

B21 An Analysis of Drug Residue From Needle-Exchange Syringes in Washington, DC

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Learning Overview: The goals of this presentation are to: (1) impart knowledge of real-time Intravenous (IV) drug use in Washington, DC; (2) illustrate geospatial drug trends from used syringes in Washington, DC; and (3) compare geospatial drug trends from used syringes, death investigations syringes, and seized drug evidence.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by showing how a long-term implementation of this syringe surveillance program can offer a robust monitoring system of drug trends in Washington, DC, by combining with multiple laboratory data streams providing intelligence on IV drug-user practices and emerging dangerous substances.

This presentation will provide insight into geospatial drug trends in Washington, DC, compiled from the analysis of drug residue within used syringes, donated by needle-exchange programs. This data is compiled alongside existing data from death investigation syringes and seized suspected Controlled Dangerous Substance (CDS) exhibits. This study represents the first time an analysis of residual contents from used syringes collected from harm reduction services (needle-exchange programs) has been conducted in the District of Columbia. As drug abuse remains a complex, dynamic phenomenon, it is hypothesized herein that the triangulation of data from three different sources will allow for more comprehensive opioid monitoring.

Since the opioid epidemic was declared a public health emergency in 2017, increased knowledge of up-to-date opioid abuse, opioid trends, and novel emerging substances has been needed. What began as an outbreak of prescription drug abuse evolved into a second wave of heroin overdoses, followed by a third wave of synthetic opioid overdoses. These synthetic opioids, most particularly fentanyl, often arrive in the hands of users unknowingly and can prove deadly despite administration of the opioid antagonist naloxone. Public health organizations and harm reduction services require real-time, comprehensive data to allow for the revision and adaptation of intervention and prevention strategies. Similarly, policy makers and law enforcement agencies need data synchronous to current drug-use trends to quickly adapt drug legislation. Prior to the implementation of this syringe surveillance project, all drug-trend data was compiled from analysis of syringes from fatal overdose cases (death investigations) and law enforcement seizures of suspected controlled dangerous substances. While data from death investigation syringes is beneficial in supporting medicolegal death investigations, the necessary information arrives after a casualty has occurred. Likewise, analysis of seized evidence can provide insight into the District of Columbia's drug supply, but lacks confirmed usage trends by current IV drug users.

This presentation will impact the forensic science community by demonstrating how the analysis of drug residue will equip laboratories with essential supportive data, while illustrating much needed current trends in injection drug use in Washington, DC. In cooperation with three local needle-exchange programs, anonymously donated syringes were collected on a weekly basis. Syringes were collected individually in sharps safety tubes and geotagged with the collection site locations. The analysis of residual content in syringes was accomplished by performing a methanolic extraction prior to filtering, then Gas Chromatography/Mass Spectrometry (GC/MS). Batches were prepared and run bi-weekly, with time from exchange to analysis estimated between one to seven days. Geospatial analysis was performed using ArcGIS® Pro™, highlighting the prevalence of specific controlled dangerous substances. Preliminary data suggests a higher occurrence of methamphetamine used intravenously than was reflected in previously obtained data from death investigation syringes alone. Eutylone, a synthetic cathinone, has been observed for the first time in the residual content from multiple syringes. Additionally, an emerging trend of xylazine has been observed as a common fentanyl adulterant. Other preliminary data notes the high prevalence of fentanyl, both in combination with other opioids and alone, while simultaneously reflecting low incidence of unadulterated heroin.

Long-term implementation of this syringe surveillance program can offer a robust monitoring system of drug trends in Washington, DC, by combining with multiple laboratory data streams. This provides new intelligence on IV drug-user practices and emerging dangerous substances. Such knowledge is invaluable to users, public health officials, medical providers, emergency responders, and law enforcement agencies.

Needle Exchange, Syringes, Opioids