone enquiries a week. These often relate to more complex cases when specific patient-related advice is needed.

The UKTIS has seen increasing use of its information resources during the year, especially its new *bumps* website and the information this contains about drug and chemicals exposures during pregnancy, written for, and openly accessible to, the general public.

Surveillance work had demonstrated the value of NPIS and UKTIS data for monitoring issues of public health importance, such as episodes of toxicity related to newer drugs of misuse, household products, 2,4-dinitrophenol, electronic cigarettes and pesticides.

It remains essential that the NPIS and UKTIS are resourced adequately so they can safely provide these frontline clinical services. Advice provided by the NPIS encourages evidence-based management of poisoned patients and identifies the many patients where risk is low and where hospital referral or admission can be avoided.

8 Recommendations

Outcome of Recommendations for 2014/15

- 1 To review staffing and structure of the service in the light of reductions in available funding

Outcome: Completed. The NPIS supported a review of staffing that was completed by Public Health England in October 2014

- 2 To launch the new module on the UKTIS public facing website that allows women to provide pregnancy outcome information after exposure

Outcome: Completed. This module went live in March 2015

- 3 To monitor and report on enquiries relating to 2,4-dinitrophenol (DNP) and the impact of recent actions by Public Health England and the Food Standards Agency

Outcome: Completed. Further data are provided in this annual report, but continued monitoring is needed in view of the recent increase in clinical cases referred to the NPIS

- 4 To develop a procedure for dealing with enquiries from distressed members of the public, in conjunction with other support organisations

Outcome: Completed. An operational policy was finalised and made available to NPIS staff in December 2014 for handling telephone calls received from distressed members of the public during out-of-hours cover arrangements for the Republic of Ireland

- 5 To explore the recoding of drugs of misuse on UKPID to allow more rapid and complete production of data and more comprehensive toxicosurveillance of the harms encountered by NHS staff managing patients reporting exposure to these substances

Outcome: Completed. A new coding structure has been agreed and is being implemented

- 6 To continue to highlight the importance of safe use and storage of consumer products, especially e-cigarettes and reed diffusers

Outcome: Further data are provided in this annual report, but continued monitoring is needed in view of the recent increase in clinical cases referred to the NPIS

Recommendations for 2015/16

- 1 To review the consultant support required by the NPIS to maintain a safe and effective clinical service

- 2 To relaunch the TOXBASE app as a free service for NHS and PHE staff, allowing rapid and convenient access to information about poisoning

- 3 To launch and evaluate the UKTIS online reporting tool for pregnant women now available on the *bumps* website

- 4 To continue to monitor clinical enquiries related to DNP and e-cigarette refills and to support the responsible government agencies in planning the actions they need to take

APPENDIX A

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Deputy Director, NPIS Cardiff; Consultant Physician, Clinical Pharmacologist, Toxicologist and Honorary Clinical Senior Lecturer, Cardiff and Vale University Health Board and Department of Pharmacology, Therapeutics and Toxicology, Institute of Molecular and Experimental Medicine, School of Medicine, Cardiff University

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Professor of Clinical Pharmacology and Head of Department of Pharmacology, Therapeutics and Toxicology, Institute of Molecular and Experimental Medicine, School of Medicine, Cardiff University

Dr A Thomas MBChB MRCP

Senior Lecturer in Clinical Pharmacology and Honorary Consultant Physician, Department of Pharmacology, Therapeutics and Toxicology, Institute of Molecular and Experimental Medicine, School of Medicine, Cardiff University

Dr J P Thompson BMedSci MBChB FRCP FBTS FEAPCCT

Director, NPIS Cardiff; Senior Lecturer in Clinical Pharmacology, Department of Pharmacology, Therapeutics and Toxicology, Institute of Molecular and Experimental Medicine, School of Medicine, Cardiff University

NPIS Edinburgh

Dr J W Dear PhD FRCPE

NHS Research Scotland Career Research Fellow and Consultant in Acute Medicine and Clinical Toxicology, Royal Infirmary of Edinburgh

Professor M Eddleston ScD FRCPE FEAPCCT

Director, NPIS Edinburgh; Professor of Clinical Toxicology and Lister Prize Fellow, University of Edinburgh; Consultant Clinical Toxicologist, Royal Infirmary of Edinburgh

Dr G Jackson BSc DipMedTox PhD

Information Services Manager, NPIS Edinburgh

Dr E A Sandilands MD FRCPE PGCertMedEd

Consultant Physician and Clinical Toxicologist, Royal Infirmary of Edinburgh; Honorary Senior Clinical Lecturer, University of Edinburgh

