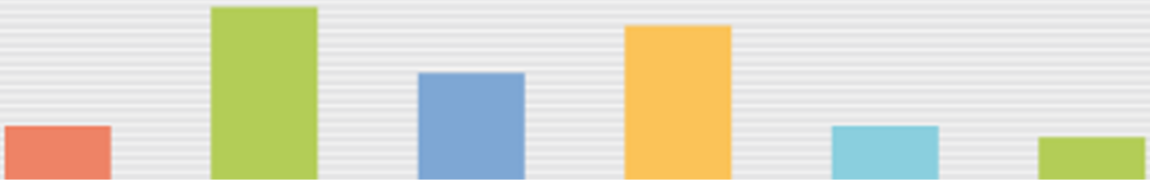
European Monitoring Centre
for Drugs and Drug Addiction

Wastewater based epidemiology
Introduction

Liesbeth Vandam and João Matias

19 September 2016



In this presentation…

- Wastewater based epidemiology - a new tool to rapidly report on new trends

- WBE:
  - Its potential for monitoring drug use
  - Challenges for and limitations of WBE

- EMCDDA publications on WBE

WBE — how does it work?

eawa
aquatic research

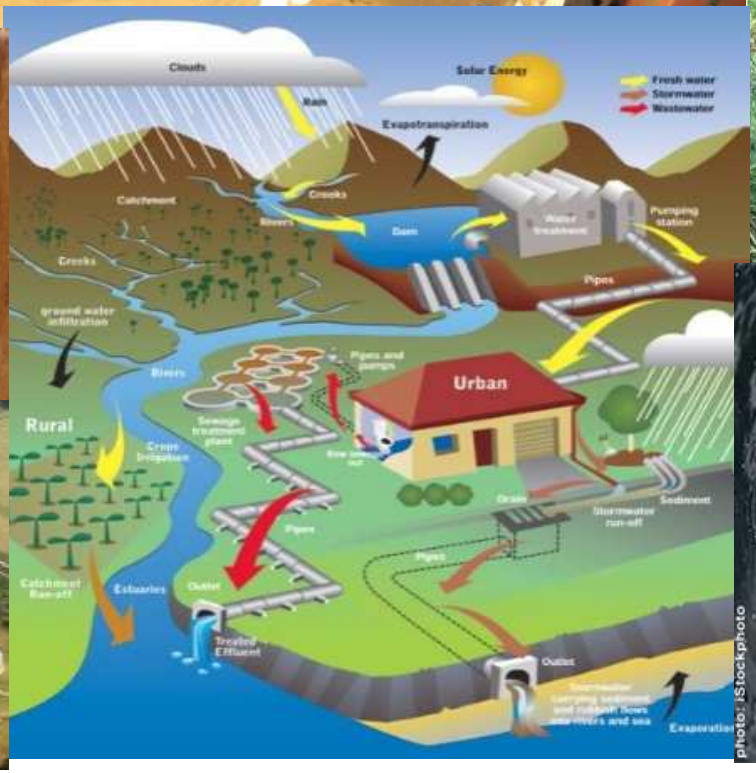
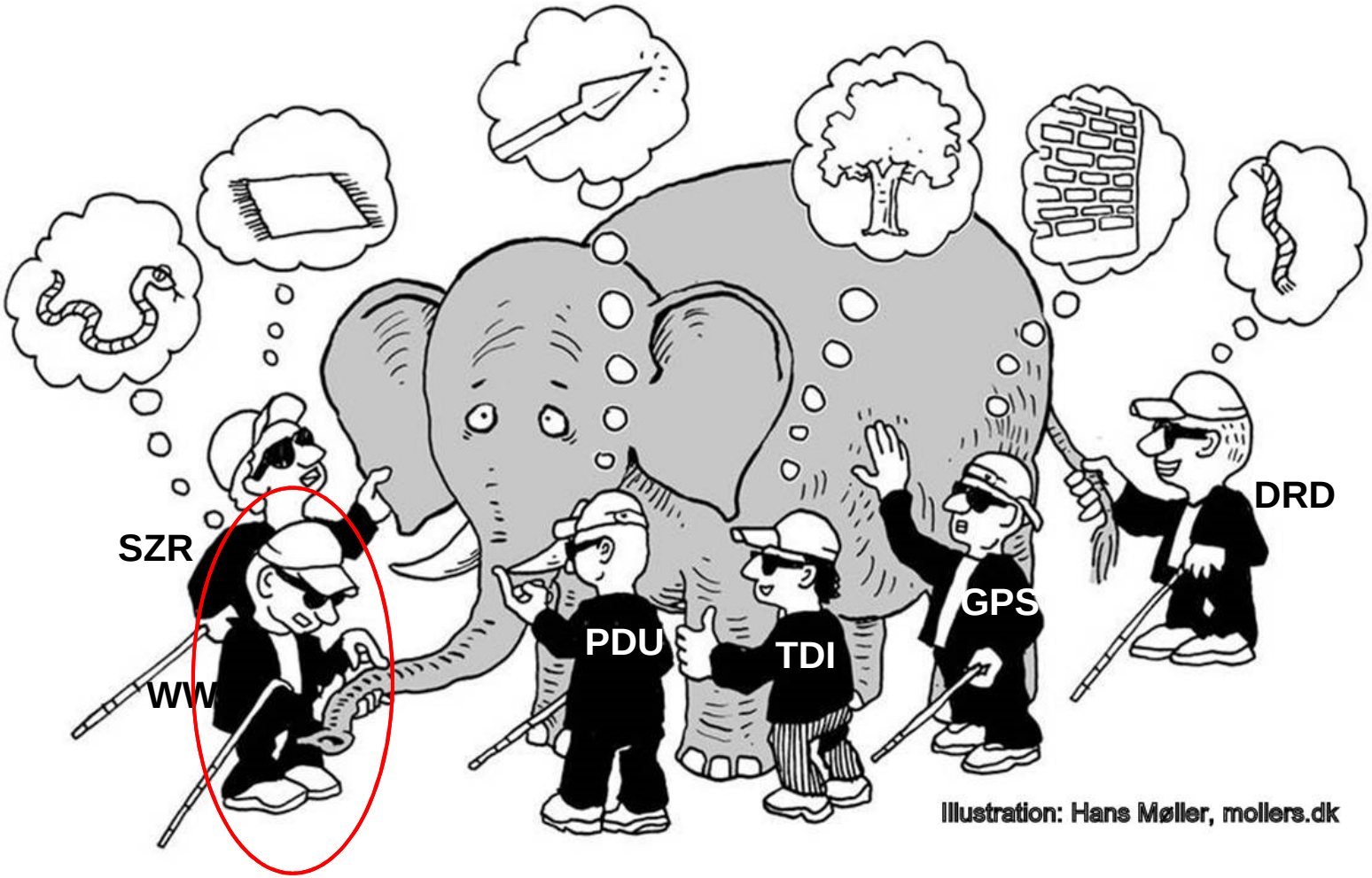
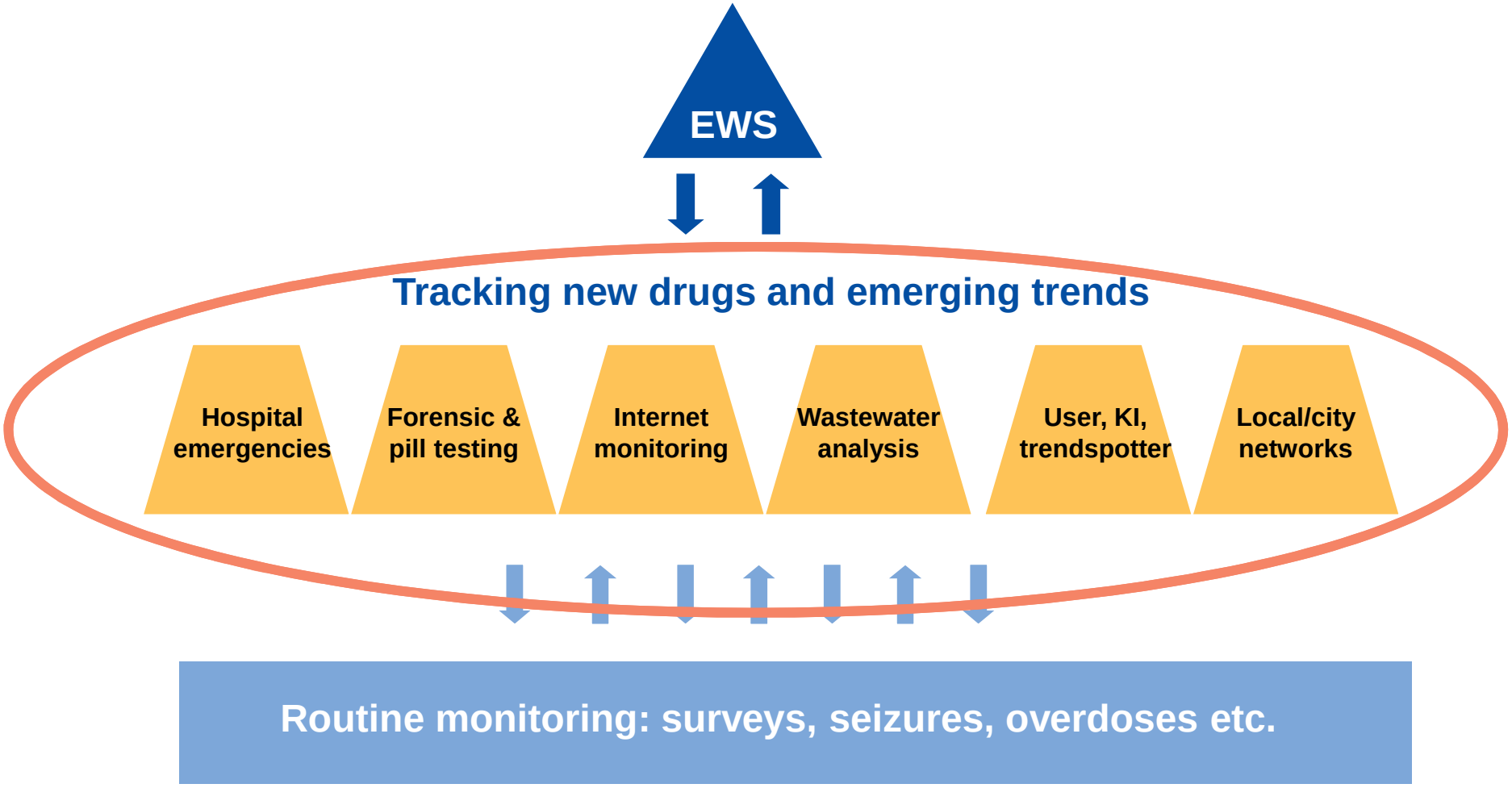

