DEA TOX

DRUG ENFORCEMENT ADMINISTRATION

TOXICOLOGY TESTING PROGRAM

QUARTERLY REPORT

1st Quarter – 2022

U.S. Department of Justice
Drug Enforcement Administration
Diversion Control Division
Drug and Chemical Evaluation Section

Contents

Introduction

The Drug Enforcement Administration's Toxicology Testing Program (DEA TOX) began in May 2019 as a surveillance program aimed at detecting new psychoactive substances within the United States. In response to the ongoing synthetic drug epidemic, the Drug Enforcement Administration (DEA) awarded a contract with the University of California at San Francisco (UCSF) to analyze biological samples generated from overdose victims of synthetic drugs.

In many cases, it can be difficult to ascertain the specific substance responsible for the overdose. The goal of DEA TOX is to connect symptom causation to the abuse of newly emerging synthetic drugs (e.g. synthetic cannabinoids, synthetic cathinones, synthetic opioids, other hallucinogens, etc.).

DEA has reached out to local health departments, law enforcement partners, poison centers, drug court laboratories, hospitals, and other medical facilities to offer testing of leftover or previously collected samples for analysis of synthetic drugs. DEA TOX is interested in patients thought to have ingested a synthetic drug, where the traditional drug screen has produced little or no viable options to explain the symptoms exhibited by the patient (alcohol and THC are exempted). DEA TOX may approve leftover unused biological samples (or biological samples) or occasionally non-biological samples for testing from a medical facility or law enforcement partner only.

Once DEA TOX is contacted (**DEATOX@DEA.GOV**) and upon approval by DEA of the request for testing of specific samples, the originating laboratory is invited to send their samples to the Clinical Toxicology and Environmental Biomonitoring (CTEB) Laboratory at UCSF. DEA covers the full cost of analysis for each sample approved for testing. Using liquid chromatography quadrupole time-of-flight mass spectrometry, synthetic drugs identified within the samples are confirmed and quantified. Levels denoted in the tables below with a defined range represent the low and high concentrations reported when the frequency of detection is greater than one. The CTEB laboratory currently maintains a comprehensive drug library consisting of the following:

912 new psychoactive substances (**NPS**);
161 traditional illicit drugs (**TID**);
93 prescription or over-the-counter (**OTC**) drugs;
15 dietary supplement stimulants (**DSS**); and
Multiple precursor chemicals, additives or impurities (**P/A/I**)

This publication presents the results of cases analyzed and completed by the CTEB laboratory from January 1, 2022 through March 31, 2022.

Summary

Between January 1, 2022 through March 31, 2022, 104 biological samples and 1 drug product from 98 cases originating from 13 states namely, Alabama (19), Colorado (1), Iowa (1), Kansas (1), Kentucky (38), Nebraska (4), New York (4), North Carolina (1), Oregon (5), Pennsylvania (1), Tennessee (21), Texas (1), and Washington (1) were submitted to DEA TOX. These samples were analyzed for NPS, TID, prescription or OTC drugs, DSS, and P/A/I. The biological samples submitted consisted of 8 serum, 6 plasma, 32 whole blood, and 58 urine samples. The paraphernalia is further described on page 13.

DEA TOX identified and confirmed a total of 580 drugs and metabolites that consisted of 65 NPS detections, 216 TID detections, 278 prescription or OTC drug detections, and 20 P/A/I detections during this reporting period (Fig. 1A)[1]. While some drugs identified could be placed in more than one category, for purposes of this report and for consistency, DEA TOX placed such substances in a single category only. Many prescription drugs that are commonly abused and encountered are listed as TID. Substances that are not approved by the Food and Drug Administration for medical use within the U.S. are considered NPS.

A breakdown of the 580 total drug and metabolite confirmations demonstrated 88 different drugs, which consisted of 15 NPS, 14 TID, 55 prescription and OTC drugs, and 4 P/A/I (Fig. 1B)[1].

