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Some insights and ideas about creating supply indicators and studying markets

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About RAND Europe

- **Non-partisan, non-profit research organization**
- **Headquartered in the US, two European offices**
  - **Cambridge and Brussels**
- **60+ researchers on both sides of the Atlantic conducting research on substance use, markets, and drug policy**

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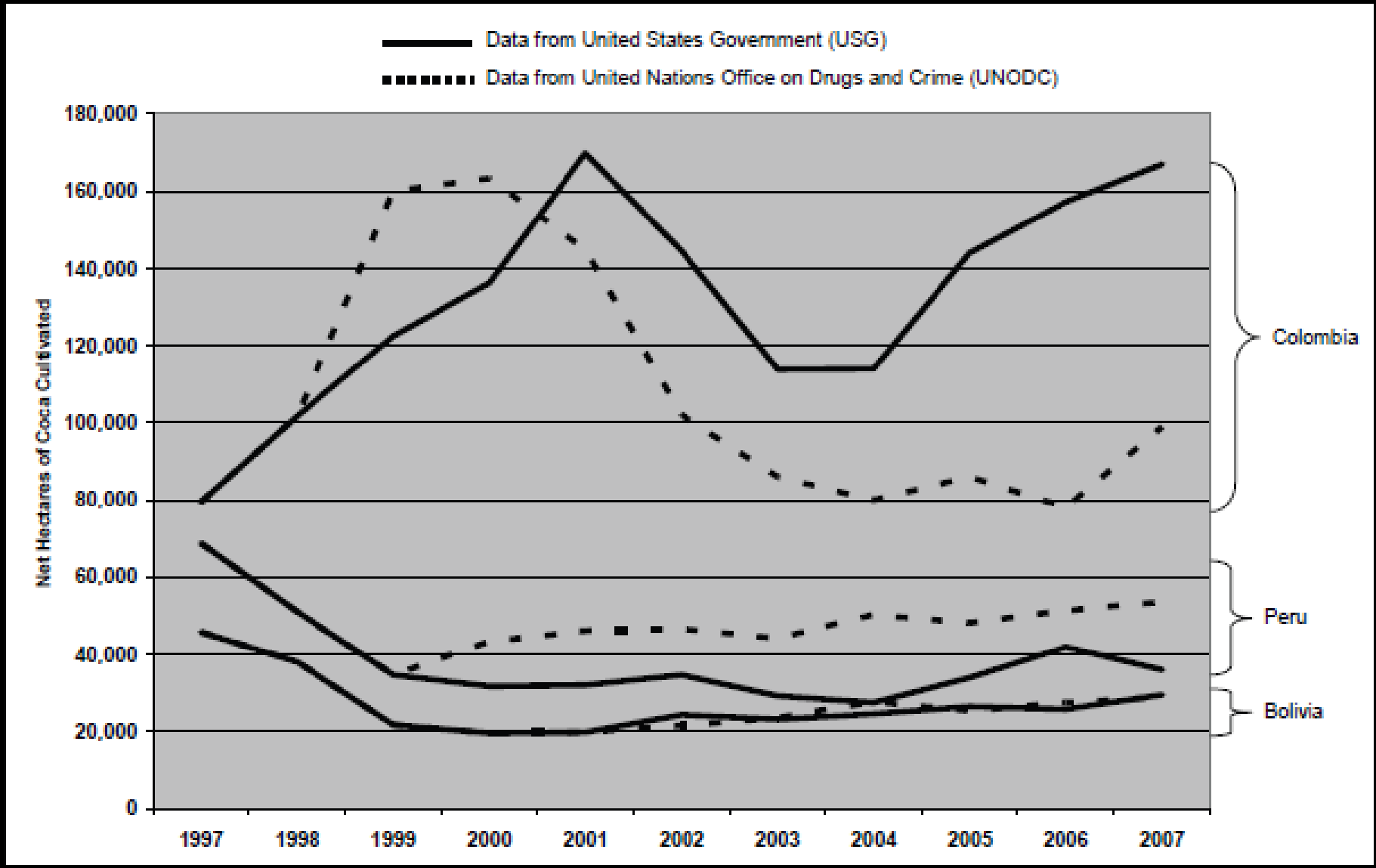
Insights based on recent collaborations

- **Recently completed projects**
  - **Report on global illicit drugs markets (with Trimbos)**
  - **Understanding drug markets and supply-reduction**
- **Current projects**
  - **Further analysis of the EU illicit drugs market (with ICPR and Trimbos)**
  - **What America's users spend on illicit drugs and trends in the supply of illicit drugs (with Carnegie Mellon University)**

