



# HSE Emerging Drug Trend Monitoring

## Year 2 Results from The Syringe Analysis Programme 2022

*The identification of injecting trends in the  
Dublin and Midland Region through the  
application of syringe analysis methodology*

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# Main Findings

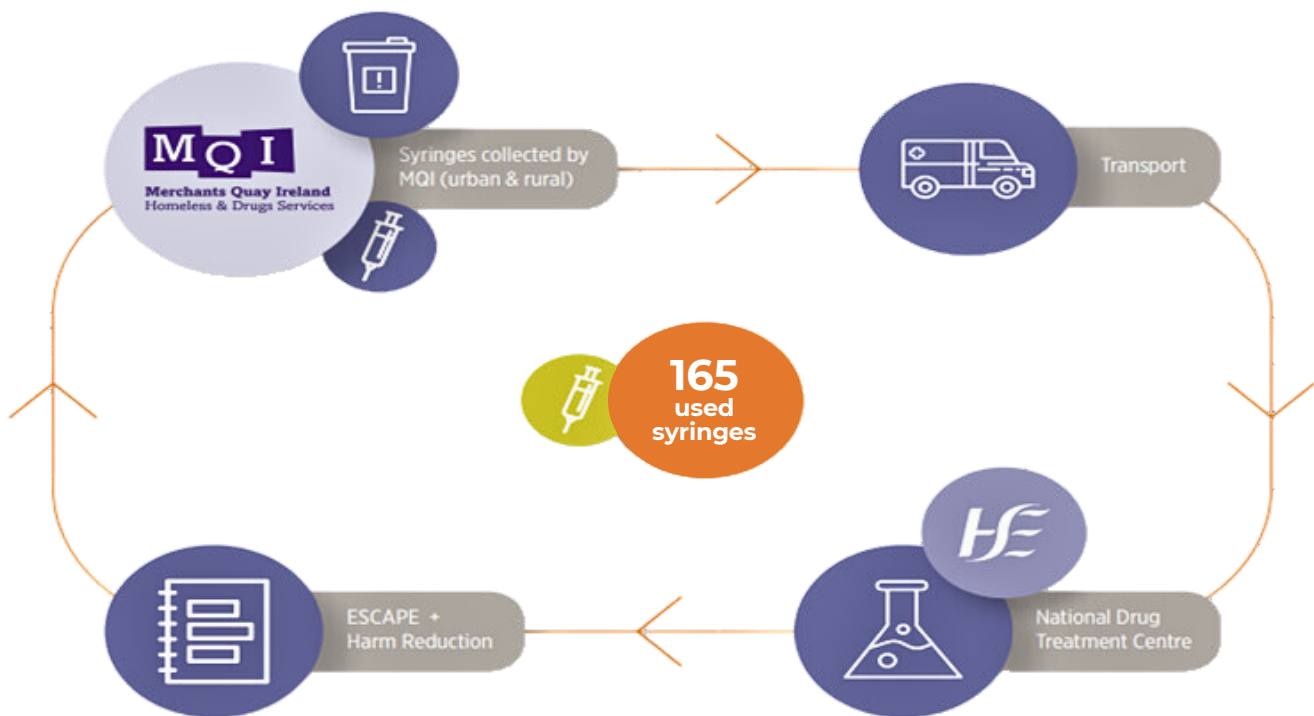
- **165 used syringes were collected from Merchants Quay Ireland in the Dublin (100 syringes) and Midlands Regions of Offaly, Longford and Laois (65 syringes)** which were submitted to the HSE National Drug Treatment Centre for analysis through September – October 2022
- **Analysis performed by LC-MS** (Liquid Chromatography-Mass Spectrometry) for 235 different types of drugs and metabolites to identify both the contents of the syringes and the contents of the blood within the syringes
- **Seven different drug classes/categories were detected in total** contained within the syringes which were amphetamines, benzodiazepines, cocaine, opioids, cathinones, ketamine and other medicines
- **26 different substances and metabolites were detected in syringes** (note, metabolites are not named in this report)
- **A number of syringes contained a number of drugs and metabolites with as many as 15 detected in one single syringe**
- **Concern on representation of the drug market.** As there were repeat donations of syringes by a limited pool of individuals in some collection centres in 2022, there are concerns of how representative the results are of drug market trends. The 2023 study will attempt to source syringes from a more diverse range of drug users
- **Heroin remained the most common drug in syringes.** Similar to the 2021 findings, heroin was the most common drug found within syringes (90.0% Dublin and 78.5% Midlands)
- **Cocaine continues to be the second most common drug found in syringes.** Cocaine was the second most common drug within syringes (71.0% Dublin and 50.8% Midlands), however there was a reduction in the presence of cocaine in Dublin and Midlands syringes when compared with 2021 findings (86.5% Dublin and 89.1% Midlands)
- **There has been a reduction in some drugs detected.** A number of substances identified in the 2021 collection were not present in the 2022 review such as methamphetamine and oxycodone
- **There was a decrease in the presence of pregabalin in Dublin** (24.7% in 2021 to 3.0% in 2022) and a decrease in the Midlands (34.5% in 2021 to 15.4% in 2022)
- **There was a decrease in the presence of methadone detected in the syringes.** Findings decreased in Dublin (61.8% in 2021 to 33.0% in 2022) and in the Midlands Region (50.9% in 2021 to 16.9% in 2022). It is important to note that the presence of methadone is most likely due to the presence of blood in the syringes as opposed to a trend of injecting methadone
- **An increase in flurazepam in the Midlands Region.** There was an increase in the detection of the benzodiazepine flurazepam in the Midlands Region (12.7% in 2021 to 20% in 2022) which had been documented as a local injecting trend in the 2021 results
- **Trends detected from blood in samples.** There was an increase in the presence of MDMA in the Dublin Region (1.1% in 2021 to 7.0% in 2022) which is likely linked with the substance presence in blood contained within the syringes and not from injecting practices
- **The most common ‘cutting agents’** remained similar across the two years of the study which were caffeine (84.2%) and paracetamol (81.2%). The percentage of these adulterants identified in substances was similar to the 2021 results (caffeine 83.3% and paracetamol 88.2%)

