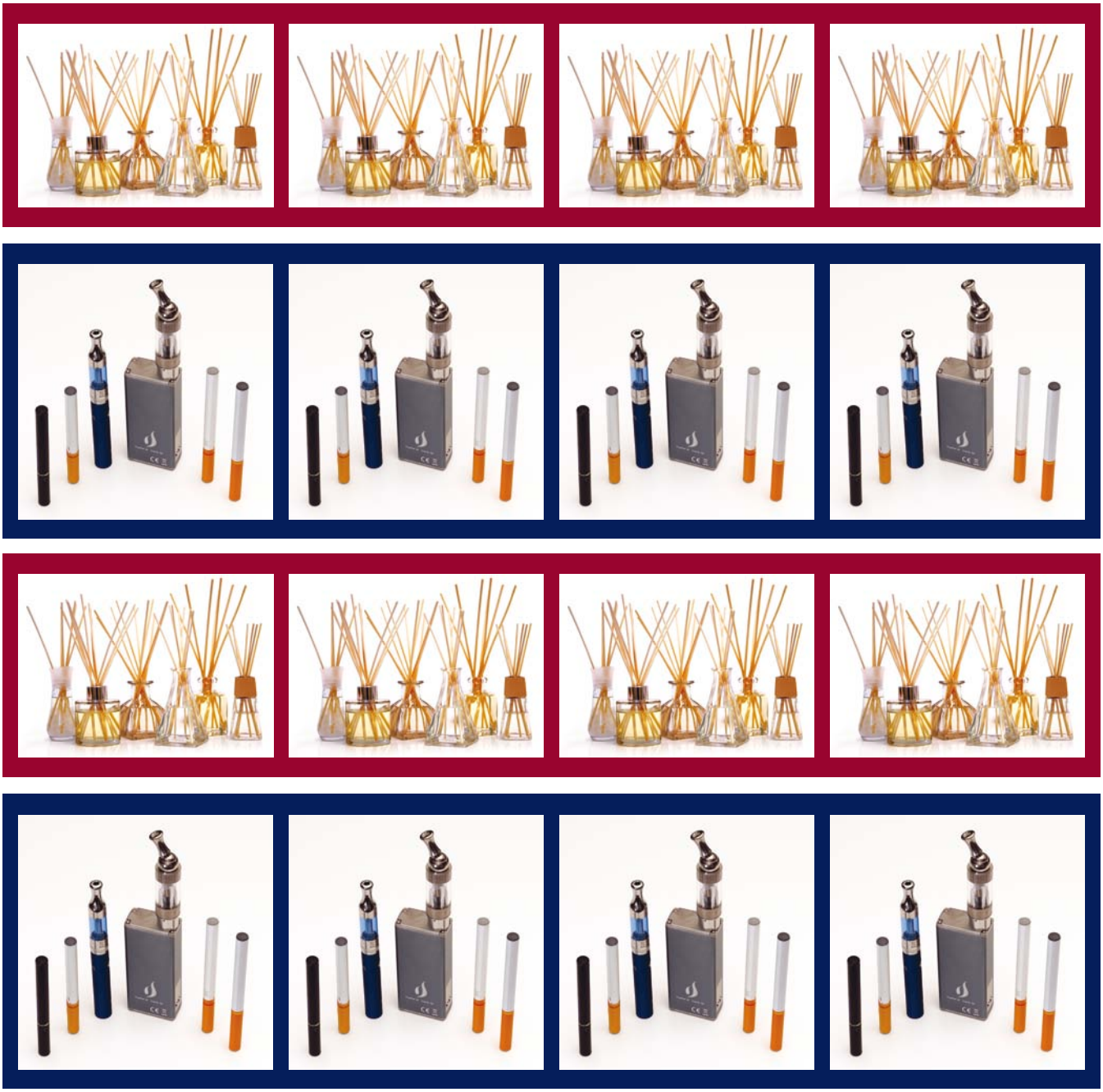
Public Health England

NPIS
National Poisons Information Service

National Poisons Information Service

Report 2013/14



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

National Poisons Information Service

A service commissioned by Public Health England on behalf of the UK health departments

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 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 telephone helplines (NHS 111, NHS 24 and NHS Direct).

NPIS units at 31 March 2014

NPIS Birmingham Unit

City Hospital, Birmingham
hosted by Sandwell and West Birmingham Hospitals NHS Trust
Director: Professor J A Vale MD FRCP FRCPE FRCPG FFOM FAACT FBTS FBPharmacolS FEAPCCT Hon FRCPSG

NPIS Cardiff Unit

Llandough Hospital, Cardiff
hosted by Cardiff and Vale University Health Board
Director: Dr J P Thompson BMedSci MBChB FRCP FBTS FEAPCCT

NPIS Edinburgh Unit

Royal Infirmary of Edinburgh
hosted by NHS Lothian – University Hospitals Division
Director: Professor M Eddleston MA PhD FRCPE FEAPCCT

NPIS Newcastle Unit

Regional Drug and Therapeutics Centre, Newcastle
hosted by Newcastle upon Tyne Hospitals NHS Foundation Trust
Director: Professor S H L Thomas BSc MD FRCP FRCPE

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Front cover
Reed diffusers © Reckitt Benckiser and electronic cigarettes © John Thompson, NPIS Cardiff

Foreword

Poisoning or suspected poisoning, encompassing drug overdose, recreational drug toxicity, accidental poisoning and occupational or environmental exposures, continues to be an important public health issue in the UK. Challenges for the NHS include the large numbers of patients presenting each year, the diversity of substances that may be involved and the absence of clinicians with specific expertise in the management of poisoning in most UK hospitals.

2013 marked the 50th anniversary of the National Poisons Information Service (NPIS) and the support that it provides to NHS professionals in managing patients with suspected poisoning. This has been achieved by the provision of evidence-based information and management advice on a 24 hours a day basis, delivered by telephone and through the NPIS online database, TOXBASE®. The availability of accurate poisons information is highly cost effective as it substantially reduces unnecessary hospital referrals and admissions for patients at low risk of clinical toxicity and optimises treatment and shortens hospital stay for those at risk of, or with features of, poisoning.

The NPIS is commissioned by Public Health England on behalf of all four UK departments of health and by Beaumont Hospital, Dublin, on behalf of the government of the Republic of Ireland.

This report is a formal statement of NPIS activity, accountability and governance for 2013/14. The information provided demonstrates the increasing use of the service by the NHS, the exceptional value that users place on the service as evidenced by their feedback and the value of data collected for public health surveillance purposes. This performance has been achieved in spite of funding pressures which affect the NPIS as they do other services provided or commissioned by Public Health England. Maintaining the volume and quality of services in the face of further restrictions on budgets and staff numbers will be a key challenge for the immediate future.

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Contents

Executive Summary

Background

The National Poisons Information Service (NPIS) is commissioned to provide information and advice for NHS health professionals to support the management of patients with suspected poisoning. This is a common presentation, involving approximately 140,000 people who are admitted to UK hospitals 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® *, backed up by its telephone advice service 24 hours a day, staffed by information scientists and further 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 clinical toxicity, while improving 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 576,000 TOXBASE user sessions and around 1,527,000 separate product accesses during 2013/14, increases of 14.1% and 10.7%, respectively, on equivalent figures for the previous year. The most frequent users were hospital departments (66%) and NHS 111, NHS 24 and NHS Direct staff (22%).

The total number of telephone enquiries during 2013/14 was around 56,000, an increase of 3.5% over the previous year, with NHS 111, NHS 24 and NHS Direct (34%), hospitals (28%) and primary care (24%) the most frequent users. Over 2,300 enquiries were referred to NPIS consultants, an increase of around 5% over 2012/13, of which 89% came from hospital staff.

The telephone enquiries include nearly 2,900 exposures to drugs and chemicals during pregnancy referred to UKTIS. This is a similar number to the previous year, but the number of downloads of detailed pregnancy information from TOXBASE has increased by 12% to 64,500 and UKTIS monograph summary downloads increased by 50% to 122,000 compared with 2012/13. During the year UKTIS developed its public facing website '***bumps***' – best use of medicines in pregnancy (www.medicinesinpregnancy.org) – and prepared 25 information leaflets covering around 40 exposures for the launch of the website at the beginning of April 2014.

It is essential to update the approximately 17,000 product entries in TOXBASE regularly. During 2013/14 NPIS staff wrote or revised around over 3,300 entries, while UKTIS staff wrote or updated 64 of the 345 detailed pregnancy monographs available on TOXBASE.

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 2013/14 over 24,000 safety data sheets (SDS) were added to the Centre, which now contains this information for 116,000 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 92% for the TOXBASE website, 98% for the telephone poisons information service and 93% 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 2013/14 are summarised below.

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

Drugs of misuse

The NPIS has monitored activity related to 61 different drugs of misuse, including novel psychoactive substances. There were around 1,600 telephone enquiries and 58,500 TOXBASE accesses related to these substances, increases of 30% and 10%, respectively, compared with the figures for the previous year. The largest increases were for synthetic cannabinoid receptor agonists (chemically manufactured derivatives of cannabis), with 13-fold more telephone enquiries and 2.5-fold more TOXBASE accesses compared to the previous year. There were also substantial increases in enquiries relating to unidentified 'legal highs'.

Paracetamol

Following changes in the management of paracetamol poisoning recommended by the Medicines and Healthcare Products Regulatory Agency in 2012, there have been increases in TOXBASE accesses, NPIS telephone enquiries and consultant referrals relating to paracetamol. Telephone enquiries have subsequently fallen towards baseline levels, but increases in TOXBASE accesses for paracetamol have been sustained.

2,4-dinitrophenol

During 2013 NPIS staff noted several cases of severe toxicity following use of 2,4-dinitrophenol (DNP), a chemical sold on the internet and sometimes used for weight reduction and 'fat burning'. A review of NPIS data showed a substantial increase in referred cases, from less than one annually, to five in 2012, and 22 in 2013, despite a warning about the dangers of using DNP issued by the Food Standards Agency in November 2012. Of 30 cases identified since 2008, five were fatal. There was also a steep rise in TOXBASE accesses relating to DNP. After sharing these data with Public Health England and the Food Standards Agency, further warnings were issued to the public with education targeted at key user groups, eg in gyms. Subsequently there has been an apparent reduction in enquiry numbers, although further monitoring is needed to ensure this reduction is sustained.

Urgent alerting

The NPIS has established an urgent alerting system to allow immediate follow up of accesses to TOXBASE that involve specific agents of interest. During the year approximately 3,600 patient-specific alerts were received. Of these, 330 involving 43 different substances were followed up by NPIS staff; the substances most commonly involved were carbon monoxide, chlorine, CS gas, ammonia and hydrofluoric acid.

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 2,100 different TOXBASE entries and calls to the NPIS telephone service. Overall, information was collated on around 1,200 potential exposures during the year.

Reed diffusers

These have become popular household air fresheners but the liquid they contain includes several potentially toxic substances. Telephone enquiries relating to these products have increased from 61 in 2010 to 206 in 2013; the majority (96%) of the 511 cases referred to the NPIS during this four-year period were children under five years of age. Most affected patients have minor or no symptoms, but there were nine patients with moderate features, including respiratory effects and eye irritation from direct contact with the liquid.

Electronic cigarettes

In view of the increasing use of electronic cigarettes and the potential toxicity of the nicotine solution they contain, the NPIS has recently reviewed enquiries relating to these products. There has been a steep rise in annual enquiries with most relating to accidental exposure (usually ingestion). Of 204 enquiries during 2013/14, 44 involved children under five. Of these, there was one patient with severe toxicity, and there were two with moderate effects and 94 with mild features. Although most cases were not associated with serious toxicity, these data emphasise the importance of safe storage and packaging of these products.

Education and Research

NPIS staff continue to be active in education and research, with 86 contributions to the scientific literature published during 2013/14, including 37 peer-reviewed original scientific papers.

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 by giving examples of its activity – in particular on recreational drugs, paracetamol poisoning and poisoning with reed diffusers.

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 health care 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 health professionals in the UK. While the structure of the NPIS has changed, 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 enquiries 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 health care 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 over 140,000 NHS hospital admissions in the UK each year (just under 1% of the total number), 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 so access 24 hours a day to high quality information and clinical advice about poisoning is essential to treat these patients.

Over the past decade, there has been a small reduction in the number of patients admitted to hospitals throughout the UK for poisoning. Part of this may be due to national strategies aimed at reducing rates of suicide and self-harm. Other reasons are unclear, but the online availability of TOXBASE since 1999 and the clear criteria for hospital referral, admission and duration of observation that this provides may have played a part.

At the same time, however, new drugs of misuse are emerging 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 poisoning received by NHS public access helplines (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 health care assistance is summoned.

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

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 effects and ultimate outcomes of cases of severe or unusual poisoning. This assists the service 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 National Poisons Information Service

The NPIS provides a 24 hour, 365 day a year, consultant-supported clinical toxicology advice service to assist health care 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 phone calls about chemical incidents and forward this information to the Centre for Radiation, Chemical and Environmental Hazards of Public Health England.

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 to their local populations.

Over recent years, there has been some increase in the number of consultant staff available to assist colleagues in the management of more seriously unwell patients, in NPIS units and also in geographically separate acute hospitals. This expansion in the availability of 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 health care units who register for it, including hospital departments, primary care practices and NHS helpline services – NHS 111, NHS 24 and NHS Direct. The NPIS also provides a 24 hour telephone information service for health professionals using a single national telephone number (0844 892 0111) if 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 post-graduate qualifications in toxicology. Complex enquiries are referred on to NPIS consultant staff as necessary on a 24 hours a day basis.

Audio recordings of all NPIS telephone enquiries are now retained for governance purposes and clinical data are logged within a specially designed national 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

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 where she or he is located.

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 new Cloud system are improved functionality, increased resilience and more efficient cooperative working between the NPIS units. Enquiries can be transferred, conference calls established, and real-time reporting facilities made available. NPIS SPIs and consultants can log in remotely, allowing rapid up-scaling of telephone staffing if this is needed.

NPIS reporting needs and further improving the disaster recovery system are currently being addressed.

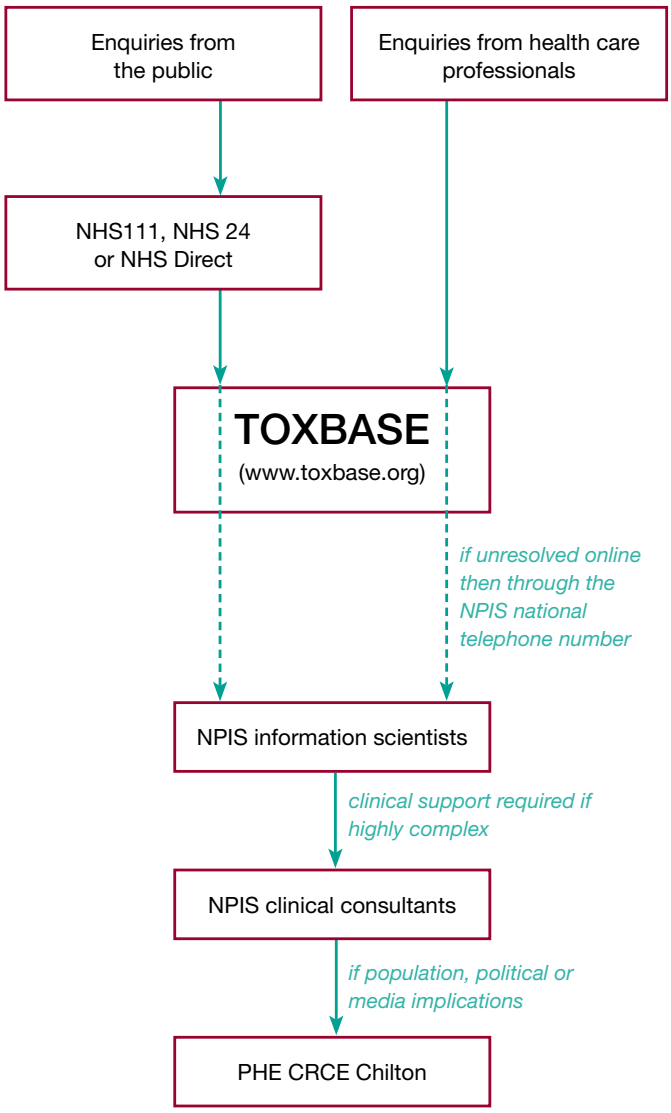


FIGURE 2.1 How poisons enquiries are answered

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 health professionals are referred to the NPIS. The NPIS is also contracted to provide poisons information for users in the Republic of Ireland: TOXBASE is provided to major hospital emergency departments and to the National Poisons Information Centre in Dublin. 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 also 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 also regular meetings and teleconferences of the TOXBASE Editing Group, with representation from each unit, to ensure consistent and nationally agreed database content. 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 2013/14 being in excess of 575,000). 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, defendable 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 approximately four times a year (two face-to-face meetings and two web/teleconferences) 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 2013/14, 3,309 entries were added or edited and 422 were discontinued or deleted.

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 2013/14

3.1 Overall Service Profile

This report concentrates on NPIS activity in 2013/14, as reflected by TOXBASE user sessions, TOXBASE accesses, telephone enquiries and consultant referrals. Increased use of TOXBASE by health professionals for routine enquiries releases NPIS staff to perform more strategic work for the service, including production and revision of TOXBASE monographs, follow up of calls of interest and 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 615,777. This is an increase of 11.3% compared to 2012/13. In addition, 64,437 UKTIS monographs were accessed on TOXBASE during 2013/14, an increase of 12.4% compared to 2012/13.

The number of user sessions includes 7,868 educational sessions, a 22.2% decrease on the 2012/13 figure but a 12.9% increase on the 2011/12 one.

Sessions from all the NPIS units and from the Northern Ireland Regional Medicines and Poison Information Service have been excluded from further detailed analyses, as these accesses may be for training/education, to access operating procedures or for monograph-writing, as well as for answering telephone enquiries.

Therefore, a total of 575,794 sessions originating in England, Northern Ireland, Scotland and Wales have been analysed for this report (an increase of 14.1% on the number of sessions in 2012/13). Sessions originating overseas are presented elsewhere (Box 3.1).

There were 1,807,641 individual product accesses in 2013/14. Applying the same criteria as for session data gives a total of 1,527,518 product accesses from UK-based, non-poisons-centre users, which are analysed below. This number is an increase of 10.7% on the 2012/13 figure.

A total of 55,669 telephone enquiries were received by the NPIS in 2013/14 (including 2,866 calls to UKTIS);

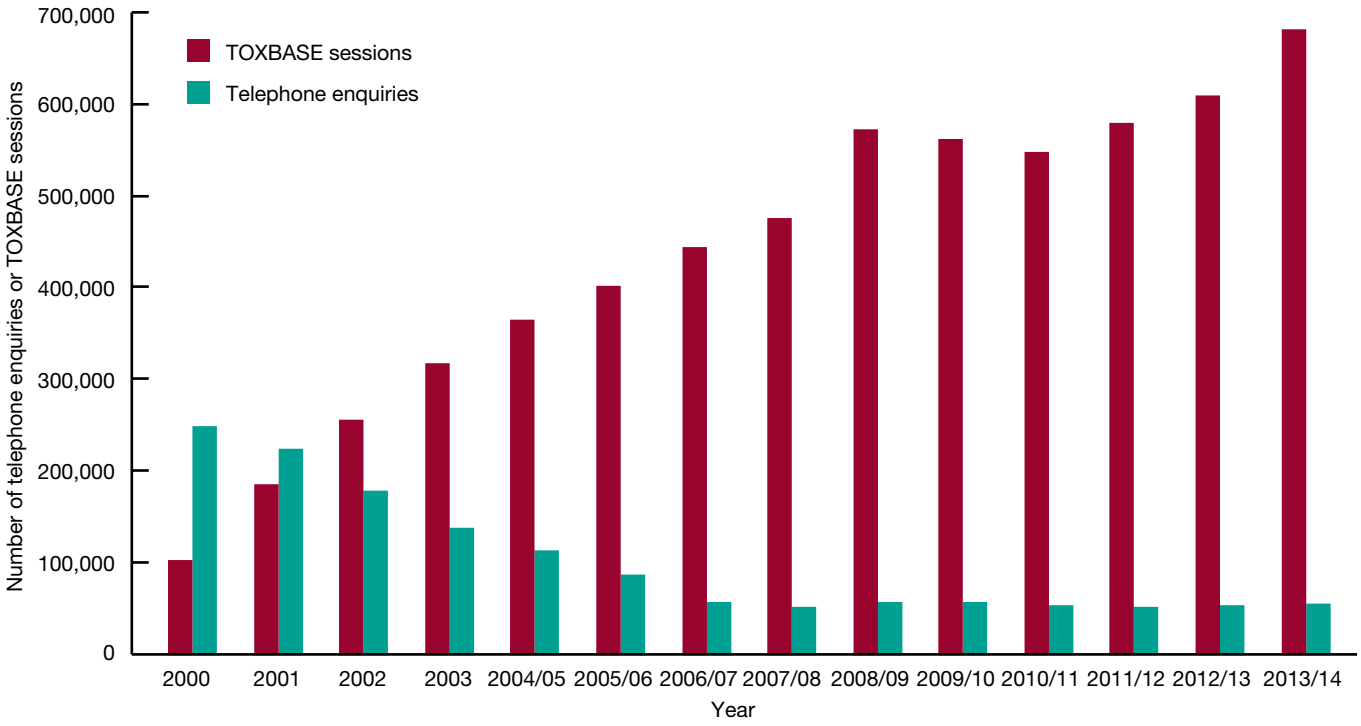


FIGURE 3.1 Annual number of telephone enquiries to the NPIS and TOXBASE sessions from 2000 to 2013/14 (data for 2000–2003 are by calendar year; subsequent data are by financial year)

TABLE 3.1 Origin of poisons enquiries to the NPIS in 2013/14

	Telephone enquiries (involving patients)		TOXBASE sessions		Combined total	
Country	Number	Rate per 100,000 population (mid-2012)*	Number	Rate per 100,000 population (mid-2012)*	Number	Rate per 100,000 population (mid-2012)*
England	44,063	82.4	478,576	894.6	522,639	977.0
Northern Ireland	439	24.1	12,182	668.0	12,621	692.1
Scotland	2,230	42.0	57,321	1,078.8	59,551	1,120.7
Wales	2,837	92.3	27,715	901.6	30,552	993.9

* Based on 2012 mid-year population estimates from http://www.ons.gov.uk/ons/rel/pop-estimate/population-estimates-for-uk--england-and-wales--scotland-and-northern-ireland/mid-2011-and-mid-2012/index.html (accessed 30 June 2014)

this is an increase of 3.5% from 2012/13. The analyses presented in this report include only telephone enquiries to the NPIS that related to patients, of which there were 51,594 (an increase of 3.9% on 2012/13). These data include the 2,334 referrals to NPIS consultants for specialist advice, a 5.2% increase in the number of referrals compared to 2012/13.

Table 3.1 shows the number of poisons enquiries from UK countries compared to population size.

