



B132 A Three-Year Review of Novel Psychoactive Substance (NPS) Prevalence in Drug Identification Casework

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Learning Overview: After attending this presentation, attendees will understand popularity trends in the United States since 2015 of Novel Psychoactive Substances (NPS) by using forensic drug identification casework and correlating that to trends from toxicology results from human performance and death investigation casework. The presentation will also enable attendees to anticipate potential future trends regarding NPS drug use in both seized drug and toxicological analysis.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by better preparing forensic chemists and toxicologists to be able to detect and identify NPS in forensic studies and casework.

Increased NPS frequency in seized drug evidence often presages increased NPS positivity in death investigation casework. Typically, new substances are identified in seized drug casework before they are encountered in toxicology casework as the higher concentrations in seized material and the use of non-targeted screening methods, such as gas chromatography/mass spectrometry (GC/MS), enables more ready identification. Forensic toxicology methods, which must anticipate several matrices, require quantitative methods with lower detection limits, and the identification and detection of drug metabolites takes more time to develop and validate. When coupled with region-specific data, trends that link seized drugs and toxicology data can be useful information for entities addressing both the public health and public safety aspects of NPS use.

In the NMS laboratory, at least 92 unique NPS compounds were confirmed in seized drug casework via GC/MS analysis and confirmed by comparison with available reference standards, since September 2015. These lab cases were tallied and sorted by lab received date to generate trend data. Trends of NPS in drug identification cases were collected through at least three years of retrospective data-mining of historical LIMS data and were grouped generally by similar drug pharmacology: designer benzodiazepines, designer opioids, dissociatives, hallucinogens, stimulants, and synthetic cannabinoids.

Notable trends in this review include significant sudden increases in synthetic cannabinoid seizures (such as FUB-AMB and 5-Fluoro ADB) starting in mid-2016 with a noticeable decline by the end of 2016. For example, the total 5-Fluoro ADB detection rates in 2016 increased from 43 to 139 cases between the first and second quarter, peaked at 404 cases in the third quarter, and declined to 31 cases in the final quarter. Steady increases in designer opioid seizures (such as acetyl fentanyl and carfentanil) have been observed since 2016 and continue through mid-2018. Acetyl fentanyl, the most frequently detected designer opioid was reported in 21 cases in 2016, 62 cases in 2017, and 112 cases through the first half of 2018. Toxicological data from biological specimens within the same time-period were compared for correlation.

In conclusion, prominent trends in reported NPS cases were presented in a 3-year review of drug analysis data from a large reference lab. The implications of tracking prevalence and trends in drug seizure casework over time and in real time include providing valuable information for stakeholders in the forensic science community, controlled substance legislators, and national public health advocates as NPS recreational drug use inevitably evolves.

Novel Psychoactive Substances, Drug Analysis, Trends