Global review of drug checking services operating in 2017

Introduction

Drug checking services invite members of the public to anonymously submit psychoactive drug samples for forensic analysis and then provide individualised feedback of results and counselling as appropriate. These services are known under many names, including: drug checking (services), street drug analysis, pill testing, adulterant screening, multi-agency safety testing, and drug safety testing. Here, we use the term 'drug checking services', while acknowledging that a lack of agreement about terminology persists.

The rationale for the operation of these services is to inform people who decide to use currently illegal drugs or new psychoactive substances (NPS) about the content and purity of the products, so they can make a more informed decision about whether to use them or how to use them (Brunt et al., 2017). These services also monitor drug market changes and when particularly dangerous drug samples are identified, they can issue tailored public alerts and inform specific harm reduction interventions (Vidal Giné et al., 2017).

In recent times, we have seen the emergence of hundreds of NPS, as well as a rise in purity of substances typically used in nightlife settings, including MDMA and cocaine. In parallel, we have seen the emergence of drug checking services globally. The last time a substantive review of drug checking services was undertaken was in 2001 (Kriener et al., 2001) and this review only covered European countries. A brief updated report released by the EMCDDA recently profiled some aspects of drug checking services, but it again covered the main European services only (Brunt, 2017).

This bulletin is the first time a global perspective has been taken. This work sought to identify and document the features of drug checking services operating across the globe as at 2017.

Methods

We developed a survey to be completed by drug checking services about the technologies used, the setting of the service, aspects of the process of operation, its scale and length of operation, funding models, and comments on its history and challenges to operation.

A list of contacts for known existing services was constructed that met our definition. We emailed those contacts with an invitation to complete the survey, in English, German, and French where appropriate. Within that invitation we also asked service providers to provide additional contacts for services we did not yet have listed. The list was expanded through this process, within each country and world region. The result of this iterative process is that we feel confident that we have identified the existing services.[1] We followed up contacts to encourage them to complete the survey, which ran from April to July 2017.

[1] But we could be wrong, and we welcome new information about existing services we may have missed that were operating during the sample data collection period April-July 2017.

Following survey closure, the survey data were checked and cleaned. Some internal inconsistencies were amended after checking with the agency contacts. Others updated the data when profiles were provided back to them for checking in October 2017.

The response rate to the survey was high. However, service providers in Wales and Brazil did not fully respond to our request for participation and a few projects were only mentioned after we closed the data collection period (see profiles appendix).

Data were used in two ways:

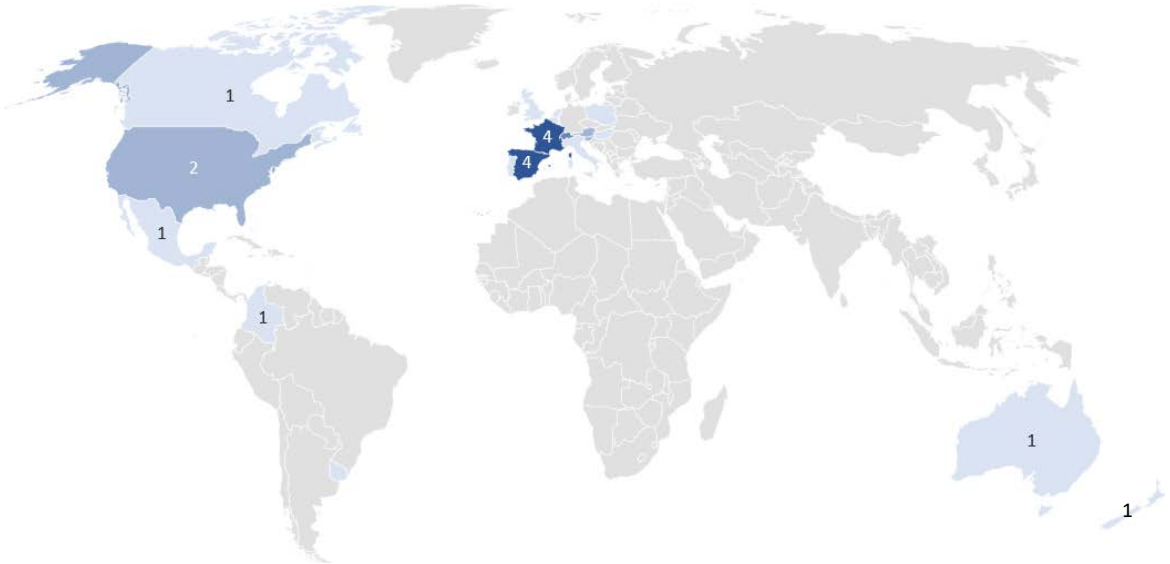
1. a quantitative summary of the results across all services (this bulletin);
2. a narrative profile report, providing details of each service.

