

ACMT ToxIC Registry: Applications in NPS surveillance

Alex Manini, MD, MS, FAACT, FACMT
Professor of Emergency Medicine
Division of Medical Toxicology
Icahn School of Medicine at Mount Sinai



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Background

- Data from field intelligence, laboratory testing and other sources needs to complement the syndromic information collected from overdoses, adverse events and outbreaks.
- The Toxicology Investigators' Consortium (**Toxic**) Registry includes clinical data on NPS use from **47 cities in the U.S.**

Toxic Registry

- American College of Medical Toxicology (ACMT) is a professional nonprofit society of physicians with recognized expertise in medical toxicology
- The College is dedicated to advancing the science and practice of medical toxicology through a variety of activities
- Prominently among them is the **Toxicology Investigators Consortium (ToxiC)**

Scope of Medical Toxicology

- Medical Toxicology is a field of medicine dedicated to the evaluation and treatment of poisoned and envenomated patients.
- This also includes adverse health effects of medications, occupational and environmental toxins, and biological agents.
- Medical Toxicology is an officially recognized subspecialty by the American Board of Medical Specialties.

Medical Toxicology Practices

- Emergency departments and in-patient units where they directly treat acutely poisoned patients
- Outpatient clinics and occupational health settings where they evaluate the health impact from exposure to toxic substances in the home or workplace
- National and regional poison control centers where they provide medical direction for health professionals, personal responders and the general public
- Academic institutions where they are involved in teaching, research, and improving evidence-based patient care

Toxicology Investigators Consortium (ToxIC)

- Established in 2010, ToxIC is the ACMT's nation-wide research and collaboration network.
- Organizationally, ToxIC is a registry, a multi-center research group, and a toxcovigilance network.
- All participating ToxIC sites, which are constituted by the majority of medical toxicology training programs and practices around the U.S., enter all of their cases into the ToxIC Registry.
- The Registry collects clinical and exposure information on all patients in a HIPAA-compliant highly secure online Registry. The ToxIC Registry consists of a main registry and several important sub-registries.

Toxic Innovation in Syndromic Surveillance

- Using Toxic as a registry for research purposes responds to the shortcomings that hamper the ability of drug abuse epidemiologists and treatment clinicians to keep up with trends and toxicity of emerging novel psychoactive substances (NPS).
- Traditional monitoring systems such as The National Survey of Drug Use and Health (NSDUH) – Treatment Episode Data Set, and the Poison Control System cannot reliably detect NPS use because awareness of emerging NPS is delayed—or even nonexistent. Precise clinical effects of new drugs, including toxicity and adverse events, remain elusive targets.
- Toxic-based research studies overcome these challenges with an established, nationwide network of physician toxicology experts who treat, at the bedside, acute episodes of drug toxicity.
- The Toxic Registry, therefore, offers a fundamentally new way to identify adverse events related to NPS overdose and, concurrently, regional and temporal trends.

Toxic Study Sites

- **Toxic** maintains a core case registry in which participating sites agree to record all cases seen at local hospitals and EDs where a consultation by a medical toxicologist was requested to aid clinical care.
- The core registry was established in January 2010 with 4 participating sites; as of May 1, 2018, it contained over 62,000 cases from 47 U.S. cities, representing exposures to over 1,100 different toxicological agents, including a multitude of NPS.
- The **Toxic** registry features two characteristics that allow for collection of robust and unique data.
 - *First*, all patients in the registry are seen at the bedside by highly-trained, board certified medical toxicologists.
 - *No other surveillance system contains clinical information obtained by physicians with this degree of toxicologic expertise.*
 - The *second* is the ability to collect high quality data on novel exposures, such as emerging NPS use, symptoms, and treatment received.

Toxic as Nationwide Network

- Over 65 U.S. hospitals in 35 U.S. cities nationwide were participating in **Toxic** as of May 1, 2018.
- This represents 40 medical centers, 23 States, and all 10 Federal Districts. Many **Toxic** investigators work in one or more academic medical center, as well as in hospitals in smaller and/or distant community health care facilities.
- Many of the participating referral medical centers regularly receive transfers of unknown or unrecognized toxicity from NPS use.
- This feature extends the reach of **Toxic** into urban, suburban, and rural areas while preserving its ability to collect community-level adverse event data associated with opioid overdose.

Opioids at ToxIC Sites, 2015-2017

- We queried the ToxIC Registry for self-reports of opioid overdoses over a 3 year period.
- There were 921 in 2015, 1063 in 2016, and 1000 in 2017, for an average of 994 overdoses/year.
- Demographically, 34.6% were non-Hispanic Whites, about 34.5% were African American, 20% were of Hispanic ethnicity, and 9% were of other racial groups.
- Specific self-reported opioid drug exposures were 5% fentanyl or fentanyl-analogues, and 25.9% “heroin”.