# About the Project

In the second phase of the Syringe Analysis Programme, the HSE in partnership with Merchants Quay Ireland collected 165 used syringes from the Dublin and Midland regions during September and October 2022. The residual drugs were extracted from these syringes and the data used to compare drug trends from the two regions. The Syringe Analysis Programme is the first of its kind in Ireland, whereby community services and a laboratory collaborate to conduct analysis. This enables the HSE to identify temporal and geographical trends annually as part of their emerging drug trend monitoring.

The sample collection is reviewed by the HSE National Drug Treatment Centre Laboratory; the results were then reviewed by the HSE National Clinical Lead for Addiction Services for signs of concern and then submitted to the European Syringe Collection and Analysis Enterprise (ESCAPE) Network.

The ESCAPE Network coordinate a yearly collection campaign of used syringes in a sentinel network of European cities, using a common methodology in order to obtain representative and comparable data on injecting drug use. It is intended that this approach will provide timely, city-level data that can complement other information and help identify possible emerging health threats throughout Europe (EMCDDA, 2021; Brunt et al., 2021).



# Analytical Process

Syringe analysis is a scientific approach that involves obtaining information through the analyses of the content of used syringes. In Ireland, this programme is led by the HSE National Drug Treatment Centre Laboratory. The results are reviewed by the HSE annually at the time of collection and upon analysis to inform the direction of emerging drug trend work.

In brief and taking care to avoid needle stick injury, syringes were flushed with 1ml of methanol which was pumped 5 times to extract the drugs in the syringe. The extract was filtered and then transferred to clean sealed vials. Sample extracts were frozen until analysis could be carried out. Macroscopic and microscopic observations including the syringe type and condition were recorded (blood, wear marks, broken/no needle, difficulty rinsing etc.).

Analysis of 235 drugs and metabolites was performed by LC-MS (Liquid Chromatography-Mass Spectrometry). These analyses spanned a wide range of substances including opiates (including new synthetic opioids), benzodiazepines, amphetamines, cocaine, new psychoactive substances (NPS), Z-Drugs, gabapentinoids, ketamine and various cutting agents.