Results

Geographic reach

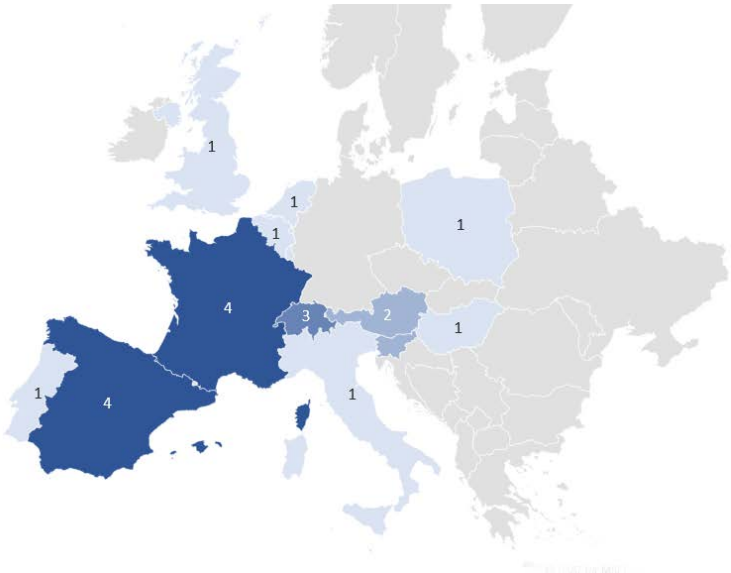
Service representatives from 20 countries completed the survey, representing 31 different checking services (run by 29 separate organisations[2]). Twenty-three of the 31 services were operating within European countries: France (4)[3], Spain (4), Switzerland (3)[4], Austria (2), Slovenia (2), Belgium (1), Hungary (1), Italy (1), Luxembourg (1), Netherlands (1), Poland (1), Portugal (1), and the United Kingdom (1). Six of the 31 services were operating in the Americas, including United States (2), Canada (1), Colombia (1), Mexico (1) and Uruguay (1). Two of 31 services were operating in Australasia, including in Australia (1) and New Zealand (1). Nine of 31 services reported that they analyse samples from people who live outside of their own country, if they present to the service. Two of 3 postal services reported accepting samples posted from any part of the world.

Figure 1: Number of drug checking services globally (see Figure 2 for Europe)



[2] Two organisations ran two separate services.
[3] In France, there were 5 laboratories and 38 projects, see profiles appendix.
[4] In Switzerland, there was one additional service, see profiles appendix.

