


# NDARC

National Drug &  
Alcohol Research Centre

The Difference is Research



## Opioid overdose deaths in Australia

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**UNSW**  
SYDNEY

Australia's  
Global  
University

# Objectives

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- Present trends in opioid overdose deaths in Australia
- Place trends in context with:
  - other countries
  - pharmaceutical opioid utilisation in Australia and internationally
- Present characteristics of opioid overdose deaths
- Contrast heroin and PO overdose deaths to understand whether different policy responses are required

## Data

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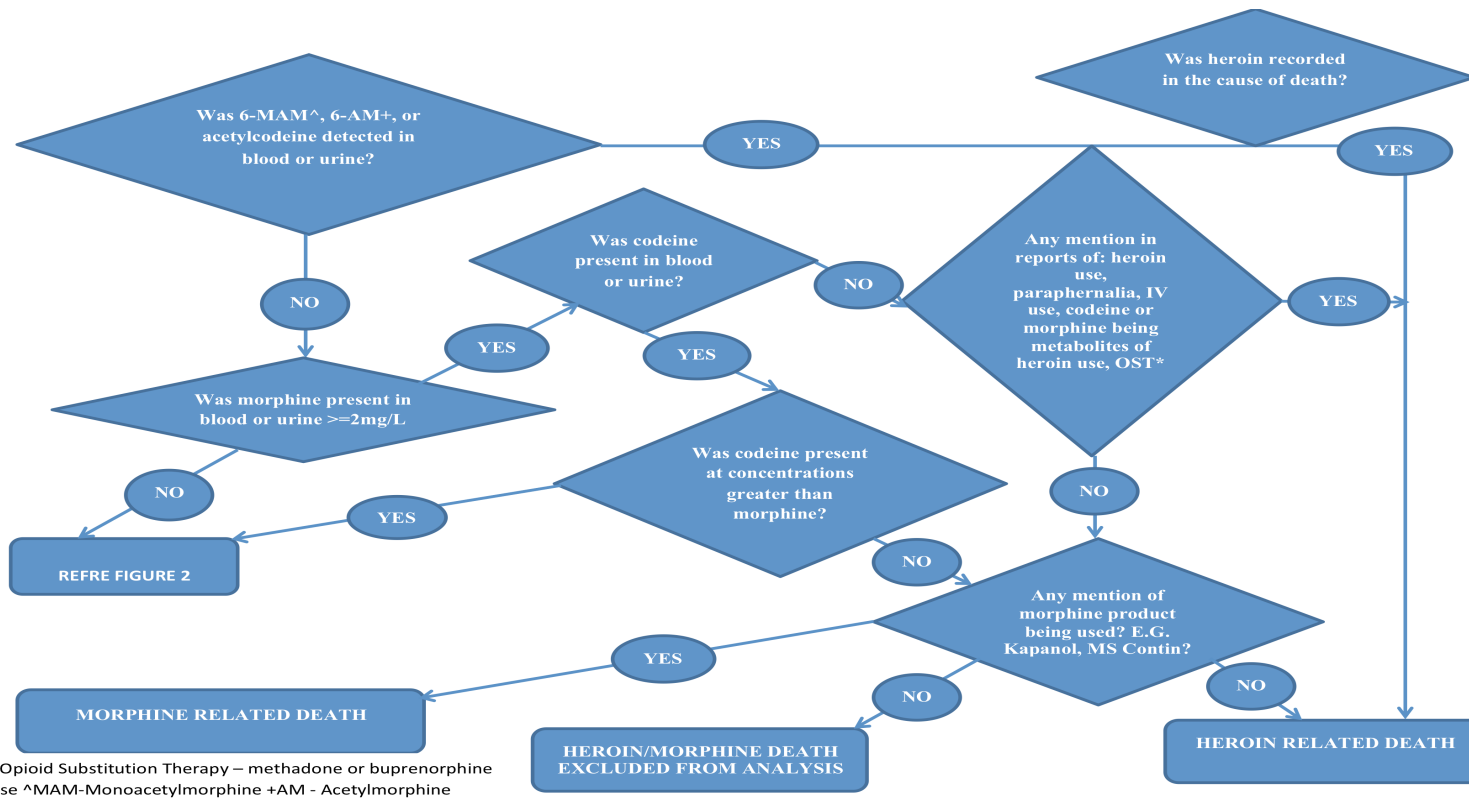
- Deaths extracted from the National Coronial Information System
- Online coronial database with autopsy, coroners, toxicology and police reports
- Allows for detailed analysis of the circumstances of deaths including:
  - History of substance use problems, chronic pain problems, opioid prescribed, opioid injected, toxicology
- Not constrained by ICD coding
  - allowed for separation of morphine and oxycodone, fentanyl and tramadol
- Developed methodology to distinguish between heroin and morphine deaths in consultation with a toxicologist

# Definitions

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- Opioid overdose deaths - deaths in which opioids were determined by the coroner to be the underlying cause of death – Direct DRDs
  - Heroin overdose deaths - deaths attributed to illicit (heroin) opioids either alone or in combination with other pharmaceutical opioids
  - Pharmaceutical opioid (PO) overdose deaths - deaths attributed to pharmaceutical opioids only, excluding heroin
    - Monitoring is broader than in Europe
  - Undetermined opioid deaths – deaths in which it was not possible to distinguish between heroin morphine or codeine

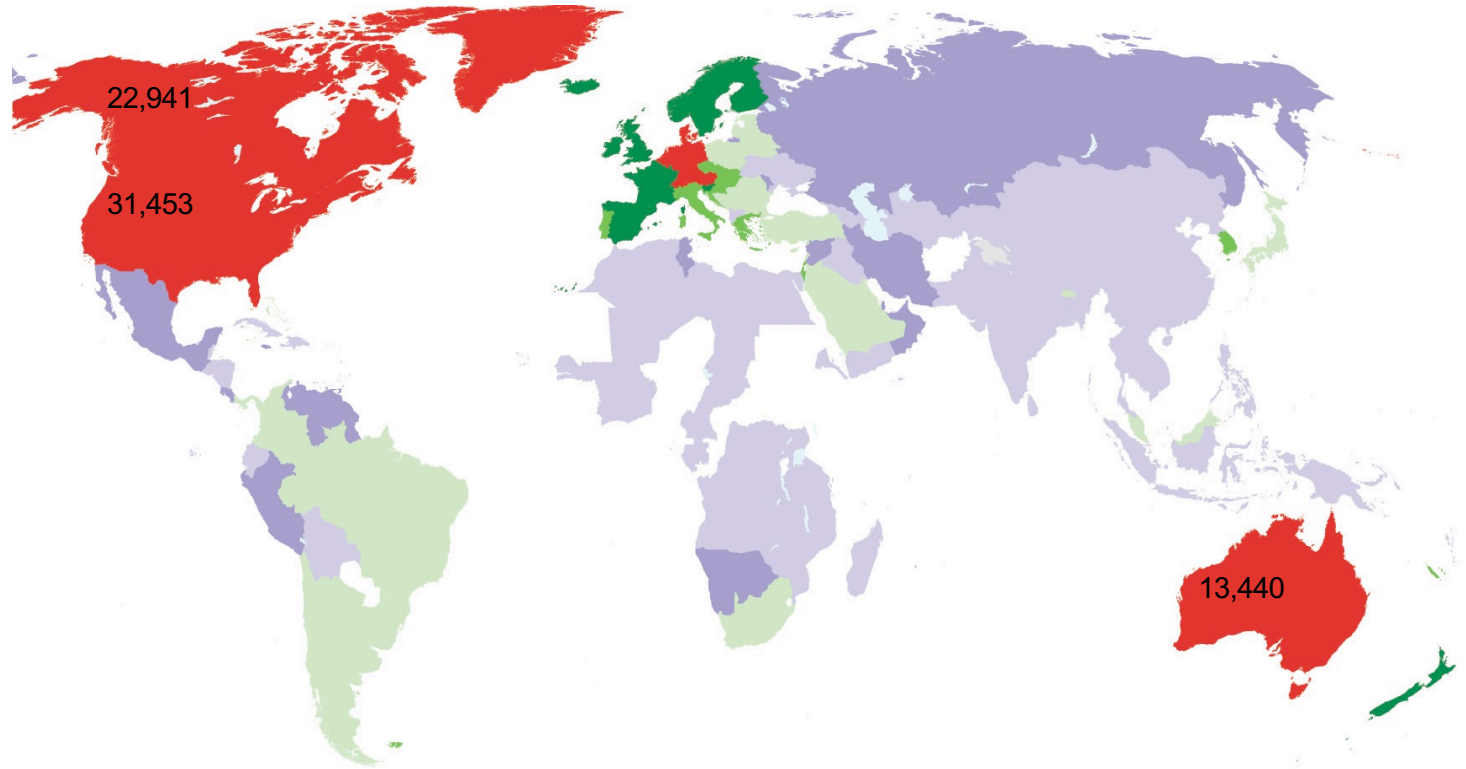
# Methodology to distinguish between heroin and morphine deaths



