



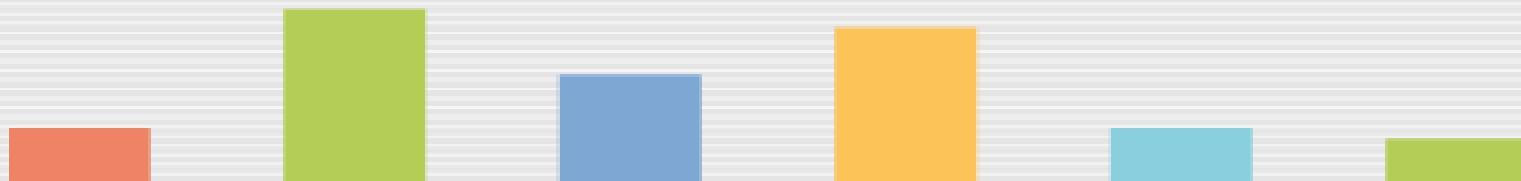
European Monitoring Centre  
for Drugs and Drug Addiction

# Analysis of used syringes

## Results from a sentinel network in European cities - 2021

The ESCAPE network – EMCDDA

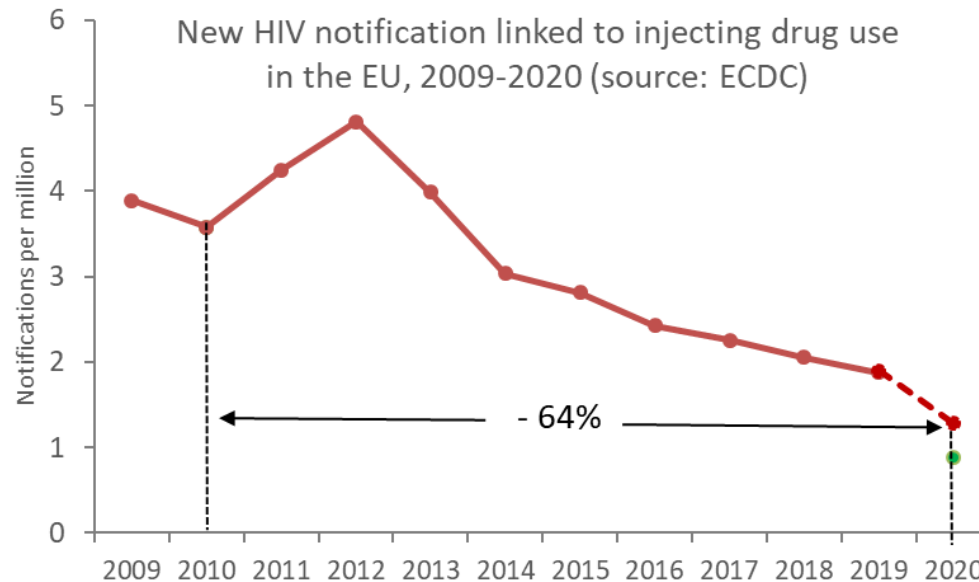
LA 2022



# Background

## Injecting drug use in the EU

- Prevalence: 2.5 [UI: 2.0-3.5] per 1,000 population 15-64 year in EU + Norway (2020)
- An estimated 559,000 PWID population in EU + Norway (2020)
- High burden of overdose and infectious diseases (HCV, HIV, HBV, bacterial infections): 705 000 DALYS for HCV attributable to injecting drug use in Western Europe in 2013 (Degenhardt et al, 2016)



# HIV outbreaks among PWID and substances injected

Most recent HIV outbreaks documented and stimulant use among PWID in Europe, 2014-22

THE LANCET HIV

ARTICLES | VOLUME 6, ISSUE 5, E315-E324, MAY 01, 2019

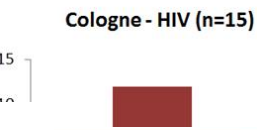
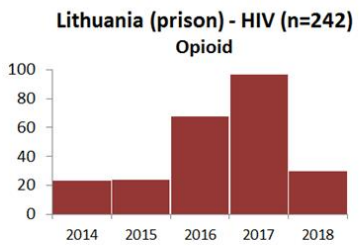
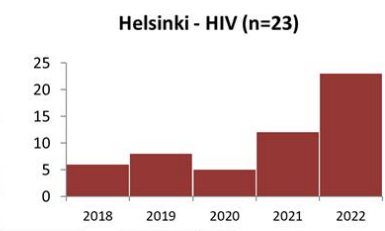
Re-emergence of HIV related to injecting drug use despite a comprehensive harm reduction environment: a cross-sectional analysis

Andrew McAuley, PhD, Norah E Palmateer, PhD, Prof David J Goldberg, DSc, Kirsten M A Trayner, MPH, Samantha J Shepherd, PhD, Rory N Gunson, PhD, et al. Show all authors

52-3018(19)30036-0 Check for updates

Eurosurveillance Europe's journal on infectious disease surveillance, epidemiology and public health

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Rapid communication

Injection of new psychoactive substance snow blow associated with recently acquired HIV infections among homeless people who inject drugs in Dublin, Ireland, 2015

Check for updates

Open Access

Like 0 Download

Coralie Giese<sup>1,2</sup>, Derval Igwe<sup>2</sup>, Zorina Gibbons<sup>3</sup>, Caroline Hurley<sup>4</sup>, Siobhan Stokes<sup>3</sup>, Sinead McNamara<sup>3</sup>, Orla Ennis<sup>4</sup>, Kate O'Donnell<sup>2</sup>, Eamon Keenan<sup>3</sup>, Cillian De Gascun<sup>5,6</sup>, Fiona Lyons<sup>7</sup>, Mary Ward<sup>4</sup>, Kostas Danis<sup>1,8</sup>, Ronan Glynn<sup>4</sup>, Allison Waters<sup>3</sup>, Margaret Fitzgerald<sup>4</sup>, on behalf of the outbreak control team<sup>9</sup>

## PLOS ONE

OPEN ACCESS PEER-REVIEWED

RESEARCH ARTICLE

Injection of cocaine is associated with a recent HIV outbreak in people who inject drugs in Luxembourg

Vic Arendt, Laurence Guillorit, Alain Origer, Nicolas Sauvageot, Michel Vaillant, Aurélie Fischer, Henri Goedertz, Jean-Hugues François, Ivailo Alexiev, Thérèse Staub, Carole Seguin-Devaux

Published: May 16, 2019 • <https://doi.org/10.1371/journal.pone.0215570>

JOURNAL ARTICLE

A Recent Human Immunodeficiency Virus Outbreak Among People Who Inject Drugs in Munich, Germany, Is Associated With Consumption of Synthetic Cathinones

Kirsten Hanke, Stefan Fiedler, Christina Grumann, Oliver Ratmann, Andrea Hauser, Patrycja Klink, Karolin Meixenberger, Britta Altmann, Ruth Zimmermann, Ulrich Marcus

Show more

Open Forum Infectious Diseases, Volume 7, Issue 6, June 2020, ofaa192, <https://doi.org/10.1093/ofid/ofaa192>

SSA SOCIETY FOR THE STUDY OF ADDICTION

Full Access

transmission following a large outbreak among people who inject drugs in Athens, Greece (2014–20)

Stavros Paraskakis, Mina Psychogiou, Evangelia Georgia Kostaki, Eleni Flountzi, Ilios Savvas Chaikalas, Martha Papadopoulou ... See all authors

January 2022 | <https://doi.org/10.1111/add.15812>



# Infective endocarditis and substances injected

Open access

Special populations

## **openheart** Different drugs, different sides: injection use of opioids alone, and not stimulants alone, predisposes to right- sided endocarditis

---

Rochelle Johnstone,<sup>1,2</sup> Nadine Khalil ,<sup>1,2</sup> Esfandiar Shojaei ,<sup>1</sup> Klajdi Puka,<sup>3</sup>  
Lise Bondy,<sup>1,2</sup> Sharon Koivu,<sup>4</sup> Michael Silverman<sup>1,2</sup>