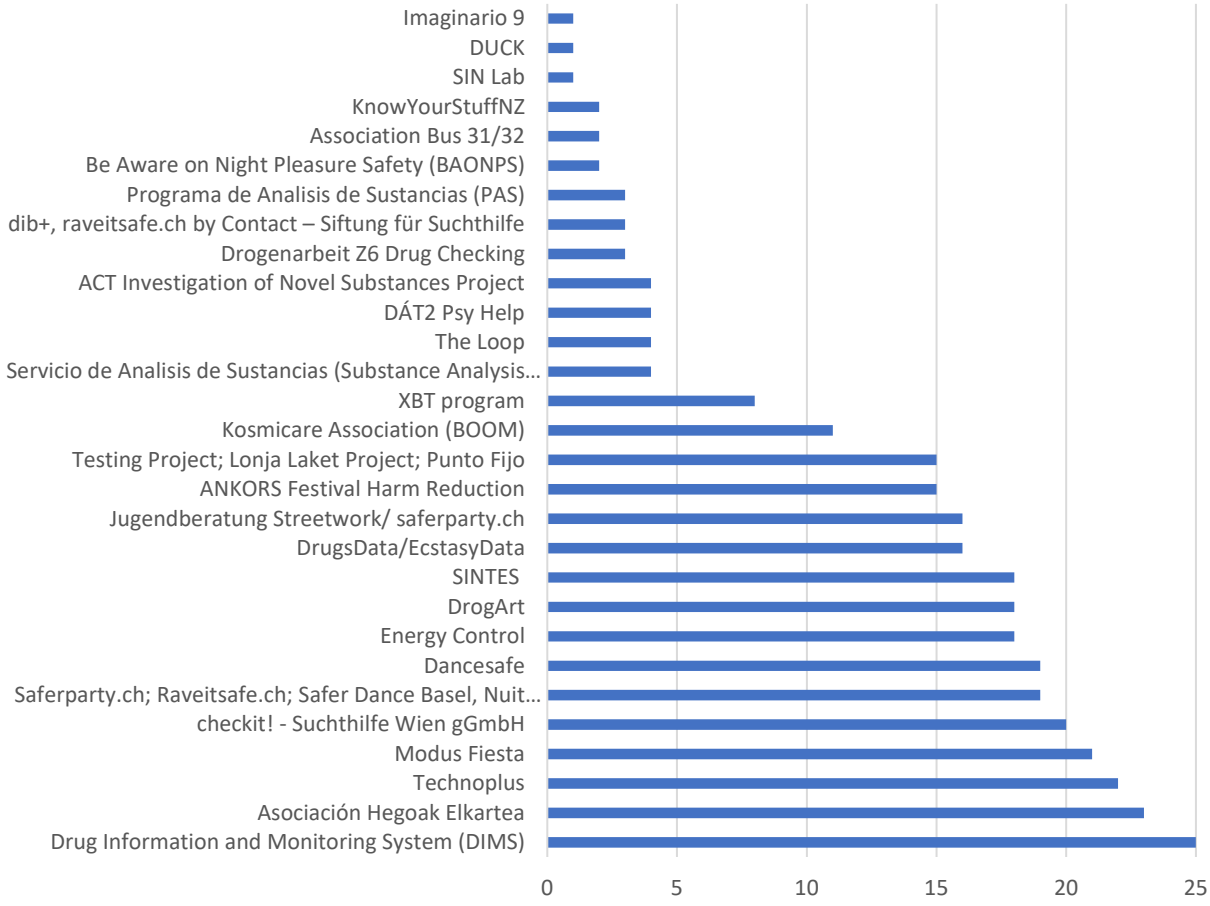
Figure 2: Number of drug checking services in European countries



Length of operation

The median number of years of operation was 11, range 1–25 years (see Figure 3). Thirteen of 29 organisations running services had been doing so only since 2013.

Figure 3: Number of years since first operation (n=29 organisations providing drug checking)