Clouds
Solar Energy
Rain
Evapotranspiration
Fresh water
Stormwater
Wastewater
Catchment
Creeks
Rivers
Dam
Water treatment
Pumping station
Pipes
ground water infiltration
Pipes and pumps
Urban
Rural
Sewage treatment plant
Crops Irrigation
Pipes
Drains
Sediment
Stormwater run-off
Catchment Run-off
Estuaries
Outlet
Treated Effluent
Outlet
Evaporation

photo: iStockphoto

WBE — a new tool in the epidemiological toolkit



WBE – a new tool to rapidly report on new trends



Wastewater analysis — its potential for drug use monitoring

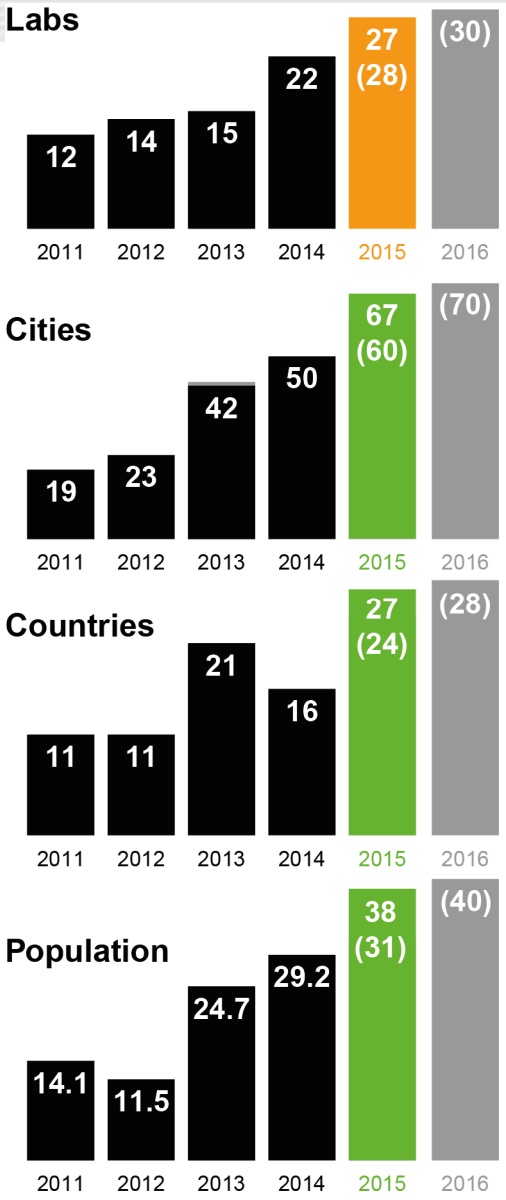
- Not subject to response and non-response bias
- It can better identify the true spectrum of drugs being consumed
- Timely information
- Information on geographical and temporal trends
- Relatively inexpensive

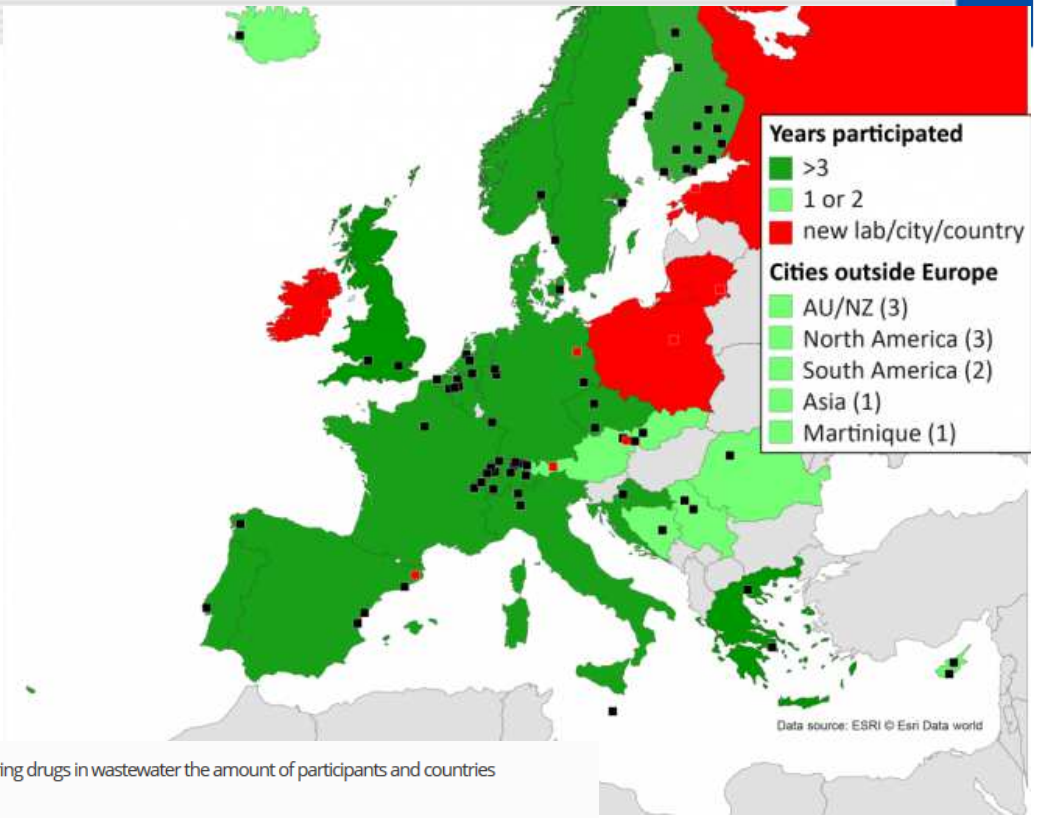
- Independent estimate of total consumption

