UK Health Security Agency

NPIS

National Poisons Information Service
Report 2023 to 2024

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

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Foreword

Every day in the United Kingdom hundreds of people present to front-line NHS healthcare professionals because of concerns about exposure to medicines, drugs or chemicals. These exposures commonly involve unintentional contact with substances found in households or gardens and, although they occur in all age groups, are particularly common in young children. Exposures also commonly occur as medicine overdoses in the context of self-harm or as a result of drug misuse, with adolescents and younger adults disproportionately involved. Occupational exposures or involvement of natural toxins such as snake envenoming are less common.

The variety of different substances that may be involved in human exposures is broad, including medicines, household and garden products, drugs of misuse, industrial chemicals and plant or animal toxins. Most NHS healthcare professionals do not have the necessary knowledge and training to manage every potential exposure so they need clinical support to provide appropriate care. This includes a source of high-quality information about the health effects that might be expected from exposure to different drugs and chemicals, advice on appropriate patient care, and the opportunity to discuss cases with a clinical toxicology expert.

The National Poisons Information Service (NPIS) is commissioned by the UK Health Security Agency (UKHSA) to provide this clinical support, which acts on behalf of the English Department of Health and Social Care (DHSC), the Scottish Government, the Welsh Government and the Northern Ireland Department of Health. Information and advice about thousands of drugs and chemicals are available via our internet database TOXBASE and the TOXBASE app, which are available free of charge to all NHS UK healthcare professionals as well as colleagues in UKHSA and the Ministry of Defence (MOD). For complex cases our 24-hour telephone advice line is available, staffed by specialists in poisons information and supported by an on-call rota of consultant clinical toxicologists for advice on more serious or challenging cases. The NPIS also provides services to the Republic of Ireland, commissioned by Beaumont Hospital, Dublin, on behalf of the Irish Government. The NPIS service is provided by 4 NHS hospitals located in Birmingham, Cardiff, Edinburgh and Newcastle, which work together to deliver a fully integrated national service.

The unborn child is particularly vulnerable to in-utero effects of drugs and chemicals, so the NPIS also delivers the UK Teratology Information Service (UKTIS), which is the designated UK source of expert advice regarding exposure to medicinal and illicit drugs as well as other chemicals during pregnancy. Information and advice about exposures to hundreds of drugs and chemicals are published openly on the internet, while NHS health professionals can access more detailed and fully referenced information via TOXBASE and obtain specialist advice by telephone during office hours.

The information and advice provided by the NPIS, including UKTIS, supports the high-quality clinical management of patients with suspected poisoning and has a role in identifying and alerting about chemical incidents. This improves the care of those at risk of serious

complications, but also avoids unnecessary referrals, admissions and treatments for those who are not at risk, reducing cost and burden on healthcare resources. This is particularly important during these challenging times in the National Health Service. The NPIS also performs research and education activities, while collecting and sharing surveillance data that are important for public health and health security in the UK and internationally.

This annual report is published as a statement of the activity, accountability, and governance of the NPIS during the reporting year.

Michael Eddleston
Chair, NPIS Clinical Standards Group

Raquel Duarte-Davidson
NPIS Commissioner, Radiation, Chemicals and Environmental Hazards Directorate, UK Health Security Agency

Executive summary

Poisoning is an important public health issue, with presentations to emergency departments continuing to increase year on year. These episodes may involve unintentional exposures, medication errors, self-harm or drug misuse. Many more patients are managed in the community, including by primary care and NHS patient advice services such as NHS 111, NHS 24 and NHS Direct.

While the majority of episodes do not produce severe clinical effects, several thousand people die each year as a result of poisoning. In England and Wales alone, poisoning-related deaths have been increasing every year over the last decade, from 2,955 in 2013 to 4,907 in 2022 - in most part due to increasing numbers of unintentional overdoses with opiates and other drugs (particularly gabapentinoids (10-fold rise) and cocaine (4-fold rise) (1).

The National Poisons Information Service (NPIS) is commissioned to provide 24-hour information and advice to NHS healthcare professionals across the UK to support the management of patients with suspected poisoning. This information is provided primarily via TOXBASE, an online database containing information on more than 21,000 agents. TOXBASE is also available as an app which users can access both on- and offline. A 24-hour telephone advice service, staffed by specialists in poisons information and supported by consultant clinical toxicologists, is also available for more complex cases. The availability of this expertise avoids unnecessary hospital referrals and admissions for patients at low risk of harm, while improving the quality of treatment and shortening hospital stay for those with clinical toxicity. The UK Teratology Information Service (UKTIS) provides information and advice nationally about exposures to drugs and chemicals during pregnancy.

Activity

During 2023 to 2024 (changes from 2022 to 2023 activity in parentheses) there were:

NPIS

- 894,571 (+10.1%) TOXBASE user sessions from 8,885 (+6.3%) different registered UK healthcare departments; hospital departments and NHS patient advice services were the most frequent users
- 2,939,964 (+13.8%) TOXBASE online page views (average 3.3 page views per online user session)
- 312,774 (+9.8%) app accesses from 30,031 (+6.0%) TOXBASE app subscribers
- 41,779 (+7.9%) patient related telephone enquiries answered, of which 2,390 (+11.5%) were referred to an NPIS consultant clinical toxicologist; the most frequent telephone enquirers were NHS patient advice services and healthcare professionals working in hospitals

- 5,076 (+16.8%) TOXBASE entries written or updated, and 32,814 (+2.1%) safety data sheets submitted to the NPIS Product Data Centre, bringing the total to nearly 403,000

UKTIS

- 2,515,802 (+21.1%) downloads of publicly available information about drugs in pregnancy provided by the ‘bumps’ website
- 27,012 (+1.4%) accesses by healthcare professionals to the detailed information on drugs and chemical exposures in pregnancy held on TOXBASE
- 786 enquiries (+4.2%) about specific patients handled by the UKTIS telephone advice service

Quality

The NPIS has clear clinical governance procedures and quality assurance exercises continue to demonstrate that all of the services provided have very high user satisfaction. The proportion of respondents scoring services as very good or excellent was 93.6% for the NPIS telephone poisons information service, 95.2% for TOXBASE online, and 100% for the UKTIS telephone service.

Surveillance

The NPIS continues to collect clinical information on important causes of poisoning from across the UK. This helps us improve our clinical advice for health professionals and provides valuable information for public health surveillance of poisoning. Examples of work carried out during 2023 to 2024 include work on poisoning with drugs of misuse, pesticides, carbon monoxide, and dinitrophenol.

Introduction

Poisoning is an important public health issue in the UK, accounting for hundreds of thousands of hospital presentations per year, and many more consultations with primary care and NHS patient advice services such as NHS 111, NHS 24 and NHS Direct.

Poisoning can be categorised according to type of exposure, substance involved or circumstance of exposure. Inappropriate exposures to medicines and other drugs are a common source of poisoning and might involve use by someone who was not prescribed the medicine or involve unintentional or intentional ingestion of excessive doses (an ‘overdose’). Recreational drug misuse is a major public health problem in the UK and may involve licensed medicines or non-medicinal substances. Finally, people may be exposed to substances that are not intended for human use (for example household cleaning products), environmental toxins (for example carbon monoxide), or natural toxins (for example mushrooms or snakes).

The majority of episodes of poisoning in the adult UK population are caused by drug overdose in the context of intentional self-harm, although drug misuse is an important cause of mortality. In children, unintentional exposures are common, particularly involving substances found within the household. Many thousands of different substances may be involved in these cases, making it very difficult for NHS staff to keep up to date on risk assessment, diagnosis and management. The great majority of UK hospitals do not have specialist clinical toxicology services, therefore 24-hour access to high-quality information and clinical advice concerning people with exposure to drugs and chemicals is essential for their safe and effective management.

The NPIS is a network of dedicated poisons units commissioned by the UKHSA on behalf of the UK health departments to provide poisons information to healthcare professionals. The role of the NPIS within the NHS is to support the appropriate triage, referral, assessment and treatment of poisoned patients. This is achieved by the provision of advice to emergency departments, GP practices and NHS patient advice services to aid the decision-making process as to whether patients require medical assessment or hospital admission or can be safely managed at home. Information and advice are provided in the first instance via TOXBASE®, an online poisons information database, and via a 24-hour telephone advice line for provision of specific advice on individual cases. The information on TOXBASE is updated regularly using published literature, experience from NPIS telephone enquiry data, and direct clinical experience of NPIS-linked clinical departments.

Drug and chemical exposures during pregnancy can cause particular concern because these may affect the fetus as well as the mother. UKTIS, hosted by the NPIS, is a service providing advice to healthcare professionals and patients about potential effects on the unborn child. As well as providing information and advice, UKTIS collects new information on the potential adverse fetal effects of exposure to drugs and chemicals during pregnancy, including the therapeutic use of medicines.

The NPIS (including UKTIS) is funded primarily through government ‘grant-in-aid’ from UK health departments, with commissioning managed by UKHSA. The service also receives some contract income for providing services in other countries, as well as research income for specific projects. Providing a high-quality responsive service to NHS users, including maintaining our essential and highly used online platforms, is NPIS’s key priority.

National Poisons Information Service

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

The 4 NPIS units are currently based within NHS teaching hospitals (2 in England and one each in Scotland and Wales). Birmingham, Cardiff and Newcastle participate in a 24-hour national telephone enquiry rota; the Edinburgh unit receives telephone enquiries during working hours only as its main focus is on the editing and production of TOXBASE.

The 4 units also take telephone calls about chemical exposures, operating an early warning alerting system for UKHSA and providing clinical advice, ensuring efficient use of resources. The units liaise with the UKHSA Radiation, Chemicals and Environmental Hazards Directorate (RCE) and Public Health Scotland (PHS) regarding real-time management of chemical incidents.

The service has consultant clinical toxicologist support available to advise on the management of more complex presentations and patients who are seriously unwell. This is provided by NHS consultant staff in the 4 NPIS units and colleagues from 2 other NHS Trusts (Guy's and St Thomas' NHS Foundation Trust and York Hospitals NHS Foundation Trust). These NPIS consultants also provide locally funded specialist services in clinical toxicology in their own hospitals. The availability of this dispersed expertise is important for resilience and health security in the UK. Due to the NPIS receiving many enquiries about children, UKHSA has commissioned additional support from a consultant specialising in paediatrics.

The primary source of information provided by the NPIS is its online database, TOXBASE, which is available free of charge to all UK NHS healthcare units, including hospital departments, primary care practices and NHS patient advice services. TOXBASE is the National Institute for Health and Care Excellence (NICE) mandated, and DHSC recommended, initial source of poisons information for healthcare professionals in the UK. Ensuring that the information on TOXBASE is current and evidence-based is of paramount importance for patient safety and to maintain the confidence of healthcare professionals. It is also essential that the great majority of enquiries are made via TOXBASE as NPIS telephone services do not have the capacity to absorb the substantial increase in telephone enquiries that would result from TOXBASE information becoming unavailable or outdated. Uninterrupted access to TOXBASE is therefore crucial to the service and the NPIS strives to ensure that it remains operational at all times, with robust systems in place to respond to outages.

The TOXBASE app for mobile devices is also available without charge to UK NHS, UKHSA and MOD healthcare professionals and has the advantage of being available on personal mobile devices both on- and offline.

While TOXBASE provides a wealth of information, it cannot provide all the answers for individual patients or complex cases and healthcare professionals are encouraged to discuss such cases with the NPIS. To address this requirement, the NPIS provides a 24-hour telephone information service for healthcare professionals using a single national telephone number (0344 892 0111). NPIS activity is reflected in TOXBASE user session data and accesses to individual entries, as well as telephone enquiry numbers and consultant referrals.

Telephone enquiries are managed by specialists in poisons information (SPIs) who may have a scientific, nursing or pharmacy background and are qualified to at least degree level, with the majority also holding postgraduate qualifications in toxicology. In determining the severity of each clinical case, SPIs use the World Health Organization (WHO)'s Poisoning Severity Score (PSS), developed by the International Programme on Chemical Safety, the European Commission and the European Association of Poison Centres and Clinical Toxicologists (EAPCCT) (2). Enquiries about complex or severe cases, or where a review by an NPIS consultant might allow a patient to either not be admitted to hospital or be discharged home earlier, are referred to NPIS consultants. Figure 1 illustrates how poisons enquiries are answered by the NPIS.

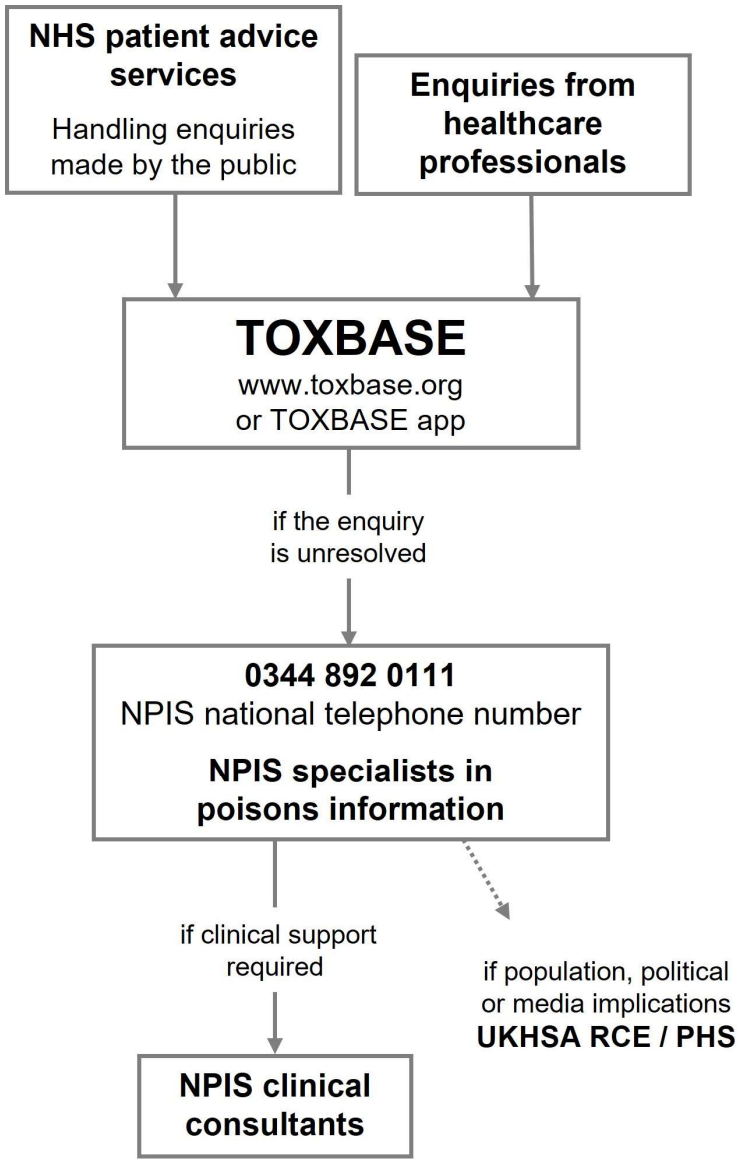
If calls are received which have population, political or media implications, referral is made to UKHSA RCE or Public Health Scotland as appropriate.

Audio recordings of all NPIS telephone enquiries are retained for governance purposes and clinical data are logged within a specially designed national database, the UK Poisons Information Database (UKPID). Data are uploaded to a central server, allowing access by other NPIS units that may be involved in the subsequent management of any particular patient. This also allows easy collation of activity data and surveillance of the patterns of enquiries received. Details of all telephone enquiries made since 2007 are held within UKPID, making it an invaluable resource for studying the patterns of poisoning in the UK. To safeguard this data and improve usability, development of an updated version of UKPID is ongoing.

In Northern Ireland, the Regional Medicines and Poison Information Service in Belfast provides a poisons information service, including clinical toxicologist cover, during working hours, while out-of-hours enquiries are automatically routed to the NPIS. The NPIS is also contracted to provide poisons information for users in the Republic of Ireland through the provision of TOXBASE to major hospital emergency departments and to the National Poisons Information Centre (NPIC) in Dublin. The NPIS also provides direct out-of-hours telephone support to health professionals and the general public in Ireland.

Information on the potential toxicity to the unborn child from maternal exposure to drugs and chemicals in pregnancy is provided by UKTIS. Information is provided for healthcare professionals by telephone and via TOXBASE, but summary advice is also openly available on the UKTIS website and public advice leaflets are held on the 'bumps' website.

Figure 1. How poisons enquiries are answered by the NPIS



The NPIS maintains a consistent approach, irrespective of the NPIS unit answering an enquiry, through a formal UK-wide strategic framework for training and governance, agreeing clinical advice and supporting the management of the service. Operating procedures are updated regularly and available to NPIS staff on a closed area of TOXBASE.

Commissioning issues are dealt with by the UKHSA NPIS Commissioning Group, while clinical issues, including clinical governance, are discussed by the NPIS Clinical Standards Group. Both groups meet at least quarterly and are attended by a representative of the commissioner, and a senior clinician and manager from each of the 4 NPIS units. Invitations are also extended to representatives of the NPIC in Dublin. Other senior NPIS staff are invited to attend as observers on a rotational basis.

Regular teleconferences are held by the TOXBASE Editing Group to ensure consistent and nationally agreed database content. The NPIC 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 ensure the database remains an effective and reliable record of clinical enquiries to the NPIS.

To ensure a consistent 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. These educational meetings provide an opportunity for clinicians and SPIs to present updates on current topics, research and audit projects, and to discuss complex clinical cases and governance issues. These events occur several times a year, both virtually and face-to-face, and hosting is rotated around the 4 NPIS units. Clinicians and SPIs are encouraged to attend and present at international toxicology conferences such as the annual congress of the EAPCCT.

Cost benefit of NPIS

The NPIS provides timely reassurance and expertise in response to both routine and complex cases of poisonings. It is a well-used front line clinical service and an intrinsic component of the UK health security arrangements, fulfilling national and international requirements. The NPIS service uses significant resource; it is therefore important to assess the benefits provided by the service, such as avoidance of unnecessary hospital referrals and admissions, reduced lengths of stay, and improvements in the quality of treatment for those patients admitted. The NPIS has previously published research demonstrating its cost-effectiveness through reducing referrals to emergency departments as a result of its advice (3).