Figure 3.2 shows that users in hospital departments and NHS helpline staff – NHS 111, NHS 24 and NHS Direct – were once again responsible for the majority of TOXBASE sessions: 378,055 (65.7%) and 128,040 (22.2%), respectively, similar to the proportions seen in 2012/13. In contrast, telephone enquiries received were distributed more evenly across hospital, NHS 111, NHS 24 and NHS Direct, and primary care users: 14,258 (27.6%), 17,720 (34.3%), and 12,166 (23.6%), respectively. The number of telephone enquiries from NHS 111, NHS 24 and NHS Direct staff increased by 25.7% from 2012/13. However, the NPIS received fewer queries from primary care users by both telephone and TOXBASE sessions: telephone enquiries decreased by 10.8% (from 13,643 to 12,166) and TOXBASE sessions decreased by 1% (from 21,466 to 21,254) compared to 2012/13.

As in previous years, the majority of TOXBASE sessions involving hospital-based health care providers came from

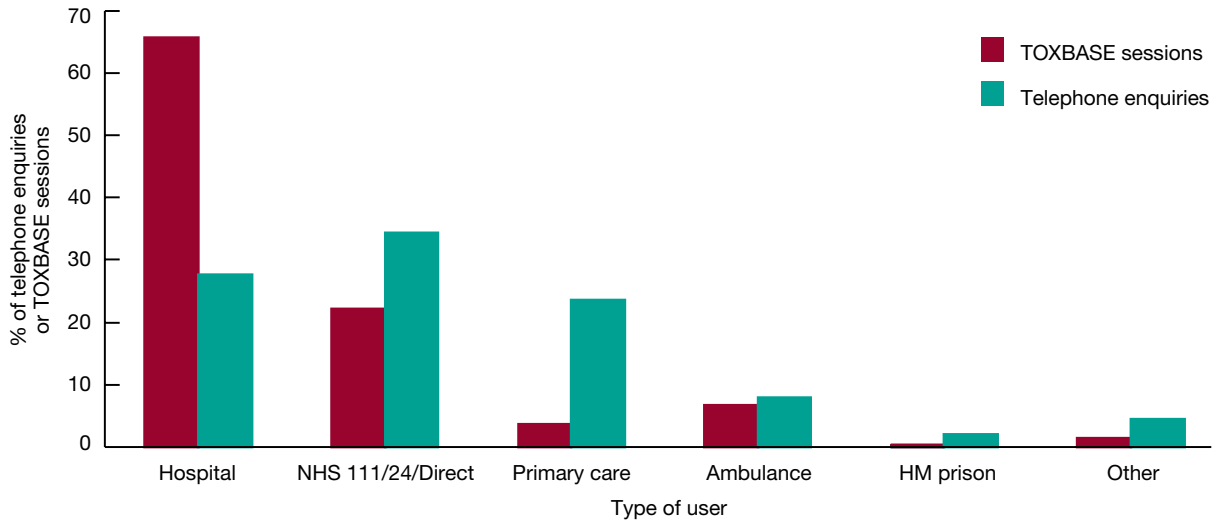


FIGURE 3.2 Telephone enquiries to the NPIS and TOXBASE sessions in 2013/14 by type of user

emergency departments (326,449; 86.3%) (Table 3.2), with medicines information departments and pharmacies the second most common type of hospital users (32,237; 8.5%). Of the telephone enquiries, 39.8% (20,521) were made by doctors and 46.9% (24,195) by nurses.

TABLE 3.2 Hospital TOXBASE session data by department in 2013/14

Department	Number of sessions
Emergency departments	326,449
Medicines information and pharmacies	32,237
Minor injuries units	3,227
Admission/assessment units	3,087
Paediatrics	2,630
Toxicology wards	1,375
Psychiatric units	1,322
Intensive care units	1,076
Urgent care	1,020
General medicine	928
Biochemistry and other laboratories	832
Anaesthetics	536

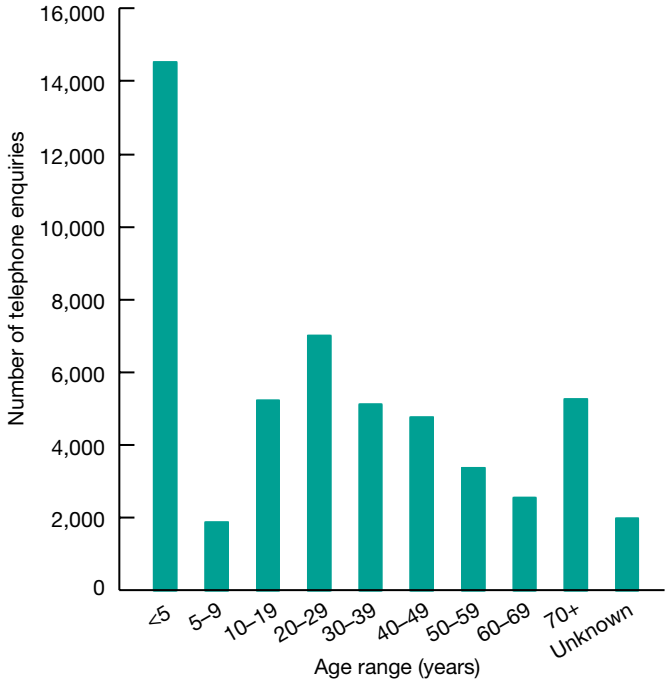


FIGURE 3.3 Age of poisoned patients as reported in telephone enquiries to the NPIS in 2013/14

The age ranges of patients who were the subject of telephone enquiries are shown in Figure 3.3. Just over half of the patients (51.6%) were female and over a quarter (28.1%) were children under the age of five years. This age and sex distribution remains similar to that in previous years.

The majority of exposures reported in telephone enquiries were unintentional (52.1%), ingestions (86.9%), that occurred at home (86.9%). Figure 3.4 shows the type of poisonings reported to the NPIS during telephone enquiries in 2013/14; as in previous years, the largest single category was unintentional ingestions.

The types of agents that were the subject of TOXBASE accesses and telephone enquiries are shown in Figure 3.5. Pharmaceuticals were the most common source of enquiries (69.9% of accesses; 63.6% of

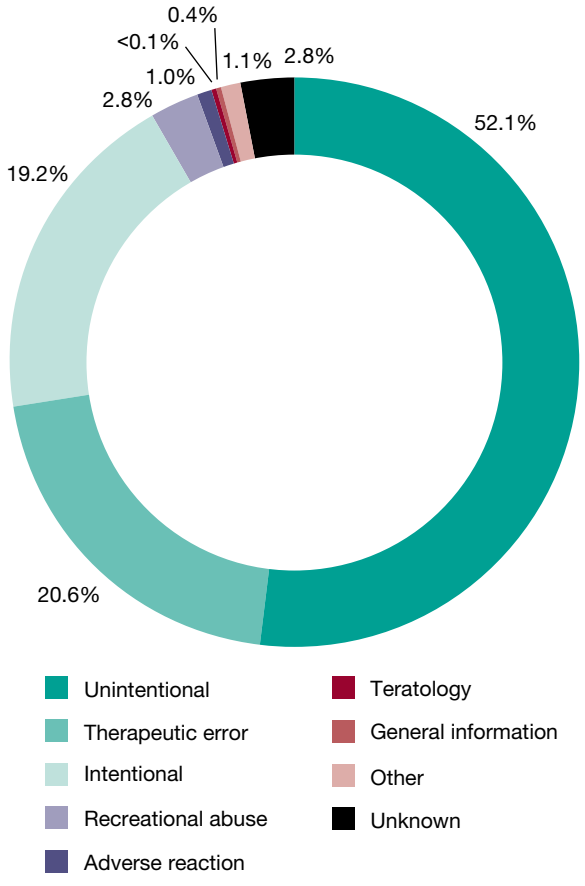


FIGURE 3.4 Types of poisonings as reported in telephone enquiries to the NPIS in 2013/14

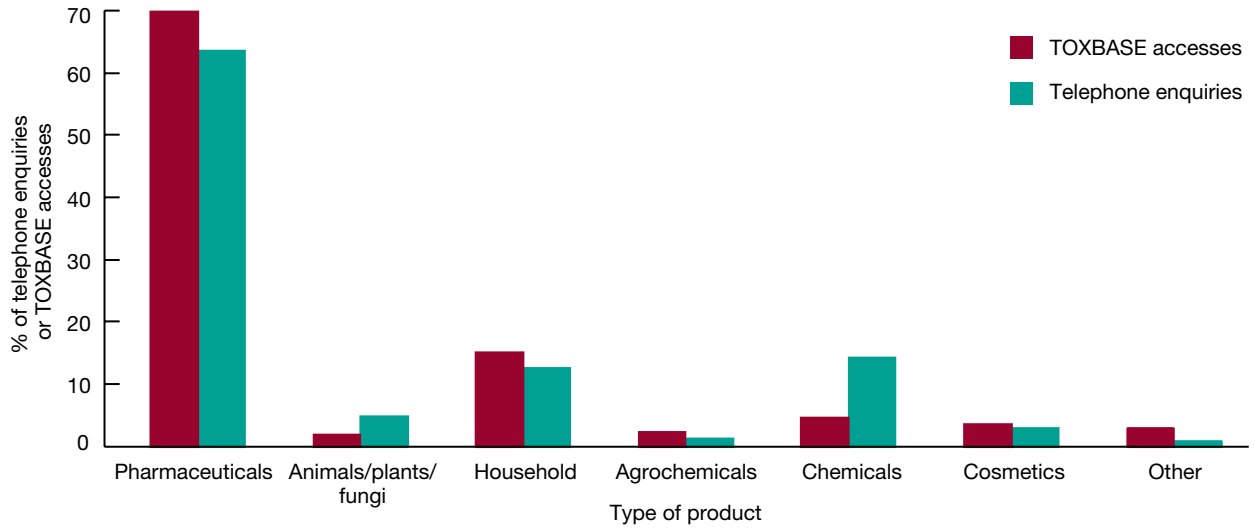


FIGURE 3.5 Types of agents involved in telephone enquiries to the NPIS and TOXBASE accesses in 2013/14

telephone enquiries). As noted in previous years, the percentages of TOXBASE accesses and telephone enquiries for each group of agents were similar except for the chemicals group (4.5% and 14.3%, respectively) and the animals/plants/fungi group (1.9% and 4.8%, respectively). Users may prefer to discuss such cases with the NPIS, as they may be unsure about how to treat poisoning with an unknown species of animal/plant/fungus or with an unknown chemical. Additionally, low toxicity and less common species of plants, or rarely encountered chemicals, may not have monographs on TOXBASE, requiring the enquirer to contact the NPIS for advice. The NPIS is currently undergoing a project to add entries to TOXBASE when a phone enquiry involves a product not found on its database.

Table 3.3 shows the 10 pharmaceutical agents that were most frequently the subject of telephone

TABLE 3.3 Pharmaceutical agents: top telephone enquiries and TOXBASE accesses in 2013/14

	Telephone enquiries		TOXBASE accesses	
Rank	Agent	Number of enquiries	Agent	Number of accesses
1	Paracetamol*	6,105	Paracetamol*	121,800
2	Ibuprofen	2,569	Ibuprofen	50,919
3	Co-codamol†	1,482	Diazepam	26,959
4	Citalopram	844	Citalopram	26,059
5	Tramadol	819	Tramadol	22,696
6	Diazepam	804	Zopiclone	20,688
7	Zopiclone	709	Sertraline	20,277
8	Sertraline	690	Mirtazapine	19,167
9	Mirtazapine	656	Fluoxetine	18,727
10	Aspirin	649	Quetiapine	18,378

* Does not include compound analgesics
† Contains only paracetamol and codeine

BOX 3.1 Non-UK and subscription users of the NPIS

The NPIS provides out-of-hours telephone support under contract to the Republic of Ireland. During 2013/14, there were 1,720 telephone enquiries routed to the NPIS national telephone service from this source. NPIS units also received 174 telephone enquiries from outside the UK and the Republic of Ireland.

As well as the out-of-hours contract, the NPIS provides TOXBASE to medical professionals in the Republic of Ireland, with the majority of users being hospital emergency departments. In 2013/14 there were 9,743 TOXBASE sessions (an increase of 1.4% on 2012/13) made by 46 registered Irish departments, accounting for 29,409 individual TOXBASE accesses (an increase of 7.9% on 2012/13).

TOXBASE is provided under special agreements to users in over 40 countries outside the British Isles; 15,731 TOXBASE sessions were made by these users in 2013/14, an increase of 6.7% on the 2012/13 figure. There were 53,037 product accesses made during these overseas sessions, an increase of 21.5% from 2012/13. As found in previous years, Brazil uses TOXBASE the most, accounting for 26.8% of all overseas user sessions, followed by Australia (13.5%), Belgium (10.2%) and the Czech Republic (8.2%). Just under half (48.5%) of the overseas sessions originated in Europe. A comparison of the top 10 accessed pharmaceuticals by users in the UK, Ireland and overseas countries is shown in Table 3.4. While paracetamol is still the most accessed TOXBASE entry from overseas countries, as a proportion of the total accesses, it is much lower than in the British Isles.

enquiries and TOXBASE accesses. It should be noted that the number of enquiries and accesses listed for paracetamol do not include those for compound analgesics (eg those containing both paracetamol and codeine), which are counted separately. The number of enquiries and accesses for ethanol are also excluded. The pattern of enquiries and accesses are similar to those of the previous two years, with analgesics and antidepressants predominating.

The number of accesses to TOXBASE entries containing paracetamol only showed an increase of 20.7% compared to accesses in 2012/13; telephone enquiries regarding paracetamol showed a decrease of 12.2% compared to 2012/13 (see Section 6.2). While co-codamol is the third most common pharmaceutical about which the NPIS receives telephone enquiries, in 2013/14 it was not one of the top 10 most accessed product entries on TOXBASE.

TABLE 3.4 Pharmaceutical agents: top TOXBASE accesses by UK, Republic of Ireland and overseas users in 2013/14

	UK		Republic of Ireland		Overseas	
Rank	Agent	Count (% of total)	Agent	Count (% of total)	Agent	Count (% of total)
1	Paracetamol*	121,800 (7.8%)	Paracetamol*	2,165 (7.4%)	Paracetamol*	1,164 (2.1%)
2	Ibuprofen	50,919 (3.3%)	Diazepam	617 (2.1%)	Clonazepam	715 (1.3%)
3	Diazepam	26,959 (1.8%)	Zopiclone	569 (1.9%)	Amitriptyline	699 (1.3%)
4	Citalopram	26,059 (1.7%)	Ibuprofen	559 (1.9%)	Sertraline	661 (1.2%)
5	Tramadol	22,696 (1.5%)	Quetiapine	510 (1.7%)	Quetiapine	633 (1.2%)
6	Zopiclone	20,688 (1.4%)	Escitalopram	504 (1.7%)	Fluoxetine	622 (1.2%)
7	Sertraline	20,277 (1.3%)	Pregabalin	503 (1.7%)	Carbamazepine	619 (1.2%)
8	Mirtazapine	19,167 (1.3%)	Alprazolam	467 (1.6%)	Ibuprofen	505 (1.0%)
9	Fluoxetine	18,727 (1.2%)	Venlafaxine	466 (1.6%)	Diazepam	455 (0.9%)
10	Quetiapine	18,378 (1.2%)	Olanzapine	377 (1.3%)	Risperidone	415 (0.8%)

* Does not include compound analgesics

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 (18:00 to 09:00 hours, Monday to Thursday, 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 2,334 referrals made to NPIS consultants (daytime and out-of-hours) in 2013/14, an increase of 5.2% on 2011/12. Figure 3.6 shows referrals by month over the past three years.

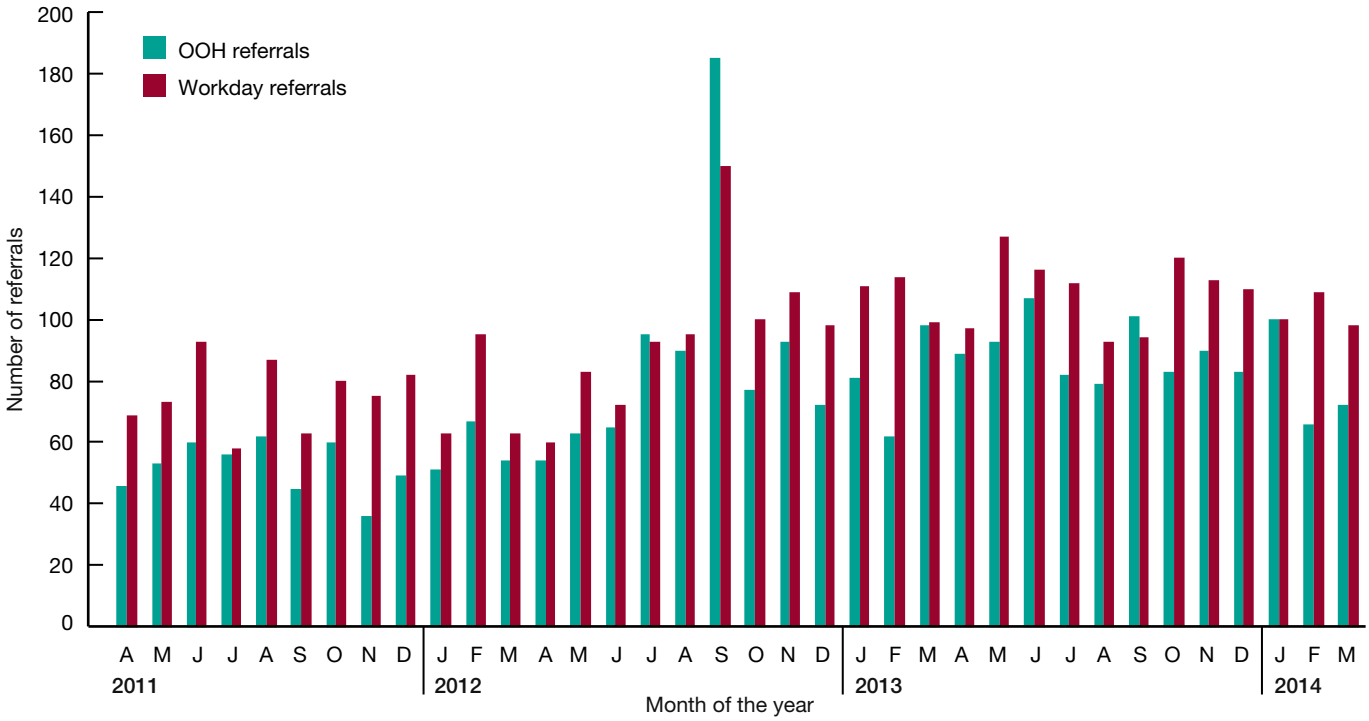


FIGURE 3.6 Monthly NPIS consultant referrals (given as out-of-hours and workday referrals) from April 2011 to March 2014

The spike in enquiries received by the NPIS was a result of changes made to NPIS advice on paracetamol poisoning following recommendations issued by the Commission on Human Medicines in September 2012 (see Section 6.2)

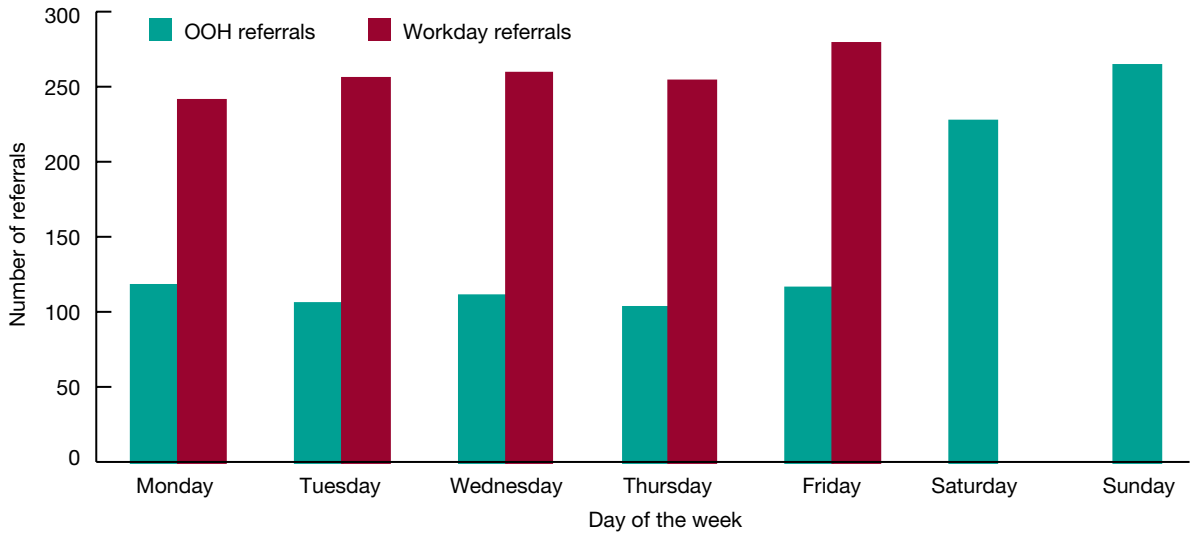


FIGURE 3.7 NPIS consultant referrals (given as out-of-hours and workday referrals) in 2013/14 by day of the week

TABLE 3.5 NPIS consultant referrals by country in 2013/14, with 2012/13 values for comparison

Country	Number of referrals	Rate per 100,000 population*	% in 2013/14	% in 2012/13
England	1,858	3.5	79.6	77.1
Northern Ireland	32	1.8	1.4	1.8
Scotland	285	5.4	12.2	12.8
Wales	117	3.8	5.1	6.0
Republic of Ireland	31	–	1.3	1.8
Other	11	–	0.5	0.6
Total	**2,334**			

* Based on 2012 mid-year population estimates from http://www.ons.gov.uk/ons/rel/pop-estimate/population-estimates-for-uk--england-and-wales--scotland-and-northern-ireland/mid-2011-and-mid-2012/index.html (accessed 30 June 2014)

The distribution of these referrals by day of the week is shown in Figure 3.7. The average number of referrals per day was 6.4 (range 1–17 referrals), with fewer referrals at the weekend. Referrals by country are shown in Table 3.5.

The great majority of consultant referrals came from calls originating in hospitals (2087 or 89.4%), with calls from GPs/primary care being the next most common source (145 or 6.2%: Table 3.6). There was a decrease in consultant referrals following calls from NHS 111, NHS 24 and NHS Direct, down from 5.9% of referrals in 2012/13 to 1.9% in 2013/14.

The enquiries

Table 3.7 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/anti-freeze) and iron. For 154 referrals, the product taken (if any) was unknown and help with diagnosis was required. Ethanol was reported to be involved in 184 consultant referrals.

TABLE 3.6 NPIS consultant referrals from hospital by department in 2013/14

Source	Number of referrals	% of total
Emergency departments	990	42.4
Intensive care units	388	16.6
Other hospital units	197	8.4
Paediatrics	184	7.9
Admission/assessment units	131	5.6
General medicine	107	4.6
Medicines information and pharmacies	22	0.9
Psychiatric units	22	0.8
Unspecified hospital units	37	1.2
Minor injuries units	9	0.4

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.

