

Research aims to curb fatalities caused by illicit drugs

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University of Technology Sydney (UTS) Center for Forensic Science Ph.D. candidate Harry Fursman is working on two fronts to prevent harm to people who use drugs: He is testing a new handheld device for

rapidly and accurately identifying drug specimens and conducting ongoing chemical analysis of used syringes.

Drugs that are contaminated or substituted with an unexpected substance are a leading cause of death among people who use drugs. In Sydney last week one person died and two people were taken to the hospital due to heroin overdoses, after using what they thought was cocaine.

Fursman aims to tackle this significant risk by providing objective insights into [current trends](#) and consumption habits among people who are injecting drugs. He will present his research on substance testing at the upcoming [International Association of Forensic Sciences \(IAFS\) conference](#) held in Sydney 20–24 November.

Portable drug testing device: MicroNIR

Fursman is testing a small handheld, near-infrared device known as the MicroNIR, which can rapidly and accurately identify and quantify suspected [drug](#) specimens. He wants to test this technology in Australian contexts, as well as assess its usability, costs and accuracy for operational implementation.

"Initially we had to optimize its use within Australia as it's based on machine learning models trained with drugs of different chemical compositions than we typically see here," Fursman said. "We found that it is very accurate. It correctly predicts the identity of suspected drugs over 95% of the time and the purity estimates obtained are also quite accurate.

"It is able to collect this highly [accurate data](#) not only by direct contact with a small amount of the substance but also by scanning through a plastic bag or glass container. This means we can help minimize risk to the person testing the drugs."

The MicroNIR is already in use in a number of countries. Fursman hopes to see it adopted in Australia, not only for policing but also at drug testing services for supervised injecting facilities, music festivals and clubs.

Chemical analysis of used syringes

In tandem with testing the MicroNIR device, Fursman is conducting ongoing chemical analyses of used syringes at the Sydney Medically Supervised Injecting Center (MSIC). The aim is to understand if people are injecting what they believe they are and to identify trends in injected substances over time.

"While most people are injecting what they think they are injecting (primarily heroin and methamphetamine), unexpected instances, like ketamine as a substitute for methamphetamine, underscore the need for vigilance and reliable testing methods.

"We've also found that in general there are not too many instances of heavily cut substances or multiple drugs injected at once," said Fursman.

Significance and implications

Fursman's research addresses a critical issue affecting people who use drugs, health professionals, and policymakers. By ensuring [accurate information](#) on the drugs being used, these findings empower individuals to make informed decisions about drug consumption, facilitating safer drug use practices.

The MicroNIR's potential integration into frontline policing and health care settings promises greater efficiency, safety, and decision-making in the fight against drug-related harm.

Collaborating closely with industry partners, such as MSIC, this research fosters real-world solutions, and aims to drive meaningful change toward a safer and more informed society.

Provided by University of Technology, Sydney

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