NPIS activities

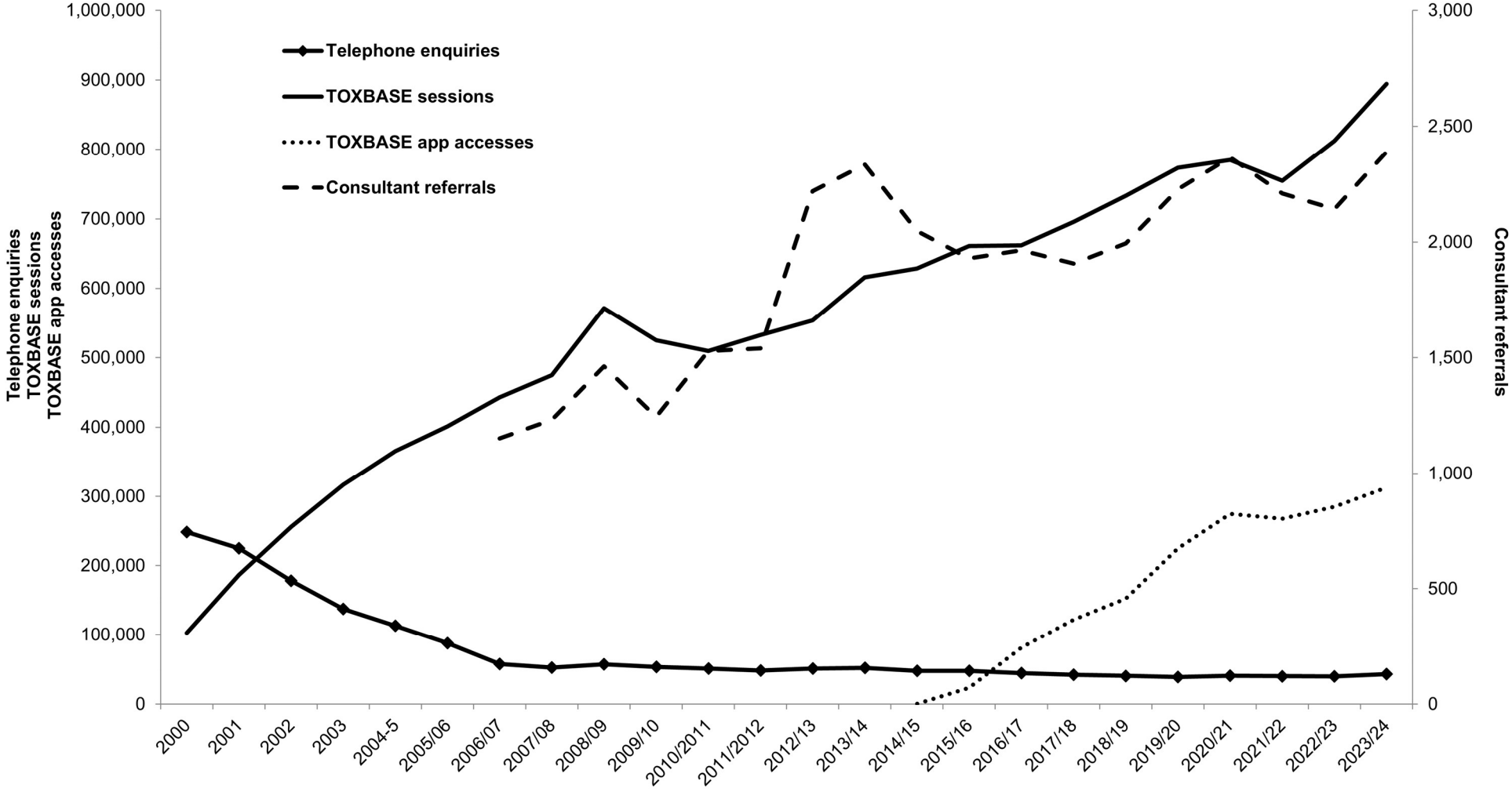
Overall service profile

The overall activity for NPIS services, both within the UK and overseas, in 2023 to 2024 is summarised below (change from 2022 to 2023 in parentheses):

- 8,885 (+6.3%) healthcare departments registered to use TOXBASE online
- 894,571 (+10.1%) TOXBASE online user sessions
- 2,939,964 (+13.8%) TOXBASE online page views
- 30,031 (+6.0%) individual TOXBASE app users
- 312,774 (+9.8%) TOXBASE app page accesses
- 41,779 (+7.9%) patient related telephone enquiries answered
- 2,390 (+11.5%) telephone enquiries referred to a consultant toxicologist
- 5,076 (+16.8%) TOXBASE entries written or updated

Figure 2 shows that the number of enquiries via TOXBASE online and the app continue to increase year on year. Consultant referrals increased by 11.5% in 2023 to 2024 compared to 2022 to 2023. The number of telephone enquiries received via the national helpline increased by 7.9% - the first increase in telephone enquiry numbers since before the COVID-19 pandemic. Service use across all our services has risen in 2023 to 2024, following a period of lower service usage during the COVD-19 pandemic.

Figure 2. Number of TOXBASE online sessions, TOXBASE app accesses, telephone enquiries and consultant referrals between 2000 and 2023 to 2024



UK service profile

In 2023 to 2024, there were 792,618 TOXBASE online user sessions generated in the UK, compared to 721,092 in 2022 to 2023 (+9.9%). A user session is defined as one login by a registered user where the user may access one or more pages several times, the average page views per session being 3.3. Hospital departments were the main source of UK user TOXBASE online sessions (513,262; 64.8%), most of which originated in emergency departments (452,721; 88.2%). As in previous years most accesses to the TOXBASE app were from UK ambulance services (59.8%). UK NHS patient advice services remain the heaviest users of the NPIS national helpline number, accounting for 43.0% (17,976) of all enquiries received, followed by hospital departments (10,680; 25.6%). The total number of TOXBASE online user sessions, TOXBASE app accesses and patient related telephone enquiries generated by UK users of NPIS services are shown by workplace type in Table 1.

During the reporting year (changes from 2023 to 2024 in parentheses) there were:

- 71,526 (+9.9%) more TOXBASE online UK user sessions, including
    - 4,858 (+13.8%) more sessions from primary care
    - 43,550 (+10.0%) more sessions from hospital users
    - 13,078 (+9.6%) more sessions from NHS patient advice services
- 12,877 (+5.1%) more UK TOXBASE app accesses:
    - increases seen across all user categories
- 41,779 (+7.9%) more patient related telephone enquiries answered, including:
    - 474 (+38.7%) more enquiries from HM Prison users
    - 951 (+23.3%) more enquiries from ambulance users
    - 4,382 (+16.6%) more enquiries from NHS patient advice services
- 869 (+10.0%) more enquiries relating to intentional self-harm

Table 2 lists the most common subjects of accesses/enquiries received across all routes of access to NPIS (TOXBASE online, TOXBASE app and telephone enquiries). It shows that UK healthcare professionals, regardless of what medium they use to seek advice, continue to need most help managing poisonings from analgesics, in particular paracetamol, and antidepressants.

Table 1. Use of NPIS services by workplace type as of 31 March 2024 (UK only)

Workplace type	Number of TOXBASE online user sessions (% of total)
Emergency department	452,721 (57.1)
NHS patient advice services	148,658 (18.8)
Ambulance	75,477 (9.5)
Primary care	39,816 (5.0)
Medicines information	18,285 (2.3)
Pharmacy	13,331 (1.7)
Paediatrics	7,198 (0.9)
Admissions/assessment	6,220 (0.8)
All others	30,912 (3.9)

Workplace type	Number of TOXBASE app page accesses (% of total)
Ambulance	157,598 (59.8)
Emergency department	45,989 (17.4)
Admissions/assessment	14,585 (5.5)
General practice	9,038 (3.4)
ITU/HDU	8,517 (3.2)
NHS patient advice services	1,668 (0.6)
All others	26,349 (10.0)

Workplace type	Number of patient related telephone enquiries (% of total)
NHS patient advice services	17,976 (43.0)
Hospital	10,680 (25.6)
General practice	5,257 (12.6)
Ambulance	5,024 (12.0)
Prison	1,700 (4.1)
All others	1,142 (2.7)

Table 2. Most commonly accessed product pages on TOXBASE online and the TOXBASE app, and the most common agents involved in telephone enquiries in 2023 to 2024 (UK only)

Rank	TOXBASE online	Number of page views
1	Paracetamol*	177,667
2	Ibuprofen	49,400
3	Sertraline	36,693
4	Pregabalin	27,167
5	Codeine*	25,735
6	Propranolol	25,239
7	Diazepam	24,691
8	Quetiapine	23,896
9	Mirtazapine	21,187
10	Amitriptyline	20,941

Rank	TOXBASE app	Number of accesses
1	Paracetamol*	23,404
2	Sertraline	5,674
3	Ibuprofen	5,291
4	Amitriptyline	5,128
5	Diazepam	4,336
6	Quetiapine	3,992
7	Pregabalin	3,903
8	Mirtazapine	3,830
9	Codeine	3,754
10	Zopiclone	3,253

* does not include product accesses for combination products or those listed under proprietary names, for example co-codamol or Zapain

Rank	Telephone enquiries	Number of calls
1	Paracetamol	7,707
2	Codeine	2,282
3	Ibuprofen	3,130
4	Ethanol	1,152
5	Sertraline	1,028
6	Naproxen	936
7	Mirtazapine	831
8	Quetiapine	692
9	Propranolol	682
10	Pregabalin	637

In addition, NPIS provides guidance on the use and correct administration of antidotes. Table 3 lists the most accessed antidote pages on TOXBASE online and the app, and the most common antidotes recommended during telephone enquiries. In 2023 to 2024 there were 46,103 TOXBASE online accesses to antidote pages compared to 44,886 in 2022 to 2023 (+2.7 %). By far the most common access was to the acetylcysteine antidote page. As might be expected, given that ambulance users are the heaviest users of the app, they commonly seek guidance on administration of naloxone and atropine, antidotes that are required urgently for common poisonings. Antidotes were recommended in 1,908 telephone enquiries in 2023 to 2024, including 172 cases where multiple antidotes were recommended for individual patients. Antidotes recommended during telephone calls differ from the most accessed on TOXBASE (both online and via the app) - they include high dose insulin, sodium bicarbonate and folinic acid, all antidotes used to stabilise seriously unwell patients, reflecting the use of the telephone enquiry line by healthcare professionals seeking guidance on treating these patients.

Table 3. Most commonly accessed antidote pages on TOXBASE online and the TOXBASE app, and most commonly recommended antidotes during telephone enquiries in 2023 to 2024 (UK only)

Rank	TOXBASE online	Number of page views
1	Acetylcysteine	32,264
2	Fomepizole 1,860; ethanol 414 (toxic alcohols)	2,274
3	Naloxone	1,415
4	Flumazenil	1,133
5	Desferrioxamine	635
6	Glucagon	577
7	Procyclidine	571
8	Antivenom (adder)	474
9	Methylthioninium chloride	427
10	Dantrolene	260

Rank	TOXBASE app	Number of page accesses
1	Naloxone	307
2	Acetylcysteine	276
3	Atropine	159
4	Fomepizole 70; ethanol 56 (toxic alcohols)	126
5	Flumazenil	104
6	Glucagon	70
7	Cyanide antidotes	67
8	Methylene blue	58
9	Pralidoxime	57
10	Sodium bicarbonate	44

Table 3. continued/

Rank	Telephone enquiries	Number of calls
1	Acetylcysteine	1,067
2	Toxic alcohols (Fomepizole 195; ethanol 11)	206
3	Sodium bicarbonate	158
4	High dose insulin	146
5	Naloxone	82
6	Folinic acid	58
7	Heavy metal antidotes*	56
8	Digifab	50
9	Antivenoms	45
9	Glucagon	45
10	Methylthioninium chloride	34

* includes: 36 DMSA, 15 sodium calcium edetate and 5 DMPS

TOXBASE online in the UK

As of 31 March 2024, there were 8,885 healthcare departments registered to use TOXBASE online in the UK (+6.3% on 31 March 2023). In 2023 to 2024 there were over 2.9 million individual page accesses via TOXBASE online in the UK:

- 20,785 currently active product and plant pages, of which 12,473 (60.0%) different pages were viewed a total of 1,433,754 (+8.2%) times
- 172 currently active antidote pages, of which 143 (83.1%) different antidote pages were viewed a total of 46,103 (+2.7%) times
- 3,063 currently active further information pages (for example: common features and management, toxic doses, help interpreting ECGs, administration of antidotes) of which 1,518 (49.6%) different information pages were viewed a total of 861,122 (+4.6%) times
- 5,076 pages written or updated in 2023 to 2024

TOXBASE's dosage calculator is frequently utilised by UK users (209,045; 23.0% of all information page accesses). Information pages on toxic doses are also frequently accessed (165,858 accesses). The most accessed toxic dose information pages were: NSAIDs (26,853), opioids (24,794) and SSRIs (19,029).

TOXBASE app for iOS and Android mobile devices

The TOXBASE app offers convenient mobile access to up to date poisons advice at the point of care. It is synchronised with online TOXBASE content and provides offline access when no internet connection is available, making it a particularly invaluable resource for emergency responders. The app is available from the iOS app store and Google Play.

Figure 3 shows examples of screenshots from the app (the co-codamol entry on an Android device, and the vinyl chloride entry on an iPad).

The design of the app is regularly updated to improve usability, and to ensure compatibility with the ever-changing market of mobile devices.

As of 31 March 2024 the app provided NHS, UKHSA and MOD users with full and free TOXBASE access on validation of professional email addresses. For other users, a paid version of the app was available; funding from the small fee charged being used towards ongoing development and hosting costs.

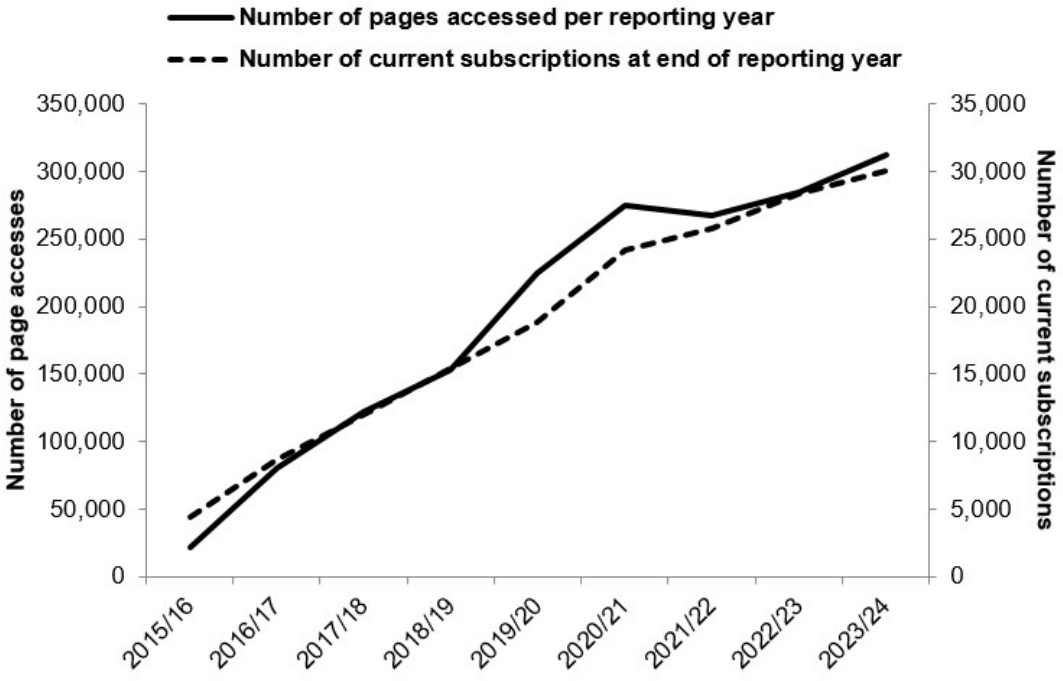
The number of subscribers changes daily as accounts are created, lapse and are renewed; on 31 March 2024 there were 30,031 current subscribers (29,167; 97.1% NHS/UKHSA/MOD and 864; 2.9% other). NPIS clinicians and SPIs have access to the app to support their NPIS duties and to increase service resilience in case of interruption to internet access. The most frequent UK healthcare workplace types are shown in Table 1; ambulance personnel were the most common.

During the 2023 to 2024 reporting year, app subscribers (excluding NPIS users) accessed 312,774 pages including 225,511 product entries and 87,263 antidote and information pages. Tables 2 and 3 above show the top UK product and antidote pages accessed on the app.

There was a 6.0% increase in the number of subscribers from the previous year, and a 9.8% increase in the number of pages accessed, as shown in Figure 4.

Figure 3. TOXBASE app screenshots

Figure 4. TOXBASE app subscriptions and pages accessed between 2015 to 2016 and 2023 to 2024



NPIS national telephone enquiry helpline

TOXBASE is the NICE mandated and DHSC recommended initial source of poisons information for healthcare professionals in the UK. It is supported by the NPIS national telephone enquiry helpline, available for more complicated enquiries due to ingestion of multiple agents, patient co-morbidities, where the patient is severely unwell, or for less experienced TOXBASE users. The enquiry line provides 24-hour access to advice from SPIs and, when required, a network of UK consultant toxicologists.

Figure 5 shows the age ranges of the patients involved; patients aged 5 years or less were most common, representing 20.7% (8,637) of all poisoned patients. As in previous years poisonings were predominantly unintentional (15,744; 37.8%; Table 4), by ingestion (60,146; 88.3%; Table 5) and occurred at home (35,672; 85.4%; Table 6).

Figure 5. Age ranges of patients reported to NPIS during telephone enquiries in 2023 to 2024

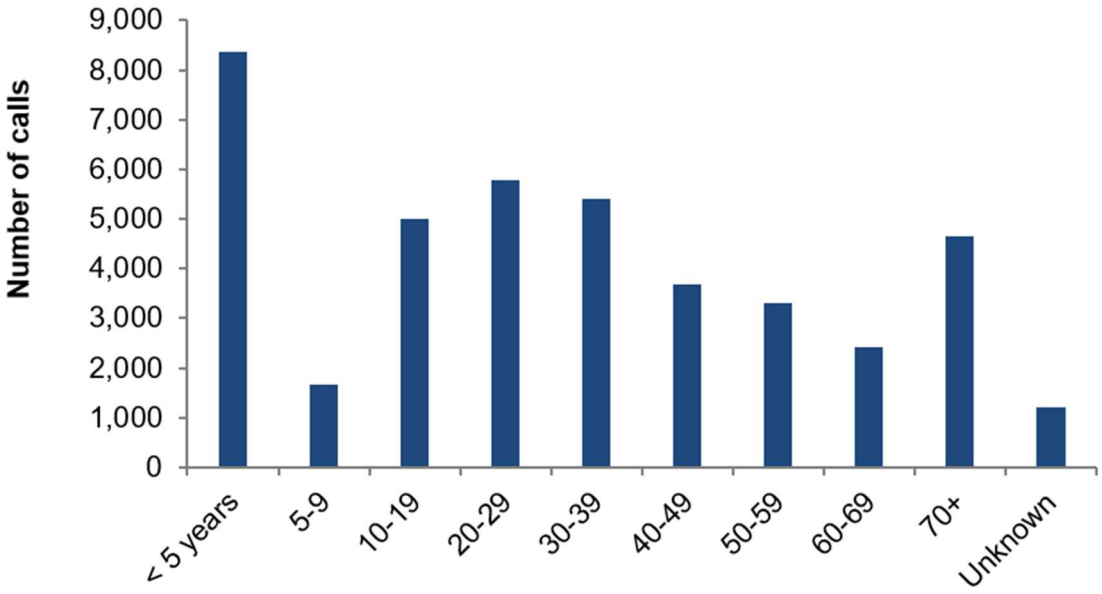


Table 4. Circumstances of poisonings reported to the NPIS during telephone enquiries in 2023 to 2024

Circumstance	Number (% of total)
Unintentional	15,744 (37.7)
Intentional self-harm	9,527 (22.8)
Therapeutic error	7,060 (16.9)
Intentional therapeutic excess	3,628 (8.7)
Medical error	1,485 (3.5)
Unknown	1,028 (2.5)
Intentional	963 (2.3)
Recreational misuse	882 (2.1)
Other	693 (1.6)
Adverse reaction	571 (1.4)
Malicious potential	122 (0.3)
General information	76 (0.2)

Table 5. Exposure route of poisonings reported to the NPIS during telephone enquiries in 2023 to 2024

Route of exposure	Number* (% of total)
Ingestion	60,146 (88.3)
Inhalation	3,100 (4.6)
Skin contact	1,591 (2.3)
Eye contact	982 (1.5)
Other	767 (1.1)
Subcutaneous	402 (0.6)
Intravenous	340 (0.5)
Insufflation	280 (0.4)
Intramuscular	225 (0.3)
Bite or sting	215 (0.3)
Needlestick	84 (0.1)

* the number of exposure routes exceeds the total number of enquiries because patients may be exposed via multiple routes/multiple agents during one episode of poisoning, for example ingestion and skin contact, or inhalation and eye contact

Table 6. Location of poisonings reported to the NPIS during telephone enquiries in 2023 to 2024

Location	Number (% of total)
Home/domestic	35,672 (85.4)
Prison	1,611 (3.9)
Nursing/care home	1,062 (2.5)
Work	919 (2.2)
Hospital	612 (1.5)
Public area	601 (1.4)
School	513 (1.2)
Unknown	452 (1.1)
Other	258 (0.6)
GP surgery	44 (0.1)
Agricultural workplace	35 (0.1)

There were 41,799 patient related telephone enquiries, for which a poisoning severity score (2) was recorded in 40,731 (97.4%). The source of these patient related enquiries included:

- 17,730 (43.5%) from NHS patient advice services
- 10,385 (25.5%) from hospitals
- 5,064 (12.4%) from GPs
- 4,863 (12.0%) from ambulances
- 2,689 (6.6%) from other sources, for example prisons, pharmacies

The severity of symptoms recorded in these enquiries ranged from none to fatal:

- 25,099 (61.6%) no symptoms
- 12,098 (29.7%) minor symptoms
- 2,109 (5.2%) moderate symptoms
- 1,396 (3.4%) severe symptoms
- 29 (0.1%) fatalities

Most enquiries where no or only minor symptoms (17,641; 99.5%) were reported originated from NHS patient advice services. For these enquiries, only 5,124 (28.9%) referrals to emergency departments were made, meaning that the UK NPIS, via one of its services alone, prevented up to 12,606 (71.1%) potential referrals to UK emergency departments in 2023 to 2024.

