Driving under the influence of NPS in Finland: analytical perspectives, legal issues and statistics

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Overview

- Pre-laboratory analytical and laboratory analytical perspectives and methodologies
- Legal issues related to NPS and driving under the influence (DUI)
- Interpretation issues: Evaluation of psychomotor performance of a driver under the influence of NPS
- Recent statistics of NPS in DUI cases in Finland

Handling of DUI cases in Finland

- Finnish police are authorized by law to submit drivers to a preliminary oral fluid drug test on site (needs no suspicion)
- DrugWipe® 6S (Securetec) screens for amphetamine/ methamphetamine, opiates, cocaine, cannabis and benzodiazepines (analyte group specific)
- Practically no response to the vast majority of NPS
- Evidence of impairment: Police fulfills standardized field sobriety observation sheet
- Further evidence of impairment: A clinical field sobriety test
- Whole blood samples are submitted to further laboratory investigations and confirmation

More detailed information:
Lillsunde and Gunnar, Drugs and driving: the Finnish perspective, Bulletin on Narcotics (UNODC), vol. 57, 2005.

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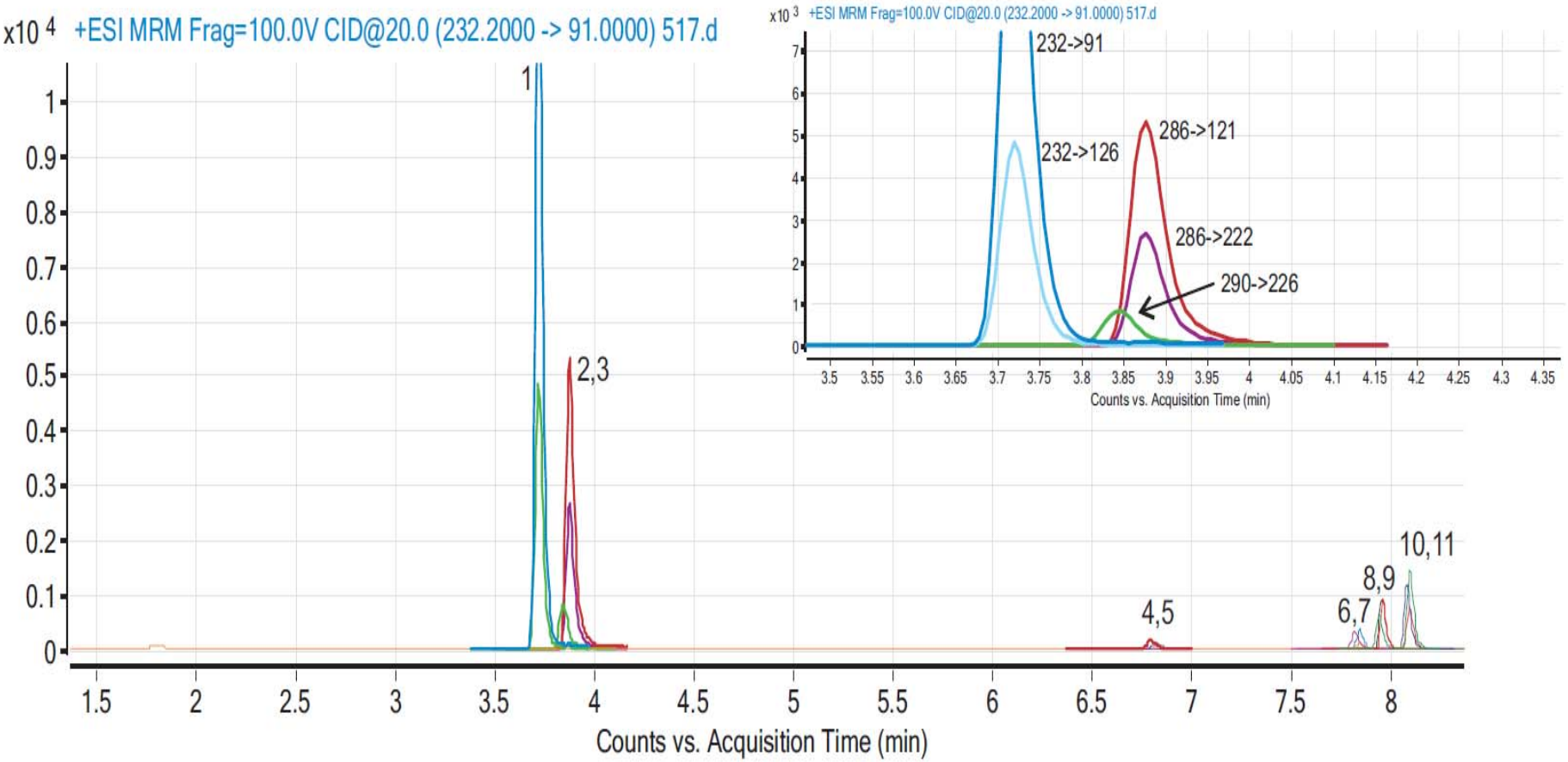
Challenge of NPS in toxicological work