Dr A Veiraiah MB BS MRCP

Consultant in Acute Medicine and Toxicology, Royal Infirmary of Edinburgh

NPIS Newcastle (including UKTIS)

Mrs S Bradley BSc MSc MSc

Information Services Manager, NPIS Newcastle

Dr S L Hill BSc MBBS MRCP

Consultant Physician and Clinical Toxicologist, Newcastle upon Tyne Hospitals NHS Foundation Trust; Honorary Senior Clinical Lecturer, Institute of Cellular Medicine, Newcastle University

Dr S Stephens BSc PhD

Assistant Head of Teratology, UK Teratology Information Service, Newcastle upon Tyne Hospitals NHS Foundation Trust; Honorary Associate Fellow, Institute of Cellular Medicine, Newcastle University

Dr H K R Thanacoody MD FRCP FRCPE

Consultant Physician and Clinical Toxicologist, Newcastle upon Tyne Hospitals NHS Foundation Trust; Honorary Senior Clinical Lecturer, Institute of Cellular Medicine, Newcastle University

Professor S H L Thomas BSc MD FRCP FRCPE

Director, NPIS Newcastle and UKTIS; Consultant Physician, Newcastle upon Tyne Hospitals NHS Foundation Trust; Professor of Clinical Pharmacology and Therapeutics, Newcastle University

Dr L M Yates MBChB PhD DRCOG MRCPCH

Head of Teratology, UKTIS; Consultant in Clinical Genetics, Institute of Genetic Medicine, Newcastle upon Tyne Hospitals NHS Foundation Trust; Honorary Senior Clinical Lecturer, Institute of Genetic Medicine, Newcastle University

Consultants providing on-call support for the NPIS

Dr P I Dargan FRCPE FACMT FRCP FAACT FEAPCCT FBPhS

Consultant Physician and Clinical Toxicologist, Clinical Director, Guy's and St Thomas' NHS Foundation Trust, and King's Health Partners, London; Reader in Toxicology, King's College London, London

Dr W S Waring BMedSci MB PhD FRCPE FBPhS

Consultant Physician in Acute Medicine and Clinical Toxicology, York Teaching Hospital Foundation Trust; Honorary Senior Lecturer in Medicine, Hull York Medical School, York

Dr D M Wood MD FRCP FACMT FBPhS

Consultant Physician and Clinical Toxicologist and Service (clinical) Lead for Medicine, Guy's and St Thomas' NHS Foundation Trust and King's Health Partners, London; Honorary Senior Lecturer, King's College London, London

Consultants providing specialist support for the NPIS

Dr M Anderson BSc BMedSci BMBS MRCPCH

Consultant Paediatrician, Great North Children's Hospital, Newcastle upon Tyne Hospitals NHS Foundation Trust

Dr J M Wraight MBChB MSc FCEM Dip Med Tox

Consultant Emergency Physician with Toxicology, St John's Hospital, Livingston, and the Royal Infirmary of Edinburgh

National and International Appointments of NPIS Senior Staff

NPIS staff have roles in supporting many important aspects of toxicology, both nationally and internationally. These include advisory roles to international and national bodies, including government, as well as academic activities. The range of their roles presented below provides a flavour of these activities and indicates the wider 'added value' of the NPIS.

NPIS Birmingham

Dr S M Bradberry

INTERNATIONAL ACTIVITIES

Scientific Committee Member: European Association of Poison Centres and Clinical Toxicologists

UK ADVISORY COMMITTEES

Member: Health and Safety Executive Pesticide Incident Appraisal Panel

ACADEMIC ACTIVITIES

Honorary Senior Lecturer: School of Biosciences, University of Birmingham

Joint Course Organiser: MSc (Toxicology), University of Birmingham

Educational Supervisor: Sandwell and West Birmingham Hospitals NHS Trust

Member: Drugs and Therapeutics Committee, Sandwell and West Birmingham Hospitals NHS Trust

Mr A Campbell

INTERNATIONAL ACTIVITIES

President: European Association of Poisons Centres and Clinical Toxicologists (EAPCCT)

Member: Scientific and Meetings Committee (EAPCCT)

Member: Finance Committee (EAPCCT)

Member: Communications Committee (EAPCCT)

Member: Nomination Committee (EAPCCT)

Chair: Education Committee (EAPCCT)

Member: Contracts Working Group (EAPCCT)