In contrast, moderate, severe and fatal enquiries originated from mainly hospitals (3,101; 87.7%), followed by:

- 209 (5.9%) from ambulances
- 94 (2.7%) from GPs
- 89 (2.5%) from NHS patient advice services
- 41 (1.2%) from other sources

There were 14,075 (79.4%) enquiries from NHS patient advice services related to exposures to a single product, and 3,655 (20.6%) of enquiries related to exposures to multiple products, including one case of a patient exposed to 13 products. The most common products involved in these enquiries are shown in Table 7.

Table 7. Most common products involved in enquiries from NHS patient advice services in 2023 to 2024

Product	Number
Ibuprofen	895
Paracetamol	470
Naproxen	315
Co-codamol	233
Aspirin	206
Bisoprolol	147
Atorvastatin	141
Codeine	121
Lansoprazole	113
Anadin Extra	103

There were 10,385 telephone enquiries from hospitals in 2023 to 2024; 7,595 (73.1%) related to exposures to a single product, and 2,790 (26.9%) related to exposures to multiple products, including one case of a patient exposed to 18 products. The most common products involved in these enquiries are shown in Table 8.

Table 8. Most common products involved in enquiries from hospitals in 2023 to 2024

Product	Number
Paracetamol	2,552
Ibuprofen	409
Unknown agent	223
Digoxin	184
Propranolol	288
Sertraline	301
Diazepam	185
Quetiapine	224
Iron	364

A comparison of circumstances between NHS patient advice services and hospital enquiries is presented in Table 9. Most enquiries from NHS patient advice services were unintentional (9,439; 53.3%) or caused by therapeutic error (4,139; 23.5%). Enquiries from hospitals were mostly intentional self-harm (4,332; 41.7%) or unintentional (3,144; 30.3%).

Table 9. Circumstance of enquiries originating from NHS patient advice services and hospitals in 2023 to 2024

Circumstances	Number of enquiries from NHS patient advice services (% of total)	Number of enquiries from hospitals (% of total)
Unintentional	9,439 (53.2)	3,144 (30.3)
Therapeutic error	4,139 (23.4)	474 (4.6)
Intentional therapeutic excess	2,279 (12.9)	306 (2.9)
Medical error	659 (3.7)	312 (3.0)
Intentional self-harm	253 (1.4)	4,332 (41.7)
Recreational abuse	156 (0.9)	446 (4.3)
Other	805 (4.5)	1,371 (13.2)

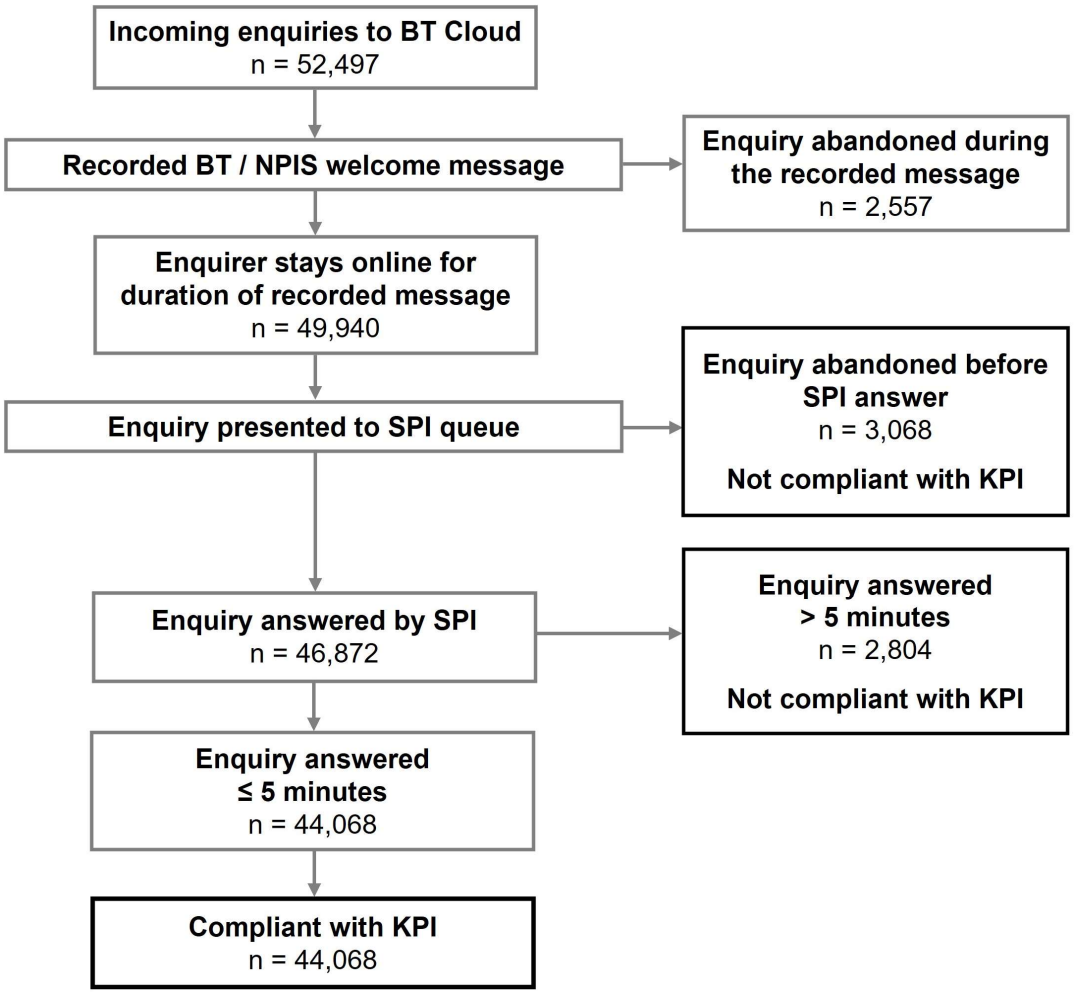
All NPIS services including the NPIS telephone enquiry helpline continue to be invaluable clinical resources for healthcare professionals working across a range of healthcare facilities in the UK, providing urgent advice regarding the management of poisoned patients at any time of the day or night. This ensures that less severe, unintentional exposures are managed effectively out of hospital and more severe, intentional self-harm exposures are managed efficiently in hospital.

Telephone enquiry handling

The NPIS uses a bespoke BT Cloud Contact™ system to deliver telephone enquiries received from healthcare professionals across the UK via a single number (0344 892 0111) to SPIs in the 4 units. This system has several benefits including conference call functionality and a comprehensive reporting tool. The latter enables close monitoring of workload, wait times, dropped (abandoned) calls and call duration at national, individual unit and individual SPI level. It also allows assessment of compliance with the UKHSA stipulated key performance indicator (KPI) that 95% of telephone requests are answered within 5 minutes of the call being made. Not all telephone enquiries received are recorded onto the enquiry logging system (UKPID). Examples of these enquiries include line tests, repeat calls made by healthcare professionals with additional case specific details and healthcare professionals contacting the NPIS to provide follow-up data on previously discussed cases. Telephone enquiry data were assessed retrospectively for the period 1 April 2023 to 31 March 2024 using the BT Cloud data reporting tool and analysed using Microsoft Excel. Figure 6 summarises the flow of telephone enquiries through the BT platform.

The median wait time for a call presented to the SPI queue to be either answered or abandoned was 35 seconds (IQR, 30-56 seconds). Approximately 1% (691) of enquirers waited longer than 10 minutes for their call to be answered. Of the 46,872 enquiries that were answered, the median talk time was 5 minutes and 25 seconds (325 seconds, IQR, 224-483 seconds) with 15.3% of answered enquiries lasting 10 minutes or more (7,186). The longest enquiry lasted one hour and one minute. The proportion of enquiries that were abandoned before being answered by a SPI was low at 6.1% (3,068); the median wait time before abandonment was 61 seconds (IQR, 23-217 seconds). One hundred and fifty-three (4.9%) users waited in the SPI queue for more than 10 minutes before abandoning their call. There were 5,872 (11.8%) enquiries that were not answered within 5 minutes, the majority (3,483, 59.3%) of which were received between midday and 10 pm. The data demonstrates that the NPIS provides a robust service, answering 93.8% of all presented enquiries and the large majority (88.2%) within a wait time of 5 minutes or less. The service, however, is tasked to answer 95% of enquiries within 5 minutes; a review of resources available during critical times may be required to address increased surge in calls during busy times.

Figure 6. Summary of telephone enquiry flow through the BT platform in 2023 to 2024



Consultant referrals

Daytime cover of the national telephone number is provided by SPIs in each NPIS unit, who are supported by consultants, academic clinical staff and/or specialist registrars, with appropriate supervision where needed.

The NPIS operates an out-of-hours national consultant clinical toxicology on-call rota for the UK and the Republic of Ireland. There are 17 consultant clinical toxicologists (14 from the 4 NPIS units and 3 from hospitals in York and London) contributing to out-of-hours cover (weekdays 18:00-09:00, weekends and public holidays). All are involved in the care of poisoned patients in their own local NHS hospitals. A nationally agreed protocol is used to determine when SPIs should refer enquiries to a consultant. The national consultant rota is managed from NPIS Edinburgh.

Units provide cross-cover in emergencies and occasionally support colleagues in other units. NPIS Edinburgh also provides consultant support for enquiries from Northern Ireland during the working week. Details of all telephone calls to the NPIS are logged on the UKPID database and sent to the relevant consultant for local or national audit and checking.

There were 2,390 referrals to NPIS consultants in 2023 to 2024 (an 11% increase from 2022 to 2023) representing 5.6% of all telephone enquiries. Of these 1,264 (52.9%) were received during working hours and 1,126 (47.1%) out-of-hours. The median number of referrals per day was 3. By far the most consultant referral calls (2,250; 91.1%) came from hospitals (Table 10), with calls from GPs/primary care (67; 2.8%) and NHS patient advice services (38; 1.6%) being the second and third most common sources respectively.

Table 11 shows the most common types of agents involved in referrals to consultants. The list reflects agents that are commonly ingested and those associated with more complex poisoning where consultant input into patient care is often required; it also highlights the number of calls relating to unknown agents. A referral to a consultant may also be made when a consultant review may avoid the patient being referred to hospital or allow earlier discharge than normal.

Analysis of consultant referrals is used to improve the services offered by the NPIS, in particular TOXBASE. Issues highlighted by difficult or complex calls are discussed among NPIS staff at regular TOXBASE Editing Group meetings which facilitates necessary revisions to the advice provided on TOXBASE.

Table 10. NPIS consultant referrals from hospitals by department in 2023 to 2024

Source	Number of referrals from hospitals (% of total hospital referrals: 2,250)
Adult emergency departments	980 (43.6)
Intensive care units	585 (26.0)
Paediatrics	291 (12.9)
Unspecified hospital units	175 (7.8)
Admission/assessment units	87 (3.9)
General medicine	86 (3.8)
Other adult hospital units	32 (1.4)
Medicines information and pharmacy	14 (0.6)

Table 11. Agents commonly involved in NPIS consultant referrals in 2023 to 2024

Rank	Agent	Number of referrals (% of total referrals: 2,390)
1	Paracetamol (inc. combination products)	482 (20.2)
2	Unknown agent	233 (9.7)
3	Drugs of misuse	173 (7.2)
4	Propranolol	137 (5.7)
5	Amlodipine	126 (5.3)
6	Digoxin	122 (5.1)
7	Lead containing products	114 (4.8)
8	Bites and stings	101 (4.2)
9	Venlafaxine	87 (3.6)
10	Ethylene glycol/methanol/antifreeze	84 (3.5)

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.

NPIS Product Data Centre

NPIS Birmingham is responsible for collecting and disseminating chemical safety information to other UK poison units. On 1 January 2021, Annex VIII of EU Classification, Labelling and Packaging Regulation (1272/2008) was implemented in Northern Ireland. This has meant that the UK is currently operating a dual system of chemical safety information submission. Whether information is submitted in the harmonised European format for Northern Ireland, or the non-harmonised format for Great Britain, it is securely held on the NPIS Product Data Centre, to which all NPIS staff have 24-hour access. This composition information is used to advise healthcare professionals contacting the NPIS for the acute management of poisoned patients as well as to update TOXBASE, enabling end-users to obtain specific advice on many common products. In 2023 to 2024 a total of 32,814 submissions (15,891 of which were in the EU harmonised format) were made to the NPIS, with the Product Data Centre now holding composition information on nearly 403,000 products.

Operating a dual system for chemical safety submission is challenging and in July 2023, the UKHSA and NPIS Birmingham began a technical discovery project to identify opportunities to improve the existing software solution used to accept, store and share chemical safety information within the NPIS.

The process is currently resource intensive. Following the technical discovery exercise, recommendations were made to develop a service for industry to submit information securely through a bespoke online portal with improved back-office views to enhance the provision of emergency healthcare advice.

User research has included multiple stakeholder interviews to identify ‘pain-points’ both within industry making the submissions and for the scientists working within the service accessing the composition information. Assumptions and prototypes have been tested with stakeholders through an ‘alpha’ stage and work now progresses into ‘beta’ phase to develop a tool that harnesses the latest information technology and reduces the administrative burden on the NPIS.

Electronic engagement

The NPIS has a long history of engaging with service users electronically, going back as far as the early 1980s when TOXBASE was first developed as a response to increasing numbers of poisons enquiries, and was revolutionary in information delivery for poisons information. In September 2023 TOXBASE celebrated its 40th anniversary; the TOXBASE website and the TOXBASE app for Android and iOS remain a unique format for poisons information provision internationally.

In 2023 to 2024 TOXBASE was moved to a new software provider with minimal disruption in user experience. This has resulted in changes to password security in line with the latest

regulations and is likely to result in better and more reliable reporting of TOXBASE access numbers in relation to poisoned patients.

UKTIS deliver information to healthcare professionals via the UKTIS website and provide public facing information at the 'bumps' website.

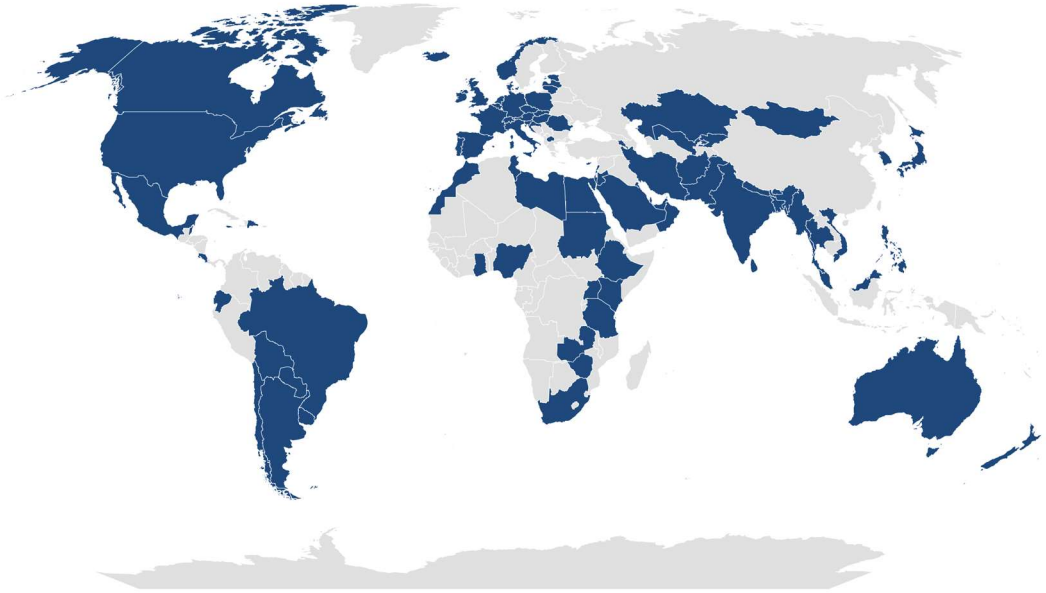
The NPIS website is focused on providing information to our stakeholders. It holds information on the structure and function of the NPIS and details the range of services offered to healthcare professionals on all aspects of poisoning and links to affiliated organisations and relevant websites. Visitors to the website can download NPIS publications, including annual reports dating back to 2004. The website was created and is maintained by NPIS Birmingham with collaboration from the other units. Examples of research undertaken by the NPIS and presented at international toxicology conferences are also accessible on the website. Members of the public are signposted to appropriate sources of emergency advice as well as provided with free access to leaflets and posters about poisoning in the home and garden. In addition, information specifically for industry who engage with NPIS has been made available on the website to clarify the requirements of both UK and EU specific legislation as a consequence of the UK's departure from the EU.

TOXBASE overseas

TOXBASE continues to be a well-regarded source of poisons information internationally and its international use has grown steadily. Paid subscriptions to TOXBASE online from upper middle- and high-income countries are available, although they represent only 11% of our overseas users.

The UK NPIS remains a front-line clinical NHS service, dedicated to improving care for poisoned patients. It continues to offer TOXBASE free of charge or at a reduced rate to many poison centres within low- and middle-income countries, helping to improve resilience and build capacity in poison centres and hospitals where needed most. As of 31 March 2024 there were 328 overseas departments registered for TOXBASE online and 1,108 individually registered TOXBASE app users, in 106 countries outside the UK (Figure 7).

Figure 7. TOXBASE online (and/or app) use by country (dark shading) 2023 to 2024



In 2023 to 2024 TOXBASE online users, in 62 different countries, made 434,868 product and information page accesses. There were 101,953 TOXBASE online user sessions (11.4% of all TOXBASE online user sessions), an increase of 10,665 (+11.7%), viewing on average 4.3 pages per session. Users in Brazil, Ireland and the Philippines made the most use of TOXBASE online. Overseas users made 300,681 accesses to 9,388 different product pages online, an increase of 12.5% and 6.3%, respectively, compared with 2022 to 2023. The majority (250,691, 83.3%) of all product accesses were made by overseas poison information centres.

