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# What works. Testing drugs for harm reduction.



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# About 360Edge.

360Edge is Australia's leading specialist consultants in alcohol and other drug policy and practice.

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# In brief.

The recent deaths of 6 young people at music festivals in Australia connected to MDMA has led to local calls for the introduction of drug checking services (sometimes called 'pill testing' in Australia and drug safety testing in the UK) to assist people who use drugs to make safer decisions about the drugs they intend to consume.

Drug checking services both vary in the primary purpose of the testing; who conducts the analyses and how; the range of quantitative or qualitative analytical methods used; who disseminates test results and how; where testing is located; whether test results go directly to consumers or via an intermediary; and the level of engagement with other stakeholder.

Evidence supports on-site rapid 'real time' testing where drugs are also sourced on-site, mostly directly from people who use, and information is provided direct-to-consumers and emergency services onsite, as well as via

broadcast alerts to attendees through social media and other channels.

There is also evidence supporting approaches where drugs are primarily sourced from drop off sites and medical incidents, with results provided via stakeholder meetings, alerts broadcast through social media and other channels.

Although evidence is still emerging, there is research showing that drug checking alters behaviour of people who use drugs. They are more likely to consume less when the drug profile differs from expectations. Drug-checking services also alter drug markets in positive ways and provide valuable information to front-line emergency services.

Further research is required to determine the effectiveness of drug checking to reduce hospitalisations and fatalities as a result of drug taking, but the limited research available is promising.



# Contents.

In brief.....	4
Introduction.....	6
What is drug checking?.....	6
Why drug checking?.....	7
Community support.....	7
Operational elements.....	9
Overview of key elements.....	9
Setting.....	9
Source of drug.....	11
Communication.....	12
Testing technique.....	13
Case examples.....	16
Fixed site drug checking: DIMS.....	16
'Pop up' festival drug checking: Know Your Stuff NZ.....	17
Postal drug checking: Energy Control Spain.....	18
Multi Agency Safety Testing: The Loop UK.....	19
Evidence.....	21
Monitoring and data collection.....	21
Behaviour change.....	22
Market change.....	23
Overdose.....	24
Brief intervention.....	24
Other areas of festival safety.....	25
Future evaluation and research.....	25
References.....	28



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# 01 Introduction.

Music festivals are a key environment where young people use illicit drugs, most commonly cannabis and MDMA (Methylenedioxymethamphetamine) or ecstasy. The recent deaths of 6 young people at music festivals in Australia connected to MDMA have led to calls for the introduction of drug checking (also sometimes referred to as 'pill testing' in Australia and 'drug safety testing' in the UK).

## What is drug checking?

Many illicit drugs, including MDMA, started as pharmaceutical compounds and are less risky when consumed in their pure state at known and appropriate doses. But because the illicit drug market is unregulated, not knowing what one is consuming is a major risk associated with taking illicit drugs.

Because they are illegal, consumers are unable to determine the contents or strength of the chemicals contained in a substance, and are also unable to titrate the dose themselves to reduce risks. Unlike regulated drugs, such as alcohol and pharmaceuticals, which are clearly

labelled with strength and contents, unregulated drugs are a bit of a mystery.

Drug checking involves taking a sample of a drug and testing the contents using one or more forensic analyses in order to identify the contents and strength of the submitted sample.

Analysis of street drugs by community-based services began in the US in the late 1960s and early 1970s.<sup>1</sup> Drug safety testing expanded in Europe in the 1990s with growing concern about synthetic 'party drugs' such as MDMA at dance events. In 1992, the Dutch government-funded Drug Information and Monitoring System (DIMS) was established and similar services sprung up across Europe in subsequent years.<sup>2</sup>

In Australia, two small trials of drug checking have been undertaken at the Groovin' the Moo festival in the ACT in 2018 and 2019<sup>3</sup> and there have been calls to expand trials to other festivals. In November 2019, the NSW Coronial Inquest into a number of deaths at music festivals recommended the introduction of drug checking.<sup>4</sup>

## A note about terminology

There isn't a globally accepted definition of drug checking, although international organisations are working to standardise the term. The lack of universally accepted terminology is a hinderance to comparing the strengths and weakness of various interventions. Variations exist in location of testing, source of tested drugs and how information is communicated to the public. We have used the broadest possible definition of drug checking as: *Testing drugs for the purpose of harm reduction, where results are communicated to the public.*

'Drug checking' is the internationally accepted term for this activity. Although used elsewhere in the past, 'pill testing' is now a particularly Australian term. The terminology changed to recognise that not many drugs that are brought in for testing are pills, and may also be powders or capsules. We have used the term drug checking throughout this report rather than pill testing.

