CAN DRUG PURITY ACCOUNT FOR THE INCREASING LOAD OF METHAMPHETAMINE IDENTIFIED IN AUSTRALIAN WASTEWATER MONITORING STUDIES?

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Introduction and Aims: Analysis of drug residues in wastewater is being increasingly applied internationally to monitor trends in drug consumption. Ongoing monitoring of an urban site in South-East Queensland has identified a four-fold increase in mean daily methamphetamine load between 2010 and 2015. This may relate to increases in numbers of consumers, increases in frequency of use, increases in drug purity, or a combination. This study aimed to determine whether purity changes could account for these trends in sewer loads.

Methods: Between 2010 and 2015, 486 daily representative samples were taken from a treatment plant serving an urban population of over 150,000. Purity data from methamphetamine seized in the same region were collected from Queensland Forensic services.

Results: Methamphetamine consumption estimated by wastewater increased from a mean of 363 to 1126 mg/1000/day between 2010 and 2015. Purity of seizures in this region increased from mean of 17.8% to 65.7% in this same period. These were strongly correlated ($r=0.88$, 95%CI 0.79-1.00, $p=0.02$). While there was a strong linear annual increase in methamphetamine load ($\beta=142.2$, 95%CI 79.3-205.1, $p=0.003$); after controlling for purity, the relationship between year and methamphetamine load did not differ from zero ($p=0.13$).

Discussions and Conclusions: Drug load estimations in wastewater monitoring do not routinely incorporate drug purity. This analysis demonstrates that purity changes can account for a substantial proportion of methamphetamine load increases in this region. If wastewater analysis is to be used in an ongoing monitoring capacity, local purity data must be incorporated to facilitate interpretation of trends.

Disclosure of Interest Statement: No pharmaceutical grants were received in the development of this study.