R56 Pilot Study Sub-Registry

- A ToxIC based pilot study, “NIDA National Early Warning System Network (iN3): An Innovative Approach” (Grant **R56 DA038366**) began data collection in October 2014 at **11 ToxIC** sentinel sites.
- This pilot study collected short answer qualitative information as a part of clinical assessment of patients presenting with exposure to NPS (and other novel, emerging drugs) to better understand user knowledge, attitudes and behaviors related to NPS use.
- Between Oct 2014 and Dec 2015, we collected data on 124 cases, the majority of whom were male, white, and in their 20s. Several individuals reported use of more than one synthetic drug.

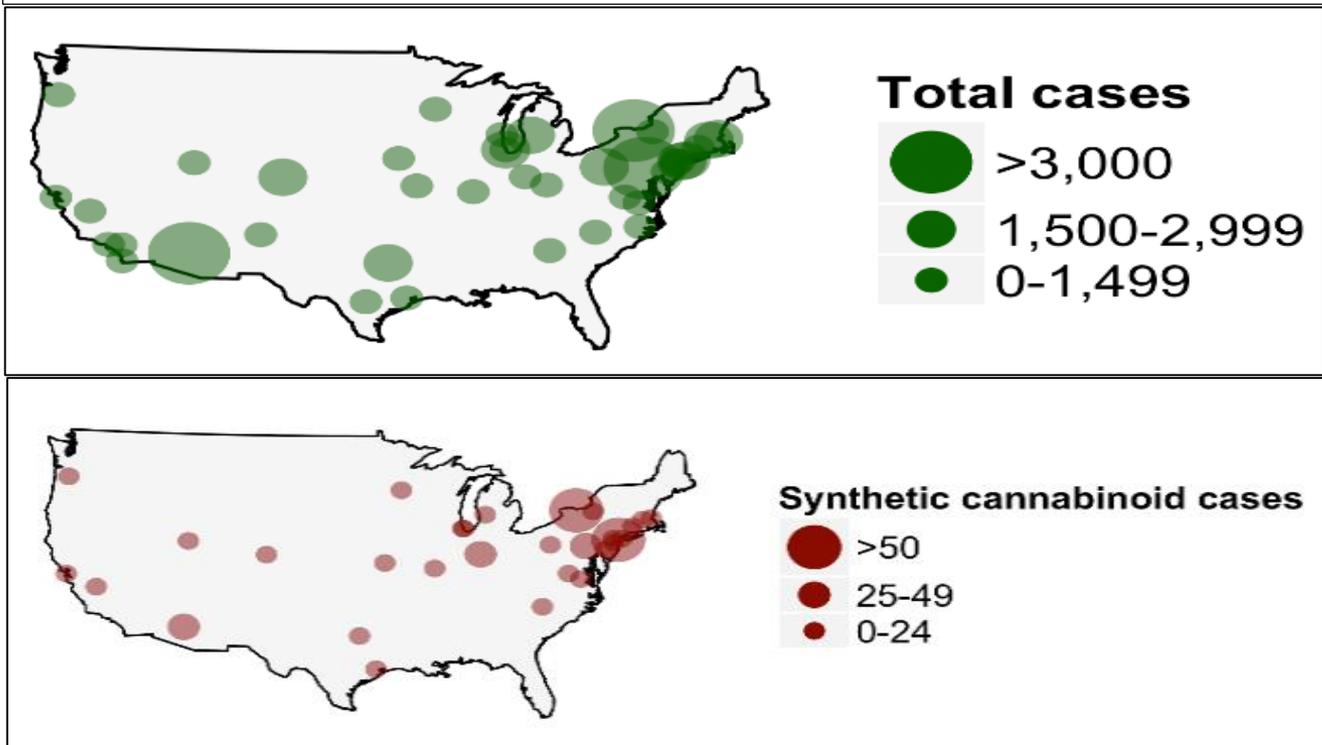
NPS in the ToxiC Core Registry

- A ToxiC-based study was recently published on 690 cases of NPS poisoning in three target categories: cannabinoids, cathinones, and hallucinogens.
- Logistic regression showed a significant change in the mean annual % of cannabinoid vs. total cases by **ToxiC** site.

Riederer AM, et al. MMWR Morb Mortal Wkly Rep. 2016;65(27):692-5

Synthetic Cannabinoid cases over a 5-year period in the ToxIC registry

ToxIC Registry cases by city, January 1, 2010 through November 30, 2015



Future Directions

- Provide clinicians with the ability to recognize NPS overdoses early in the course of drug overdose emergencies.
- Assess the knowledge, attitudes and behaviors related to NPS use in communities across the US.
- Insights into severity of NPS Use, specifically with regard to synthetic fentanyl analogues and SCRAAs
- Uncover latent variables to help understand this new disorder, which would guide therapeutic directions and future prevention efforts

Thank You for Your Attention

- Questions?
- Email: alex.Manini@mssm.edu
- Twitter: @ManiniAlex