

Wastewater Forensic for Tracking Illicit Drug Use and Trade

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Abstract:

Globally, the consumption of illegal drugs is increasing rapidly. However, we have witnessed physical enforcement alone has not been able to effectively identify and control illicit drug use and trade. Recently, wastewater-based epidemiology (WBE) has emerged as a good alternative for objectively and rapidly identifying the spread of illegal drug use in a local community. In the EU, WBE is applied more for the influent of wastewater treatment plants (WWTP), which can provide information about socioeconomic characteristics of illegal drug (or narcotics) use in the WWTP service area. In fact, possession or use of illegal drugs is no longer considered as a crime in the EU. Therefore, WBE is utilized to understand regional distribution of illegal drug use: so-called epidemiological information. However, in a country like Korea where trade, possession, or use of illegal drugs is strictly prohibited, survey of domestic wastewater for identifying illegal content is being performed from a different perspective with the consideration of the fact that only limited number of people have the access to the drugs. The WBE for illegal drugs is being evolved to wastewater-based forensic (WEF) in Korea. In WEF, the sources of wastewater with high content of illegal drugs are tracked to develop a more effective interventions for the users. For the purpose, local sewer networks along with regional socio-economical development are analyzed using a geographic information system. Based on the information obtained by the sewer network analysis, wastewater collection sites are determined; wastewater samples collected at these sites are analyzed for determining contents of different drugs. In addition, past drug-related crimes in the region are analyzed together with the socio-economic information and the result from the analysis of wastewater samples using an AI-based statistical tool for better understanding the sources of illegal drugs in the region. In the conference, we will present in detail how we are carrying out WEF for identifying and understanding the trade and use of illicit drugs in Korea.

Key words: Wastewater Forensic, illicit drug, GIS, AI-based statistics

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