## Syringe and needle characteristics

### Macroscopic Observations:

The following Macroscopic Observations were recorded:

1. Syringe/Needle type
2. Visible traces of blood in syringe (necessary to record as if there is blood present the contents of the syringe as well as the contents of the blood are both analysed)
3. Wear marks (this may indicate if the syringes have been used previously)
4. Distinctive signs

A review was then conducted on the common types of syringes and needles obtained. A breakdown of syringe and needle types found in each location are shown in Figures 1-4.

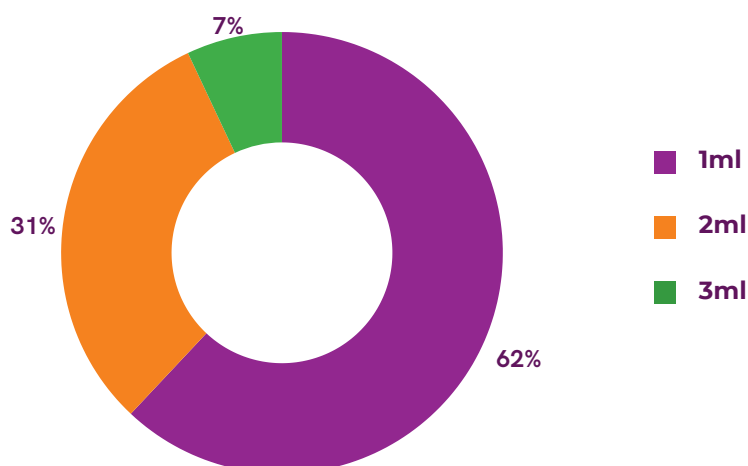


Figure 1: Dublin syringe types

Figure 2: Dublin needle types

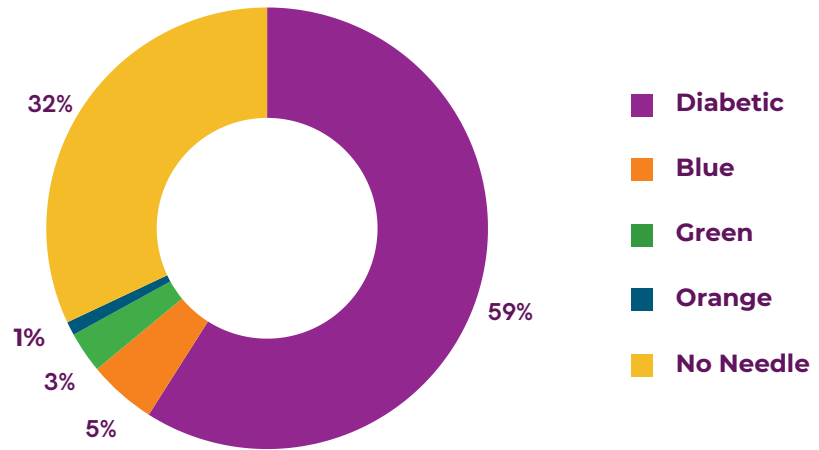


Figure 3: Midlands syringe types

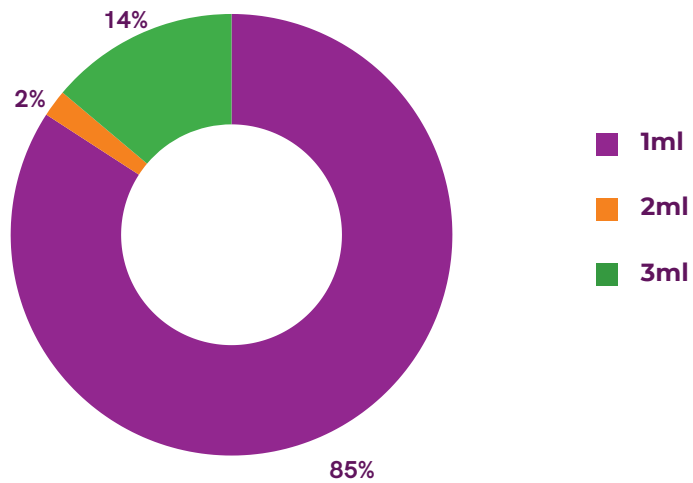
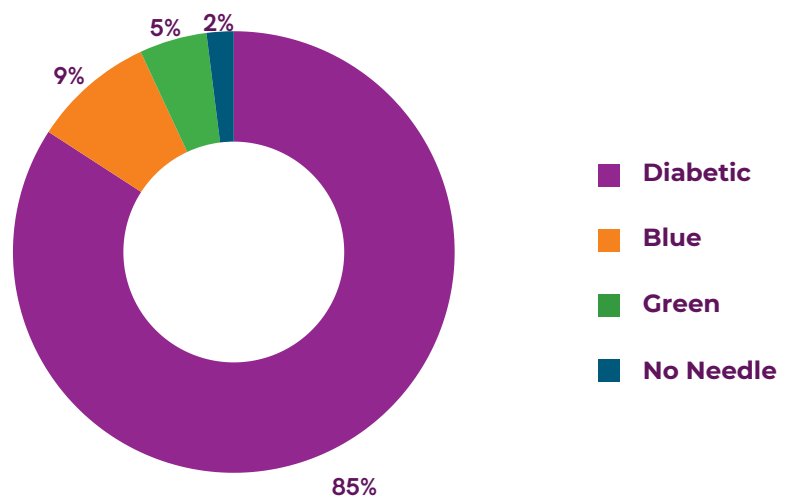


Figure 4: Midlands needle types



Green, blue, orange, brown and diabetic needles were recorded in this study along with a variety of syringe sizes. From a harm reduction perspective, the diabetic needles have the advantage of causing less damage to veins as they are very narrow bore. The majority of syringes in both the Dublin and Midlands samples were diabetic syringes.

