

Combined Surveillance and Monitoring of Seized Substances (CoSMoSS), music festival pilot

BRIEF REPORT



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1. Project overview

The Combined Surveillance and Monitoring of Seized Samples (CoSMoSS) is a joint project involving the NSW Police Force, NSW Ministry of Health (MoH) and NSW Health Pathology Forensic and Analytical Science Service (FASS). The project commenced in October 2019, as part of the NSW response to addressing harms associated with illicit drugs.

The CoSMoSS project involves expanded routine analysis and reporting on a sample of street level drugs seized by NSW Police.

The purpose of the CoSMoSS project is to:

- monitor for changes in the composition of street level drugs including MDMA, heroin, cocaine and methamphetamine;
- identify high-risk / adulterated substances in community circulation;
- inform the public of key findings; and
- provide the public with relevant harm reduction advice.

The CoSMoSS music festival pilot has focused on MDMA seized from music festivals in NSW. This project complements existing clinical and toxicological surveillance work performed by FASS' Illicit Drugs Analysis Unit (IDAU) under the Drug Misuse and Trafficking Regulation 2011ⁱ; as well as other collaborations with FASS, the NSW Poisons Information Centre and the NSW Ministry of Health.



Produced by **NSW Police Force** in collaboration with **NSW Health** (Centre for Alcohol and Other Drugs and NSW Health Pathology Forensic and Analytical Science Service).

2. Methods

Nineteen music festivals occurring in the five-month period between 5 October 2019 and 7 March 2020 were included in the CoSMoSS music festival pilot. These festivals were all assessed by NSW Health as having a likelihood of drug-related harm as per the *Guidelines for Music Festival Event Organisers: Music Festival Harm Reduction* (December 2019)ⁱⁱ.

At each of these music festivals, NSW Police were present and seized drugs as per their usual standard operating procedures at music festivals. The CoSMoSS music festival pilot involved selecting a sample of the drugs seized at these festivals (which were suspected by NSW Police officers to be MDMA) and submitting these for testing at FASS' Illicit Drugs Analysis Unit (FASS IDAU).

A sampling strategy was developed to ensure that enough substancesⁱⁱⁱ were tested to result in useable estimates of purity and adulterant proportions. Police Standard Operating Procedures (SOPs) were developed by the Drug and Alcohol Coordination / Drug and Firearms Squad to guide Exhibits Officers at local police stations in identifying substances suitable for inclusion in the CoSMoSS project. Substances with an estimated net weight greater than 200mg were prioritised for inclusion in the CoSMoSS music festival pilot, as this increased the likelihood that purity of the substance could be determined. When there was an insufficient number of substances of adequate weight, substances weighing less than 200mg were included to meet the minimum sample number required.

After suitable substances were identified by the Exhibits Officer, they were then transported to NSW Police Forensic Evidence and Technical Services (FETS) at the first available opportunity. FETS staff measured the physical length of the capsules/tablets/drug-bags, took photos, and then delivered the substances to FASS IDAU at the first available opportunity. Analysis by FASS IDAU included exhibit description, weight determination, presumptive testing, preparation/chemical extraction for drug and diluent screening, GCMS or LCMS (qualitative analysis), preparation/chemical extraction for purity analysis, UPLC (quantitative analysis), interpretation and report preparation, photography if required and technical review. Substances were then stored and destroyed consistent with standard operating procedures.

Results from the testing conducted by FASS IDAU, were circulated to the CoSMoSS project committee for review and action. For each substance, FASS IDAU reported the container type, contents, main drug identified, purity, average dose, average weight and any identified adulterants.

3. Results

3.1 Type and count of substances analysed

- There were 302 substances analysed by FASS IDAU with MDMA identified as the primary drug in 287 of these (95%).
- Of the 287 substances found to contain MDMA, 239 were capsules (83%), 22 were tablets (8%), and the remaining 26 substances (9%) included bags, balloons and paper packages.
- There were 15 substances that did not contain MDMA. These substances were found to contain no drug, MDA (1 x capsule, and 1 x tablet), cocaine (4 x bags, containing powder), isobutyl nitrite (5 x glass bottle, containing liquid), or methylamphetamine (1 x bag), and sildenafil (1 x tablet).
- The number of suspected MDMA substances submitted for analysis from a single festival ranged from 7 to 19, average 14.
- Each substance submitted for analysis contained a variety of items. The number of items varied greatly: 1 to >1,000 tablets or capsules, and <50mg to >1,000 mg of loose contents in paper packaging or plastic bags.