Fig. 1A Detection frequency

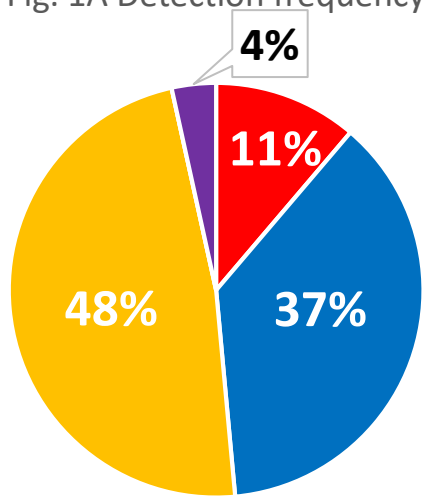
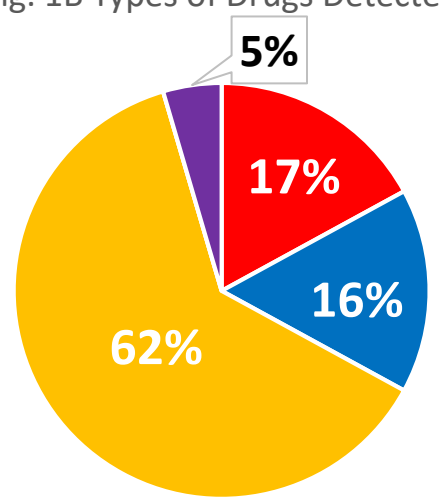


Fig. 1B Types of Drugs Detected



[1] No dietary supplement stimulants (DSS) were detected in the 1st quarter of 2022.

New Psychoactive Substances

DEA TOX confirmed 65 detections comprising of 15 NPS[§] (Table 1) from five different classes of drugs (Figure 2A) in the first quarter of 2022. Three of these detections are further demonstrated in Table 5. The total encounters for each NPS class are summarized in Figure 2B.