Outline

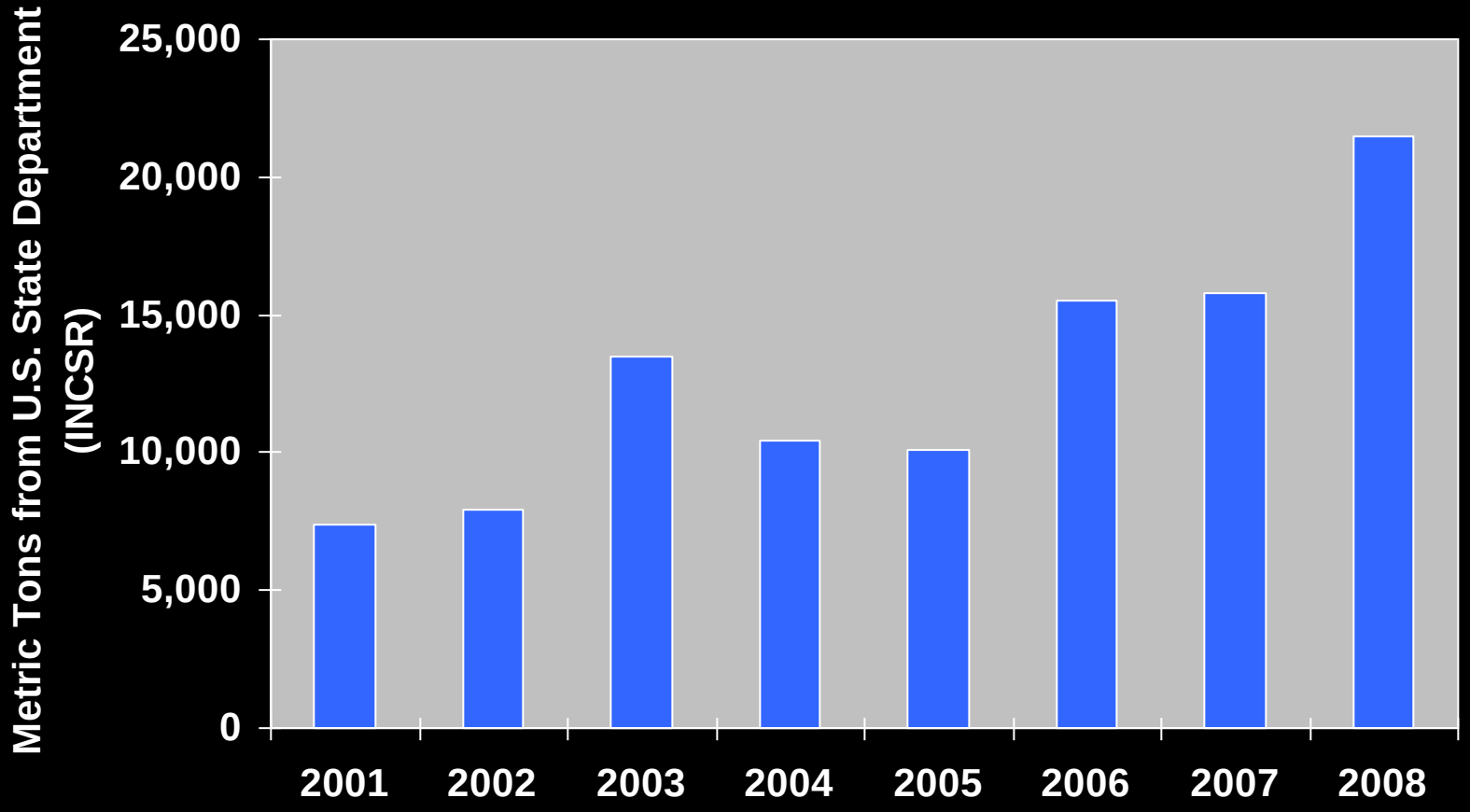
- **Discrepancies in conventional supply indicators**
- **Fully exploiting seizure data**
- **Learning more from heavy users**
- **Estimating time from harvest to seizure**