Wastewater analysis — challenges and limitations

- No information on prevalence of use
- Recreational versus heavy drug users – complexity in patterns of use
    - Frequency of use
    - Which users
    - Routes of administration
    - Purity
- City data versus national data
- Wide range of uncertainties: sampling of wastewater, different back-calculation methods, behaviour of biomarkers in the sewer, etc.
- Ethical issues?

SCORE as data provider





Since 2011 when we started with monitoring drugs in wastewater the amount of participants and countries has been growing rapidly

Year	Countries	Cities
2011(1)	11	19
2012(2)	11	23
2013(2)	21	42
2014	19	50
2015	27	67
2016	>28	>70

2016: More information about the 2016 campaign can be found here

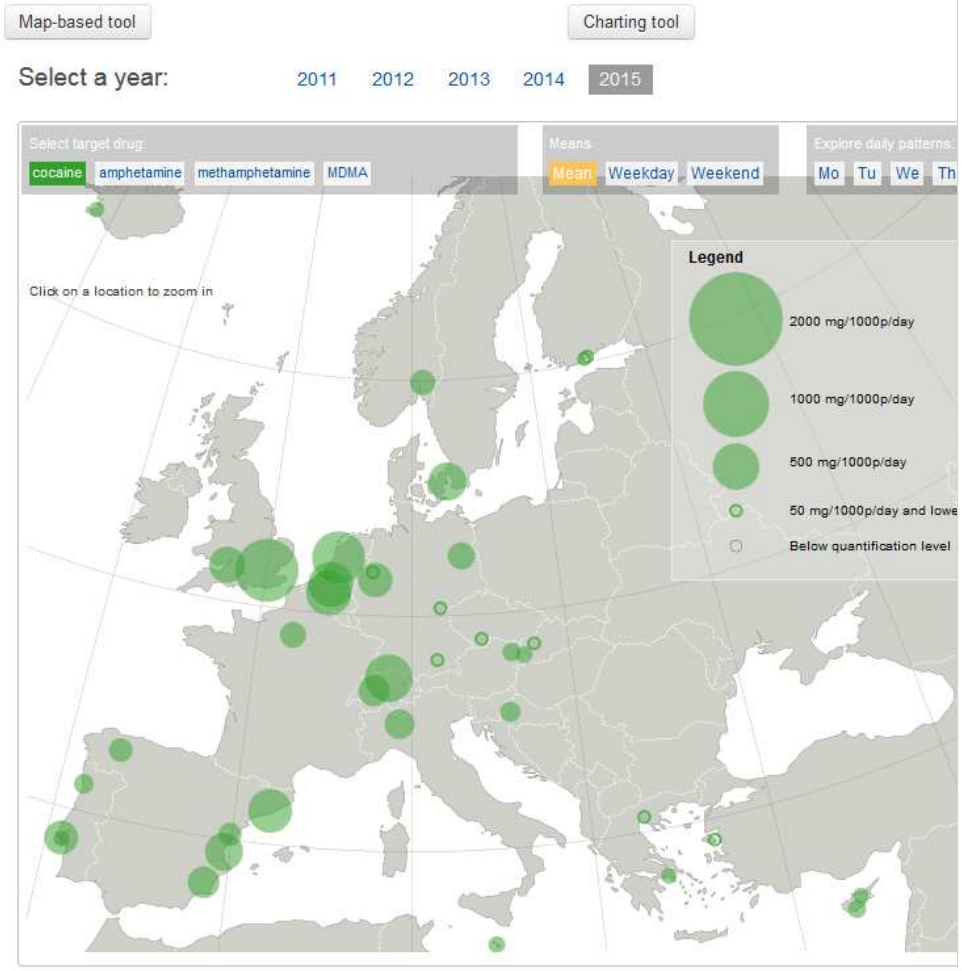
2015: The results of the 2015 monitoring campaign will be available 31th May 2016, here on the EMCDDA website together with the release of the European Drug Report (EDR) 2016.