TOXBASE app users, in 79 different countries, made 35,027 product page accesses to 2,016 different product pages; individuals from Saudi Arabia, Brazil, and Australia made the most use of the TOXBASE app.

As is seen in the UK, paracetamol was the most accessed product by overseas users and the most accessed products via TOXBASE online are a mixture of analgesics, antidepressants, anxiolytics and the antipsychotic quetiapine. The specific antidepressants and anxiolytics commonly accessed by overseas users differs to those in the UK and include clonazepam, alprazolam and escitalopram. Unlike in the UK, the most accessed products differ between platforms, in that overseas app users are also likely to seek advice regarding anticonvulsants (carbamazepine) and antihistamines (loratadine and cetirizine) (Table 12).

Table 12. Top product pages accessed by overseas users via TOXBASE online and the TOXBASE app in 2023 to 2024

Rank	Product page	Number of TOXBASE online accesses
1	Paracetamol	10,322
2	Clonazepam	6,403
3	Sertraline	5,283
4	Quetiapine	4,773
5	Amitriptyline	3,956
6	Fluoxetine	3,369
7	Ibuprofen	3,127
8	Diazepam	3,042
9	Alprazolam	3,024
10	Escitalopram	2,995

Rank	Product page	Number of TOXBASE app accesses
1	Paracetamol	827
2	Ibuprofen	671
3	Quetiapine	550
4	Diclofenac	512
5	Amlodipine	423
6	Metformin	395
7	Cetirizine	392
8	Escitalopram	380
9	Carbamazepine	370
10	Loratadine	362

UK Teratology Information Service

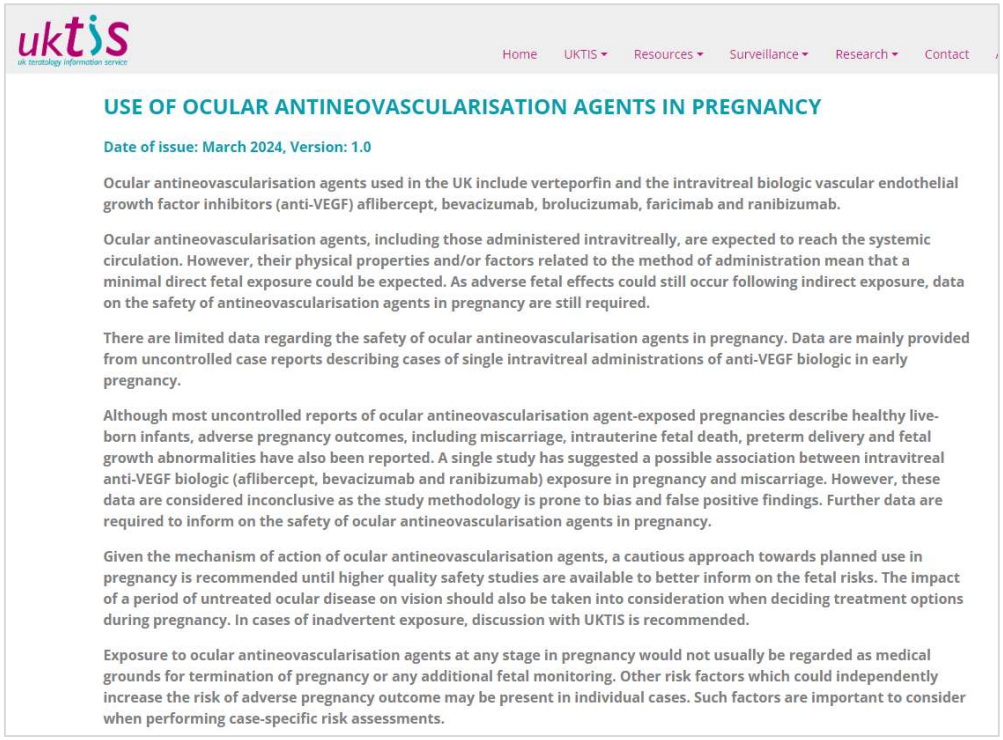
Overview

The UK Teratology Information Service (UKTIS) provides evidence-based safety information to healthcare professionals in the UK about the effects of medication and other exposures during pregnancy in order to help reduce preventable birth defects and adverse pregnancy outcomes.

Support and advice for healthcare workers is accessed via a telephone enquiry line and online systematic evidence reviews from the UKTIS website. In addition, UKTIS also provides information directly to women and their families via patient information leaflets accessed via the 'bumps' website (Best Use of Medicines in Pregnancy) (Figure 8). These services are provided by a small team of experienced scientists led by a Consultant Obstetrician in Maternal and Foetal Medicine for pregnant women, those planning a pregnancy and those who may have had an adverse pregnancy outcome. Information regarding paternal exposures is also available.

Many women need to take medicines in pregnancy to control chronic or acute health conditions to maintain their health and that of their unborn baby. Others may be inadvertently exposed to medication, chemicals or other hazards either occupationally or through environmental exposure. Pregnancy safety data is often limited and of varying quality, making it difficult for healthcare workers to provide patient risk assessments regarding continued medication use in pregnancy, or to establish the risk of fetal harm. UKTIS undertakes surveillance for teratogenic signal detection, collecting valuable data from healthcare professionals and women. UKTIS is highly active in several national and international research activities in the area of reproductive toxicity, utilising the data collected by UKTIS data collection systems.

Figure 8. Website view of an UKTIS systematic evidence review and 'bumps' patient information leaflet



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USE OF OCULAR ANTINEOVASCULARISATION AGENTS IN PREGNANCY

Date of issue: March 2024, Version: 1.0

Ocular antineovascularisation agents used in the UK include verteporfin and the intravitreal biologic vascular endothelial growth factor inhibitors (anti-VEGF) aflibercept, bevacizumab, brolucizumab, faricimab and ranibizumab.

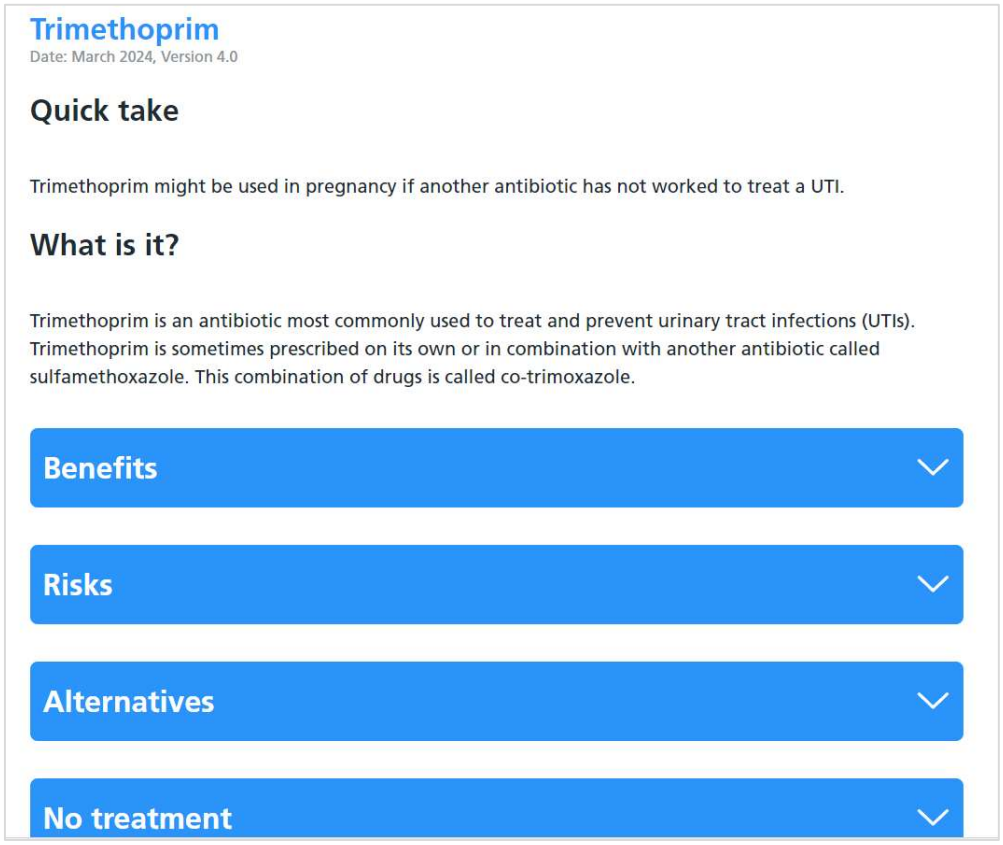
Ocular antineovascularisation agents, including those administered intravitreally, are expected to reach the systemic circulation. However, their physical properties and/or factors related to the method of administration mean that a minimal direct fetal exposure could be expected. As adverse fetal effects could still occur following indirect exposure, data on the safety of antineovascularisation agents in pregnancy are still required.

There are limited data regarding the safety of ocular antineovascularisation agents in pregnancy. Data are mainly provided from uncontrolled case reports describing cases of single intravitreal administrations of anti-VEGF biologic in early pregnancy.

Although most uncontrolled reports of ocular antineovascularisation agent-exposed pregnancies describe healthy live-born infants, adverse pregnancy outcomes, including miscarriage, intrauterine fetal death, preterm delivery and fetal growth abnormalities have also been reported. A single study has suggested a possible association between intravitreal anti-VEGF biologic (aflibercept, bevacizumab and ranibizumab) exposure in pregnancy and miscarriage. However, these data are considered inconclusive as the study methodology is prone to bias and false positive findings. Further data are required to inform on the safety of ocular antineovascularisation agents in pregnancy.

Given the mechanism of action of ocular antineovascularisation agents, a cautious approach towards planned use in pregnancy is recommended until higher quality safety studies are available to better inform on the fetal risks. The impact of a period of untreated ocular disease on vision should also be taken into consideration when deciding treatment options during pregnancy. In cases of inadvertent exposure, discussion with UKTIS is recommended.

Exposure to ocular antineovascularisation agents at any stage in pregnancy would not usually be regarded as medical grounds for termination of pregnancy or any additional fetal monitoring. Other risk factors which could independently increase the risk of adverse pregnancy outcome may be present in individual cases. Such factors are important to consider when performing case-specific risk assessments.



Trimethoprim

Date: March 2024, Version 4.0

Quick take

Trimethoprim might be used in pregnancy if another antibiotic has not worked to treat a UTI.

What is it?

Trimethoprim is an antibiotic most commonly used to treat and prevent urinary tract infections (UTIs). Trimethoprim is sometimes prescribed on its own or in combination with another antibiotic called sulfamethoxazole. This combination of drugs is called co-trimoxazole.

Benefits

Risks

Alternatives

No treatment

Information provision to healthcare providers

UKTIS continues to update and provide detailed, fully referenced systematic evidence reviews, providing critical appraisal of the published data for over 700 drug and chemical exposures, for registered health professionals. These are accessed either direct from the UKTIS website, or via a referral link from TOXBASE. UKTIS also provide summaries/ abstracts of each of the reviews which are openly available to all on uktis.org.

In 2023 to 2024 over 250,000 summaries and 27,000 systematic evidence reviews were accessed. If information cannot be found on the UKTIS website, or healthcare providers have a complex enquiry, they can telephone UKTIS for advice. In 2023 to 2024 the service answered 786 telephone enquiries.

Access to information for healthcare providers remained relatively stable this year, with a slight increase in the number of telephone enquiries received by the service and accesses to the systematic evidence reviews. In response to an increasing number of calls about the use of eye medication (afibercept/bevacizumab), which is used to treat retinal vascular disease, UKTIS has written and published a systematic evidence review on the available published pregnancy safety data. Increasing use of therapeutic amfetamines for the treatment of attention deficit hyperactivity disorder (ADHD) has also impacted the number of calls to the service. In response UKTIS reviewed the published literature regarding exposure in pregnancy, publishing a review for healthcare providers and a corresponding leaflet for women.

Information provision to members of the public

‘Bumps’ is a patient facing website providing freely available information produced by UKTIS for women and their families. Patient information leaflets are written to correspond with the systematic evidence reviews available on uktis.org. This year there were over 2.5 million hits on the ‘bumps’ leaflets.

The ‘bumps’ website was upgraded in 2023 to 2024 to provide improved accessibility of the interface, including a much more prominent search function for users looking for information about medicines in pregnancy. The new website will also have a link to a new pregnancy registry to collect participant self-reported data, which can be utilised to conduct observational safety monitoring of maternal medication use in pregnancy. This is currently under development.

External collaborations

UKTIS have provided expertise to the Moorfields Manual of Ophthalmology; Medicines in pregnancy update 2024 and continued to support NHS England with the nhs.uk medicines A-Z pages, reviewing pregnancy and fertility content for 50 product pages in 2023 to 2024.

Research and development

Newcastle Health Innovations Partners (NHIP)

UKTIS successfully applied for funding from Newcastle Health Innovations Partners (NHIP) to carry out a pilot study to develop an animation about pregnancy sickness medicines specifically designed for people from ethnic minority communities, taking into account language and cultural factors. This project is partly undertaken in response to the findings from the MBBRACE report 2022 which demonstrated that black women were at almost 4 times greater risk of maternal mortality than white women. One of the reasons for this finding was thought to be barriers to engagement with health services.

The animation is expected to be finished by the end of 2024 and will be freely available for use across maternity services in the UK.

ConcePTION Project

The ConcePTION project is funded by the Innovative Medicines Initiative (IMI; grant agreement number 821520). This 5-year European project consists of multiple work packages which together aim to address the uncertainties which exist around the effects of medication used during pregnancy and breastfeeding. The aim was to produce a ‘research ecosystem’ to generate and disseminate reliable evidence around gestational medication safety. UKTIS have been actively involved in several of the key work packages. In 2023 to 2024, in conjunction with multiple European partners from both publicly funded institutions and the pharmaceutical industry, UKTIS have led work package tasks validating data collection tools for the long-term follow-up of infants with *in utero* medication exposures, developed guidelines for the statistical analysis and reporting of single exposure arm drug safety studies, led the collection and analysis of data in a multinational study of medications used to treat multiple sclerosis in pregnancy, and continued to produce written safety information for a website that provides up to date information about drug use during pregnancy (Mothers Using Medicines Safely; MUMS). UKTIS have also continued to promote the core data elements required for the performance of pregnancy pharmacovigilance (PregPV) studies at an international meeting of drug safety professionals from medical regulatory agencies and the pharmaceutical industry (Drug Information Association annual conference) and teratology experts (European Network of Teratology Information Services annual conference).

NCARDRS Project

UKTIS were granted NHS England (NHSE) honorary contracts to explore the feasibility of combining NHS Business Services Authority (NHSBSA) medication dispensing data and National Congenital Anomaly and Rare Diseases Registration Service (NCARDRS) congenital anomaly datasets for teratogen surveillance purposes. In this project, data are transferred to UKTIS (via a secure system) to perform analysis of the data to identify exposures which occurred during the first trimester of pregnancy. Using a disproportionality case-control approach, UKTIS subsequently undertook screening of the data to identify any

exposures which were over-represented for specific congenital anomalies. In 2023 to 2024, a preliminary linkage was successfully undertaken to develop an understanding of the required data manipulation and analysis techniques that would be required to use these linked datasets for teratogen surveillance purposes. The full NCARDRS dataset (congenital malformations reported in 2020 and 2021) will be analysed in 2024 to 2025.

ENTIS collaborative studies

International collaborative work with other Teratology Services have continued, as part of our membership to the European Network of Teratology Services. This year UKTIS contributed to studies on the use of modafinil, and GLP1 receptor antagonists in early pregnancy.

Future work

In 2024 to 2025 UKTIS will finalise an ongoing project to investigate the feasibility of implementing an online data capture tool to collect medication exposure and pregnancy, fetal, neonatal and childhood outcome information directly from women using medicines during pregnancy.

The primary objectives are to:

- recruit a sample of pregnant women to provide information via an online data collection tool designed for the purposes of monitoring medication safety in pregnancy.
- assess the ability of this system to maintain participant engagement and perform structured follow-up of the reported pregnancy through to fetal, neonatal and childhood outcome.
- assess the suitability of using the information provided for teratogen surveillance purposes.

Secondary objectives include:

- exploring the willingness of participants to provide their consent to allow access to information contained within available national electronic healthcare records.
- describing the demographics of women who provide data to the system.
- utilising the reported data to analyse the risk of adverse pregnancy, fetal, neonatal and childhood outcomes for pregnancy cohorts with exposure to specific medications.

The platform space on the ‘bumps’ website has been built and is ready. Launch of this data collection tool is anticipated soon.

In 2024 to 2025 UKTIS will also focus on improvements to quality assurance data collection for all the services offered. UKTIS will look to develop new satisfaction surveys for the telephone enquiry service and for online information. Healthcare provider communication is key to gaining feedback, and UKTIS will look for innovative solutions to collect data from them, with a focus on the usefulness of the information provided and the ease of accessibility.

Clinical governance

NPIS aims to provide a high-quality service to ensure patient safety is, and continues to be, a high priority. Our approach to clinical governance is detailed in previous annual reports and includes detailing critical and near miss events and a comprehensive system of user feedback. The section below details critical and near miss events reviewed, along with service user feedback during 2023 to 2024.

Analysis of critical and near miss events

From April 2023 to 2024 there were 19 events discussed by the Clinical Standards Group.

During 2023 to 2024, there were 7 individual critical events where NPIS could not provide the correct number of SPIs to fulfil rota commitments which led to a reduced staffing level below required standards for a total of 20 hours. On one occasion, the line number dropped to 1 line for 8 hours overnight; BT Cloud statistics were reviewed, indicating that only 2 calls were abandoned during this time (which is the mean number dropped on any night shift). As increased funding has been provided for the service over the past 2 years, the NPIS has continued to recruit staff to achieve the required number of SPIs in each unit and produce a detailed National Operating Procedure for the process to be followed in the event of critical staff shortages.

Another critical event related to a local Trust network and internet failure at one of the 24-hour units which led to a number of lines not being opened during approximately 40 minutes and a reduced number of staff able to answer calls. Suitable cover was requested from remaining units and only one call was abandoned during this time. Action has been taken to ensure continued internet access despite local connectivity issues.

On 4 occasions, the nominated consultant toxicologist scheduled to provide cover for the out-of-hours national rota was not contactable. The call was dealt with by another consultant toxicologist. The matter was investigated, and action taken to reduce the risk of recurrence.

An ambulance service complained about a prolonged answering wait time for a call via the NPIS line. The service was extremely busy during this time answering 15 of the 19 enquiries delivered to the platform in the one-hour window during which the ambulance personnel were trying to contact NPIS. On further investigation it appears that the caller attempted to telephone the NPIS, waited in the queue, but then hung up after a period of waiting and called again, which meant their call was pushed to the back of the queue.

One incident involved a late presenting paracetamol overdose in an adolescent patient who presented to hospital 16 hours post overdose. Due to the uncertain time of ingestion at the time of assessment, the hospital followed TOXBASE management guidance and waited for blood results to come back before starting treatment with acetylcysteine. At the time of admission, the amount ingested was not disclosed by the patient (it was later discovered to be 48 tablets), and it is not known from the information provided to NPIS whether the patient

was symptomatic on presentation to hospital. Sadly, this young patient died, and the cause of death was recorded as acute liver failure secondary to paracetamol overdose. The NPIS were notified of this case by the assistant coroner who acknowledged that commencing acetylcysteine on admission would likely have not changed the outcome given the large ingestion and late presentation. This resulted in revision of the text for the paracetamol TOXBASE entry (>6 years of age presenting 8-24 hours) to improve clarity, making it explicit as to the circumstances when acetylcysteine should be started immediately in late presenters, including those where the amount ingested is unknown.