Mode of submission

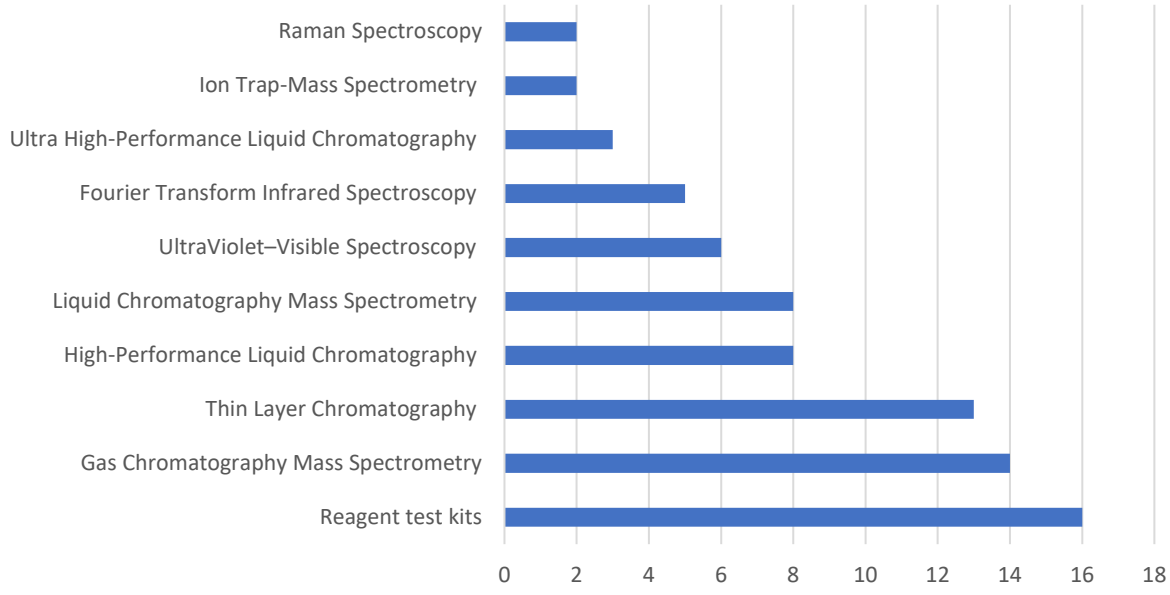
Three modes of submission were identified: on-site, fixed-site and postal. Twenty-three of 31 services reported conducting on-site setting, including at festivals, nightclubs and other mass gatherings. Eighteen of 31 services reported operating in fixed-site settings, including offices and outreach centres, and 2 of these services operated in hospital or emergency department settings. Three services reported offering a postal submission service. Considering the different combinations of modes of submission, 12 operated only on-site, 10 ran on-site and fixed-site services, 6 operated only a fixed-site service, and single services reported operating on-site/fixed-site/postal, fixed-site/postal and only postal.

The service modes of submission (on-site, fixed-site, postal) appear to be largely driven by the regulatory environments where they operate, as well as the capacity of sites (e.g., nightclubs, festivals) to allow services on-site. That is, promoters may be willing to host a drug checking service at their event, but to do so may reduce their chances of getting appropriate approvals from government authorities, because, in some countries, hosting drug checking is viewed as an acknowledgement that drug use is occurring at their event (Levy, 2004).

Drug analysis methods

Services provided a list of all the drug analysis methods that they used (see Figure 4). Fifteen of 31 reported at least 1 mass spectrometry or liquid chromatography method (including GC-MS, LC-MS, HPLC, UHPLC, IT-MS). 11 reported at least 1 spectroscopy method (including FTIR, UV-Vis, Raman). TLC was utilised by 13 services. Sixteen of 31 services reported use of reagent tests. A quarter (4 of 16) services who used reagent kits reported only using this method: in most cases, reagent kits were combined with other analysis techniques.

Figure 4: Drug analysis methods employed by drug checking services



Note: Multiple responses were allowed. N=31 services responded to this question.

While Figure 4 only includes the techniques asked about in the survey, in the free-text 'other' category, responses included Nuclear Magnetic Resonance (NMR) (4), UV Lamp for LSD identification (2), wet extraction (solvent washing) for MDMA purity in tablets (1), hemp test (1), Liquid Chromatography/Quadrupole Time-of-flight Mass Spectrometry (LC/QToF/MS) (1) and High Resolution Mass Spectrometry (HRMS) (1). Some services also described the capacity to send samples they could not identify to other services where more advanced equipment was available. Counting both the standard and 'other' category responses, services reported use of a median of 3 different analysis methods (Range 1-8).

Of those services reporting the use of reagent kits (n=16), the most common reagent tests used were Marquis (16), Mandelin (15), Mecke (14), Ehrlich (12) and Simon (10). Reagents used by less than half were Liebermann (6), Froehde (6), Folin (6) and RobaTest or Ropadope (4). Additional reagents reported as free-text 'other' responses included Scott (semi-quantitative cocaine test) (5), Cocaine Cuts (cocaine additives test) (1) and Hoffman (DMT and LSD test) (1). Counting both the standard and 'other' category responses for reagent testing, services who reported use of reagent test kits reported use of a median of 6.5 different reagent kit types (range 2–10).

Regarding the types of results received from testing, 14 of 31 services reported being equipped to identify multiple substances as well as purity or dosage, 10 identified multiple substances (but not purity or dosage), 5 identified one main substance only, and 2 identified one main substance as well as the purity of that substance. Two of the services that identified multiple substances as well as purity or dosage specified that purity analysis was only done for specified compounds, including MDMA, cocaine and 2C-B.