Source: Roxburgh et al, Forensic Science International (2018).

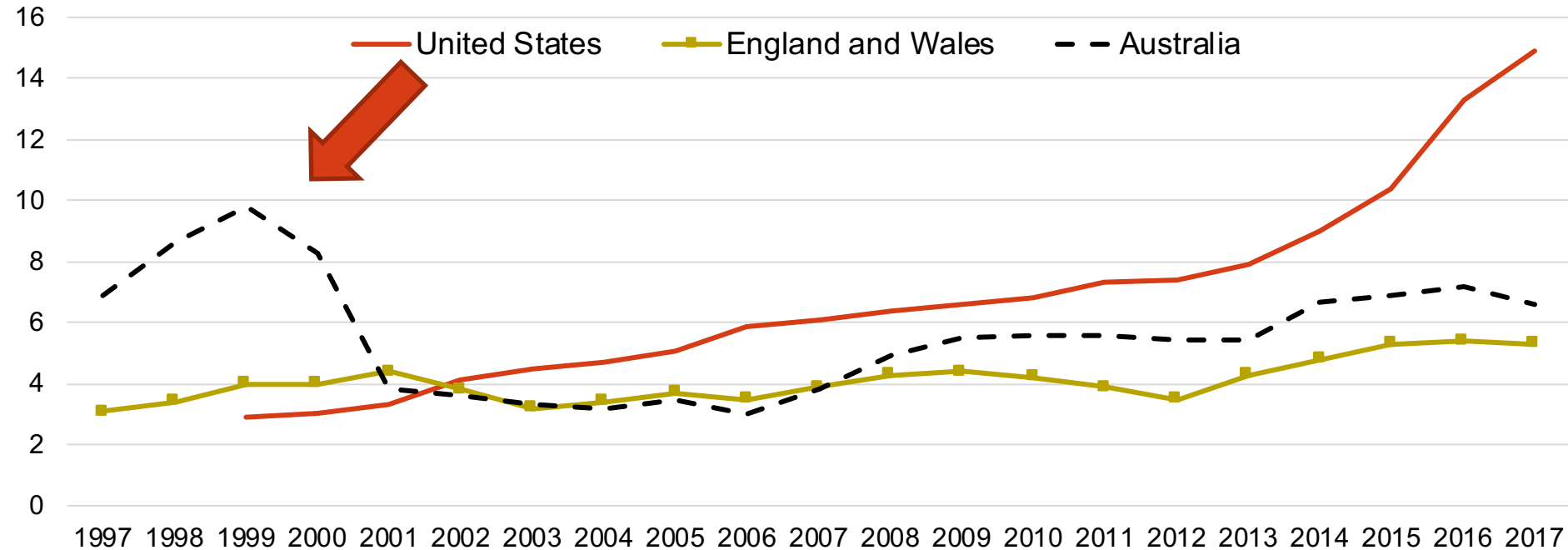
# Pharmaceutical opioid utilisation internationally

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Source: INCB 2011-13 data Berterame et al, Lancet (2016)

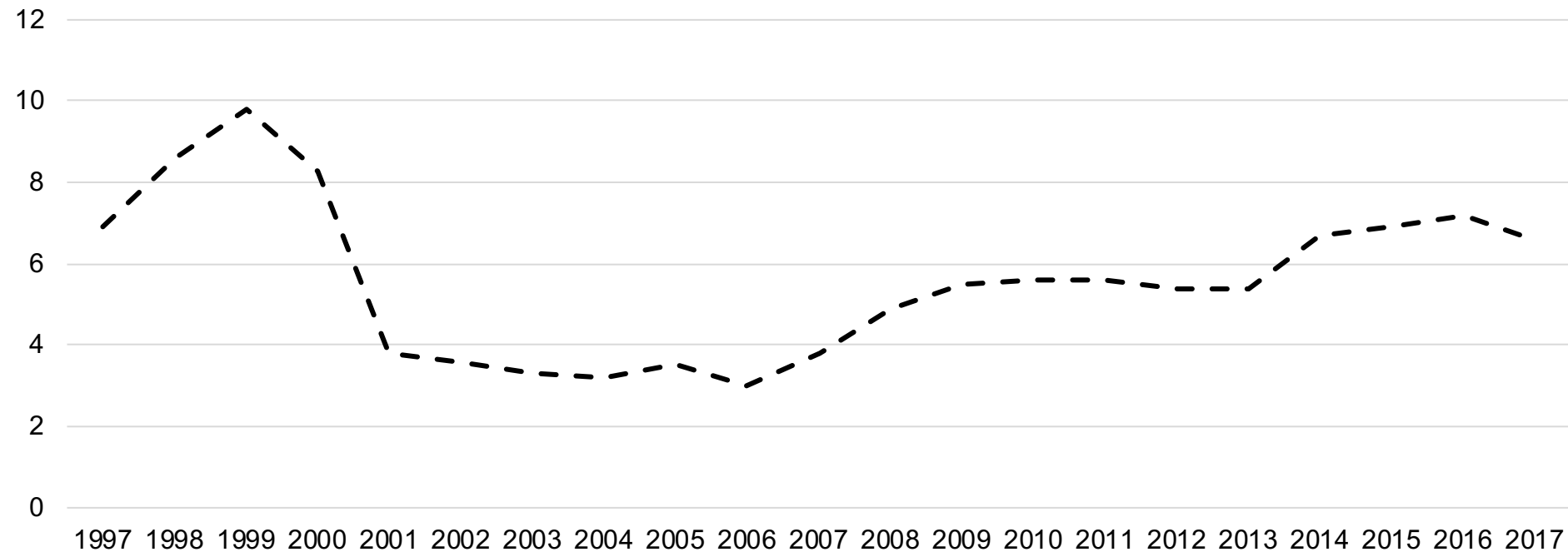
# Opioid overdose mortality per 100,000 population Australia, US, England and Wales, 1997 to 2017



**Sources:** US data – Centers for Disease Control and Prevention; England and Wales data – Office for National Statistics; Australian data – Australian Bureau of Statistics, Roxburgh et al 2018. <sup>1</sup>Population rates for the United States are calculated across all ages, while the remaining rates are calculated among people aged 15 to 64 years.