Professor J A Vale

INTERNATIONAL ACTIVITIES

Member: Advisory Board Hong Kong Poisons Centre

INTERNATIONAL SOCIETIES

Past President: Clinical and Translational Specialty Section, Society of Toxicology

INTERNATIONAL JOURNALS

Reviews Editor: *Clinical Toxicology*

Editorial Board Chairman: *Medicine*

Editorial Board Member: *Drugs*

UK ADVISORY COMMITTEES

Chairman: Ministry of Defence Research Ethics Committee

Consultant: Dstl Porton Down

Member: Expert Advisory Group on Management of Casualties Caused by Chemical Terrorism (Blain II)

ACADEMIC ACTIVITIES

Joint Course Organiser: MSc (Toxicology), University of Birmingham

Examiner: MRCP(UK) Part 2 Clinical Examination (PACES)

Member: SAC in Toxicology, Royal College of Pathologists

Examiner: Faculty of Occupational Medicine

NPIS Cardiff

Dr J Coulson

INTERNATIONAL ACTIVITIES

Represented NPIS at EMCDDA, June 2014

Guest presenter at an EU funded TAIEX workshop on novel psychoactive substances, November 2014

UK ADVISORY COMMITTEES

Member: Committee on Toxicity

Co-opted member: Tramadol subcommittee to the Advisory Panel on Substance Misuse

NHS NATIONAL AND REGIONAL COMMITTEES

Member: All Wales Medicines Strategy Group

ACADEMIC ACTIVITIES

Clinical Senior Lecturer: Cardiff University

Visiting Lecturer: Birmingham University

Dr C V Krishna

INTERNATIONAL ACTIVITIES

International PACES examiner for the Royal College of Physicians UK

UK ADVISORY COMMITTEES

Member: Specialist Advisory Committee, Clinical Pharmacology and Therapeutics

Workforce Lead for Clinical Pharmacology in the UK

NHS NATIONAL AND REGIONAL COMMITTEES

Chairman and Training Programme Director: Clinical Pharmacology Training in Wales

Member: New Medicines Group, All-Wales Medicines Strategy Committee

Member: Joint Specialty Committee, Clinical Pharmacology and Therapeutics

Member: All-Wales Specialist Training Committee in Clinical Pharmacology

ACADEMIC ACTIVITIES

Member: SAC, Clinical Pharmacology and Therapeutics, UK

Member: Prescribing Skills Assessment, Certificate/Diploma/MSc in Medical Toxicology, Cardiff University

Course Organiser: Certificate/Diploma/MSc in Medical Toxicology, Cardiff University

Member: Steering Committee, Diploma in Therapeutics, Cardiff University

PACES Examiner: Royal College of Physicians, UK

Professor P A Routledge

INTERNATIONAL ACTIVITIES

Associate Director: World Health Organization Clearing House for Chemical Incidents, Cardiff, Wales

Member: Expert Panel of the Hong Kong Poison Control Network

INTERNATIONAL JOURNALS

Editorial Board Member: *Adverse Reactions and Acute Poisoning Reviews*

Editorial Board Member: *Adverse Drug Reactions Bulletin*

ADVISORY COMMITTEES

Chair: All-Wales Medicines Strategy Group (until November 2014)

Consultant Advisor in Toxicology to the Chief Medical Officer (Wales)

Co-opted Member: Advisory Panel on Substance Misuse (Wales)

NHS NATIONAL AND REGIONAL COMMITTEES

Chair: UK Herbal Medicines Advisory Committee

Member: External Advisory Panel, Royal Pharmaceutical Society

Chair: Welsh Emerging Drugs and Identification of Novel Substances Project Steering Group (WEDINOS)

ACADEMIC ACTIVITIES

Course Director: Postgraduate Diploma/MSc Programmes in Medical Toxicology, Therapeutics and Occupational Health, Cardiff University

Honorary Secretary: Clinical Pharmacology Colloquium

President Emeritus: British Pharmacological Society

Dr A Thomas

NHS NATIONAL AND REGIONAL COMMITTEES

Medical Director: Yellow Card Centre Wales

Member: New Medicines Group, All-Wales Medicines Strategy Committee

Member: All-Wales Specialist Training Committee in Clinical Pharmacology

ACADEMIC ACTIVITIES

Theme Lead: BDS Human Disease Course, Cardiff University

Member: Steering Committee, Diploma/MSc in Medical Toxicology, Cardiff University

