Trend Report: Q1 2019

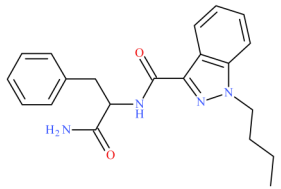
Synthetic Cannabinoids in the United States

Purpose: The objective of this report is to provide up-to-date information regarding the status of synthetic cannabinoid prevalence, positivity, and discovery within the United States.

Project Overview: Novel psychoactive substances (NPS), including synthetic cannabinoids, continue to provide great challenges for forensic scientists, clinicians, and public health and safety personnel. Synthetic cannabinoids have been implicated in an increasing number of emergency room admissions, death investigations, and intoxication events in corrections populations. Maintaining a current scope of analysis can be challenging, often requiring availability of comprehensive analytical methodologies and reference materials for identifications. This project employs a novel approach to analysis of biological samples and extracts by comprehensive non-targeted data acquisition using liquid chromatography high resolution quadrupole time-of-flight mass spectrometry (LC-QTOF). The scope of analysis contains more than 250 synthetic cannabinoid parent compounds and metabolites. Sample analysis and data processing occur on a weekly basis. In addition, retrospective analysis of datafiles is conducted as new synthetic cannabinoid standards become available. This model allows for real-time identification of novel synthetic cannabinoids and trend analyses. In collaboration with NMS Labs, sample extracts were received during this reporting period from forensic casework where for cause testing was directed for synthetic cannabinoids using a regularly updated panel. In total, cases were submitted from 32 states and the District of Colombia.

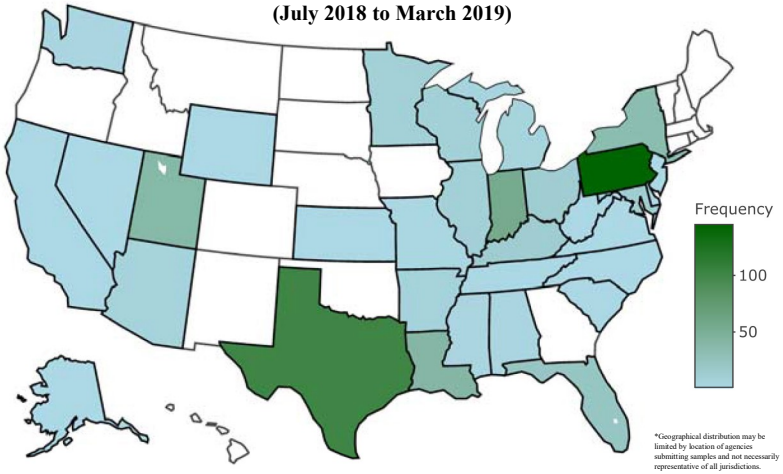
New Synthetic Cannabinoid Identified In March 2019

APP-BINACA



Heat Map of Synthetic Cannabinoid Positivity*

(July 2018 to March 2019)



*Geographical distribution may be limited by location of agencies submitting samples and not necessarily representative of all jurisdictions.

Synthetic Cannabinoid Positivity

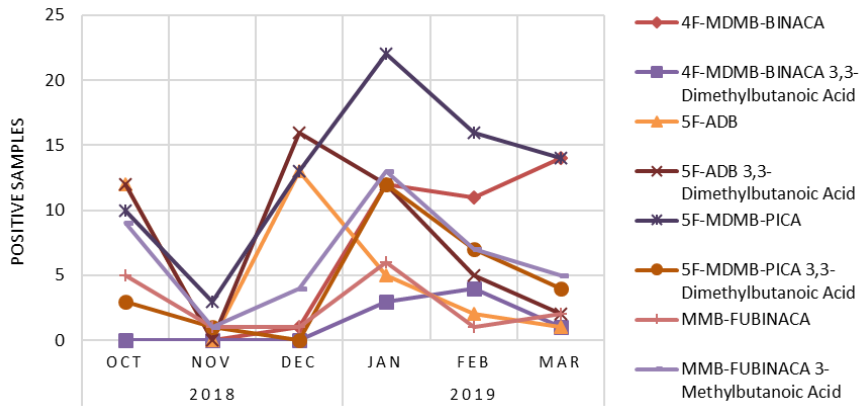
(January 2019 to March 2019)

Analyte (Parent)	Positive Samples (n=196)	% Positivity (n=1,533)
5F-MDMB-PICA	52	3.4%
4F-MDMB-BINACA	37	2.4%
MMB-FUBINACA (FUB-AMB)	9	0.6%
5F-ADB (5F-MDMB-PINACA)	8	0.5%
APP-BINACA	6	0.4%
ADB-FUBINACA	2	0.1%
5F-AMB	1	0.1%
4-cyano CUMYL-BINACA	1	0.1%
HU-331	1	0.1%

Analyte (Metabolite)	Positive Samples (n=196)	% Positivity (n=1,533)
MMB-FUBINACA 3-Methylbutanoic Acid	25	1.6%
5F-MDMB-PICA 3,3-Dimethylbutanoic Acid	23	1.5%
5F-ADB 3,3-Dimethylbutanoic Acid	19	1.2%
4F-MDMB-BINACA 3,3-Dimethylbutanoic Acid	8	0.5%
5F-AMB 3-Methylbutanoic Acid	1	0.1%
MDMB-FUBICA 3,3-Dimethylbutanoic Acid	1	0.1%
ADB-PINACA N-Pentanoic Acid	1	0.1%
5F-NPB-22 3-Carboxyindazole	1	0.1%

Synthetic Cannabinoid Trends

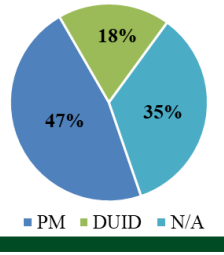
(Plotted by Month Analyzed; October 2018 to March 2019)



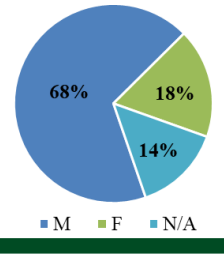
Demographics

(Jan. 2019 to Mar. 2019)

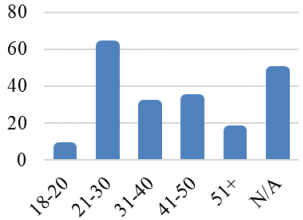
Case Type (n=196)



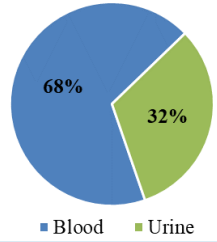
Sex (n=196)



Age (n=196)



Matrix (n=194)



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