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

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

TABLE 3.7 Agents commonly involved in NPIS consultant referrals in 2013/14

Rank	Agent	Number of referrals
1	Paracetamol (including 86 co-codamol)	520
2	Drugs of misuse	246
3	Drug/substance (unknown)	154
4=	Antifreeze/ethylene glycol/methanol	91
4=	Iron	91
6	Amitriptyline	78
7=	Digoxin	77
7=	Ibuprofen	77
9	Aspirin/salicylate	73
10	Amlodipine	64
11	Citalopram	62
12=	Bites and stings	61
12=	Quetiapine	61

NPIS Birmingham coordinates the NPIS Product Data Centre and liaises with manufacturers to ensure that the data held are comprehensive and up to date. In 2013/14, 24,633 SDS were added to the Centre, which now holds some 116,000 current SDS, one of the largest product databases in Europe. The database is indexed by product name, manufacturer, date of SDS and the accession date for the SDS to the database. The database is also fully text searchable, which enables searches to be made on any other criteria, eg active ingredients or use.

NPIS Birmingham has also developed a database to support the Centre. This second database holds contact details for more than 2,400 companies, assists in tracking correspondence with companies, and includes data on the current marketing status of products.

The NPIS Product Data Centre is well placed to meet the recent proposals* made by the Competent Authorities for REACH and CLP (CARACAL) and of coding all products by the new 'unique formulation identifier' (UFI), if introduced.

* Harmonisation of Information for Poison Centres; working paper for a possible Commission proposal according to Article 45(4) of Regulation (EC) No. 1272/2008 on classification, labelling and packaging of substances and mixtures

3.4 NPIS Literature Database and *Current Awareness in Clinical Toxicology*

Access to current scientific literature is essential to ensure that NPIS staff are equipped to answer enquiries on all aspects of human toxicology and to keep TOXBASE up to date. All NPIS staff have access 24 hours a day to the NPIS Literature Database, managed by NPIS Birmingham. The database currently contains 99,982 citations on all aspects of clinical, occupational and environmental toxicology. In 2013/14, some 8,479 references were added to the database, which is fully searchable using keywords, authors, journals and text words. Citations are selected using specially developed searches 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 a monthly *Current Awareness in Clinical Toxicology* bulletin. Each issue lists some 400 citations, with around 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, increasing global awareness of the UK's NPIS.

3.5 NPIS Website

The NPIS website, www.npis.org, created and maintained by NPIS Birmingham, 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 health 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.

Between April 2013 and March 2014, the site had over 30,000 visitors and nearly 70,000 page views. The most popular documents downloaded were the NPIS poster listing commonly ingested low toxicity substances and the latest NPIS annual report.

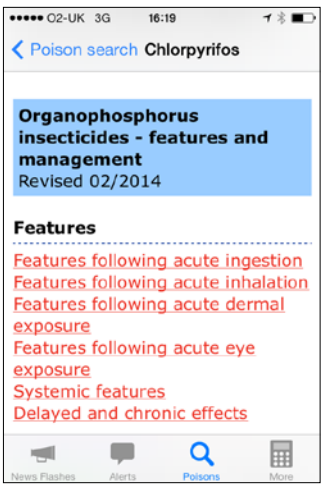
3.6 TOXBASE App for Smart Phones

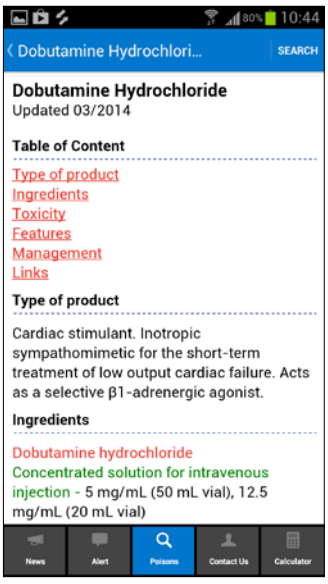
The TOXBASE app has been available for iPhone and iPad since October 2012 and for Android devices since May 2013. Developed in response to advancing technology and user feedback, the TOXBASE app offers greater user mobility and – for the first time – off-line availability of TOXBASE information.

The app is available to individual health 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 users seeking poisons information from around the world.

As of 31 March 2014, 49% of all 550 subscribers were doctors, while ambulance service personnel of all grades represented an additional 36% of users and 28% of users were based in hospital emergency departments. Around 20% of subscribers were located outside the UK.

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. A small fee is charged at the request of the commissioner so that development and hosting costs can be recovered.

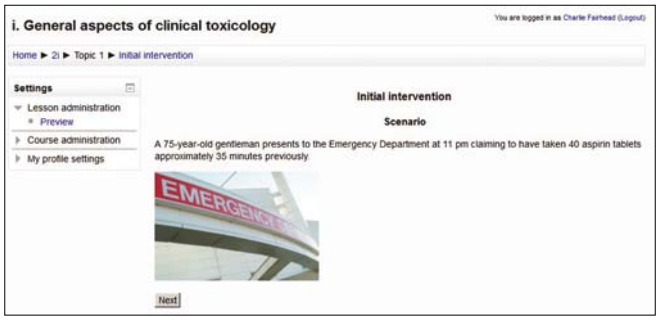




3.7 TOXlearning – A Clinical Toxicology E-learning Resource

A clinical toxicology e-learning resource was first developed by NPIS Edinburgh in 2005. This resource, which used an older-style platform, was available to NHS health care workers across the UK until 2013 and was used by over 2,500 individuals during this period.

On 1 December 2013, the e-learning resource was shifted to a Moodle e-learning platform, and re-launched as 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 assist doctors, nurses and pharmacists in hospitals and general practice, ambulance personnel, staff of NHS 111, NHS 24 and NHS Direct, and other health professionals improve their knowledge of the clinical management of poisoned patients (see Box 3.2).

The resource is being used by between 40 and 60 users per week, 93% of whom come from the UK. The top user types are nurses (29%), ambulance/paramedics (25%) and doctors (17%). The top places of work are NHS 111, NHS 24 and NHS Direct (24%), ambulance services (18%), schools of nursing and medicine (13%) and hospital emergency departments (12%).

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.

BOX 3.2 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

4 UKTIS Activities in 2013/14

4.1 Overview of the Service

The UK Teratology Information Service (UKTIS), formerly the National Teratology Information Service (NTIS), is commissioned to provide advice to UK health professionals on the fetal effects of medicines, poisonings and chemical exposures in pregnancy, and to conduct surveillance of known and emerging teratogens by collecting pregnancy outcome data for these enquiries. UKTIS provides this support through a specialist national teratology telephone line and by maintaining a library of written monographs summarising the scientific data on teratogenic effects of various exposures in pregnancy on TOXBASE. Summaries of all monographs are openly available at www.uktis.org.

Surveillance data collected by UKTIS are reported in UKTIS monographs, presented at scientific meetings internationally, and/or published in peer-reviewed journals. UKTIS also provides information on request to official organisations such as the Medicines and Healthcare Products Regulatory Agency (MHRA), the Commission for Human Medicines (CHM), the European Medicines Agency (EMA), and the Food Standards Agency.

UKTIS works closely with other international teratology services such as the European Network of Teratology Information Services (ENTIS), of which UKTIS is a founder member, Motherisk (Canada) and the Organisation of Teratology Information Specialists (OTIS), which encompasses teratology services in the USA.

In recent years UKTIS has focused on maintaining and updating the written scientific pregnancy drug and chemical monographs available to health professionals through www.toxbase.org. This has enabled UKTIS to manage the increased demands on the service by directing enquirers in the first instance to this written online resource of around 345 documents (providing information on over 400 exposures), thereby encouraging use of the specialist national teratology telephone line only for complex enquiries or where a patient-specific risk assessment is required.

During 2013/14 increased use and awareness of UKTIS continued, with almost 190,000 requests for information on pregnancy exposure received either online or by telephone (Figure 4.1). These included 64,500 downloads of detailed pregnancy monographs from www.toxbase.org, a 12.4% increase compared to 2012/13, and 122,000 UKTIS monograph summary downloads from www.uktis.org by users worldwide, a 50% increase on 2012/13. In addition, there were 2,866 telephone enquiries, a similar figure to that in the previous year (2,888).

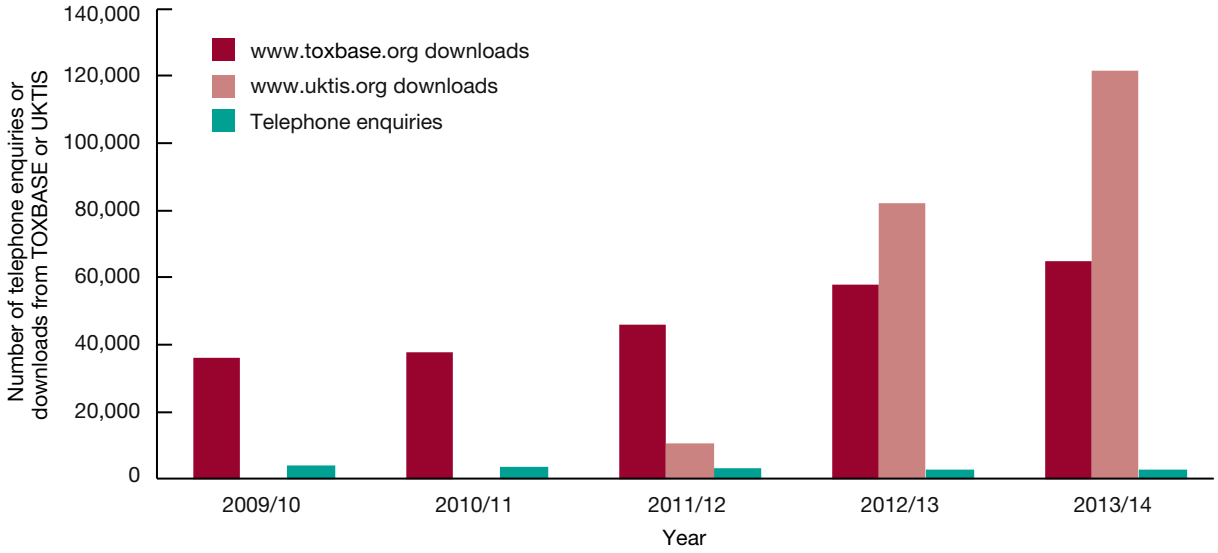


FIGURE 4.1 Telephone enquiries to UKTIS and monograph downloads from www.toxbase.org from April 2009 to March 2014, and monograph summary downloads from www.uktis.org from November 2011 to March 2014

The gradual decline in telephone enquiries over the past five years and dramatic increase in access of online written information produced by UKTIS suggest that the strategies implemented by UKTIS to deal with increasing demands for information have been effective.

The geographical distribution of users of the UKTIS national telephone enquiry line has remained consistent over time (Table 4.1). UKTIS took 43 calls from outside the UK, most of which were from the Republic of Ireland.

TABLE 4.1 Distribution of teratology enquiries to UKTIS in 2013/14

Country	Number of enquiries	% of enquiries	Enquiries per million population
England	2,536	88.5	47.7
East Anglia	*134*	*5.3*	
East Midlands	*223*	*8.7*	
Greater London	*510*	*20.0*	
North East and Yorkshire	*460*	*18.0*	
North West	*364*	*14.3*	
South East	*403*	*15.8*	
South West	*206*	*8.1*	
West Midlands	*236*	*9.3*	
Northern Ireland	23	0.8	12.8
Scotland	124	4.3	23.4
Wales	131	4.6	42.3
Outside the UK	57	2.0	N/A
Channel Islands	*8*	*0.3*	
Isle of Man	*6*	*0.2*	
Other	*43*	*1.5*	
Not recorded	9	0.3	N/A
Total	**2,866**	**100**	

As in previous years, half of all enquiries received by UKTIS related to a drug or chemical exposure that had already occurred in a pregnant woman (Figure 4.2). This is not unexpected as up to 50% of pregnancies are unplanned. Encouragingly, prepregnancy enquiries (21%) and preconception enquiries (11%) accounted for a third of enquiries.

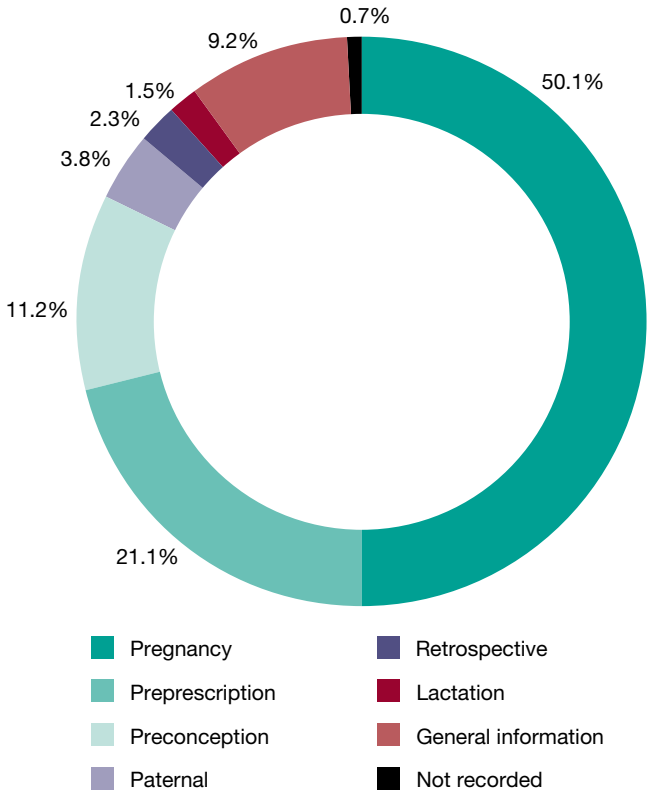


FIGURE 4.2 Telephone enquiries to UKTIS in 2013/14 by stage of pregnancy

Most (87%) enquiries to UKTIS related to the therapeutic use of medicines during pregnancy. The second and third most common telephone enquiries related to drug overdose or poisoning during pregnancy. UKTIS is one of only a few teratology information services worldwide which operates in concert with a poisons service and is therefore able to provide advice on both the immediate management of the poisoned mother and the longer term effects on the fetus. Fewer than 3% of enquiries involved environmental or occupational exposures (Table 4.2).

Hospital pharmacists (31.5%) remain the most frequent type of caller to UKTIS, but absolute numbers have dropped over the past five years and enquiries from GPs (29.3%) now account for almost a third of calls. Hospital doctors represent only 17.4% of service users contacting UKTIS for advice, suggesting that many continue to contact UKTIS through their hospital pharmacist (Figure 4.3).

TABLE 4.2 Telephone enquiries to UKTIS in 2013/14 by category of exposure

Type of exposure	Number of enquiries	% of enquiries
Therapeutic	2,489	86.8
Drug overdose	88	3.1
Poisoning	116	4.0
Substance abuse	29	1.0
Complementary medicines	9	0.3
Occupational	44	1.5
Environmental	40	1.4
Miscellaneous	51	1.8
Total	**2,866**	**100**

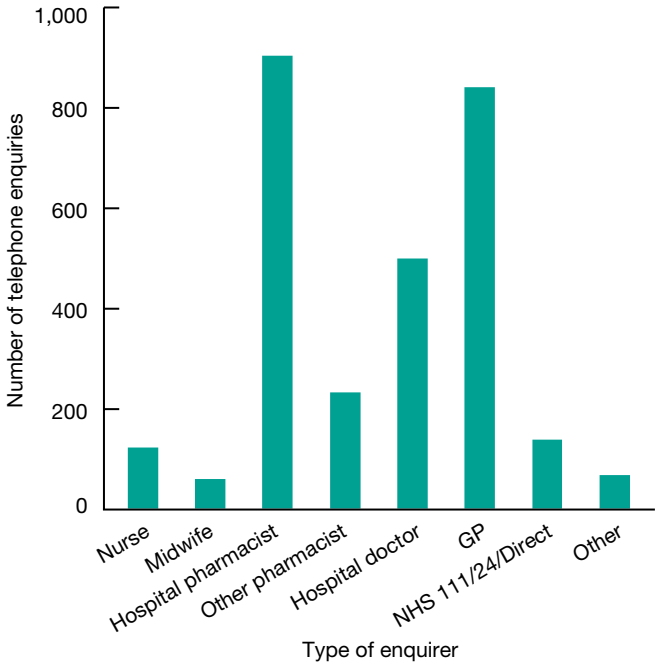


FIGURE 4.3 Telephone enquiries to UKTIS in 2013/14 by profession of enquirer

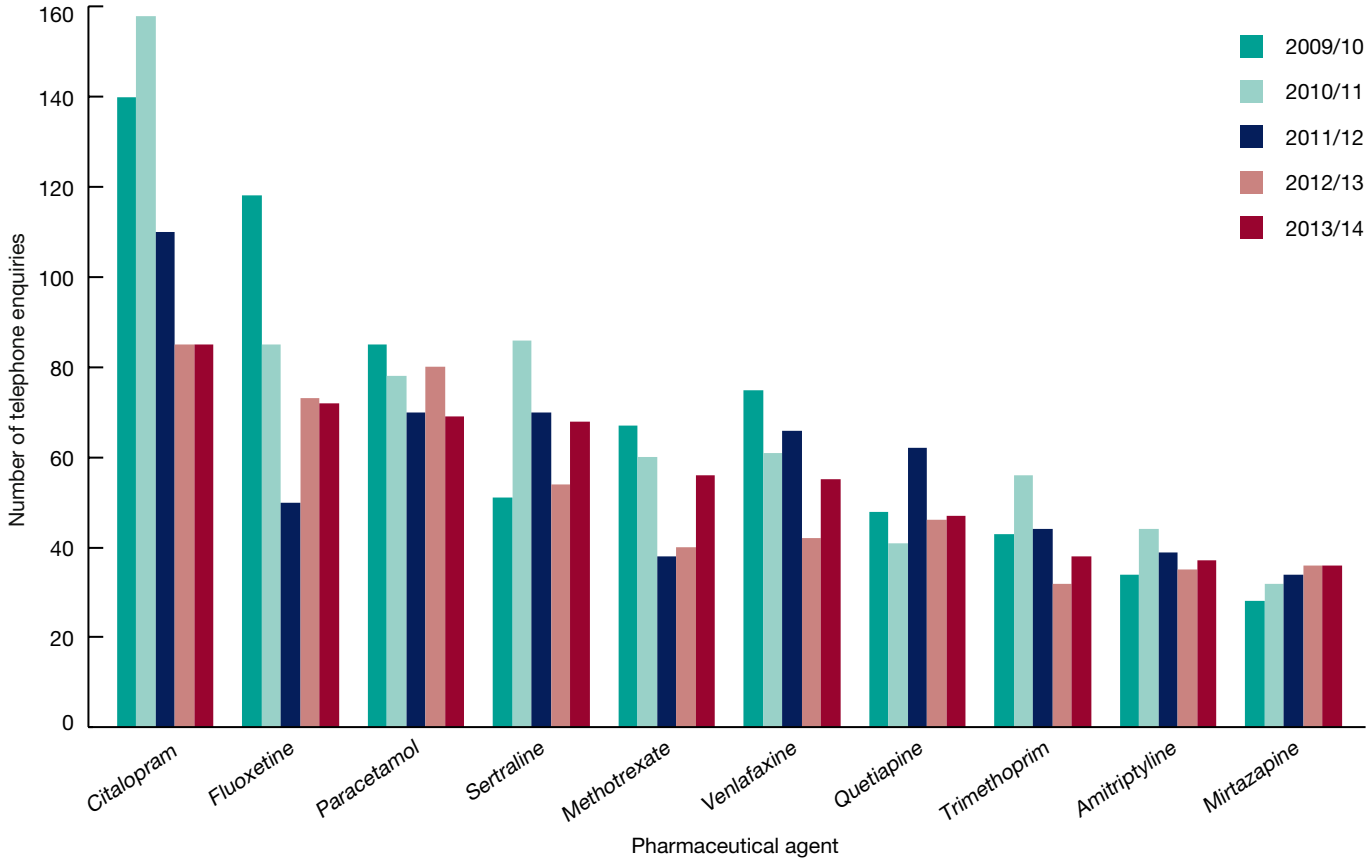


FIGURE 4.4 Top 10 telephone enquiries to UKTIS from 2009/10 to 2013/14 by type of pharmaceutical agent

Substances involved in telephone enquiries

The 2,866 pregnancy related telephone enquiries answered by UKTIS in 2013/14 involved a total of 5,932 chemical or medicine exposures. Telephone requests for current information on the fetal effects of antidepressants and antipsychotics continue to predominate and represent seven of the ten most frequent enquiries to the service. The most common requests are for information on the use of the SSRI antidepressants citalopram and fluoxetine (Figure 4.4).

Pregnancy monographs

UKTIS monographs are comprehensive scientific reviews of published information relating to the teratogenicity or reproductive toxicology of a specific exposure in pregnancy. Pregnancy surveillance data collected by UKTIS are also reported, and, where no published data are available for a substance, unpublished data are reviewed. UKTIS monographs are available to registered users on TOXBASE. In November 2011, monograph summaries were made freely available on the UKTIS website (www.uktis.org).

During 2013/14, UKTIS produced 64 new or updated pregnancy monographs. This is fewer than in previous years due to the simultaneous development of a new public facing website, '***bumps***' (see below) and the production of patient information for this website, which was launched in April 2014.

The monographs that were most commonly accessed differed between registered TOXBASE users (health care providers) and global internet users (who had unrestricted access to summary information on UKTIS). The top 20 most accessed pregnancy monographs on www.toxbase.org and summary documents on www.uktis.org for 2013/14 are listed in Table 4.3.

TABLE 4.3 Top 20 most frequently accessed pregnancy summaries on www.toxbase.org and www.uktis.org in 2013/14

	www.toxbase.org		www.uktis.org	
Rank	Pregnancy monograph	Number of accesses	Pregnancy monograph summaries	Number of accesses
1	Nausea and vomiting	2,280	Hyoscine	3,490
2	Mebendazole	1,821	Trimethoprim	2,878
3	Co-amoxiclav	1,405	Diclofenac	2,550
4	SSRIs	1,289	Gentamicin	1,908
5	Codeine	1,280	Diazepam	1,736
6	Paracetamol overdose	1,035	Aspirin	1,573
7	Amitriptyline	992	Propranolol	1,483
8	Ondansetron	983	Mefenamic acid	1,429
9	Constipation	964	Amitriptyline	1,340
10	Corticosteroids	946	Acetone	1,133
11	Anthelmintics	878	Doxycycline	1,113
12	NSAIDs	860	Saunas and steam room	1,102
13	Ibuprofen	846	Olanzapine	1,035
14	Citalopram	842	Metoprolol	1,029
15	Antibiotics	839	Clarithromycin	1,013
16	Paracetamol	830	Formaldehyde	1,007
17	Diazepam	817	Bisoprolol	1,003
18	Cetirizine	815	Nitrofurantoin	982
19	Tramadol	776	Co-amoxiclav	950
20	Pain relief	766	Venlafaxine	935

4.2 Service Development – New Public Facing Website

A substantial project in 2013/14 was the development of a public facing website, '***bumps***' – best use of medicines in pregnancy (www.medicinesinpregnancy.org). This new website will enable the online provision of openly accessible information that is consistent with that in UKTIS scientific monographs but summarised in a format suitable for members of the public. Twenty-five information leaflets covering 40 pregnancy exposures were available on the website at its launch in April 2014. Additional '***bumps***' information leaflets will be produced in tandem with new or updated UKTIS health care professional monographs, with the aim of producing a patient leaflet for most of the 345 UKTIS monographs on TOXBASE.