## Opioid overdose mortality per 100,000 population, 1997-2017 Australia

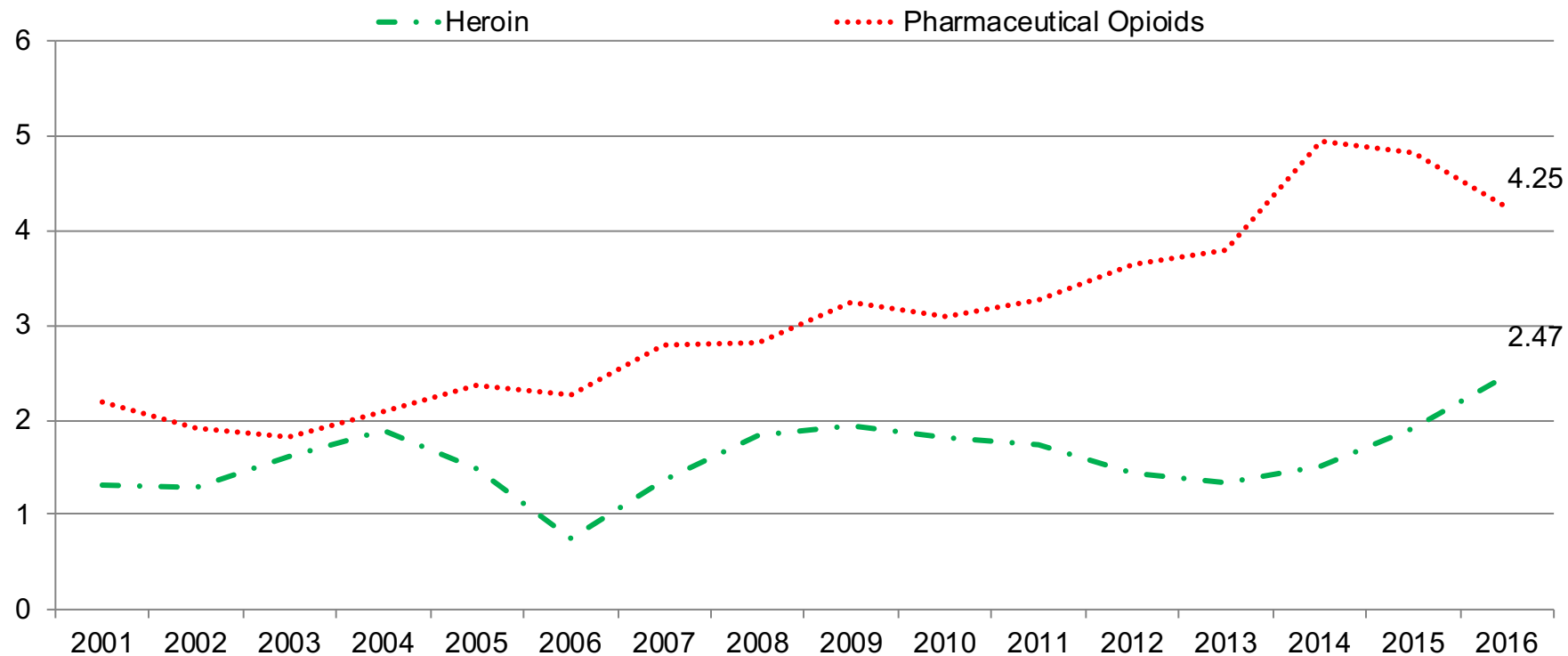
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**Source:** Australian Bureau of Statistics, Roxburgh et al 2018.