Member: Steering Committee, Diploma in Therapeutics, Cardiff University

Member: Final Year Examination Executive, Cardiff University

Dr J P Thompson

INTERNATIONAL ACTIVITIES

Member: Advisory Board Hong Kong Poisons Centre

Consultant: WHO Collaborating Centre for Chemical Incidents

INTERNATIONAL SOCIETIES

Chair: EAPCCT Working Group on International Poisons Centre Activities and Regulatory Affairs

Member: EAPCCT Board

ADVISORY COMMITTEES

Member: Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment (COT)

Senior Medical Officer: Yellow Card Centre (Wales)

NHS NATIONAL AND REGIONAL COMMITTEES

Member: Joint Specialty Committee, Clinical Pharmacology and Therapeutics

Member: New Medicines Group, All-Wales Medicines Strategy Committee

Member: All-Wales Specialist Training Committee in Clinical Pharmacology

Member: New Medicines Group for All Wales Medicines Strategy Group

Chair: Human Toxicology Section, British Toxicology Society

ACADEMIC ACTIVITIES

Associate Course Director: Certificate/Diploma/MSc in Medical Toxicology; Therapeutics; and Occupational Health, Policy and Practice, Cardiff University

Theme Lead: Prescribing and Therapeutics Education, School of Medicine, Cardiff University

NPIS Edinburgh

Dr J Dear

NHS NATIONAL AND REGIONAL COMMITTEES

Deputy Director: Yellow Card Centre, Scotland

Member: Lothian Formulary Committee

ACADEMIC ACTIVITIES

External Examiner: BSc Clinical Pharmacology, Kings College, London

External Examiner: MSc/Diploma in Medical Toxicology, Cardiff University
 Member: British Pharmacological Society Clinical Section Committee
 Chair of the Toxicology Affinity Group for British Pharmacological Society

Professor M Eddleston

INTERNATIONAL ACTIVITIES

Advisor: World Health Organization/Department of Mental Health and Evidence and Policy on Environmental Health

INTERNATIONAL JOURNALS

Editorial Board Member: *Clinical Toxicology*

UK ADVISORY COMMITTEES

Member: UK Department of Health Committee on Antivenoms

Dr E A Sandilands

UK ADVISORY COMMITTEES

Advisor: Consortium of Local Education Authorities for the Provision of Science in Schools (CLEAPSS)

NHS NATIONAL AND REGIONAL COMMITTEES

Member: Lothian Drug and Therapeutics Committee

ACADEMIC ACTIVITIES

NPIS Educational Lead

Lead: Undergraduate Educational Lead, Royal Infirmary of Edinburgh

NPIS Newcastle (including UKTIS)

Dr S Hill

NHS NATIONAL AND REGIONAL COMMITTEES

Member: UK Focal Point Early Warning System on Novel Psychoactive Substances

Member and Curriculum Lead: Specialist Advisory Committee, Clinical Pharmacology and Therapeutics, Northern Deanery Representative

ACADEMIC ACTIVITIES

Strand Lead: Masters in Clinical and Health Sciences with Therapeutics

Module Lead: Masters in Clinical and Health Sciences with Therapeutics – Drug Discovery and Pre-clinical Development

Module Lead: Drug Discovery and Development, Masters by Research in Translational Medicine, Newcastle University

Training Programme Director and SAC Representative: Clinical Pharmacology and Therapeutics, Northern Deanery

Member: Clinical Pharmacology and Therapeutics STC (Northern Deanery)

Member: Acute Medicine STC/DWDN Lead (Northern Deanery)

Educational Supervisor: PHE Funded Advanced Fellowship in Clinical Toxicology

Dr H K R Thanacoody

UK ADVISORY COMMITTEES

Member: Independent Scientific Advisory Committee, Medicines and Healthcare Products Regulatory Agency

Member: Pharmacovigilance Expert Advisory Group, Medicines and Healthcare Products Regulatory Agency

ACADEMIC ACTIVITIES

Member: Question Writing Group: Joint Royal Colleges MRCP (Part 1) Examining Board

Module Leader: Experimental Medicine and Therapeutics, MRes in Translational Medicine, Newcastle University

Module Leader: Drug Development from First-in-Man to Bedside, Masters in Clinical and Health Sciences, Newcastle University

Professor S H L Thomas

INTERNATIONAL ACTIVITIES

Member (previous President): European Association of Poisons Centres and Clinical Toxicologists

Expert Panel Member: European Medicines Agency

INTERNATIONAL JOURNALS

Senior Editorial Board Member: *Clinical Toxicology*

UK ADVISORY COMMITTEES

Member: Commission for Human Medicines

Co-opted Member: Technical Committee, Advisory Council on Misuse of Drugs

Member: Expert Advisory Group on Management of Casualties Caused by Chemical Terrorism (Blain II)