- Pre-screening of potentially emerging drug candidates to be included in bioanalytical methods through multiple sources:
  - EWS
  - National drug seizures statistics and co-operation with authorities
  - Internet discussion forums, user reports
  - Wastewater analysis
  - Research projects and international collaboration
- Some NPS are very potent with low concentrations in biofluids (such as in whole blood and DUI cases) and metabolites unknown (especially for urine)
- Challenge of getting suitable reference standards (price, not commercially available, slow delivery, administrative bureaucracy)

Efficient methodologies: UHPLC-MS/MS (in combination with other mass spectrometric techniques)



1. alpha-PVP (0.019 mg/l), 2. 7-aminoclonazepam-d4, **3. 7-aminoclonazepam (0.028 mg/l)**, 4. buprenorphine-d4, **5. buprenorphine (0.59 ng/ml)**, 6. clonazepam-d4, **7. clonazepam (0.0097 mg/l)**, 8. alprazolam-d5, 9. **alprazolam (0.019 mg/l)**, 10. nordazepam-d5 and **11. nordazepam (0.081 mg/l)**

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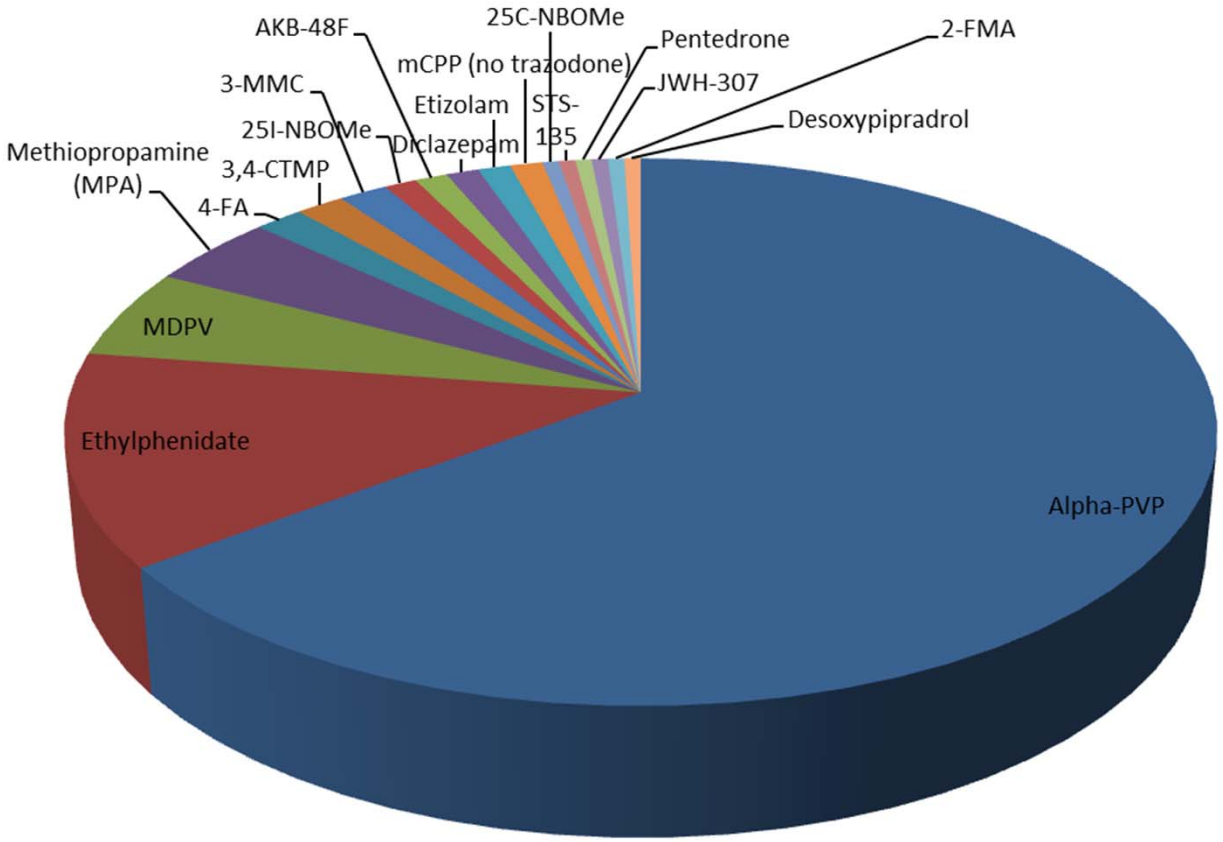
Legal issues related to DUI of NPS

