

# Is this really ketamine? Presence of methoxetamine in drug samples delivered as ketamine for substance analysis

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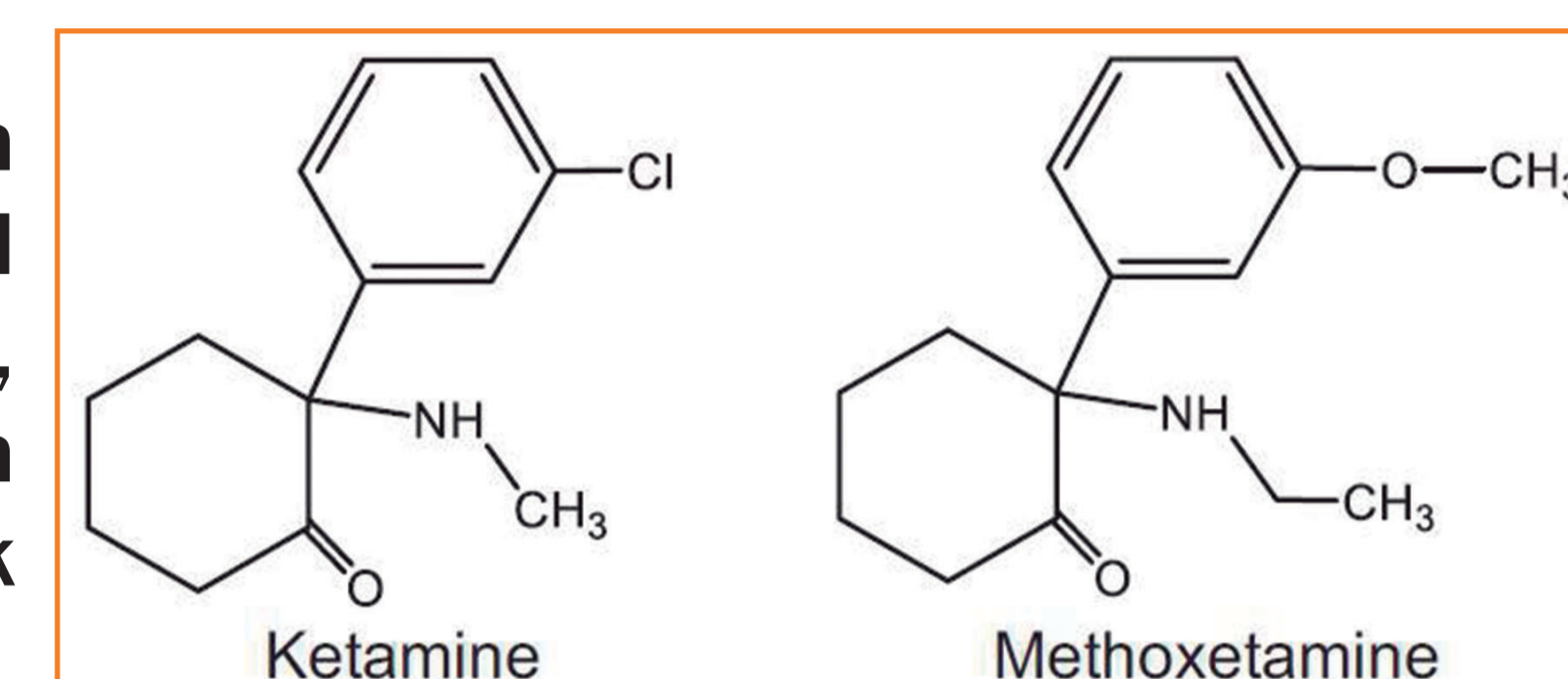
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## Introduction

New psychoactive substances (NPS) are drugs that have recently become available, and are not world-wide regulated. They often intend to mimic the effect of controlled drugs (1), becoming a public health concern. In 2014, 101 new substances were reported for the first time in the EU (2). Methoxetamine, an NPS, is a dissociative hallucinogenic acting as a NMDA receptor antagonist, clinically and pharmacologically similar to Ketamine (3). It differs from ketamine on its higher potency and duration as well as on its possible serotonergic activity, probably leading to more severe side effects. It has been one of the 6 substances requiring risk assessment by EMCDDA during 2014(3), and several case reports have described fatal outcomes related with its use(4).



## Objective

The aim of this study was **1)** to explore the presence of methoxetamine from the samples handled to, and analyzed by Energy Control and **2)** to determine whether methoxetamine is being delivered as ketamine for recreational use.