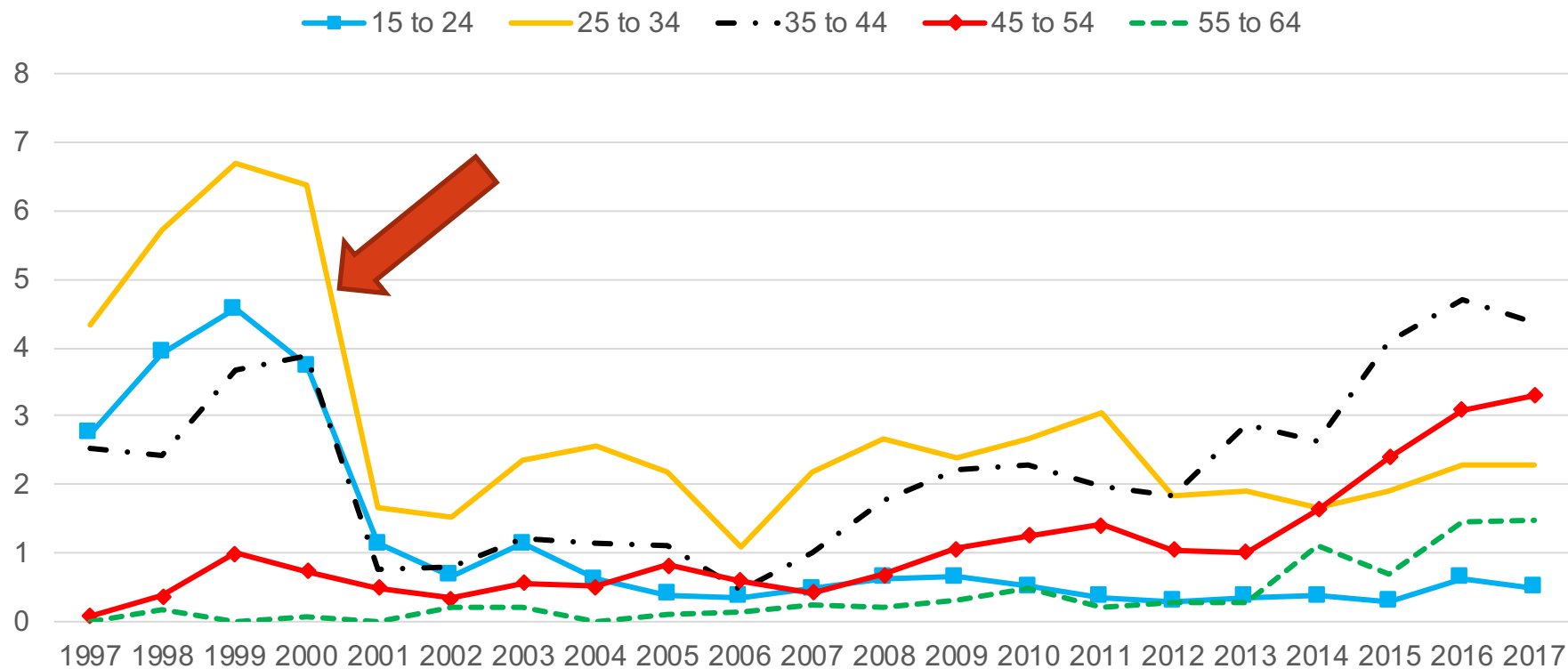


# Heroin and pharmaceutical opioid (PO) overdose deaths per 100,000 population Australia 2001-2016



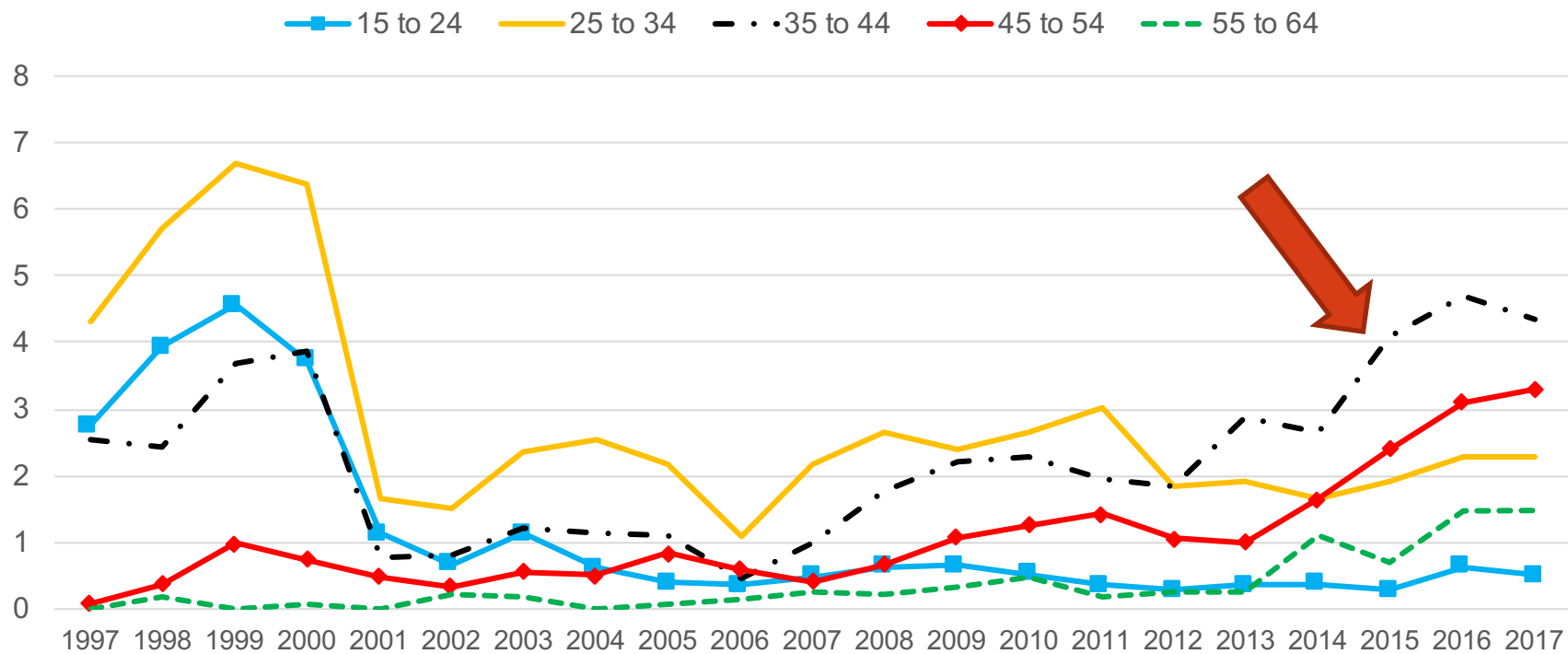
Source: Roxburgh et al, Drug and Alcohol Dependence 2017; Roxburgh et al 2018

## Heroin deaths per 100,000 population by age group, Australia



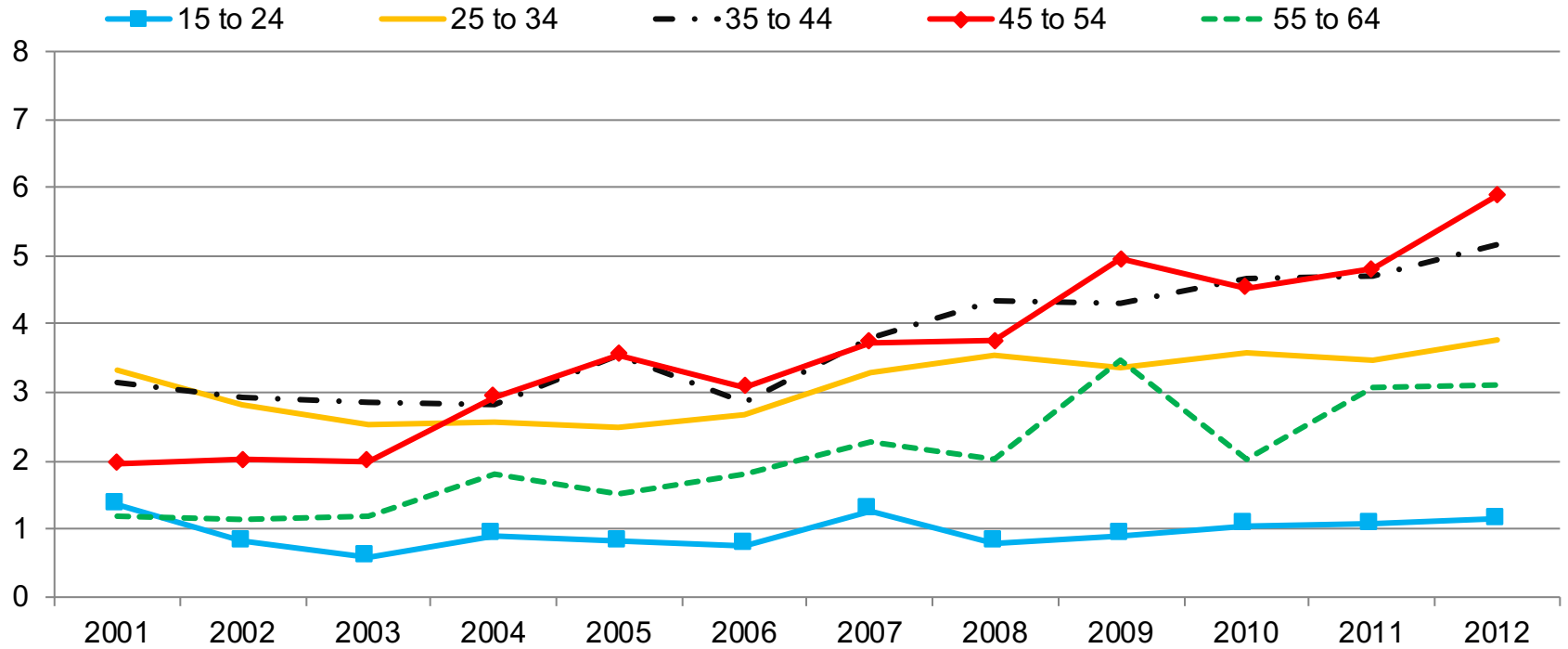
Source: NDARC, Drug Trends; Australian Bureau of Statistics