Johnstone R, et al. Open Heart 2022;9:e001930. doi:10.1136/openhrt-2021-001930

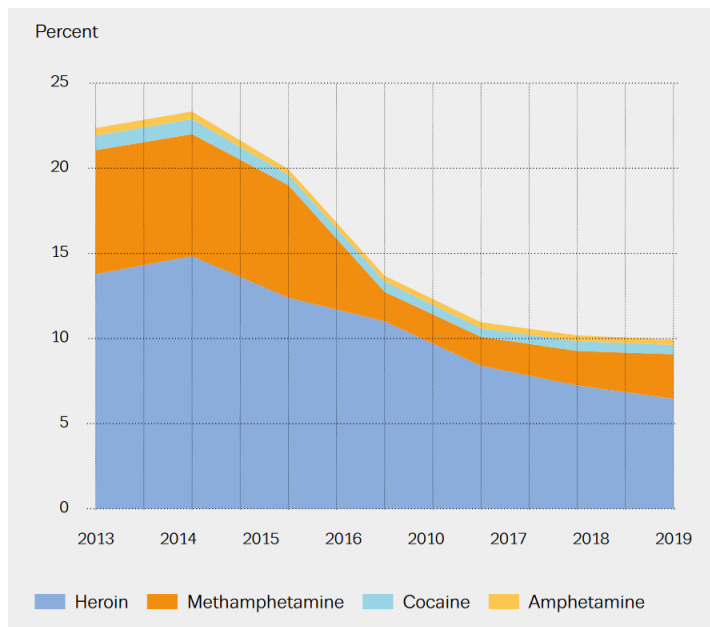


# Background

## Limitations of existing data sources on substances injected

- Treatment Demand Indicator: self-reported, focus on primary drug, bias towards opioids
- Surveys among PWID: self-reported

Injecting among first-time treatment entrants with heroin, cocaine, amphetamine or methamphetamine as primary drug: percentage reporting injecting as main route of administration [source: EMCDDA]



Fake oxycodone tablets seized in Europe in 2021-2022  
[Source: EMCDDA]

(a) Fake oxycodone tablets containing metonitazene seized by Norwegian customs, Norway, July 2021



Source: Norwegian Customs Laboratory.

# Objective

## Objective of the ESCAPE network

- To identify which drugs are injected in participating cities by analysing the content of a sample of used syringes
- Last campaign 2021
- To share knowledge and expertise

score



# Methods

## ESCAPE collection sites 2021

- 13 cities from 12 countries



- 45 collection sites from 13 cities

### Face-to-face needle and syringe exchange programmes (NSP)



People who inject drugs can anonymously discard used syringes into an appropriate container in the low-threshold facility and receive in turn new injection paraphernalia.

65% NSP

### Automatic injection kit dispensers with bins (AIKD)



Street-mounted automatic dispensers enable the self-operated exchange of injection equipment. Used syringes can be deposited in a special container in return for a token, which can be exchanged for an injection kit from the dispenser. AIKD has the potential to reach injecting drug users who are not in contact with health and social services.

27% AIKD

### Drug consumption rooms



In drug consumption rooms, the exchange process is reversed. A sterile syringe is given to a user. After the supervised injection, the user disposes the syringe in a container located in the supervised injection room.

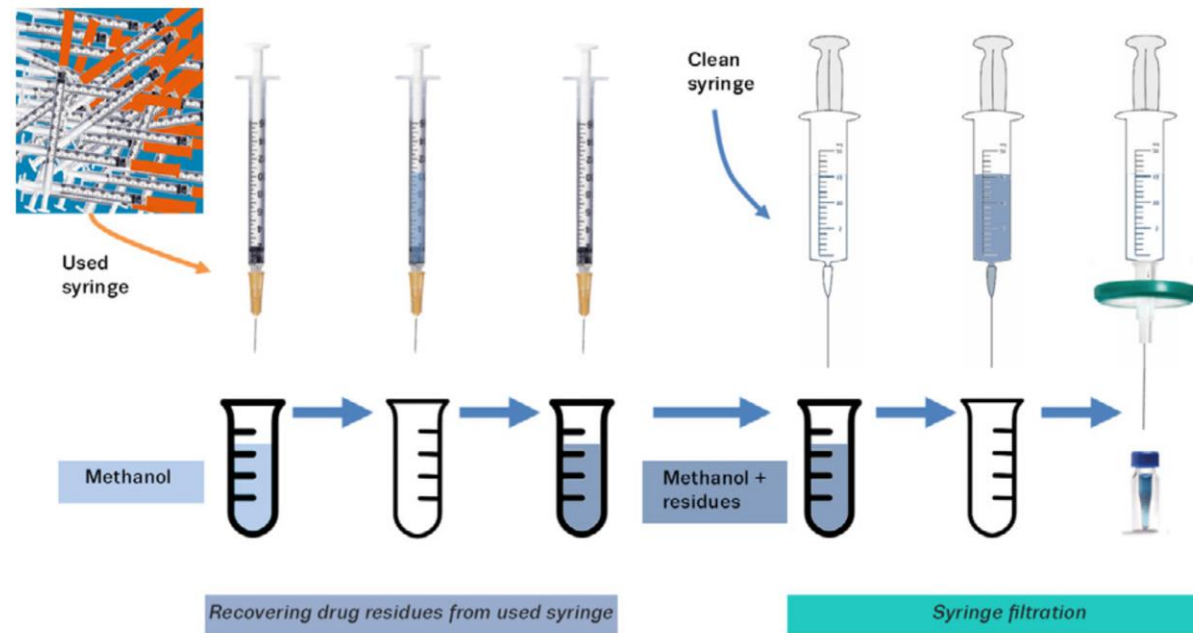
4% DCR

# Methods

## ESCAPE laboratory methods

### Extraction

Extraction of syringe content for chemical analysis, ESCAPE



### Analytical methods

City	Laboratory	Analytical method	Equipment
Balty	Forensic Expert Centre in Chisinau	Screening method	GC-MS/MS
Budapest	Toxicology Laboratory of the Institute of Forensic Medicine of the University of Debrecen	Screening method	GC-MS
Cologne	Institute of Forensic Medicine, Medical Center - University of Freiburg	Targeted screening method	HPLC-MS
Dublin	HSE National Drug Treatment Centre Laboratory	Targeted screening method	HPLC
Helsinki	Forensic Toxicology Unit at National Institute for Health and Welfare	Targeted and non-targeted screening methods (~1200 drugs in database and possibility to detect unknown compounds)	UHPLC-MS/MS UHPLC-QTOF/MS
Lausanne	University Institutes at the University Center of Legal Medicine, Lausanne-Geneva	Screening method	GC-MS
Oslo	Department of forensic Sciences, Oslo University Hospital	Targeted screening method	UHPLC-MS/MS
Paris	Laboratory of Public health and Environment Paris Sud University	Targeted screening method	HPLC-MS/MS
Vilnius	Lithuanian Police Forensic Science Centre and Forensic Science Centre of Lithuania.	Screening method	GC-MS
Tallinn	Estonian Forensic Science Institute	Screening method	GC-MS
Riga	Latvian Institute of Organic Synthesis	Targeted and non-targeted screening method, library search	UHPLC-QTOF/MS
Prague	Forensic Laboratory of Biologically Active Substances	Screening method and library search	UHPLC-MS/MS





# Methods

## Indicators

- Percentage of detection by drug category (substances classified in 19 drug categories + degradation products + adulterants), by city
- Percentage of syringes with 2 or more combinations of drug categories, by city
- Denominator: total number of syringes testing positive for at least one drug category, by city

## Data entry, validation and analysis

- ESCAPE generic protocol
- ESCAPE platform



European Syringe Collection  
and Analysis Enterprise  
Generic Protocol



**ESCAPE** About ESCAPE

Available data on the substances injected by users are based on self-reports collected in drug treatment registries or ad-hoc surveys. While these data are informative, they are often available only after some delay and are not analytically confirmed. Moreover, little is known about people who inject drugs that are not reached by drug services. The ESCAPE (European Syringe Collection and Analysis Project Enterprise) project seeks to complement existing data on substances injected by users, by providing timely and local information derived from the analysis of the residual content of used syringes.