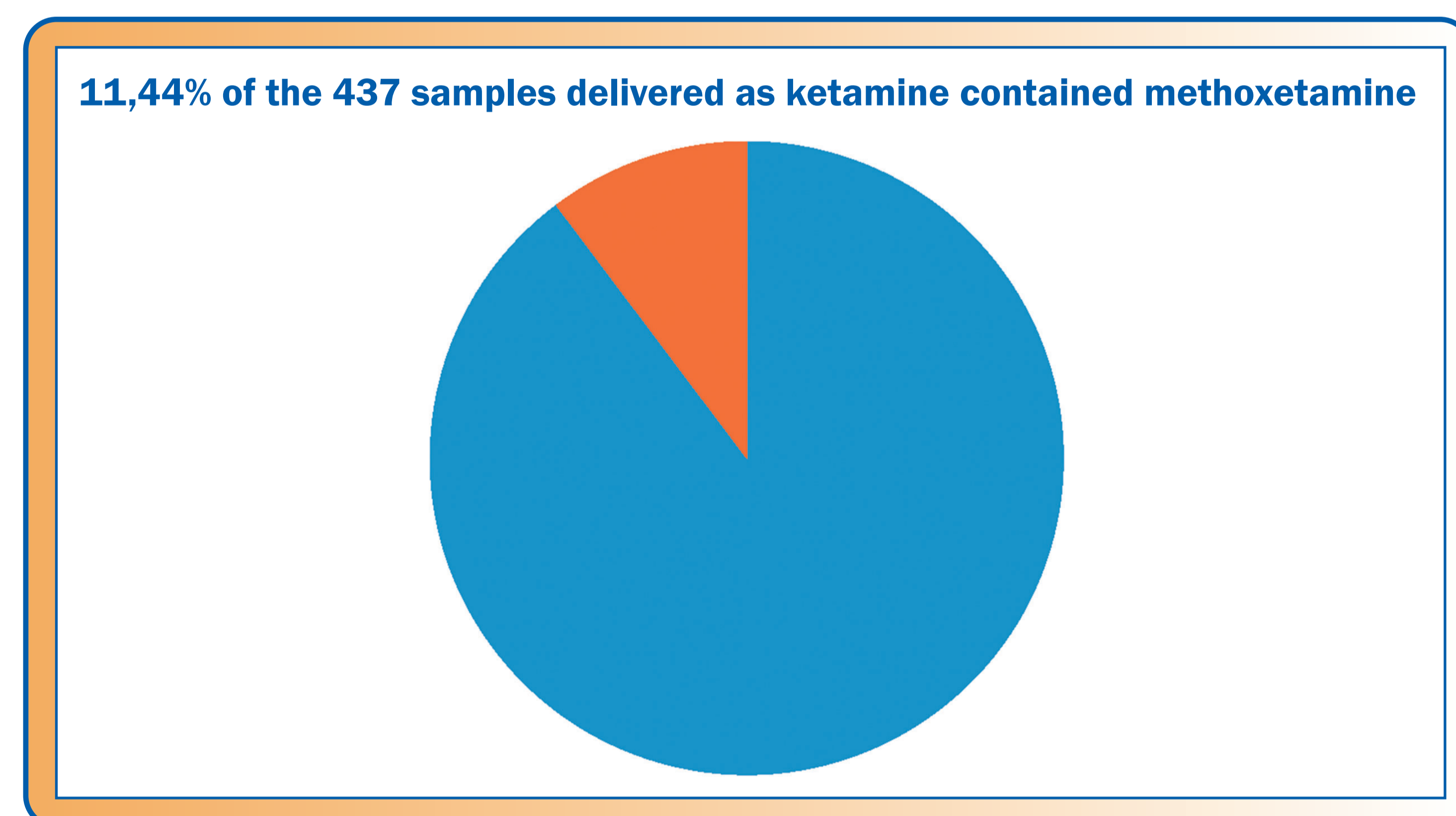
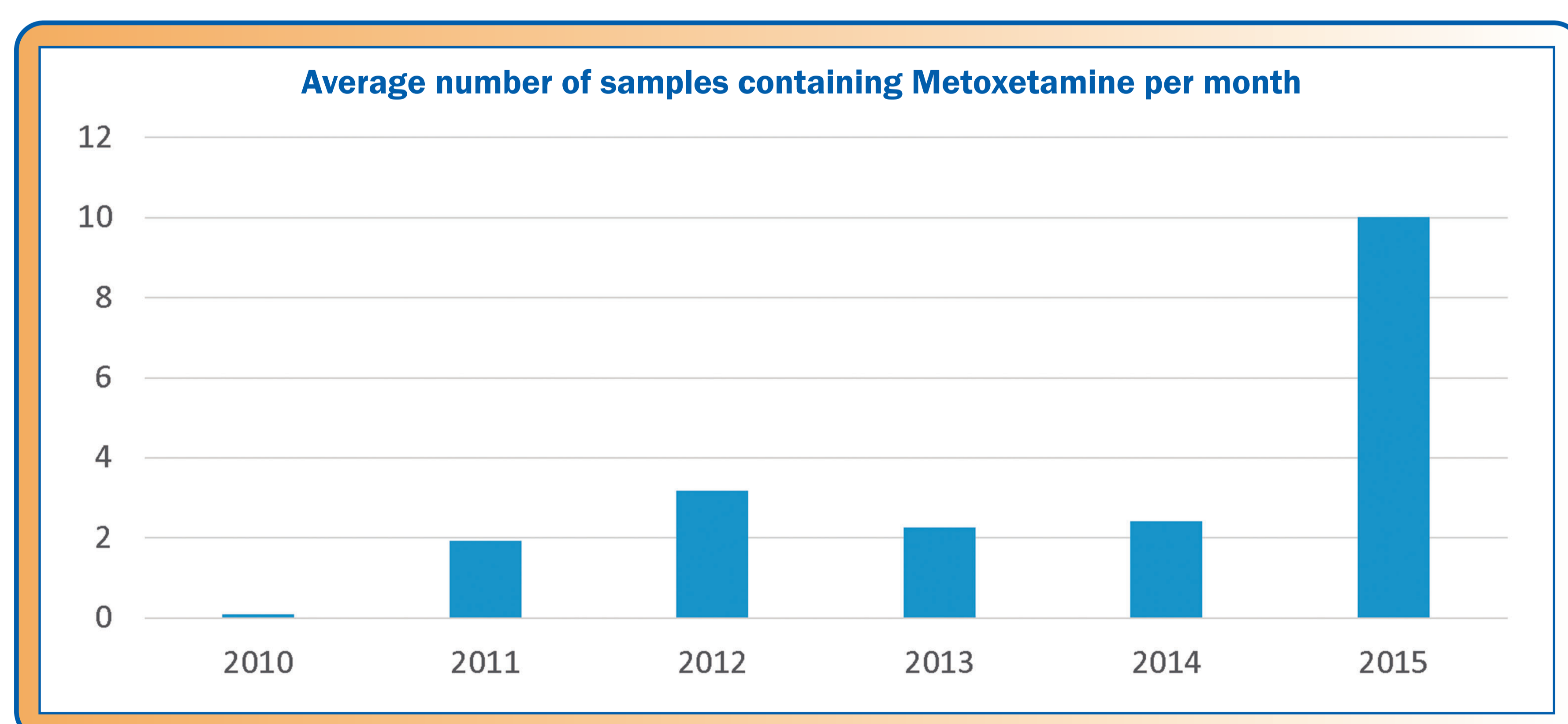