# Why drug checking?

Drug checking services are based on the principle of harm reduction. The primary aim of this approach is to reduce the harms associated with the use of psychoactive drugs in people who currently use alcohol or other drugs.

It has a different aim to demand reduction (prevention and treatment) or supply reduction (law enforcement and customs) initiatives, which aim to reduce the level of illicit drug consumption in the community. Some have argued that drug checking has both demand and supply reduction impacts as well as harm reduction impacts.<sup>5</sup>

Drug checking reduces harms by providing people with better information about what they intend to take to enable them to make safer decisions about their use. This includes not taking that drug at all; taking less of the drug; taking it over a longer period of time; taking it in a different setting; taking more care in mixing with other substances; or using a different route of administration.

# Community support.

Current government policy at Australian music festivals has largely focused on supply reduction through law enforcement activities. Police are routinely engaged to maintain law and order at festivals, including related to



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policing illicit drug use, possession, and dealing.

However, these strategies have not been shown to reduce use or harms. In fact, evidence suggest that they increase harms. In a recent study, 70% of festival goers said a police presence does not deter them from using drugs at festivals,<sup>5</sup> suggesting that drug use is likely to continue regardless of the presence of law enforcement.

In addition, the use of drug detection dogs has been shown to increase harms significantly. There are many documented cases of people swallowing all the drugs in their possession in response to sniffer dogs, increasing risk of adverse impact including overdose.<sup>6</sup> They may have been intending to take these drugs over several days of a festival. People are also more likely to purchase drugs inside a festival when police dogs are present to avoid carrying drugs into a venue.<sup>5</sup> As a result their drugs may be purchased from unknown sellers, which increases risks of drug-related harms more than buying from a trusted known source. A UK study found that festival drug dealers were twice as

likely to mis-sell substances as neighbourhood dealers.<sup>2</sup>

There is significant support for a harm reduction approach to illicit drugs, including drug checking. Around 39% of teenagers and 52% of young adults in Australia believe that if a person is caught in possession of MDMA, they should be handled in a non-punitive way: either given a caution; referred to a treatment or education program; or fined (34.9% teenagers, 26.6% young adults). Around 10% of young people (aged between 18 and 29) believe ecstasy should be regulated for sale.

Drug checking is well accepted among the target audience for this service. More than 82% of the 2,300 young Australians aged between 16 and 25 years surveyed in 2013 were supportive of drug checking facilities.<sup>7</sup>

A recent survey of 851 Australians who reported using psychostimulants and/or hallucinogens and attending licensed festival or clubs reported that nearly all (94%) would use an on-site drug checking service if it was available.<sup>8</sup>



# 02 Operational elements.

## Overview of key elements.

Drug checking facilities operate in a variety of ways both locally and overseas. Commonly services differ on:

- Setting: where testing is located
- Source: where the drugs for testing are sourced
- Communication: who disseminates test results and how; whether test results go directly to users or via an intermediary; and the varying levels of engagement and support from other stakeholder groups
- Technique: the range of quantitative or qualitative analytical methods used; and who conducts the analyses and how

## Setting.

The location of facilities has a major impact on the analytical techniques used and the ability to communicate harm reduction information to people who use drugs.

A review by the NSW-based Drug Policy Modelling Program concluded that the

location of drug checking services is largely driven by the local regulatory environment and the willingness and capacity of venues to host the services.<sup>9</sup>

The global review found that:<sup>9</sup>

- 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.<sup>9</sup>

A web survey of 851 Australians who attend festivals by Barratt et al (2017) found that 94% would use a mobile drug checking on site and 80% would use a fixed site service external to a site.<sup>8</sup>

### On-site mobile services

On-site or mobile drug checking facilities usually operate at festivals or venues where illicit drugs are sourced and consumed. However, some mobile sites can operate and ‘pop up’ in other areas to better provide accessible drug checking information.

Internationally, Check It in Austria, Safer Dance in Switzerland, The Loop UK, Know Your Stuff in New Zealand and Check!n in Portugal are examples of on-site facilities that test drugs on the spot in clubs or at dance events and immediately communicate the results to consumers. Pill Testing Australia has also operated a mobile facility at one festival in Australia.

In most cases, the analytical techniques at these on-site facilities are more limited but many services such as Check it, Safer Dance and the Loop also utilise fixed site laboratories to conduct further testing with more sophisticated equipment.