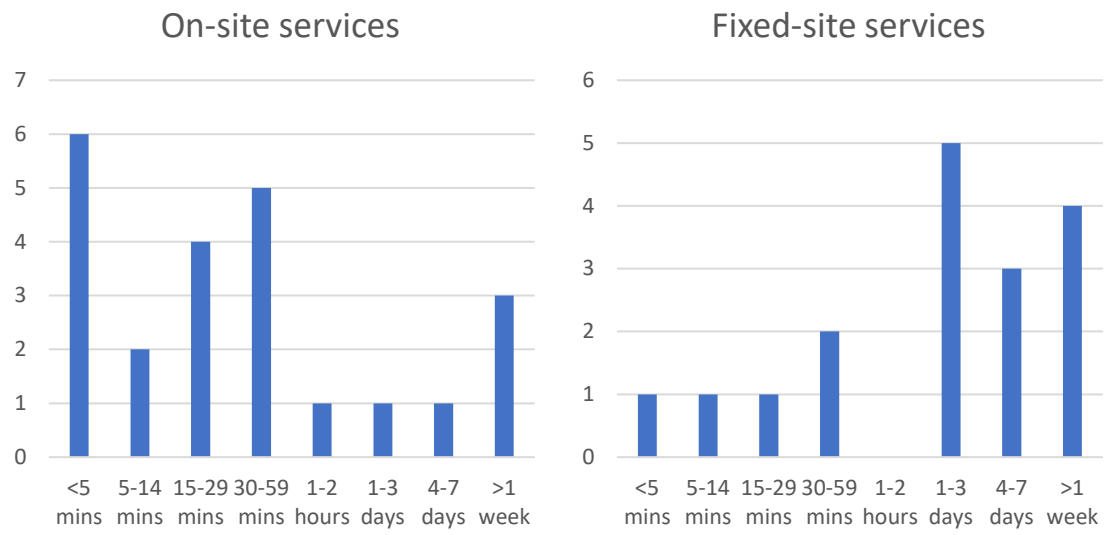
For identification of substances in a pill, most services (22 of 31) only required a scraping of the pill or none (in the case of 1 service that used Raman spectroscopy, which can be conducted without the device touching the substance), while others used a quarter (5), a half (1) or a whole pill (3). Some services mentioned that they would conduct testing on any amount, such as a scraping, but could conduct more reliable testing on greater amounts, so they sought them when possible. Additionally, access to the whole pill was preferred in order to photograph, measure and weigh it for cataloguing. For the 15 services that conducted quantitative analysis on pills, the minimum amount needed for this kind of analysis was a scraping (4), a quarter pill (6), half a pill (1), a whole pill (3) and 5mg (1).

For identification of substances in a powder (n=25 responses), the median amount required for testing was 10mg (range 0-50mg). The modal amount required was 10mg (8), then 5mg (5). For quantitative analysis on powders (n=13 responses), the median amount required for testing was 10mg (range 1-50). The mode was 10mg (4), then 5mg (2) and 50mg (2).

Service model aspects

The reported wait times for service users (how long they have to wait for results of the analysis process) are shown in Figure 5 for on-site services (23) and fixed-site services (17). The median wait time was 15–29 minutes for on-site services and 1–3 days for fixed-site services. The three postal services reported a wait time of over 1 week.

Figure 5: Wait times for service users by service type



Note: On-site service n=23; fixed-site services n=17

Almost every service (30 out of 31) provided a brief intervention (one-on-one session between service user and service staff), 25 services provided harm reduction materials/leaflets, 11 services reported providing an 'other' response (e.g., counselling, medical assistance, referral to other services), and one service provided no additional information or intervention. Nine services also reported offering secure disposal facilities to service users to discard drug samples safely.