Member: Ministry of Defence Advisory Committee on Military Medicine

NHS NATIONAL AND REGIONAL COMMITTEES

Director: Yellow Card Centre (Northern and Yorkshire)

Medical Director: Regional Drug and Therapeutics Centre, Newcastle

Member: Northern Treatment Advisory Group

Member: North of Tyne Area Prescribing Committee

Chair: North of Tyne Area Prescribing Committee, Formulary Subcommittee

ACADEMIC ACTIVITIES

Strand Leader: MRes in Translational Medicine and Therapeutics, Newcastle University

Dr L Yates

INTERNATIONAL ACTIVITIES

Chair: Working Group 2: Independence and Transparency, European Medicines Agency (EMA) – European Network of Centres for Pharmacoepidemiology and Pharmacovigilance (ENCePP)

Board Member: European Network of Teratology Information Services (ENTIS)

Member: Pregnancy Special Interest Group, (EMA-ENCePP)

Panel member: EUROMEDICAT Conference, Poznan, February 2015 – Session Chair and Invited Panel Member

NHS NATIONAL AND REGIONAL COMMITTEES

Member: Northern Congenital Abnormality Survey (NorCAS)

Steering Committee November 2012 – present

UK ADVISORY COMMITTEES

Member: Expert Advisory Committee, Medicines and Healthcare Products Regulatory Agency (MHRA)

Member: Expert Advisory Committee, European Medicines Agency (EMA) Scientific Advisory Group on Neurology

Consultants providing on-call support for the NPIS

Dr P I Dargan

INTERNATIONAL ACTIVITIES

Member: European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) Scientific Committee

Board Member: European Association of Poison Centres and Clinical Toxicologists

Scientific Committee Member: European Association of Poison Centres and Clinical Toxicologists

Board Member: Asia Pacific Association of Medical Toxicology

Scientific Committee Member: Asia Pacific Association of Medical Toxicology

Member: American College of Medical Toxicology International Committee

International Advisory Board: Indian Society of Toxicology

Abstract Reviewer: American Academy of Clinical Toxicology

Expert Adviser: World Health Organization

Member: WHO/UN Global Alliance to Eliminate Lead from Paint

Member: WHO Global Burden of Disease Expert Panel

Delegate to the Council: European Association of Clinical Pharmacology

INTERNATIONAL JOURNALS

Editorial Board Member: *Clinical Toxicology*

Editorial Board Member: *Quarterly Journal of Medicine*

Editorial Board Member: *Case Reports in Medicine*

Editorial Board Member: *Journal of Addiction Therapy and Research*

Editorial Board Member: *Toxicologie Analytique et Clinique*

Editorial Board Member: *Journal of Addiction*

UK ADVISORY COMMITTEES

Member: Advisory Council on Misuse of Drugs

Member: Technical Committee, Advisory Council on Misuse of Drugs

Co-chair: College of Emergency Medicine Antidote Guideline Group

Member: London Drug and Alcohol Policy Forum

Steering Group Member: National Programme for Substance Abuse Deaths

ACADEMIC ACTIVITIES

Reader in Toxicology: King's College London

Member: King's College London Phase 5 Examination Board Member

Member: Faculty of Translational Medicine, Biomedical Research Centre (BRC) at Guy's and St Thomas' NHS Foundation Trust and King's College London

Member: London Ambulance Service Clinical Audit and Research Steering Group

Examiner: MRCP (UK) Part 2 Clinical Examination (PACES)

External Examiner: University College London PhD, University of Sydney PhD

Member: WHO Global Burden of Disease Expert Panel

Dr W S Waring

INTERNATIONAL JOURNALS

Associate Editor: *Therapeutic Advances in Drug Safety*

Editorial Board Member: *European Journal of Clinical Pharmacology*

Editorial Board Member: *Expert Review of Clinical Pharmacology*

Editorial Board Member: *Recent Patents on Cardiovascular Drug Discovery*

UK ADVISORY COMMITTEES

Member: Independent Review Panel for Borderline Products, Medicines and Healthcare Products Regulatory Agency

