

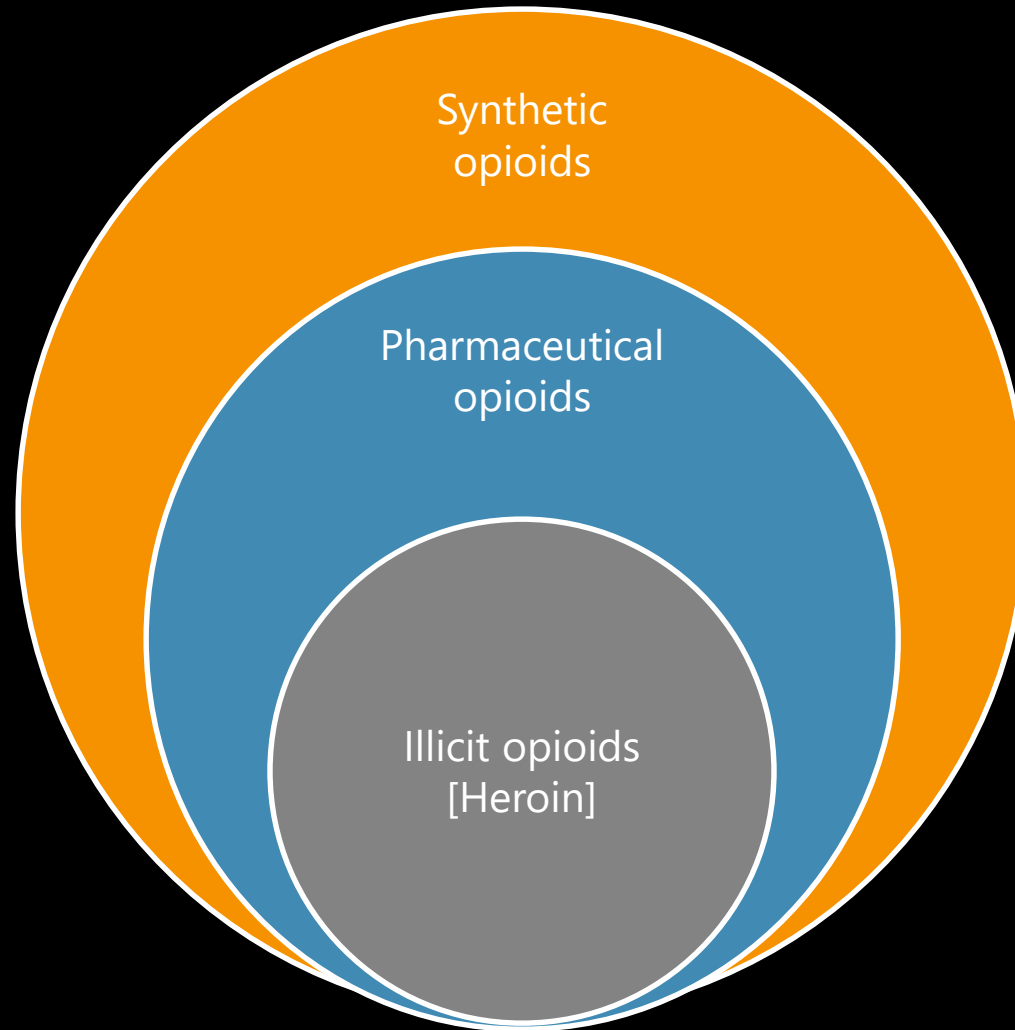


# Synthetic Opioids and the Forensic Science Perspective

Monica Joshi  
Department of  
Chemistry

December 6, 2018

# Opioid crisis

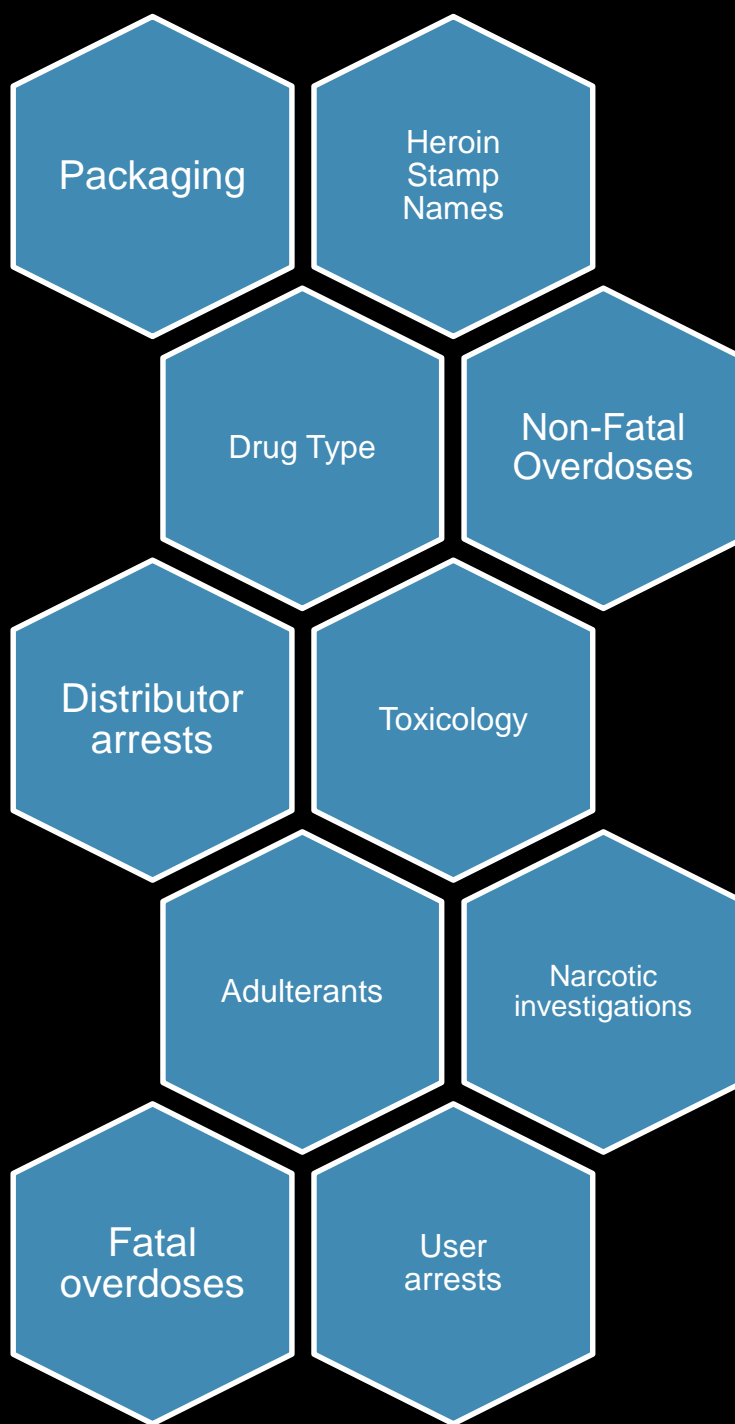


# Synthetic Opioids- Fentanalogs

Prescription pain medications	Synthetic opioids	
Buprenorphine	Acetylfentanyl	Acryfentanyl
Codeine	Furanylfentanyl	Para-chloroisobutyryl fentanyl
Dihydrocodeine	Butyrylfentanyl	Para-fluorobutyryl fentanyl
FENTANYL	Beta-hydroxythiofentanyl	Ortho-fluorobutyryl fentanyl
Oxycodone	U-44770	Meta-fluorobutyryl fentanyl
Hydrocodone	4-anpp	Isobutyryl fentanyl
Morphine	Para-fluorofentanyl	Fluoroisobutyryl fentanyl
Hydromorphone	Metaflurorfentanyl	Methoxyacetylfentanyl
Oxymorphone	Carfentanil	Cyclopropyl/crotonylylfentanyl
Methadone	Valeryl fentanyl	Phenylfentanyl
Meperidine		benzylfentanyl
Pentazocine		

# Multifaceted Approach

- Enhanced reporting
- Surveillance
- Research and technology
- Policy



# Evidence Collected for Analysis

- Pills
- Powders
- Glassine bags
- Paraphrenalia



# Demand on analysts and laboratories

- Safety
- Complexity of evidence
- Analytical challenges
- Average cost per case
- Greater turnaround time

# Safety concerns

- Collection
- Field testing
- Laboratory testing
- Contamination of surfaces



# Handling safety

- Avoid any action that may cause the powder to become airborne.
- Powder-free nitrile gloves should be worn during routing drug handling.
- Protect your eyes; wear OSHA-approved protection for eyes and face.
- Protect your lungs; wear a fitted N95 or P100 respirator to eliminate potential inhalation.
- Personal Protective Equipment (PPE) worn during seizures must be disposed of properly.
- Do not eat, drink, smoke, or use the bathroom while working in an area with suspected adulterants.
- Do not touch the eyes, mouth, or nose after touching any surface potentially contaminated.
- Wash skin thoroughly with cool water and soap; do not use hand sanitizer.