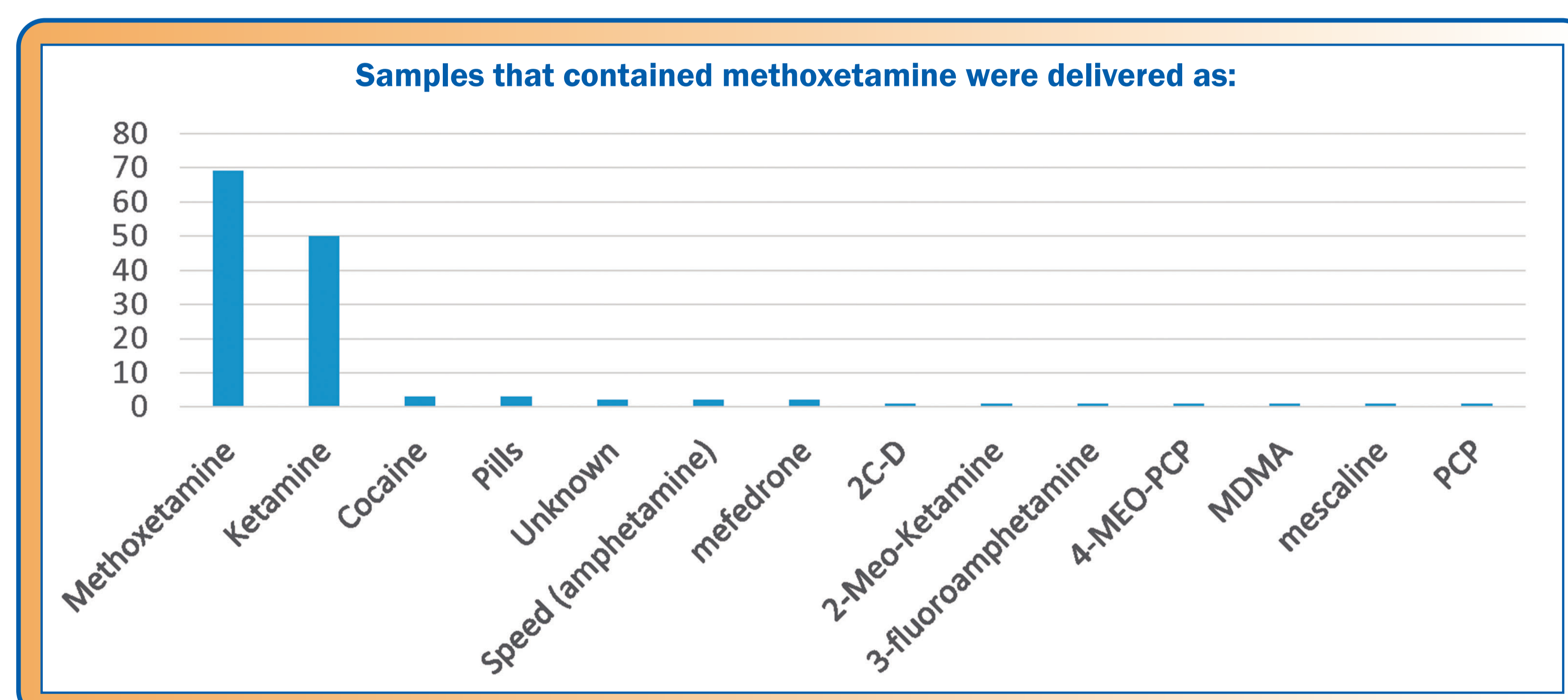
## Material and methods