There were 5 incidents involving TOXBASE: 1 interruption to the UK NPIS Early Warning System (EWS), 1 partial loss of function and 3 full outages.

The UK NPIS EWS was not fully operational between 11:19 on 9 January 2024 and 14:45 on the 10 January 2024. During this time 186 accesses to agents of special interest on TOXBASE did not trigger an urgent alert email to the SPI on duty. The telephone enquiry line remained fully operational throughout this period. Allowing for this interruption, the availability of the UK NPIS EWS for the 2023 to 2024 period remained high at 99.7% overall.

The partial loss of function also occurred on the 10 January 2024, when between 07:10 and 15:00 agents starting with the letter B were not directly searchable. During this period TOXBASE users would have seen an automated message stating that their search had failed and advising them to try searching via the A-to-Z listing. All entries remained available via these A-to-Z listings. This occurred because the search engine within TOXBASE at this time was being routinely updated; if such updates encounter a technical difficulty, a partial loss of function can result. This problem has occurred infrequently. However, it should not occur again as the search engine facility has been upgraded with effect from 8 May 2024.

There were 3 full outages when TOXBASE was offline for 39 minutes in total. Between 16:50 and 17:00 on 25 January, between 9:27 and 9:37 on 30 January and between 13:58 and 14:17 on 6 February 2024. All 3 of the full outages occurred in office hours as a consequence of development work that was being undertaken as part of the planned migration of the TOXBASE platform to a new software provider. The outages were noted and rectified within a few minutes and no increase in telephone enquiry numbers were noted during these outages, suggesting that callers had not had difficulty in accessing advice.

In addition, during the 19-minute outage on 30 January both the TOXBASE iOS and Android apps lost connectivity to the server and became unavailable when offline. Following migration of TOXBASE to the new software provider, which involved a major rebuild of the app, this problem should not occur again.

TOXBASE online was available for 99.9% during this reporting year demonstrating that TOXBASE online remains a highly reliable and valuable front-line tool, offering rapid access to key clinical information to healthcare professionals treating poisoned patients across the UK.

Quality assurance exercises

Telephone information service user satisfaction

NPIS have been gathering information on user satisfaction with their telephone enquiry service since 2002 to survey service performance, user requirements/expectations, and to identify any areas for improvement.

Historically this was carried out using a postal questionnaire which was then adapted to an email form. During the 2022 to 2023 reporting year the questionnaire was modified, and data was collected using Microsoft Forms in an attempt to increase the response rate by improving accessibility, and to automate data collection and analysis. An increase in the number of respondents was observed using this method and this process was continued.

Between 1 April 2023 to 31 March 2024, the questionnaire was sent out via Microsoft forms to a random sample of telephone enquiries. The sample size was 10% of calls from the 24-hour units (Birmingham, Cardiff and Newcastle), and 20% of calls from the Edinburgh unit to adjust for the fewer telephone enquiries taken by this unit.

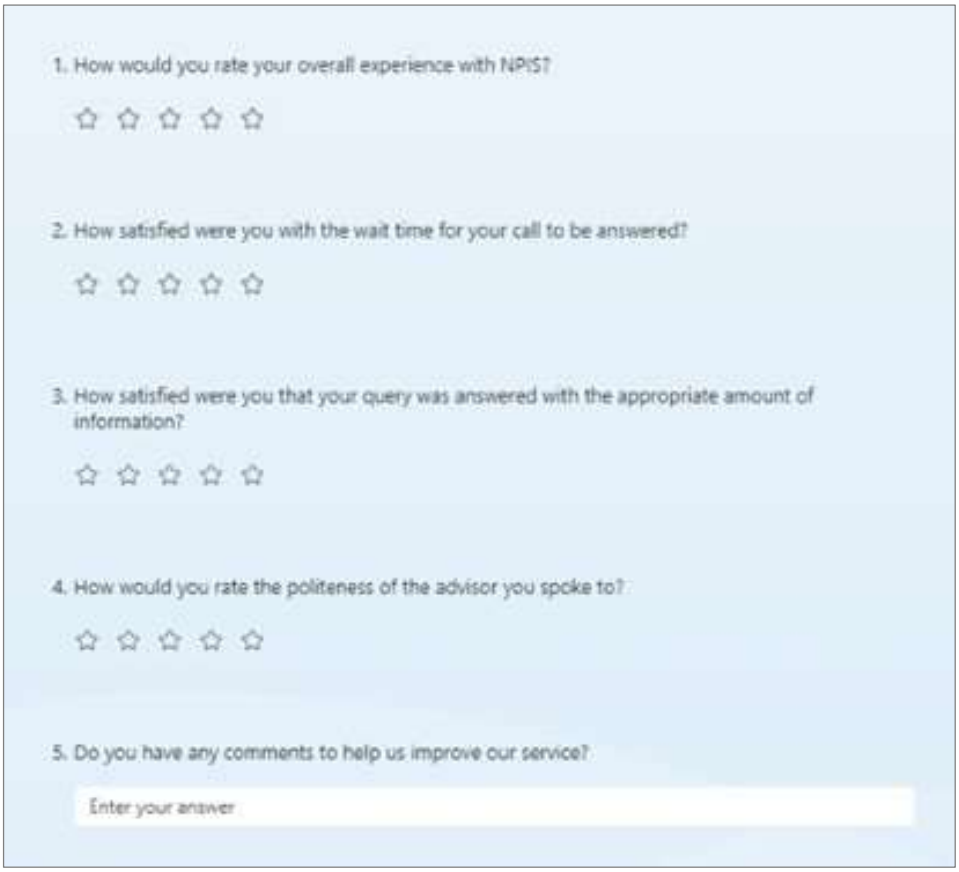
During this year, 4,702 questionnaires were sent out, of which 665 forms were completed (14.1%). This was a 1.7% increase in return rate from the previous year (Table 13).

Table 13. Response rate 2014 to 2024

Year	2014/ 2015	2015/ 2016	2016/ 2017	2017/ 2018	2018-2019	2019/ 2020	2021 (1 Jan – 31 March)	2021/ 2022	2022/ 2023	2023/ 2024
QA Type	Postal	Postal	Postal	Postal	Postal	Postal	Email	Email	MS Forms	MS Forms
Response rate (%)	26.6	23.5	24.3	22.5	18.9	17.3	11.7	9.6	12.4	14.1

The form consisted of 5 questions for which users were requested to respond with a star rating between 1 and 5, with a higher star rating correlating with increased satisfaction, and 5 stars being extremely satisfied (Figure 9).

Figure 9. Telephone information QA questionnaire



Survey results

The survey results show that most of the respondents (>97%) were highly satisfied with the service, selecting 4 or 5 stars for each question (Table 14). This is consistent with the satisfaction scores for previous years. For the few that answered the questions with a rating of 1 or 2 stars, they commented that the reason for this rating was that the wait times were too long.

For the final question, we asked users to provide feedback to help us improve our service, for which 363 users (55.6%) commented. The majority of them used this space to express their gratitude towards the advisors they spoke to and commented on the excellence of the service. Some indicated that the reason for their call was to seek clarity from TOXBASE and that they were satisfied when they spoke to a SPI. Some also commented on the delay in answering due to the call volume.

Table 14. Telephone information satisfaction scores in 2023 to 2024

	Number of respondents (%)				
Question	**1 Low**	**2**	**3**	**4**	**5 High**
How would you rate your overall experience with NPIS?	0 (0%)	1 (<1%)	5 (<1%)	36 (5.5%)	614 (93.6%)
How satisfied were you with the wait time for your call to be answered?	1 (<1%)	1 (<1%)	8 (1.2%)	62 (9.4%)	586 (88.9%)
How satisfied were you that your query was answered with the appropriate amount of information?	0 (0%)	2 (<1%)	13 (2.0%)	29 (4.4%)	617 (93.3%)
How would you rate the politeness of the advisor you spoke to?	0 (0%)	0 (0%)	1 (<1%)	18 (2.7%)	640 (97.1%)

In summary, this quality assurance survey indicates that users continue to be highly satisfied with the telephone service provided by NPIS. During previous years, in particular during the COVID-19 pandemic, there was a decline in response which appears to have been reversed for the second consecutive year by changing the survey method from a postal questionnaire to Microsoft Forms.

TOXBASE user satisfaction

Formal QA is obtained from TOXBASE users using an online questionnaire. A selection of users are automatically asked to complete and submit one of a series of short QA forms during their online session. To combat user fatigue, differing forms are presented throughout the year. Invitations are generated every 5 to 15 database logins; this number is also varied throughout the year. A total of 1,204 returns were received during the 2023 to 2024 reporting year.

Users were asked to grade a series of statements on a Likert scale of 1 to 6 where 1=disagree completely, and 6=agree completely. TOXBASE user satisfaction scores are shown in Table 15. Satisfaction scores remain good.

Overall satisfaction with TOXBASE on a scale of 1 to 6 was indicated on 1,017 returns; 95.2% scored either 5 (good) or 6 (excellent).

Table 15. Summary of TOXBASE user satisfaction scores in 2023 to 2024

Satisfaction score is the percentage of respondents who agree ‘completely’ (6) or ‘a lot’ (5).

Number of responses	Question	Satisfaction score
177	“I had confidence in the information for my query”	96.6
177	“Logging on to the database was easy”	92.7
492	“Finding the information I required was easy”	87.8
535	“The information was sufficient for managing this case”	88.9

The percentage of respondents who disagreed ‘a lot’ or ‘completely’ with the above statements was small (1.7%, 2.3%, 3.3% and 5.8% respectively). In particular, users dealing with complex or difficult cases who find they need more in-depth information are clearly signposted by TOXBASE to contact the service by phone for specialist advice.

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

Free text comments were provided on 216 TOXBASE QA returns (17.9%), which can be grouped as shown in Table 16.

Table 16. Summary of free text comments on TOXBASE from quality assurance returns in 2023 to 2024

Type of comment	Number (% value) *
Positive comments and thanks	136 (62.9)
Suggestions	62 (28.7)
Comment related to other NPIS services	14 (6.5)
Specific issues	9 (4.2)
Negative comments	6 (2.8)
Information technology	2 (0.9)

* users often offer multiple comment types within one response

UKTIS

In 2023 to 2024 UKTIS sought feedback via paper questionnaire sent to a random sample of telephone enquirers with a response rate of 5 out of 28 (17.9%) questionnaires sent out being returned. The responses that were received indicated a high degree of satisfaction with the service, with 100% of responders reporting that they found it easy to contact the service, enquiry staff were polite and helpful, the service was easy to contact, the enquiry was answered in an acceptable time frame and at an acceptable pace, the information received was relevant and useful, and they had confidence in the reply.

Education and training

Training for scientific staff

Each NPIS unit provides structured in-house training and assessment in both clinical and non-clinical (for example communication) skills to prepare scientific staff for dealing with healthcare professionals who contact the service for advice. Training is structured towards learning objectives covering all aspects of clinical toxicology, from the mechanisms of toxicity to the management of poisoned patients. These are clearly set out in a national training curriculum. Additionally, scientific staff may wish to undertake a postgraduate qualification in toxicology to further enhance their knowledge and expertise.

All NPIS staff are encouraged to participate in research and submit papers to peer reviewed journals and national and international meetings.

Continuing professional development

CPD for NPIS staff is an essential component of the clinical governance structure of the service. A national CPD programme equips both clinicians and scientific staff with the necessary knowledge and expertise to provide up to date, accurate, evidence-based and consistent advice on all aspects of poisoning.

It is the responsibility of the CPD lead, an NPIS consultant appointed by the unit directors every 3 years, to organise the rolling programme of meetings. An NPIS scientist is also appointed every 3 years, to ensure the needs of the scientific staff are well represented within the educational programme. The primary role of the CPD meetings is to ensure that clinicians and scientists remain up to date with the latest developments within clinical and academic toxicology. This includes education on new poisons, antidotes and other emerging treatment modalities.

The NPIS annual CPD programme previously consisted of 2-day meetings held twice each year, with all NPIS units hosting in turn, allowing staff opportunity for CPD along with the benefit of networking during an evening social event. Following the impact of the COVID-19 pandemic and related restrictions, regular bimonthly CPD sessions have been held virtually

over an online video conferencing platform at minimal added financial cost. This platform allowed for secure storage of recorded presentations for future exclusive use of NPIS staff, further maximising educational benefit. Feedback was very positive in response to these changes. In the 2023 to 2024 year further scheduling changes were introduced with 2 national CPD events held within the 2023 calendar year including a special anniversary event hosted by NPIS Edinburgh, celebrating 60 years since its establishment (Box 1).

Box 1. NPIS CPD event, hosted by NPIS Edinburgh

Day 1: Wednesday 13 September 2023

The 2006 London polonium-210 case: a clinical overview (Prof Paul Dargan, Guy's and St Thomas' NHS Foundation Trust, London)

Ethanol biomarkers in clinical practice (Dr Mark Pucci and Dr Loretta Ford, NPIS Birmingham)

Propranolol poisoning: a local and national perspective (Ms Hayley Williams, NPIS Birmingham and Dr Emma Morrison, NPIS Edinburgh)

Should calls received on the national rota be followed up? (Pro: Mr Pardeep Jagpal, NPIS Birmingham, Con: Dr Gill Jackson, NPIS Edinburgh)

Paracetamol poisoning: past, present and future (Prof Nick Bateman and Prof James Dear, NPIS Edinburgh)

A trip down memory lane (Dr Euan Sandilands, NPIS Edinburgh)

Day 2: Thursday 14 September 2023

Antipsychotics enquiries to the NPIS (Prof James Coulson, NPIS Cardiff)

What has endoscopy ever done for us? (Dr Gail Masterton, Consultant Gastroenterologist, NHS Lothian)

The use of vitamin K in the management of paracetamol poisoning (Dr Arvind Veiraiah, NPIS Edinburgh)

NIHR RIGHT4: Preventing deaths from acute poisoning in low- and middle-income countries (Prof Michael Eddleston, NPIS Edinburgh)

International developments and collaborative activities (Mr Haydn Cole, UKHSA)

A case of severe metformin-associated lactic acidosis in a teenager (Dr Mark Anderson, Great North Children's Hospital, Newcastle)

Herbal enquiries to the NPIS (Ms Ella Edwards and Mr Callum Welfoot, NPIS Cardiff)

What is the gold standard: why do we audit? (Mrs Sonia Bradley, NPIS Newcastle and Mrs Gloria Alldridge, NPIS Cardiff)

An annual session showcasing external NPIS scientific contributions, in addition to a special Christmas CPD event with a guest international speaker were also successfully organised with good virtual attendance and participation. Overall, feedback remains positive.

TOXlearning – a clinical toxicology e-learning resource

A clinical toxicology e-learning resource has been provided to NHS healthcare professionals across the UK by NPIS Edinburgh since 2005. The TOXlearning resource is available to all NHS staff, as well as UK medical, nursing and paramedic students, UKHSA staff, and UK and international TOXBASE subscribers.

The resource provides a useful and accessible training resource for those wishing to learn how to use TOXBASE effectively when handling enquiries about poisoning, and also learn more about the management of common overdoses. It is especially useful for NHS patient advice services staff.

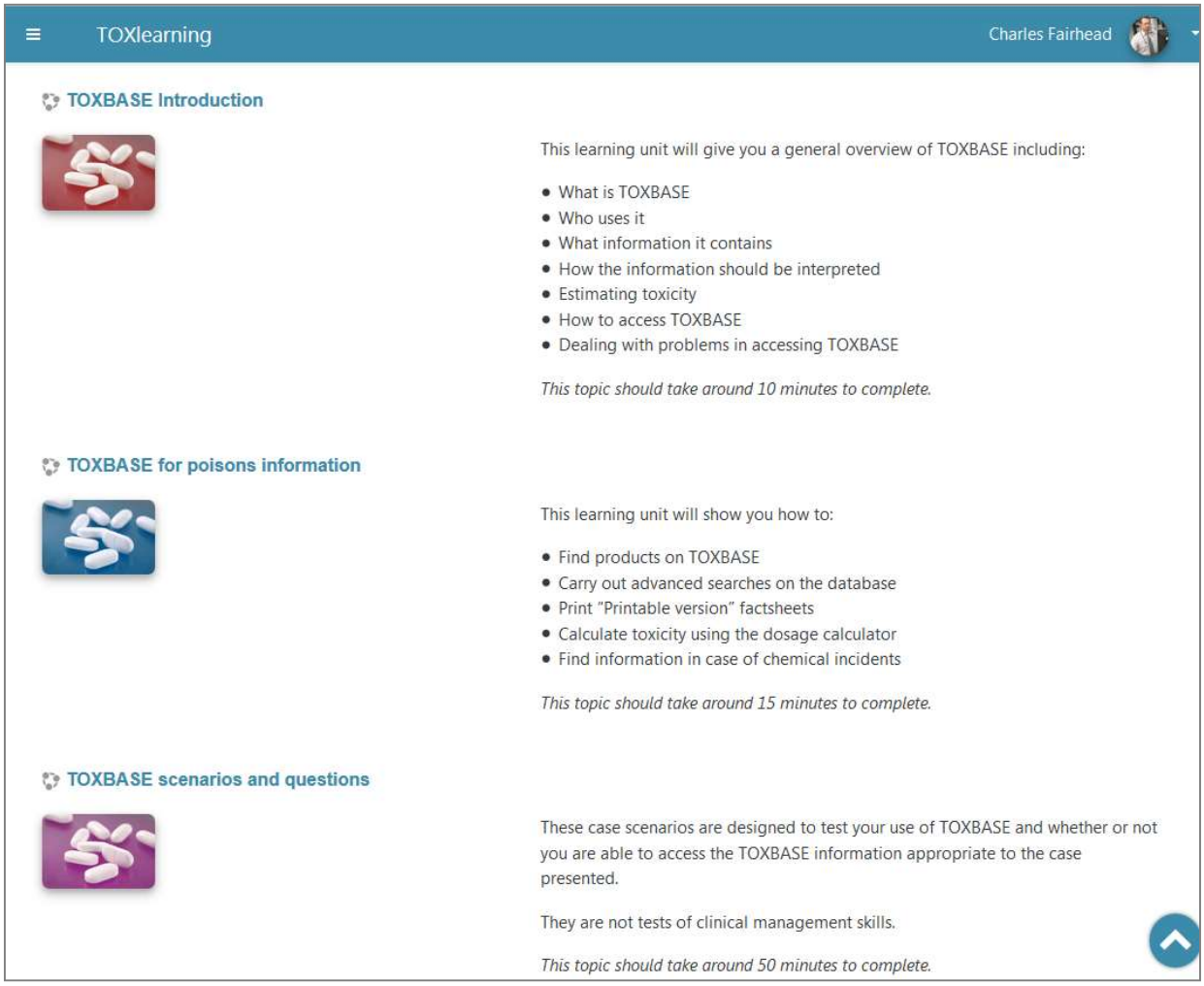
The NPIS recommends that TOXBASE users of all types and grades complete the ‘Using TOXBASE’ module. Box 2 shows the topics included within each module, and Figure 10 shows a screenshot of the ‘Using TOXBASE’ module from the resource. Registration and access are free; users can work through courses at their own pace, save their work, obtain their scores and print off their results for CPD files.

Box 2. TOXLearning modules

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 and drugs of misuse.