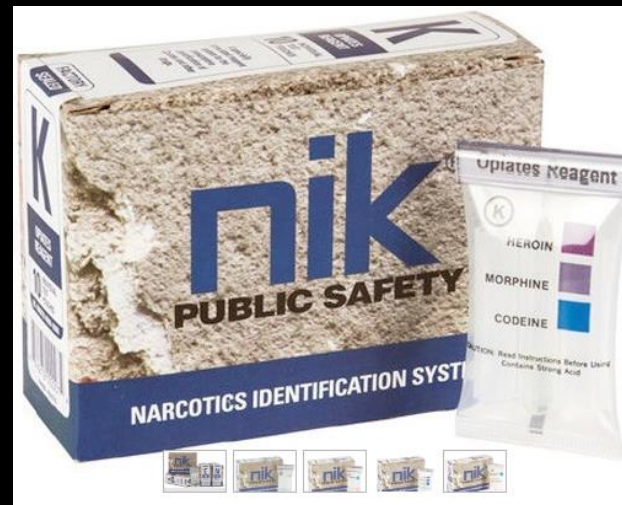
# Field Testing Devices



Trace detection – ion mobility spectrometers

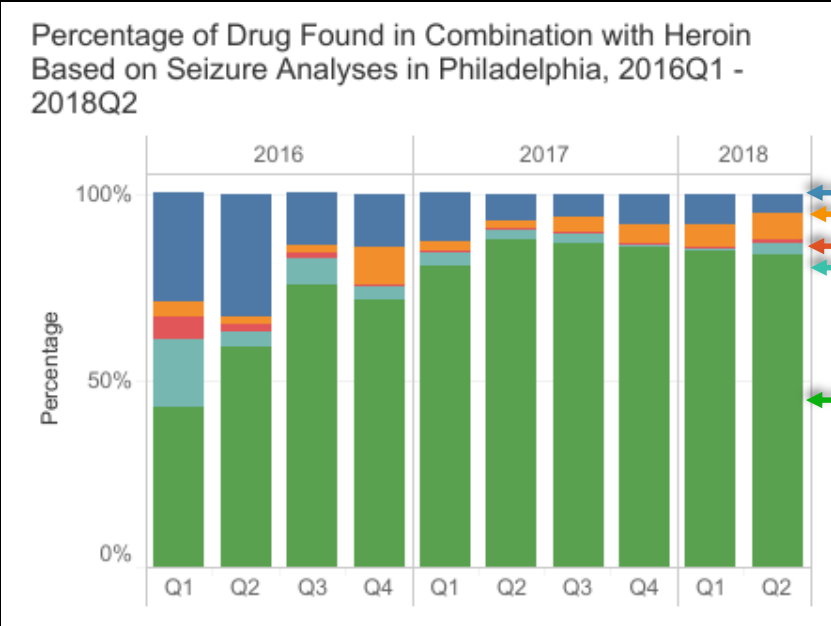
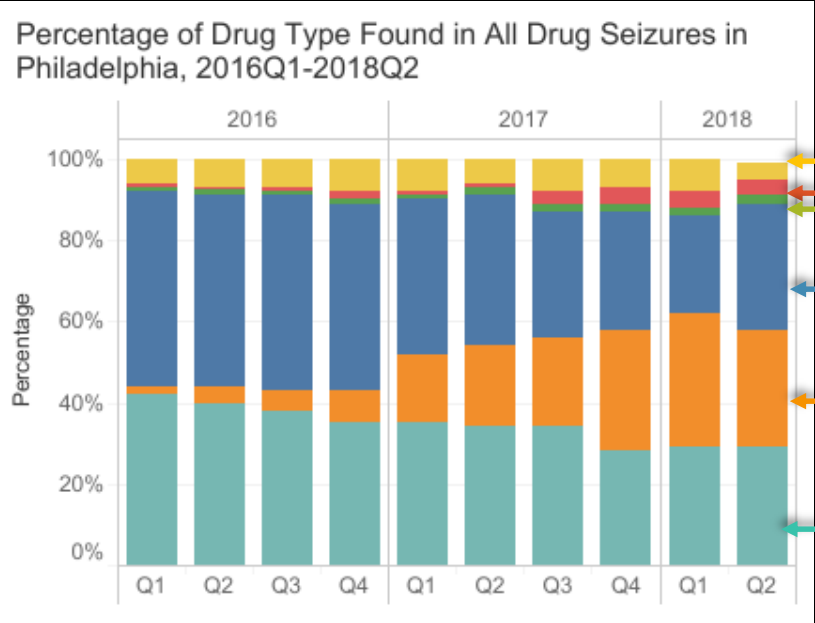


Handheld Raman spectrometers-  
Analysis directly in containers.



Color test kits- Not safe. One has to  
open bags and test the powders.

# Complexity



# Laboratory testing

- Complex chromatograms
- Lack of reference standards
- Lab safety
  - Snorkel hoods, masks, other PPE
- Average cost of analysis/per case: \$313 (Up 157%)
- 98% increase in lab expenditure (Up 143%)
  - Based on **Project FORESIGHT** and national surveys of labs