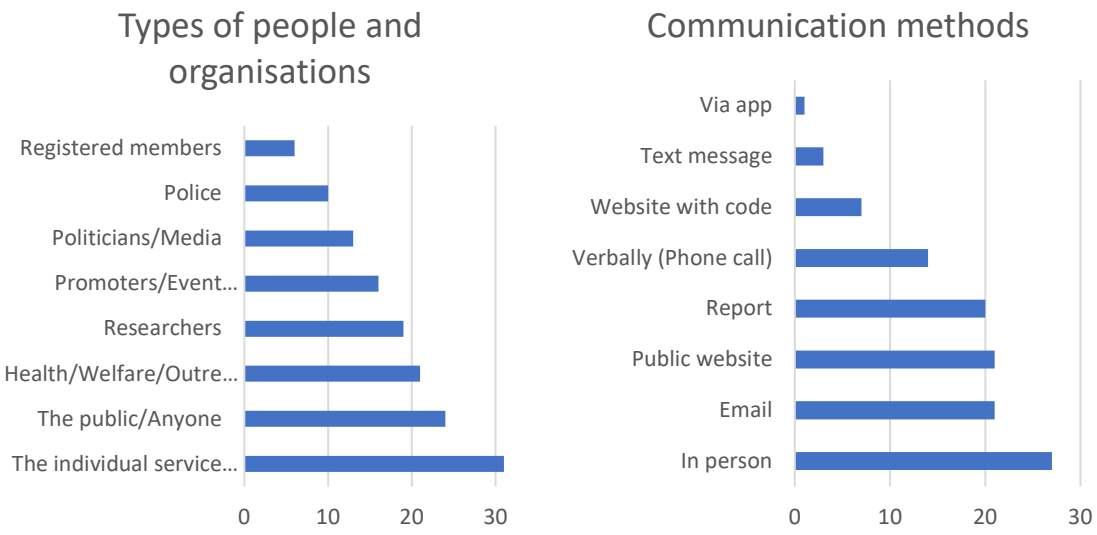
Services were asked whether drug samples are provided back to service users by service staff, as this practice may represent a legal risk in some jurisdictions. Only 1 service reported that they did provide samples back to service users. The most common practice was to only ask for the amount needed for the test (15 of 31). Some services reported that they never provided drugs back even if only a part of the sample was used for the analysis (7), while the remainder reported that returning drugs to service users was not relevant to them (6) because service staff never handled the samples (e.g., service users were instructed by staff to place substance in a tube) or their service did not interact directly with service users (e.g. postal service).

Communication of analysis results

Services were asked to consider to whom and how they communicate their results, including individual and aggregate test results and warnings/alerts. All services communicated results directly to individual service users (as per the definition of a drug checking service), and more than half of the services also alerted the public (24), health/welfare/outreach (21), researchers (19) and promoters/event managers (16) of the test results (see Figure 6).

Methods of communication of results, regardless of type of person, were primarily in person (27), public website (21), email (21), and reports using aggregate data (20) (see Figure 6).

Figure 6: Communication of test results



When services provided analysis results back to individual service users, they did so in person (27), by phone call (11), email (10), website public (6), website with a code (4), report using aggregate data (4), text message (2) and app (1).

A database of analysis results was maintained by 28 of 31 services. Most (17) of these maintained a restricted access database, while 8 reported that the database could be accessed upon request, and 3 that the database was open access.

Funding sources

Services were asked about the sources of funding received to conduct drug checking. Some form of government funding was received by most services (21 of 31). The most commonly reported was national funding (10), then state funding (9), city/municipality level funding (8), and international funding (4). Fifteen services reported government funding from a single type; 6 reported funding from multiple government funding types. Of the services with a single government funder, 5 reported receiving only national funding, 6 reported receiving only state funding, 2 reported receiving only city/municipality level funding, and 2 received only international funding, including European Union funding.

Eleven services reported relying on a variety of non-government funding sources, either from promoters (7), service user co-payments (4), private or philanthropic foundations (2) or private donations (2). However, only one service was funded solely by promoters, and just one other solely by service user co-payments, with none being funded solely by other types of non-government funding source.

Four services reported that they receive no funding whatsoever. There was a high reliance across the sample on in-kind support from volunteers and auspice organisations. That is, even when government funding was received, it was not typically enough to fully fund the operations of the service. Some services also commented that the inclusion of drug checking in their service made them ineligible to seek formal funding from government sources in their country.

