Temporal monitoring of stimulants during the first COVID-19 wave in Belgium from a wastewater-based epidemiologic perspective.

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Background and aims

- SARS-CoV-2 countermeasures could potentially limit consumption or access to stimulants
- In this study, wastewater-based epidemiology (WBE) was used to temporally estimate stimulant consumption during the first wave of the COVID-19 pandemic (Mar – Jun 2020)
- The aims were to (i) evaluate intra- and inter-year changes in consumption of stimulant use; and (ii) measure the effect of governmental restrictions on stimulant use during the first wave of the COVID-19 pandemic

Wastewater-based epidemiology

- Influent wastewater contains a wealth of information about the population attached to a wastewater treatment plant (WWTP)
- After exposure to xenobiotics, metabolic excretion products (biomarkers) are released, transported, and pooled in the sewer system
- Daily, 24-h composite, influent wastewater samples are analysed for these biomarkers, and measured concentrations are back-calculated to population-normalised mass loads (PNML) by considering the total volume of wastewater and population covered by the WWTP:
  \[ PNML = \frac{[\text{concentration sample}] 
  \times [\text{total wastewater volume}]}{[\text{population covered by WWTP}]} \]

Materials and methods

- 4 WWTP sampled = 4 cities
- 12% of Belgian population
- 341 composite 24-h influent samples analysed

Results

Amphetamine

Benzoylcegonine

MDMA

Fig 1: Timeline of governmental measures and period categorisation.

Graphs showing population normalised mass loads (mg/day/1000 people) for each period.

Discussion

- Limited impact of governmental restrictions on stimulant consumption during first wave
- People continue to use stimulants during home confinement
- Stable or increased consumption compared to 2019
- Findings not fully in agreement with survey reports, surveyed in population of known drug users, from Sciensano and EMCDDA

Conclusions

- WBE is a complementary data source on stimulant use
- It can be used to evaluate the impact of COVID-19 measures on stimulant consumption
- Triangulation between different information sources on stimulant use is needed, as inconsistencies were found

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