**About the platform**

This interactive ecosystem is restricted to the members of the ESCAPE network and integrates:

1. An interactive dashboard providing an overview of validated results, with the possibility to navigate between cities, sites, years and substances.
2. A data entry module that allows the network to securely report data from the chemical analysis as well as qualitative information on the local context where syringes/needles are collected.
3. A social network module (humhub) allowing members of the network to interact in a secure environment, sharing questions, information and experiences.
4. A data management module to update information on members of the network, cities, collection sites and participating laboratories.

**FAQ:** We have a section in the Forum for Frequently Asked Questions. In case you have comments, questions or suggestions you would like to make please use the FAQ section of the Forum

Dashboards Data Entry Management Forums

# Results 2021 campaign

Number of syringes/needles analysed:

**2008**



Number of syringes/needles with any psychoactive substance:

**1733**



Number of psychoactive substances detected:

**63**

# Results 2021 campaign

	amphetamines	heroin	cocaine	cathinones	methadone	fentanyl and derivatives	buprenorphine	benzodiazepines	other opioids	piperidines & pyrrolidines	ketamine	MDMA	morphine	other amphetamines	other drugs	other medicines
<b>Dublin (89)</b>	36%	93%	87%	11%	62%			3%	8%	1%	8%					27%
<b>Paris (120)</b>	7%	5%	11%	89%	12%	3%	5%	1%	2%		1%		8%			1%
<b>Cologne (332)</b>	1%	86%	47%	1%	3%					4%						
<b>Lausanne (124)</b>		17%	77%		2%			27%	8%				15%			
<b>Oslo (160)</b>	59%	68%	3%				1%	4%	1%	1%	1%	1%	3%			
<b>Prague (162)</b>	62%	11%	1%	2%		1%	49%									1%
<b>Budapest (130)</b>	4%	60%	18%	43%	8%				1%					2%		
<b>Helsinki (167)</b>	41%		1%	8%	2%		38%	17%		1%						2%
<b>Tallinn (120)</b>	68%		15%	25%	2%	2%	4%	3%	13%			4%				
<b>Riga (121)</b>	47%	2%		20%	12%	2%	19%	6%	1%			6%	2%			7%
<b>Vilnius (57)</b>	7%	4%			4%	88%									2%	
<b>Balty (96)</b>	19%			7%	46%			3%	31%							



# Results 2021 campaign: Dublin

Number of syringes/needles analysed

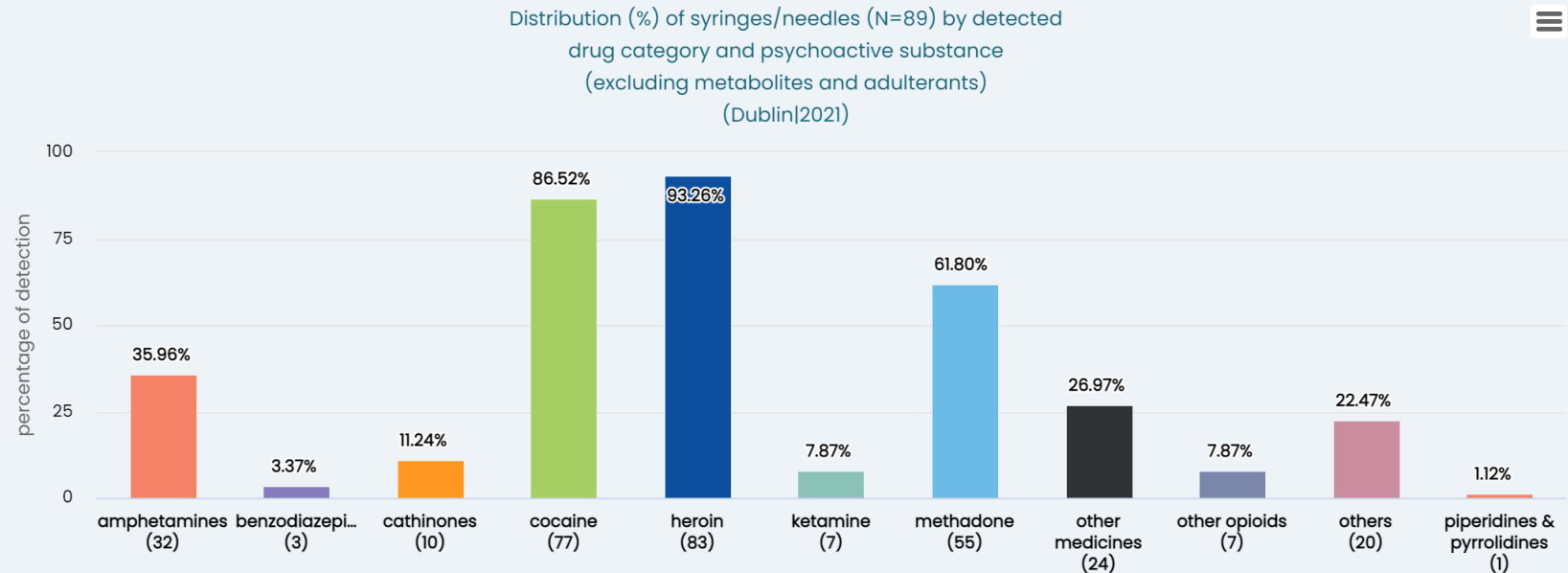
100

Number of syringes/needles with any psychoactive substance

89

Number of psychoactive substances detected

22



- **Main finding/new trend:** heroin (93%) with re-emergence of cocaine (87%)
- **Combinations:** 95% of syringes containing 2 or more drug categories (Most common: cocaine + heroin + methadone)
- **Other substances of public health relevance:**
  - New evidence of cathinone use (3-MMC) – risk assessment by EMCDDA in 2022
  - Methamphetamine (36%) – chemsex scene?
  - 8% of syringes contained oxycodone
  - 25% of syringes contained pregabalin



# Results 2021 campaign: Helsinki

Number of syringes/needles analysed

186

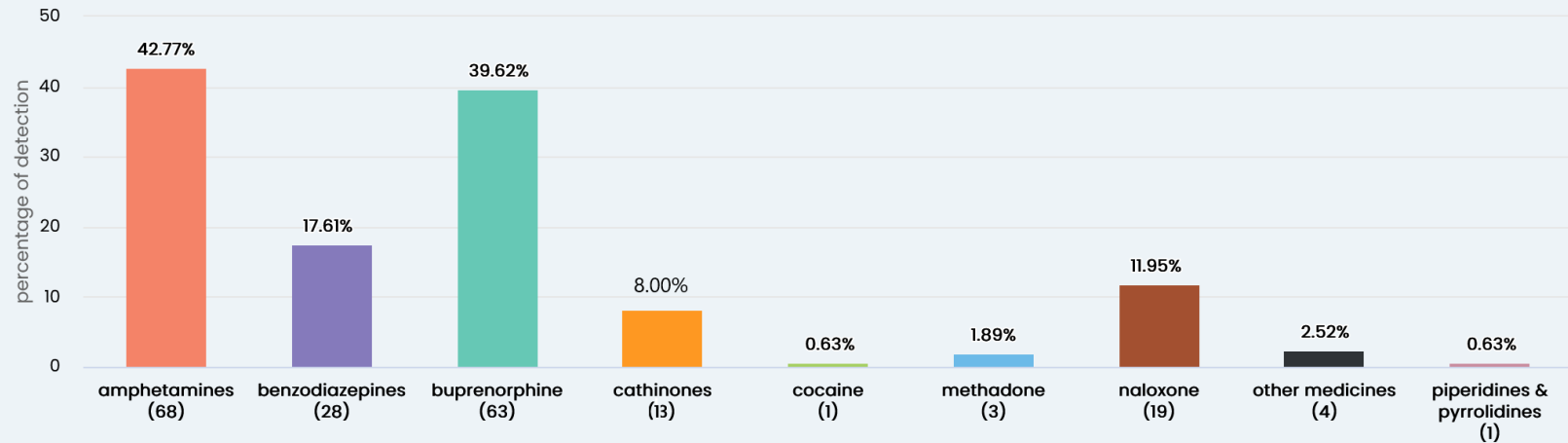
Number of syringes/needles with any psychoactive substance

159

Number of psychoactive substances detected

16

Distribution (%) of syringes/needles (N=159) by detected drug category and psychoactive substance (excluding metabolites and adulterants) (Helsinki|2021)