# Drug Analysis Results

Substances were identified as being contained within the syringes by the presence of the parent drug or the metabolite compound. Overall, traces of 7 different drug classes/categories were detected in the syringes analysed in the study from both the Dublin and Midlands Regions. Drugs detected include amphetamines, benzodiazepines, cocaine, opioids, cathinones, ketamine well as other medicines specified in Table 1. In total, 26 different substances and metabolites were detected in syringes with as many as 15 drugs, metabolites and adulterants present in a single syringe. Metabolites are not named in this report.

**Table 1:** Substances found in the Dublin (100 syringes) and Midlands Regions (65 syringes), excluding substances considered as adulterants or 'cutting agents'.

Drug	Dublin	Midlands
<b>Cathinones</b>		
<b>3-MMC</b>	<b>1.0%</b>	<b>0.0%</b>
<b>Amphetamines</b>		
<b>Amphetamine</b>	<b>2.0%</b>	<b>1.5%</b>
<b>MDMA</b>	<b>7.0%</b>	<b>3.1%</b>
<b>Benzodiazepines</b>		
<b>Flurazepam</b>	<b>2.0%</b>	<b>20.0%</b>
<b>Diazepam</b>	<b>1.0%</b>	<b>0.0%</b>
<b>Alprazolam</b>	<b>1.0%</b>	<b>0.0%</b>
<b>Cocaine</b>		
<b>Cocaine</b>	<b>71.0%</b>	<b>50.8%</b>
<b>Opioids</b>		
<b>Heroin</b>	<b>90.0%</b>	<b>78.5%</b>
<b>Methadone</b>	<b>33.0%</b>	<b>16.9%</b>
<b>Other medicines</b>		
<b>Zopiclone</b>	<b>0.0%</b>	<b>7.7%</b>
<b>Pregablin</b>	<b>3.0%</b>	<b>15.4%</b>
<b>Ketamine</b>		
<b>Ketamine</b>	<b>3.0%</b>	<b>0.0%</b>

On interpretation of these results, it is important to note that substances detected in these syringe samples may be present from

