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**RESEARCH  
SUMMARY**

# Study of syringes collected in Estonian harm reduction services for drug residues 2023

A study of syringe residues provides an answer to which psychoactive substances are used by people who inject drugs in different regions of Estonia. It is chemically objective information that helps:

- to get a good overview of the regional drug market,
- to provide input for early warning of users,
- to better plan harm reduction (including overdose prevention) and treatment activities.

## Study method

To gain insight into the drugs used, the contents of **syringes used by people who inject drugs** were chemically analyzed. A liquid chromatography quadrupole mass spectrometer with a time-of-flight detector and, in some cases, a gas chromatography mass spectrometer was used for analysis. The analysis was carried out by the **Estonian Forensic Science Institute**. The syringe residue analysis method has been in use in Estonia since 2021. The chemical analysis of syringe residues has also been successfully carried out by other European cities that gather under the international **ESCAPE project** (European Syringe Collection and Analysis Project).

## Sample

The sample was formed based on syringes collected in the framework of Estonian harm reduction services. A total of **430 randomly selected syringes** were collected in May and June 2022. It was important that the syringes would be visually complete and recently used.

The numbers of participating services were following: five from Tallinn, four from Kohtla-Järve, three from Narva, two from Tartu and one from Rakvere, Jõhvi, Maardu, Kiviõli, Pärnu and Paide. From services with smaller clientele at least 15 syringes were selected and with larger ones 30 syringes.

## Harm reduction service in numbers\*



**3,853**  
users



**93,170**  
visits



Services are provided in:

**15** stationary centres

**15** outreach units

**3** pharmacies

**2** mobile units

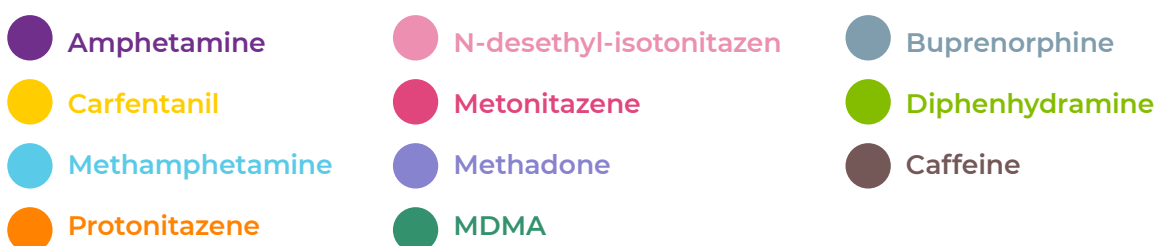
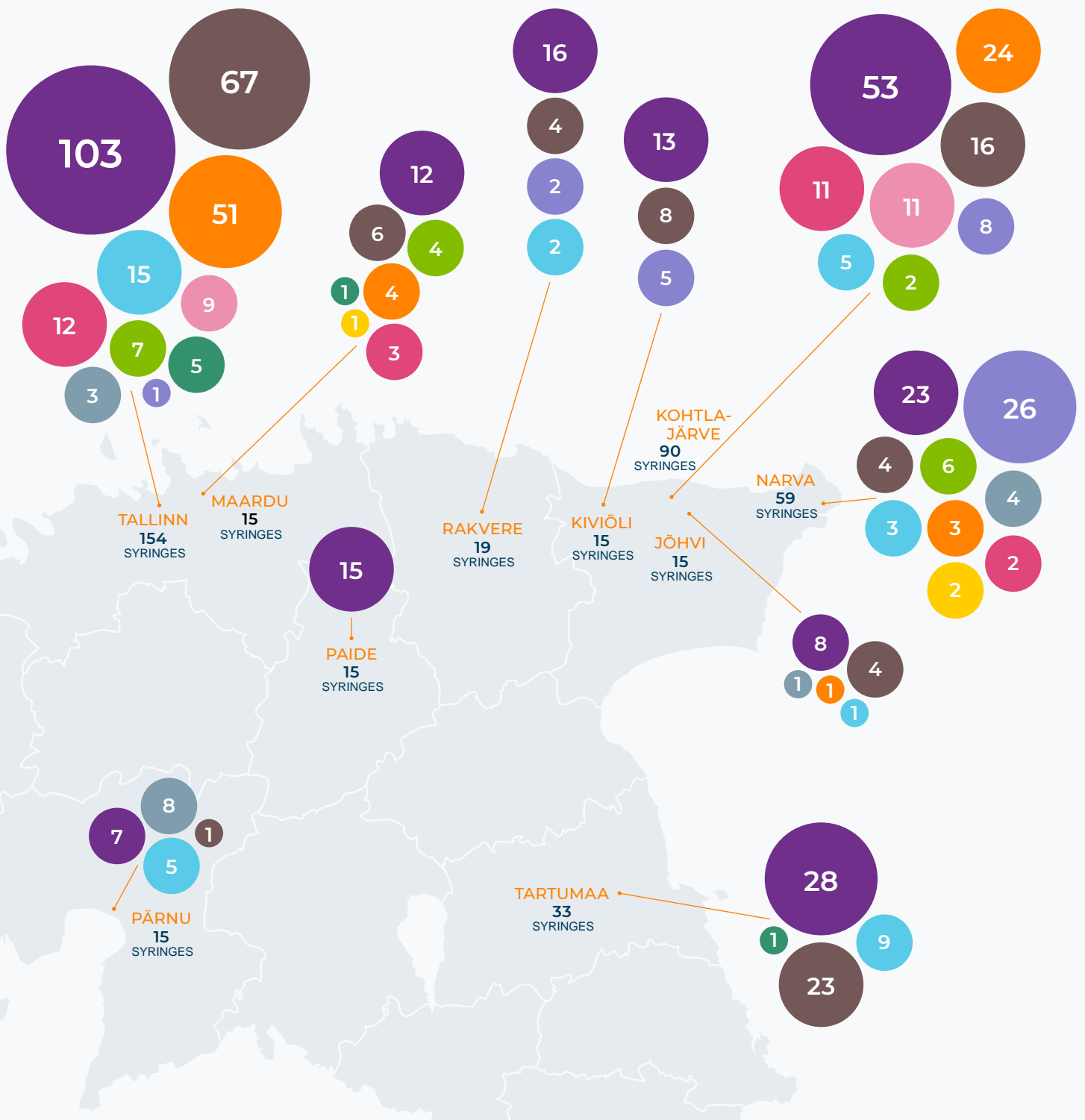