- **Main finding/new trend** : amphetamine (43%), buprenorphine (40%)
- **Combinations**: 17% of syringes containing 2 or more drug categories (Most common: amphetamine + buprenorphine)
- **Other substances of public health relevance** :
  - Benzodiazepines (alprazolam, midazolam, clonazepam) (18%)
  - Cathinones (alpha-PHP) (7%)



# Results 2021 campaign: Vilnius

Number of syringes/needles analysed

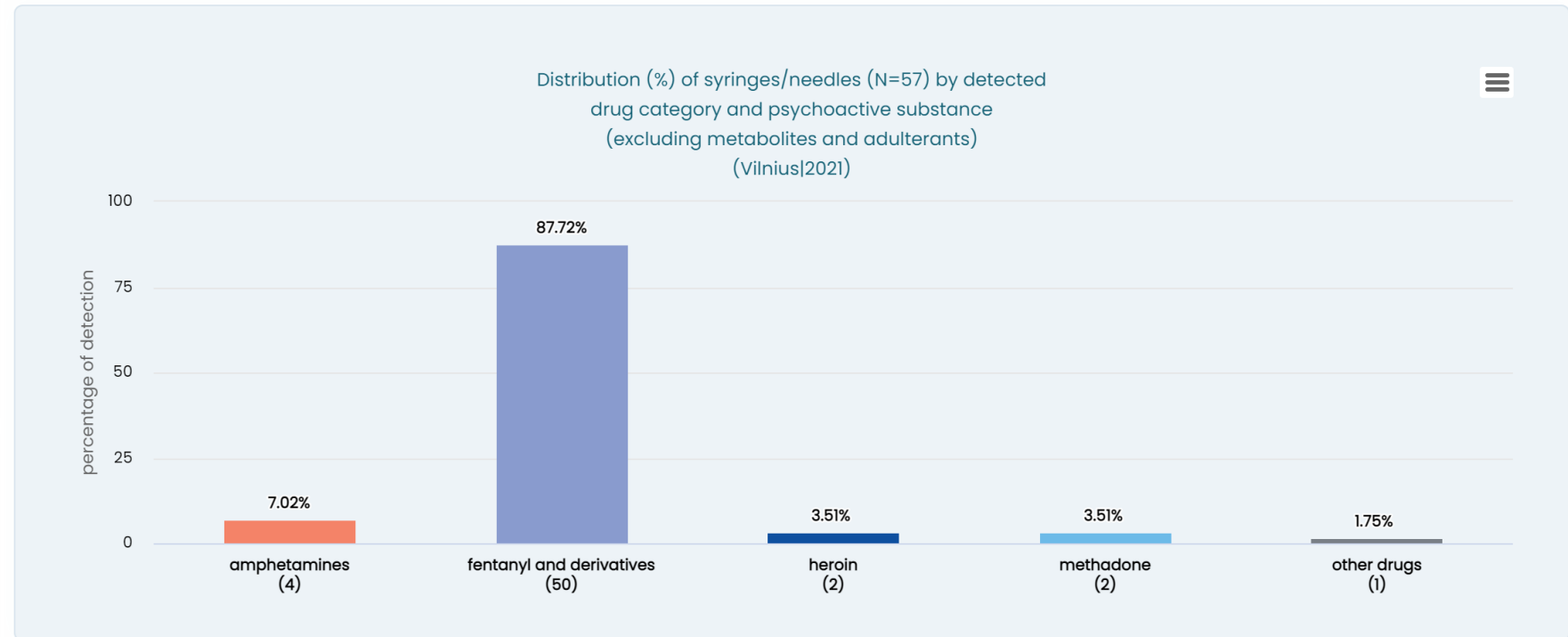
150

Number of syringes/needles with any psychoactive substance

57

Number of psychoactive substances detected

7



- **Main finding/new trend** : reappearance of carfentanil (88%), drop in methadone
- **Combinations**: Majority of syringes contained carfentanil with diphenhydramine (adulterant)
- **Other substances of public health relevance** : diphenhydramine (antihistamine) injection in Kyrgyz prisons linked to self-reported skin infections

# Discussion

## Limitations

- Results not linked to individual users
  - Contextual information
- Selection bias/Representativeness
  - Multiple collection sites; mixing of syringes
- Bias from blood traces?
  - Analytical methods picking up strong signals; THC not commonly detected
- Combinations: simultaneous use vs re-use vs sharing?
  - Qualitative surveys



# Conclusions

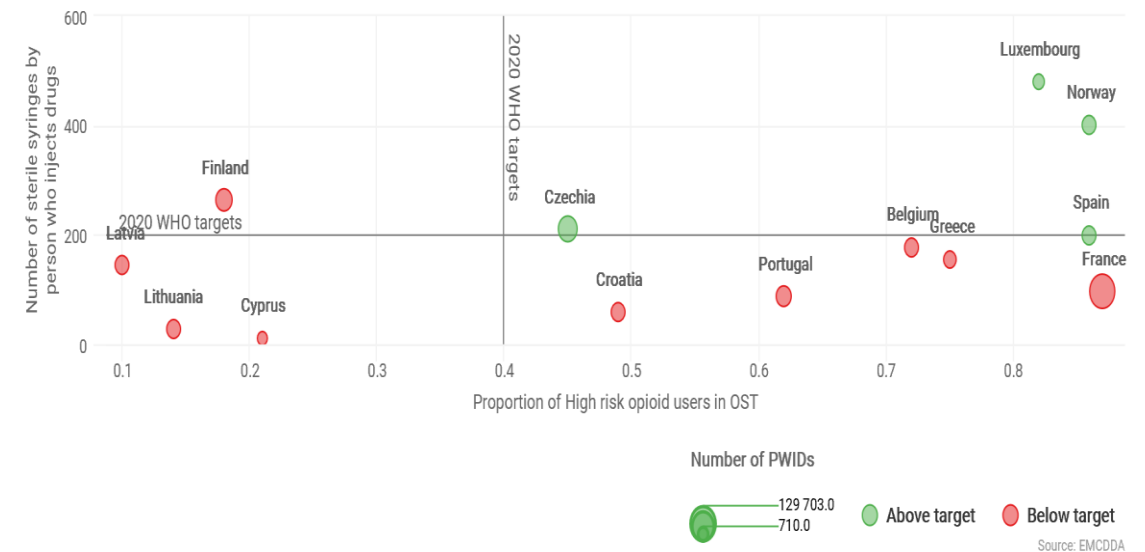
## Main findings

- **Diversity** of substances detected in syringes across cities and within cities
  - Local supply, different sub-populations
- **Stimulants** commonly found in a majority of city, increase in cocaine and cathinones detection in some cities
  - Higher risk of HIV outbreaks - increased harm reduction coverage and tailored services needed
- **Combinations** indicating polydrug use or re-use
  - Increased risk of severe harms and infectious diseases – increased harm reduction coverage needed

## Next steps

- Improving geographical representativeness
  - EU cities from Greece, Spain,
  - EU4MD project: Tunisia, Lebanon, Ukraine

Figure 8. Number of clean syringes distributed per PWID and proportion of high-risk opioid users in opioid substitution treatment, EU countries, 2020 or latest available data



● **Prevention and control of infectious diseases among people who inject drugs: New evidence within the updated guidance from the ECDC and the EMCDDA**

13:20 to 14:50

📍 Networking zone 3 (N3)

👤 Janelle Sandberg, Thomas Seyler

● **Methods and Problems with Estimating Prevalence of People Who Inject Drugs, studies and debate on how to get better and more consistent estimates in Europe and Rest of the World**

13:20 to 14:50 📍 Central square 2 (C2)