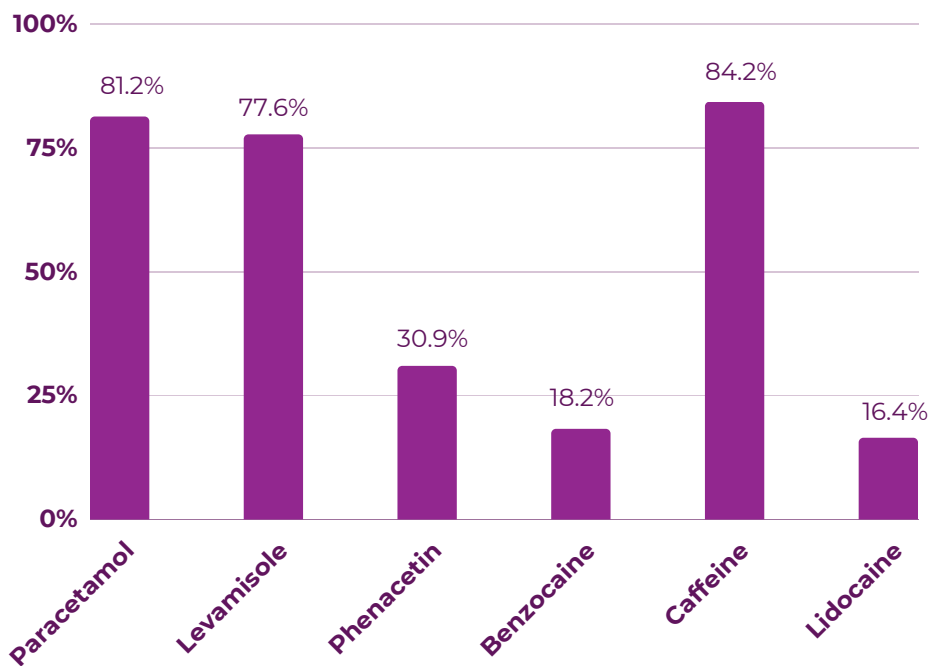
- a) the drug being present in the syringe for the purpose of injection of the drug
- or
- b) from traces extracted from blood in the syringe indicating that the user had consumed the substance being detected through other administration routes (oral, snorting, smoking etc)

The amount of blood contained in a syringe can vary and could be based on culturally mediated practices such as 'booting' 'flushing', or 'back loading' where a person draws more blood into the syringe and flushes it back into the vein. This occurs after the drugs are injected and not before to check if they have accessed a vein which is known as 'registering' (McElrath, 2006).

## Adulterants

Adulterants are commonly used to cut the primary drug controlled drug (EMCDDA, 2021a) or are used to augment the effects. As shown in Figure 5, adulterants were present in many of the syringes from both the Dublin and Midlands Region and included caffeine, levamisole, paracetamol, phenacetin, lidocaine and benzocaine.

**Figure 5 Adulterants found in all syringes (N=165)**





## Comparison of Results 2021-2022

Heroin and cocaine were the most common drugs identified over the two year duration of this project. However, there were a number of limitations to the 2022 study which should be considered when interpreting the data.

While applying the same methodology with the same services in the Dublin and Midlands Regions for both years, there was difficulty in obtaining diverse and representative syringe samples for the 2022 programme. This was as a result of new deposit points in hostel accommodation where people discard of their equipment and also as a result of drug market shifts with increases in crack cocaine smoking among service users. Based on these changes, there are some early indications of a reduction in injecting practices by some individuals.

Feedback from participating centres in the 2022 study indicated that there was a reduced number of people who inject drugs participating by comparison to 2021. As a result, the 2022 results are based on fewer number of people who inject drugs and may not accurately reflect the drug trends among the wider community. An overview of trends identified in syringes from the same areas during the 2021 and 2022 studies are shown in Table 2 and Table 3.