- In Finland, the zero-tolerance law is applied if controlled drugs or their active metabolites are found in the blood (not applied, if a person has a valid prescription)
- The impairment law is applied for all other substances: a driver will be convicted for driving while intoxicated if it can be proved that his or her driving ability was impaired by the use of drugs
- Impairment must be shown in court based on:
  - The documentation by the police officer
  - Clinical sobriety test performed by a physician (not always performed)
  - The laboratory report, including a pharmacological evaluation based on the test results

Legal issues related to DUI of NPS (cont..)

→ Classification of NPS may have significant impact on DUI cases since often very limited amount of scientific information is available for assessing impairment based on laboratory results for NPS (if NPS is classified either by national or international decision, the zero tolerance law can be applied instead of impairment law)

NPS findings in DUI cases in Finland (01/01-15/05/2014; N =1897)



Compound	N of positives
Alpha-PVP	123
Ethylphenidate	24
MDPV	10
Methiopropamine (MPA)	8
4-FA	3
3,4-CTMP	3
3-MMC	3
25I-NBOMe	2
AKB-48F	2
Diclazepam	2
Etizolam	2
mCPP (no trazodone)	2
25C-NBOMe	1
STS-135	1
Pentedrone	1
JWH-307	1
2-FMA	1
Desoxypipradrol	1

* Tens of NPS included in the analytical process; e.g. all of the 15 most common NPS seized by the Finnish Customs in 2013, were included.