Despite some limitations of on-site facilities they have proven effective at identifying discrepancies between user expectations and test results. In particular mobile sites that utilise a combination of techniques have the most effectiveness.

An evaluation of Portugal’s Check!n facility at one festival in 2014 found that 45 per cent of the samples were not

what users expected and, as a result, 29 per cent indicated that they would not consume them. Of the 71 per cent that intended to consume them, 10 per cent aimed to obtain more information, 15 per cent would take a smaller amount and 30 per cent would not mix it with other substances.<sup>10</sup>

Localised, on-site testing also has the distinct advantage of sourcing drugs from the festival or club in which the drugs would be consumed as well as the ability to communicate information to consumers either directly or in-directly via alerts at the venue.

Agencies operating on-site (including first-aid workers, peer educators and police) can also interact with the on-site lab improving frontline responses.

### **Fixed site services**

Fixed site facilities operate from permanent offices, outreach centres, community centres, and even churches. These may involve mobile laboratories or access full laboratories for the most advanced chemical analysis techniques to provide the most accurate information on drug composition.

The Netherlands’ Drugs Information and Monitoring System (DIMS) was established in 1992. It now provides 30 testing and drop off facilities around the country where service users can submit their drug samples.



More than 100,000 samples were collected and analysed by DIMS between 1992 and 2010.<sup>11</sup> DIMS works by people submitting their samples anonymously. If a person attends a drop off centre, the person can be provided with some testing results on-site (reagent testing, chromatography etc) or can wait for the sample is sent directly to a central laboratory for further testing.<sup>11</sup>

A fixed site drug checking facility also



operates within the City of Zurich. The Drug Information Centre Zurich (DIZ) was established in 2006, and comprises free analysis of substances and a consultation with a social worker.<sup>12</sup>

The DIZ is open twice a week and conducts 40 analyses per week. Obligatory counselling includes drug

information, safer use advice and referrals, and clients must also complete a questionnaire.<sup>13</sup>

### Postal

Whole drugs are sent in the post to the fixed site laboratory which communicates the results of the analysis back to the poster, typically via email or on a website using an anonymous key. Fixed site services have a longer wait time for results. No drugs are returned via post in this model.<sup>9</sup>

### Home

Home-testing of drugs with colorimetric reagent kits are also commonly used by people who use drugs. Kits are legally available for purchase online as well as from adult shops.

In Australia, kits have been provided by harm reduction groups such as the University of Melbourne Chapter of Students for Sensible Drug Policy. These testing kits are very rudimentary and are not able to provide comprehensive information on risks on their own.

## Source of drug.

The source of drugs to be tested often depends on the regulatory environment of where the drug checking agency is to be operated. Nevertheless, both on-site and fixed site facilities can source drugs from a variety of sources, including:



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- **Direct-from-consumer:** Drug checking facilities may acquire drug samples directly from the consumer. Ideally, formal legal exceptions have been made, although there are drug checking services operating within a legal 'grey area' with police discretion or 'underground' through self-organised peer drug checking. This is the preferable method for testing facilities as it allows micro-level drug-market information from that specific time and place as well as an ability to communicate harm reduction information directly to consumer. It is also the only way to accurately track the difference between what people expect the substance to be and what it actually is.
- **Amnesty bins:** Providing drug disposal bins within and near festivals and leisure events allows consumers to discard illicit drugs safely without fear of police intervention. These drugs can then be provided to on-site or off-site facilities for testing.
- **Police seizures:** Police currently test seized drugs in their own laboratories but results are not usually released in a timely manner that has harm reduction benefits. Seizures by police can be provided to on-site or off-site facilities for testing.
- **Emergency services:** Emergency services, first aid and welfare staff will often encounter illicit drugs in the process of helping festival goers with

their medical needs. These drugs can be provided to on-site or off-site facilities for testing to help identify the best treatment for drug affected people.

- **Ground finds:** Venue attendees and staff may find substances on the ground that they bring for testing.

## Communication.

Drug checking most commonly refers to communication models that interact directly with the person intending to take the drug, but how test results are delivered is often heavily dependent on setting, source, and the regulatory environment in which facilities operate.

A global review of 31 drug checking services found that, in addition to communicating results with consumers directly, 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.<sup>9</sup>

Methods of communication of results were primarily in person (27), public website (21), email (21), and reports using aggregate data (20). Services that provided analysis results directly to individual service users 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).