NHS NATIONAL AND REGIONAL COMMITTEES

Regional Specialty Advisor: Clinical Pharmacology and Therapeutics

Member: Regional RCP Advisory Appointments Committee

CPT Representative: RCP Revalidation Specialty Advisory Group

Clinical Examiner: PACES, Royal College of Physicians of Edinburgh

Member: Regional Training Committee for Acute Medicine

ACADEMIC ACTIVITIES

Honorary Senior Lecturer: Hull York Medical School

Dr D M Wood

INTERNATIONAL ACTIVITIES

Expert Advisor: European Monitoring Centre for Drugs and Drug Addiction

Member: American Academy of Clinical Toxicology Scientific Review Committee

INTERNATIONAL SOCIETIES

British Pharmacological Society Clinical Section representative:

Council of the European Association of Clinical Pharmacology and Therapeutics

INTERNATIONAL JOURNALS

Editorial Board Member: *Journal of Medical Toxicology*

International Scientific Committee Member: *Toxicologie Analytique et Clinique*

UK ADVISORY COMMITTEES

Co-opted Member: UK Advisory Council on the Misuse of Drugs Technical and Novel Psychoactive Committees

Trustee and Member: Council of the British Pharmacological Society

Member: Scientific advisory group on the Health Foundation Funded 'Project Neptune'

Member: Advisory Board of the Angelus Foundation

NHS NATIONAL AND REGIONAL COMMITTEES

Member: Department of Health Early Warning System

Member: Public Health England National Drugs Intelligence Network

ACADEMIC ACTIVITIES

Joint Project Co-ordinator: European Drug Emergencies Network (Euro-DEN) Plus

Lecturer: NPIS/CEM Clinical Toxicology Training Days

APPENDIX B

NPIS Publications in 2014/15

Sixty-four contributions to the scientific literature were published in 2014/15 by NPIS staff* including one major clinical toxicology textbook.

Peer-reviewed Papers

Bateman DN, Carroll R, **Pettie J**, Yamamoto T, Elamin ME, Peart L, **Dow M**, Coyle J, Cranfield KR, Hook C, **Sandilands EA**, **Veiraiiah A**, Webb D, Gray A, Dargan PI, Wood DM, **Thomas SHL**, **Dear JW**, **Eddleston M**. Effect of the UK's revised paracetamol poisoning management guidelines on admissions, adverse reactions, and costs of treatment. *Br J Clin Pharm* 2014; 78: 610–18.

Bateman DN, **Dear JW**, Carroll R, **Pettie J**, Yamamoto T, Elamin ME, Peart L, **Dow M**, Coyle J, Gray A, Dargan PI, Wood DM, **Eddleston M**, **Thomas SH**. Impact of reducing the threshold for acetylcysteine treatment in acute paracetamol poisoning. The recent United Kingdom experience. *Clin Toxicol (Phila)* 2014; 52: 868–72.

Bateman DN, **Dear JW**, **Thanacoody HK**, **Thomas SHL**, **Eddleston M**, **Sandilands EA**, Coyle J, **Cooper JG**, Rodriguez A, Butcher I, Lewis SC, Vliegenthart AD, **Veiraiiah A**, Webb DJ, Gray A. Reduction of adverse effects from intravenous acetylcysteine treatment for paracetamol poisoning: a randomised controlled trial. *Lancet* 2014; 383: 697–704.

Bradberry SM, Wilkinson JM, Ferner RE. Systemic toxicity related to metal hip prostheses. *Clin Toxicol (Phila)* 2014; 52: 837–47.

Coulson JM. The relationship between blood pressure variability and catecholamine metabolites: a pilot study. *J Hum Hypertens* 2015; 29: 50–52.

Coulson JM, Murphy K, Harris AD, Fjodorova M, Cockcroft JR, Wise RG. Correlation between baseline blood pressure and the brainstem FMRI response to isometric forearm contraction in human volunteers: a pilot study. *J Hum Hypertens* 2014. Published online 13/11/14, doi: 10.1038/jhh.2014.103.

Dear JW. Urinary exosomes join the fight against infection. *J Am Soc Nephrol* 2014; 25: 1889–91.

Hill SL, **Thomas SHL**, Flecknell PA, Thomas AA, Morris CM, Henderson D, Dunn M, Blain PG. Rapid and equivalent systemic bioavailability of the antidotes HI-6 and dicobalt edetate via the intraosseous and intravenous routes. *Emerg Med J* 2014. Published online 20/11/14, doi:10.1136/emmermed-2014-204171.

Hornby RJ, Starkey Lewis P, **Dear J**, Goldring C, Park K. MicroRNAs as potential circulating biomarkers of drug-induced liver injury: key current and future issues for translation to humans. *Exp Rev Clin Pharmacol* 2014; 7: 349–62.

