New Psychoactive Substances in Europe
Diversity and Harms

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Lisbon Addictions
The past: from a trickle

U.S. Drug Sleuths Finally Solve Mystery of the Deadly China White

New Narcotic Identified After Monthlong Quest

As Federal drug agents and California police stepped up their search for the sources of the China White, the forensic chemists turned their detection scales to a backlog of other, more routine cases. The challenge of identifying a new drug from the street comes no more than once or twice a year.
The present: to a flood

500+ monitored
Synthetic cannabinoids

155 monitored

Number of seizures

Quantity seized (kg)

200-fold increase in seizures 2008–13
Synthetic cathinones

95 monitored

60-fold increase in seizures 2008–13
AH-7921

A 40 year old 'failed' medicine, sold as a 'research chemical'

Pharmacological & chemical studies

- 1973 – 1974
- Receptor studies 1980
- Receptor studies 1983
- Patent issued 1976
- Receptor studies 1988

Test purchase from Internet 2012
- 15 deaths & 6 NFI reported 2012 – 2013

Joint Report launched 2013
- EMCDDA risk assessment 2014

Appears on Internet (Wikipedia) 2010
What caused the flood?

1. Chemical companies based in China and India synthesise NPS in bulk quantity.

2. Shipped by air or sea to Europe.

3. Processed and packaged into legal highs, research chemicals and food supplements.

4. Sold openly in headsmart shops and online.

5. 8% lifetime use in young adults.

Illicit drug market.
AH-7921
'Failed medicine'

- **first detected in 2012** (Wikipedia in 2010), sold as a 'research chemical'; 20+ vendors selling up to 1kg, eventually **detected in 9 countries**

- **opioid analgesic**, invented in the 1970s but not commercialised

- **µ-opioid receptor agonist**; analgesic potency similar to morphine; evidence of abuse liability and dependence liability (animal studies)

- **limited epidemiological information**; polydrug use common, route oral, re-dosing & injecting; no prevalence data, but not widely used (e.g. use limited to experimentation, self-treat pain and opioid withdrawal)

- **15 deaths in a 10 month period** associated with the substance; 6 non-fatal intoxications

- **naloxone appears to reverse the effects**

- **Did it have diffusion potential?**
4-Methylamphetamine

'By accident'?

- **first detected in 2009** (Belgium)

- **sold and used as amphetamine** — found in combination with amphetamine and caffeine; switch in precursors used to make amphetamine

- **detected in 17 countries**

- **no demand from users** — they didn't know they were taking it

- **stimulant** — derivative of amphetamine; first synthesis in 1938; investigated as an anorectic by SKF in 1950s but not commercialised as medicine

- **stimulates release and inhibits reuptake of 5HT, DA and NE** — but greater effects on 5HT reuptake than DA or NE compared to amphetamine; MAO inhibitor; LD50 (mice) similar to amphetamine; LSD-like effects? no data on 4-MA–amphetamine co-administration

- **21 deaths in 20 months** associated with the substance; small number of non-fatal intoxications

- **diffusion potential** — as it was sold as amphetamine
4,4′-DMAR

'Novel substance'

- **first detected in 2012** by the Netherlands—**90kg seizure** by customs; detected in 9 countries

- **stimulant**, derivative of aminorex and 4-methylaminorex (U4Euh)

- **not previously described** in the literature—a real designer/novel drug!

- **sold as 'Seroto' a 'research chemical'**—ad campaign included animal data; sales online appeared to decease after deaths; then appeared as **ecstasy, which were linked to a cluster of deaths**

- **potent substrate-type releaser at DAT, NET, SERT**

- limited epidemiological information; polydrug use common, route oral

- **31 deaths in a 12 month period** associated with the substance; 1 non-fatal intoxication
Final thought

UN Conventions

- Dependence
- Abuse liability
- Ill effects

In reality

- Dependence (sometimes, non-clinical data)
- Abuse liability (sometimes, non-clinical data)
- Ill effects (Acute toxicity (non-fatal intoxications and deaths))

How much data do we need to act – what is the tipping point?
A special thanks to the national Early Warning Systems and their networks

http://www.emcdda.europa.eu/activities/action-on-new-drugs

@toxicovigilance