

New England college town wastewater reveals high usage of stimulants and a rise in drug use during the pandemic

December 6 2022



Credit: Pixabay/CC0 Public Domain

The COVID-19 pandemic helped legitimize Wastewater-based Epidemiology (WBE) as a less invasive, cost-efficient way to monitor public health. WBE allows scientists to detect concentrations of drugs or biomarkers in sewage, providing an estimate of community drug use or disease infection rates.

Sheree Pagsuyoin, an expert on wastewater monitoring for drugs and COVID-19 at the University of Massachusetts-Lowell, will present the results of a two-year study of drug use in a rural New England town during the Society for Risk Analysis Annual Meeting, Dec. 4-8 in Tampa, Florida. Her analysis showed that the consumption of dangerous drugs like fentanyl and amphetamines in the rural town rose during the early months of the pandemic.

The greatest increase, of 286 percent, was seen in usage of the stimulant Methylenedioxymethamphetamine or MDMA (commonly known as Ecstasy or Molly).

When an individual consumes drugs, traces of those chemicals eventually end up in sewage (via the toilet). To look for trends in drug use within the community, Pagsuyoin and her team collected sewage samples from a local wastewater facility twice monthly over a two-year period, from September 2018 to August 2020.

The samples were analyzed for concentrations of 10 priority opioids and stimulants, including morphine, codeine, hydrocodone, methadone, fentanyl, cocaine, methamphetamine, amphetamine, MDMA, and methyldiethanolamine or MDEA.

Study results showed that the highest per capita consumption was of cocaine, morphine, and amphetamine; that drug consumption was greater

during spring semesters; and that the highest per capita consumption of fentanyl was greater than that of other rural and university settings in the U.S. (as reported in previous studies).

According to the U.S. Centers for Disease Control and Prevention (CDC), New England is considered to be a hotspot of the opioid crisis in the U.S. There are high rates of drug consumption and drug-related deaths from [prescription drugs](#) such as fentanyl, oxycodone, hydrocodone, methadone, codeine and morphine. This newest research shows that some communities may also be experiencing a crisis with stimulants.

"Our findings reflect the regionwide problem with opioid-related overdoses and increasing stimulant prescription rates," says Pagsuyoin.

A new, rapid biosensor for detecting COVID in the air and wastewater

Pagsuyoin, who is an environmental engineer, has also been developing and testing a new, rapid biosensor for detecting COVID and other viruses in the air and water. This three-year pilot study is a collaboration with colleagues from the University of Massachusetts-Lowell, Northeastern University and the University of the Philippines.

The small sensor combines two different patented sensors—one created as a breathalyzer for detecting COVID, the other for detecting cancer in wastewater. "We tweaked the technology so it can work in air ducts as well as the sewer," says Pagsuyoin. "It's sensitive enough that we can use it to differentiate between COVID variants. It is also specific enough that it won't react to another pathogen that is not COVID." The researchers plan to test the new device in Massachusetts and the Philippines.

The researchers have named their new device DiSenDa (for Disease Surveillance with Multi-Modal Sensor Network and Data Analytics) and Pagsuyoin says it represents the first time that wireless sensing, genomic testing, [cloud computing](#), real-time [data analytics](#), [artificial intelligence/machine learning](#) and mobile apps are being used together to fight the pandemic.

"We like to think of DiSenDa as an inexpensive, low-maintenance early warning system for disease outbreaks," Pagsuyoin has said. "It's like having an army of sentinels constantly guarding people's health."

More information: Conference:
www.sra.org/events-webinars/annual-meeting/

Provided by Society for Risk Analysis

Citation: New England college town wastewater reveals high usage of stimulants and a rise in drug use during the pandemic (2022, December 6) retrieved 18 April 2024 from <https://medicalxpress.com/news/2022-12-england-college-town-wastewater-reveals.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--