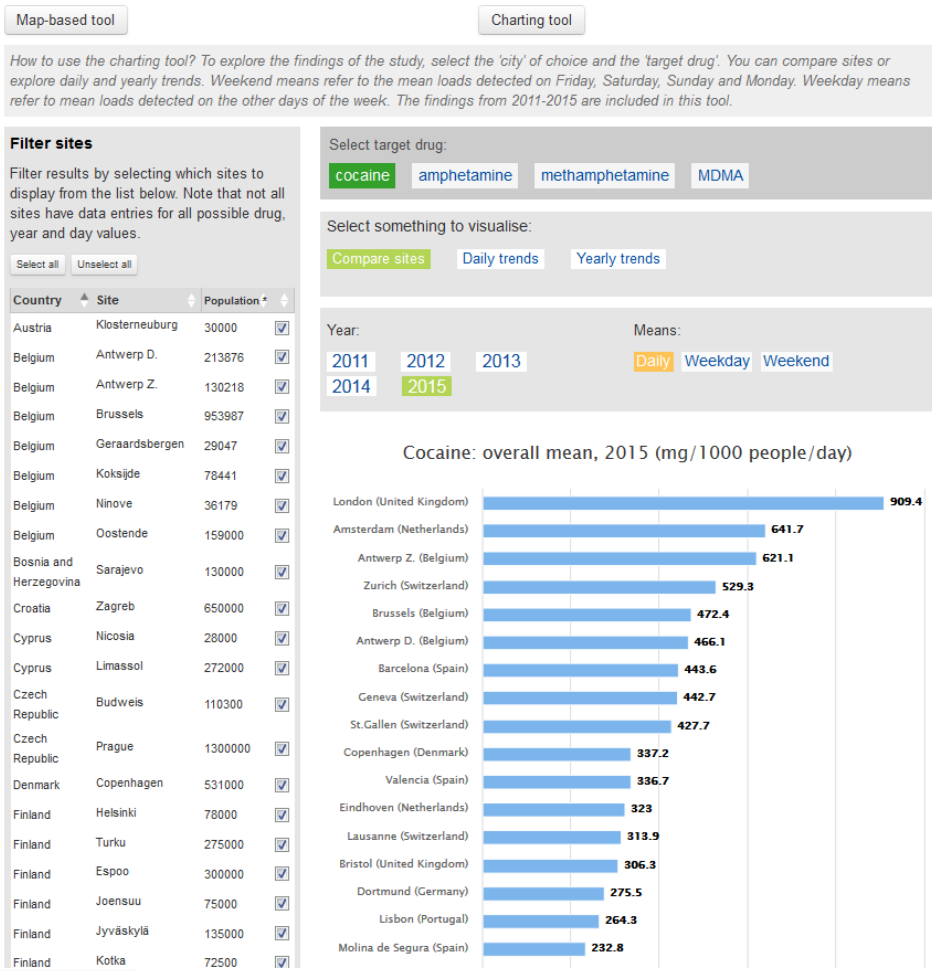
2014: The results of the 2014 monitoring campaign can be found here

score

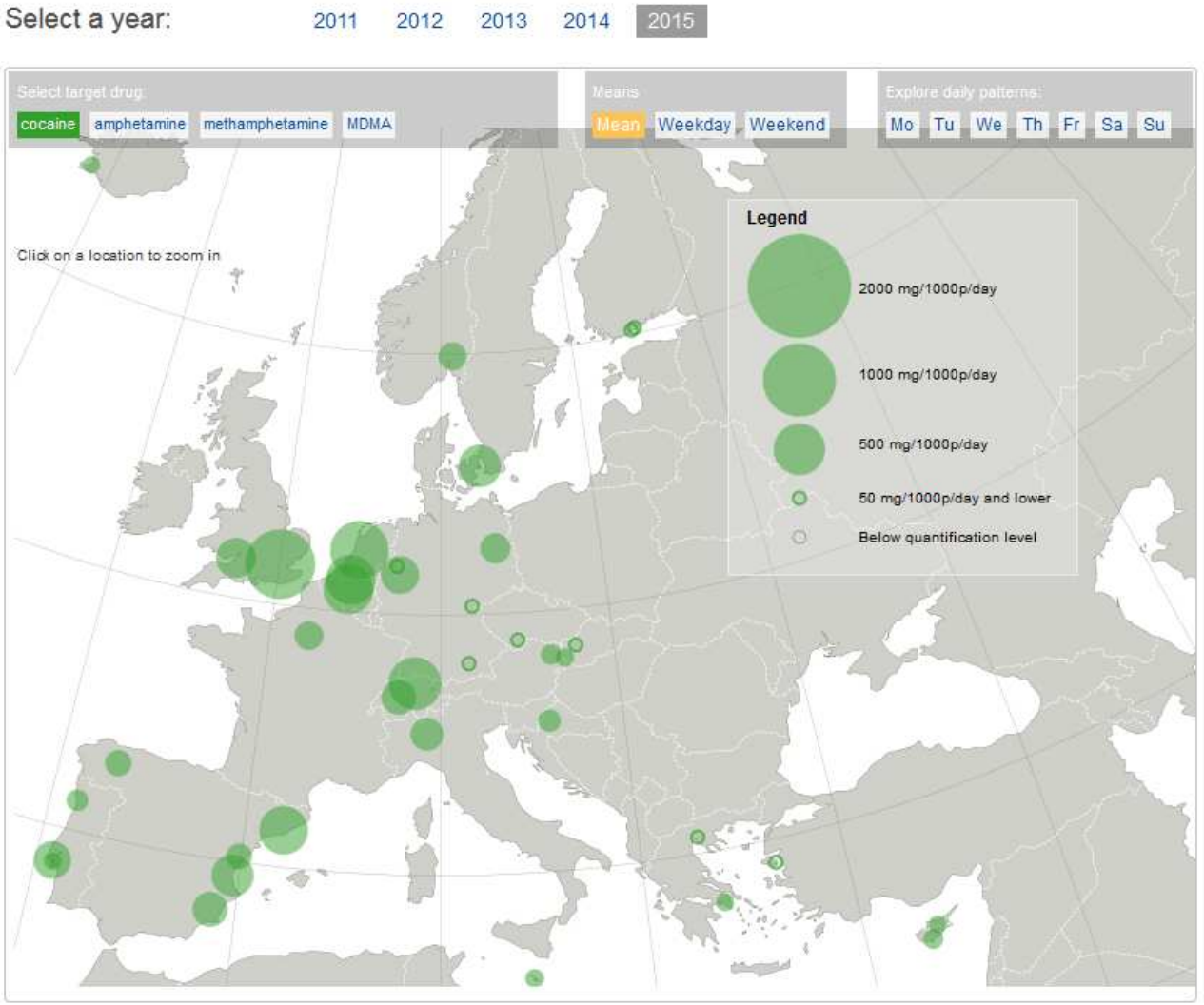
EMCDDA publication of wastewater findings