Differences in coca cultivation estimates



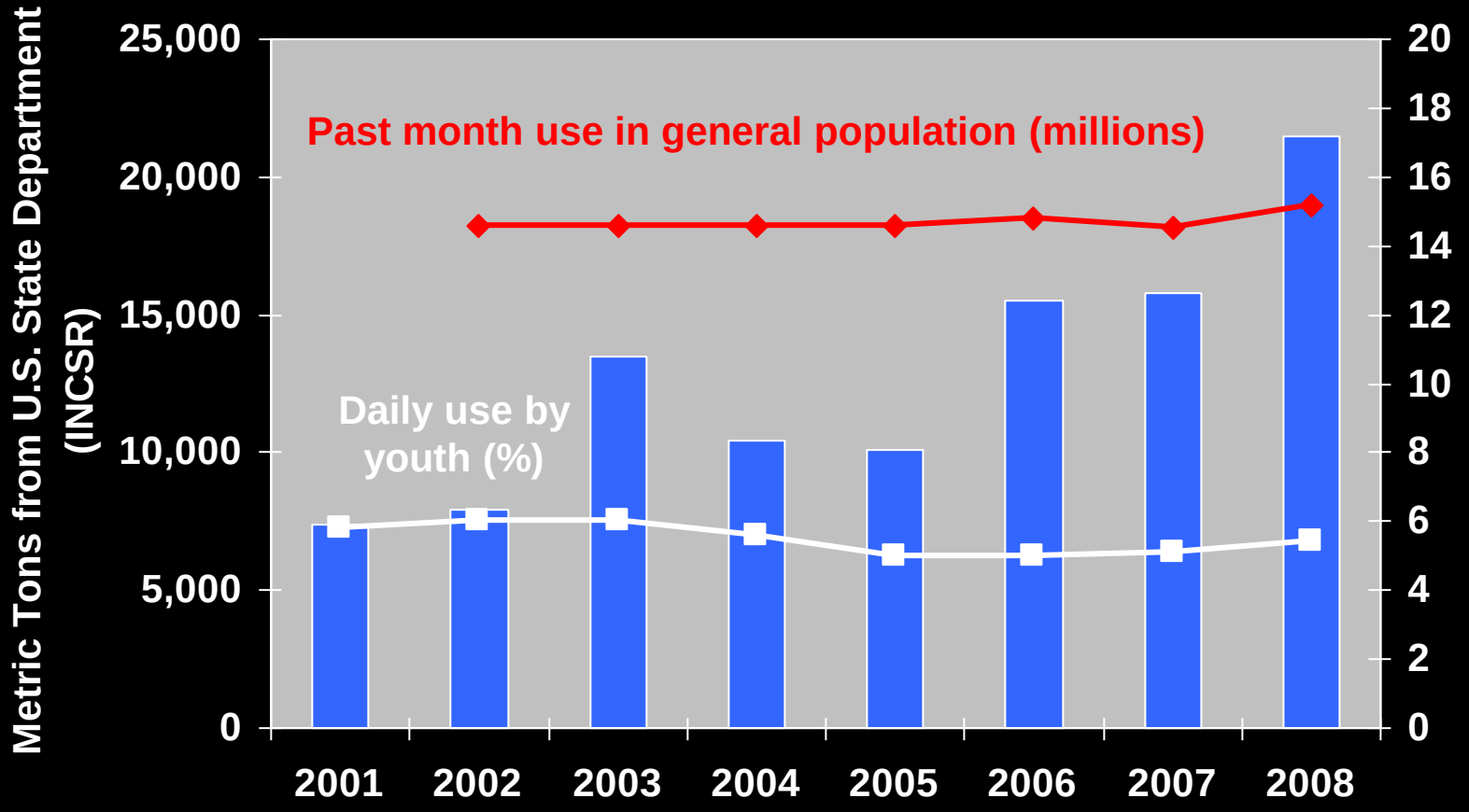
Source: Kilmer & Pacula, 2009

Net Mexican marijuana production allegedly tripled from 2001 to 2008 . . .



Source: Kilmer, Caulkins, Pacula, & Reuter, 2011

. . . but marijuana use in U.S. was flat



Source: Kilmer, Caulkins, Pacula, & Reuter, 2011

Important differences closer to home: Arrests for drug supply offenses

- **EUROSTAT**
  - **"Drug trafficking includes illegal possession, cultivation, production, supplying, transportation, importing, exporting, financing etc., of drug operations which are not solely in connection with personal use"**
- **EMCDDA**
  - **The term 'reports for drug law offences' covers different concepts, varying between countries.**
  - **Based on data from REITOX National Focal Points**