Figure 10. Screenshot from TOXlearning



Areas of interest

Drugs of misuse

Introduction

The number of NPIS telephone enquiries and the volume of TOXBASE online and app accesses give an indirect indication of the drugs of misuse most encountered by health professionals using our services. The data can be used to follow trends with time, including the emergence of new substances, and to characterise features of toxicity reported for different substances. These data are useful for monitoring and assessing toxicity relating to drugs of misuse and are shared periodically with responsible agencies including UKHSA, the Office for Health Improvement and Disparities (OHID), and the Advisory Council on the Misuse of Drugs (ACMD).

Methods

Telephone enquiries are included in this analysis if the exposure is to a substance with no other purpose than drug misuse, or when the exposure has been classified as ‘recreational’ by the SPI receiving the call, irrespective of the substance involved and including medicinal drugs. This has the advantage of identifying substances not previously recognised as being involved in misuse.

The intent of the exposure is not available when using TOXBASE access data either online or using the TOXBASE app. Analysis of TOXBASE access data for prescription drugs does not allow insight into whether the access related to an exposure resulting from recreational drug misuse, self-harm or therapeutic error. Consequently, accesses to TOXBASE pages that relate to licensed medications are omitted from cumulative data, with the exceptions of diazepam, methylphenidate, ketamine and methadone, which are under specific surveillance.

Overall activity

This year there was an increase in the absolute number of telephone enquiries, TOXBASE online accesses and TOXBASE app accesses related to drugs of misuse. These absolute increases in activity also reflected a relative increase in the proportion of NPIS overall activity that is accounted for by drugs of misuse. During 2023 to 2024 there were 902 telephone enquiries to the NPIS meeting the drug misuse criteria, an 18% in absolute call numbers compared to 2022 to 2023 (764 calls). Of these 902 calls 78.5%, 10.2%, 6.9%, 3.8% were from England, Ireland, Scotland, and Wales respectively; there were no calls from Northern Ireland. These enquiries related to 268 different substances or products and accounted for 2.1% of all NPIS telephone enquiries, compared to 1.9% last year.

There were also 105,902 TOXBASE online accesses, a 20% increase compared to last year. These related to 1,120 different substances or products and accounted for 7.4% of all TOXBASE online accesses, compared to 6.7% of all TOXBASE activity last year. There were 15,782 TOXBASE app accesses related to drug of misuse, a 11% increase and accounting for 5.1% of all TOXBASE app accesses, compared to 5.0% last year.

Activity related to individual drugs of misuse

The top substances of misuse involved in telephone enquiries and TOXBASE online and app accesses are shown in Table 17. The overall increased NPIS activity related to drugs of misuse this year was driven by increases in well-established substances. The substances and their relative order remain largely unchanged over a number of years. Cocaine and diazepam continue to dominate. Unlike previous years, there was no significant increase in nitrous oxide enquiries to the service.

Table 17. Top drugs/substances of misuse involved in telephone enquiries and TOXBASE online and app accesses in 2023 to 2024 (% change from 2022 to 2023)

Rank	Telephone enquiries	Number	% change from 2022/23
1	Cocaine	329	+213.3
2	Cannabis	186	+95.8
3	MDMA	107	+75.4
4	Ketamine	103	+145.2
5	Heroin	71	+255.0
6	Methadone	70	+400.0
7	Unknown drug of misuse*	50	+31.6
8	Diazepam	46	+84.0
9	Pregabalin	42	+27.3
10	Amfetamine	31	+121.4

Rank	TOXBASE online accesses	Number	% change from 2022/23
1	Diazepam**	24,715	+0.6
2	Cocaine	16,883	+21.7
3	MDMA	7,852	+35.2
4	Cannabis	7,828	+34.1
5	Ketamine	7,793	+46.7
6	Methylphenidate**	7,150	+25.9
7	Heroin	4,718	+13.0
8	Nitrous oxide	4,574	+2.7
9	Street benzodiazepines	2,780	+11.6
10	GHB	2,437	+30.3

Table 17. continued/

Rank	TOXBASE app accesses	Number	% change from 2022/23
1	Diazepam**	4,457	+5.4
2	Cocaine	2,136	+4.8
3	Ketamine	1,262	+29.7
4	MDMA	969	+13.6
5	Cannabis	855	+16.0
6	Methylphenidate**	831	+32.5
7	Heroin	662	+0.6
8	GHB	479	+19.2
9	Nitrous oxide	391	-13.3
10	Poppers	383	+12.0

* 'Unknown drug of misuse' refers to calls where the clinician suspects that the person has taken a drug of misuse but does not know which specific substance(s)
** May include TOXBASE accesses relating to therapeutic use

Patterns of NPIS activity for selected substances over time

Figures 11 and 12 show NPIS activity related to selected substances of interest over the last 10 years, showing the continuation of upward trends in activity for cocaine, cannabis and ketamine seen previously. It is apparent that a reduction in NPIS activity seen from 2019 to 2023, possibly an effect of COVID-19 and associated societal changes, has been reversed and the previous steadily increasing temporal trend has returned. While the percentage values in Table 17 are striking it should be noted that overall NPIS activity has also increased this year for all substances and proportionate to all NPIS activity the relative increases for each drug of misuse substance are more modest.

Substances of particular interest

Synthetic opioids remain of great public health concern with involvement in deaths reported in the UK. NPIS have not received calls about synthetic opioid exposures this year. We suspect this relates to an inability to clinically distinguish (and therefore diagnose) the effects of synthetic opioids from conventional opioids and may represent an under reporting of the true prevalence.

Conversely TOXBASE accesses for synthetic opioids has increased again this year, driven exclusively by 2-benzyl benzimidazole substances (nitazenes). This year there were 340 online accesses about 17 different nitazenes compared to 53 accesses about 10 substances in the preceding year, with isotonitazene, etodesnitazene (etazone) and metonitazene being the most commonly encountered. Activity related to fentanyl derivatives remains unchanged and low in prevalence.

Figure 11. TOXBASE accesses by year for selected substances 2014 to 2015 to 2023 to 2024

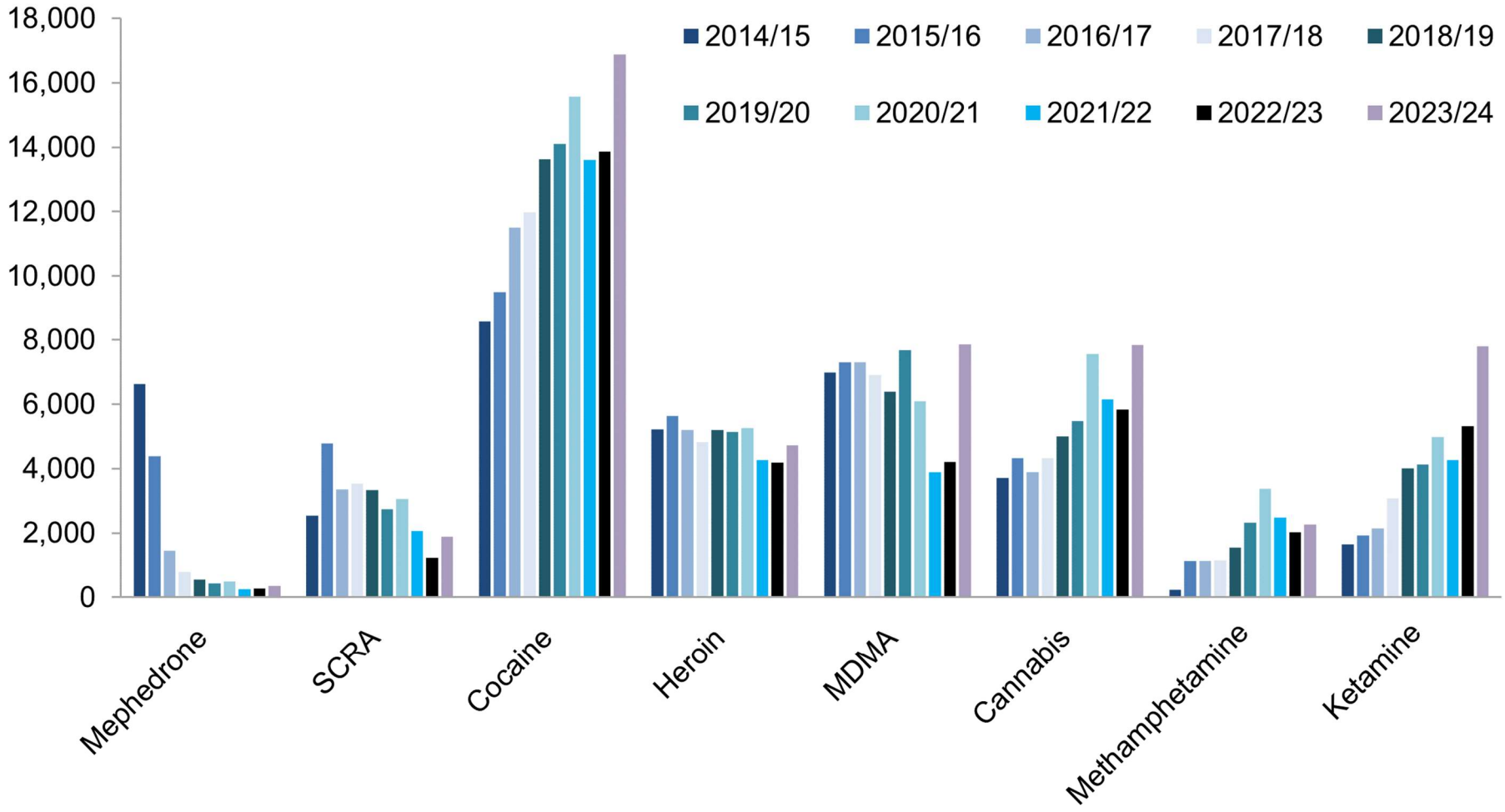
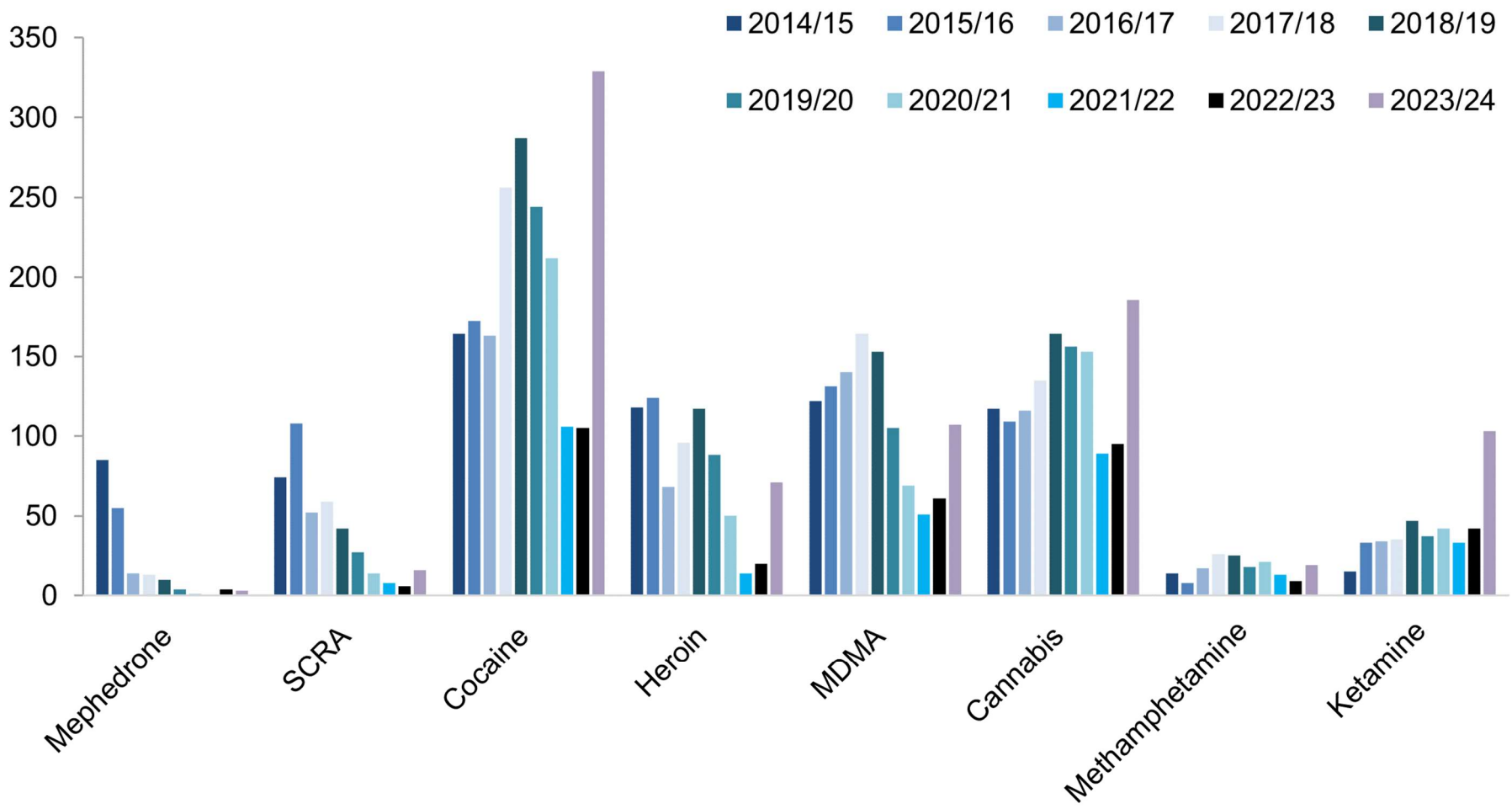


Figure 12. NPIS telephone enquiries by year for selected substances between 2014 to 2015 and 2023 to 2024



Pesticides

The NPIS pesticide surveillance system was established in 2004 under approval of the Pesticides Safety Directorate and funded by the UK Department for Environment, Food and Rural Affairs (DEFRA). The work was implemented to better describe the incidence and character of pesticide exposures in the UK that result in contact with health professionals (thereby selecting for more serious exposures). Surveillance data are collated and both quarterly and annual reports are submitted to the government's Expert Committee on Pesticides via the Chemicals Regulation Directorate of UK Health and Safety Executive (HSE).

Currently, 679 TOXBASE entries for pesticides and biocides are being tracked. Incident information is obtained from follow-up of TOXBASE enquiries by an online or postal questionnaire, and from data collected during NPIS telephone enquiries.

During the year, there were 4,176 accesses to TOXBASE about pesticides of interest and information on 423 potential exposures was collected via the NPIS telephone enquiry service. The number of TOXBASE accesses (4,176 in 2023 to 2024 vs 3,709 in 2022 to 2023) regarding pesticide poisoning increased by 12.6% between periods. There was also a 10.7% increase in the number of calls (423 in 2023 to 2024 vs 382 in 2022 to 2023).

Overall, information was gathered on 629 potential exposures involving pesticides during 2023 to 2024. From these exposures, the number of cases identified for further analysis in 2023 to 2024 was 594.

The results presented below include both unintentional acute (494; 83.2%) and chronic cases (25; 4.2%) and cases of intentional self-harm (75; 12.6%).

Of the 594 cases, 582 cases (98.0%) were graded as PSS 0 (not at all poisoned) or PSS 1 (mild). Nine cases (1.5%) were graded moderate (PSS 2), and 2 cases (0.3%) were graded severe (PSS 3). One fatality was reported (0.2%).

Agents of interest

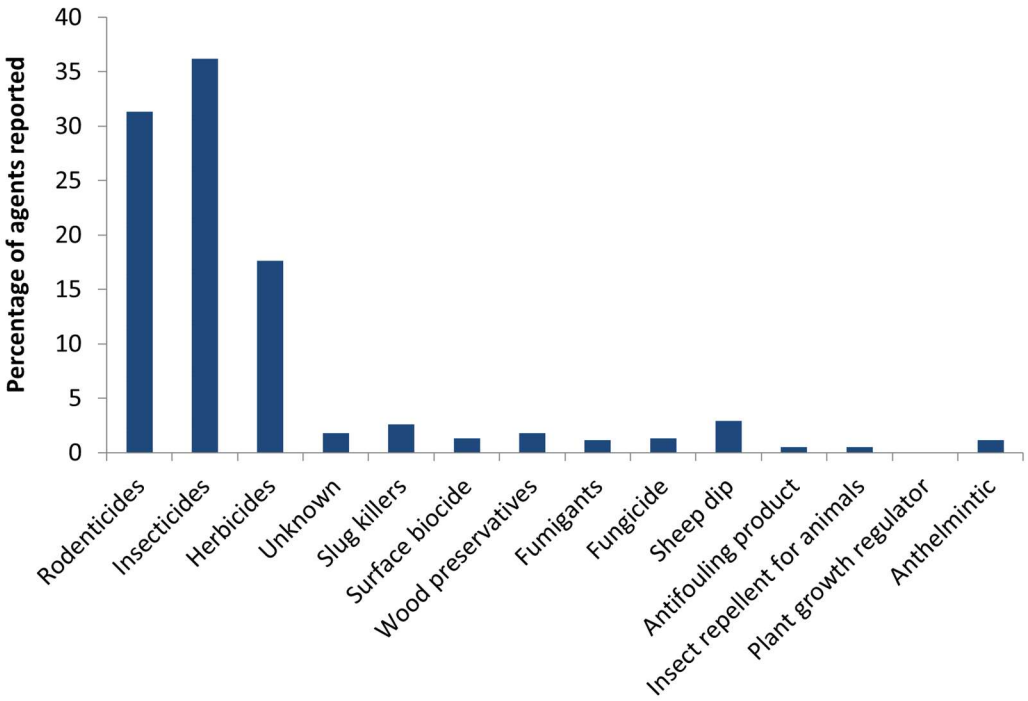
The agents most commonly involved in exposures are shown in Table 18. In addition, there were 92 cases involving unknown rodenticides.

In 2023 to 2024, patients potentially exposed to pesticide products comprised 381 adults (64.1% 13 years or older) and 204 children (34.3% 12 years or younger). There were 322 (54.2%) male patients and 265 (44.6%) female patients. There were 10 enquiries involving pregnant patients reported in 2023 to 2024 (4 in 2022 to 2023). All 10 exposures were acute; 8 were unintentional and 2 were acts of intentional self-harm. All 10 cases were graded PSS 0/PSS 1. The classes of product most commonly involved in exposures are shown in Figure 13. Permethrin, glyphosate, difenacoum and tetramethrin were the most commonly involved substances. Multiple/combination products were involved in some incidents.

Table 18. Pesticides most frequently (≥20) reported by respondents in suspected pesticide exposures during 2023 to 2024 compared with 2022 to 2023, ordered by rank in 2023 to 2024

Ingredient	2022 to 2023	2023 to 2024
Permethrin	70	61
Glyphosate	41	45
Difenacoum	43	34
Tetramethrin	33	30
Brodifacoum	41	28
Bromadiolone	23	27
Cypermethrin	23	26

Figure 13. Pesticide exposures by class of product (as reported by respondent) in 2023 to 2024 (619 agents)



Carbon monoxide

From June 2015 to June 2023, the NPIS received funding from the Carbon Monoxide Research Trust (CORT; formerly known as the Gas Safety Trust) to analyse all enquiries relating to carbon monoxide (CO) exposure in the UK. The epidemiology of CO poisoning remains difficult to elucidate accurately due to complexities in identification, categorisation and reporting of exposures. Whilst exposures may be intentional (self-harm), we focused on unintentional exposures which (i) may be related to fires (where additional toxicity such as cyanide may contribute), or (ii) those that are non-fire related. Assessment of unintentional non-fire related CO exposures was the primary objective of this study as these pose a serious public health challenge since patients may not be aware of the risks and subsequent symptoms of CO exposure.