http://home.emcdda.europa.eu/topics/pods/waste-water-analysis

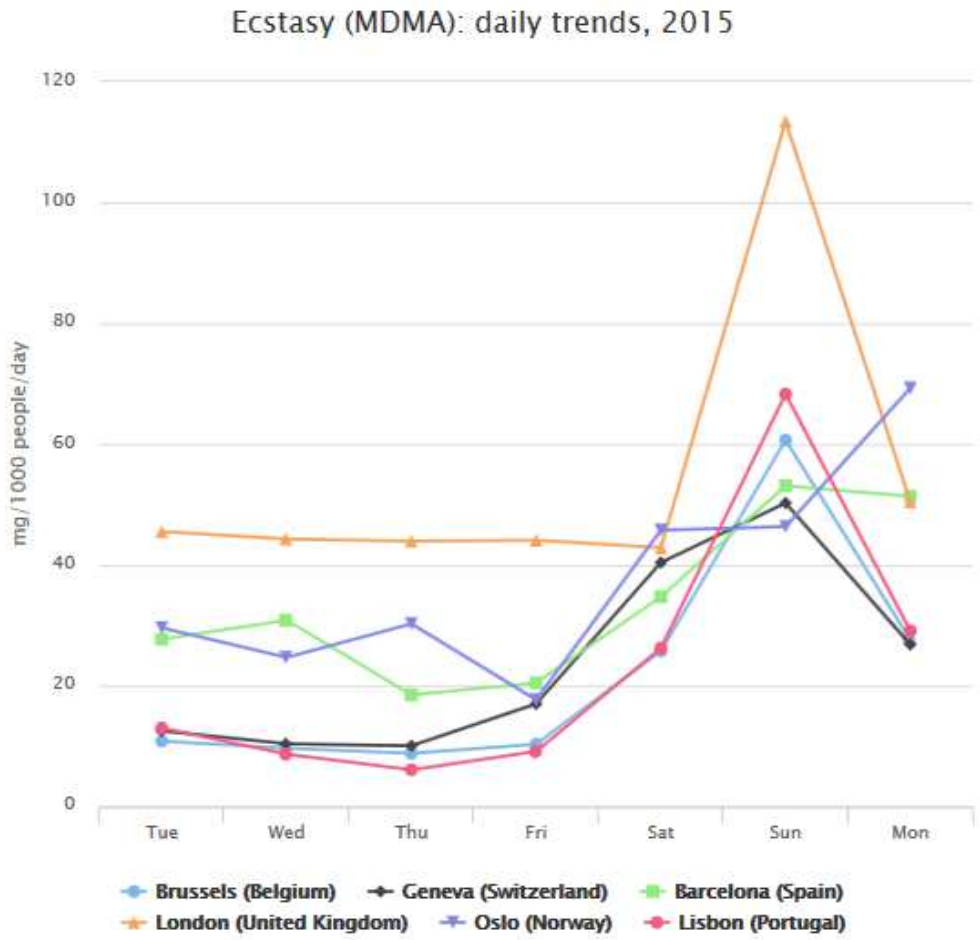




An overview of key results – geographical variation

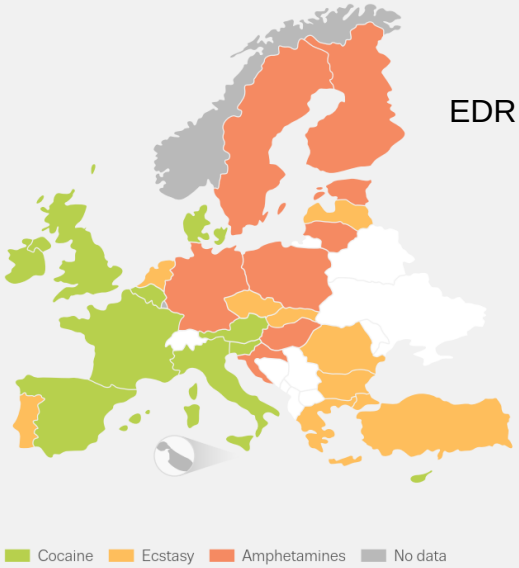


An overview of key results – temporal variation



Comparison with other monitoring tools?

