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Integration of wastewater-based epidemiology in the national drug monitoring system of various countries

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Aim: Illicit drug residues, in particular their urinary metabolites, are now being analysed in wastewater in various countries to assess and monitor the consumption of illicit drugs at the community level. The objective of this work is to present examples of how results from wastewater analysis can be used, together with conventional surveillance methods, to evaluate current drug policies, identify new threats to public health, develop new strategies and guide law enforcement, both at the regional and national level.

Methods: Results from wastewater sampling campaigns conducted in Switzerland and Belgium are scrutinised to understand their implications from the perspective of policy makers, social workers, addiction researchers and law enforcement. Current knowledge about the epidemiology of drug use in the investigated areas as well as police intelligence about the functioning and structure of local drug markets are included in the investigation. Focus is set on data about cocaine, heroin and amphetamine-type stimulants.

Results: Results from wastewater analysis provided an indirect estimate of the size of the drug market in the investigated areas, as well as a mean to monitor its evolution over time. This information is of particular interest for law enforcement trying to assess the share held by specific criminal organisations on local drug markets. This information can also help understand the structure of criminal organisations, as well as identify their supply routes. From an epidemiological perspective, the information derived from wastewater analysis facilitates the identification of potential changes in drug use (e.g. consumption habits, availability of new substances) compared to conventional surveillance methods. Furthermore, when data derived from the latter is combined to wastewater results, current drug policies and harm reduction measures can be better evaluated.

Conclusion: Wastewater-based epidemiology provides additional and highly relevant information to evaluate illicit drug use both from its epidemiological and criminal dimensions. Yet, to unfold its full potential and allow understanding the implications of wastewater results from a public health perspective, the approach needs to be integrated into the existing surveillance methods.