A second major component of the '***bumps***' website has involved developing a secure online '***my bump's record***' to enable women to provide anonymised information about themselves, their pregnancy and any pregnancy exposures (such as to medicines, chemicals, alcohol and cigarettes) directly to UKTIS. Once the IT platform has become functional, women who register their pregnancy will be encouraged, by email prompts, to update their record throughout the pregnancy and, where a live-born 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 health professionals and will offer a means of enhanced surveillance, in particular for signals suggestive of longer term effects of a medicine on behaviour or learning ability.

4.3 Surveillance and Research

In 2013/14 UK surveillance data collected by UKTIS contributed to peer-reviewed reports on pregnancy outcomes following maternal treatment with the neuraminidase inhibitors, oseltamivir and zanamivir, during the 2009 A/H1N1 influenza pandemic, and to an international collaborative paper on pregnancy outcome following maternal gabapentin use.

Joint working between UKTIS and the British Isles Congenital Anomalies Registries (BINOCAR) has continued as part of a multiagency response coordinated by UKTIS to implement enhanced surveillance for increased rates of birth defects following the outbreak of the novel Schmallenberg virus in autumn 2011. This caused limb deformities in fetuses of infected cattle and sheep, but reassuringly surveillance through this programme does not suggest a teratogenic effect in humans.

UKTIS collaboration in a European multicentre research project with 31 public and private partners is ongoing. The project, Pharmacoepidemiological Research on Outcomes of Therapeutics (PROTECT), has been funded by the EU Innovative Medicines Initiative to address limitations of current methods in the field of pharmacoepidemiology and pharmacovigilance. PROTECT will trial direct patient data collection using web-based and telephone systems. It will test the transferability of the data into a common language and explore linkages to data from electronic health records and registries. In the past year UKTIS has recruited patients to the study. Recruitment closed in March 2014 and data analysis is now underway.

UKTIS continues to collaborate with other teratology services around the world to report on the safety of specific exposures during pregnancy. In 2013/14 UKTIS contributed UK data to new international studies on a number of drugs for which human pregnancy data are limited or lacking. UKTIS initiated and led on an ENTIS (European Network of Teratology Information Services) collaborative study on varenicline use in pregnancy.

Funding has been obtained for several projects in conjunction with other academic institutions. The National Institute for Health Research (NIHR) Health Technology Assessment Programme has funded a review of the evidence for safety and efficacy of therapies used in the treatment of hyperemesis gravidarum (severe pregnancy sickness). Two further studies focus on investigating the longer term neurodevelopmental effects of *in-utero* exposure to antiepileptic drugs in collaboration with Bath University, the UK Epilepsy Register and the Liverpool Neurodevelopment Group, which will start in 2014.

5 Clinical Governance

Service quality and patient safety in particular are the highest priority for the NPIS. Substantial efforts are made to ensure that NPIS staff are properly trained and supported and have access to the information they need for their work. The NPIS employs robust and comprehensive clinical governance arrangements supported by detailed operational procedures to ensure that these are applied consistently in each unit. The key features of the NPIS clinical governance arrangements are 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 contentious issues, ensuring consistency of approach

Access to high quality information, eg TOXBASE

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

Continuous support from senior staff, including availability, 24 hours a day, 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 activities encompassing all aspects of NPIS work

5.1 Analysis of Critical Events

Systems are in place within the NPIS to review critical incidents so that lessons can be learned and experience shared with all relevant staff across the service nationally. The aim is to eliminate avoidable adverse patient outcomes and continuously improve service quality. The NPIS has an open culture which encourages staff to report critical events, including complaints, adverse comments or near misses, without fear of recrimination. Reported events are reviewed initially by the director of the originating unit and those with possible relevance to the other NPIS units are reviewed at a national level by the NPIS 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 any necessary changes.

Between April 2013 and March 2014, there were 12 events reported and discussed nationally. Two of these related to TOXBASE guidance. One enquirer suggested an additional form of therapy that might be considered in severe poisoning and another sought justification for a recent change in the TOXBASE guidance. Evidence-based responses to both of these were provided that justified the content of the relevant TOXBASE entry. Three further events related to TOXBASE functionality or inappropriate downloading of TOXBASE information. The latter prompted actions to improve data security, including a more formal system of password updating.

One episode related to advice provided by telephone; on review, the Clinical Standards Group considered that the advice provided was clinically justified. In contrast to some previous years, there was only one episode of loss of telephone services – a temporary problem affecting a single unit due to errors in moving to a new telephone provider. This decline in adverse events relating to telephone functionality provides evidence of a more robust service since the institution of the BT Cloud system (see Box 2.1).

Two episodes related to confidentiality of emailed messages. As a result, appropriate procedures for emailing information and maintaining data protection were reinforced with staff. Two episodes related to requests from hospitals for data for use in their internal enquiries into patient deaths where NPIS advice was not called into question. Finally, following several distressing calls to the service from members of the public expressing suicidal ideas, a procedure for dealing with such enquiries is being developed in conjunction with other support organisations.

5.2 Quality Assurance Exercises

TOXBASE

Formal quality assurance information from TOXBASE users is obtained by an online questionnaire. A selection of users is automatically asked to complete and submit short quality assurance forms during their online sessions. 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 reduce user fatigue.

A total of 873 returns were received between 1 April 2013 and 31 March 2014. The respondents comprised 99 hospital consultants, 56 GPs, 221 other grade doctors, 210 nurses, 120 NHS helpline staff – NHS 111, NHS 24 and NHS Direct – 74 pharmacists and 52 ambulance staff/paramedics.

There were 451 users who reported that they primarily used TOXBASE for 'routine enquiries', 267 for a 'triage decision' and 155 for 'complex enquiries'; 214 reported using TOXBASE daily, 375 weekly and 284 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 5.1).

When asked to indicate their overall satisfaction with TOXBASE on a scale of one to six where one = poor and six = excellent, 847 (91.7%) scored either five or six.

TABLE 5.1 Summary of user satisfaction scores for TOXBASE

Rank	Question	Satisfaction score (%)*
1	I had confidence in the information for my query	96.2
2	Logging on to the database was easy	90.4
3	The information was sufficient for managing this case	88.5

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

Users were invited to give comments and suggestions in a free text field. Any issues specific to entries were dealt with as they arose, while the remainder were collated for discussion at the TOXBASE Editing Group and NPIS Clinical Standards Group meetings.

In summary, the majority of respondents reported they found use of TOXBASE easy and that the database provided the information they required.

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 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 873 returns, 137 (14.5%) included free text comments. The free text comments can be grouped as shown in Table 5.2.

TABLE 5.2 Summary of free text comments from quality assurance returns

Positive comments	46 (33.5%)
Specific issues	30 (21.9%)
Other services	19 (13.9%)
Suggestions	16 (11.7%)
Negative comments	12 (8.8%)
Information technology	8 (5.8%)
General	6 (4.4%)

Products of interest questionnaire

Between 1 April 2013 and 31 March 2014, NPIS Edinburgh received 40 questionnaires related to products of interest on TOXBASE. These marked products 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 can be very useful for keeping entries up to date.

The most common category of agent reported was novel psychoactive agents (NPS). Sixteen exposures to NPS agents were reported: mephedrone (5), SCRAs (synthetic cannabinoid receptor antagonists) (5), benzo fury (2), 25C, 2C-D, 2C-I and dimethylamphetamine. Common symptoms reported included agitation (8 cases), tachycardia (6) and convulsions (5).

Twelve exposures to pharmaceutical products were reported: agomelatine, azathioprine, baclofen, dosulepin, etanercept, letrozole, levetiracetam, memantine, montelukast (2), orlistat and propecia. Most pharmaceutical exposures reported minor or no features of toxicity. Two exposures to the unlicensed pharmaceutical melanotan were reported. Both reported gastrointestinal effects following injection into the abdomen.

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 by the forms on TOXBASE, or by email, letter or telephone.

Telephone information service

The NPIS units have collected information on user satisfaction with their telephone enquiry service since 2002. The purpose of this survey is to establish service performance, as well as user requirements and expectations. This report provides the results of the stakeholder quality assurance questionnaire exercise for 2013/14, the 11th such exercise to be conducted.

Questionnaires were sent to a random sample of callers using the same methodology for each unit. The sample size is at least 5% of all telephone enquiries in each unit, with the exception of Edinburgh, which is not open 24 hours a day and takes fewer telephone enquiries, so is required to survey a larger proportion (10%) in order to obtain an adequate sample size.

Data are presented for the period 1 April 2013 to 31 March 2014, with equivalent figures for 2012/13 provided, in brackets in italic text, for comparison. During 2013/14, the four NPIS units answered 52,031 enquiries *(49,996)* that involved a specific patient and sent out 2,531 *(2,707)* questionnaires, a 4.9% sample overall. Birmingham and Cardiff surveyed 4.1% and 3.9% of their telephone enquiries, respectively; Newcastle surveyed 5.0% and Edinburgh 10.5%. There were 856 *(1,012)* responses received, a response rate of 33.8% *(37.4%)*. The number of questionnaires sent out and returned remains comparable to that in previous years, with a response rate that is typical of surveys of this type.

The designation of respondents reflected the profile of all users of the service, with GPs the most frequent respondents at 28.9% *(32.7%)* of all responses.

An important improvement observed was in the proportion of respondents checking TOXBASE before calling the service, which increased to 46.8% *(37.5%)*. As in previous years, those accessing TOXBASE first made their telephone enquiry most often because either they considered the information available on TOXBASE to be insufficient to answer their enquiry (52.7% *(51%)*) or there were special circumstances (30.2% *(34.2%)*). Other reasons for making a telephone enquiry were because there was a local protocol to call the NPIS (4.0% *(3.8%)*), they could not interpret the information on TOXBASE (9.9% *(9.5%)*), or they thought that the information on TOXBASE contradicted other information they had (3.2% *(1.5%)*).

Of those who did not access TOXBASE first, compared to the 2012/13 survey, there were no important changes in the reasons identified (Table 5.3). The proportion who were unaware of the availability of online information on TOXBASE changed little (27.6% *(26.3%)*). GPs continue to be the most common user group selecting this option (52.5% *(51.9%)*).

TABLE 5.3 Reasons why telephone enquirers did not consult TOXBASE first

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

TABLE 5.4 Summary of user satisfaction scores for telephone enquiries

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

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

During 2013/14, 22% *(18.5%)* of respondents reported that they do not have access to TOXBASE, while other users experienced difficulty logging on (13.1% *(12.5%)*). The numbers of people reporting that they have not been trained to use TOXBASE was a little lower than in 2012/13 at 9.7% *(12.3%)*.

As an assessment of the perceived overall quality of the service, respondents were asked how much they agreed or disagreed with a series of statements relating to their particular enquiry.

Respondents showed a high degree of satisfaction (Table 5.4). Especially good feedback (more than 96% satisfaction) was obtained for questions about the politeness of the staff, promptness of enquiry handling, confidence in the reply, the amount of information provided and the speed of delivery of the information. The satisfaction score was still more than 90% for the time taken to answer the telephone.

The overall satisfaction with the telephone enquiry service remains very high, defined as a score of five or six out of a total of six, with an overall satisfaction score of 97.6% (96.2%) if non-respondents to this question are excluded from the denominator and 95.1% (93.3%) if they are included. There were no important differences in the overall satisfaction scores between the units (Figure 5.1) and the scores were at least as good as in previous years (Figure 5.2).

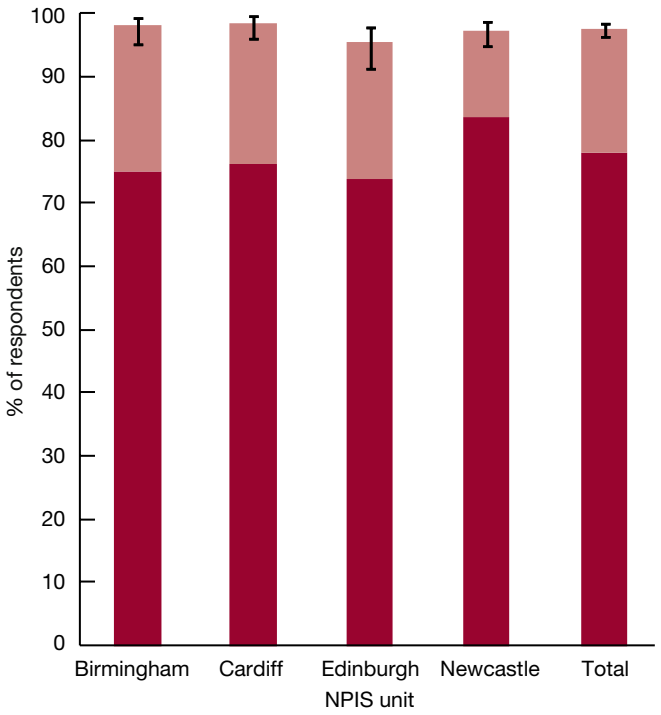


FIGURE 5.1 Overall quality scores (with 95% confidence intervals) in 2013/14 for the four NPIS units, expressed as a proportion of respondents scoring 5 ( ) or 6 ( ) out of a possible 6. Non-respondents are excluded from the denominator

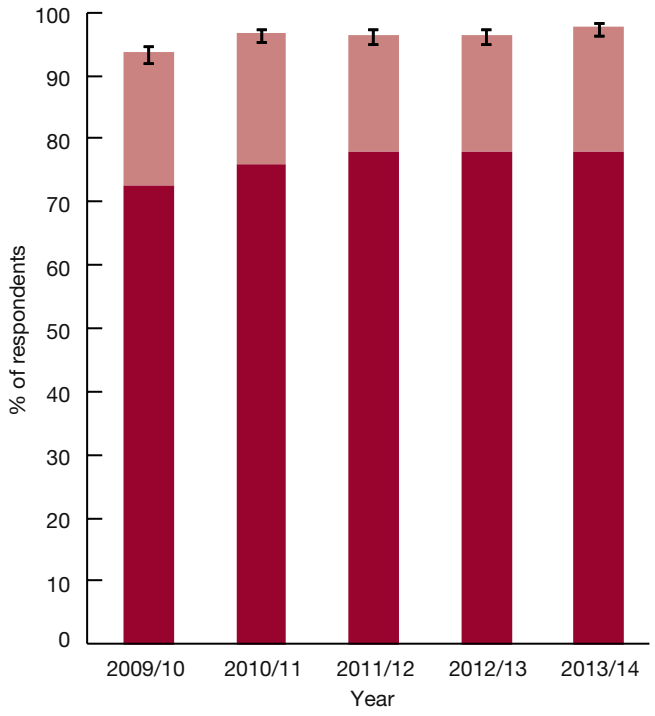


FIGURE 5.2 Overall quality scores (with 95% confidence intervals) for the four NPIS units expressed as a proportion of respondents scoring 5 ( ) or 6 ( ) out of a possible 6. Non-respondents are excluded from the denominator

In summary, respondents continue to have a very high level of satisfaction with the NPIS telephone service. The low response rate (as is typical for surveys of this nature) may have introduced bias, although this could be in either direction. As in previous years, satisfaction was slightly less for the speed with which telephone enquiries were answered – indicating one area where the service could be improved.

UKTIS

As part of its interest in customer satisfaction, UKTIS regularly asks for feedback from service users. During 2013/14, a random sample of 23 enquiries per month, representing about 10% of the monthly total of 276 enquiries made directly to UKTIS, was selected for quality assurance monitoring. Questionnaires were sent out to enquirers between one and four weeks after the enquiry. As of May 2014, 60 (21.7%) of these forms had been returned.

The designation of respondents was similar to that in previous years: GPs (45%), pharmacists (23%), hospital consultants (12%), nurses (5%), and others (13%). Of the 60 respondents, 19% had used the service more than five times and 48% had used the service between one and five times previously; 33% were first-time enquirers.

Satisfaction scores remained very high and showed further improvement compared to 2012/13, with 95% of respondents reporting confidence in the reply given and 97% of respondents reporting that the UKTIS staff who dealt with their enquiry were polite and pleasant (Table 5.5). All health professionals completing the feedback form reported they would use the service again.

TABLE 5.5 Summary of user satisfaction scores for UKTIS in 2013/14

Question	Satisfaction score (%)*
It was easy to contact UKTIS (agree)	97
The reply from UKTIS was relevant and useful (agree)	92
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)	86
The person I spoke to was polite and pleasant (agree)	97
The information was sufficient for my needs (agree)	90
I had confidence in the reply I was given (agree)	95
The information received was sufficiently detailed (agree)	97
Overall satisfaction with the service	93

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

5.3 Training and Continuing Professional Development

A comprehensive initial training programme and a national programme of continuing education makes an important contribution to the clinical governance of the NPIS, ensuring all staff are equipped to provide accurate, evidence-based advice on all aspects of poisoning.

Initial training

Each unit provides new scientific staff with structured in-house training and assessment in both theoretical clinical toxicology and communication skills, following a nationally agreed curriculum. Additionally, if not already achieved at appointment, a post-graduate qualification in toxicology is completed as soon as possible after employment commences.

Continuing professional development

One NPIS consultant is appointed by the directors for a three-year term to coordinate a rolling programme of continuing professional development (CPD) meetings for NPIS scientific and clinical staff. There are four CPD meetings each year, hosted by the NPIS units in turn. Consultant attendance is monitored as part of performance assessment.

These meetings ensure not only that everyone involved in front-line delivery of advice is up to date with the latest developments within the specialty, but also that all staff are fully aware of new or changing responsibilities within the NPIS. The meetings also provide an informal forum where colleagues can discuss difficult or controversial clinical issues and staff can gain experience in presenting cases and concerns and questions in a non-threatening environment. The routine internal review of audio recordings can highlight challenging and complex enquiries to discuss at CPD meetings. In addition, these meetings offer an opportunity for face-to-face contact between the scientific and medical staff who have previously only been in contact by phone, out-of-hours, to discuss enquiries. A sample CPD programme is shown in Figure 5.3.

Staff are encouraged to submit papers to national and international congresses and scientific meetings hosted by toxicological organisations such as the British Toxicology Society and the European Association of Poisons Centres and Clinical Toxicologists (EAPCCT). For example, NPIS staff presented some 45 posters or oral presentations at the 33rd International Congress of the EAPCCT held in Copenhagen in May 2013. Details of publications and presentations are provided in Appendix B.

NPIS CPD Cardiff

6 March 2014

Postgraduate Centre, University Hospital, Llandough, Cardiff

09.30	*Coffee*	
09.50	*Welcome and housekeeping*	
	Hot Topics *Chair: John Thompson*	
10.00	'Novel anticoagulants'	James Coulson
10.20	Magnesium poisoning in a neonate	Sian Harbon, Alison Thomas
10.40	Paracetamol poisoning in pregnancy	Alison Thomas, Euan Sandilands, Bornnali Das
11.20	Enhanced elimination: balancing cost and effectiveness in individual poisoned patients	Darren Roberts
11.50	Is there a risk of heavy metal poisoning from prosthetic hips?	Sally Bradberry
12.10	*Lunch*	
	NPIS Practice *Chair: James Coulson*	
13.10	Changes to package and labelling regulations	Peter Lamb (CRCE London)
13.40	Handling hazardous chemicals enquiries	Euan Sandilands
14.10	Desferrioxamine dose and duration: how does the evidence inform NPIS advice?	Catherine Crawford
14.40	What can the stats packages on the cloud tell us about our performance?	Alex Campbell
15.10	*Feedback and close*	

FIGURE 5.3 Sample CPD programme

6 Areas of Interest in 2013/14

6.1 Drugs of Misuse

Provision of clinical advice to health professionals managing patients with toxicity following exposure to drugs of misuse can be challenging. In addition to the 234 substances controlled under UN conventions, more than 250 novel psychoactive substances (NPS) have been recognised* and the availability of each in the UK varies with time and place, often rapidly. Furthermore, for NPS there are often very few pharmacological, toxicological or clinical data available to guide management. A further difficulty is that some drugs of misuse are sold under proprietary brand names, the chemical constituents of which may be unknown or multiple and often change over time.

It is therefore important that the NPIS retains a high level of clinical awareness of the substances and branded products in circulation in the UK and internationally and of their toxicity. The NPIS is uniquely placed to characterise the patterns and detailed clinical characteristics of the harms associated with drugs of misuse because of the frequency of contact with clinical staff treating poisoned patients across the UK. The European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) has recognised that data on the clinical harms associated with drugs of misuse are not collected and reported systematically across Europe and that such data should be an important component of toxicosurveillance. The NPIS, as a well-known and well-respected UK-wide, 24 hours a day operation, with extensive experience of collecting data on clinical harm, using a well-validated methodology and with a strong history of reporting such harms, has therefore been called upon to provide such data for the UK.

As for all NPIS data, the number of telephone enquiries and TOXBASE accesses are not direct measures of the prevalence of drug toxicity or of hospital admission. Rather they provide an indirect measure of the substances and harms being encountered by NHS professionals using the NPIS. Analytical confirmation of the specific substance(s) is typically not available and so data describe exposures as reported to the NPIS.

BOX 6.1 Substances currently being monitored by the NPIS

2 C-E	DOM
25I-NBOMe	Ethylone
2-AI	Flephedrone
2-AT	GBL
2C-B	GHB
2C-I	Heroin
2C-T-7	Ivory wave (NOS)*
2-MeO-diphenidine	Ketamine
4,4,DMAR	‘Legal highs’ (NOS)*
4-FMA	LSD
4-methyl aminorex	Magic mushrooms
4-methylamphetamine	mCPP
4-MTA	MDAI
5 or 6-APB	MDMA
5-IT	MeOPP
AH-7921	Mephedrone
Amineptine	Methadone
Amphetamines	Methamphetamine
AMT	Methcathinone
Barbiturates	Methedrone
BromodragonFLY	Methoxetamine
Butylone	Methylenedioxypyrovalerone
BZP	Methylone
Cannabis	MPA
Cocaine	MT-45
Desomorphine	Naphyrone
Desoxypipradrol (2-DPMP)	Organic nitrites
Diphenylprolinol (D2PM)	PMA
DOB	PMMA
DOI	‘Spice’/synthetic cannabinoid receptor agonists (SCRAs)
	TFMPP

* Not otherwise specified

* World Drug Report, 2013. United Nations Office on Drugs and Crime. Accessed at http://www.unodc.org/unodc/secured/wdr/wdr2013/World_Drug_Report_2013.pdf

However, published NPIS data relating to substances of misuse correlate closely with data from other sources, including those with analytical confirmation.

Enquiry numbers

During 2013/14 the NPIS specifically monitored telephone enquiries and TOXBASE accesses relating to 61 different drugs of misuse (Box 6.1), including NPS. As the data reported include only 61 substances, they do not represent all NPIS activity pertaining to drugs of misuse. For example, data on telephone activity related to branded products where the chemical content may be uncertain, are excluded.