Evaluation

Most services (20 of 31) reported that there has been some type of evaluation of their service. However, in the comments field, evaluation reports that were published and available to the public were less commonly mentioned. Many evaluations were either in-house, unpublished or currently underway. Others were not available in English. See individual service profiles for lists of available evaluations.

Discussion

This global catalogue has demonstrated the wide reach of drug checking services, now operating in 20 countries across Europe, the Americas and Australasia. It has also shown the exponential increase in the number of organisations conducting drug checking, with almost half of the organisations who responded to our survey beginning operations in the last five years. These new organisations join a contingent of established services, many with decades of experience. This catalogue shows that drug checking is certainly not a new phenomenon. It has been occurring on-site at festivals and music events, at fixed sites including outreach and treatment centres, and through postal services, for over 25 years.

What is new though is the breadth of available analytic techniques that are now being used to identify and quantify the contents of drug samples (Harper, Powell, & Pijl, 2017). While older techniques (TLC, reagent tests) are still being used (they are easy to administer and less costly), spectroscopy methods are increasingly popular. Just under half of the services used an advanced method including mass spectrometry methods. This level of technology use means that the majority of services are capable of *identifying* multiple drugs, while just under half of the services are capable of *quantifying* multiple drugs (that is, providing purity or dosage information). Such technology provides a level of detail often not attributed to drug checking services by their critics (Schneider, Galettis, Williams, Lucas, & Martin, 2016), who also argue that service users would not be willing to wait for the results of more sophisticated analysis. Our results on wait times indicate that a 30-minute wait on-site is the median with longer waits also being reported.

Reagent kits have been criticised by many due to their limitations (Schneider, et al., 2016), and the possibility that they may provide a false sense of security (Winstock, Wolff, & Ramsey, 2001). For example, MDMA adulterated with an NBOMe will likely test positive for MDMA using a Marquis test. If only one test is used, the presence of the much more dangerous NBOMe will be missed. In our sample, only four services used only reagent kits, and there was no service that reported use of only a single reagent kit. This catalogue also shows that more accurate and comprehensive analysis techniques are available and feasible for on-site use, but usually only in countries where political and funding contexts support the costs associated with these techniques.

In our sample, identification of substances typically required only a scraping of a pill or 10mg of powder. Australian research indicates that the provision of a scraping is acceptable to almost all festival goers surveyed (Barratt, Bruno, Ezard, & Ritter, 2018). Some have argued that drug checking services would not be viable if people are required to ‘give up’ a sample of their drugs for testing. In such situations, there are technologies available for substance identification that do not require any substance donation (Raman spectroscopy and DART-MS) (see also Harper, et al., 2017).

Almost every service provided a brief intervention and most provided harm reduction information alongside their feedback about the drug's content (and purity in some cases). That is, the analysis result is only the beginning of the conversation with the service provider: it provides a 'hook' to attract an otherwise hidden population into the service (Hungerbuehler, Buecheli, & Schaub, 2011).

While nine services reported offering secure disposal facilities for drugs to be discarded, the majority did not. Such a practice assists service users in discarding safely, but also enables counts of the discarded drugs as evidence of drug checking services removing the most dangerous compounds from circulation (Royal Society for Public Health, 2017; Sage, 2015).

The drug checking services surveyed here typically communicated their results to a wide variety of stakeholders, in addition to the service user themselves. While most services maintained a public website, only three services reported hosting a database of their substance testing that was open access. While only one service reported using an app to communicate with service users, we expect app-based communication to increase in coming years. For example, in 2016, an app called KnowDrugs was released that presents a combined database of drug checking results.

Many drug checking services operate in difficult or restrictive funding settings. Most services reported at least some form of government funding, while a third of services reported relying on donations or payments from non-government sources, including promoters, service user co-payments, and private donations. Many services reported that they used volunteers and relied on in-kind support from other organisations. The precarious nature of funding for many drug checking services is concerning. Lack of adequate funding limits their use of the most accurate and comprehensive analysis techniques, which typically require a greater financial outlay and greater ongoing operation costs. It also affects their capacity to conduct evaluations, which require separate resourcing. This study has identified a definite need for separate resourcing to evaluate the variety of service models currently operating (Vidal Giné, et al., 2017).