## Heroin deaths per 100,000 population by age group, Australia



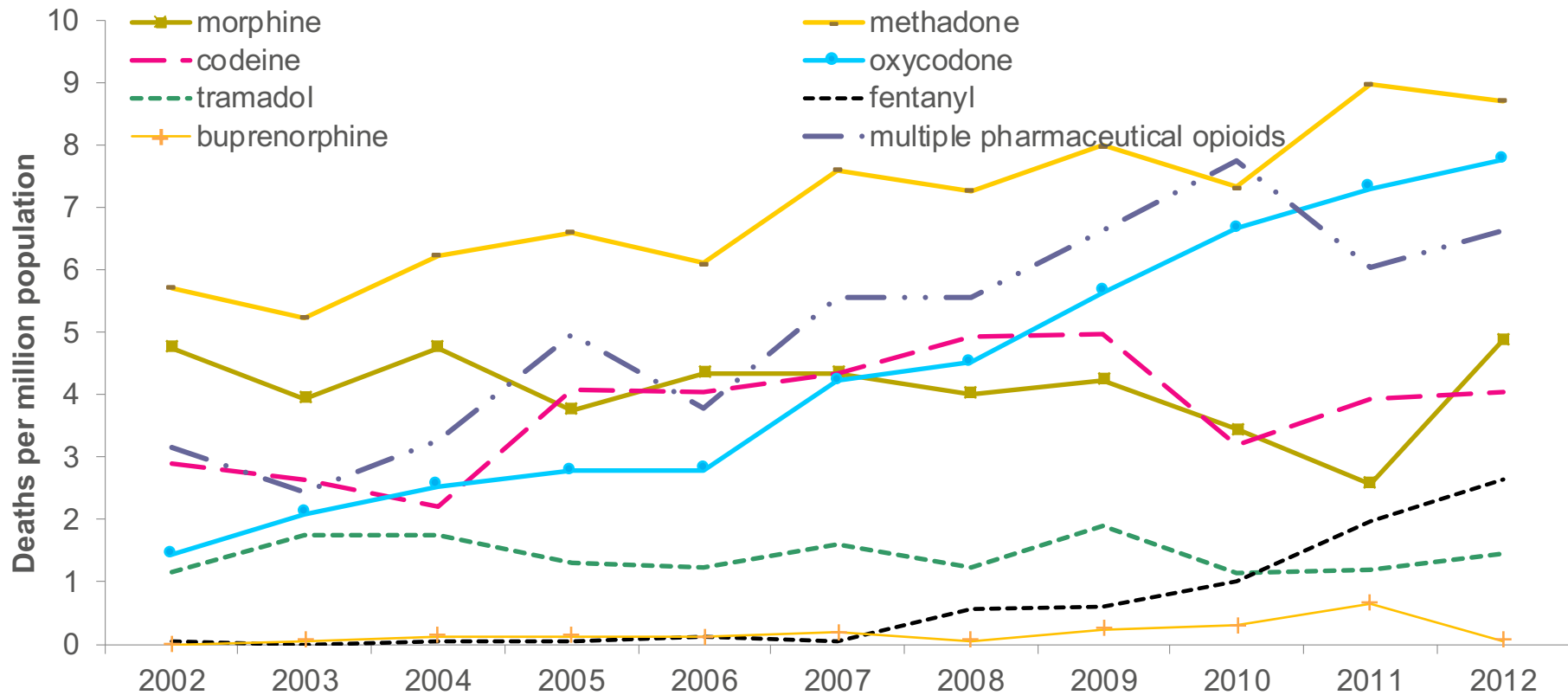
Source: NDARC, Drug Trends; Australian Bureau of Statistics

## PO deaths by age group, Australia

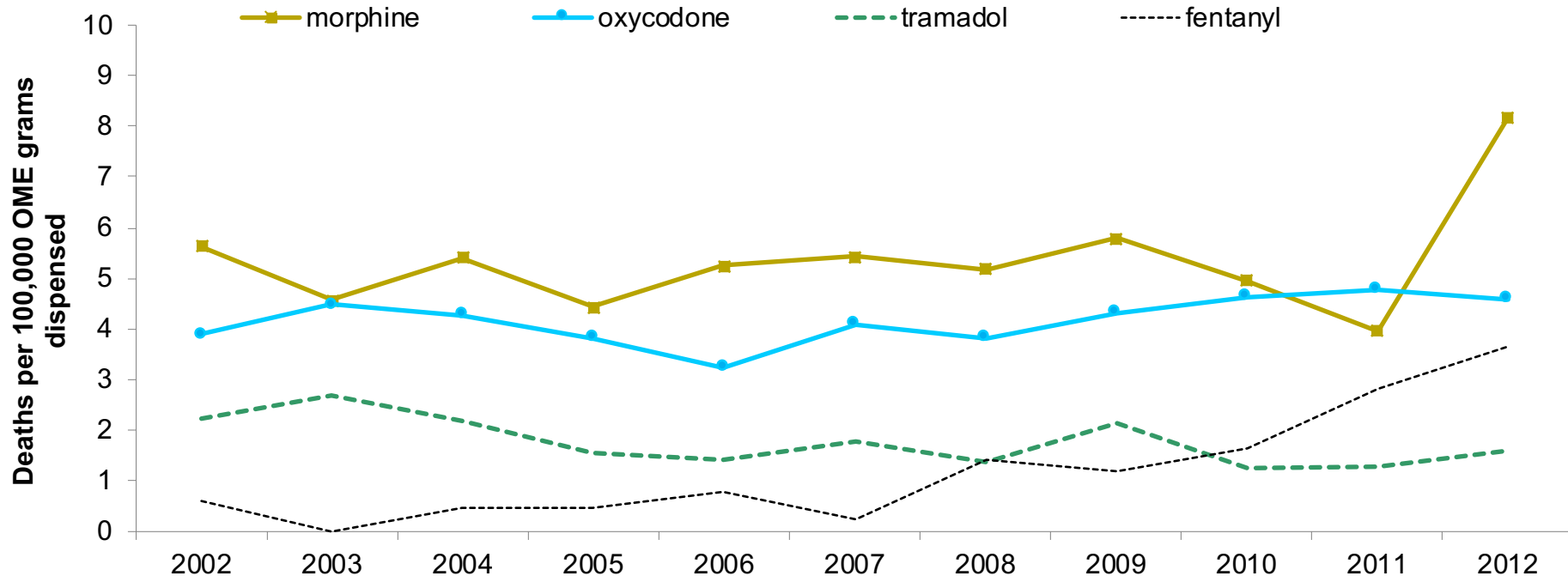


Source: Roxburgh et al, Drug and Alcohol Dependence (2017)

## PO deaths by individual opioid, Australia



# PO deaths (by opioid) per 100,000 Oral Morphine Equivalence (OME) grams dispensed annually, Australia



## Number of deaths by opioid, 2000 to 2015

	Number	%
Heroin	3,648	34
PO deaths	6,418	59
Buprenorphine only	40	<1
Codeine Only	921	14
Fentanyl only	267	4
Methadone only	1,573	24
Morphine only	1,000	15
Multiple opioids	1,285	20
Oxycodone only	1,092	17
Tramadol only	335	5
Undetermined opioid deaths	729	7
<b>TOTAL</b>	<b>10,795</b>	<b>100</b>

