Opioid Overdoses from the Toxicology Investigators Consortium (ToxIC) Fentalog Study Group — Q1 2021

Purpose: This report provides new information regarding comprehensive drug testing of clinical biological specimens collected after suspected opioid overdoses in various cities across the United States.

Overview: Drug use can lead to adverse events and overdose scenarios where individuals present to emergency departments for clinical evaluation and/or treatment. The culprit can be traditional drugs (e.g., heroin, fentanyl, cocaine, methamphetamine) or novel psychoactive substances (NPS); however, proper drug testing methodologies must be employed for accurate identification and characterization. Street-level drug preparations can containing undeclared or unwanted substances, such as toxic adulterants or NPS, which can potentiate effects or lead to adverse reactions. Understanding of emerging drug trends and drug testing results can help direct new or revised approaches to clinical treatment and harm reduction efforts.

Objective: A partnership between the American College of Medical Toxicology (ACMT) and the Center for Forensic Science Research and Education (CFSRE) was established to comprehensively assess the role and prevalence of synthetic opioids and other drugs among suspected overdose events in the United States.

Sample Source: Patients presented to emergency departments within ACMT's Toxicology Investigators Consortium (ToxIC) experiencing a suspected opioid overdose. Residual, discarded biological samples were obtained for testing against an expansive library of drugs and other substances. Our findings provide a near real-time assessment of the drug market and allude to resulting implications on clinical institutions.

Testing: Analysis was performed via liquid chromatography quadrupole time-of-flight mass spectrometry (LC-QTOF-MS). The scope of testing targeted more than 900 drugs, including a vast majority of NPS and metabolites. Drug classes included opioids, stimulants, cannabinoids, and benzodiazepines, among others.

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Location: Portland, OR

Key Findings:

- 94% of samples were positive for at least one opioid
- Heroin metabolites (44%) were commonly detected, followed by fentanyl (25%)
- Combined opioid and stimulant use was very common (81%)
- Benzodiazepines were commonly encountered with opioids (63%)
- NPS: *para*-Fluorofentanyl, Clonazolam, Etizolam, and Flubromazolam

Location: New York, NY

Key Findings:

- 91% of samples were positive for at least one opioid
- Fentanyl (64%) was commonly detected, followed by methadone (41%) and tramadol (27%)
- Combined opioid and stimulant use was common (68%)
- PCP was detected alongside methadone (n=2)
- NPS: Clonazolam, Etizolam, MDMB-4en-PINACA, and 5F-MDMB-PICA

Location: St. Louis, MO

Key Findings:

- 100% of samples were positive for at least one opioid
- Fentanyl (100%) was commonly detected, followed by methadone (18%) and tramadol (15%)
- Combined opioid and stimulant use was common (59%)
- PCP was detected in combination with opioids
- NPS: Brorphine, Butyrylfentanyl, *para*-Fluorofentanyl, Clonazolam, Eutylone, and 4-HO-DiPT

Location: Bethlehem, PA

Key Findings:

- 91% of samples were positive for at least one opioid
- Fentanyl (86%) was commonly detected, followed by prescription opioids (14%)
- Xylazine was observed alongside fentanyl (27%)
- Combined opioid and stimulant use was common (50%)
- PCP (n=2) was detected with and without opioids
- NPS: Etizolam

Summary:

- Distinct geographical differences were observed (e.g., opioids, NPS)
- Fentanyl was the most commonly detected opioid nationally (76%)
- Combined opioid and stimulant use was common nationally (63%)
- Several NPS were detected (incl. opioids, benzodiazepines, cannabinoids)

ACMT American College of Medical Toxicology

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