The epidemiology of (meth)amphetamine

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Conflicts of interest

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The history of (meth)amphetaminene

- 1887: amphetamine synthesized by the Romanian chemist Lazăr Edeleanu in Berlin
  - Related to the newly isolated ephedrine (Nagai Nagayoshi)
- 1927: Gordon Alles synthesized it
  - tested it on himself
  - an artificial replacement for ephedrine
- Methamphetamine was first synthesized from ephedrine in Japan in 1920 by chemist Akira Ogata, via reduction of ephedrine using red phosphorus and iodine

Historical uses of central stimulants
"Bond cursed himself for an impulse that earlier in the day would have seemed unthinkable. Champagne and Benzedrine - never again."

Ian Fleming, 'Moonraker', 1955

(Meth)amphetamine

- Use of methamphetamine increased during WWII
- Both sides used central stimulants in combat
- Lieutenant Yukio Seki:
  - First kamikaze fighter of Japan, Oct 25th 1944
Hvor ofte er metamfetamin hovedårsaken til en innleggelse i behandling i USA? (per 100 000)
### Annual prevalence of drug use at the global level, by illicit drug category, 2009-2010

- **Cannabis**: 4.5% (95% CI: 4.1-4.9)
- **Amphetamines**: 2.8% (95% CI: 2.4-3.3)
- **Ecstasy**: 1.3% (95% CI: 0.9-1.7)
- **Cocaine**: 0.6% (95% CI: 0.4-0.9)
- **Opioids**: 0.5% (95% CI: 0.3-0.7)
- **Hallucinogens**: 0.8% (95% CI: 0.5-1.1)

Source: UNODC estimates based on ARQ data and other official sources.

### Trends in the volume of seizures, by main drug categories (index: 1998 = 100)

- **ATS**: Minimum: 100, Maximum: 350
- **Cocaine**: Minimum: 100, Maximum: 350
- **Cannabis**: Minimum: 100, Maximum: 350
- **Heroin and morphine**: Minimum: 100, Maximum: 350

Source: UNODC ARQ.
Fig. 13a: Amphetamine seizures in Europe, 2000-2009

* Data for 2009 for the Netherlands were unavailable; the value used is that corresponding to the year 2008, and is only included to estimate the regional total.
** Data for the United Kingdom for 2007, 2008 and 2009 are based on incomplete data for some jurisdictions for the financial years 2007/08, 2008/09 and 2009/10 respectively, and adjusted for the missing jurisdictions using the distribution in 2006/07.
Source: UNODC, DGTAD.

Fig. 13b: Methamphetamine seizures in West and Central Europe, 2000-2009

Source: UNODC, DGTAD.
Fig. 2. Measured mass-flow (mg/h) of methamphetamine and benzoylecgonine through the Oslo sewage system during the period of 4–30 September 2009. Six-hour composite samples (time proportional, total volume 1000 mL) were continuously collected and analysed throughout each day (2 am, 8 am, 2 pm, 8 pm).

From Reid MJ, Langford KH, Mørland J, Thomas KV. Quantitative assessment of time dependent drug-use trends by the analysis of drugs and related metabolites in raw sewage Drug Alcohol Dep 2011
Amphethamine vs. methamphetamine

- Very similar
  - Abuser don’t know what they buy!
    - Evidence in criminal courts
    - Interview with injecting drug users
- In US: methamphetamine = "ice"
  - Higher purity
  - Most often smoked
  - Can be injected
- In Scandinavia: methamphetamine – in powder form like amphethamine
  - Did this increase the accessibility to the market?
- Clinical knowledge: meth is more potent!
  - True?
  - Increased lipid solubility:
    - Quicker passing the blood brain barrier (quicker and higher high)
  - More difficult to metabolize
    - Longer duration of action?
- Methamphetamine is not less dangerous!
  - Why more potent
  - How much more potent
  - More potent in generating psychosis?
Figur 4.10: Antall beslag av heroin, cannabis, kokain og amfetamin 1974–2008
Number of seizures of heroin, cannabis, cocaine and amphetamines 1974–2008

Figur 5.1: Prosentandel av ungdom i alderen 15–20 år som oppga at de noen gang hadde brukt forskjellige narkotiske stoffer, Norge (treårig glidende gjennomsnitt).
Figur 5.3: Prosentandel av ungdom i alderen 15–20 år som oppga å ha blitt tilbudt ulike typer stoff, NORGE [treårig glidende gjennomsnitt].

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Methamphetamine is taking over and is more dangerous?

Cases from the criminal justice system
Data from the Norwegian Institute of Public Health

Cases from forensic autopsies
Data from the Norwegian Institute of Public Health

Number of seizures by year
Data from the Norwegian police

Driving under the influence
Data from Norwegian Institute of Public Health
Patients in acute psychiatry

• 100 patients in emergency psychiatry the fall of 2003
• 22 had amphetamines in either blood and/or urine
• 14 (63 %) were methamphetamine positive
• In a later survey methamphetamine had increased further

Mordal et al 2010
Syringe exchange buss in Oslo

- Users don’t discriminate between amphetamine and methamphetamine
- Many declare that they have used amphetamines during the last month
  - Average 14.5 days last month
- Increase in share who have used amphetamines over the years 1999-2008
- Increase in the number of days used
- Price has gone down