

# 'Flushing' out drug use trends early in the COVID-19 pandemic

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At the start of the COVID-19 pandemic, stay-at-home orders and other restrictions drastically affected how people lived and worked, resulting in social isolation and economic instability. Now, researchers show that

some people turned to a variety of drugs for relief. Using wastewater analysis, the team identified a spike in consumption of easily abused prescription opioids and anti-anxiety sedatives, while some illicit drug use plummeted, between March and June 2020.

The researchers will present their results today at the fall meeting of the American Chemical Society (ACS).

[Previously](#), Bikram Subedi, Ph.D., and his research group used residues in wastewater to study illicit [drug](#) consumption in [rural communities](#). With the onset of COVID-19 restrictions, the team turned to wastewater again. "We hypothesized that some of the drug profiles would be different, and personal drug use behavior would be altered due to isolation, loss of jobs and loss of life," says Subedi, who is the principal investigator on the project.

By June 2020, about 40% of adults in the U.S. were struggling with their mental health, and 13% of those had started or increased their substance use, according to [survey results](#) published in an August 2020 paper by another team. So, to get an idea of community-wide habits and [anxiety levels](#) at the start of the pandemic, Subedi's team at Murray State University used wastewater epidemiology. They calculated per capita consumption for a diverse set of drugs based on their presence in sewage entering treatment plants. With this technique, the researchers developed comprehensive and nearly real-time patterns of prescription and [illicit drug use](#), which are important to public health authorities, law-enforcement and other agencies.

The researchers collected raw sewage samples from treatment facilities in two towns in western Kentucky and northwest Tennessee, says Alexander Montgomery, a graduate student who is presenting the work. Back in the lab, they measured the levels of easily abused prescription medications, illicit drugs and their metabolites. As Montgomery

explains, the team took extra precautions with these samples because no one knew if SARS-CoV-2 could survive in wastewater. "I had to be extremely careful with every step of the extraction and handling process," he says.

Their results showed that consumption of hydrocodone—one of the most abused prescription opioids—spiked by 72% from March to June 2020. The researchers suggest the change was because people had easier access to doctors as they switched to telemedicine appointments. Conversely, the use of illicit stimulants dropped by 16% for methamphetamine and 40% for cocaine. The researchers suggest that travel restrictions limited interstate and international trafficking of these drugs. "Our results match with all of the sources that we could find pertaining to other drug estimations in the community," says Montgomery, including declines in city and state police methamphetamine and cocaine seizures. And now, even more recent data released by the U.S. Centers for Disease Control and Prevention show that nationwide, [drug overdose deaths](#) increased by nearly 30% from the prior year with the majority caused by opioid overdoses. Overdose deaths from fentanyl-laced illegal stimulants also increased in 2020.

At the same time, the prevalence of benzodiazepines—anxiety-related sedatives—was elevated by nearly 30% and antidepressants increased by 40%. In a related project that is also being presented by Subedi's team at ACS Fall 2021, they examined the same wastewater samples for isoprostanes—hormones that indicate oxidative stress and anxiety—and found their levels rose significantly. "That tells us as people's anxiety levels increased, the levels of prescription drug consumption also increased," Subedi says, aligning with additional interventions recommended by health professionals to treat elevated [mental health](#) issues.

"The trends that we are reporting are only for the first four months of

the early COVID-19 pandemic, and they may not be true for an extended period of time," Subedi says. Although the pandemic is now receding in some parts of the world, the team continues monthly wastewater sampling. Subedi notes that monitoring the trends of drug use and community-level anxiety post-pandemic will help explain the overall effects that the COVID-19 pandemic has had on people's lives.

**More information:** Trends in drug consumption during COVID-19 pandemic using wastewater-based epidemiology, ACS Fall 2021.

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