The NPIS received 1,561 telephone enquiries related to the 61 monitored drugs of misuse during 2013/14, a 30% increase since 2012/13, and constituting 3.0% of all NPIS telephone enquiries (see Table 6.1 for the most common drugs of misuse). Over the same period there were 58,469 TOXBASE accesses related to these 61 substances, an increase of 10.3% over the previous year, representing 4.0% of all TOXBASE accesses. When corrected for overall increases in NPIS telephone enquiries and TOXBASE accesses, these drugs of misuse telephone enquiries increased by 24.9% and TOXBASE accesses by 0.6% compared to 2012/13.

Key changes compared to 2012/13

The largest increases in activity relate to synthetic cannabinoid receptor agonists (SCRAs) for which telephone enquiries increased more than 13-fold (from 10 to 131 enquiries), making these substances the second most common drug of misuse encountered in telephone enquiries after cocaine. Similarly, TOXBASE accesses for SCRAs have increased by 253% and these are now in the top 10 drugs of misuse accessed. This is of concern to health professionals as the toxicity of SCRAs appears to be different and more severe than that for cannabis.

Enquiries relating to 'legal highs' (not otherwise specified), including enquiries where the specific chemical involved has not been identified and branded products where the chemical contents are unknown, have also increased substantially compared to last year, with 63% and 66% increases in telephone enquiries and TOXBASE accesses, respectively.

Outside the top 10 substances, other changes of note compared to last year are increased activity regarding LSD, with a 150% increase in telephone enquiries (8 to 20) and a 58% increase in TOXBASE accesses (701 to 1,104). TOXBASE accesses for alphamethyltryptamine (AMT)

TABLE 6.1 Top 10 drugs of misuse for telephone enquiries and TOXBASE accesses

	Telephone enquiries			TOXBASE accesses		
Rank	Drug of misuse	Number of enquiries in 2013/14	% change from 2012/13	Drug of misuse	Number of accesses in 2013/14	% change from 2012/13
1	Cocaine	159	23.3	Cocaine	8,889	23.9
2	SCRAs*	131	1,330.8	Mephedrone	7,061	–16.3
3	'Legal highs' (NOS)†	111	63.1	MDMA	5,857	22.6
4	MDMA	104	19.1	Amphetamines	5,124	26.4
5	Cannabis	103	30.8	Heroin	4,862	26.4
6	Heroin	85	–0.9	Ketamine	3,576	19.5
7	Amphetamines	76	25.9	Cannabis	3,526	11.4
8	Methadone	68	22.1	Methadone	2,615	–9.1
9	Barbiturates	66	4.5	'Legal highs' (NOS)†	2,381	65.9
10	Mephedrone	57	–14.5	SCRAs*	2,367	252.8

* Synthetic cannabinoid receptor agonists, including 'Spice'

† 'Legal highs' (not otherwise specified) refer to NPIS enquiries where the specific substance has not been identified although the exposure to a 'legal high' is confirmed (for example, the patient has taken a tablet, powder or branded product) or the 'legal high' page on TOXBASE has been accessed

increased by 347% (53 to 247), although telephone enquiries decreased by 55% (31 down to 14). The NPIS has received telephone enquiries and TOXBASE accesses related to desomorphine, a synthetic opiate, for the first time this year. Figure 6.1 shows activity related to selected (most frequently encountered) individual substances.

In addition to the above, the NPIS received 10 telephone enquiries and 90 TOXBASE accesses regarding the products 'Green Rolex' or 'Green Budweiser'. Based on the available analytical data, these contained paramethoxyamphetamine and paramethoxy-methamphetamine at the time of the enquiries. 'Green Rolex' products were associated with several deaths during 2013/14.

Monthly trends

Monthly trends in telephone enquiries and TOXBASE accesses for specific substances are shown in Figure 6.2. These demonstrate the increased and sustained activity relating to SCRAs and 'legal highs'.

Mephedrone enquiries remains relatively high compared to other NPS, although telephone enquiries and TOXBASE accesses regarding mephedrone have reduced compared to last year, by 15% and 16%, respectively. TOXBASE data suggest a seasonal variation in the use of mephedrone, with increased enquiries over the summer months. The reasons for this are uncertain, but summer music festivals may be one contributing factor.

Annual trends

Over the last decade, as a result of increasing awareness and use of TOXBASE, overall NPIS activity has evolved so that there has been an increasing proportion of enquiries through TOXBASE accesses and fewer telephone enquiries (although this year calls have increased by 3.5%). In order to compare data for drugs of misuse between different years, data reported over the longer term are presented as proportions of the total NPIS telephone and TOXBASE activity (Figures 6.3 and 6.4).

Cocaine, MDMA and heroin continue to account for the largest proportions of NPIS activity relating to class A drugs have been observed for both telephone enquiries and TOXBASE accesses. The exceptions are heroin (telephone enquiries) and methadone (TOXBASE).

Data provision

The NPIS provides statistical data requested by the UK Focal Point on Drugs Early Warning System, the Advisory Council on the Misuse of Drugs and the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA). Box 6.2 shows the reports provided during 2013/14.

BOX 6.2 Reports provided by the NPIS relating to drugs of misuse including novel psychoactive substances

Home Office

Report on enquiries from UK health professionals relating to tryptamines	March 2014
Report on enquiries from UK health professionals relating to synthetic cannabinoid receptor agonists	March 2014

DEWS* (for EMCDDA)

Updated report on enquiries relating to methoxetamine, AH-7921, 25I-NBOMe and methylenedioxypyrovalerone (MDPV)	February 2014
Report on enquiries relating to methoxetamine, AH-7921, 25I-NBOMe and methylenedioxypyrovalerone (MDPV)	November 2013

DEWS

Information on acute toxicity relating to alphamethyltryptamine	November 2013
Telephone and TOXBASE enquiries relating to the top 20 NPS encountered by the NPIS since 1 January 2013 for the EU iTREND project	July 2013
NPIS data relating to 'Exodus' products	June 2013
Report on enquiry numbers relating to 5- or 6-(2-aminopropyl)benzofuran, 5- and 6-(2-aminopropyl)-2,3-dihydrobenzofuran (5- and 6-APDB) and 5- and 6-(2-aminopropyl)indole	May 2013

* Drugs Early Warning System

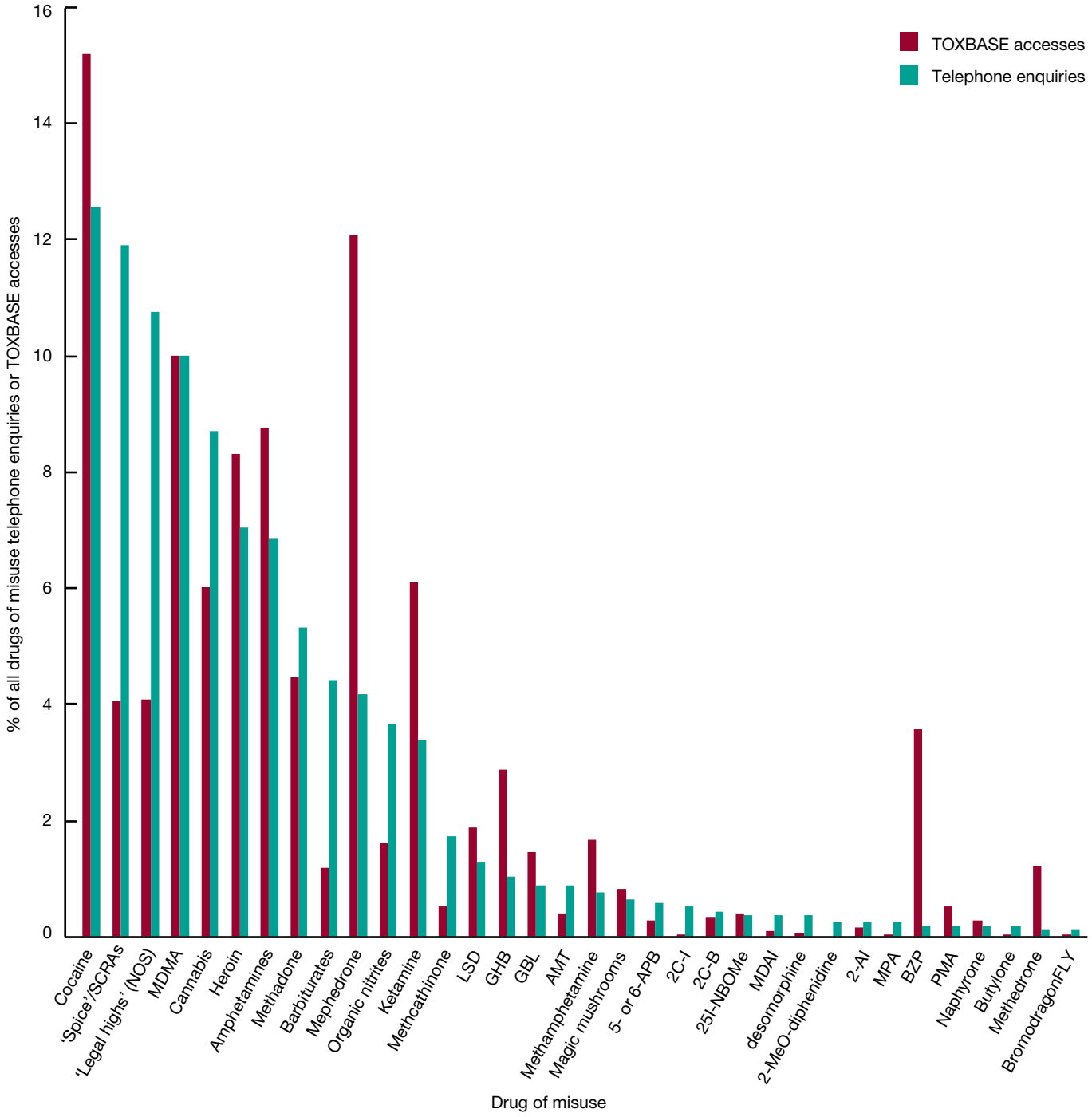


FIGURE 6.1 Activity related to individual substances as a proportion of the total drugs of misuse activity in 2013/14 (the most commonly encountered substances are shown)

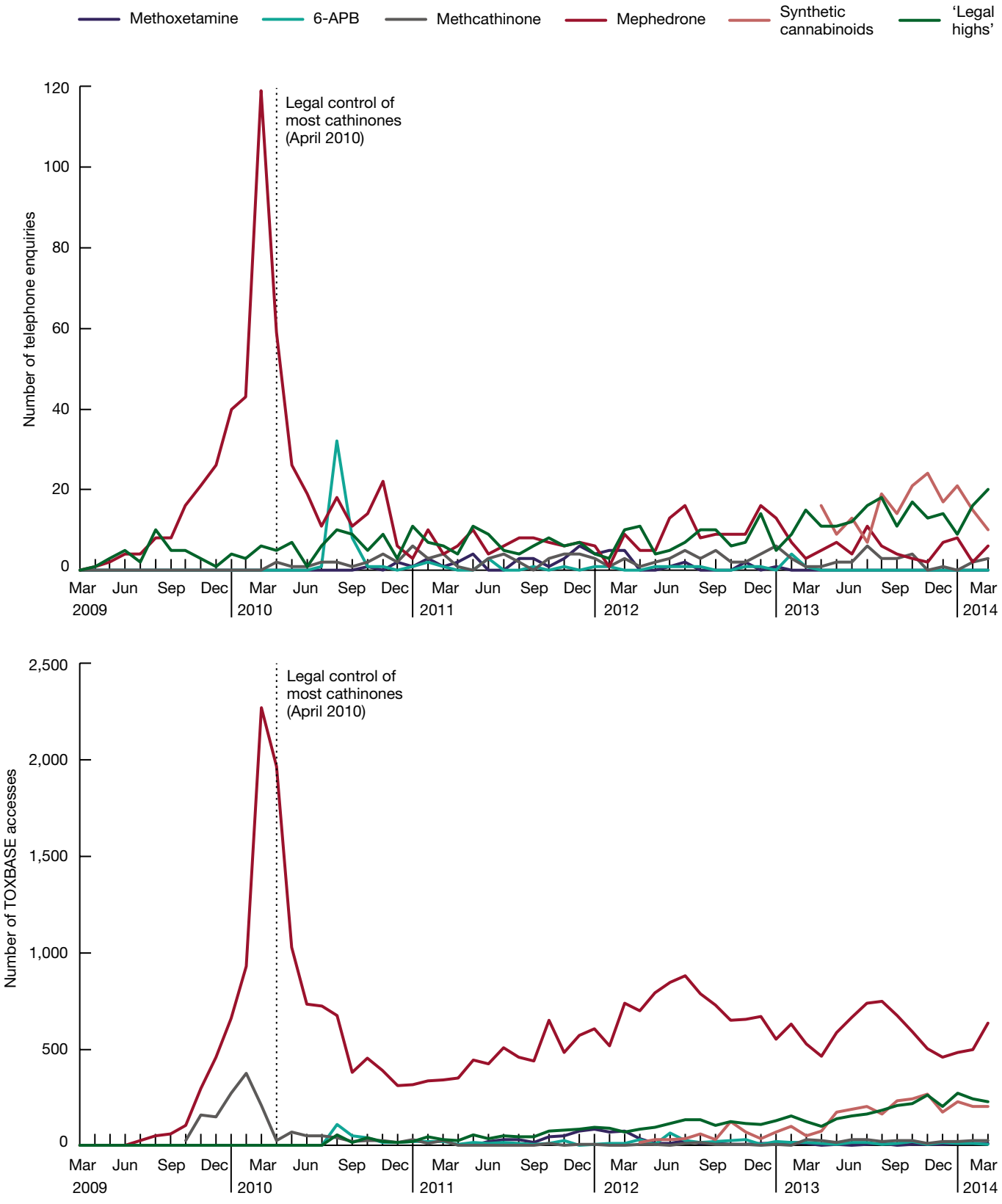


FIGURE 6.2 Monthly trends in telephone enquiries to the NPIS (above) and TOXBASE accesses (below) for specific substances from March 2009 to March 2014

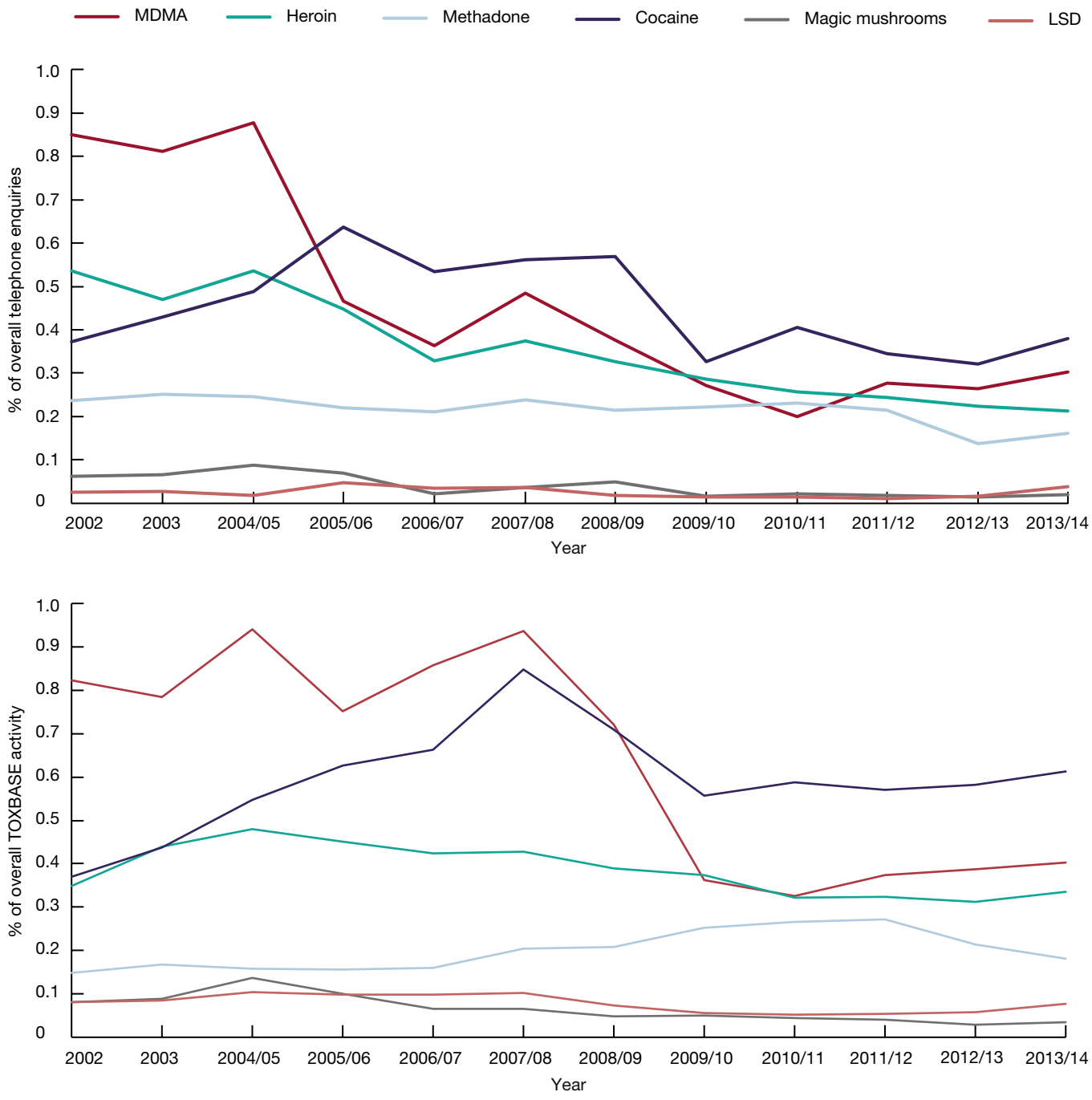


FIGURE 6.3 Proportion of telephone enquiries to the NPIS (above) and TOXBASE accesses (below) relating to selected class A drugs of misuse (data for 2002 and 2003 by calendar year; subsequent data by financial year)

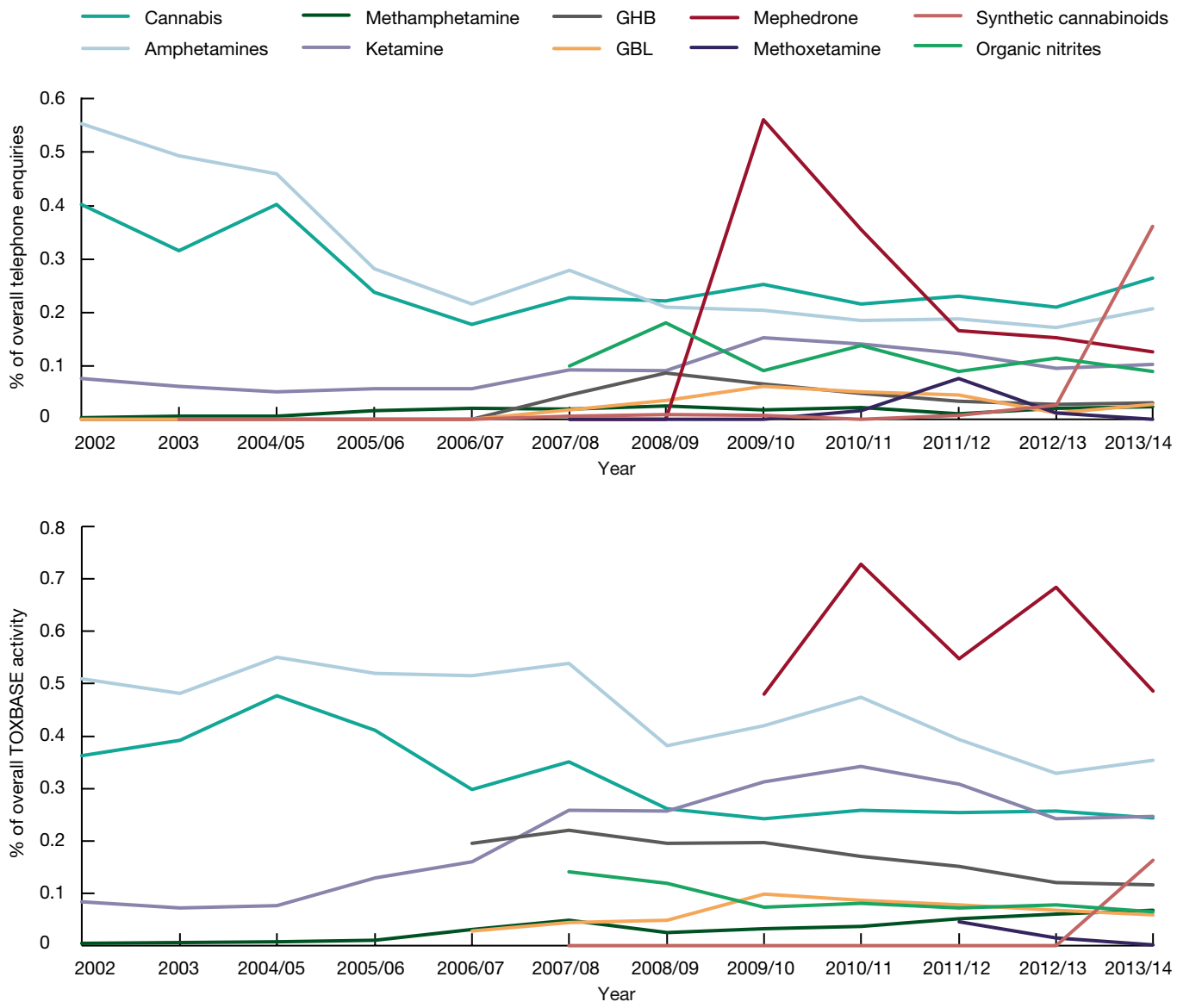


FIGURE 6.4 Proportion of telephone enquiries to the NPIS (above) and TOXBASE accesses (below) relating to selected drugs of misuse other than class A drugs (data for 2002 and 2003 by calendar year; subsequent data by financial year)

Future strategy

Over the next 12 months the NPIS aims to alter the way that substances are coded in its databases to allow reporting of activity data relating to all drugs of misuse, rather than 61 selected substances. This will allow more comprehensive toxicosurveillance of drugs of misuse and the harms encountered by NHS staff managing patients reporting exposure to these substances.

6.2 Paracetamol

On 3 September 2012, the Commission for Human Medicines (CHM) recommended substantial changes to the use of the antidote acetylcysteine for the management of paracetamol poisoning. The licensed indication for acetylcysteine was changed to include all patients taking a staggered overdose of paracetamol and those for whom there was doubt about the timing of paracetamol ingestion. The blood paracetamol concentration at which acetylcysteine was indicated was lowered by 50% for most patients and risk factors (eg starvation and chronic excess alcohol use) were no longer to be considered. These changes were intended to increase the numbers of patients with paracetamol poisoning receiving acetylcysteine to avoid the rare episodes of serious and sometimes fatal hepatotoxicity that have been reported in patients who had been considered not to require an antidote, using previous guidance.

These recommendations have impacted not only on the management of acute and staggered paracetamol overdose, but also on the management of accidental therapeutic use of excessive doses of paracetamol, which is a common source of enquiries to the NPIS.

Further CHM recommendations were to increase the duration of administration of the first dose of intravenous acetylcysteine from 15 minutes to one hour, to remove all contraindications to treatment with acetylcysteine and to introduce weight-based acetylcysteine dosing tables for adults and children.