Hulse EJ, Davies JOJ, Simpson AJ, Sciuto A, **Eddleston M**. Respiratory complications of organo-phosphorus nerve agent and insecticide poisoning - implications for respiratory and critical care. *Am J Resp Crit Care Med* 2014; 190: 1342–54.

Kamour A, **George N**, **Gwynnette D**, **Cooper G**, **Lupton D**, **Eddleston M**, **Thompson JP**, **Vale JA**, **Thanacoody HKR**, **Hill S**, **Thomas SHL**. Increasing frequency of severe clinical toxicity after use of 2,4-dinitrophenol in the UK: a report from the National Poisons Information Service. *Emerg Med J* 2014. Published online 23/6/14, doi: 10.1136/emmermed-2013-203335

Kamour A, **James D**, **Lupton DJ**, **Cooper G**, **Eddleston M**, **Vale JA**, **Thompson JP**, **Thanacoody HKR**, **Hill SL**, **Thomas SHL**. Patterns of presentation and clinical features of toxicity after reported use of ([2-aminopropyl]-2,3-dihydrobenzofurans), the 'benzofuran' compounds. A report from the United Kingdom National Poisons Information Service. *Clin Toxicol (Phila)* 2014; 52: 1025–31.

Knipe DW, Metcalfe C, Fernando R, Pearson M, Konradsen F, **Eddleston M**, Gunnell D. Suicide in Sri Lanka 1975-2012: age, period and cohort analysis of police and hospital data. *BMC Public Health* 2014;14: 839.

Konickx LA, Bingham K, **Eddleston M**. Is oxygen required before atropine administration in organo-phosphorus or carbamate pesticide poisoning? – a cohort study. *Clin Toxicol (Phila)* 2014; 52: 531–7.

Newham R, Corcoran ED, **Dear JW**, Hems S, McTaggart S, Bennie M (2015). A qualitative study of the relationship between the Scottish Medicines Consortium and their clinical experts. *J Eval Clin Prac* 2015. Published online 23/3/15.

Perry L, **Adams RD**, **Bennett A**, **Lupton DJ**, **Jackson G**, **Good AM**, **Thomas SH**, **Vale JA**, **Thompson J**, **Bateman DN**, **Eddleston M**. National toxicovigilance for pesticide exposures resulting in healthcare contact – an example from the UK's National Poisons Information Service. *Clin Toxicol (Phila)* 2014; 52: 549–55.

Sabbiseti VS, Waikar SS, Antoine DJ, Smiles A, Wang C, Ravisankar A, Ito K, Sharma S, Ramadesikan S, Lee M, Briskin R, De Jager PL, Ngo TT, Radlinski M, **Dear JW**, Park BK, Betensky R, Krolewski AS, Bonventre JV. Blood kidney injury molecule-1 is a biomarker of acute and chronic kidney injury and predicts progression to ESRD in type I diabetes. *J Am Soc Nephrol* 2014; 25: 2177–86.

Slaughter RJ, Mason RW, Beasley DMG, **Vale JA**, Schep LJ. Isopropanol poisoning. *Clin Toxicol (Phila)* 2014; 52: 470–78.

Thanacoody R, Caravati EM, Troutman B, Höjer J, Benson B, Hoppu K, Erdman A, Bedry R, Mégarbane B. Position paper update: whole bowel irrigation for gastrointestinal decontamination of overdose patients. *Clin Toxicol (Phila)* 2014. Published online 16/12/14.

Vliegenthart ADB, Tucker CS, Del Pozo J, **Dear JW**. Zebrafish as model organisms for studying drug induced liver injury. *Br J Clin Pharmacol* 2014; 78: 1217–27.

* NPIS staff are given in bold type.

Weber-Schoendorfer C, Oppermann M, Wacker E, Bernard N; network of French pharmacovigilance centres, Beghin D, Cuppers-Maarschalkerweerd B, **Richardson JL**, Rothuizen LE, Pistelli A, Malm H, Eleftheriou G, Kennedy D, Kadioglu Duman M, Meister R, Schaefer C. Pregnancy outcome after TNF- α inhibitor therapy during the first trimester: a prospective multicentre cohort study. *Br J Clin Pharmacol* 2015. Published online 25/3/15.

Winterfeld U, Klinger G, Panchaud A, **Stephens S**, Arnon J, Malm H, Te Winkel B, Clementi M, Pistelli A, Maňáková E, Eleftheriou G, Merlob P, Kaplan YC, Buclin T, Rothuizen LE. Pregnancy outcome following maternal exposure to mirtazapine: a multicenter, prospective study. *J Clin Psychopharmacol* 2015. Published online 31/3/15.