👤 Mathiew Hickman, Thomas Seyler





# The ESCAPE network

**EMCDDA:** Thomas Néfau, Bruno Guarita, André Noor, Thomas Seyler

**Podane Ruce:** Barbara Janikova

**Dublin:** Sinead McNamara, Siobhán Stokes

**Paris:** Catherine Duplessy, Sara Karolak

**Cologne:** Daniel Deimel, Jürgen Kempf

**Lausanne:** Elodie Lefrançois

**Oslo:** Hallvard Gjerde, Lihn Bache-Andreassen, Anne L. Bretteville-Jensen and Kristin Hanoa

**Prague:** Barbara Janikova, Petra Cihlarova, Martin Kuchar

**Budapest:** József Csorba

**Helsinki:** Teemu Gunnar, Anne Arponen, Anna Pelander and Sanna Kyllönen

**Tallinn:** Katri Abel-Ollo, Aime Riikoja

**Riga:** Ieva Pugule, Osvalds Pugovics, Solveiga Grinberga, Eduards Sevostjanovs

**Vilnius:** Brigita Rasimaite, Jurgita Žilinskaitė, Viktorija Stifanovičiūtė, Rūta Gedminienė

**Beyrouth:** Elie Aaraj, Hany Kallassy

**Tunis:** Abderrazek Hedhili, Bilel Moslah

**Balty:** Andrey Mondringa

**Odessa :** Mariia Nosalska, Maria Malakhova, Slava Kushakov, Lesya Tonkonog



[https://www.emcdda.europa.eu/topics/escape\\_en](https://www.emcdda.europa.eu/topics/escape_en)

European Monitoring Centre for Drugs and Drug Addiction

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## Syringe residues analysis (ESCAPE)

Publications News Events Library Media

### Overview

Available data on the substances injected by users are based on self-reports collected in drug treatment registries or ad-hoc surveys. While these data are informative, they are often available only after some delay and are not analytically confirmed. Moreover, little is known about people who inject drugs that are not reached by drug services. The ESCAPE (European Syringe Collection and Analysis Project Enterprise) project seeks to complement existing data on substances injected by users, by providing timely and local information derived from the analysis of the residual content of used syringes.

### Publications →

Publications by the EMCDDA on this topic

- EU Drug Markets: Signals of spreading methamphetamine use in Europe**  
May 2022  
This page examines how methamphetamine use in Europe including the effects and harms, possession and offences, and a wide range of other data sources providing insights about the role of methamphetamine in European consumer markets. This resource is part of EU Drug Market. Methamphetamine — In-...
- An analysis of drugs in used syringes from sentinel European cities**  
February 2021  
This report presents new findings from the ESCAPE (European Syringe Collection and Analysis Project Enterprise) network, based on the chemical analysis of the contents of used syringes across sentinel sites in Europe. Syringes were collected in 2018 and 2019 from the bins of street automatic...
- ESCAPE generic protocol**  
February 2021  
This protocol documents a new approach that has been developed to monitor substances injected by people who inject drugs through analytically confirmed data at the local level: the analysis of residual content of used syringes. Used syringes contain traces of drugs that can be analysed to inform...
- European Drug Report 2020: Trends and Developments**  
September 2020  
This report provides a comprehensive analysis of patterns emerging across Europe in the areas of drug supply, illicit drug use and associated public health problems. National data sets are also provided across these themes and on key harm-reduction interventions. The report is available in English...



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emcdda

# Results 2021 campaign: Cologne

Number of syringes/needles analysed

342

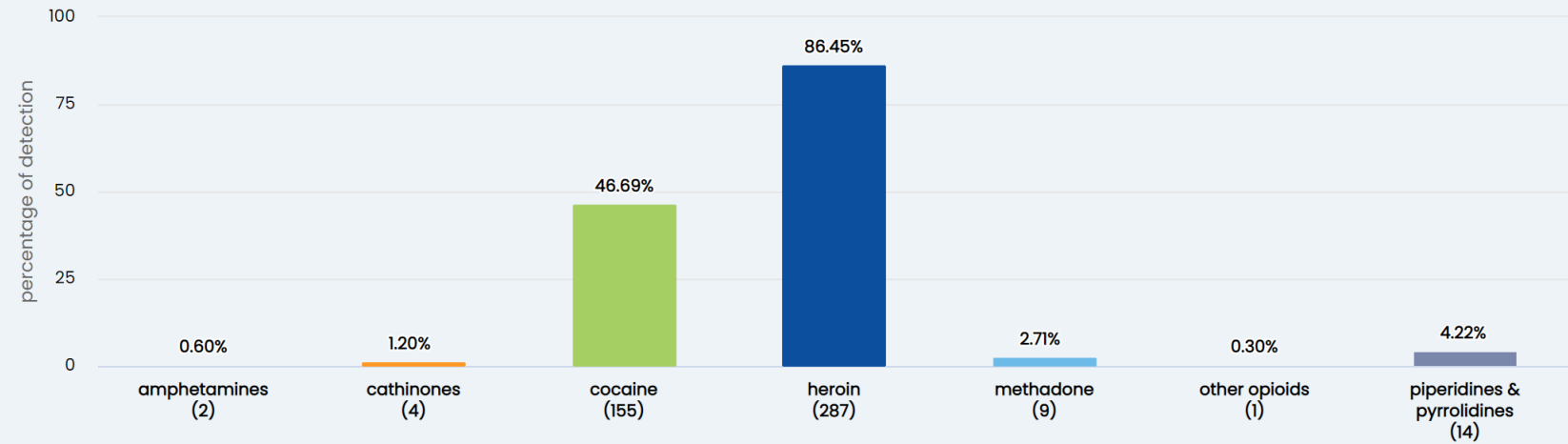
Number of syringes/needles with any psychoactive substance

337

Number of psychoactive substances detected

21

Distribution (%) of syringes/needles (N=332) by detected drug category and psychoactive substance (excluding metabolites and adulterants) (Cologne|2021)



- **Main finding/new trend** : cocaine (47%) and heroin (86%)
- **Combinations**: 36% of syringes containing 2 or more drug categories (Most common: cocaine + heroin)
- **Other substances of public health relevance** :
  - Methylphenidate (4%)
  - Methadone (3%)
  - Cathinones (6 types) (1%)



# Results 2021 campaign: Lausanne

Number of syringes/needles analysed

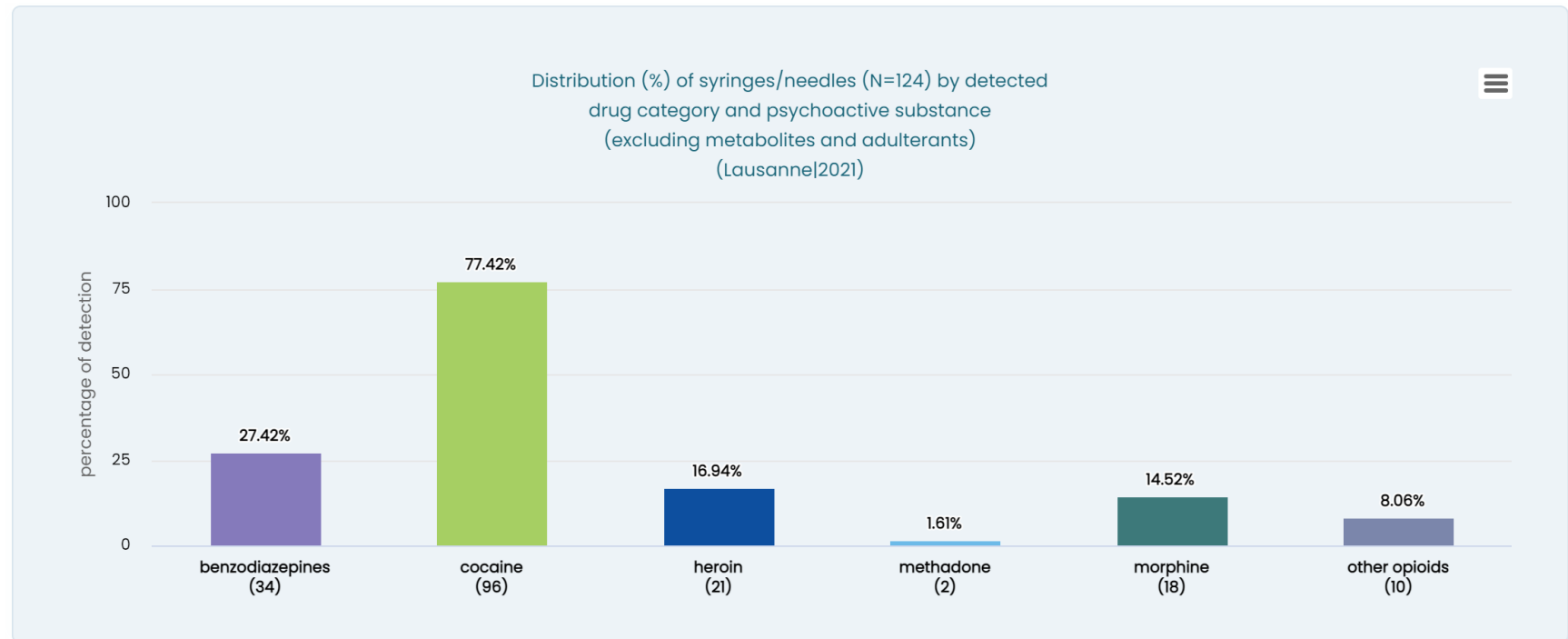
150

Number of syringes/needles with any psychoactive substance

126

Number of psychoactive substances detected

11



- **Main finding/new trend** : cocaine (77%) and benzodiazepines (midazolam) (27%)
- **Combinations**: 33% of syringes containing 2 or more drug categories (Most common: cocaine + midazolam)
- **Other substances of public health relevance** : morphine *retard* replacing buprenorphine