The introduction of the new guidelines resulted in a substantial increase in work, and contact with the service through telephone enquiries, TOXBASE accesses and consultant referrals. TOXBASE accesses concerning paracetamol increased immediately and were 42% greater during 2013/14 than in 2011/12 (Figure 6.5). An immediate and substantial increase in telephone enquiries also occurred. Although telephone enquiries about paracetamol subsequently reduced in the six months following the initial peak in activity, they remain higher this year than in 2011/12 (Figure 6.5).

The greatest increase in enquiries following the new guidelines was in relation to adult exposures. While these were less frequent in 2013/14 than in 2012/13, they remain greater than in 2011/12, the year before the new guidelines were introduced (Figure 6.6).

Enquiries are documented to record the circumstances of exposure, with deliberate exposure, accidental exposures and therapeutic errors being the most common for paracetamol. Enquiries about intentional poisoning have fallen slightly over the last three years. In contrast, however, those concerning therapeutic error showed a substantial increase following the new guidelines, peaking during 2012/13 and remaining high during 2013/14. Enquiries concerning accidental exposures also rose following introduction of the new guidelines and remain higher than before (Figure 6.7).

A key role for the NPIS is to advise on the need for hospital referral for patients presenting with suspected poisoning in primary care. For telephone enquiries received about paracetamol from outside hospital, the new guidance has resulted in a higher proportion of patients being referred to hospital (Figure 6.8).

While trying to ensure that TOXBASE contains the essential information required for the effective management of these cases, there are still instances where discussion with a specialist in poisons information (SPI) or NPIS consultant toxicologist will be beneficial. Referrals for consultant advice on paracetamol poisoning increased sharply following the introduction of the new CHM recommendations and were 63% greater in 2013/14 than in 2011/12, the year before the new guidelines were introduced (Figure 6.9).

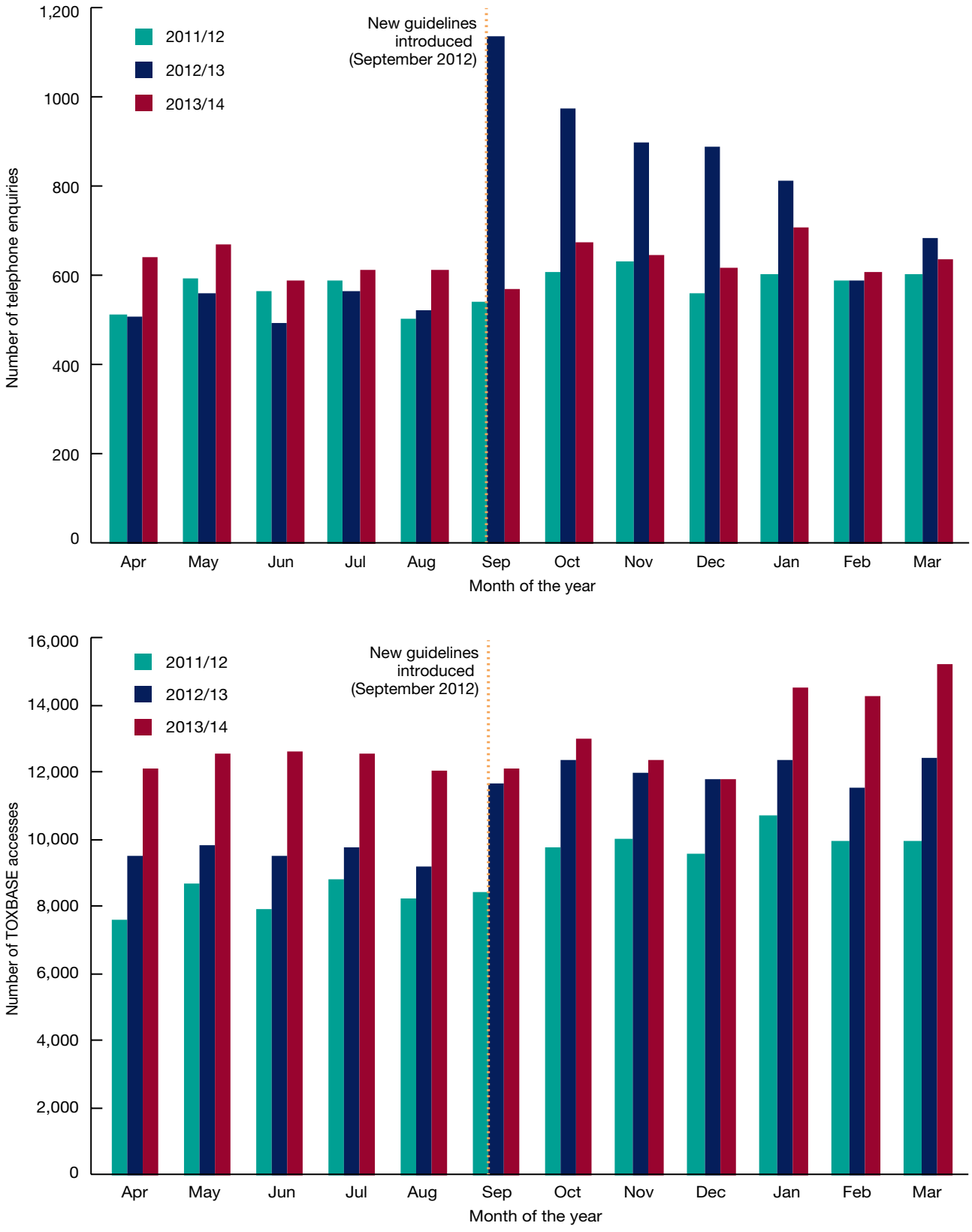


FIGURE 6.5 Number of telephone enquiries about paracetamol to the NPIS (above) and TOXBASE accesses (below) from 2011/12 to 2013/14

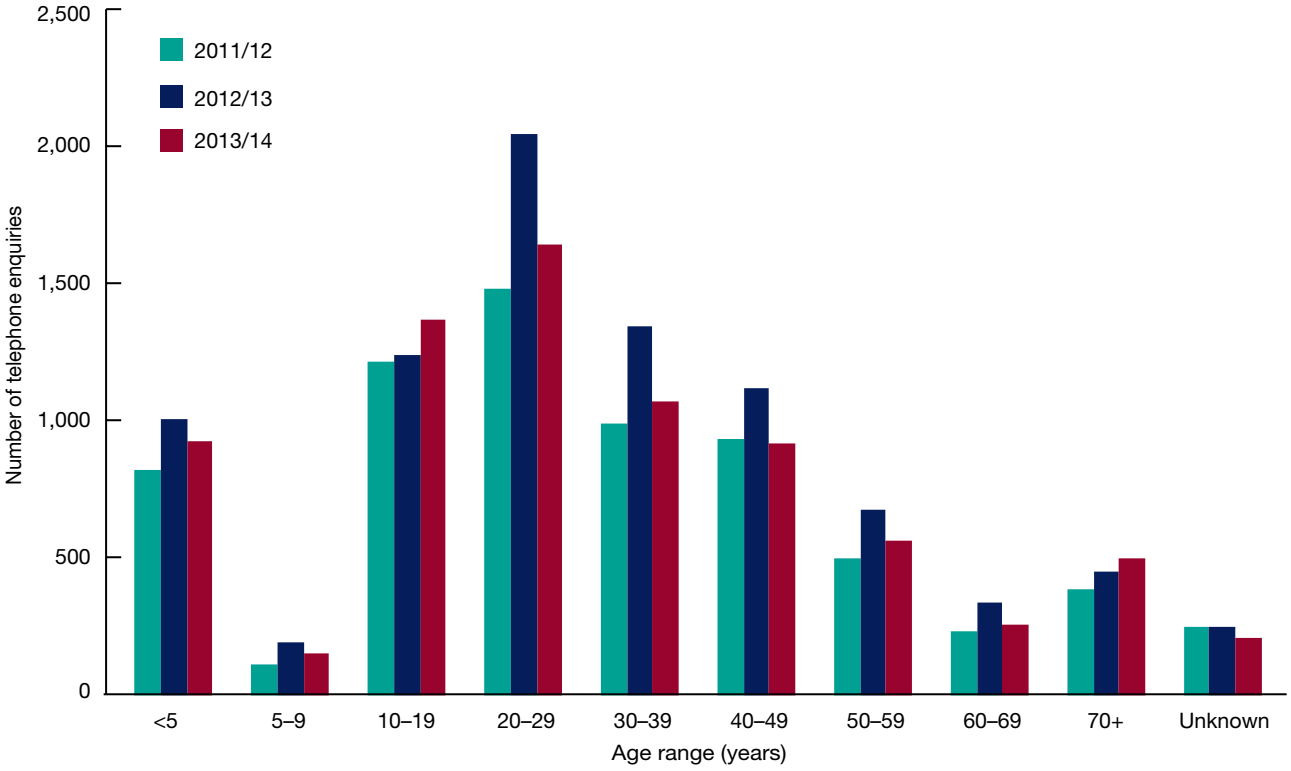


FIGURE 6.6 Age of patients involved in telephone enquiries about paracetamol to the NPIS from 2011/12 to 2013/14

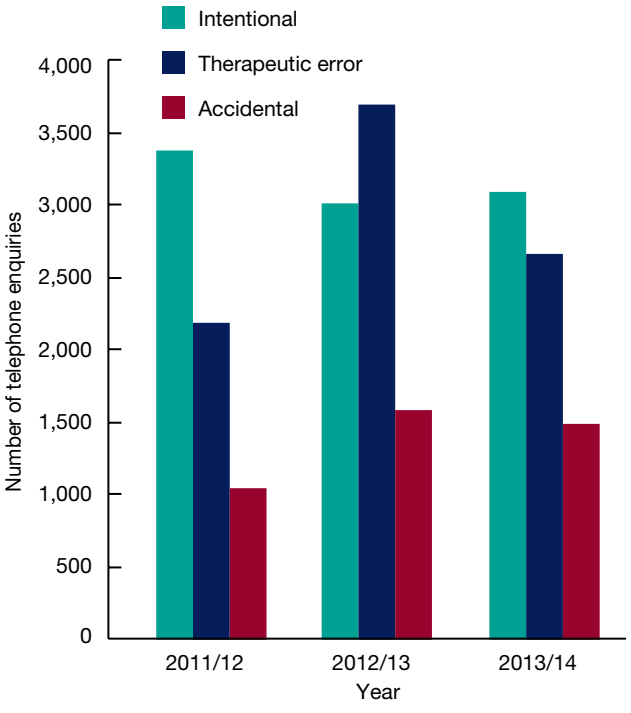


FIGURE 6.7 Circumstances of exposure for telephone enquiries about paracetamol to the NPIS from 2011/12 to 2013/14

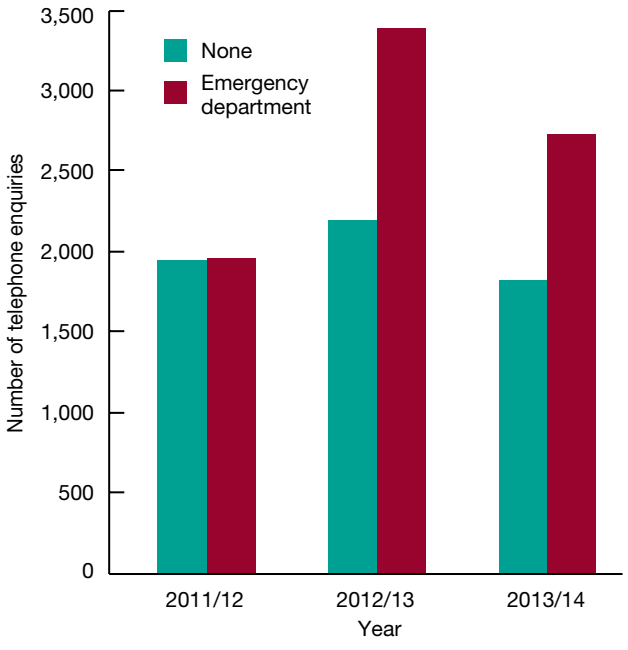


FIGURE 6.8 Recommendation for referral to hospital for telephone enquiries about paracetamol to the NPIS from outside hospital, from 2011/12 to 2013/14

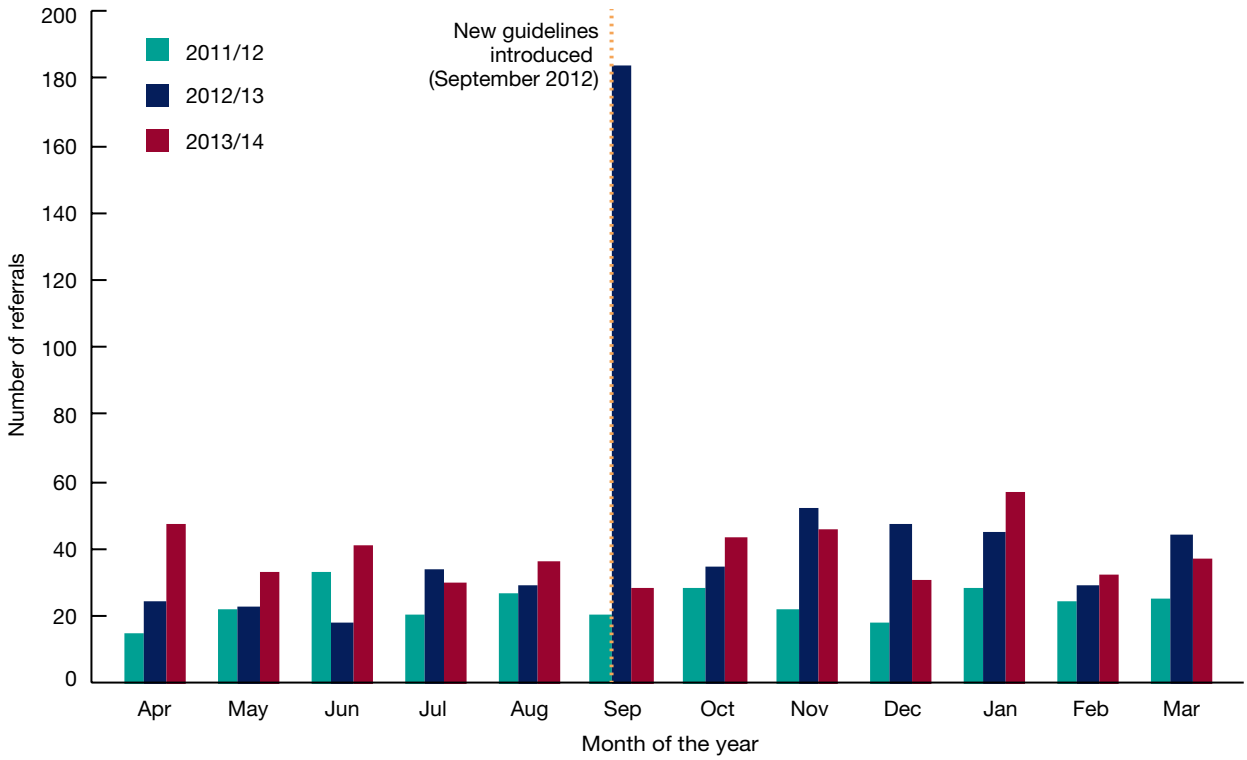


FIGURE 6.9 Referrals about paracetamol to NPIS consultants from 2011/12 to 2013/14

Conclusion

The introduction of the new licensed indication for acetylcysteine and CHM recommendations has resulted in an increase in enquiries to the NPIS concerning paracetamol and an increase in referral rates to hospital for assessment. Although telephone enquiry numbers have subsequently fallen towards baseline levels, increases in TOXBASE accesses for paracetamol have been sustained. This increase in enquiries is consistent with the reported increase in patients being admitted to hospital and being treated for paracetamol overdose in the UK since the guidelines were issued*.

6.3 Urgent Alerting

Since March 2012, the NPIS has been able to rapidly detect users accessing TOXBASE entries that have been identified as being of special interest. Currently, the NPIS is monitoring 142 chemicals which have the potential to be involved in large-scale exposures, where there is the potential for multiple casualties and for deliberate release. When a health care professional accesses the TOXBASE entry of interest (eg chlorine, carbon monoxide, ammonia or hydrogen cyanide), they are asked whether they are managing a patient. If they are, they are asked to enter their contact details to allow further assistance to be provided by the NPIS.

If an entry of interest is accessed, the NPIS receives an automatic email alert ('urgent alert') within five minutes, providing the time of access, the user's department and location, whether they are managing a patient and their contact details if entered. An information scientist from NPIS Edinburgh, or the on-call centre at evenings and weekends, will contact the user as soon as possible to collect details on the case and to offer consultant advice

* Bateman DN, Carroll R, Pettie J, et al. Effect of the UK's revised paracetamol poisoning management guidelines on admissions, adverse reactions, and costs of treatment. Br J Clin Pharmacol 2014; 78(3): 610–18. doi: 10.1111/bcp.12362

if required. The information scientist will then also contact PHE CRCE, other poisons centres and NPIS consultants as appropriate – for example, if there has been a large or serious exposure.

During 2013/14, the NPIS received 20,130 urgent alerts. Discounting access by the NPIS and educational users, 14,949 urgent alerts were received, an increase of 37.2% from 2012/13, involving 130 different entries. The most commonly accessed entry (3,884 accesses) was carbon monoxide, which represented 26.0% of all urgent alert accesses (see Table 6.2).

A total of 3,590 urgent alerts were marked as relating to a patient; user contact details were provided for 455 of these. Excluding cases where the user had input their details multiple times, the user was from an overseas poisons centre or the user had already contacted the NPIS, 330 accesses were followed up by NPIS staff, an increase of 20.9% on the equivalent figure for 2012/13. The followed-up cases involved 43 different TOXBASE entries; the most commonly accessed entries, and the numbers of cases and follow ups involving these chemicals, are given in Table 6.2.

As the NPIS is informed of all accesses within a 10-minute period, multiple accesses from the same department or single accesses from geographically close departments can be spotted. The NPIS can then follow up these accesses using contact details on record in case there has been a chemical release in the area. During 2013/14, the NPIS followed up seven such cases, where no contact details were given but where there were multiple accesses to the same entry.

The NPIS can, in near real time, collect data on patients presenting with specific poisonings to hospitals across different regions of the UK, while establishing direct communication. The NPIS has several advantages for such a surveillance role: it offers a 24 hour service, it can act promptly on real-time alerts, disseminating the information appropriately and rapidly, and it is frequently used by hospital emergency departments across the UK as the first source of advice on cases where poisoning might be suspected.

6.4 2,4-dinitrophenol

2,4-dinitrophenol (DNP) is a synthetic chemical that was marketed in the USA in the 1930s for weight reduction. It acts by uncoupling a process in cells called oxidative phosphorylation, causing energy to be released as heat. Unfortunately, some users experienced severe fever associated with multi-organ failure, especially with the use of higher doses. Human use of DNP was

TABLE 6.2 Chemicals of interest for toxicosurveillance – the 10 most frequently accessed entries on TOXBASE in 2013/14

	TOXBASE entries		TOXBASE entries related to cases		TOXBASE entries related to cases followed up by NPIS staff	
Rank	Agent	Number of alerts (% of 14,949)	Agent	Alerts relating to cases (% of 3,590)	Agent	Number of follow ups (% of 330)
1	Carbon monoxide	3,884 (26.0%)	Carbon monoxide	1,331 (37.1%)	Carbon monoxide	98 (29.7%)
2	Chlorine	1,489 (10.0%)	Chlorine	384 (10.7%)	Chlorine	39 (11.8%)
3	Hydrogen cyanide	658 (4.4%)	Ammonia	181 (5.0%)	CS gas	20 (6.1%)
4	Ammonia	647 (4.3%)	Hydrofluoric acid	131 (3.6%)	Ammonia	17 (5.2%)
5	Hydrofluoric acid	642 (4.3%)	Formaldehyde	125 (3.5%)	Hydrofluoric acid	17 (5.2%)
6	Paraquat	395 (2.6%)	CS gas	121 (3.4%)	Phosphoric acid	14 (4.2%)
7	Formaldehyde	388 (2.6%)	Phosphoric acid	111 (3.1%)	Propane	14 (4.2%)
8	CS gas	353 (2.4%)	Pepper spray	110 (3.1%)	Methylene chloride	13 (3.9%)
9	Propane	330 (2.2%)	Propane	105 (2.9%)	Formaldehyde	11 (3.3%)
10	Alkalis	321 (2.1%)	Alkalis	95 (2.6%)	Acids	9 (2.7%)

therefore banned in the USA in 1938. It has, however, remained available as a chemical used in a variety of manufacturing processes and is available for purchase, including through the internet. Although not licensed as a medicine, some websites promote DNP as a supplement for weight loss and 'fat burning'.

During 2013, NPIS staff noticed an increasing frequency of clinical enquiries relating to DNP toxicity. These included cases where there were severe and sometimes fatal clinical effects. A more detailed study was therefore carried out examining telephone enquiries and TOXBASE accesses relating to DNP between 1 January 2007 and 31 December 2013. During this period, 30 separate systemic exposures were reported to the NPIS in telephone enquiries involving 27 males and three females. Of these exposures, only three occurred between 2007 and 2011, while there were five in 2012 and 22 in 2013. Of these enquiries, 28 involved acute overdose, sometimes in people who were also using lower doses of the substance on a regular basis (termed 'acute on chronic' overdoses). There were five deaths, of which four occurred after acute overdose.

A sharp rise in TOXBASE user sessions also occurred, from six in 2011, to 35 in 2012 and 331 in 2013, suggesting that health professionals needed more frequent access to information about DNP toxicity. The increase in enquiries and TOXBASE accesses during 2013 occurred despite a warning about the dangers of using DNP issued by the Food Standards Agency (FSA) in November 2012.

These NPIS data were submitted for publication and shared with the FSA and PHE. The FSA issued further warnings in August and October 2013 and has been working with the police and local authorities to restrict the illegal sale of DNP, focusing on internet sales. An educational programme has also targeted places where DNP may be sold, such as gyms.

During the first quarter of 2014, there was only a single further telephone enquiry, together with nine further TOXBASE accesses relating to DNP. This may indicate that episodes of toxicity have become less frequent following the most recent FSA actions. It remains important to monitor episodes of toxicity associated with DNP.

6.5 Radiation

Since May 2012, the NPIS has been the first point of contact for health professionals seeking advice in relation to assessing and managing people with possible exposure to radiation. Over the reporting period 2013/14, the NPIS received telephone enquiries relating to 21 individuals where exposure to radiation was suspected; this compares with 23 enquiries in the previous year. Of these 21 cases, 12 were dealt with by NPIS staff, while nine cases required referral to specialists in radiation medicine and/or environmental radiation monitoring.

The suspected radiation exposure occurred in various contexts including restoration of antique watches, clocks and compasses (3 cases), spending time in the vicinity of the Fukushima nuclear power plant (2), damage to smoke alarms (2), contact with patients treated with radioactive substances for medical reasons (2) and contact with containers labelled 'radioactive material' (5).