All samples analyzed from January 2010 to March 2015 in which methoxetamine was found were studied. Energy Control is a Spanish harm-reduction non-governmental organization that offers users the possibility of analyzing the substances they intend to consume. Substance analysis was carried out by Gas Chromatography–Mass Spectrometry.

## Results

During the period of study, from 16.6605 samples obtained, methoxetamine was found in 138 (0.83%). From these 138 samples containing methoxetamine, only 69 (50%) were delivered as such, 50 (36%) were delivered as ketamine and 19 (14%) as other substances (cocaine=3, amphetamine=2 and mephedrone=2, among others). In the 138 samples that contained methoxetamine, other compounds were also found in 42 (30%), being synthesis by-products the most frequent ones (n=23), followed by unknown substances (n=23), caffeine (n=17), mephedrone (n=6) and MDMA (n=3), among others.

Mean age of users that delivered the substances was 28 (standard deviation 5.68; range 18-42) and 76% were men.



## Conclusion

The results of this study show a significant ratio of samples handled as ketamine that actually contained methoxetamine. This fact is clinically relevant since methoxetamine is more potent and last longer than ketamine, and several fatal outcomes have been reported related to its recreational use. Severe side effects might be even more serious considering that a significant proportion of users may ignore which substance they are actually using. Despite the increasing number of studies on methoxetamine, further evidence is needed to clarify the magnitude of methoxetamine delivered as ketamine, the reasons for this phenomenon, and its clinical implications at a higher scale.

## References

- [1] Papaseit, E., Farré, M., Schifano, F., Torrens, M., 2014. Emerging drugs in Europe. *Current Opinion in Psychiatry*, 27(4), 243–50.
- [2] EMCDDA, 2015. New psychoactive substances in Europe. An update from the EU Early Warning System. Lisbon.
- [3] Corazza, O., Schifano, F., 2012. Phenomenon of new drugs on the Internet: the case of ketamine derivative methoxetamine. *Human Psychopharmacology*, 27(2), 145–9.
- [4] J.B. Zawilska. Methoxetamine – a novel recreational drug with potent hallucinogenic properties. *Toxicology Letters* 230 (2014) 402–407
- [5] Morris, H., Wallach, J., 2014. From PCP to MXE: A comprehensive review of the non-medical use of dissociative drugs. *Drug Testing and Analysis* 6 (7-8), 614–632.

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## Keywords:

Toxicology; Drug dependence & abuse: clinical; Drug monitoring