3.2 MDMA purity

- MDMA purity data was available for 255 of the 287 substances found to contain MDMA as the primary drug (88%). MDMA purity for these 255 substances ranged between 8-81%, median 74% (95% confidence intervals 73.5-74.6%). There were 32 substances found to contain MDMA, which were of insufficient volume to enable MDMA purity analysis.
- The median MDMA purity was higher in capsules than tablets (74% vs. 33%), although there were relatively few MDMA tablets included in this analysis (22 tablets, 210 capsules).

Table 1. MDMA purity in substances seized from CoSMoSS music festival pilot events

	Median MDMA purity	Minimum MDMA purity	Maximum MDMA purity	Interquartile range (IQR)
Capsules (n=210)	74%	15%	81%	63-77%
Tablets (n=22)	33%	8%	52%	28-42%
Other forms^A (n=23)	74%	51%	79%	73-78%
All substances (n=255)	74%	8%	81%	58-77%

A. Included bags, balloons and paper packages containing powder and/or crystalline substances.

3.3 MDMA dose

- MDMA dose (weight x purity) was calculated for capsules and tablets, where purity data was available.
- The median MDMA dose was higher in tablets than capsules (116 mg vs 68 mg). This contrasts with the findings for purity. Again, there were relatively few MDMA tablets included in this analysis (n=22).

Table 2. MDMA dose in substances seized from CoSMoSS music festival pilot events, capsules and tablets only

	Median MDMA dose	Minimum MDMA dose	Maximum MDMA dose	Interquartile range (IQR)
Capsules (n=210)	68.3 mg	13.6 mg	145.7 mg	49.9-79.3 mg
Tablets (n=21)	115.5 mg	23.6 mg	201.0 mg	63.0-127.7 mg

There were 8 MDMA substances identified in the CoSMoSS music festival pilot that contained a dose of 130mg or more (detailed in Table 3). This represents 3% of the total number substances found to contain MDMA in the CoSMoSS music festival pilot. Of the 22 MDMA tablets analysed in the CoSMoSS music festival pilot, 5 (22%) were found to contain a dose of 130mg or more.

Figure 1 illustrates the difference in MDMA purity and MDMA dose between the sample of capsules and tablets analysed as part of the CoSMoSS music festival pilot.

Figure 1. Boxplots of MDMA dose and MDMA purity of tablets and capsules analysed in the CoSMoSS music festival pilot, 5 October 2019 to 7 March 2020^{iv}

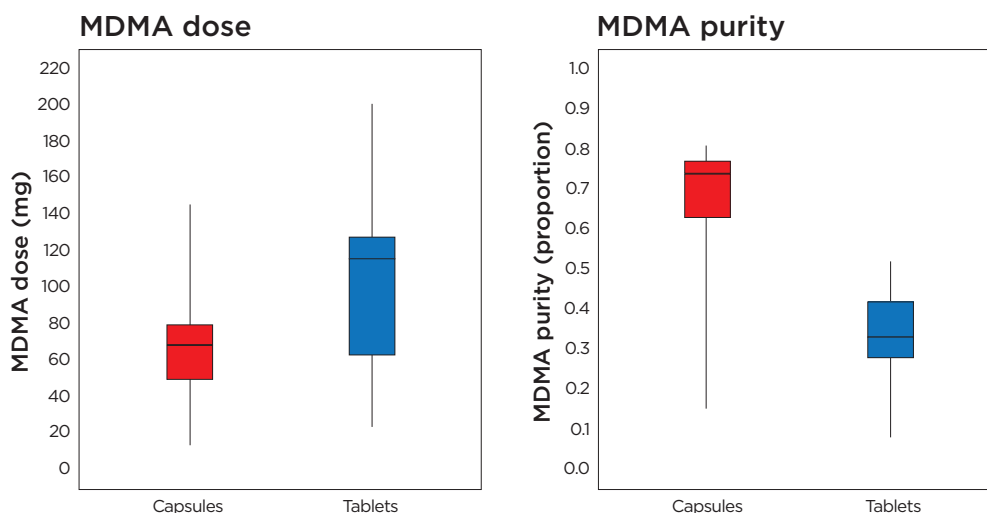



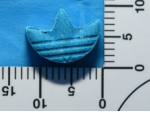

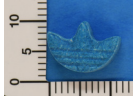




Table 3. List of individual samples analysed in the CoSMoSS music festival pilot and found to contain a high dose (>130mg) of MDMA