# Results 2021 campaign: Oslo

Number of syringes/needles analysed

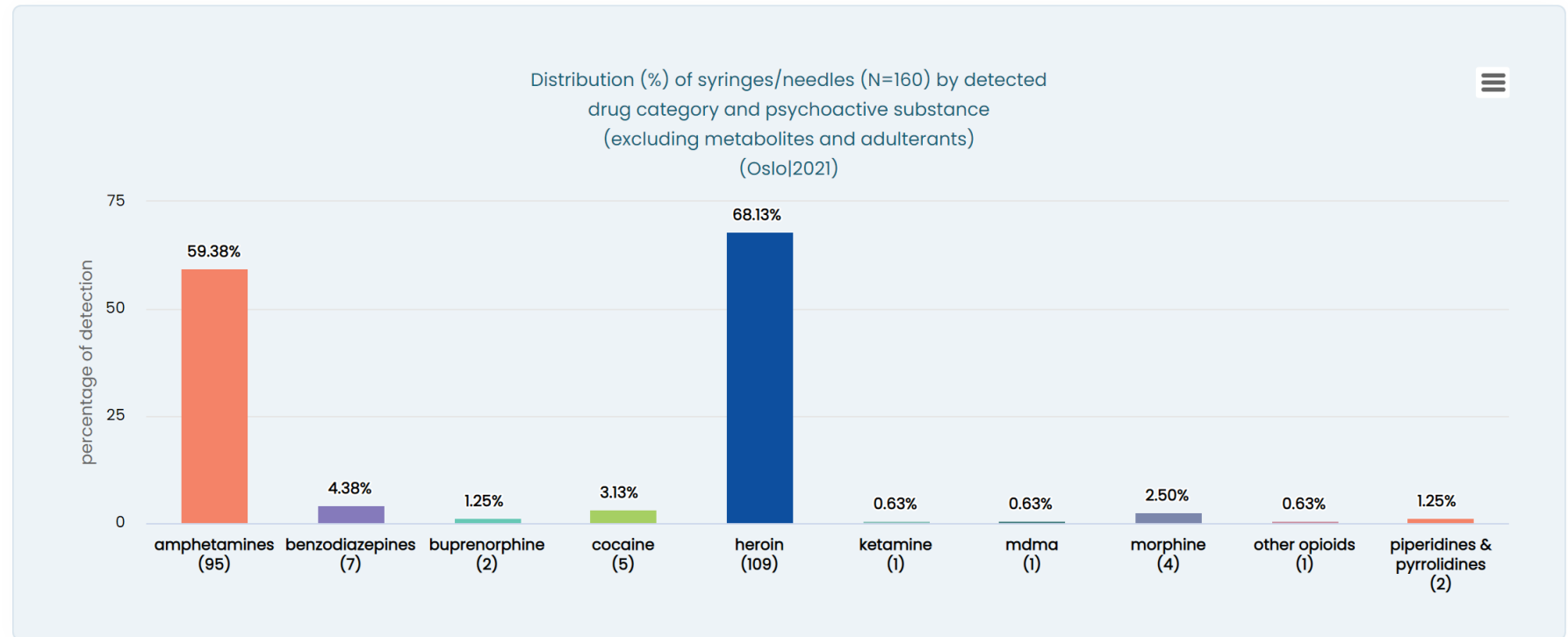
164

Number of syringes/needles with any psychoactive substance

164

Number of psychoactive substances detected

13



- **Main finding/new trend** : heroin (68%) and amphetamine (58%)
- **Combinations**: 38% of syringes containing 2 or more drug categories (Most common: heroin + amphetamine)
- **Other substances of public health relevance** : benzodiazepines (alprazolam) (4%)

# Results 2021 campaign: Prague

Number of syringes/needles analysed

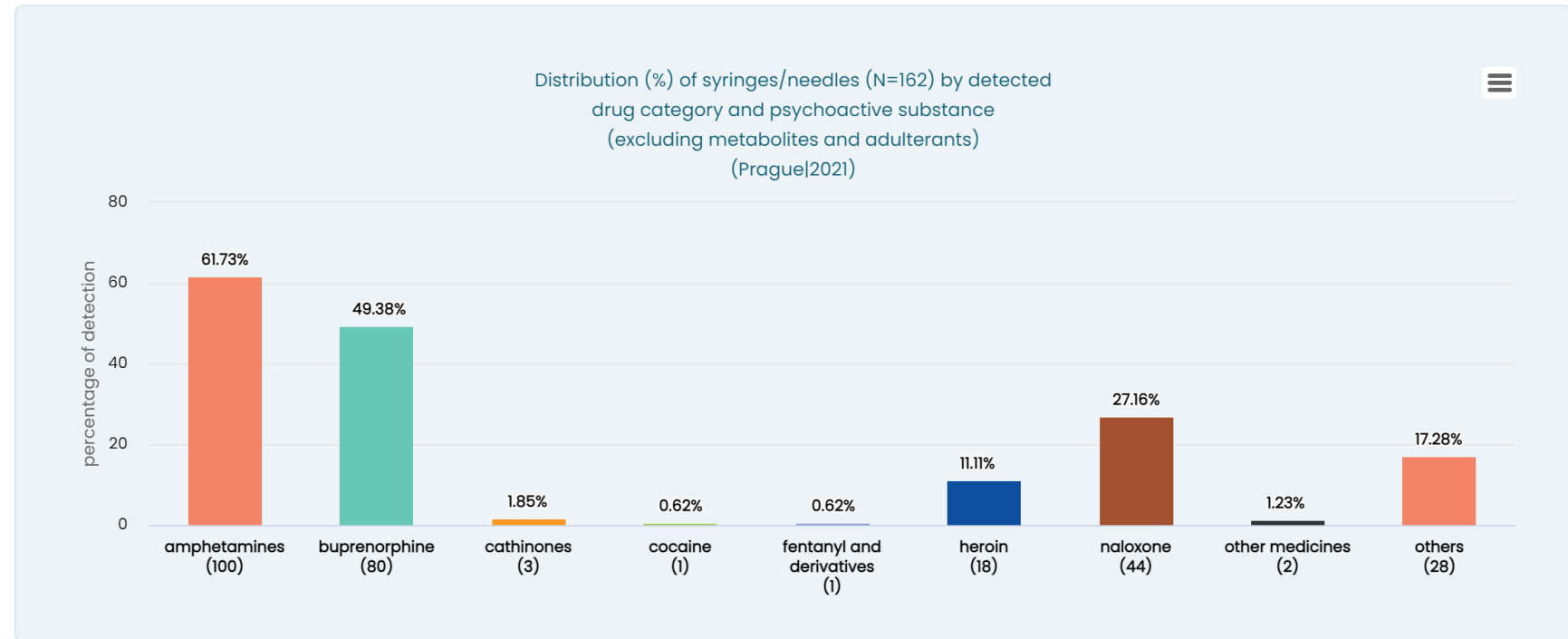
169

Number of syringes/needles with any psychoactive substance

162

Number of psychoactive substances detected

14



- **Main finding/new trend** : methamphetamine (62%) and buprenorphine (49%)
- **Combinations**: 53% of syringes containing 2 or more drug categories (Most common: meth+pseudoephedrine and meth+buprenorphine)
- **Other substances of public health relevance** : low percentage of heroin, fentanyl and other opioids and stimulants