**1,883,924**  
syringes distributed

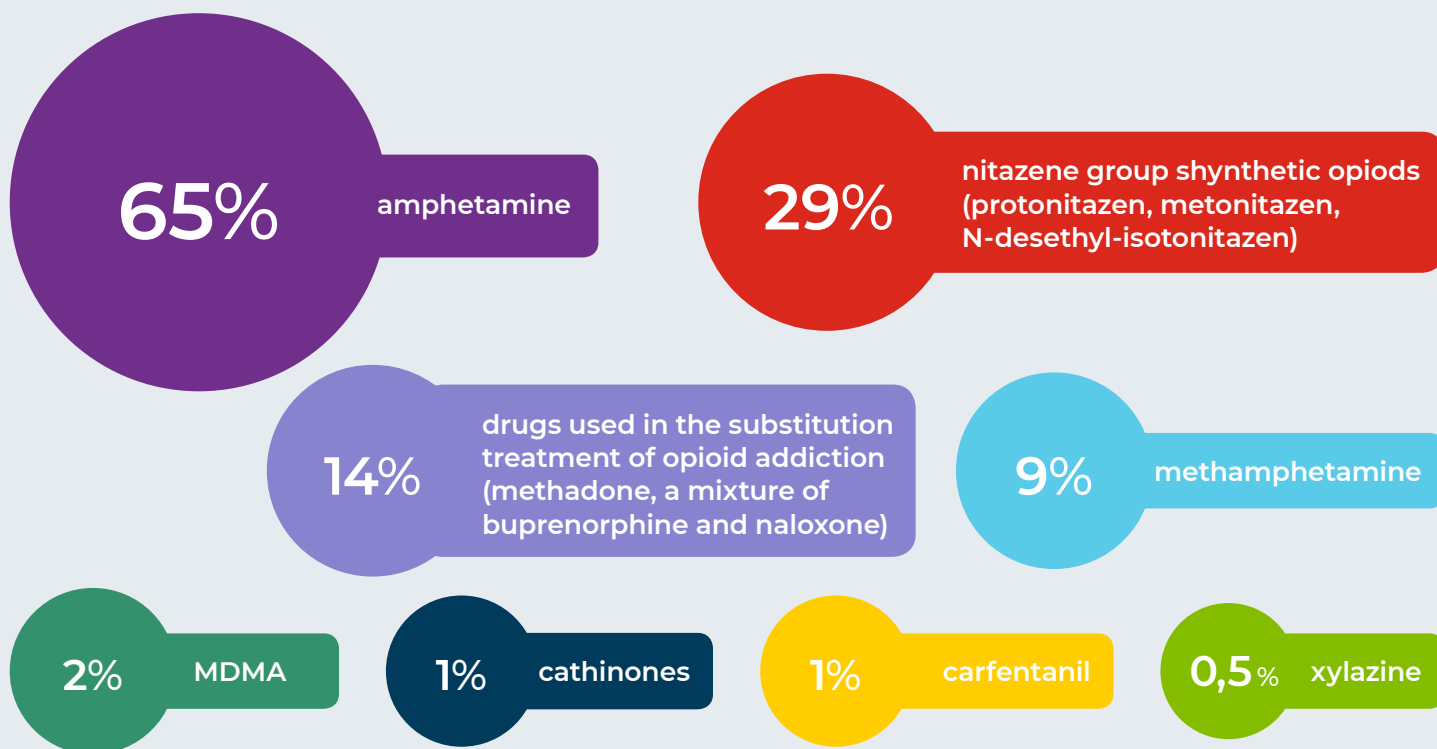
\* Data presented as the end of December 2023.

## Most frequently detected drugs and number of syringes analyzed by region (absolute numbers)\*

\*Syringes can contain several psychoactive substances



## The main drugs/groups of drugs used in total syringe sample (n=430)



## Conclusions

- Based on the study, regional differences in injected substances can be seen, but **amphetamine continues to be the most injected drug in Estonia.**
- Most of the syringes in 2023 contained one psychoactive substance (72%). Compared to 2022, the share of single-substance syringes has increased (59% in 2022).
- Compared to 2022, the share of syringes containing nitazenes has **increased sharply.** Injection of nitazenes is common in Harju County and Kohtla-Järve.
- The most prevalent nitazene in 2023 was protonitazene (19%), followed by metonitazene (7%) and N-desethyl-isotonitazene (5%). These are synthetic opioids that are **extremely dangerous** for the user. More than half of the overdose deaths in 2023 have been related to the use of nitazenes.
- Carfentanil is available in few syringes. No regular fentanyl or heroin was found in any of the syringes.
- **The injection of cathinones, α-PVP, α-PHP has decreased significantly** (10% in 2022 and 1% of syringes in 2023).
- The abuse of methadone, a mixture of buprenorphine and naloxone used in the substitution treatment of opioid addiction, has decreased somewhat (in 2022, 18% of syringes contained those medicines, in 2023, 14%). Out of a total of 16 syringes containing buprenorphine, 13 also contained naloxone. Injection of medicines used in opioid addiction substitution treatment is more common in Narva and Kohtla-Järve.
- The most prevalent from **adulterants** in syringes was **caffeine** (31%), which was always found together with amphetamine.
- From syringes were also found **other medicines**, but this was not prevalent trend. The most common medicines in syringes were diphenhydramine (n=19), diazepam (n=10), pseudoephedrine (n=8), bromazolam (n=4), oxycodone (n=2) and tramadol (n=1).
- From the new psychoactive substances in 2023, synthetic cathinone, 2-/3-/4-MMC, was found in one syringe.

Abel-Ollo K, Riikoja A, Barndök T, Kurbatova, A, Murd A. Study of syringes collected in Estonian harm reduction services for drug residues. Study summary. Tallinn: National Institute for Health Development, 2023.