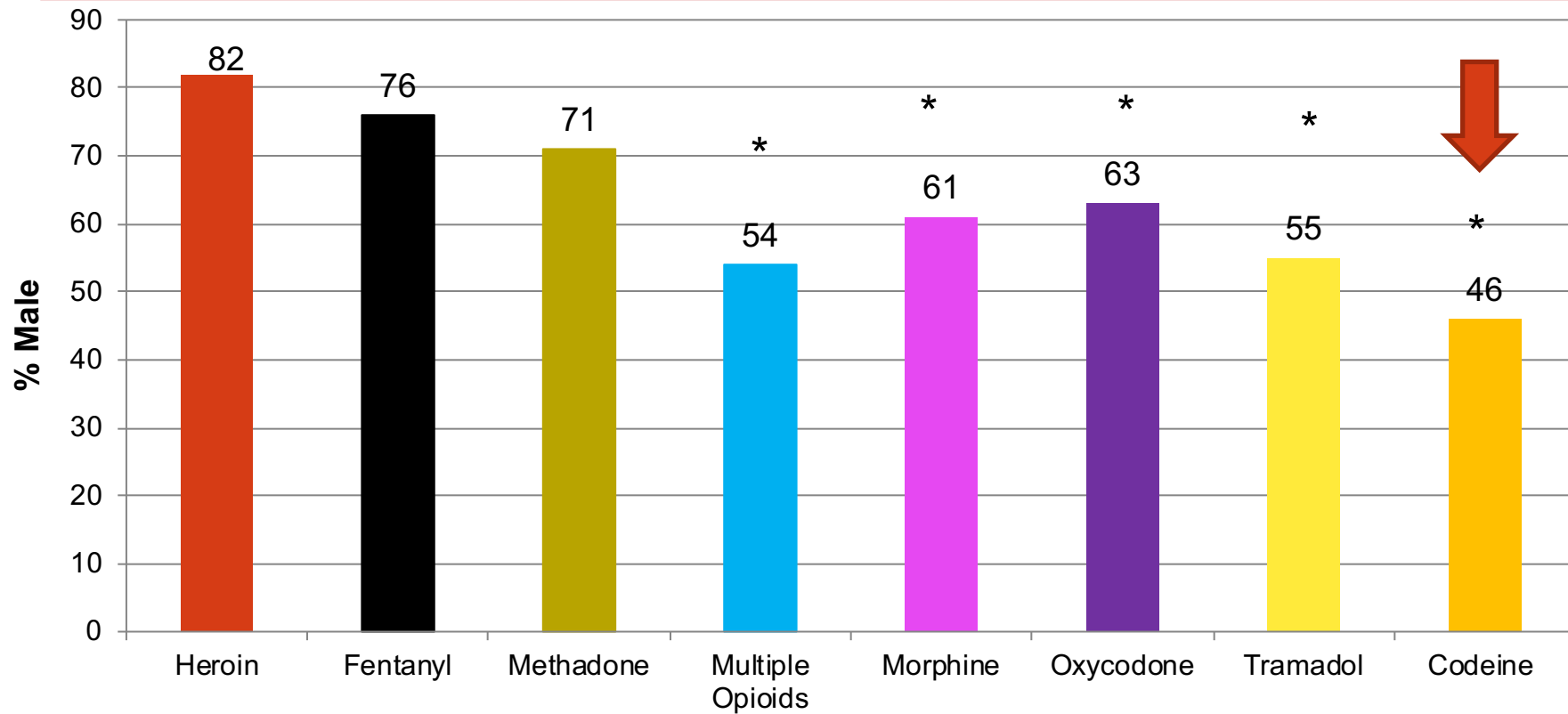
## Number of PO deaths by opioid, 2000 to 2015

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	Number	%
<b>Methadone only</b>	1,573	25
<b>Multiple opioids</b>	1,190	18
<b>Oxycodone only</b>	1,092	17
<b>Morphine only</b>	1,000	16
<b>Codeine Only</b>	921	14
<b>Tramadol only</b>	335	5
<b>Fentanyl only</b>	267	4
<b>Buprenorphine only</b>	40	<1
<b>TOTAL PO DEATHS</b>	6,418	100