Figure 2A. Number of Substances Identified for Each NPS Class

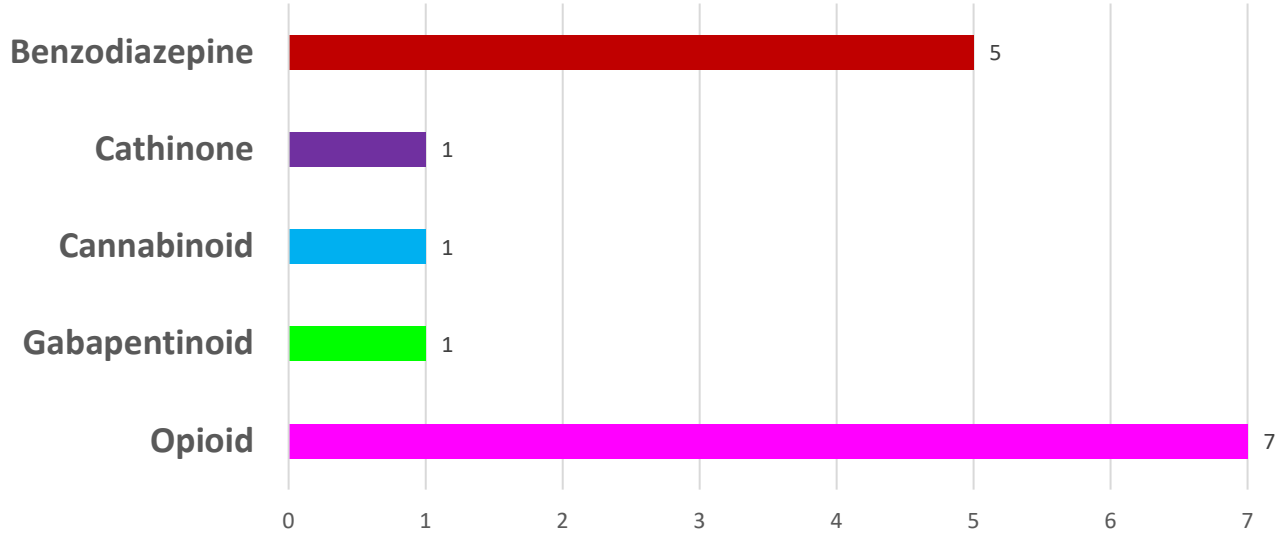


Figure 2B. Total Encounters for Each NPS Class

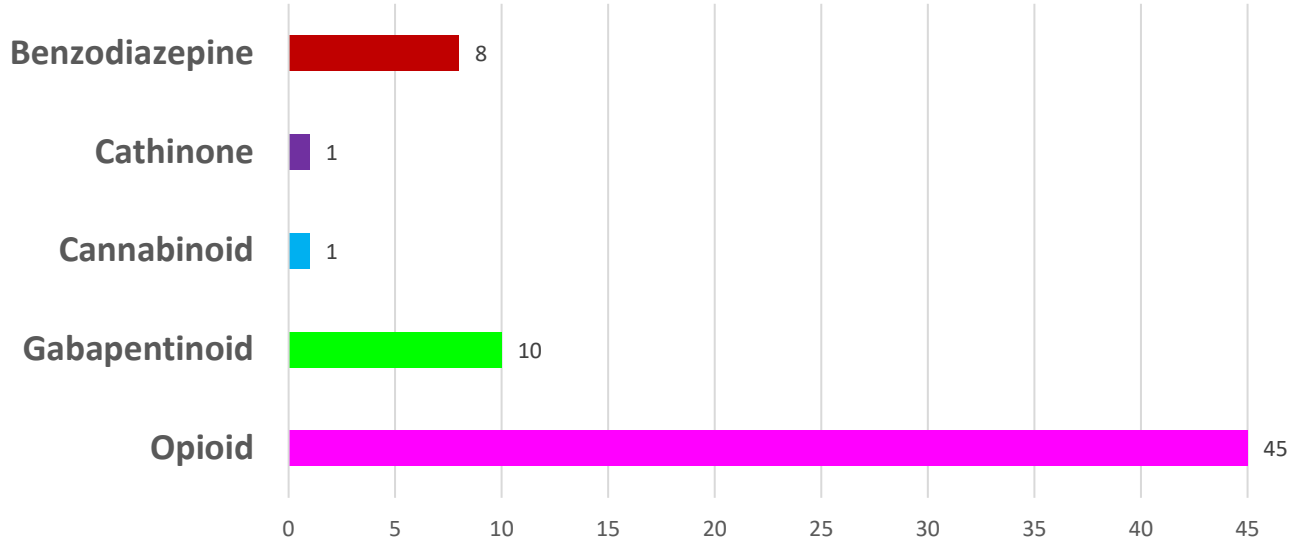


Table 1. NPS detected – First Quarter 2022

Drug Class	Drug	Freq.	States Found*	Confirmed Level(s) (ng/mL)**			
				S	P	WB	U
Benzodiazepine	8-Aminoclonazolam	3	KS, TN(2)			2.4-13.8	
	Bromazolam	2	TN(2)			0.9-10.4	
	Etizolam	1	IA			18.5	
	Flualprazolam	1	TN			5.1	
	Flubromazolam	1	IA			0.7	
Cathinone	Pentylone	1	TN			1.1	
Cannabinoid	11-nor-9-carboxy-delta-8-THC	1	TX				4580
Gabapentinoid	Phenibut	10	AL(10)				NQ
Opioids	2-Methyl-AP-237	2	KS, WA			313-379	
	Metonitazene	4	TN(4)			2.3-4.1	
	Mitragynine	4	KS, TN(2), WA			0.8-113	
	7-OH Mitragynine	1	TN			2.9	
	N-Piperidinyl Etonitazene	1	TN			2.1	
	para-Fluorofentanyl	14	KY, NE(4), TN(9)			0.6-111	
	Despropionyl *para*-fluorofentanyl	10	NE(3), TN(7)			0.2-3.3	
	Tianeptine	6	AL(6)				135-7880

* AL – Alabama; FL – Florida; IA – Iowa; KS – Kansas; KY – Kentucky; NE – Nebraska; TN – Tennessee; TX – Texas; WA – Washington

**S – Serum; P – Plasma; WB – Whole Blood; U – Urine; NQ – not quantified

§ - Parent drugs or metabolites are only counted once for the number of drugs detected in Tables 1-5. If only a metabolite is encountered in the absence of a parent drug, it will still be counted as a unique drug. Both parent drugs and metabolites are counted as detections.

Traditional Illicit Drugs

DEA TOX confirmed 216 detections comprising of 14 TIDs[§] (Table 2) in the first quarter of 2022. Five of these detections are further demonstrated in Table 5.