Some limitations of this catalogue should be noted. We did not ask service providers to describe the client group that they serve nor which drug types they typically analysed. These questions are increasingly important with the emergence of illicit fentanyl analogues being unknowingly consumed, typically as 'heroin' (Ciccarone, Ondocsin, & Mars, 2017) but also as other psychoactive substances (Lysyshyn, Dohoo, Forsting, Kerr, & McNeil, 2017). This public health threat has prompted many organisations to provide testing services for people who inject drugs at outreach and treatment services, with the aim of identifying tainted heroin before its consumption (Krieger et al., 2018; Lysyshyn, et al., 2017). Other limitations of this catalogue include a limited number of languages used to request participation—including other languages may increase the catalogue reach in future.

We already know that there are new services starting up in countries not covered in this bulletin. We look forward to updating the bulletin to reflect these new services and developments among the increasing number of drug checking services globally.

Summary of services in this bulletin

This table lists summary features of the 31 services who completed the survey.

Name of service, Country	*Start year*	*Mode of Submission*	*Analysis method(s)*
Drug Information and Monitoring System, Netherlands	1992	Fixed-site	GC-MS, LC-MS, IT-MS, FTIR, Reagents
Asociación Hegoak Elkartea, Spain	1994	On-site & fixed-site	TLC, Reagents
Technoplus, France	1995	On-site	TLC
Modus Fiesta, Belgium	1996	On-site	GCMS, TLC, Reagents
checkit! - Suchthilfe Wien gGmbH	1997	On-site	HPLC-MS/MS, UHPLC, MALDI-IT-MS/MS, HRMS
Saferparty.ch; Raveitsafe.ch; Safer Dance Basel, Nuit Blanche	1998	On-site	HPLC, GC-MS, LC-MS, UV
Dancesafe, United States	1998	On-site	Reagents
SINTES, France	1999	On-site, fixed-site & postal	HPLC, UHPLC, GC-MS, LC-MS, UV, FTIR
Energy Control, Spain	1999	Fixed site & Postal	HPLC, GC-MS, UV, TLC
Energy Control, Spain	1999	On-site	UV, TLC, Reagents
DrogArt, Slovenia	1999	Fixed-site	HPLC, GC-MS
DrogArt, Slovenia	1999	On-site & fixed-site	Reagents
Jugendberatung Streetwork/ saferparty.ch, Switzerland	2001	On-site & fixed-site	HPLC, GC-MS, LC-MS
DrugsData/EcstasyData, United States	2001	Postal	GC-MS, Reagents
ANKORS Festival Harm Reduction, Canada	2002	On-site & fixed-site	Raman, TLC, Reagents
Testing Project; Lonja Laket Project; Punto Fijo, Spain	2002	On-site & fixed-site	GC-MS, TLC, Reagents

Kosmicare Association- Integrated Drug Checking Service at The Boom Festival, Portugal	2006	On-site	TLC
XBT Program, France	2009	On-site & fixed-site	TLC
ACT Investigation of Novel Substances Project, Australia	2013	Fixed-site: Hospital	HPLC, UHPLC, GC-MS, LC-MS, FTIR, NMR
Servicio de Analisis de Sustancias (Substance Analysis Service), Colombia	2013	On-site & fixed-site	GC-MS, UV, TLC, Reagents
The Loop, United Kingdom	2013	On-site	UV, FTIR, Reagents
DAT2 Psy Help, Hungary	2013	On-site	Reagents
Drogenarbeit Z6 Drug Checking, Austria	2014	Fixed-site	GC-MS, LC-MS
Programa de Analisis de Sustancias (PAS), Mexico	2014	On-site & fixed-site	TLC, Reagents
dib+, raveitsafe.ch by Contact – Siftung für Suchthilfe, Switzerland	2014	Fixed-site	HPLC, GC-MS, LC-MS
KnowYourStuffNZ, New Zealand	2015	On-site	FTIR, Reagents
Association Bus 31/32, France	2015	On-site & fixed-site	TLC
Be Aware on Night Pleasure Safety (BAONPS), Italy	2015	On-site	Raman
DUCK, Luxembourg	2016	On-site	GC-MS, LC-MS
SIN Lab, Poland	2016	On-site	Reagents
Imaginario 9, Uruguay	2016	On-site	TLC, Reagents

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