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The main methods of providing harm reduction information are directly to a consumer, via a general alert system, or a combination of both.<sup>9</sup>

### **Direct-to-consumer**

Although there have not been any direct comparisons with other methods of communication, personal contact with well-informed professionals is considered by many to be more effective at encourage people who use drugs to pay attention to preventive information and reduce risky behaviours.<sup>14-16</sup>

Direct contact potentially serves as an immediate intervention tool to change behaviour when drugs are shown to contain unwanted or unknown contents, or unexpected strength substances.<sup>17</sup>

Direct contact is also the preferred method for people who use the service; a majority (64%) of festival goers report that they would not use a service that did not provide individual feedback of results.<sup>9</sup>

### **General alerts**

Either independently or in conjunction with direct-to-consumer communication of results, many facilities provide some sort of public alert system to disseminate information about concerning results about substances in circulation.

Alert-based systems disseminate public results on boards at festivals or post them online or through social media or festival apps.

Public-alerts can have broad reach. A recent alert from the Netherlands Drugs Information and Monitoring System (DIMS), which was set up to gain information about the drug market for policy purposes and to provide information to the public, led to national mass media warning campaigns that included national radio and television broadcasts, posts on social media and the internet, and flyers and posters at large dance events.<sup>18</sup>

## **Testing technique.**

Two major harms of illicit drugs are unexpected contents (eg active adulterants, inactive fillers and drugs that mimic other drugs) and unexpected purity.

Most drug checking facilities provide information on the presence or absence of certain drugs as well as the presence of certain adulterants by comparing the drug profile with a library of reference profiles of known substances. Drug checking services vary considerably in the chemical drug analysis techniques used. As a general overview the different analytical



techniques used by drug checking facilities include:

- **Colorimetric reagents:** These are kits containing chemicals that change colour when combined with particular chemicals. The most well-known reagents are marquis (often used for testing MDMA and speed), mandelin (often used for testing for ketamine and PMA), and mecke (often used to test for opiates). These tests only provide information about the presence or absence of a substance but not how much of the substance is present or what else is present.
- **Chromatography:** Chromatography separates mixtures of substances into their components. The most commonly used techniques are thin-layer chromatography ('TLC'), high performance liquid chromatography ('HPLC') and Ultra-High Performance Liquid Chromatography ('UHPLC').
- **Spectroscopy:** Spectroscopy uses electromagnetic radiation to get information about the structure of a substance. Commonly used techniques include fourier transform infrared spectroscopy (FTIR), ultraviolet-visible spectroscopy (UV-Vis) and Raman spectroscopy.
- **Mass spectrometry:** Mass spectrometry separates different chemicals in a substance by their mass. Techniques include gas chromatograph mass spectrometry (GC-MS), liquid chromatography

mass spectrometry (LC-MS), and ion trap mass spectrometry (IT-MS).

Generally, the more of a drug used in analysis, the greater the accuracy of information that can be provided to the consumer. Barratt (2017) found that a third of Australian potential service users reported willingness to donate a whole dose for testing.<sup>8</sup>

Some critics of drug checking cite the limitations of forensic techniques as a reason not to implement drug checking. Their argument is that the equipment can sometimes return a false negative (fail to identify something that is there) and people may take a drug thinking it is safe. However, this argument is a logical fallacy because the risk of harm, and the likelihood someone will take a drug, is significantly greater when consumers have no information about the drug's contents. Drug checking services generally have clear messaging that there is risk with all drug use – the focus is on highlighting risk, not guaranteeing safety.

Many services use multiple methods of testing to reduce the risks of false positives. The global survey of drug checking service providers found that 15 of the 31 services reported at least 1 mass spectrometry or liquid chromatography method and 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 that used reagent kits reported only using this method in combination with other analysis techniques. The Loop UK, for example, uses six different types of analytic technique with triangulation between results and repeat testing if required.<sup>2</sup>

An international collaborative effort between 2011 and 2013, the Trans European Drug Information (TEDI) project, combined data from the drug checking systems of Spain, Switzerland, Belgium, Austria, Portugal and the Netherlands to compare results and

exchange knowledge about the different analysis techniques used.<sup>19</sup> Laboratory techniques used were often dependent on the setting, meaning the nature of the drug-checking service affects the speed, accuracy and reliability of the analysis results and, therefore, the potential extent of harm reduction.<sup>19</sup>

There is a likely compromise in conducting forensic analyses in challenging conditions that necessitates a trade-off between speed, accuracy, reliability and portability of equipment.<sup>2</sup> However, the technology is advancing rapidly and the combined use of multiple analytical techniques increases the effectiveness of these interventions.