**Table 2:** Dublin syringe analysis comparison 2021 - 2022

Drug	2021	2022
<b>Cathinones</b>		
3-MMC	11.3%	1.0%
<b>Amphetamines</b>		
Methamphetamine	32.6%	0.0%
Amphetamine	9.0%	2.0%
MDMA	1.1%	7.0%
<b>Benzodiazepines</b>		
Flurazepam	0.0%	2.2%
Diazepam	2.2%	1.0%
Alprazolam	1.1%	1.0%
<b>Cocaine</b>		
Cocaine	86.5%	71.0%
<b>Opioids</b>		
Heroin	93.3%	90.0%
Oxycodone	7.8%	0.0%
<b>Methadone</b>		
Methadone	61.8%	33.0%
<b>Other medicines</b>		
Zopiclone	4.5%	0.0%
Dextromethorphan	0.0%	0.0%
Pregablin	24.7%	3.0%
<b>Piperidines and Pyrrolidines</b>		
Methylphenidate	1.1%	0.0%
<b>Ketamine</b>		
Ketamine	7.0%	3.0%

**Table 3:** Midlands Region syringe analysis comparison 2021 – 2022

Drug	2021	2022
<b>Cathinones</b>		
<b>3-MMC</b>	<b>23.6%</b>	<b>0.0%</b>
<b>Amphetamines</b>		
<b>Methamphetamine</b>	<b>18.2%</b>	<b>0.0%</b>
<b>Amphetamine</b>	<b>1.8%</b>	<b>1.5%</b>
<b>MDMA</b>	<b>0.0%</b>	<b>3.1%</b>
<b>Benzodiazepines</b>		
<b>Flurazepam</b>	<b>12.7%</b>	<b>20.0%</b>
<b>Diazepam</b>	<b>3.6%</b>	<b>0.0%</b>
<b>Alprazolam</b>	<b>0.0%</b>	<b>0.0%</b>
<b>Cocaine</b>		
<b>Cocaine</b>	<b>89.1%</b>	<b>50.8%</b>
<b>Opioids</b>		
<b>Heroin</b>	<b>98.2%</b>	<b>78.5%</b>
<b>Methadone</b>		
<b>Methadone</b>	<b>50.9%</b>	<b>16.9%</b>
<b>Other medicines</b>		
<b>Zopiclone</b>	<b>9.0%</b>	<b>7.7%</b>
<b>Dextromethorphan</b>	<b>3.6%</b>	<b>0.0%</b>
<b>Pregablin</b>	<b>34.5%</b>	<b>15.4%</b>

Overall, there were reductions observed in a number of the drugs, notably there were significant reductions in the presence of cathinones (11.3% to 1% in Dublin and 23.6% to 0% in Midlands), methamphetamine (32.6% to 0% in Dublin and 18.2% to 0% in Midlands) and Pregabalin (24.7% to 3% in Dublin and 34.5% to 15.4% in Midlands). The only documented increases since the 2021 study were the presence of MDMA in Dublin and the injecting of Flurazepam in the Midlands Regions.

There was less variety in the types of drugs identified in the 2022 study compared with 2021 (12/16). This could be as a result of shifts in injecting practices or that the sample obtained did not capture a diverse enough user population.

Throughout the two year duration of the project in Ireland, it is noteworthy that novel synthetic opioids have not been detected in samples and this area continues to be monitored. As part of the 2022 broader European ESCAPE collection, Carfentanil was commonly found in syringes from Vilnius (92%) and Riga (29%). Another potent synthetic opioid, isotonitazene, was detected in 10% and 26% of syringes from Tallinn and Riga respectively. Xylazine, a potent veterinary tranquilliser, was detected in 13 % of syringes from Riga, where it was found in conjunction with isotonitazene, metonitazene or carfentanil (EMCDDA, 2023).

## Adulterants

Trends in the presences of adulterants remain similar between the two years with a comparison of the results shown in Table 4 below. These are all common adulterants with no unusual findings seen.

**Table 4:** Adulterant comparison 2021 - 2022

<b>Adulterant</b>	<b>2021</b>	<b>2022</b>
<b>Paracetamol</b>	<b>88.2%</b>	<b>81.2%</b>
<b>Levamisole</b>	<b>53.5%</b>	<b>77.6%</b>
<b>Phenacetin</b>	<b>21.5%</b>	<b>30.9%</b>
<b>Benzocaine</b>	<b>22.2%</b>	<b>18.2%</b>
<b>Caffeine</b>	<b>83.3%</b>	<b>84.2%</b>
<b>Lidocaine</b>	<b>5.6%</b>	<b>16.4%</b>

# Discussion

## Difficulties in obtaining syringes and sample bias

It is agreed by all partners that improvements are needed for the 2023 programme in order to capture a more diverse user profile across different regions of the country. Larger volumes of syringes will help overcome possible bias in the data with a greater pool of syringes to be available for selection.