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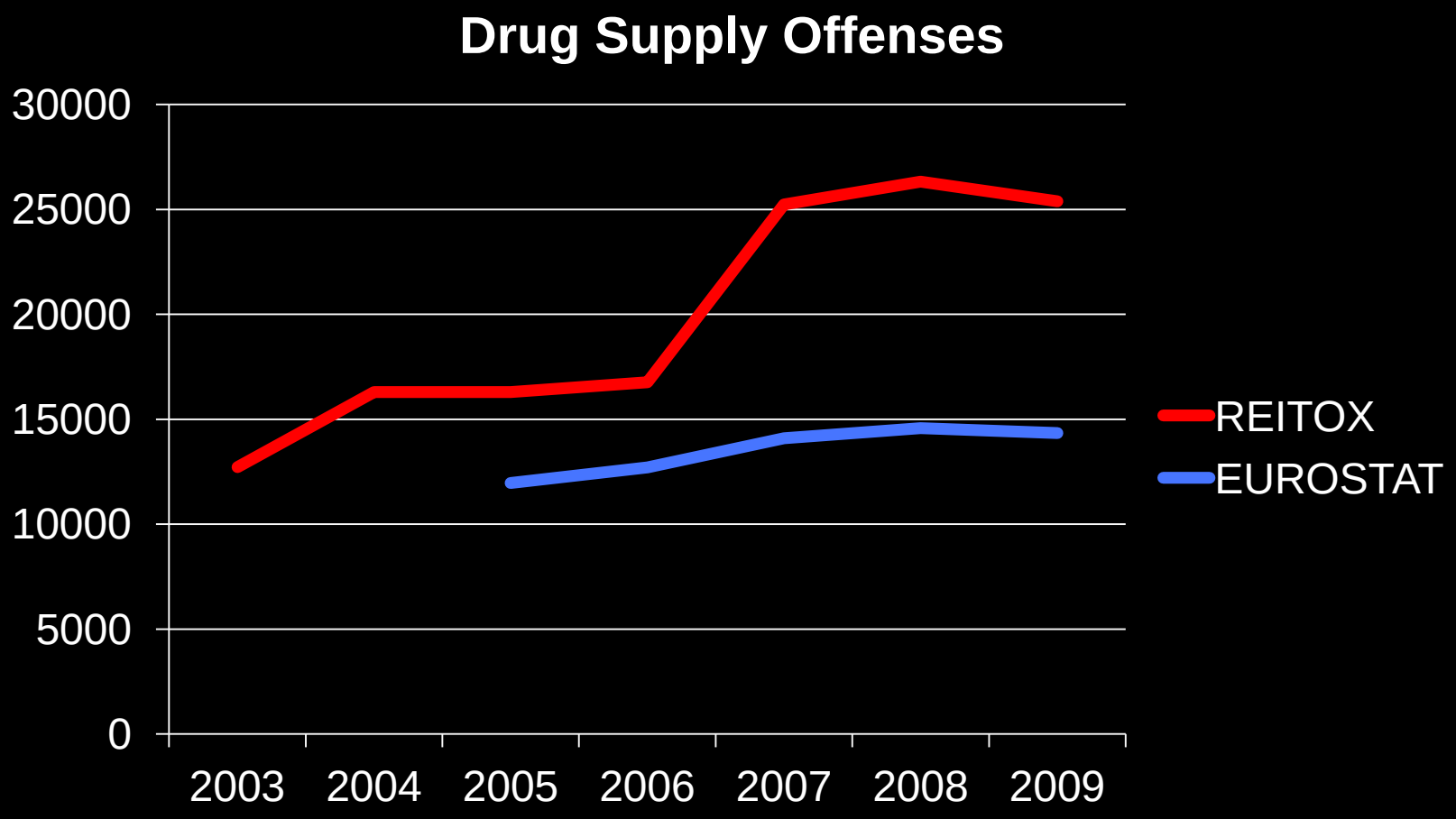
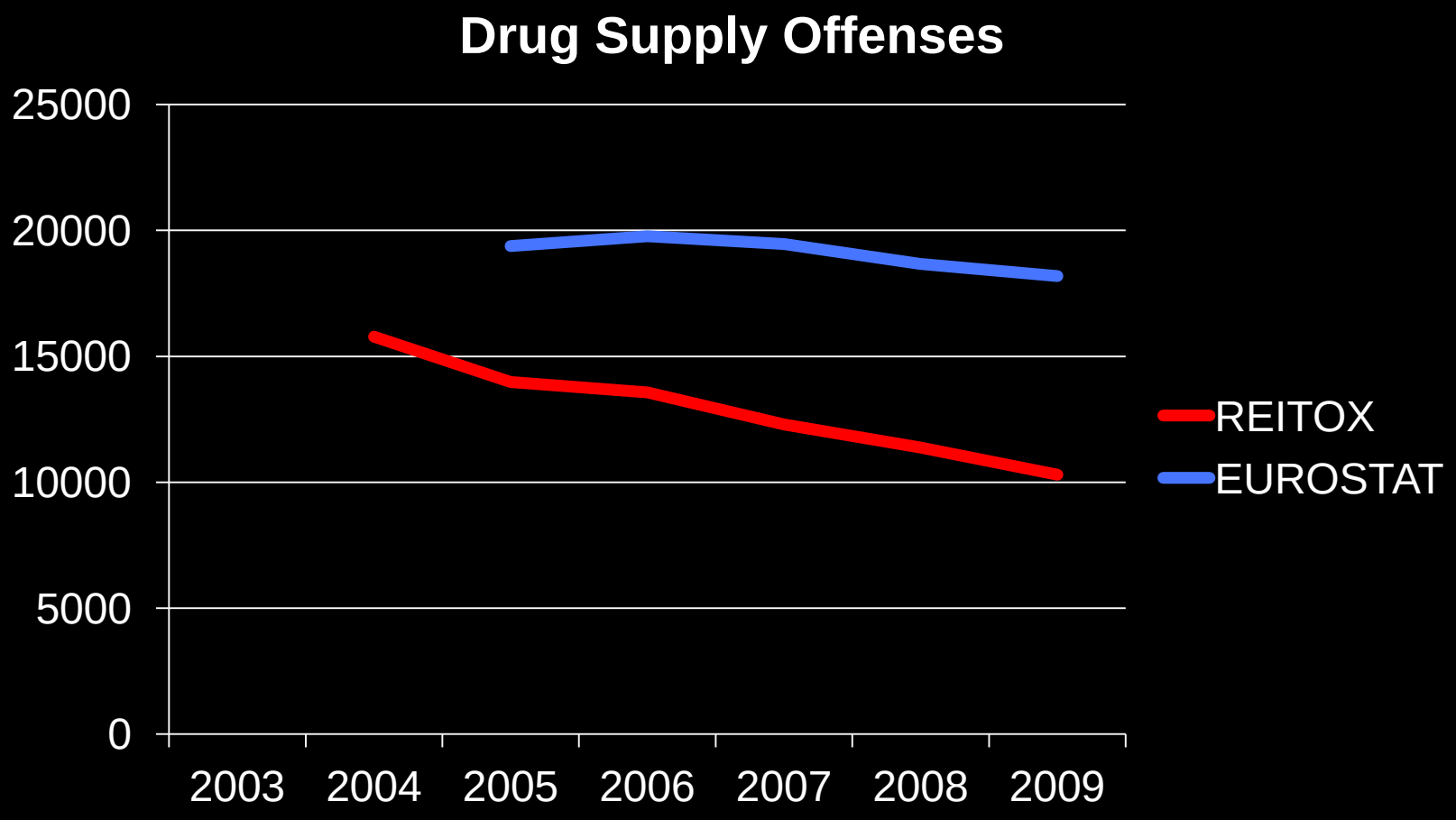
For Spain, REITOX > EUROSTAT