# 03 Case examples.

## Fixed site drug checking: DIMS.

### Who are they?

The Drugs Monitoring and Information System (DIMS), based in the Netherlands, is the oldest drug checking service in the world. DIMS receives financial support from the Ministry of Health, Welfare and Sports and coordinates drug checking with over 30 office locations throughout the country. In nearly two decades, more than 100,000 drug samples have been handed in at DIMS testing facilities.

### Services offered

- Fixed site drug checking
- Direct-to-consumer harm reduction information
- Qualitative and quantitative testing
- Sourced directly from consumer.
- Monitoring and alerts

### How the fixed-site model works

DIMS consists of a nationwide network of fixed-site facilities at drug prevention institutions in different places in the Netherlands.

People who use drugs hand in pills or other substances anonymously for a test. Staff consist of health and prevention

professionals who communicate to consumers about the effects of the particular substances and their associated risks.<sup>11</sup>

Important information, such as experiences with adverse effects with the drug in question are recorded and saved in the DIMS database. Other important inputs in the database are regional origin, date, source of purchase, price, and reason for testing.<sup>11</sup>

Some sites are merely receiving stations and directly send all the samples they receive to the DIMS Bureau at the Trimbos Institute and do not offer on-site testing.

A number of analytical techniques are used on site with reagent testing occurring initially at intake to determine whether a tablet contains any Ecstasy-like substances, amphetamine, a hallucinogenic compound, or none of these.

Moreover because of weekly input of information on tablets and because of the fact that Ecstasy tablets are usually produced in large batches, certain tablets can be determined and recognised through a specially developed a database on the DIMS website known as the 'recognition list'.<sup>11</sup>



This allows for more rapid identifying of substances at the fixed site, without the need to be sent off for further testing.

Tablets that are not recognised by this online system are sent for further testing. Qualitative and quantitative analyses of the drugs samples occur at the DIMS bureau using a combination of thin layer chromatography, UV spectroscopy and mass spectrometry techniques.<sup>11</sup>

Individuals who submitted pills for lab testing phone the fixed site a week after submission for an explanation of results.

Information is also used to assist with alerts as well as to improve the provision of direct-to-consumer harm reduction information and to monitor illicit drug markets.

## Evaluation

An evaluation of Jellinek Prevention, which is part of DIMS and operates in Amsterdam, along with two other European drug checking facilities in 2002, concluded that people who used these services were better informed and showed more health-conscious behaviour.<sup>20</sup> The evaluation further noted that drug checking services such as DIMS are crucial to understanding emerging trends in the synthetic drugs market.<sup>20</sup>

# ‘Pop up’ festival drug checking: Know Your Stuff NZ.

## Who are they?

KnowYourStuffNZ started in 2015, offering qualitative substance analysis on-site at festivals in New Zealand. The service is self-funded by volunteers, and indirect national funding.

## Services offered

- On-site mobile drug checking
- Direct-to-consumer harm reduction information
- Qualitative testing
- Sourced directly from consumer.
- Monitoring and alerts

## How the ‘pop up’ festival model works

Drugs are provided by users on-site at festivals and are tested using a combination of reagents and FT-IR Spectroscopy. Information provided to users is purely qualitative in nature noting potential content and not purity of substances. Moreover, consumers are provided with harm reduction information on site. Results are recorded and conveyed in terms such as: “This result is consistent with the presence of XYZ” rather than “This is XYZ” in order to



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adequately convey limitations of testing techniques.

## Evaluation

There have been no external evaluations of KnowYourStuffNZ but internal evaluations indicate that the intervention has been effective at positive behaviour change. In 2018/19 KnowYourStuffNZ attended 13 events and tested 805 samples. Key findings included<sup>21</sup> 87% of the season's samples were what people expected and 62% of service users who received a negative test result said that they did not intend to consume the substance.

# Postal drug checking: Energy Control Spain.

## Who are they

Energy Control is a drug prevention project founded in 1998 in Spain that consists of peer-to-peer interventions, school workshops, and the use of new technologies and other activities in the area of risk reduction associated with drug use.

The service is partly funded by the government, and also charges users for some services. As at 2014, the service had analysed more than 12,000 substances.<sup>22</sup> Some of the main drugs

tested include MDMA, cocaine, speed and a range of new psychoactive substances.

Drug checking services are offered through on-site drug checking at events or via a drop-in centre. There is also scope to receive drugs to test via post from anywhere in the world.