We have published 4 years of NPIS data (4) and below we provide data for both the 6-month period January 2023 to June 2023 and a final summary of the 8-year data collection. During the period 1 January 2023 to 30 June 2023, data were available for 279 patient-related CO exposures. Ninety (32.3%) patients were male, while 131 (47.0%) were female (gender not specified for 58 (20.8%) patients). Exposures comprised 198 adults (≥13 yrs, 71.0%) and 41 children (≤12 yrs, 14.7%). Age was not specified in 40 exposures (14.3%). Seven exposures involved pregnant women (2.5%).

The highest proportion of exposures resulted from faulty domestic boilers (80, 28.7%). Exposures were most commonly of low severity (184, 65.9%) and associated with no symptoms or mild symptoms only. Central nervous system symptoms were most prominently observed with headache reported with the highest frequency. One fatality (0.4%) was reported to the NPIS during this period.

Whilst a raised carboxyhaemoglobin concentration (COHb%) is considered necessary to confirm an exposure, clinical interpretation is complex. It may be affected by patient-related factors such as smoking status, activity and co-morbidity, and environmental factors such as atmospheric CO concentration at the scene, exposure duration, time since exposure and administration of oxygen. In this cohort, blood COHb% concentrations were reported in 66 (23.7%) patients and ranged from 0.1% to 45% (median = 1.7%). Since many patients were not acutely unwell at presentation, this may explain why an invasive blood COHb% was measured in less than one quarter of patients.

Over the 8-year data collection period (July 2015 to June 2023), the overall results are very similar to those seen in the above 6-month period. These are briefly detailed below:

- data available for 5,538 patients.
- 1,357 (24.5%) were male, 1865 (33.7%) were female. Gender was not specified for 2,316 (41.8%) patients.
- in children, those aged 0–9 years (730; 13.2%) were involved in a significantly greater proportion of CO exposures than those aged 10–19 years (367; 6.6%; P

<0.0001). More than two thirds of children in the 0-9 years cohort were aged 0-4 years.

- in adults, the largest number of exposures occurred in patients aged 20-29 (736; 13.3%) and 30–39 years (749; 13.5%). These were significantly greater than those aged ≥ 40 years (P < 0.0001).
- CO exposures were most often reported during winter months.
- faulty boilers in a domestic setting were most frequently reported as the CO source.
- short term exposures (≤ 24-hours) were reported in nearly 30% of cases.
- the majority of exposures resulted in no or mild symptoms only (70.4%).
- there were 12 unintentional fatalities reported during the 8-year study period.
- symptoms involved the CNS, GI or CV systems but were often non-specific in nature.
- Pregnant women were involved in 135 unintentional exposures. The majority (91.1%) reported no or minor symptoms only. Three pregnant patients had symptoms of moderate severity whilst in 9 patients, no information about the symptoms were available.
- where carboxyhaemoglobin concentrations were available, the data suggest a positive correlation with poisoning severity; however, this was not statistically significant.
- activation of a CO alarm was reported in 21.0% of cases. Reassuringly, the majority of these cases were associated with mild symptoms or no symptoms at all.

Overall, these data demonstrate that the NPIS is uniquely placed to collect valuable epidemiological information on all aspects of CO poisoning from patients across the UK.

Dinitrophenol

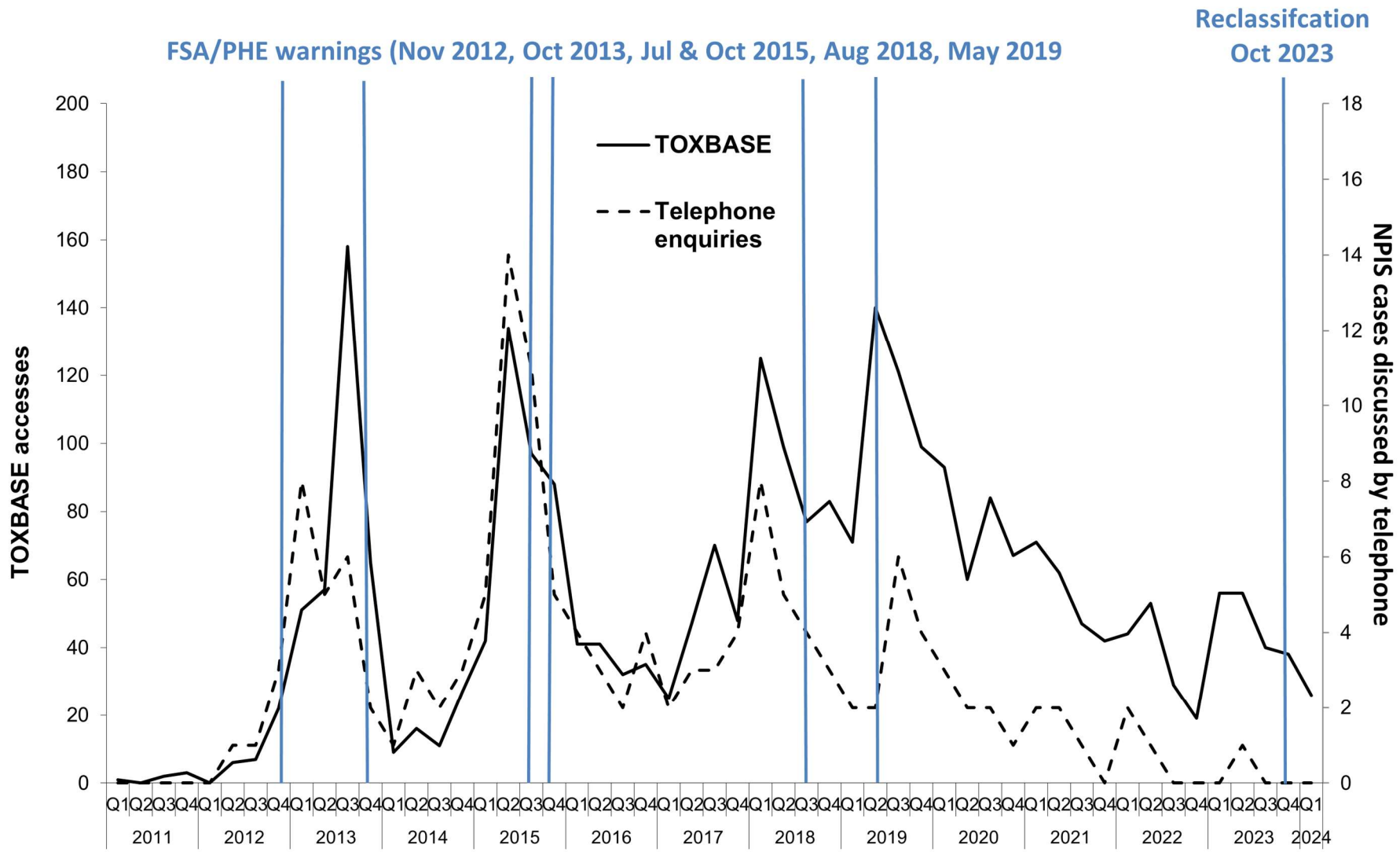
2,4-Dinitrophenol (DNP) is a toxic industrial chemical that blocks the normal mechanisms for storage of energy in the body, including fat, and is sometimes ingested by users to produce weight reduction, ‘fat burning’ or ‘body sculpting’. Unfortunately, DNP can cause serious health effects in humans including high fever, rapid heart rate, agitation, headache, diarrhoea, vomiting, convulsions, acidosis, muscular rigidity and multi-organ failure. These effects can be fatal despite intensive medical treatment.

DNP was previously classified as a poison under the Poisons Act 1972 until 1996. In response to a number of deaths from DNP in the UK, NPIS responded to a consultation by the Home Office recommending reclassification of DNP. In October 2023, DNP was reclassified as a poison under the Poisons Act 1972, to make it more difficult for members of the public to acquire it.

The NPIS first reported an increase in enquiry numbers and deaths relating to DNP in 2013 and has since been monitoring and reporting these to UKHSA and the Food Standards Agency and also publishing data in annual reports. Various actions have been taken in response to the increase in enquiry numbers, including provision of warnings to the public and information to healthcare professionals, as detailed in previous annual reports.

The information provided here has been obtained using the same methodology as described in previous annual reports. Quarterly numbers of DNP-related TOXBASE accesses and individual cases of systemic exposure reported in telephone enquiries since January 2011 are shown in Figure 14. During the 2023 to 2024 reporting year there was 1 further case of systemic DNP exposure referred to the NPIS and no fatality (compared to 7, 5 and 1 case annually in the 3 previous reporting years). In total there have now been 150 cases of systemic DNP exposure discussed by phone with the NPIS since 2007, including 102 males and 48 females. Of these, 27 (18.1%) are known to have died, including 18 males and 9 females. NPIS received an enquiry in 2022 to 2023 about a fatality relating to use of a caffeine supplement where the reported clinical features could possibly have been due to DNP; analytical confirmation of exposure was confirmed subsequently at post-mortem during the 2023 to 2024 reporting year and this case has now been included in the figures. Together with at least 7 further fatal cases reported by the Food Standards Agency or the Office of National Statistics that were not discussed with the NPIS at any stage in previous years, there have been at least 34 DNP-related deaths in the UK since 2007.

Figure 14. Quarterly NPIS telephone enquiries and TOXBASE accesses relating DNP, January 2011 to March 2024



Joint NPIS / Royal College of Emergency Medicine guidelines on acute opioid toxicity

Acute opioid toxicity is a common reason for presentation to emergency departments in the UK and therefore commonly a reason for seeking NPIS advice. There has been increasing concern in the UK and elsewhere about the potential for severe opioid toxicity relating to the emergence of the nitazene (2-benzyl benzimidazole) opioids and a range of other potent synthetic new psychoactive substance opioids (5,6).

Therefore, it was timely to look at producing national guidance for clinicians managing patients with acute opioid toxicity in the emergency department. A working group from NPIS and the Royal College of Emergency Medicine (RCEM) drafted a guideline, which included a flowchart to provide practical guidance on the assessment and management of acute opioid toxicity, in particular on the use of titrated intravenous naloxone in those with respiratory depression. Additional detail was provided on the use of naloxone infusions, frequency of patient monitoring and the potential for providing secondary prevention.

The guidance was reviewed and approved by the RCEM Toxicology Special Interest Group, the RCEM Quality in Emergency Care Committee (QECC) and the NPIS Clinical Standards Group (CSG). The guideline was launched on 13 May 2024 (7), and was published in the Emergency Medicine Journal (8).

Conclusions

The NPIS and UKTIS continue to provide high-quality information and advice to NHS health professionals regarding the management of patients with suspected poisoning and drug and chemical exposures in women who are pregnant. Our excellent user feedback reflects the quality of the services provided and the continuing commitment and hard work of all our staff. The service has developed robust systems to ensure quality of information and advice during future periods when home working may be required. Its work helps ensure efficient and cost-effective management of poisoned patients across the UK, improving outcomes and reducing costs to the NHS.

Increasing use of TOXBASE and the TOXBASE app is welcome, because these are highly effective methods for the rapid delivery of written information and clinical advice. The growing use of ‘bumps’ as a publicly accessible source of advice about drugs and chemicals in pregnancy is similarly welcome, allowing pregnant women to become better informed and discuss their concerns with their doctor or midwife.

Recommendations

Outcome of recommendations for NPIS in 2023 to 2024

1. ‘Continue collaborative working between Cardiff and Vale University Health Board, Sandwell and West Birmingham NHS Trust, Newcastle Upon Tyne Hospitals NHS Foundation Trust and NHS Lothian to provide NPIS services. Work closely with UKHSA to maintain service provision and the agreed level of staffing within each poisons unit, whilst maximising resources available to allow the service to function effectively for its users.’

The additional funding identified by UKHSA in 2022 has addressed the service’s resource issues until the next funding review. Concurrently, the NPIS has continued to develop additional income streams where possible and to identify areas of cost savings.

2. ‘Continue to work with UKHSA, as the newly appointed body, and the HSE to fulfil their obligations to receive, store and manage material data sheets for chemicals sold in Northern Ireland and in Great Britain utilising the resources available. Ensure the NPIS has access to this information when needed.’

UKHSA and NPIS Birmingham continue to work together to explore how to improve the management of material data sheets for chemicals used and/or sold in Northern Ireland and in Great Britain.

3. ‘Continue to monitor episodes of poisoning of public health importance, retrospectively and in real-time via the NPIS Early Warning System, reporting to responsible government agencies as appropriate and promoting the role of the UK NPIS in public health.’

The NPIS continues to monitor episodes of poisoning relating to pesticides, carbon monoxide, drugs of misuse, and dinitrophenol as detailed in this report and provided this information to responsible public bodies. It continues to respond to UK hospitals accessing TOXBASE regarding chemicals of interest to support management of patients and alerting UKHSA.

4. ‘Work with UKHSA to improve the national response to chemical incidents, including reviewing current processes and contributing toxicology expertise in the detection, reporting and management of incidents.’

Discussions are ongoing to engage the NPIS consultants more fully in the national chemical incident response. A recent CPD meeting also took place to explore chemical, biological, radiation, and nuclear (CBRN) needs and future collaborations across the NPIS service, UKHSA and other government organisations involved in chemical incident response. The event was very well attended across the 2 days by almost 100 healthcare professionals,

including regional and national stakeholder representation. Educational content included refreshers on CBRN hazards for those working in clinical toxicology and emergency medicine. In addition, there were important updates from stakeholders including the UK Health Security Agency, the National Ambulance Resilience Unit and the National CBRN Centre. Experts from the Royal Centre for Defence Medicine, Defence, Science and Technology Laboratory and the Institute of Naval Medicine gave essential informative lectures on managing both individual and mass casualty poisoning events.

5. ‘Continue to utilise NPIS data sets as the primary source of poisoning data in the UK to provide healthcare services, improvements to those services, contribute to cutting edge research in toxicology and provide public health surveillance for the UK, reporting to responsible government agencies across the UK as appropriate.’

Data actively being used to inform government bodies and public bodies, such as Advisory Committee on the Misuse of Drugs, CRD HSE and UKHSA.

6. ‘Continue to organise high-quality hybrid and online continuing professional development for NPIS staff to ensure users of the service are confident about the reliability and quality of the information provided.’

Multiple CPD days and online meetings have been completed over the year, supporting ongoing education of SPIs and consultant toxicologists.

7. ‘Explore ways of increasing feedback to the service to ensure the views of users are heard and acted upon in improving TOXBASE and the national helpline service.’

The new online questionnaire approach has resulted in a modest ongoing response rate to quality assurance. This will be monitored over the coming years to find ways of increasing feedback.

8. ‘Continue to improve poisons information provision in low and middle-income countries worldwide (as defined by the Organisation for Economic and Cooperation and Development’s Development Assistant Committee list of official development assistance recipients) by providing direct access to TOXBASE.’

This has been successful with multiple poison information centres using TOXBASE at no cost to improve the care of their population and response to poisoning outbreaks, including for example the Nepalese and Bangladeshi national poison information centres.

9. ‘Continue to play a world-leading role as a national network of poisons information centres involved in research, policy change and poisons information centre capacity building that aims to improve outcomes for poisoned patients globally.’

Multiple overseas engagements as demonstrated at the NPIS Edinburgh 60-year anniversary CPD meeting, including the NIHR RIGHT4 Preventing Deaths from Acute Poisoning in Low- and Middle-Income Countries and its work at APAMT and MENATOX congresses.

Recommendations for NPIS in 2024 to 2025

1. Continue collaborative working between Cardiff and Vale University Health Board, Sandwell and West Birmingham NHS Trust, Newcastle Upon Tyne Hospitals NHS Foundation Trust and NHS Lothian to provide NPIS Services. Work closely with UKHSA to maintain service provision within each poisons unit, whilst maximising resources available to allow the service to function effectively for its users.

2. Continue to monitor episodes of poisoning of public health importance, retrospectively and in real-time via the NPIS Early Warning System, reporting to responsible government agencies as appropriate and promoting the role of the UK NPIS in public health.

3. Continue to work with UKHSA to improve the national response to chemical incidents, including reviewing current processes and contributing toxicology expertise in the detection, reporting and management of incidents.

4. Continue to organise high-quality hybrid and online continuing professional development for NPIS staff to ensure users of the service are confident about the reliability and quality of the information provided.

5. Continue to work with UKHSA and the HSE, to fulfil their obligations to receive, store and manage material data sheets for chemicals sold in Northern Ireland and in Great Britain utilising the resources available. Ensure the NPIS has access to this information when needed.

6. Continue to play a world-leading role as a national network of poisons information centres involved in research, policy change and poisons information centre capacity building that aims to improve outcomes for poisoned patients globally.

7. Continue to produce and improve knowledge about poisoning in the UK through improvements in accuracy and presentation of TOXBASE and enquiry activity data.