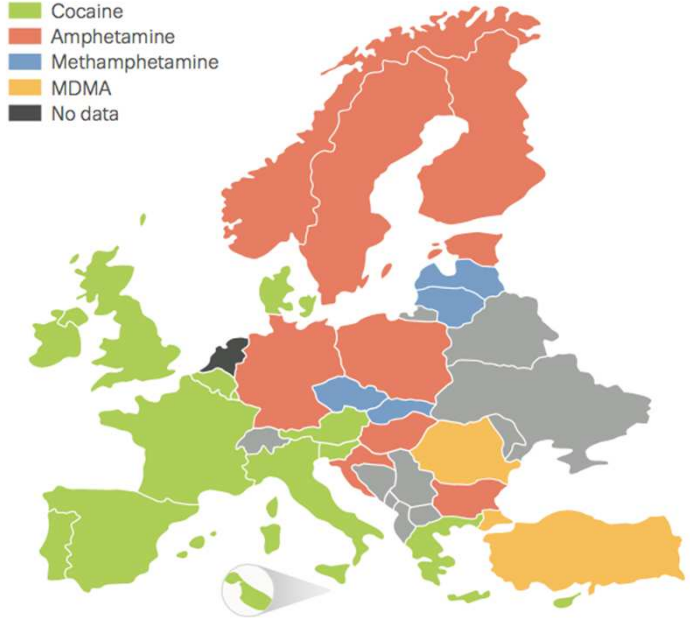
Predominant stimulant drug by last year prevalence among young adults (15–34)

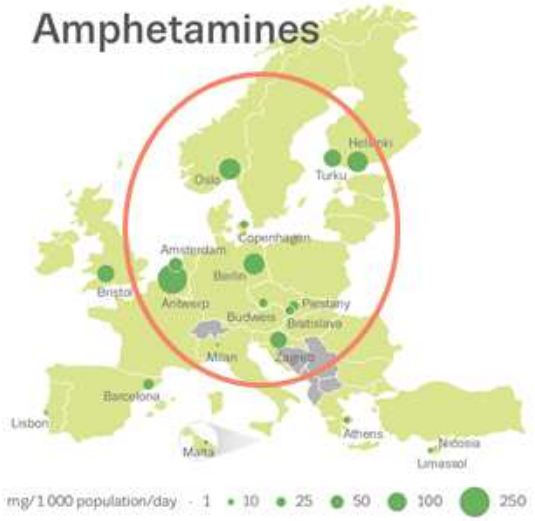


EDR 2015

EDR 2016:

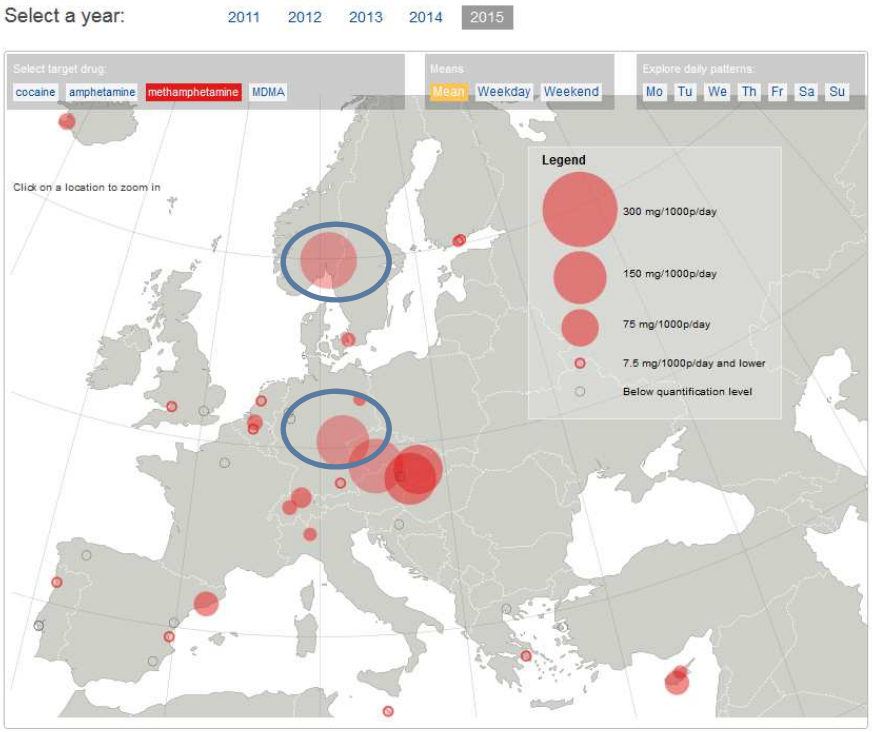
Most frequent stimulant seized in Europe, 2014 or most recent data