## Services offered

- Fixed site drug checking
- On-site mobile drug checking
- Direct-to-consumer harm reduction information
- Sourced directly from consumer, on-site, and via postal service
- Qualitative and quantitative testing
- Monitoring and alerts

## How the mail service works

Energy Control's fixed site operations can receive drugs to test via post. Once received drugs are tested via a number of qualitative and quantitative methods including HPLC, GC-MS, UV/Vis, and



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TLC testing. No drugs are returned in the post, with consumers phoning the service to be provided with results and harm reduction information.

## Evaluation

Internal evaluations have found that the drug checking services have effectively monitored the illicit drug market and assisted in targeting hard-to-reach user demographics.<sup>23</sup>

# Multi Agency Safety Testing: The Loop UK.

## Who are they?

The Loop UK is a non-profit social enterprise established in 2013 that provides drug checking as well as welfare and harm reduction services at nightclubs, festivals and other leisure events.

The Loop also provides staff training on drugs awareness, in-house welfare service delivery, the prevention of drug related harm at events, and the delivery of drug safety testing services.

Prior to 2016, The Loop UK provided forensic testing of samples from agencies on site at festivals and nightclubs and reported the results back to the collecting agencies for harm

reduction purposes. After 2016, The Loop introduced publicly accessible drug checking to the UK in the form of Multi Agency Safety Testing (MAST). The Loop also conduct non-public testing to improve agency responses.

## Services offered

- Community-based city centre and event-based festival and nightlife drug checking with mobile pop-up laboratories and fixed site commercial and university laboratories
- Direct-to-consumer individual test results and healthcare consultations (-2016 onwards)
- Sourced directly from consumer and from collaborative agencies and individuals
- Agency consultancy and information service
- Qualitative and quantitative analysis
- Monitoring and alerts issued through media, social media and apps
- Staff training

## How MAST works

Along with users submitting drugs directly for testing at on-site facilities, The Loop UK refers to their approach as a Multi Agency Safety Testing approach. This includes sourcing drug for testing from a variety of agencies on site including, amnesty bins, the police, emergency services, welfare and general staff on site. This information is then



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communicated back to agencies to assist their work as well as via alerts, with samples associated with medical incidents prioritised. The key to the multi-agency framework is to harness support of all onsite agencies including police and healthcare staff, as well as utilising professional chemists and healthcare staff to deliver the Loop's testing service to the highest standards, with the primary aim of harm reduction.

## Evaluation

A recent evaluation of The Loop facilities across four days at a UK festival<sup>2</sup> revealed that one in five substances was not as sold or acquired. One in five service users utilised the independently verified disposal service for onwards safe destruction of further substances of concern in their possession and another one in six moderated their consumption.

# 04 Evidence.

The evidence supporting drug checking in the academic literature is still emerging, but early indications are promising for the use of drug checking as a harm reduction intervention.

Although concerns have been raised that allowing drug checking services will increase the use of recreational drugs, this is not supported by international evidence. Several studies have demonstrated that the presence of a drug checking facilities does not encourage those who do not use drugs to begin drug use.<sup>12, 19, 20, 24</sup> Instead, drug checking facilities appear to make it less likely a drug will be consumed if it contains a substance they were not expecting, potentially reducing drug use.<sup>19</sup>

Overall there is no evidence that drug prevalence, initiation or mortality rates have increased in European countries with drug safety testing by comparison with those without.<sup>12, 20, 25</sup>

A global review<sup>9</sup> found that most drug services (20 of 31) reported that there has been some type of evaluation of their service. However, evaluation reports that were published and available to the public were less common; many evaluations were either in-house, unpublished or currently underway.

## Monitoring and data collection.

Monitoring of illicit drug markets is crucial for understand drug trends to assist front-line services. New psychoactive substances are increasingly being mis-sold as drugs such as MDMA and LSD, the monitoring of which is assisted by data from drug checking services.<sup>22, 26, 27</sup>

The drug checking service operated by Energy Control has made 50 and 82 notifications reporting the identification of new NPS to the Spanish Early Warning System (EWS) in 2015 and 2016, respectively. The same applies to most other European drug checking services that report their information on NPS directly to the European EWS.

Establishment of centralised databases such as those in the Netherlands and France provide strong evidence for the utility of drug checking services as public health surveillance tools. Findings of adulterated drugs can be communicated to the public through posters at events, press releases, and written, broadcast, and social media<sup>11, 18, 23, 27, 28</sup> as well as through peer networks of PWUD.<sup>23</sup>

In addition to local and national warnings, results of the Dutch drug checking experience led to the Early Warning System (EWS) of the EMCDDA. This system allows for cross-border information sharing and the generation of “red alerts” related to detection of adulterated drug supplies.<sup>18, 28, 29</sup>

Novel collaborations in Europe have recently sought to combine drug checking data from European drug checking NGOs as part of the Trans European Drug Information (TEDI) project.<sup>27</sup> The TEDI Workgroup has identified drug checking as a cost-effective healthcare resource, with attributable reductions to both short- and long-term healthcare costs associated with illicit drug use.

