



Minnesota Drug Overdose and Substance Use Surveillance Activity

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Minnesota Drug Overdose and Substance Use Surveillance Activity (MNDOSA)

- Determine the burden of overdoses/substance abuse related visits to emergency departments and hospitals in Minnesota
 - Currently 8 Hospitals are participating in the surveillance project
 - Majority are in the Northeast Portion of the state
 - Looking to expand further into the metro area and other larger cities
- Identify patients by overdose clusters and/or unusual, atypical clinical presentations
- Identify substances consumed by individuals
 - Helps to inform future approaches to treatment and prevention
 - Alert us to newly detected drugs as they enter the district
- Describe the populations most affected to help focus and guide prevention efforts

MNDOSA Epidemiology Investigation



Protecting, Maintaining and Improving the Health of All Minnesotans

Interoffice Memorandum

TO: Ruth Lynfield, MD, State Epidemiologist
Jon Roesler, MS, Epidemiologist Supervisor, Injury & Violence Prevention Unit
Mark Kinde, MPH, Director, Injury & Violence Prevention Unit

FROM: Edward P. Ehlinger, MD, MSPH Commissioner of Health

A handwritten signature in blue ink, likely belonging to Edward P. Ehlinger.

SUBJECT: Designation of Epidemiologic Investigation

DATE: October 1, 2017

Under the auspices of Minnesota Statutes, section 144.05, subdivision 1, paragraph (a), the Department is conducting an epidemiologic investigation of drug overdose, substance abuse, and other poisoning. The data from this investigation are necessary to protect the public's health. Consequently, I am designating these data as health data under Minnesota Statutes, section 13.3805, subdivision 1. Health data are classified as private under section 13.3805, subdivision 1, and are not discoverable, pursuant to Minnesota Statutes, section 144.658.

This investigation includes obtaining data from hospitals, medical examiners, police departments, crime laboratories, community organizations and other entities.

Your investigation should be constrained by available resources.

- The Minnesota Commissioner of Health issued a Memorandum.
- Classified our surveillance as an Epidemiological Investigation.
- Same state statute was used for EVALI investigation.

Public Health Lab Toxicology Testing

Patient Reports to hospital with overdose symptoms

Remaining biological specimen is preserved and sent to health lab

Toxicology testing is performed

Results issued to epidemiology and hospital partners



Current Analytical Capabilities

- Targeted semi-quantitative analysis with qualitative reporting; LC-QQQ
- Due to the number of targeted compounds and existing methodologies, three analytical methods were developed (six when including both matrices)
 - Opioids (fentanyl and fentanyl-analogs) – 40 compounds
 - (CDC panel of 140+ fentanyl compounds being added to spectral library)
 - Designer Drugs (e.g., synthetic cannabinoids, cathinone's) – 93 compounds
 - (vendor panel of 350+ being added to spectral library)
 - Multi-Drug Panel (e.g., stimulants, benzos, barbiturates, etc.) – 138 compounds

New Semi-Targeted Analytical Approach



- High-Resolution Mass Spectrometry (HRMS)
 - Can analyze for all detectable analytes in one run vs the current three method analysis.
 - Will greatly increase the number of detectable analytes (more than a thousand potential compounds)
 - Gain the ability back-mine data when new analytes become available.
 - Some HRMS have ability to perform structural elucidation studies on unknown compounds.
 - Feature is really helpful for completely new compounds of interest.

- 2019 Data – 219 specimens were analyzed (More if we include EVALI)
 - 107 Different drugs were detected
 - Subjects averaged ~8 drug analytes in system
 - 63% of all specimens contained Methamphetamine
 - 26% of all specimens contained Fentanyl
 - Identified 9 different Fentanyl analogues
 - Fentanyl was typically found in combination with another opioid (ex. Acetyl Fentanyl)
- In 2020, we identified Isotonitazine in two different OD clusters and 4f-MDMB-Butinaca in gummies found at a park and consumed by children
 - Done using HRMS semi-targeted approach

MNDOSA Reflections (From the lab)

- Toxicology testing will only detect what you look for
 - Limiting Toxicology testing to only opioids may miss the scope of the problem
- Getting immediate access to the clinical specimens is highly important
- Hospitals have a regular destruction schedule for specimens
 - Clinical records will be there long after the specimen is gone
- Having a champion at the hospital to push buy-in is extremely helpful
- Dialog with the lab is important
 - Shipping needs, testing progress, interpretation

Thank you.

Jason Peterson

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