Table 2. TID detected – First Quarter 2022

Drug Class	Drug	Freq.	States Found*	Confirmed Levels (ng/mL)**			
				S	P	WB	U
Amphetamines	Amphetamine	12	KY(9), TN(3)	13.7	79.3	4.3-172	3320-10700
	Methamphetamine	33	AL(2), KY(18), NC, NE, TN(11)	2.5-1130	999	3.2-1750	8.2-98000
	4-Hydoxymeth-amphetamine	11	KY(11)				12.1-1230
	HMMA[‡]	3	KY(3)				3.5-835
Arylcyclohexyl-amines	Ketamine	7	KY(7)	398	20.4		2290-6040
Cannabinoids	11-nor-9-carboxy-delta-9-THC	17	CO, IA, KS, KY(12), OR, PA	60.6-121	187	141	60.6-4580
	Delta-9-THC	1	KS			56.8	
Cocaine	Cocaine	10	KY(3), NE(4), TN(3)			0.4-996	7-257000
	Benzoylecgonine	15	KY(6), NE(4), TN(5)			1.5-559	12.4-1290000
	Cocaethylene	7	KY(2), TN, NE(4)			NQ	NQ
	Ecgonine methyl ester	10	KY(3), NE(4), TN(3)			NQ	
Opioids	Codeine	1	TN			0.9	
	Fentanyl	30	CO, IA, KY(14), NC, TN(13)	1.9-7.5	3.7	0.5-63.8	9.3-6160
	Norfentanyl	23	CO, IA, KY(13), TN(8)	1.8-2.1	3.4	0.2-20.6	45.3- 4600
	Beta-Hydroxyfentanyl	6	CO, KY(3), TN(2)		0.3	0.9	4.6-72.4

Drug Class	Drug	Freq.	States Found*	Confirmed Levels (ng/mL)**			
				S	P	WB	U
Opioids (continued)	Hydrocodone	2	KY, TN			2.4	70.7
	Hydromorphone	6	KY(5), TN	20.6		1.8	19.2- 247
	Morphine	5	IA, TN(4)			0.5-37.1	
	Oxycodone	5	KY(3), TN(2)		3.5	4.7-28.3	14.7
	Oxymorphone	1	KY				NQ
	Tramadol	3	KY(2), TN			0.8	80.8
	Desmethyl-cis-Tramadol	3	KS, KY, TN			0.5-10.9	58.3

* AL – Alabama; CO – Colorado; FL – Florida; IA – Iowa; KS – Kansas; KY – Kentucky; NE – Nebraska; NC – North Carolina; OR – Oregon; PA – Pennsylvania; TN – Tennessee; WA – Washington

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‡ 4-Hydroxy-3-methoxymethamphetamine

§ - Parent drugs or metabolites are only counted once for the number of drugs detected in Tables 1-5. If only a metabolite is encountered in the absence of a parent drug, it will still be counted as a unique drug. Both parent drugs and metabolites are counted as detections.

Prescription and Over the Counter Drugs

DEA TOX confirmed 278 detections comprising of 55 prescription or OTC drugs[§] (Table 3) in the first quarter of 2022. Two of these detections are further demonstrated in Table 5. Drugs for the prescription and OTC drugs panel are not typically quantitated unless specifically requested thus "Confirmed Levels" are not provided.

Table 3. Prescription or OTC drugs detected – First Quarter 2022

Drug Class	Drug	Freq.	States Found*
Anesthetic	Lidocaine	11	KY(8), NC, TN(2)
Anticonvulsant	Carbamazepine	1	TN
	Gabapentin	18	AL, KY(6), TN(11)
	Lamotrigine	3	KY(2), TN
	Levetiracetam	2	KY(2)
	Oxcarbazepine	2	TN(2)
Antidepressant	Amitriptyline	2	KY(2)
	Nortriptyline	1	KY
	Citalopram	4	KY(2), TN, WA
	Doxepin	1	TN
	Duloxetine	2	OH, TN
	Fluoxetine	11	AL, KY(8),TN, WA
	Norfluoxetine	9	KS, KY(5), NY, TN, WA
	mCPP**	2	KS, KY
	Paroxetine	2	AL, TN
	Protriptyline	2	KY(2)
	Sertraline	3	OR, TN(2)
	Trazodone	2	KS, KY
Antidiabetic	Metformin	2	OR, TN
Antihistamine	Chlorpheniramine	2	AL, TN
	Diphenhydramine	20	KS, KY(8), NY, OR, TN(9)
	Doxylamine	1	TN
	Hydroxyzine	5	IA, KY, TN(3)
	Promethazine	1	TN
Antipsychotic	Aripiprazole	1	TN
	Olanzapine	3	KY(2), OR
	Ziprasidone	2	OR, TN