Drug checking can also be a useful to monitor demographic data about users of drugs, drug trends and patterns of use that are useful for state agencies related to health and law enforcement.<sup>30</sup> This information in-turn can be relayed to users to provide education about substances of concern onsite and the risks associated with ecstasy consumption.<sup>19</sup>

## Behaviour change.

Evidence suggests that drug checking assists young people in making informed

choices about drugs they wish to consume.<sup>31, 32</sup>

Service user disposal rates have been measured by intentions after hearing test results;<sup>3, 31, 33, 34</sup> self-reported historical recall;<sup>35</sup> hypothetical intentions into the future;<sup>17, 20, 36, 37</sup> or actual disposal rates immediately after hearing test results<sup>2, 38, 39</sup> with the potential for independent verification.<sup>2</sup>

Evaluation of the Checkit! initiative in Vienna, Austria, which provides on-site testing at raves and music festivals, found that two thirds of participants who received an unexpected test result reported that they would not use the tested drug and would warn their peers of a potential contaminated source.<sup>31</sup>

Data from a dance festival drug checking initiative in Portugal found that 74% of participants would not use the tested drug after receiving unanticipated results, citing concerns related to the “unknown” nature of the adulterants or potential harms of known adulterants.<sup>33</sup> A more recent evaluation by the same researchers of another festival found 94.3% of the service users reported that they would not take the drug when results were ‘unexpected’.<sup>40</sup> An Australian survey showed 76% of frequent ‘ecstasy’ consumers (N = 178) would not take a drug if a test could not determine the content.<sup>17</sup>



Results from the recent pilot in the ACT by Pill Testing Australia, reported that after receiving their results, 58% said they intended to consume the drugs as planned, 18% said they would not use any illicit drugs, 12% said they would use less than they originally intended, 5% said they would not use this drug but another drug, 7% said they were undecided.<sup>3</sup>

Results from UK's first on-site festival drug checking service (Multi Agency Safety Testing [MAST]) found that one in five individuals handed over further substances of concern in their possession for onwards safe destruction by the police.<sup>2</sup> Furthermore, service users whose sample contents were as expected but higher strength planned to take a lower dose of the substance in future. Other harm reduction behaviours included taking care in mixing substances and talking with friends and acquaintances about their test result.<sup>41</sup>

Research from drug checking at dance festivals in Western Canada found that individuals were more likely to discard drugs on-site when unknown or harmful contaminants were detected, and were more likely to discard drugs if contaminants were either "unknown" (36%) or known to have high toxicity (31%; such as PMMA/PMA, NBOME and 2C-T-7).<sup>39,42</sup>

## Market change.

People who use drugs tend to have a high level of trust in their drug dealers, but less so when drugs are sourced opportunistically from an unfamiliar source such as at music festivals.<sup>43</sup> Festival drug dealers in a UK study were found to be twice as likely to mis-sell products as neighbourhood dealers.<sup>2</sup>

A survey of twenty people who use drugs in Vancouver, Canada indicated that people would provide knowledge to drug dealers about drug contents if they were to use a drug checking service.<sup>43</sup> Drug checking can act as quality control on the illicit market, with drug manufacturers and dealers less likely to distribute highly dangerous substances when clients are able to check their drugs.<sup>27</sup> Survey reports of people who access drug checking suggest that inconsistent or contaminated drugs means that people will find a new dealer.<sup>20,33</sup> In countries where drug checking is well-established, tested samples more closely follow anticipated composition trends, as compared to countries not employing drug checking.<sup>23</sup>

While the DIMS system has not been directly linked to prevention of drug-related deaths, monitoring systems have shown decreases in detected batches of harmful drugs from local supplies following alerts.<sup>44</sup> Early reviews of DIMS found that after each campaign,



compounds people were warned against were no longer found in samples brought in for testing.<sup>28</sup> Some dangerous substances which were used to adulterate MDMA have disappeared from the market in Europe following the introduction of drug checking.<sup>19</sup> Although further research is required, this is potentially the result of increased consumer pressure for drug profiles to match expectations.<sup>45</sup>

## Overdose.

Although research is limited, there is some evidence that drug checking can play a role in preventing drug-related hospitalisations and deaths.<sup>11, 31, 46</sup>

Deaths and hospitalisations as a result of illicit drugs such as MDMA are relatively rare in Australia, and are heavily dependent on changes in illicit drug markets, weather and patterns of consumption.