The main aim of reporting to the ESCAPE network is to obtain yearly samples that provide a representative overview of the local drug market in nominated geographical locations across Europe. To do this, it must be ensured that a number of samples do not emerge from one individual or one specific user group as this may not provide an accurate representation of wider drug market trends. In an attempt to engage with new user groups, new services in Tallaght will take part in the 2023 collection process so syringes are obtained within and outside of Dublin City Centre.

However, it should be acknowledged that there may be additional barriers to obtaining samples in Ireland as a result of the current trend of the emergence of crack cocaine smoking among the user cohort that is currently injecting. This area requires on-going review by needle exchange services and greater efforts are also required by exchange services to ensure injecting equipment is returned through the provision of sharps bins and direct engagement with the individual users of the service.

## Flurazepam trends in the Midlands Region

Injecting Flurazepam has remained as a small but sustained trend in the Midlands Regions across the two years of this study. This trend was first identified in 2021 for the Midlands area only (Mc Namara et al., 2022) with the second sample collection confirming that there has been a slight increase (7.3%) in the presence of the injection of this drug in that area, while it has not presented in Dublin samples across the two years. The results won't identify which clients are engaging in this practice or in which area of the Midlands the samples were obtained, therefore this trend requires on-going monitoring by service providers at a local level. Once the area of use is identified, tailored harm reduction provision is required due to the additional health risks associated with injecting tablets.

## Reduction in the presence of stimulants cocaine, 3-MMC and methamphetamine

The 2022 data shows a reduction in the presence of cocaine injecting which is not representative of regional and national drug trends being reported. In some areas of the country, the HSE is aware of crack cocaine injecting that is leading to new healthcare challenges which requires further monitoring nationally.

Both 3-MMC and methamphetamine were documented as new and emerging trends in the 2021 sample review (Mc Namara et al., 2022) with significant reductions recorded in the 2022 study. When interpreting these results, it should be acknowledged that there may be sample bias and therefore these findings are not a representative reflection of all drug user groups or Irish market trends. It is known from service providers that other user groups such as men who have sex with men engage in the injection of stimulants like methamphetamine and this trend may not be captured in the 2022 study. It is also known that cathinones such as 3-MMC and 3-CMC may be emerging in different geographical regions and among other user groups. Through the HSE Safer Nightlife Programme the synthetic cathinone 3-CMC was detected for the first time in Ireland in the form of crystals discarded in a surrender bin located in a medical area linked with an adverse health related presentation (Killeen et al., 2022). In addition, 3-CMC was identified by the HSE at Life Festival in May 2023 being sold as 'blow' cocaine linked to the South East of Ireland drug market as well as at Electric Picnic Festival sold as

cocaine. These findings show that synthetic cathinones may be still available across different Irish drug markets but these trends are not being fully captured due to gaps in analytical drug monitoring and limitations of the syringe sample collection.

## Recommendations for 2023

### **Expand project to access greater representation of the Irish drug market**

The project will be expanded in 2023 to help gain greater market insights. The HSE will now partner with a number of services in Tallaght and Clondalkin to capture trends within Dublin which are outside of the City Centre.

### **Conduct surveys with staff on drug trends at the time of sample collection**

While accessing data directly from people who use services can be difficult, surveys could be completed by staff at the time of sample collection to obtain information on drug trends and presentations they are observing

### **Further review needed to observe possible shifts in administration practices**

Further discussion among national needle exchange services is required to monitor injecting trends that may be changing due to the current prevalence of crack cocaine smoking among this user community.

### **Stimulant injecting training**

Despite overall reductions in the presence of stimulants in the 2022 findings, there are reports from services of increases in stimulant injecting in different parts of the country. Investment may be needed to ensure all staff are trained in delivering safer injecting interventions for stimulant user groups.

### **Increase analytical drug monitoring activities**

Greater monitoring of the different drug markets is required to provide a more accurate representation of emerging drug trends.

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