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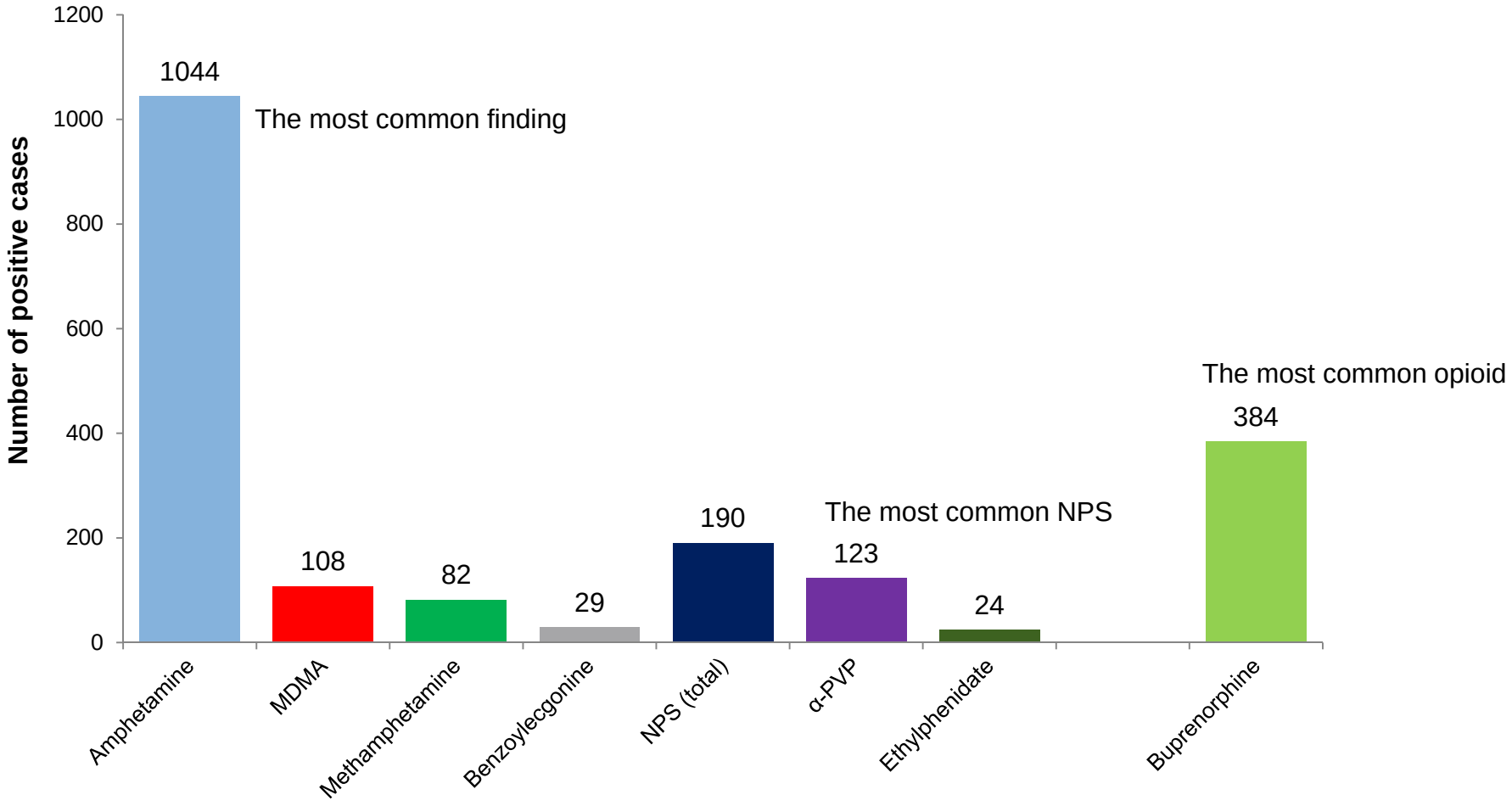
Prevalence of NPS in comparison with traditional drugs of abuse 01/01-15/05-2014 in DUI cases (n=1897)



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Conclusions and remarks

- Efficient and systematic analytical methodologies and processes for biosamples allow not only case-by-case toxicological work, but overall picture of a recent drug situation
- The number of NPS findings remained relatively low as compared to those of amphetamine, the most commonly detected illicit drug in DUI cases
- The use of preliminary on-site drug tests used by police may lead to underestimation of NPS prevalence in road traffic
- The most common NPS findings in Finland are stimulants, the prevalence of synthetic cannabinoids is low among suspected drunken drivers
- Only a few NPS have become popular in Finland (MDPV, 2-DPMP, now alfa-PVP and to a smaller extent ethylphenidate)

Conclusions and remarks (cont..)

- All NPS that have become popular among suspected drunken drivers have been stimulants with significant intravenous use
- Over three fourths of all recent NPS findings in DUI cases were either alpha-PVP or ethylphenidate
- Very recent findings (2014) show that alpha-PVP was more common than methamphetamine, MDMA or cocaine in DUI cases in Finland
- While the use of MDPV has decreased in Finland, alpha-PVP has become popular
- Alpha-PVP was put under the narcotics law by national decision at 30/12/2013.

  → The number of positive cases in DUI cases has not decreased (123 cases until 15/05/2014, 210 cases for a whole year 2013)