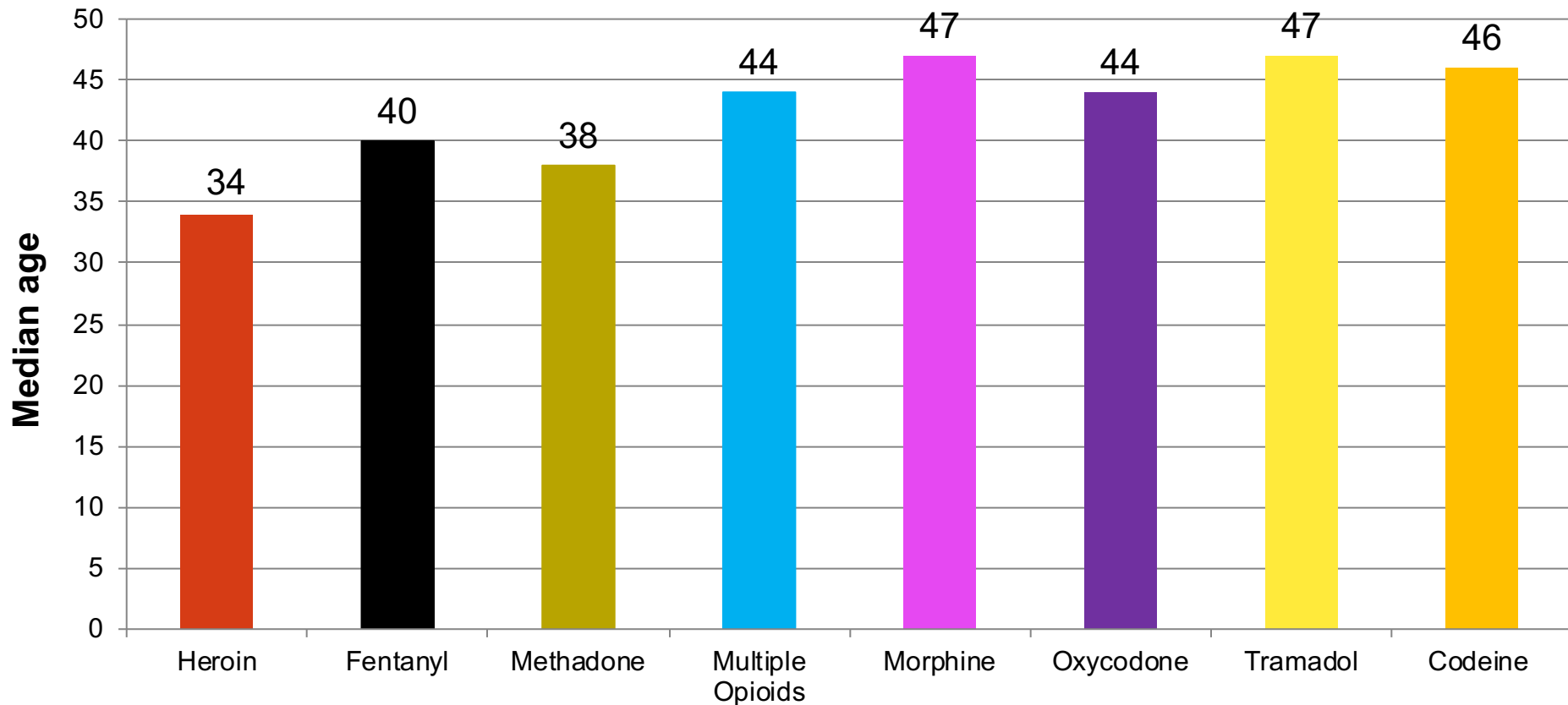


## Proportions of opioid deaths among males - heroin vs PO deaths



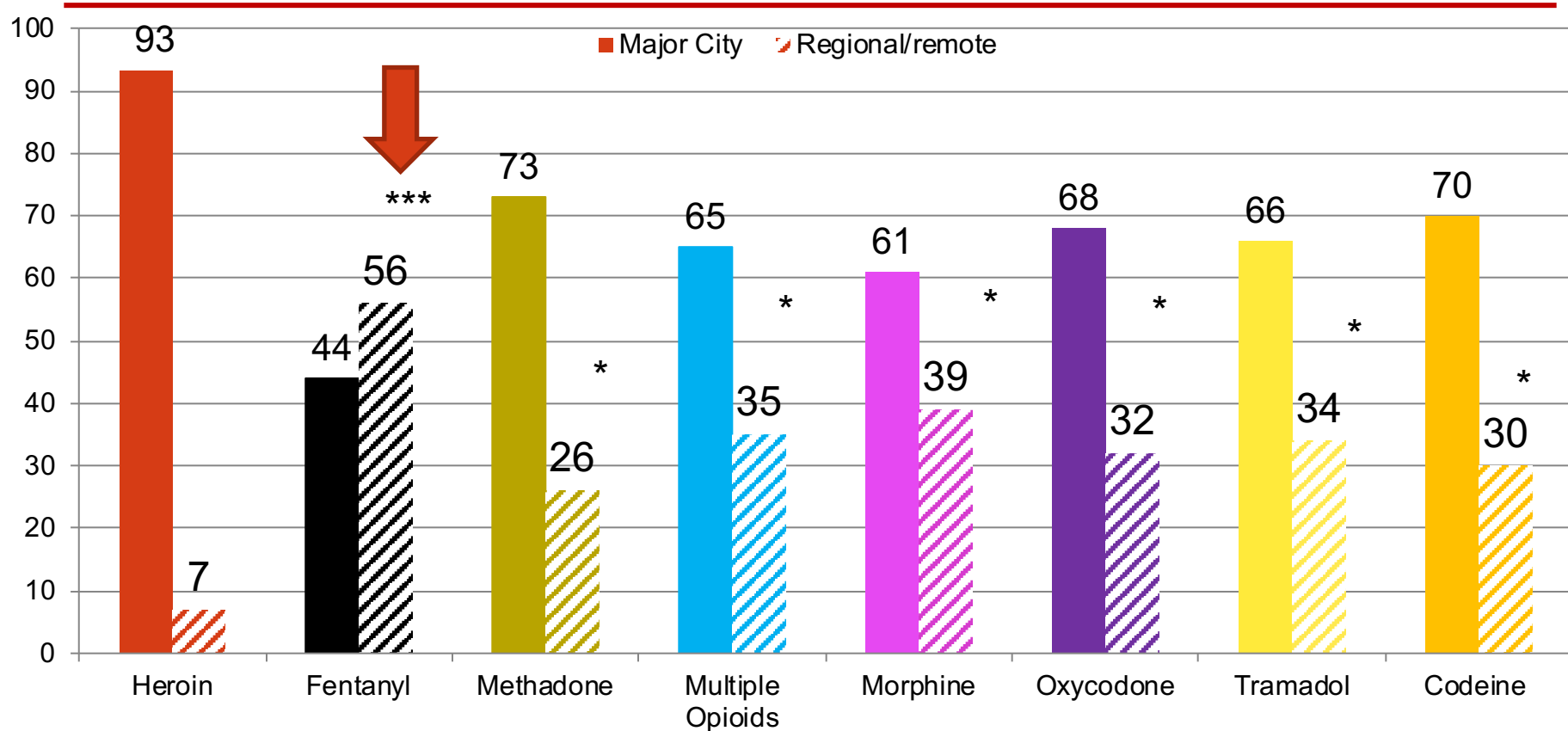
\* Significantly different to heroin deaths. **Source:** Roxburgh et al, Drug and Alcohol Dependence (2019)

## Median age opioid deaths – heroin vs PO deaths



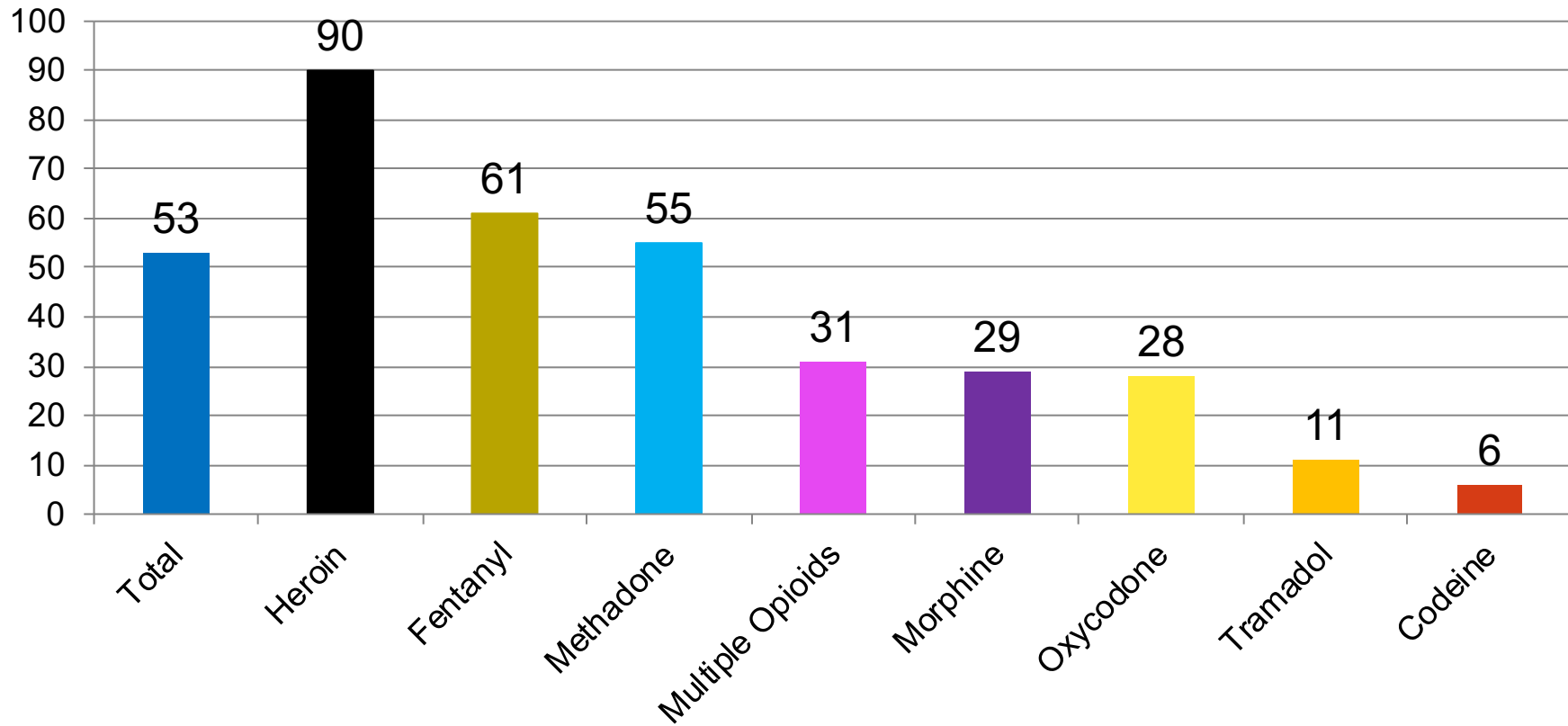
\* Significantly different to heroin deaths. **Source:** Roxburgh et al, Drug and Alcohol Dependence (2019)