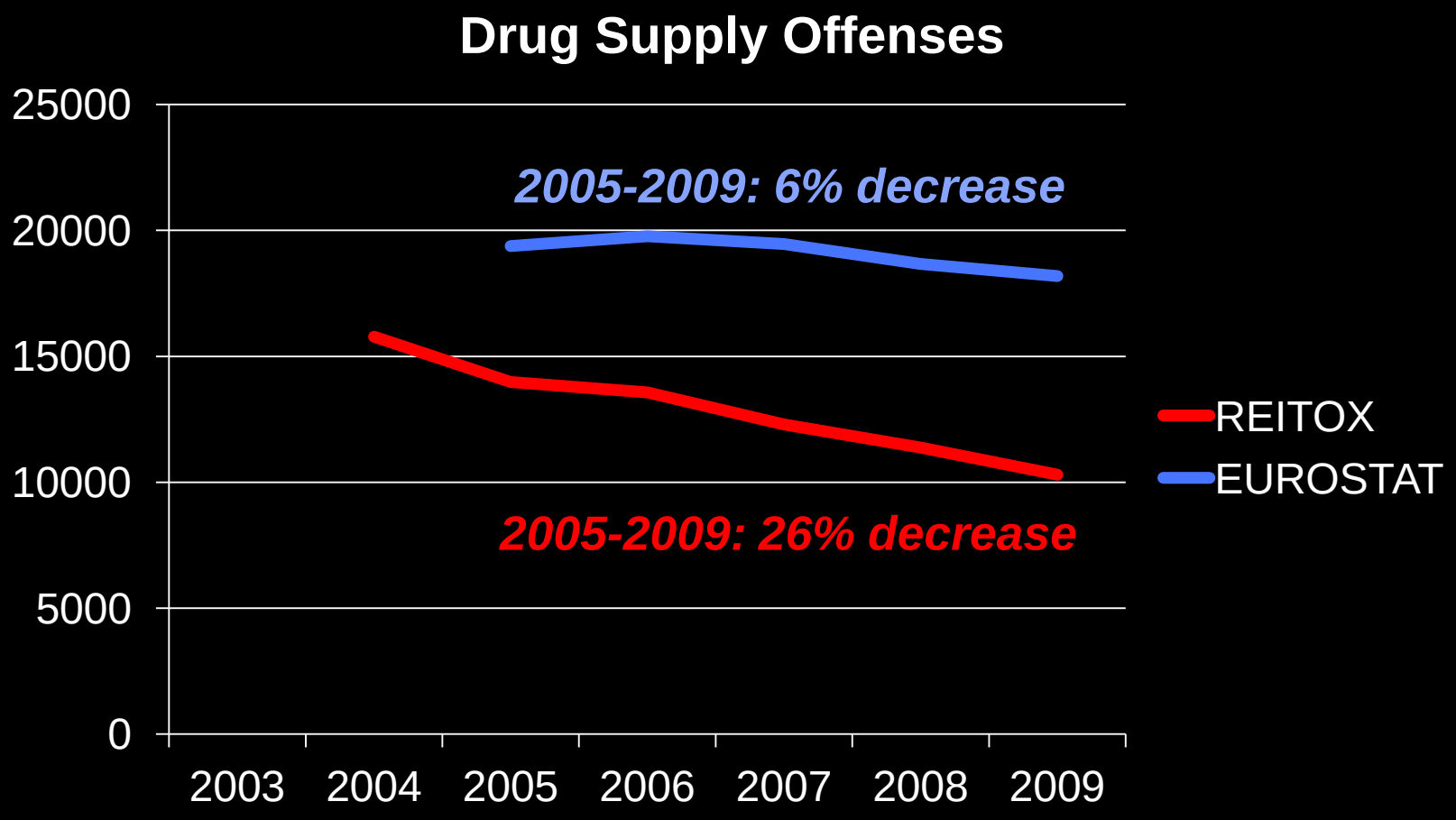
REITOX: “Arrests made in case of dealing/trafficking (criminal offences).”
EUROSTAT reported break in 2005 because of penal code change, no definition