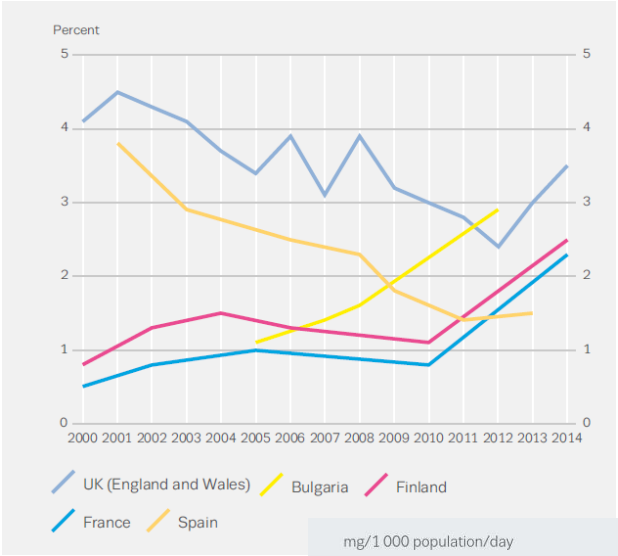


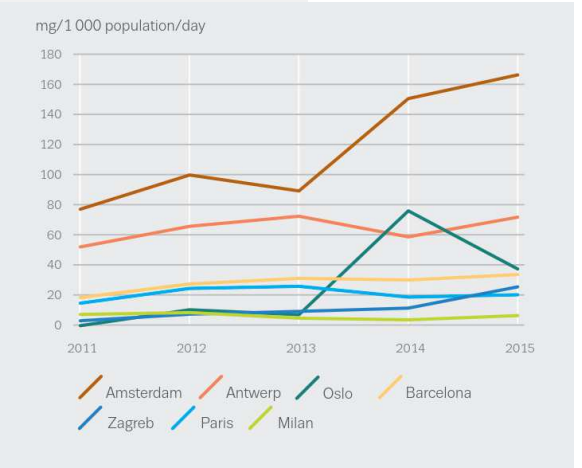
Comparison with other monitoring tools?

Methamphetamine changes



MDMA changes





Where do we go next?

- **WBE as a new tool in the epidemiological toolkit – integration in EDR and Statistical Bulletin**
- **Further comparisons are needed between wastewater and other data sets**
- WBE can provide information on illicit drugs, tobacco, misuse of medicines, health and illness indicators
- WBE as an outcome measurement tool?
- Total consumption estimates?

Find out more?

Wastewater analysis and drugs — a European multi-city study

Intro | 1. Analysis | 2. Interactive | 3. Terms and definitions | 4. Methods and ethics | Find out more

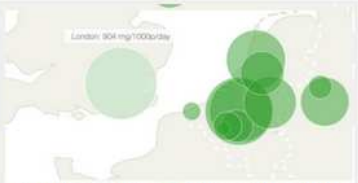
Introduction

Last update: 31.05.2016

The findings of the largest European project to date in the emerging science of wastewater analysis are taken up in this 'Perspective on drugs'. The project in question analysed wastewater in over 60 European cities and towns (hereinafter referred to as 'cities') to explore the drug-taking habits of those who live in them. The results provide a valuable snapshot of the drug flow through the cities involved, revealing marked geographical variations*.

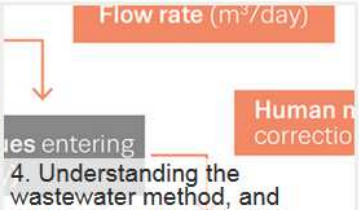
Part of the Perspectives on drugs *(PODs) series, launched as part of the European Drug Report package, these designed-for-the-web interactive analyses provide deeper insights into a selection of important issues.*

1. Analysis: results from a European multi-city study



2. Interactive: explore the data from the study

3. Terms and definitions



4. Understanding the wastewater method, and addressing ethical issues

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*In total, 67 cities in 27 countries worldwide participated in the 2015 SCORE wastewater monitoring campaign. For the purpose of this analysis data was analysed from 44 cities in 18 countries (EU and Norway). Additional data from other countries and cities can be found in the POD interactive element.

Was

Activities in the area of wastewater analysis

Analysing communal wastewaters for drugs and their metabolic products in order to estimate their consumption in the community is a developing field, involving scientists working in different research areas, including analytical chemistry, physiology and biochemistry, sewage engineering, spatial epidemiology and statistics, and conventional drug epidemiology.

News | Data | Meetings | Key documents

Key documents and related project studies

Related projects

- SEWPROF Initial Training Network
- Sewage Analysis CORe group Europe (SCORE)

Guidelines

- Score-consensus protocol for sampling, analysis and report (October 2013)

Key scientific articles

- Rodríguez-Álvarez, T., Racamonde, I., González-Mariño, I., Borsotti, A., Rodil, R., Rodríguez, I., Zuccato, E., Benito Q J., Castiglioni, S., (2015), 'Alcohol and cocaine co-consum two European cities assessed by wastewater analysis', Sci the Total Environment, 536, pp. 91-98.
- Mastroianni, N., Lopez de Alda, M., Barcelo, D., (2015), 'Comprehensive monitoring of the occurrence of 22 drugs of and transformation products in airborne particulate matter ir city of Barcelona', Science of the Total Environment, 532, pp.344-352.
- Been, F., Benaglia, L., Lucia, S., Gervasoni, J-P., Esseiva, Delémont, O., (2015), 'Data triangulation in the context of o monitoring via wastewater analyses', Drug and Alcohol Dependence, 151, pp.203-210.

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Thank you!

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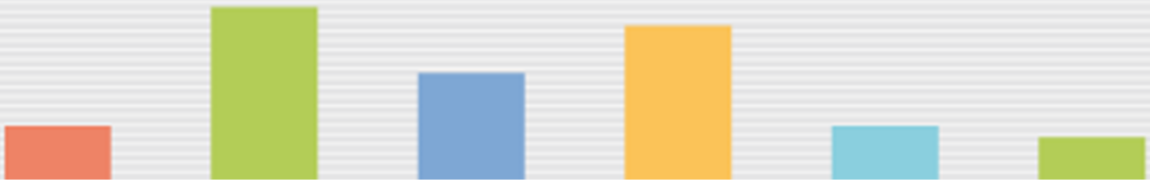
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