Nevertheless, comparisons between festivals providing drug checking facilities and those without indicate a role in reducing hospitalisations.

A recent evaluation of onsite drug checking facilities at a festival in the UK found a 95% reduction in drug-related transports to hospital compared with the previous year.<sup>2</sup>

## Brief intervention.

Under a direct-to-consumer model of drug checking, there is a captive audience of people who use drugs in order to deliver harm reduction information.

Both onsite or offsite testing facilities also provide people who use drugs with an opportunity to gain accurate harm reduction information as well as brief counselling or referral to treatment services if required.<sup>45, 47</sup>

Reports from Energy Control, Know Your Stuff and The Loop show that a great majority of drug checking users have never been in touch with drug services before so these services are able to access a new and 'hidden' user group from a service perspective.<sup>45</sup>





## Other areas of festival safety.

Drug checking services are not a panacea and should exist alongside a number of other harm reduction interventions at music festivals. Some of the harm reduction interventions identified in a recent set of guidelines released by the NSW government include:<sup>48</sup>

- Effective site and crowd management including planning for emergency vehicle access, providing appropriate sanitation and allowing for smoke-free areas
  - Providing harm reduction information and education on-site
  - Peer-based drug and alcohol reduction programs
  - Quality on-site medical service provision
  - Providing free, cool water to patrons
- Responsible service of alcohol and food safety
  - Providing shade, cooling measures and sun safety
  - Providing 'chill out' spaces
  - Preventing noise related harms

Drug-checking facilities exist as one feature of a number of interventions designed to reduce drug related harms at music festivals.

## Future evaluation and research.

Existing research and evaluations of drug checking services indicate support for drug checking as a harm reduction intervention, but have notable limitations. Generally, evaluations have focused on operational outputs (such as number of drugs tested; number of brief interventions delivered; contaminants



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and purity levels found) rather than outcomes (such as changes in intended behaviour, actual behaviour, overdose rates, and market behaviour) or process measures (such as operations, acceptability).

An evaluation framework was developed by researchers Australian National University to the latest drug checking pilot at Groovin' The Moo festival in Canberra.<sup>49</sup> The evaluation framework uses participant surveys (pre, post and two months follow up from service use), observational data and administrative data such as policing and health services data. Key research questions intended to be answered by the evaluation are:

1. How successfully was the program implemented, given its specific context?
2. To what extent was the program received positively by participants and by other key stakeholders?
3. To what extent did the program result in participants' attitudinal and/or behavioural change related to illicit drug use?
4. To what extent did the program produce valuable information about illicit drug availability in Canberra, and how did the authorities use that information?
5. Did the program have any unintended consequences, either positive or negative? If so, what were they?

6. Should the program continue and, if so, what changes in the program and its contexts are desirable?

Whilst this evaluation framework provides some insight into the effectiveness of drug checking facilities at music festivals, what is required is a number of pilot programs to occur across different festivals, different jurisdictions and different countries to provide robust comparative data. Given the nature of festival environments, randomised controlled trials are not a viable method to evaluate drug checking as an intervention.

Drug checking facilities are analogous to other harm reduction interventions such as safe injecting facilities and needle syringe programs. The evidence-base for safe injecting facilities was developed through the allowance of pilot programs to allow comparisons across jurisdictions and to monitor local effects. Through this process of comparison, safe injecting facilities were found to:

- Reduce drug-related deaths due to overdose at a local level<sup>50, 51</sup>
- Reduce emergency call-outs in areas of concern<sup>52</sup>
- Decrease visible public injecting and needle litter<sup>53, 54</sup>
- Increase referrals to drug treatment centres<sup>53, 55</sup>
- Effectively engage marginalised target populations of substance



- users, including homeless and co-morbid clients<sup>56, 57</sup>
- Improve both hygiene and safer use behaviours amongst clients<sup>58, 59</sup>
- Reduce needle sharing and other injecting risk behaviour<sup>60, 61</sup>

Similarly, drug-checking facilities should be evaluated to measure outcomes of:

- Drug disposals, both intended and verified

- Localised drug-related morbidity and mortality, such as first aid attendance and hospitalisations at festivals
- Effective engagement with target populations

Drug checking services could be used to also estimate the prevalence of drug use at festivals, similar that conducted by the Loop UK.<sup>62</sup>



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