Drug Class	Drug	Freq.	States Found*
Benzodiazepine	Alprazolam	5	IA. KY, NY, TN(2)
	Alpha-hydroxy Alprazolam	2	IA, KY
	Clobazam	1	TN
	Clonazepam	1	KY
	7-amino Clonazepam	3	KS, KY(2)
	Diazepam	2	TN(2)
	Nordiazepam	2	TN(2)
	Lorazepam	7	CO, KY(5), OR
	Midazolam	15	CO, KY(12), NC, OR
	Mirtazapine	1	AL
	Nitrazepam	1	KY
	Oxazepam	3	KY(2), NC
	Temazepam	2	KY, NC
Cardiovascular	Amiodarone	2	KY(2)
	Atenolol	1	KY
	Atorvastatin	1	IA
	Atropine	2	KY(2)
	Carvedilol	2	KY(2)
	Clonidine	4	KY(2), TN(2)
	Furosemide	2	KY(2)
	Lisinopril	3	IA, KY(2)
	Metoprolol	4	IA,TN(3)
	Propanolol	1	KS
Cough Suppressant	Dextromethorphan	6	KY(3), OR, TN(2)
	Dextrorphan	5	KY(3), TN(2)
Decongestant	Norpseudoephedrine	5	KY(3), TN(2)
	Phenylephrine	1	KY
	Pseudoephedrine	6	KY(6)
Muscle Relaxant	Baclofen	3	IA, KY(2)
	Cyclobenzaprine	4	KY(2), TN(2)
Opioid	Buprenorphine	5	KY(5)
	Norbuprenorphine	2	KY(2)
	Methadone	1	TN
	EDPP	1	TN
	Naloxone	21	KY(14), NE(2), TN(5)
	Naltrexone	1	KY
Pain Reliever	Acetaminophen	31	AL(2), CO, KY(21), OR, TN(7)
Respiratory	Albuterol	1	KY
Tuberculostatic	Levofloxacin	1	TN

* AL – Alabama; CO – Colorado; FL – Florida; IA – Iowa; KS – Kansas; KY – Kentucky; NE – Nebraska; NC – North Carolina; NY – New York; OR – Oregon; PA – Pennsylvania; TN – Tennessee; TX – Texas; WA – Washington

**mCPP is an expected metabolite of trazadone

§ - Parent drugs or metabolites are only counted once for the number of drugs detected in Tables 1-5. If only a metabolite is encountered in the absence of a parent drug, it will still be counted as a unique drug. Both parent drugs and metabolites are counted as detections.

Precursors/Additives/Impurities

DEA TOX confirmed 20 detections comprising of five P/A/I[§] (Table 4) in the first quarter of 2022. Two of these detections are further demonstrated in Table 5.

Table 4. P/A/I detected – First Quarter 2022

Drug Class	Drug	Freq.	States Found*	Confirmed Levels (ng/mL)**			
				S	P	WB	U
Adulterant	Quinine	1	NE			NQ	
Impurity	N,N-dimethylamphetamine	3	KY(2), TN			2.6	462-1510
Precursor	4-ANPP	14	IA, KY(4), TN(9)	1.1		1.2	11-21.3

* IA- Iowa; KY – Kentucky; NE – Nebraska; TN – Tennessee

**S – Serum; P – Plasma; WB – Whole Blood; U – Urine.

§ - Parent drugs or metabolites are only counted once for the number of drugs detected in Tables 1-5. If only a metabolite is encountered in the absence of a parent drug, it will still be counted as a unique drug. Both parent drugs and metabolites are counted as detections.

Drug Paraphernalia

DEA TOX received 1 exhibit (Fig. 2) and confirmed 12 detections[§] (Table 5) in the first quarter of 2022.