APPENDIX A Senior NPIS staff

NPIS Birmingham

Professor S M Bradberry BSc MD FRCP FAACT FEAPCCT
Director, NPIS Birmingham and West Midlands Poisons Unit, City Hospital, Birmingham and Alcohol Lead, Sandwell and West Birmingham NHS Trust, Birmingham

Dr M E M O Elamin MBBS DTM&H PgCertClinEd MSc(Med Tox) FRCP
Consultant Physician and Clinical Toxicologist, NPIS Birmingham and West Midlands Poisons Unit, Birmingham City Hospital

Mr P S Jagpal BSc MSc CMgr MCMI
Service Manager, NPIS Birmingham

Dr M Pucci MBChB MRCP(UK) DipMedTox BSc MSc
Consultant in Acute Medicine and Clinical Toxicology, Birmingham City Hospital

NPIS Cardiff

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

Professor J Coulson BSc MBBCh LLM MD DipMedTox DipTher MFPH FRSB FBPhS FRCP FRCPE ERT
Professor in Clinical Pharmacology and Toxicology, School of Medicine, Cardiff University and Honorary Consultant, Cardiff and Vale University Health Board

Dr L A Gray BA MBBCh MRCP
Medical Director, NPIS Cardiff; Consultant Physician in Clinical Pharmacology and Therapeutics, Cardiff and Vale University Health Board

Dr A Thomas MBChB FRCP DipMedTox, DipTher
Senior Lecturer in Clinical Pharmacology, Centre for Medical Education, Cardiff University and Honorary Consultant, Cardiff and Vale University Health Board

NPIS Edinburgh

Professor J W Dear PhD FRCPE
Professor of Clinical Pharmacology and Honorary Consultant Clinical Toxicologist, University of Edinburgh and NHS Lothian

Professor M Eddleston ScD FRCPE FRSE FEAPCCT FBPhS
Professor of Clinical Toxicology, University of Edinburgh; Consultant Clinical Toxicologist, NPIS Edinburgh and Royal Infirmary of Edinburgh; Clinical lead for the NPIS and Chair of the NPIS Clinical Standards Group

Dr G Jackson BSc DipMedTox PhD
Manager, NPIS Edinburgh

Dr E Morrison, MBChB(Hons) PhD BSc(Hons), FBhPS FRCP(Edin)
Consultant in Acute Medicine, Medicines Management and Toxicology, Royal Infirmary of Edinburgh

Dr E A Sandilands BSc MD FRCPE
Consultant Physician and Clinical Toxicologist, Royal Infirmary of Edinburgh; Honorary Clinical Senior Lecturer, University of Edinburgh

Dr A Veiraiah MB BS MRCP
Director, NPIS Edinburgh; 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 FRCP
Consultant Physician and Clinical Toxicologist, Newcastle upon Tyne Hospitals NHS Foundation Trust; Honorary Clinical Senior Lecturer, Translational and Clinical Research Institute, Newcastle University

Dr K K Hodson MD MRCP(UK) MRCOG DipTher
Head of Teratology, UKTIS; Consultant in Obstetrics and Maternal Medicine, Newcastle upon Tyne Hospitals NHS Foundation Trust; Associate Clinical Lecturer, Translational and Clinical Research Institute, Newcastle University

Dr S Stephens BSc PhD
Assistant Head of UK Teratology Information Service, Newcastle upon Tyne Hospitals NHS Foundation Trust; Honorary Associate Fellow, Translational and Clinical Research Institute, Newcastle University

Dr H K R Thanacoody MD FRCP FRCP(Edin)
Director, NPIS Newcastle and UK Teratology Information Service (UKTIS); Medical Director, Regional Drugs and Therapeutics Centre; Consultant Physician and Clinical Toxicologist, Newcastle upon Tyne Hospitals NHS Foundation Trust; Honorary Senior Clinical Lecturer, Translational and Clinical Research Institute, Newcastle University

Dr S M Wiltshire BMedSci BM MRCP
Consultant Physician and Clinical Toxicologist, Newcastle upon Tyne Hospitals NHS Foundation Trust

Other consultants providing on-call support for the NPIS

Professor P I Dargan FRCPE FACMT FRCP ERT FAACT FEAPCCT FBPhS MAE FCRaz FRSB
Consultant Physician and Clinical Toxicologist, Clinical Director and Caldicott Guardian, Guy's and St Thomas' NHS Foundation Trust, London; Professor of Clinical Toxicology, King's College London, London

Dr W S Waring BMedSci MB PhD FRCPE FRCP FBPhS
Consultant Physician in Acute Medicine and Clinical Toxicology, York Teaching Hospitals NHS Foundation Trust; Honorary Senior Lecturer in Medicine, Hull York Medical School, York

Dr D M Wood MD FRCP FEAPCCT FACMT FAACT FBPhS
Consultant Physician and Clinical Toxicologist, Chair of Drug and Therapeutics Committee and Co-Chair of Medication Safety Committee, Guy's and St Thomas' NHS Foundation Trust and King's Health Partners, London; Reader in Clinical Toxicology, King's College London, London

Consultants providing specialist support for the NPIS

Dr M Anderson BSc BMedSci BMBS MRCPCH
Consultant Paediatrician, Great North Children's Hospital, Newcastle upon Tyne Hospitals NHS Foundation Trust

National and international appointments of NPIS senior staff

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

NPIS Birmingham

Professor S M Bradberry
INTERNATIONAL SOCIETIES
Fellow: American Academy of Clinical Toxicology
Fellow: European Association of Poisons Centres and Clinical Toxicologists
Past President: Clinical and Translational Speciality Section, Society of Toxicology
UK ADVISORY COMMITTEES
Member: PHE Lead exposure in children surveillance system steering group
Member: Home Office, Office for security and counter terrorism. Chemical Expert Panel
ACADEMIC ACTIVITIES
Honorary Professor: School of Pharmacy, University of East Anglia
Honorary Professor: School of Biosciences, University of Birmingham
Joint Course Organiser: MSc (Toxicology), University of Birmingham
Educational and Clinical Supervisor: Sandwell and West Birmingham NHS Trust

Dr M E M O Elamin
INTERNATIONAL SOCIETIES
Board Member (at Large): MENATOX (Middle East and North Africa Clinical Toxicology Association)
Member: Scientific Committee, MENATOX (Middle East and North Africa Clinical Toxicology Association)
UK ADVISORY COMMITTEES
Member: UKHSA Expert Advisory Group on Antivenoms
NHS NATIONAL AND REGIONAL COMMITTEES
ACADEMIC ACTIVITIES
Member: MRCP Part 1 and 2 Specialty Question Writing Group
Honorary Senior Clinical Lecturer: School of Biosciences, University of Birmingham
Casual Lecturer: Masters in Pharmacotoxicology, Faculty of Medicine and Surgery, University of Malta
External Marker: MRes Toxicology and MRes Translational Medicine and Therapeutics, Faculty of Medical Sciences, Newcastle University

Mr P S Jagpal
INTERNATIONAL ACTIVITIES
Board Member: European Association of Poison Centres and Clinical Toxicologists
Member: Scientific Committee of European Association of Poison Centres and Clinical Toxicologists
UK ADVISORY COMMITTEES
Member: Register of Specialists for Chemicals, Materials and Toxicology, Office for Product Safety and Standards

Dr M Pucci
UK ADVISORY COMMITTEES
Co-opted member: Advisory Committee on the Misuse of Drugs (ACMD) for the Review on Nitrous Oxide: updated harms assessment
NHS NATIONAL AND REGIONAL COMMITTEES
Member: Birmingham and Solihull Integrated Medicines Optimisation Committee
ACADEMIC ACTIVITIES
Honorary Clinical Lecturer: MSc (Toxicology), University of Birmingham
Educational and Clinical Supervisor: University Hospitals Birmingham NHS Foundation Trust
Senior Author: Prescribing Safety Assessment (PSA), British Pharmacological Society
Author: University of Birmingham and Health Education England Script® e-learning programmes on drugs of misuse, and cannabis-based products for medicinal use

NPIS Cardiff

Professor J Coulson
UK ADVISORY COMMITTEES
Member: Committee on Toxicity
Member: Herbal Medicines Advisory Committee, MHRA.
Member: Expert Committee on Pesticides
NHS NATIONAL AND REGIONAL COMMITTEES
Chair: New Medicines Group
ACADEMIC ACTIVITIES
Honorary Professor of Clinical Pharmacology and Toxicology: Cardiff Metropolitan University
Visiting Professor of Clinical Pharmacology: University of South Wales

Dr L A Gray
NHS NATIONAL AND REGIONAL COMMITTEES
Chair: All Wales Prescribing Advisory Group (AWPAG) for All Wales Medicine Strategy Group
Chair: Medicines Safety Executive (MSE), Cardiff and Vale University Health Board
ACADEMIC ACTIVITIES
Programme Director: Postgraduate Diploma in Medical Toxicology, Cardiff University

Member: Prescribing Safety Assessment (PSA) Assessment Board, British Pharmacological Society
Medical Lead: Cardiff Update in Medical Toxicology

Dr A Thomas
NHS NATIONAL AND REGIONAL COMMITTEES
Medical Director: Yellow Card Centre Wales
Member: All Wales Medicines Strategy Group
ACADEMIC ACTIVITIES
PSA Lead: Cardiff University School of Medicine
Theme Lead: BDS Human Disease Course, Cardiff University
Member: Final Year Exam Executive, Cardiff University

NPIS Edinburgh

Professor J Dear
INTERNATIONAL ACTIVITIES
Member: Expert Advisory Group EU IMI TransBioLine Consortium, Critical Path Institute Acute Kidney Injury Working Group
INTERNATIONAL SOCIETIES
Vice-President: Clinical and Translational Toxicology Specialty Section, Society of Toxicology (SOT)
INTERNATIONAL JOURNALS
Senior Editor: British Journal of Clinical Pharmacology
UK ADVISORY COMMITTEES
Member: Scottish Medicines Consortium
NHS NATIONAL AND REGIONAL COMMITTEES
Deputy Director: Yellow Card Centre, Scotland
Member: Lothian Formulary Committee

Professor M Eddleston
INTERNATIONAL ACTIVITIES
Member (WHO Chair): WHO Expert Advisory Group for the FAO and WHO Joint Meeting on Pesticide Management
Board Member: South Asian Clinical Toxicology Research Collaboration, Peradeniya, Sri Lanka
INTERNATIONAL JOURNALS
Senior Editorial Board Member: Clinical Toxicology
UK ADVISORY COMMITTEES
Member: Expert Advisory Group on Antivenoms, UK Department of Health and Social Security
Deputy Chair: Expert Committee on Pesticides, UK Health and Safety Executive
NHS NATIONAL AND REGIONAL COMMITTEES
Member: Area Drug and Therapeutics Committee, NHS Lothian

ACADEMIC ACTIVITIES
Director: Centre for Pesticide Suicide Prevention, University of Edinburgh
Co-Director: NIHR RIGHT4: Preventing Deaths from Acute Poisoning in Low-and Middle-Income Countries, University of Edinburgh

Dr G Jackson
UK ADVISORY COMMITTEES
Medical Sub Group Member: The All-Party Parliamentary Carbon Monoxide Group

Dr E Morrison
INTERNATIONAL SOCIETIES
Fellow: Royal College of Physicians (Edinburgh)
Fellow: British Pharmacological Society
UK ADVISORY COMMITTEES
Member: Scottish Medicines Consortium
Member: National Review Panel for PACS Tier 2, Healthcare Improvement Scotland
NHS NATIONAL AND REGIONAL COMMITTEES
Chair: NHS Lothian Area Drugs and Therapeutics Committee
Member: Individual Patient Treatment Request panel, NHS Lothian

Dr E A Sandilands
UK ADVISORY COMMITTEES
Associate Director of Training: Royal College of Physicians of Edinburgh
ACADEMIC ACTIVITIES
Assessment Lead: Edinburgh Medical School, University of Edinburgh
MSc Critical Care, Toxicology Lead: Royal College Physicians Edinburgh and University of Edinburgh

Dr A Veiraiah
NHS NATIONAL AND REGIONAL COMMITTEES
Specialist Advisor: CMO (Scotland), Clinical Pharmacology, Therapeutics and Toxicology

NPIS Newcastle (including UKTIS)

Dr S Hill
UK ADVISORY COMMITTEES
Co-opted Member: New Psychoactive Substances sub committee of the Advisory Council on the Misuse of Drugs
NHS NATIONAL AND REGIONAL COMMITTEESNHS NATIONAL AND REGIONAL COMMITTEES
Member and Curriculum and Assessment Lead: Specialist Advisory Committee, Clinical Pharmacology and Therapeutics, Northern Deanery Representative
ACADEMIC ACTIVITIES

Module Lead: Drug Discovery and Development, Masters by Research in Translational Medicine, Newcastle University
Training Programme Director and SAC Representative: Clinical Pharmacology and Therapeutics, HEE North East
Member: Clinical Pharmacology and Therapeutics STC (HEE North East)
Educational Supervisor: PHE Funded Advanced Fellowship in Clinical Toxicology
Deputy Director of Medical Education (Undergraduate Lead): Newcastle Upon Tyne Hospitals NHS Foundation Trust
Co-Director: NIHR Newcastle Clinical Research Facility, Royal Victoria Infirmary, Newcastle upon Tyne

Dr K K Hodson
INTERNATIONAL SOCIETIES
Member: ENTIS (European Network of Teratology Information Services) Scientific Committee
UK ADVISORY COMMITTEES
Member: MHRA Medicines for Women's Health Expert Advisory Committee
Member: RCOG COVID-19 Vaccination in Pregnancy Working Group
Member: British Rheumatological Society Guidelines for the management of rheumatological disease in pregnancy
Member: British Society of Haematology Guidelines for the management of metallic heart valves in pregnancy
NHS NATIONAL AND REGIONAL COMMITTEES
Member: MHRA Safer Medicines in Pregnancy and Breastfeeding Consortium
ACADEMIC ACTIVITIES
Lead Consultant: Obstetric Medicine Training in NE England
Course Organiser: Obstetric Medicine Teaching Course, Royal College of Obstetricians and Gynaecologists

Dr S Stephens
INTERNATIONAL ACTIVITIES
Vice-chairperson: European Network of Teratology Information Services (ENTIS)
INTERNATIONAL SOCIETIES
Vice-chairperson: European Network of Teratology Information Services (ENTIS)
UK ADVISORY COMMITTEES
Member: The Safer Medicines in Pregnancy and Breastfeeding Consortium, Medicines and Healthcare Products Regulatory Agency (MHRA)
ACADEMIC ACTIVITIES
Honorary Associate Fellow: Translational and Clinical Research Institute, Newcastle University

Dr H K R Thanacoody
INTERNATIONAL ACTIVITIES
Member: EAPCCT Acetaminophen/Paracetamol Clinical Toxicology Recommendations Collaboration
INTERNATIONAL SOCIETIES
Board Member: European Association of Poisons Centres and Clinical Toxicologists
Member: British Pharmacological Society
INTERNATIONAL JOURNALS
Executive Editor: British Journal of Clinical Pharmacology
UK ADVISORY COMMITTEES
Member: Herbal and Complementary Medicines Expert Advisory Group (HCM EAG), British Pharmacopoeia Commission
NHS NATIONAL AND REGIONAL COMMITTEES
Clinical Advisor: Health Service Ombudsman
ACADEMIC ACTIVITIES
Module Leader: Experimental Medicine and Therapeutics, MRes in Translational Medicine, Newcastle University
Member: BSc Pharmacology Curriculum Committee, Newcastle University
Member: MRCP(UK) Part 1 Standard-Setting Group

Dr S M Wiltshire
ACADEMIC ACTIVITIES
Educational and Clinical Supervisor: University Hospitals Newcastle NHS Foundation Trust

Other consultants providing on-call support for the NPIS

Professor P I Dargan
INTERNATIONAL ACTIVITIES
Member: European Association of Poison Centres and Clinical Toxicologists Scientific Committee
President Elect: European Association of Poison Centres and Clinical Toxicologists
Member: American College of Medical Toxicology International Committee
Abstract Reviewer: American Academy of Clinical Toxicology
Expert Adviser: World Health Organization, United Nations Office on Drugs and Crime, and European Monitoring Centre for Drugs and Drug Addiction
Member: WHO/UN Global Alliance to Eliminate Lead from Paint
Member: WHO Global Burden of Disease Expert Panel
INTERNATIONAL JOURNALS
Senior Editorial Board Member: Clinical Toxicology
Editorial Board Member: Toxicologie Analytique et Clinique
UK ADVISORY COMMITTEES
Commissioner to the UK Commission on Human Medicines
Expert Adviser: Advisory Council on Misuse of Drugs

Chair: Royal College of Emergency Medicine and National Poisons Information Service Antidote Guideline Group
ACADEMIC ACTIVITIES
Member: Faculty of Translational Medicine, Biomedical Research Centre (BRC) at Guy's and St Thomas' NHS Foundation Trust and King's College London
Member: MRCP (UK) Scenario Editorial Committee
Examiner: MRCP (UK) Part 2 Clinical Examination (PACES)
Member: WHO Global Burden of Disease Expert Panel

Dr W S Waring
INTERNATIONAL JOURNALS
Associate Editor: Therapeutic Advances in Drug Safety
Editorial Board Member: European Journal of Clinical Pharmacology
Editorial Board Member: Expert Review of Clinical Pharmacology
Editorial Board Member: Recent Patents on Cardiovascular Drug Discovery
UK ADVISORY COMMITTEES
Member: Independent Review Panel for Borderline Products, Medicines and Healthcare products Regulatory Agency
NHS NATIONAL AND REGIONAL COMMITTEES
Regional Specialty Advisor: Clinical Pharmacology and Therapeutics
Member: Regional RCP Advisory Appointments Committee
ACADEMIC ACTIVITIES
Honorary Senior Lecturer: Hull York Medical School

Dr D M Wood
INTERNATIONAL ACTIVITIES
Member: American Academy of Clinical Toxicology Scientific Review Committee
Member: Clinical Toxicology Collaborative: Activated Charcoal Systematic Review
Member: Clinical Toxicology Collaborative: Paracetamol Systematic Review
Member: Clinical Toxicology Collaborative: Amanita Toxicity Review
Member: EXtracorporeal TReatments In Poisoning (EXTRIP) 2 workgroup
Expert Advisor: European Monitoring Centre for Drugs and Drug Addiction (EMCDDA)
Expert Advisor: United Nations Office on Drugs and Crime (UNODC)
Expert Advisor: World Health Organisation
INTERNATIONAL SOCIETIES
Member: Scientific Committee of European Association of Poisons Centres and Clinical Toxicologists (EAPCCT)
Member: International Committee of American College of Medical Toxicology
INTERNATIONAL JOURNALS
Senior Editorial Board Member: Journal of Medical Toxicology
International Scientific Committee Member: Toxicologie Analytique et Clinique
UK ADVISORY COMMITTEES
Member: UK Advisory Council on the Misuse of Drugs (ACMD)

Member: ACMD Technical, Novel Psychoactive and Nitrous Oxide Working Groups
Member: COMed Working Group/All-Party Parliamentary CO Group (on behalf of the NPIS)
Member: Royal College of Emergency Medicine Nitrous Oxide and Naloxone Guidelines Group
Member: Consensus on Acute Behavioural Disturbance in the United Kingdom (CABDUK) Study Group
Member: Joint Royal Colleges Ambulance Liaison Committee (JRCALC) Overdose and Poisoning Guideline Group
Clinical Co-Ordinator: National Confidential Enquiry into Patient Outcome and Death (NCEPOD)
Trustee and Board Member: Positive East
NHS NATIONAL AND REGIONAL COMMITTEES
Co-Vice Chair: South East London Integrated Medicines Optimisation Committee
Member: South East London Joint Formulary Committee (as Guy's and St Thomas' NHS Foundation Trust representative)
ACADEMIC ACTIVITIES
Joint Project Co-ordinator: European Drug Emergencies Network (Euro-DEN) Plus project
Lecturer: NPIS/RCEM Clinical Toxicology Training Days
Lecturer: NPIS Cardiff Update in Medical Toxicology course
Royal College of Physicians (RCP) representative: Royal College of Pathology (RCPath) Specialty Advisory Committee on Toxicology

APPENDIX B NPIS publications

NPIS staff published 55 contributions to the scientific literature in 2023 to 2024; NPIS staff are shown in **bold** type, except where NPIS staff were part of a collaborative group.

[#] early online publication details for these publications were previously listed in the 2022 to 2023 NPIS report

Peer-reviewed papers

Andrews P, Anseeuw K, Kotecha D, Lapostolle F, **Thanacoody R**. 'Diagnosis and practical management of digoxin toxicity: a narrative review and consensus'. European Journal of Emergency Medicine 2023: volume 30, pages 395-401

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About the National Poisons Information Service

The role of the NPIS is to advise NHS healthcare professionals on the diagnosis, treatment and care of poisoned patients across the United Kingdom. Poisoning is a common cause of hospital admission in the UK, with similar numbers of admissions to other common medical emergencies. NPIS advice ensures that healthcare professionals not only have access to up to date information about treating poisoned patients, but also information to safely manage appropriate cases of minor poisoning at home, thus reducing unnecessary use of NHS resources. The major workload of the NPIS is to advise hospital emergency departments, NHS patient advice services (NHS 111, NHS 24 and NHS Direct) and also primary care services.

NPIS Birmingham unit

City Hospital, Birmingham, hosted by Sandwell and West Birmingham NHS Trust
Director: Professor S M Bradberry BSc MD FRCP FAACT FEAPCCT

NPIS Cardiff unit

University Hospital Llandough, Cardiff, hosted by Cardiff and Vale University Health Board
Director: Dr L A Gray BA MBBCh MRCP

NPIS Edinburgh unit

Royal Infirmary of Edinburgh, hosted by NHS Lothian
Director: Dr A Veiraiah MB BS MRCP

NPIS Newcastle unit

Regional Drug and Therapeutics Centre, Newcastle, hosted by Newcastle upon Tyne Hospitals NHS Foundation Trust
Director: Dr H K R Thanacoody MD FRCP FRCPE

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UKHSA is responsible for protecting every member of every community from the impact of infectious diseases, chemical, biological, radiological and nuclear incidents and other health threats. We provide intellectual, scientific and operational leadership at national and local level, as well as on the global stage, to make the nation health secure.

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