For Netherlands, REITOX < EUROSTAT



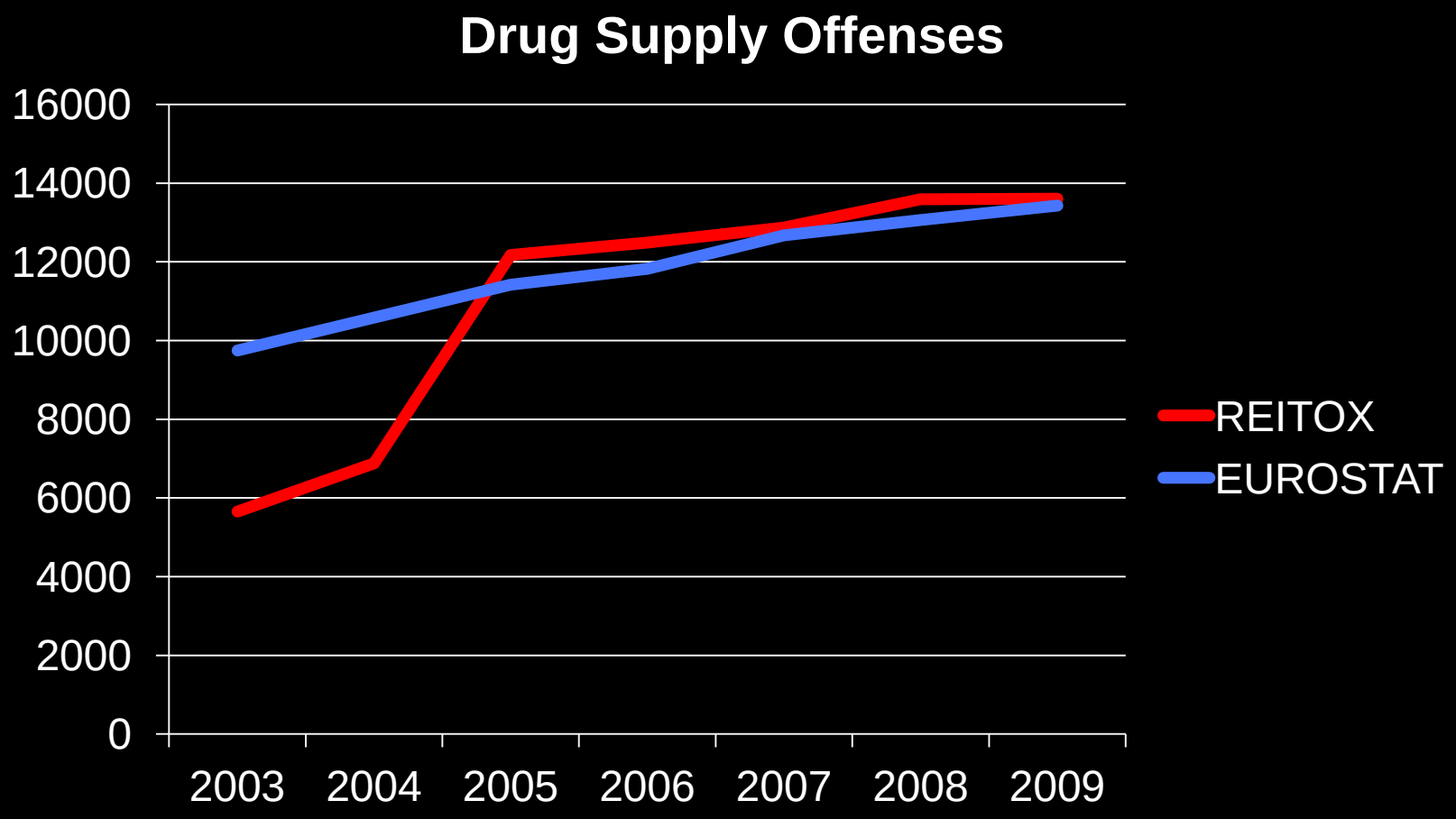
REITOX: “Offences against the Opium Act considered in need of Prosecution Department.”
EUROSTAT: Only present data going back to 2005, no definition given

For Netherlands, REITOX < EUROSTAT



REITOX: “Offences against the Opium Act considered in need of Prosecution Department.”
EUROSTAT: Only present data going back to 2005, no definition given

For Belgium, no longer a discrepancy



REITOX: “Police reports of offences related to illicit drugs.”
EUROSTAT: “Includes unauthorised production, import, export and trading of drugs.”

These discrepancies can matter and some are being addressed

- **Activities of other countries can have obvious implications for drug supply and indicators in BE**
- **Fortunately, institutions are currently working together to address these disparities**
  - **EMCDDA, EUROSTAT**
  - **EC working to harmonize criminal justice databases**
- **All of these examples serve as a reminder to be careful when using official administrative data**

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Total seizures useful, not a great indicator

- **Quantity seized is a function of at least three factors (Reuter, 1995)**
  - **The quantity shipped**
  - **The care taken by smugglers**
  - **The relative skill of the interdictors**
- **Thus, seizures may decrease because law enforcement becomes more effective or less ineffective**
- **Suggests collecting more info than just total seizures and total weight**

Beyond total and average weight

- **Would like information about the distribution of weights**
  - **Minimum, maximum, median, average, mode, variance**
- **Even better to have statistics by "weight bin"**
  - **Example of 4 bins: <u>≤1g</u>, <u>1g-10g</u>, <u>11g-200g</u>, <u>200g+</u>**
  - **Will likely differ by drug**
  - **Would allow us to better understand whether and how law enforcement is influencing the different levels of the markets**
- **And of course, purity information is of critical importance for understanding market dynamics**

There is a wealth of purity information waiting to be analyzed by researchers

- **European Network of Forensic Science Institutes (ENSFI)**
  - **Has a working group on illicit drugs**
- **We surveyed 56 ENSFI members, received responses from 21 labs in 16 countries**
- **Focus on 16 labs (one from each country)**
  - **15 publicly owned, mostly by law enforcement**