Description		MDMA dose (mg)	MDMA purity (%)
Pink tablets marked 'C P'		201.0	43%
'QDance' tablets, orange/white		191.3	43%
Clear capsules		145.7	78%
'Adidas' tablets, blue		145.0	49%
Clear capsules		142.5	70%
'Adidas' tablets, blue		134.0	51%
Green/white capsules		131.0	72%
'Tesla' tablets, blue		131.0	33%

3.4 Adulterants

In this context, 'adulterant' refers to any additional compound other than the main compound, and can include psychoactive substances and diluents. Adulterants were identified in less than 15% of the 287 substances containing MDMA as the primary substance (n=41). Seven (7) of the 287 substances that contained MDMA as the primary substance also contained adulterants that were psychoactive substances; these included ketamine (n=2), ketamine and cocaine (n=1), MDEA (n=1), N-Moc-MDMA and T-Boc-MDMA (n=1), and caffeine (n=2). None of the psychoactive adulterants identified were considered serious enough at the indicated low purities to warrant the issuing of public safety information. The only other adulterant detected, dimethyl sulfone (non-psychoactive) was not considered serious enough at the indicated purity to warrant the issuing of public safety information. None of the substances analysed and found not to contain MDMA were adulterated, or were likely to be a high risk to public health.

3.5 Limitations

The above findings arose from an analysis of MDMA detected by police at NSW music festivals and therefore may not be representative of all MDMA available in NSW.

4. Action taken in response to results

4.1 Consultation with clinical experts

The NSW Ministry of Health established an expert advisory panel (Standing Panel on Toxicity Risk, SPaTOR), to provide advice on findings from the CoSMoSS pilot and related projects as required, specifically related to substances with high dose and those with adulterants of concern. The panel includes representation from clinical toxicologists, addiction medicine specialists, community organisations and experts in public health. Over the course of the CoSMoSS music festival pilot, the panel advised on the public health response including issuing public drug warnings in specific situations, and assisted in developing suitable messaging.

4.2 Public drug warnings issued

Five public drug warnings (relating to 9 individual substances) were published on the NSW Health website as a direct result of the CoSMoSS music festival pilot. Each of these warnings was in relation to a high dose capsule or tablet, rather than an adulterant of concern. These public drug warnings highlighted high dose MDMA tablets and capsules of concern as well as the variability in dosage that is identified in MDMA circulating in NSW. The public drug warnings can be accessed at <https://www.health.nsw.gov.au/aod/public-drug-alerts/Pages/default.aspx>. The NSW Ministry of Health led the development of these public drug warnings, in collaboration with experts in clinical toxicology, addiction medicine, public health and community organisation representation. Approval for publication was sought from the NSW Chief Health Officer and the NSW Police Force prior to publication, and the office of the Minister for Health and Medical Research was also informed. The NSW Ministry of Health worked closely with associated community organisations, music festival organisers and health services to disseminate public drug warnings broadly.

5. Acknowledgements

The CoSMoSS project would not exist without the commitment of each of the agencies involved:

- NSW Police Force: Drug and Alcohol Coordination, Drug and Firearms Squad and Forensic Evidence & Technical Services (FETS)
- NSW Health Pathology: Forensic and Analytical Science Service (FASS) Illicit Drugs Analysis Unit (IDAU)
- NSW Ministry of Health: Centre for Alcohol and Other Drugs

The CoSMoSS committee would also like to acknowledge their respective Media and Communications units, festival staff and organisers, and NSW Police Officers working at music festivals.

- i Drug Misuse and Trafficking Regulation 2011 is available at <https://legislation.nsw.gov.au/#/view/regulation/2011/451/part3/div2>
- ii Guidelines for Music Festival Event Organisers: Music Festival Harm Reduction (December 2019) are available at <https://www.health.nsw.gov.au/aod/Publications/music-festival-guidelines.PDF>
- iii Substances is defined for the purpose of this report as 'what appeared by eye to police, to be a unique batch of tablets, capsules, powder, crystal or liquid that was possessed by a single person'. If a single person possessed three pink capsules believed by police to be MDMA and a bag of white powder believe by police to be cocaine, this would be referred to as two separate substances. If police searched two people found to be in possession of what appeared to be the same green and white capsules, this was referred to as two substances.
- iv Boxplots are a standard method used to display the distribution of data points based on a five key number summary: maximum (indicated by the upper end of the thin black line), third quartile (indicated by the upper edge of the coloured box), median (indicated by the thick black line through the coloured box), first quartile (indicated by the lower edge of the coloured box) and minimum (indicated by the lower end of the thin black line).