# Results 2021 campaign: Budapest

Number of syringes/needles analysed

171

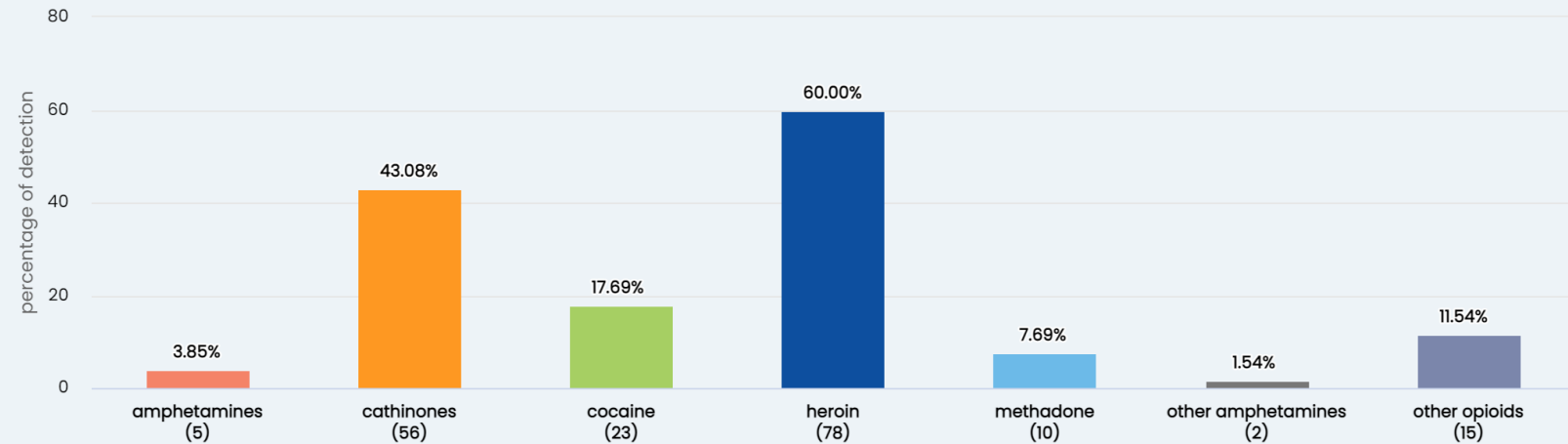
Number of syringes/needles with any psychoactive substance

145

Number of psychoactive substances detected

15

Distribution (%) of syringes/needles (N=130) by detected drug category and psychoactive substance (excluding metabolites and adulterants) (Budapest|2021)



- **Main finding/new trend** : high detection of heroin (60%) and cathinones (43%) (5 different types, n-ethylhexedrone most common)
- **Combinations**: 34% of syringes containing 2 or more drug categories (Most common: cathinones + cocaine + heroin)
- **Other substances of public health relevance** :
  - Increase in cocaine (18%)



# Results 2021 campaign: Tallinn

Number of syringes/needles analysed

120

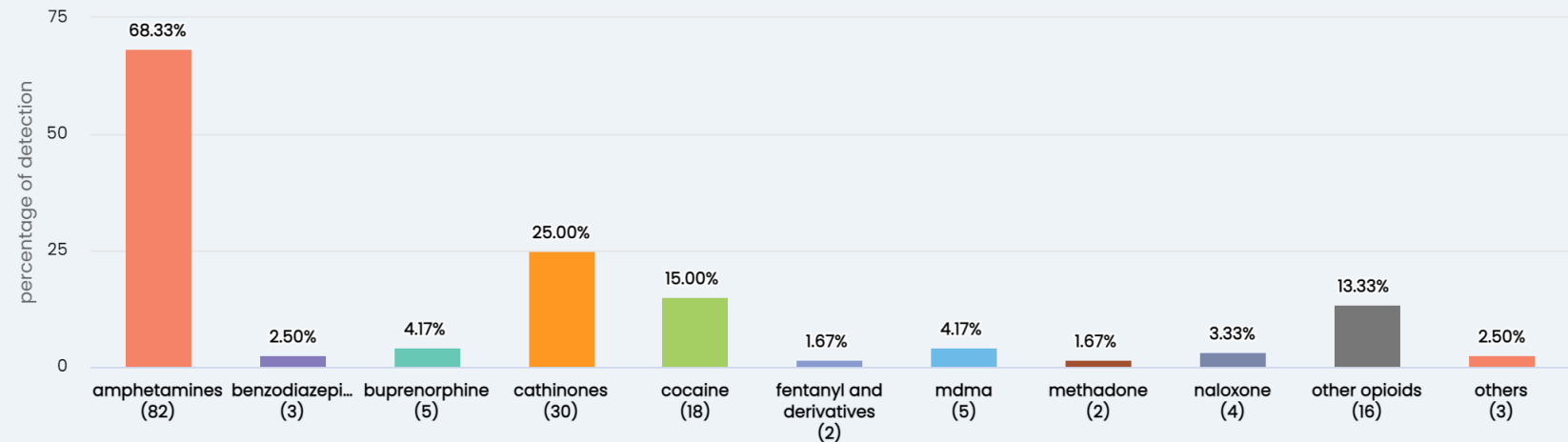
Number of syringes/needles with any psychoactive substance

120

Number of psychoactive substances detected

18

Distribution (%) of syringes/needles (N=120) by detected drug category and psychoactive substance (excluding metabolites and adulterants) (Tallinn|2021)



- **Main finding/new trend** : amphetamine (66%), methamphetamine (18%), cathinones (alpha-PVP) (25%),
- **Combinations**: 26% of syringes containing 2 or more drug categories (Most common: amphetamines + alpha-PVP)
- **Other substances of public health relevance** :
  - Cocaine (15%)
  - Isotonitazene (13%)
  - Fentanyl (1%) and carfentanil (1%)



# Results 2021 campaign: Riga

Number of syringes/needles analysed

200

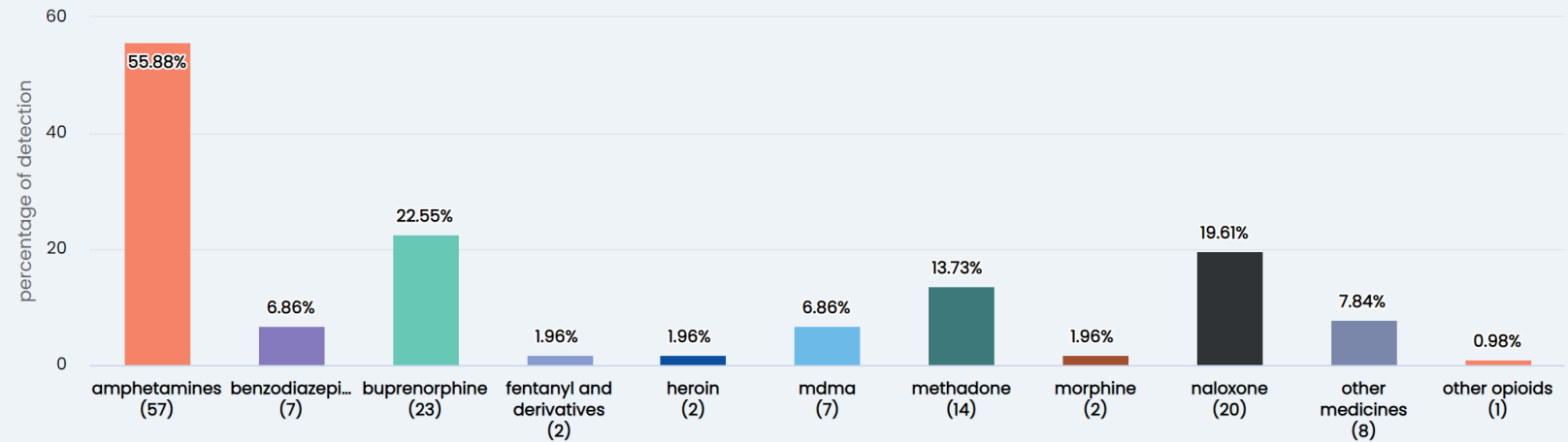
Number of syringes/needles with any psychoactive substance