Survey insights from 16 labs

- More than half of these labs reported testing at least 1,000 samples in a typical month.
  - Less than 25% reported <250 samples per month
- Asked whether they collected information about the type of drug, quantity analysed, and purity in a computer database
  - 15 of the 16 said yes
- Asked when the institute began entering this information into a computer database
  - Mean and median were both close to 1999
  - Minimum = Before 1980; Maximum = 2005

More survey insights from 16 labs

Country	Would you share purity data with select researchers for statistical analysis?	Approximately how may institutes in your country assess the purity of illicit substances?	Approximately how many samples of illicit drugs are tested in a typical year for the entire country?
Belgium	Yes	5–10	>=1,000 & <10,000 samples
Czech Republic	Yes	5–10	>=25,000 samples
France	Yes	11–20	Do not know
Germany	*	21+	*
Hungary	Yes	2–4	>=10,000 & <25,000 samples
Ireland	Do not know	1	>=25,000 samples
Italy	Yes	21+	>=25,000 samples
Norway	Yes	1	>=25,000 samples
Poland	Yes	Do not know	Do not know
Estonia	Yes	1	<1,000 samples
Slovakia	Yes	1	<1,000 samples
Spain	Yes	5–10	Do not know
Sweden	Yes	1	>=25,000 samples
Switzerland	Yes	5–10	>=1,000 & <10000 samples
Ukraine	No	11–20	>=25,000 samples
United Kingdom	Yes	1	>=10,000 & <25,000 samples

* Not reported

Source: Kilmer & Hoorens, 2010

Beyond purity: More can be learned from seizures sent to labs

- **Identification and quantification of adulterants**
- **Identification of source country**
- **UK SOCA's Project ENDORSE receives a lot of attention**
  - **Database Includes results from a battery of tests for all seizures of powdered Class A drugs and amphetamines > 25g**
  - **Images of the drugs, wrappings, containers loaded and tagged**

Must consider cost of extra analyses

- **Originally cost £70,000/month to pay forensic service providers to conduct the additional analysis**
  - **Cut back to £50,000/mo (P.McGee, Retired SOCA)**
  - **This was in addition to the cost of receiving, storing, and analysis covered in existing contracts**
- **Unclear whether ENDORSE will be cut**
- **"ENDORSE Light" for UK and others?**
  - **Could consider developing a sampling frame to preserve many of the insights while reducing costs (J. Caulkins)**

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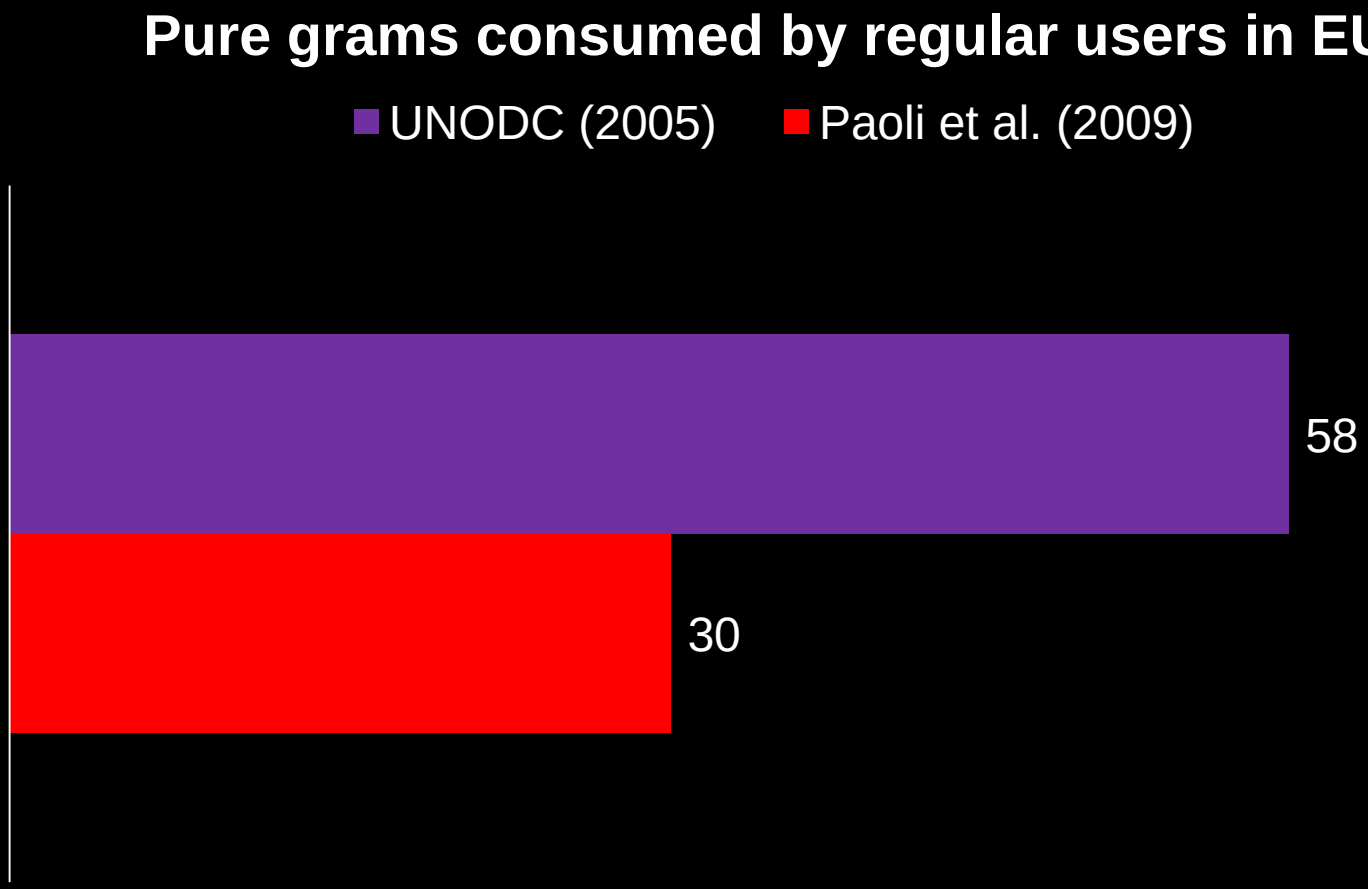
Heavy users can provide useful insights about supply changes and market activity