Table 5. Drug Paraphernalia exhibit – 1st Quarter 2022

Drug Class	Drug	State Found*	Confirmed Levels: mg of drug/gram of drug product (%)	Actual Amount within Drug Product
Exhibit 1: Total Weight – 188.2 mg				
Opioid	Fentanyl[1]	KY	26.0 (2.6)	4.9 mg
Stimulant	Cocaine[1]		15.0 (1.5)	2.8 mg
Opioid	*para*-Fluorofentanyl[2]		11 (1.1)	2.1 mg
Precursor	4-ANPP[3]		5.2 (0.52)	0.98 mg (980 µg)
Antihistamine	Diphenhydramine[4]		2.1 (0.21)	0.40 mg (400 µg)
Precursor‡	Norfentanyl[1]		0.80 (0.080)	0.15 mg (150 µg)
Stimulant	Methamphetamine[1]		0.098 (0.0098)	0.018 mg (18 µg)
Additive	Phenacetin[3]		0.075 (0.0075)	0.014 mg (14 µg)
Precursor‡	Despropionyl-*para*-fluorofentanyl[2]		0.048 (0.0048)	0.009 mg (9 µg)
Anesthetic	Lidocaine[4]		0.043 (0.0043)	0.0081 mg (8.1 µg)
Opioid	Acetyl Fentanyl[2]		0.021 (0.0021)	0.004 mg (4 µg)
Opioid	Tramadol[1]		0.021 (0.0021)	0.004 mg (4 µg)

Figure 2: Gray, semi-translucent crystals

[1] – Substance included in TID category for Figures 1A, 1B, 2A, and 2B

[2] – Substance included in NPS category for Figures 1A, 1B, 2A, and 2B

[3] – Substance included in P/A/I category for Figures 1A, 1B, 2A, and 2B

[4] – Substance included in Prescription or OTC category for Figures 1A, 1B, 2A, and 2B

* KY – Kentucky

§ - Parent drugs or metabolites are only counted once for the number of drugs detected in Tables 1-5. If only a metabolite is encountered in the absence of a parent drug, it will still be counted as a unique drug. Both parent drugs and metabolites are counted as detections.

‡ - Norfentanyl can be defined as both a precursor chemical and a metabolite of fentanyl. Similarly, despropionyl-*para*-fluorofentanyl can be defined as both a precursor chemical and a metabolite of *para*-fluorofentanyl. For statistical purposes, they have been categorized as metabolites within this document.

Contact Information

We invite medical and law enforcement facilities to contact our program if you encounter an overdose of a suspected synthetic drug and desire to have any leftover biological samples (blood preferred) analyzed further for such synthetic substances.

- **Sample Qualifications:**
  - Patients thought to have ingested a synthetic drug, where the traditional drug screen has produced little or no viable options to explain the symptoms exhibited by the patient (alcohol and THC are exempted).

- **How to Contact Us and Send Your Samples:**
  - Once the above qualifications are satisfied:
    - Email **DEATOX@DEA.GOV** with a brief description of the case (including initial toxicology screen and history) and a request for testing.
    - DEA will respond to each inquiry, and if approved, will send the instructions for packing and shipping of sample(s) to UCSF.
      - The main reason for disapproval of a case would be the identification of substances including methamphetamine, heroin, fentanyl, cocaine, LSD, PCP etc. in a routine toxicology screening at your facility.
      - This program's goal is to connect symptom causation to abuse of newly emerging synthetic drugs (e.g. synthetic cannabinoids, synthetic cathinones, fentanyl-related substances, other hallucinogens etc.).
  - Ensure that you de-identify and label the sample with a numerical value, sex, date of birth or age, and the date and time the sample was collected in accordance with the labeling instructions (sent with shipping instructions).
  - Keep a master list of the patients and the numerical values you allocated to each sample at your institution.

- **Cost of Sample Analysis:**
  - DEA will cover the full cost of testing the patient samples.
    - The sender will only be responsible for paying for packing and shipping samples to UCSF.

- **Turn-around Time:**
  - Results are expected within three to four weeks of receipt of the sample at UCSF except in rare occurrences when a novel substance is identified.

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Clinical Toxicology
and Environmental Biomonitoring Laboratory

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