There were five other cases where ionising radiation exposure was suspected: one following a visit to a power plant, one following a teaching experiment, one following geological exposure, and two following suspected poisonings. Two patients needed specific treatment: whole bowel irrigation for one and screening for possible internal radionuclide contamination in the other.

Enquiries were also received relating to non-ionising radiation exposures, such as to microwaves, radar or aerial masts, prompting the development of a non-ionising radiation monograph for TOXBASE.

6.6 Pesticides

Currently, 2,100 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.

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

During the year, there were 3,785 accesses to TOXBASE about pesticides of interest. From TOXBASE sessions, one electronic and 379 follow-up post or email questionnaires were returned. Information on a further 789 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 1,169 potential exposures involving pesticides during 2013/14. This equates to an overall return rate of 25.6%. Six exposures involved multiple patients, producing a further 49 potential exposures.

Of the 1,218 potential exposures available for analysis, there were 39 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 1,179 exposures for further analysis. The results displayed below include both unintentional acute (1,031 cases; 87.5%) or chronic (30; 2.5%) exposures and deliberate self-harm exposures (DSH) (79; 6.7%). The circumstances of exposure in 39 (3.3%) cases were unknown.

Pregnancy

There were nine enquiries involving pregnant patients reported in 2013/14. All nine exposures were unintentional and acute. None was severe. Two exposures were ranked as having WHO/IPCS/EC/EAPCCT poisoning severity score 1 (PSS 1, minor) and followed exposure to an unknown rat poison and to permethrin in an ant powder. Six exposures were ranked PSS 0 (not at all poisoned), while in one case the severity was ranked as uncertain.

Severity of all exposures

Most exposures were graded as PSS 0 (699 cases; 59.3%) or PSS 1 (431; 36.6%) by the NPIS. Smaller proportions were graded moderate (PSS 2; 20; 1.7%), severe (PSS 3; 5; 0.4%) and uncertain (23; 2.0%). One fatality was reported as a result of a pesticide exposure in this period, following intentional ingestion of the herbicide paraquat.

Agents of interest

The agents most commonly involved in exposures are shown in Table 6.3. In addition, there were 123 cases involving unknown rodenticides, 59 cases of unknown herbicides, 42 of unknown insecticides, 25 of unknown ant killers, 7 of unknown wood preservatives, and 33 of unknown pesticides.

TABLE 6.3 Pesticides most frequently reported by respondents in suspected pesticide exposures during 2013/14 compared with 2012/13, ordered by rank in 2013/14

Agent	Number in 2013/14	Number in 2012/13*
Permethrin	112	113
Glyphosate	106	101
Metaldehyde	67	89
Difenacoum	64	44
Bromadialone	64	63
Pinoxaden	45	0
Bendiocarb	38	21
Pyrethrin(s)	38	40
Diquat	32	33
Tetramethrin	29	26
Cypermethrin	26	32
Mecoprop	25	23
Imidacloprid	25	17
Deltamethrin	23	22
Moxidectin	22	22
Fipronil	22	13
Phenols/cresols	20	19/18
Piperonyl butoxide	19	23

* Values revised from those given in the 2012/13 report

In 2013/14, patients potentially exposed to pesticide products comprised 607 adults (13 years or older) (51.5%) and 556 children (12 years or younger) (47.2%), with 16 of unknown age (1.4%). There were 614 (52.1%) male patients and 512 (43.4%) female patients, and 53 cases where the gender was not specified.

The classes of product most commonly involved in exposures are shown in Figure 6.10. More than one type of product was involved in some incidents.

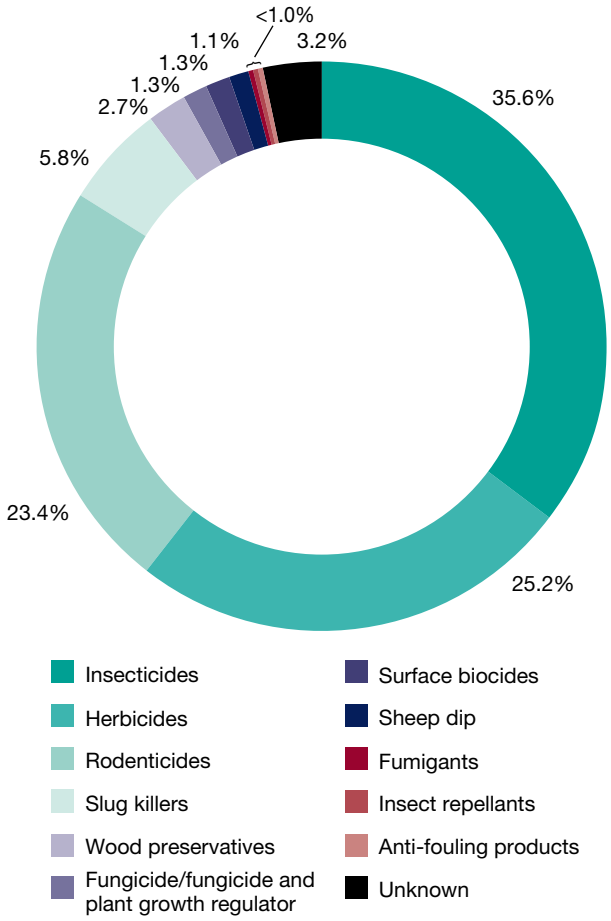


FIGURE 6.10 Pesticide exposures by class of product (as reported by respondent) in 2013/14 (1,179 cases)

6.7 Reed Diffusers

Reed diffusers have become a popular household air freshener. They comprise vessels or jars made of glass, containing fragranced liquid and 'wicking' reeds, which act to diffuse the scent of the liquid (Figure 6.11). The composition of the fragranced liquid can vary but includes essential oils, glycol ethers, isopropanol, petroleum distillates and ethanol.

FIGURE 6.11 Reed diffusers © *Reckitt Benckiser*

Although three case reports have been published*, no major study has assessed the toxicity of reed diffusers. The NPIS therefore conducted a retrospective study of the reported toxicity of reed diffusers covering the period from 1 January 2010 to 31 December 2013. Over this period the number of telephone enquiries to the NPIS regarding these products increased from 61 in 2010, 123 in 2011 and 171 in 2012, to 206 in 2013. The 561 enquiries involved 511 patients, the majority of whom (96%) were children under five years of age.

* Stanton-Growcock ST, Sztajnkrycer MD. First reported human oral exposure to a reed diffuser air freshener containing 3-methoxy-3-methyl-1-butanol (MMB). Clin Toxicol 2007; 45: 612
Strickland SS, Whitlow KS. Toxic effects from human oral exposure to 3-methoxy-3-methyl-1-butanol (MMB). Clin Toxicol 2008; 46: 643
Crandon KC, Davies JTD, Thompson JP. Reed diffuser toxicity. Clin Toxicol 2010; 48: 285

Ingestion alone (93.2%) was the main route of exposure. Eye (1.2%) and dermal (0.7%) contact alone were rare. Multiple routes of exposure occurred in 4.9% of patients; the majority were a combination of ingestion and skin contact. In two cases, three routes of exposure (ingestion, skin and eye) were reported. The brand of reed diffuser was identified in 70.1% of exposures, with 248 cases involving exposure to a reed diffuser from the Airwick™ range, which contain propylene glycol monobutyl ether, petroleum distillates, essential oils and fragrances.

The poisoning severity score was known in 508 of 511 patients and in 484 of 486 exposures by a single route (Table 6.4). No features (PSS 0) were present in 401 patients at the time of enquiry and in 98 the features present were minor (PSS 1). Nine patients were graded as having PSS 2 (moderate features); their features included hypoxia, bronchospasm, epiglottic swelling and a single short tonic-clonic convulsion. No exposures resulted in symptoms that were deemed severe (PSS 3).

TABLE 6.4 Poisoning severity score (PSS) for exposure to reed diffusers

Poisoning severity score	Ingestion	Eye	Skin
PSS 0	385	1	3
PSS 1	80	5	1
PSS 2	9	0	0
PSS 3	0	0	0

The majority (80.9%; 385 cases) of the 476 patients remained asymptomatic after ingesting fragranced liquid (306), sucking on the reeds (15), or after ingesting the water beads (51); 13 patients ingested both the fragranced liquid and water beads. The most common symptoms reported following ingestion alone are shown in Table 6.5.

Only one of four patients exposed by the dermal route alone developed symptoms (irritation). Exposure by the dermal route in conjunction with other routes occurred in 24 patients; seven developed a rash. Eye contact with the fragranced liquid occurred in six patients;

TABLE 6.5 Reed diffusers: the most common features reported following ingestion alone

Most common features	Ingestion alone (number of cases)
Vomiting	45
Coughing	11
Drowsiness	5
Nausea	5
Lip swelling/redness/irritation	5
Gagging	3
Sore mouth	3
Dysphonia	3
Bronchospasm	2
Pharyngitis	2
Tachycardia	2
Hypoxia	2
Diarrhoea	2
Pallor	2

five developed features including conjunctivitis (3) and eye pain (2). Eye contact in combination with other routes of exposure was reported in four children; three developed features including conjunctivitis (1), irritation (1) and 'oedema' (1).

While these products have the potential to cause toxicity, most patients remained asymptomatic or developed only minor features (93.5%), probably because they ingested only small quantities of fragranced liquid.

6.8 Electronic Cigarettes

The use of electronic nicotine delivery systems, including electronic cigarettes or e-cigarettes, is increasing 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. Refills contain larger quantities of fluid than individual e-cigarettes and are potentially a greater acute hazard due to the larger volume that may be ingested, either accidentally or deliberately.

Enquiries to the NPIS concerning e-cigarettes and their refill solutions have increased during the last year. A total of 204 enquiries were received this year, more than the total number of enquiries about these products in the previous six years (Figure 6.12). Children aged less than five years were involved in 22% of the enquiries (Figure 6.13).

The majority of exposures (162 of 204) were accidental. Twenty-one 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 commonest, although multiple routes of exposure also occur (Figure 6.14).

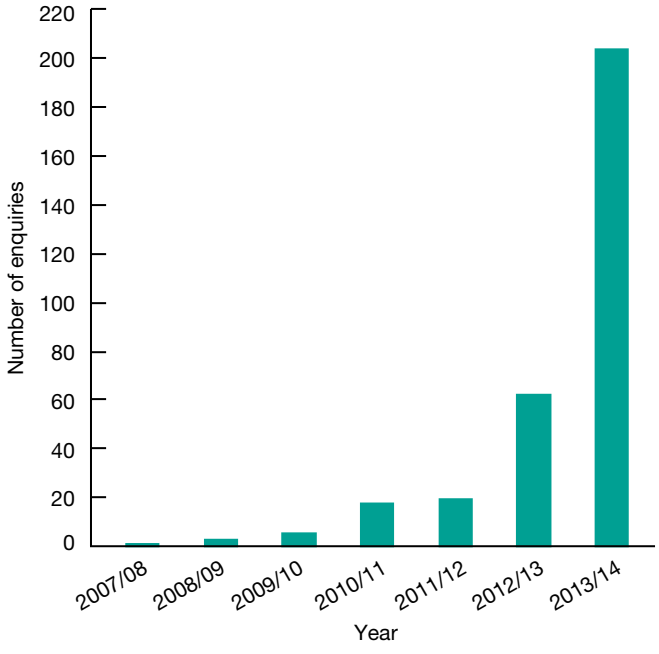


FIGURE 6.12 Number of enquiries about e-cigarettes to the NPIS from 2007/08 to 2013/14

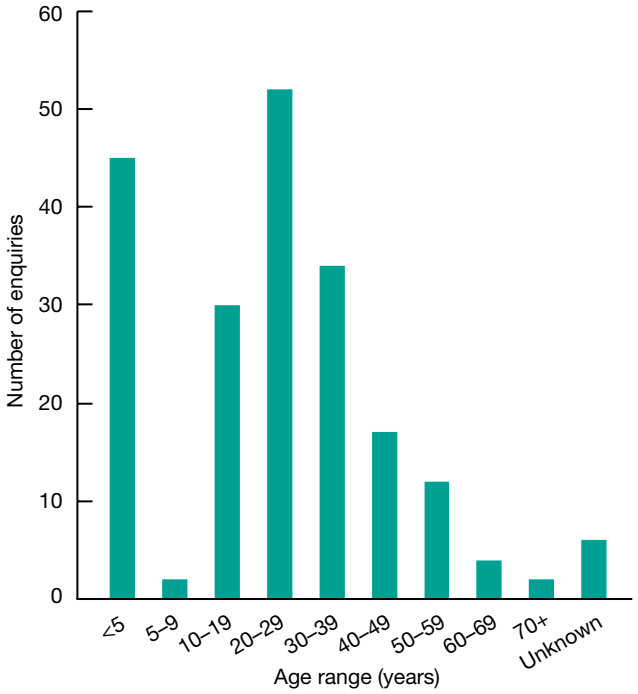


FIGURE 6.13 Age of patients in enquiries about e-cigarettes to the NPIS

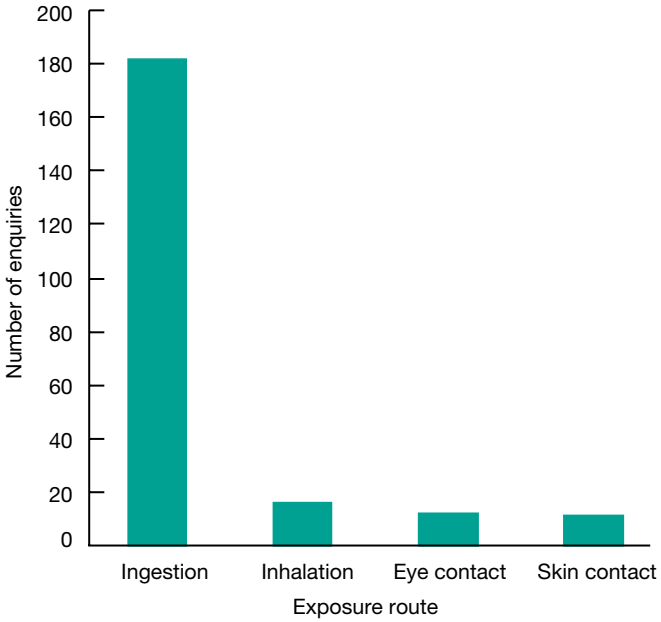


FIGURE 6.14 Route of exposure in enquiries about e-cigarettes to the NPIS

Where the clinical features were known at the time of the enquiry, 103 patients had no features of toxicity and 94 had features of only mild toxicity (four unknown). Two patients had moderate toxicity (one aged 13 months), while another had severe toxicity and was sent to an intensive care unit. Features of toxicity included conjunctivitis, irritation of the oral cavity, anxiety, vomiting, hyperventilation and changes in heart rate.

It is of concern that so many of the exposures were accidental, involved ingestion, and occurred in young children. The liquid in e-cigarettes and their refills contains toxic doses of nicotine and even small volumes can cause serious harm 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 EU Tobacco Products Directive for implementing in 2016.

7 Conclusions

It has been NPIS policy for many years to encourage use of TOXBASE as the first point of call for health professionals when they need poisons information. Use of the database continues to increase, emphasising the critical importance of ensuring that the 17,000 entries it contains are accurate and up to date.

In spite of the increasing use of TOXBASE, this year has also seen further increases in NPIS telephone enquiries; it remains essential that high quality evidence-based advice is available on a 24 hours a day basis for these more complex enquiries, with support available 24 hours a day from consultant clinical toxicologists when needed.

Although telephone enquiries to UKTIS have not increased, there have been substantial increases in accesses to information on drug and chemical exposures in pregnancy held on TOXBASE and the UKTIS website, suggesting an increased profile of the service in the UK and internationally. It remains a challenge for the service to maintain and increase the information for women who are pregnant and the health professionals involved in their care.

User feedback continues to demonstrate a very high degree of user satisfaction with all the services provided by the NPIS and there has been a very low number of critical incidents or complaints.

The NPIS, including UKTIS, has continued to be active in surveillance and research, maintaining the excellent record the service has in publishing reports and academic papers.

8 Recommendations

Outcome of Recommendations for 2013/14

1 To commission the UKTIS public facing website

Outcome: Completed

2 To complete work with the UK health departments on antidote holding centres

Outcome: Appropriate strategy agreed and being actioned by the UK health departments

3 To explore joint working with the Medicines and Healthcare Products Regulatory Agency to use data collected by the NPIS for monitoring drug safety

Outcome: Report submitted to the MHRA on opportunities for joint working

4 To encourage improved labelling of products containing toxic alcohols and glycols to warn parents of toxicity and the use of child-resistant containers

Outcome: NPIS experience submitted for publication with a recommendation that the labelling on these products should contain a warning for parents to keep them out of the reach of children

5 To encourage production of a low concentration paediatric formulation of ranitidine syrup to avoid large overdoses and unnecessary presentations to healthcare services

Outcome: Report submitted to the MHRA

Recommendations for 2014/15

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

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

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

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

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

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

APPENDIX A

Senior NPIS Staff

NPIS Consultants and Senior Staff

NPIS Birmingham

Dr S M Bradberry BSc MD MRCP FAACT FEAPCCT
Deputy Director, NPIS Birmingham and West Midlands Poisons Unit, City Hospital, Birmingham; Senior Lecturer, School of Biosciences, University of Birmingham

Mr A Campbell BSc DipMedTox FEAPCCT
Manager, NPIS Birmingham

Professor J A Vale MD FRCP FRCPE FRCPG FFOM FAACT FBTS FBPharmacolS FEAPCCT Hon FRCPSG
Director, NPIS Birmingham and West Midlands Poisons Unit, City Hospital, Birmingham; School of Biosciences and College of Medical and Dental Sciences, University of Birmingham

NPIS Cardiff

Mrs G L Alldridge MBE
Senior Information Services Manager, NPIS Cardiff

Dr J Coulson BSc MBBCh MD MRCP DipMedTox DipTher GCGI
Senior Lecturer in Clinical Pharmacology, Department of Pharmacology, Therapeutics and Toxicology, Institute of Molecular and Experimental Medicine, School of Medicine, Cardiff University

Dr C V Krishna MD FRCP DipMedTox DipTher
Deputy Director, NPIS Cardiff, and 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

Professor P A Routledge OBE MD FRCP FRCPE FBPharmacolS FBTS FRCGP FFPM
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 MA PhD FRCPE FEAPCCT
Director, NPIS Edinburgh; Professor of Clinical Toxicology and Lister Prize Fellow, University of Edinburgh; and Consultant Clinical Toxicologist, Royal Infirmary of Edinburgh

Dr G Jackson BSc DipMedTox PhD
Information Services Manager, NPIS Edinburgh

Dr EA Sandilands BSc MBChB MRCP PGCertMedEd
Consultant in Acute Medicine and Toxicology, Royal Infirmary 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
Information Services Manager, NPIS Newcastle

Dr S L Hill BSc MBBS MRCP
Consultant Physician and Clinical Toxicologist, Newcastle upon Tyne Hospitals NHS Foundation Trust, and 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, and 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, and 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; and Professor of Clinical Pharmacology and Therapeutics, Newcastle University

Dr L Yates MBChB PhD DRCOG MRCPCH
Head of Teratology, UKTIS; Consultant in Clinical Genetics, Institute of Genetic Medicine, Newcastle upon Tyne Hospitals NHS Foundation Trust; and Honorary Senior Clinical Lecturer, Institute of Genetic Medicine, Newcastle University

Retirement of Dr Elaine Farmery

This is the first of the NPIS reports that has been written without Elaine's firm hand on the tiller. Her hand has been on a tiller, but the boat was sailing the Med at the time. She told us that it was too tall for the Corinth canal and had to go the 'long way round' from the Med to the Aegean.

Elaine's contribution to the success of the NPIS network has been immeasurable. She instituted the single national consultant rota in 2005, supported by sound clinical governance arrangements to ensure standards UK-wide. These arrangements were tested in a governance review in 2007 and found to be sound. She commissioned services that more than doubled the number of interactions with NHS staff while maintaining resources by promoting TOXBASE to field first-line calls. She steered the network through the Olympic Games and the turbulence caused by unexpected new MHRA (Medicines and Healthcare Products Regulatory Agency) guidance on paracetamol, one of the leading causes of enquires to the NPIS and of patient admissions for poisoning in the UK.

We asked Elaine how she would want us to sum up her career and her answer was predictable; that we should decide. She did remind us that her interest in plants and toxins stemmed from an 'old fashioned' medical education which included botany as part of the pre-medical curriculum. She also gained huge insights into the 'medical mind' and the power of confidence and boundless enthusiasm through her years as a gynaecologist; her interest in this speciality has been a driving force for the development of UKTIS. She also brought this passion to bear in her public health career as a CCDC in Gloucestershire and as the NPIS commissioner with the Health Protection Agency and latterly Public Health England. However, Elaine was never stuck in the past. She championed development of the common database for all NPIS enquiries, urgent alerting, the TOXBASE app and the use of cloud technology to improve the flexibility and resilience of the service by routing calls to the most appropriate staff member available in the NPIS units.

Elaine has already been missed by the NPIS units. We often ask ourselves; 'What would Elaine have done?' if we want to know the right course of action. We all wish her a long, fulfilling and well-deserved retirement.