- **Information about market transactions**
  - **Expenditures, purchase characteristics**
- **New drugs entering the market**
- **Perceived risk of arrest**
- **Information about quantities consumed**
  - **Has very important consequences for market estimates and assessing the seizure rate**
  - **Important to distinguish between most recent vs. typical use days**

Tremendous variation in estimates of annual heroin consumption



Number of ways to regularly talk with heavy drug users

- **Could obtain from treatment participants or interviews with a sample of heavy users**
  - **E.g., Australia's Illicit Drug Reporting System (IDRS)**
- **Could obtain this information from arrestees/inmates**
  - **E.g., ADAM program in New Zealand, U.S.**
- **Preferable to obtain on a quarterly basis, but still useful if only done annually**
  - **Idea is to make it systematic so changes can de documented**

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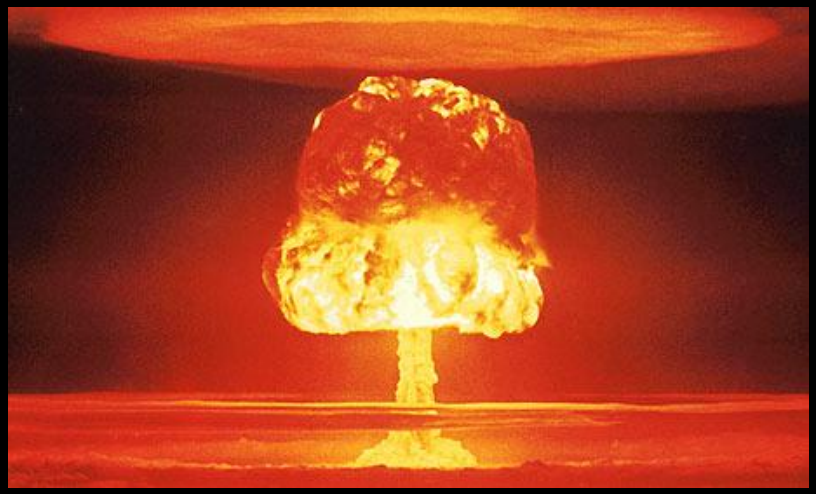
How long does it take to get plant-based drugs from the farm to the street?

- **Basic information about the supply chain is critical for truly understanding supply**
- **Traffickers may stockpile drugs and sell when price rises, or risk of seizure/theft is perceived to be low**
- **Storage and lags pose problems for assessing supply trends and supply-side interventions**
- **Analysts in the U.S. used to assume the lag for cocaine was 6-12 months**

Insights from a very "un"natural experiment



- **In advance of 1963 Nuclear Test Ban Treaty, there was a ^{14}C (Carbon-14) "bomb spike" in 1962**
- **Allegedly doubled ^{14}C in the atmosphere**
- **^{14}C content determines age of modern biological samples**
  - **E.g., plants, humans, wine**

New research demonstrates ^{14}C testing can be used to date cocaine

- **Ehleringer et al., 2012. *Forensic Science Intl***
- **Analyzed 539 cocaine specimens from the U.S. Drug Enforcement Administration**
- **Measurements made on an accelerator mass spectrometer (AMS)**
  - **With AMS only need 20-500 milligrams to test**
  - **Web searches suggest there are 5-10 AMS labs in Europe**
  - **Analysis costs $200-$500 per sample (via author email)**
    - ~50% cost is analysis, ~50% preparation/interpretation related

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Findings from Ehleringer et al., 2012

- **"Age"**
  - **Time period between when a coca leaf was harvested in South America and seized**
- **Approximate age of leaf at harvest: 3 m**
- **Average age of seizures >150kg: 18.2 +/- 1.4 m**
- **Average age of a U.S. street seizure: 24.6 +/- 1.1 m**

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Street "age" circa 2008 was 2-4 times older than assumed

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Opportunities for ^{14}C testing in Europe?

- If validated, could be useful for evaluating the effectiveness of supply reduction efforts
- Could look at "age" at typical entry points in Europe compared to street "age" in various cities
- Could build in a longitudinal component
- Other substances?
  - Found a paper which used ^{14}C testing for opium