Wood DM, **Hill SL**, **Thomas SHL**, Dargan PI. Using poisons information service data to assess the acute harms associated with novel psychoactive substances. *Drug Test Anal* 2014; 6: 850–860.

Books

Bateman DN, Jefferson R, **Thomas SHL**, **Thompson JP**, **Vale JA** (Eds). *Oxford Desk Reference: Toxicology*. Oxford University Press, 2014.

Note: The majority of editors and chapter authors of this book are employed by the NPIS. Details of individual contributions are too numerous to list.

Book Chapters

Anderson M. Recreational drugs. In *Drugs During Pregnancy and Lactation*, 3rd Edition (Schaefer C et al, Eds). Elsevier, 2015.

Stephens S, **Yates LM**. Chapter 2.21 Recreational drugs. In *Drugs During Pregnancy and Lactation*, 3rd Edition (Schaefer C et al, Eds). Elsevier, 2015: 541–71.

Yates LM, **Stephens S**. Chapter 2.22 Poisonings and toxins. In *Drugs During Pregnancy and Lactation*, 3rd Edition (Schaefer C et al, Eds). Elsevier, 2015: 575–97.

Published Congress Abstracts

Adams RD, **Crawford CL**, **Perry L**, **Thomas SHL**, **Thompson JP**, **Vale JA**, **Eddleston M**. Paracetamol excess related to dental pain in adults: National Poisons Information Service enquiries pre- and post-Medicines and Healthcare Products Regulatory Agency guideline changes. *Clin Toxicol (Phila)* 2014; 52: 391–2.

Antoine A, Sabbisetti V, Craig D, Simpson K, Park K, Bonventre J, **Dear J**. Plasma kidney injury molecule-1 predicts outcome in patients with paracetamol-induced liver injury. *Toxicol Lett* 2014; 229: S97.

Bernard N, Beghin D, Huttel E, **Dunstan H**, Ieri A, Te Winkel B, Jonville-Bera A-P, Damase-Michel C, Vial T, and the network of French pharmacovigilance centers. Pregnancy outcome after in utero exposure to Baclofen: an ENTIS collaborative study. *Birth Defects Res (Part A)* 2014; 100: 525.

Campbell AC, Ballam DS, **Vale JA**. Use of Cloud technology reporting systems to motivate and improve staff performance in a poisons information service setting. *Clin Toxicol (Phila)* 2014; 52: 343.

Coulson JM, **Thompson JP**. The management of ventricular dysrhythmia in aconite poisoning: a review of published cases. *Clin Toxicol (Phila)* 2014; 52: 390.

Crawford CL, **Jackson G**, **Thomas SHL**, **Thompson JP**, **Vale JA**, **Eddleston M**. National Poisons Information Service urgent alerting system for chemicals: data from the first year. *Clin Toxicol (Phila)* 2014; 52: 341–2.

Elamin ME, Peart LC, **Hill SL**, **Thomas SHL**. Impact of changes in UK management advice for paracetamol overdose on the numbers of adult patients admitted and treated in Newcastle upon Tyne. *Clin Toxicol (Phila)* 2014; 52: 305–6.

Green JL, Martinez EM, Bucher-Bartelson B, Desel H, Milanese G, Sesana F, de Vries I, Kupferschmidt H, **Thomas SHL**, **Thompson JP**, McBride KE, Dart RC. Global Toxiconsurveillance Network (GTNet): characterizing prescription opioid exposures reported to European Poison Centres. *Clin Toxicol (Phila)* 2014; 52: 372.

Harbon SCD, **Thompson JP**. Successful use of fomepizole during second trimester of pregnancy National Poisons Information Service (NPIS Cardiff), Cardiff and Vale University Health Board, Cardiff, UK Objective: To report a use of fomepizole during second trimester of pregnancy. *Clin Toxicol (Phila)* 2014; 52: 314–15.

James DA, **Thomas SHL**, Waugh RML, **Vale JA**, **Thompson J**, **Eddleston M**. An analysis of the UK National Poisons Information Service consultant referral process. *Clin Toxicol (Phila)* 2014; 52: 340.

Kamour A, **Gwynnette D**, George N, **Cooper G**, **Lupton DJ**, **Eddleston M**, **Thompson JP**, **Vale JA**, **Thanacoody RHK**, **Hill S**, **Thomas SHL**. Severe toxicity after use of 2,4-dinitrophenol reported to the UK National Poisons Information Service. *Clin Toxicol (Phila)* 2014; 52: 422–3.

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