Consultants providing on-call support for the NPIS

Dr P I Dargan FRCPE FACMT FRCP FAACT FEAPCCT
Consultant Physician and Clinical Toxicologist, Clinical Director, Guy's and St Thomas' NHS Foundation Trust, and King's Health Partners, London, and Reader in Toxicology, King's College London

Dr W S Waring BMedSci MB PhD FRCPE FBPharmacolS
Consultant Physician in Acute Medicine and Clinical Toxicology, York Teaching Hospital Foundation Trust, and Honorary Senior Lecturer in Medicine, Hull York Medical School, York

Dr D M Wood MD FRCP FACMT FBPharmacolS
Consultant Physician and Clinical Toxicologist, Guy's and St Thomas' NHS Foundation Trust and King's Health Partners, London, and Honorary Senior Lecturer, King's College 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 FACEM FCEM
Consultant Emergency Physician, St John's Hospital (NHS Lothian), Livingston

National and International Appointments of Senior NPIS 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-elect: European Association of Poisons Centres and Clinical Toxicologists (EAPCCT)

Member: Scientific and Meetings Committee (EAPCCT)

Member: Finance Committee (EAPCCT)

Member: Publications Committee (EAPCCT)

Member: Nomination Committee (EAPCCT)

Member: Working Group on Poisons Centre Activities (EAPCCT)

Professor J A Vale

INTERNATIONAL ACTIVITIES

Member: Advisory Board Hong Kong Poisons Centre

INTERNATIONAL SOCIETIES

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

NHS NATIONAL AND REGIONAL COMMITTEES

Member: All Wales Medicines Strategy Group

ACADEMIC ACTIVITIES

Senior Clinical Lecturer: Cardiff University

Dr C V Krishna

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

Consultant Adviser 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

Co-chair: Prescribing Safety Assessment Executive Board (2012/13)

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

Member: External Review Board, MRC Centre for Drug Safety Science, University of Liverpool 2013

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

Vice President (Clinical): British Pharmacological Society

Chair: Human Toxicology Section, British Toxicology Society

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

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: Bro Taf Localities Drug and Therapeutics Committee

Member: All-Wales Specialist Training Committee in Clinical Pharmacology

Member: New Medicines Group for All-Wales Medicines Strategy Group

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

Tutor: MSc in Translational Medicine, Edinburgh University, PhD Student

External Examiner: MRes in Translational Medicine, Newcastle University

Member: Clinical Pharmacology Specialty Question Group, MRCP(UK)

External Examiner: BSc Clinical Pharmacology, King's College London

Member: British Pharmacological Society Clinical Section Committee

Professor M Eddleston

INTERNATIONAL ACTIVITIES

Adviser: 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

NHS NATIONAL AND REGIONAL COMMITTEES

Member: Lothian Drug and Therapeutics Committee

UK ADVISORY COMMITTEES

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

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

ACADEMIC ACTIVITIES

Strand Lead: Masters in Translational Medicine – Therapeutics

Module Lead: Masters in Translational Medicine – Drug Discovery and Pre-clinical Development

Module Lead: Drug Discovery and Development, MRes 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 Fellow 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: RCPath Toxicology Specialist Advisory Committee

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

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

Professor S H L Thomas

INTERNATIONAL ACTIVITIES

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

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

Member: Pregnancy Special Interest Group, European Network of Centres for Pharmacoepidemiology and Pharmacovigilance (ENCePP)

NHS NATIONAL AND REGIONAL COMMITTEES

Member: Northern Congenital Abnormality Survey (NorCAS) Steering Committee November 2012 – present

UK ADVISORY COMMITTEES

Expert Committee Member: Medicines and Healthcare Products Regulatory Agency Sodium Valproate Article 31 Referral Working Group

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

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 Journal

Editorial Board Member: Journal of Addiction

UK ADVISORY COMMITTEES

Member: Advisory Council on the Misuse of Drugs

Member: Technical Committee, Advisory Council on the 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: 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

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

Member: Advisory Committee on Pesticides, Department for Environment, Food and Rural Affairs

Member: Medical Toxicology Panel, Department for Environment, Food and Rural Affairs

NHS NATIONAL AND REGIONAL COMMITTEES

Regional Specialty Adviser: 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

Member: Experimental Medicines Unit Steering Group, Hull York Medical School

Dr D M Wood

INTERNATIONAL ACTIVITIES

Expert Adviser: European Monitoring Centre for Drugs and Drug Addiction

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 Journal

UK ADVISORY COMMITTEES

Co-opted Member: Advisory Council on the Misuse of Drugs Technical Committee and Novel Psychoactive Substances Working Group

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: PHE National Drugs Intelligence Network

ACADEMIC ACTIVITIES

Joint Project Coordinator: European Drug Emergencies Network (Euro-DEN)

Lecturer: NPIS/CEM Clinical Toxicology Training Days

APPENDIX B
NPIS Publications in 2013/14

Eighty-six contributions to the scientific literature were published in 2013/14 by NPIS staff *.

Peer-reviewed Papers

Acheampong P, **Cooper G**, Khazaeli B, **Lupton DJ**, White S, May MT, **Thomas SHL**. Effects of MHRA drug safety advice on time trends in prescribing volume and indices of clinical toxicity for quinine. Br J Clin Pharmacol 2013; 76: 973–9.

Al-Hourani K, Mansi R, **Pettie J**, **Dow M**, **Bateman DN**, **Dear JW**. The predictive value of hospital admission serum alanine transaminase activity in patients treated for paracetamol overdose. QJM 2013; 106: 541–6.

Anderson M. The management of poisoning. Paediatr Child Health 2013; 23: 380–84.

Antoine DJ, **Dear JW**, Starkey-Lewis P, Platt V, Coyle J, Masson M, **Thanacoody RH**, Gray AJ, Webb DJ, Moggs JG, **Bateman DN**, Goldring CE, Park BK. Mechanistic biomarkers provide early and sensitive detection of acetaminophen-induced acute liver injury at first presentation to hospital. Hepatology 2013; 58: 777–87.

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

Coulson JM. The efficacy of pralidoxime in organophosphorus poisoning: A commentary. J Postgrad Med 2014; 60: 31–2.

Coulson JM, **Cooper G**, **Krishna C**, **Thompson JP**. Snakebite enquiries to the UK National Poisons Information Service: 2004–2010. Emerg Med J 2013; 30: 932–4.

Dear JW, Antoine DJ. Stratification of paracetamol overdose patients using new toxicity biomarkers: current candidates and future challenges. Expert Rev Clin Pharmacol 2014; 7: 181–9.

Dear JW, Street JM, Bailey MA. Urinary exosomes: a reservoir for biomarker discovery and potential mediators of intrarenal signalling. Proteomics 2013; 13: 1572–80. Review.

Dunstan HJ, Mill AC, **Stephens S**, **Yates LM**, **Thomas SHL**. Pregnancy outcome following maternal use of zanamivir or oseltamivir during the 2009 influenza A/H1N1 pandemic: a national prospective surveillance study. Br J Obstet Gynae 2014; published online 7 Mar 2014 (121(7): 901–6).

Eddleston M. Applied clinical pharmacology and public health in rural Asia – preventing deaths from organophosphorus pesticide and yellow oleander poisoning. Br J Clin Pharmacol 2013; 75: 1175–88.

Eddleston M. Progress with reducing mortality from organophosphorus insecticide poisoning. Anuradhapura Med J 2014, 8: 1–4.

Eddleston M, Thomas SHL, Thompson JP, Vale JA. Response to Arkell et al, regarding TOXBASE guidance. Emerg Med J 2013; published online 20 June 2013.

Fujii H, Goel A, Bernard N, Pistelli A, **Yates LM**, **Stephens S**, Han JY, Matsui D, Etwell F, Einarson TR, Koren G, Einarson A. Pregnancy outcomes following gabapentin use: results of a prospective comparative cohort study. Neurology 2013; 80: 1565–70.

Gray L, Tuthill DP, **Thompson J**. Management of drug allergy. Paediatr Child Health 2014; 24: 177–9.

Hill SL, Doris T, Gurung S, Katebe S, Lomas A, Dunn M, Blain P, **Thomas SHL**. Severe clinical toxicity associated with analytically confirmed recreational use of 25I-NBOMe: case series. Clin Toxicol 2013; 51: 487–92.

Hill SL, **Harbon S**, **Coulson J**, **Thompson J**, **Jackson G**, **Lupton DJ**, **Eddleston M**, **Vale A**, **Thomas SH**. Methoxetamine toxicity reported to the National Poisons Information Service: clinical characteristics and patterns of enquiries (including the period of the introduction of the UK's first temporary class drug order). Emerg Med J 2014; 31: 45–7.

Hughes D, **Routledge PA**. A prescribing partnership. Pub Serv Rev: Health Social Care 2013; 35: 65–7.

Hulse E, Reed F, **Eddleston M**, Etherington R, Clutton E. Experiences with a bronchial blocking device for pulmonary aspiration studies in the Gottingen Minipig. Lab Anim 2014, 48: 164–9.

Kamour A, George S, **Vale JA**. Prolonged tachycardia following analytically confirmed cyclizine ingestion. Clin Toxicol 2013; 51: 456–57.

Kamour A, **James D**, **Spears R**, **Cooper G**, **Lupton DJ**, **Eddleston M**, **Thompson JP**, **Vale AJ**, **Thanacoody HK**, **Hill SL**, **Thomas SH**. Patterns of presentation and clinical toxicity after reported use of alpha methyltryptamine in the United Kingdom. A report from the UK National Poisons Information Service. Clin Toxicol 2014; 52: 192–7.

Lazo JS, **Routledge PA**. International collaboration, a vital component of scientific progress. Pharmacologist 2013; 55: 30, and Pharmacol Matt 2013; 6: 5.

Li B, Eyer P, **Eddleston M**, Jiang W, Schopfer LM, Lockridge O. Protein tyrosine adduct in humans self-poisoned by chlorpyrifos. Toxicol Appl Pharmacol 2013; 269: 215–25.

* NPIS staff are given in bold type

Menzies RI, Zammit-Mangion A, Hollis LM, Lennen RJ, Jansen MA, Webb DJ, Mullins JJ, **Dear JW**, Sanguinetti G, Bailey MA. An anatomically unbiased approach for analysis of renal BOLD magnetic resonance images. Am J Physiol Renal Physiol 2013; 305: F845–52.

Oosthuyzen W, Sime NE, Ivy JR, Turtle EJ, Street JM, Pound J, Bath LE, Webb DJ, Gregory CD, Bailey MA, **Dear JW**. Quantification of human urinary exosomes by nanoparticle tracking analysis. J Physiol 2013; 591: 5833–42.

Proudfoot AT, **Good AM**, **Bateman DN**. Clinical toxicology in Edinburgh, two centuries of progress. Clin Toxicol 2013; 51: 509–14.

Sandilands E, Crowe J, Cuthbert H, Jenkins PJ, Johnston NR, **Eddleston M**, **Bateman DN**, Webb DJ. Histamine-induced vasodilatation in the human forearm vasculature. Br J Clin Pharmacol 2013, 76: 699–707.

Sandilands EA, Dhaun N, **Dear JW**, Webb DJ. Measurement of renal function in patients with chronic kidney disease. Br J Clin Pharmacol 2013; 76: 504–15.

Schep LJ, Slaughter RJ, **Vale JA**, Wheatley P. Was the death of Alexander the Great due to poisoning? Was it *Veratrum album*? Clin Toxicol 2014; 52: 72–77.

Thanacoody HKR, **Aldridge G**, **Laing W**, Nash S, Dargan PI, **Vale JA**, **Bateman DN**, **Thompson JP**, **Thomas SHL**. National audit of antidote stocking in acute hospitals in the United Kingdom. Emerg Med J 2013; 30: 393–6.

Thanacoody HK, Gray A, **Dear JW**, Coyle J, **Sandilands EA**, Webb DJ, Lewis S, **Eddleston M**, **Thomas SH**, **Bateman DN**. Scottish and Newcastle antiemetic pre-treatment for paracetamol poisoning study (SNAP). BMC Pharmacol Toxicol 2013; 14: 20.

Thompson J, Watson I, **Thanacoody H**, Morley S, **Thomas S**, **Eddleston M**, **Vale J**, **Bateman D**, **Krishna C**. Guidelines for laboratory analyses for poisoned patients in the United Kingdom. Ann Clin Biochem 2014; published online 29 January 2014 (51(Part 3): 312–25).

Turtle EJ, **Dear JW**, Webb DJ. A systematic review of the effect of paracetamol on blood pressure in hypertensive and non-hypertensive subjects. Br J Clin Pharmacol 2013; 75: 1396–405. Review.

Weerasinghe M, Pearson M, Peiris R, Dawson AH, **Eddleston M**, Jayamanne S, Konradsen F. The role of private pesticide vendors in preventing access to pesticides for self-poisoning in rural Sri Lanka. Inj Prev 2014, 20: 134–7.

Williams H, **Jones S**, Wood K, Scott RA, **Eddleston M**, **Thomas SH**, **Thompson JP**, **Vale JA**. Reported toxicity in 1486 liquid detergent capsule exposures to the UK National Poisons Information Service 2009–2012, including their ophthalmic and CNS effects. Clin Toxicol 2014; 52: 136–40.

Vale A, Bradberry S. Management of poisoning. Medicine 2013; 41: 179–81.5.

Vliegenthart AD, Starkey Lewis P, Tucker CS, Del Pozo J, Rider S, Antoine DJ, Dubost V, Westphal M, Moulin P, Bailey MA, Moggs JG, Goldring CE, Park BK, **Dear JW**. Retro-orbital blood acquisition facilitates circulating microRNA measurement in zebrafish with paracetamol hepatotoxicity. Zebrafish 2014; published online 13 March 2014 (11(3): 219–26).

Book Chapters

Anderson M. An uncommunicative teenager who has taken an overdose. Clinical Cases for MRCPCH Theory and Science. Royal College of Paediatrics and Child Health. Elsevier Books, 2013.

Anderson M. Trial Design. Clinical Cases for MRCPCH Theory and Science. Royal College of Paediatrics and Child Health. Elsevier Books, 2013.

Eddleston M. Poisonous plants and fish: plant cardiac glycoside poisoning. In: Hunter's Tropical Medicine and Emerging Infectious Diseases, 9th edition (Eds: Magill A et al). London: Saunders, 2013: 935–7.

Eddleston M, Warrell DA. Poisoning and envenoming. In: Oxford Handbook of Tropical Medicine, 4th edition (Eds: Davidson R et al). Oxford: OUP, 2014.

Routledge PA, Hutchings AD. Therapeutic drug monitoring. In: The Immunoassay Handbook, 4th edition: Theory and applications of ligand binding, ELISA and related techniques (Ed: Wild D). Elsevier Science, 2013: 945–62.

Thomas SHL, White J. Poisoning. In: Davidson's Principles and Practice of Medicine, 22nd Edition (Eds: Walker R et al). Churchill Livingstone, 2014.

Published Congress Abstracts

Acheampong P, **Cooper G**, Khazaeli B, **Lupton DJ**, White S, May MT, **Thomas SHL**. Effect of safety update on quinine use in leg cramps on prescribing and toxicity in the UK. Clin Toxicol 2013; 51: 294.

Adams RD, **Perry L**, **Bennett A**, **Thomas SHL**, **Thompson JP**, **Vale JA**, **Eddleston M**, **Bateman DN**. The NPIS pesticide surveillance project – eye contact with pesticides: circumstances of exposure and toxicity. Clin Toxicol 2013; 51: 353.

Adams RD, **Perry L**, **Bennett A**, **Thomas SHL**, **Thompson JP**, **Vale JA**, **Eddleston M**, **Bateman DN**. The NPIS pesticide surveillance project – neonicotinoids: comparison of toxicity against other insecticide classes. Clin Toxicol 2013; 51: 353.

Anderson M. Big poisons: what ingested substances cause significant harm to young children? Arch Dis Child 2013; 98 (Suppl 1): A59.

Bateman DN, Carroll R, **Pettie J**, Yamamoto T, Elamin ME, Peart L, **Dow M**, Coyle J, Cranfield KR, Hook C, **Sandilands EA**, **Veiriaiah A**, Webb DJ, 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 Pharmacol 2014; published online 26 March 2014 (78(3): 610-18).

Bowbeer C, **Gordon LD**, **Jackson G**, **Bateman DN**, **Eddleston M**, **Dear JW**. A comparative study of a new mobile TOXBASE app with the current internet poisons database. Clin Toxicol 2013; 51: 702.

Brown J, **Thanacoody R**. Paracetamol-induced hepatotoxicity at therapeutic doses. Clin Toxicol 2013; 51: 269.

Cooper G, **Jackson G**, **Vale JA**, **Thomas SHL**. Toxicity associated with recreational use of nitrous oxide in the United Kingdom. A report from the UK National Poisons Information Service. Clin Toxicol 2013; 51: 343.

Crawford CL, **Cooper G**, **Jackson G**, **Vale JA**, **Thomas SHL**, **Thompson JP**, **Eddleston M**. Changes in referral rates for acute toothpaste ingestions reported to the NPIS. Clin Toxicol 2013; 51: 306.

Dear JW, Antoine DJ, Starkey-Lewis P, Platt V, Coyle J, Masson M, **Thanacoody RH**, Gray AJ, Webb DJ, Moggs JG, **Bateman DN**, Goldring CE, Park BK. Mechanistic biomarkers provide early and sensitive detection of acetaminophen-induced acute liver injury at first presentation to hospital. Clin Toxicol 2013; 51: 255.

Elamin M, **Thanacoody R**. Paracetamol-induced hepatotoxicity despite paracetamol concentrations below treatment threshold. Clin Toxicol 2013; 51: 269.

Good AM, Hulten P, **Thomas SHL**. EAPCCT survey of European poisons centres: services provided. Clin Toxicol 2013; 51: 302.

Good AM, Hulten P, **Thomas SHL**. EAPCCT survey of European poisons centres: staff profile. Clin Toxicol 2013; 51: 309.

Gordon LD, **Lupton DJ**, **Jackson G**, **Eddleston M**. Initial reception of the TOXBASE app, a poisons information resource for mobile devices. Clin Toxicol 2013; 51: 308.

Green JL, Desel H, Milanesi G, Sesana S, Brown JA, Gunja N, Kupferschmidt H, De Vries I, **Campbell A**, **Thomas SHL**, **Thompson JP**, Severtson G, Poppish L, Gmerek B, Dart RC. Unintentional pediatric opioid exposures as reported to the Global Toxicosurveillance Network (GTNet) from 2008–2010. Clin Toxicol 2013; 51: 306.

Hill SL, **Cooper GA**, **Jackson G**, **Lupton DJ**, **Bradberry S**, **Thomas SHL**. What's on the 'Spice' rack? Synthetic cannabinoid receptor agonist toxicity reported to the UK National Poisons Information Service. Clin Toxicol 2013; 51: 345.

Hill SL, **Harbon S**, **Cooper GA**, **Coulson JA**, **Thompson J**, **Jackson G**, **Lupton DJ**, **Vale JA**, **Thomas SHL**. Methoxetamine toxicity reported to the National Poisons Information Service: slinical characteristics and the effect of the UK's first temporary class drug order. Clin Toxicol 2013; 51: 345–6.

Hulse EJ, Clutton RE, Drummond G, **Eddleston M**. Translational toxicological research: investigating and preventing acute lung injury in organophosphorus insecticide poisoning. J Roy Army Med Corps 2014; published online 18 December 2013 (160(2): 191–2).

Jackson G, **Lupton DJ**, **Bradberry SM**, **Spears R**, **Cooper G**, **Thompson JP**, **Eddleston M**. Establishing real-time communications with TOXBASE on-line and the TOXBASE app when agents of interest are accessed: a report on behalf of the National Poisons Information Service. Clin Toxicol 2013; 51: 304–5.

Jackson G, **Perry L**, **Spears R**, **Cooper G**, **Thompson JP**, **Eddleston M**. Summary of telephone enquiries relating to antidote exposures, graded as moderate or severe, that were received by the UK National Poisons Information Service between 01/04/2008 and 31/03/2012. Clin Toxicol 2013; 51: 363–4.

Jagpal PS, Dawas K, **Bradberry SM**. Assessment of life-threatening sulfuric acid ingestion using computed tomography imaging. Clin Toxicol 2014; 52: 428–9.

Jenkins A, John DN, Coulman SA, Hayes J, Wilkins SJ, **Coulson JM**, Sweetland H, **Thompson JP**, **Routledge PA**. Similarities and differences in views of medical and pharmacy students with regard to therapeutics and prescribing interprofessional education (IPE) sessions. Using interviews to help explain questionnaire findings. Int J Pharm Pract 2013; 21: 22–3.

John DN, Coulman S, Bradley P, Mantzourani E, Hughes M, Deslandes R, Roberts L, Wilkins S, Hayes J, **Thompson JP**, **Coulson J**, **Routledge PA**. Interprofessional therapeutics and prescribing sessions for undergraduate pharmacy and medicine students at Cardiff University – what are the academic facilitators' opinions? Learning and Working Together to Improve Safety Through Better Prescribing, May 2013.

John DN, Coulman S, Premji A, **Thompson JP**, Sweetland H, Hayes J, Routledge PA. Interprofessional v uniprofessional therapeutics learning – a comparison of third year medical students working with other medical students or with pharmacy undergraduate. Learning and Working Together to Improve Safety Through Better Prescribing, May 2103.

John DN, Coulman SA, Premji A, **Thompson JP**, Sweetland H, Hayes J, **Routledge PA**. Undergraduates' views on therapeutics interprofessional education (IPE) sessions – similarities and differences between pharmacy and medicine students. Pharm Ed 2013; 13: 97.

Jones S, **Alldridge GL**, **Thompson JP**. Advantages and disadvantages of using Cloud technology to provide telephone services to the National Poisons Information Service. Clin Toxicol 2013; 51: 309.

Jones D, **Stephens S**, **Yates LM**, **Thomas SHL**. Prospective outcomes following acute exposure to pyrethroid insecticides in pregnancy Clin Toxicol 2013; 51: 354–5.

Jones D, **Stephens S**, **Yates LM**, **Thomas SHL**. Prospective outcome data after acute exposure to carbamate insecticides in pregnancy. Clin Toxicol 2013; 51: 355.

Konickx LA, Worek F, Jayamanne S, Thiermann H, Buckley NA, **Eddleston M**. Reactivation of plasma butyrylcholinesterase by pralidoxime chloride in patients poisoned by WHO Class II toxicity organophosphorus insecticides. Toxicol Sci 2013, 136: 274–83.

Laing WJ, **Spears RA**, **Thompson JP**, **Jackson G**, **Eddleston M**. Enquiries to the UK National Poisons Information Service from ambulance services. Clin Toxicol 2013; 51: 305.

Lam H, Hayhurst C, **Holmes P**, **Thanacoody HKR**, **Thomas SHL**. Subcutaneous self-injection of tetrodotoxin and ouabain. Clin Toxicol 2013; 51: 283.

Lupton DJ, **Jackson G**, **Eddleston M**. Online behaviour of TOXBASE users seeking advice on paracetamol poisoning management. Clin Toxicol 2013; 51: 273.

McCrae JC, Webb DJ, **Veiraiah A**. Measurement of QT interval in poisoned patients with acquired long QT syndrome: sources of measurement error and effects of various treatments. Proceedings British Pharmacological Society Meeting, London – pA2 online 2013; 11: 189P.

Perry L, Bennett AR, Adams RD, Jackson G, Vale JA, Thompson JP, Lam H, Eddleston M. Bendiocarb and clopyralid: a toxicovigilance study based upon 8 years of NPIS pesticide project data. Clin Toxicol 2013; 51: 356.

Pettie J, **Dow M**. Assessment and management of paracetamol poisoning in adults. Nurs Stand 2013; 27(45): 39–47.

Pettie J, **Dow M**. Management of poisoning in adults. Nurs Stand 2013; 27(47): 43–9.

Pettie JM, Dow MA, Sandilands EA, Eddleston M. Audit of admission and acetylcysteine administration rates for paracetamol overdose following license changes recommended by the UK's Commission for Human Medicines. Clin Toxicol 2013; 51: 272–3.

Richardson JL, **Jones D**, **Dunstan HJ**, **Maitra S**, **Stephens S**, **Yates LM**, **Thomas SHL**. Gestational exposure to varenicline. Reprod Toxicol 2013; 37: 85.

Spears RA, **Thompson JP**. Telephone enquiries to the UK National Poisons Information Service relating to poisoning with recreational volatile nitrites and the frequency of use of methylthioninium chloride (methylene blue) for the treatment of methaemoglobinaemia. Clin Toxicol 2013; 51: 344.

Thanacoody HKR. Clinical toxicology of Ayurvedic medicines. Clin Toxicol 2013; 51: 262–3.

Thomas SHL. Cardiotoxicity of newer antipsychotics: mechanisms, diagnosis and management. Clin Toxicol 2013; 51: 299–300.

Other

Coulson JM, **Thompson JP**. Anaphylactoid reactions to N-acetylcysteine. Clin Toxicol 2013; 51: 727. Letter.

Routledge PA, Samuels K. New Medicines Review (May 2013). Report for the Scottish Government. http://www.scotland.gov.uk/Publications/2013/05/2542/downloads.

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