116

Number of psychoactive substances detected

15

Distribution (%) of syringes/needles (N=102) by detected drug category and psychoactive substance (excluding metabolites and adulterants) (Riga|2021)



- **Main finding/new trend** : methamphetamine (51%) and buprenorphine (23%)
- **Combinations**: 34% of syringes containing 2 or more drug categories (Most common: [buprenorphine + benzo] and [amphetamines + MDMA])
- **Other substances of public health relevance** :
  - Benzodiazepines (midazolam (6%) and clonazepam (1%))
  - Fentanyl (2%)
  - Zopiclone (8%)

# Results 2021 campaign: Balty

Number of syringes/needles analysed

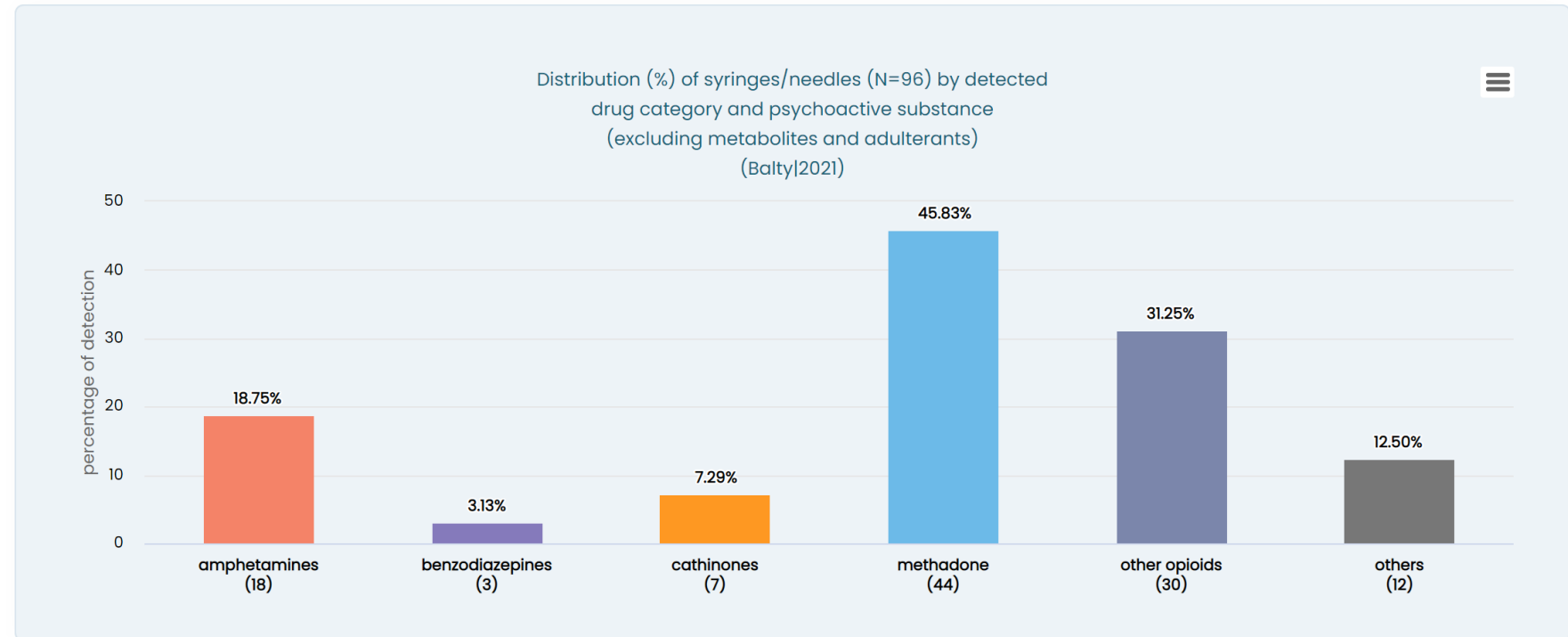
151

Number of syringes/needles with any psychoactive substance

117

Number of psychoactive substances detected

13



- **Main finding/new trend** : methadone (46%), tramadol (31%), methamphetamine (19%)
- **Combinations**: 19% of syringes containing 2 or more drug categories (Most common: methamphetamine + tramadol)
- **Other substances of public health relevance** :
  - Pseudoephedrine (9%)
  - Cathinones (alpha-PVP) (7%)
  - Benzodiazepines (diazepam) (3%)



# Results 2021 campaign: Paris

Number of syringes/needles analysed

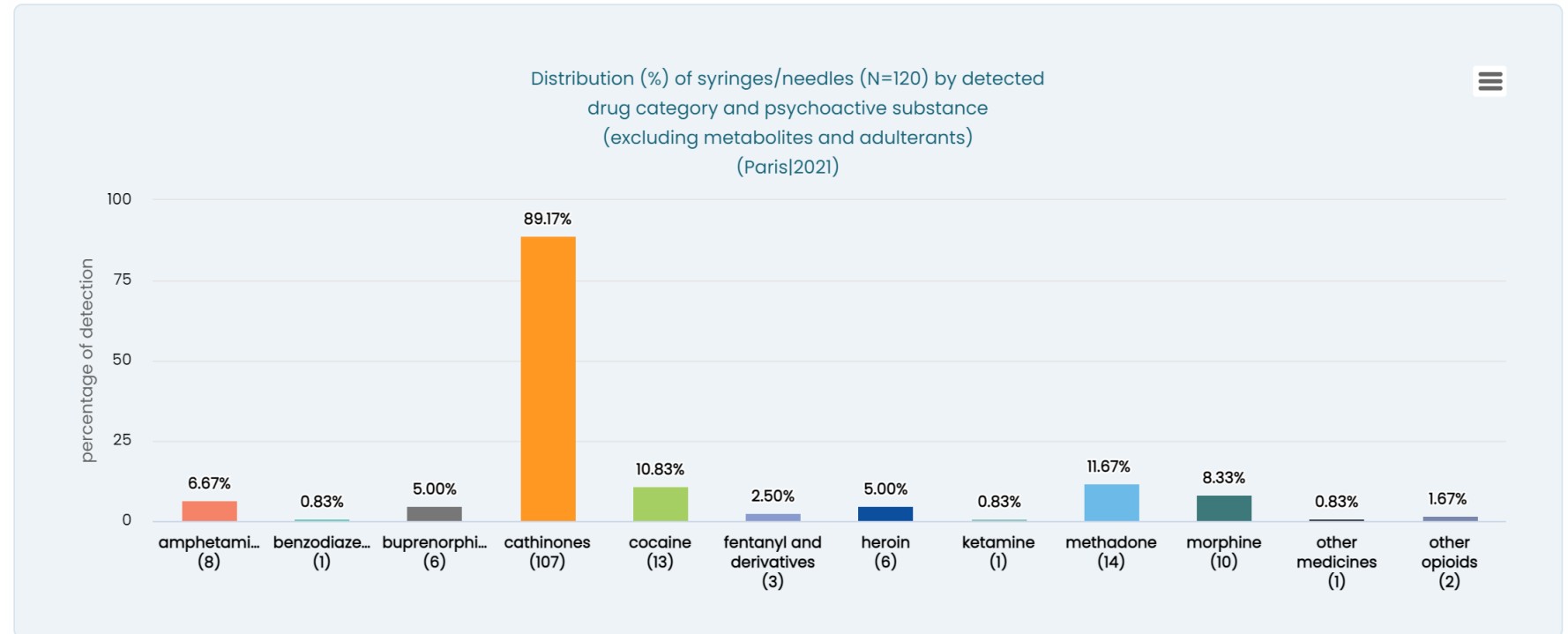
156

Number of syringes/needles with any psychoactive substance

120

Number of psychoactive substances detected

15



- **Main finding/new trend** : majority of syringes contained cathinones (3-MMC and 3-CMC) – relative decline in other substances detected
- **Combinations**: 31% of syringes containing 2 or more drug categories (Most common: cathinones + methadone)
- **Other substances of public health relevance** :
  - Morphine (8%) – from skenan©
  - Methamphetamine (7%)
  - Fentanyl (3%)