## Location of death – heroin vs PO deaths



\* Significantly different to heroin deaths. **Source:** Roxburgh et al, Drug and Alcohol Dependence (2019)

## History of injecting drug use among decedents – heroin vs PO deaths

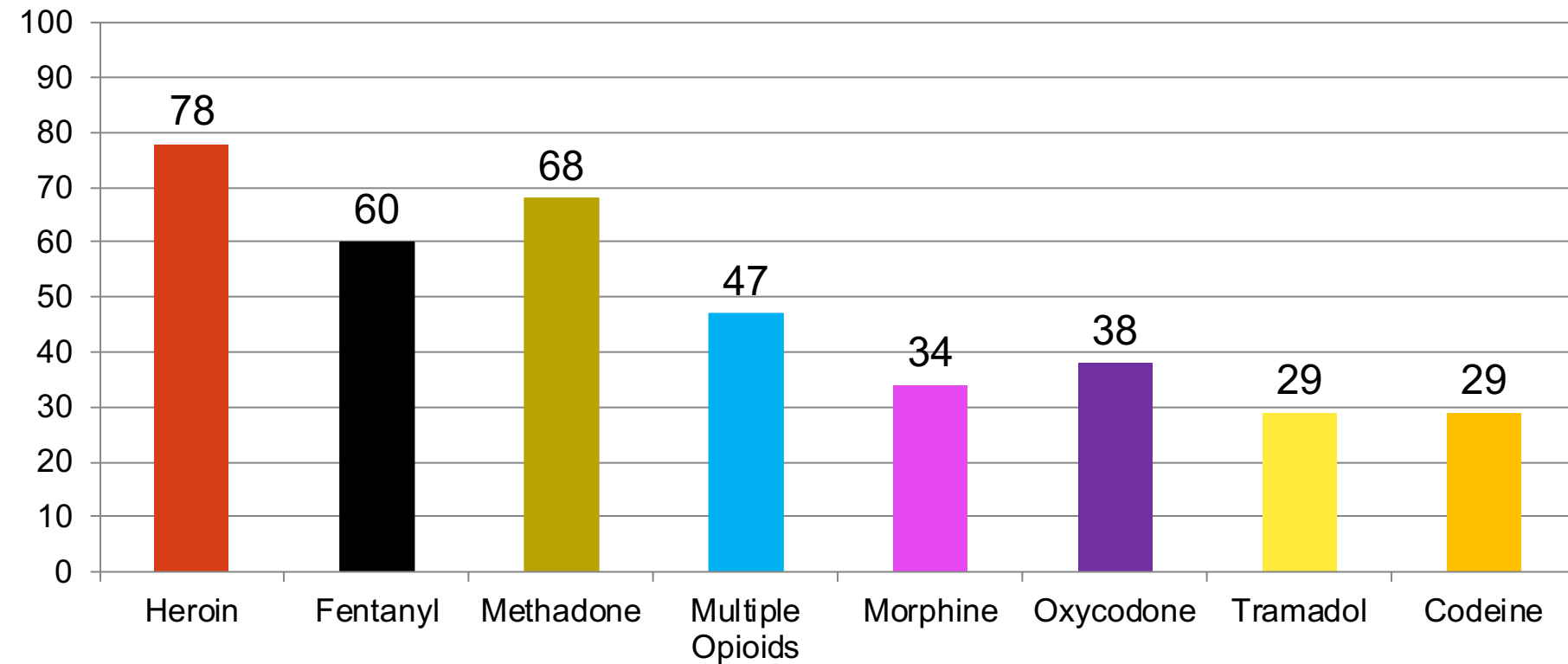


**NB:** Couldn't test differences between heroin and PO deaths due to high correlation with opioid injected prior to death

**Source:** Roxburgh et al, Drug and Alcohol Dependence (2019)

## History of substance use problems among decedents – heroin vs PO deaths

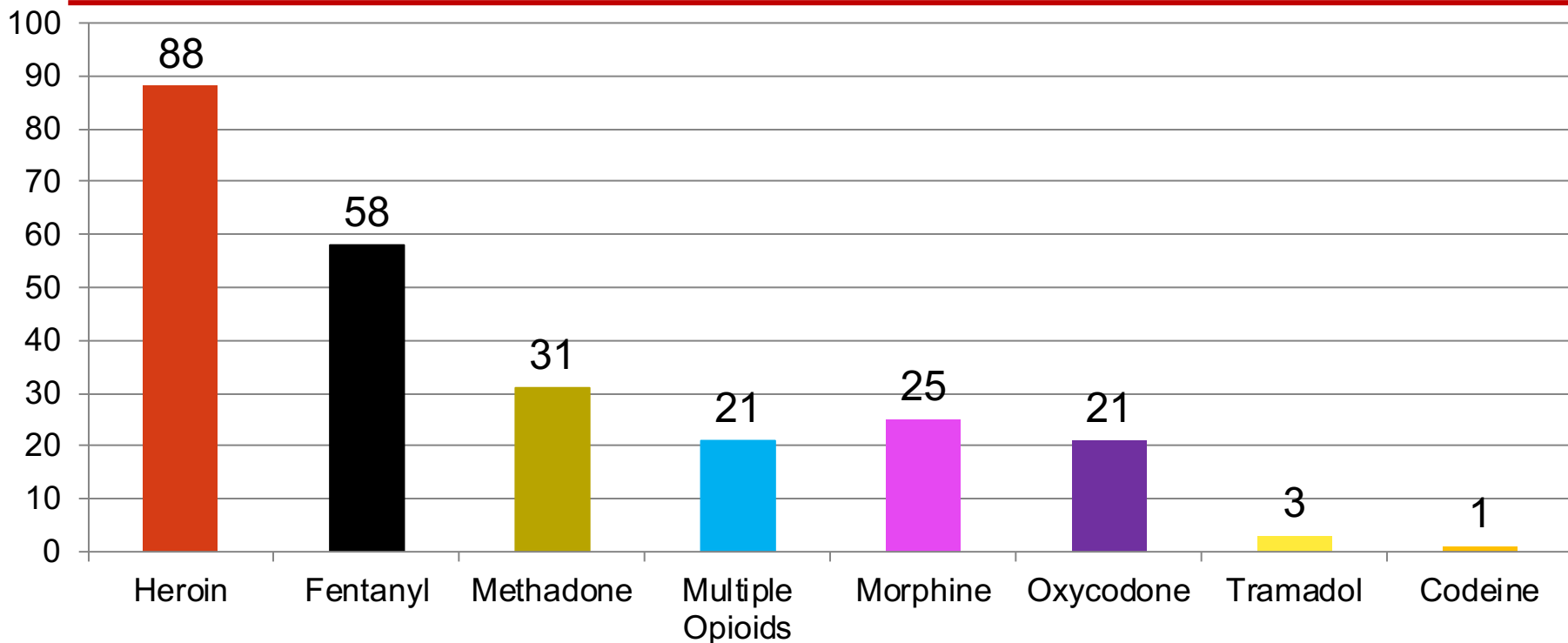
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**NB:** Couldn't test differences between heroin and PO deaths as there was an interaction effect between substance use problems & opioid injected prior to death

**Source:** Roxburgh et al, Drug and Alcohol Dependence (2019)

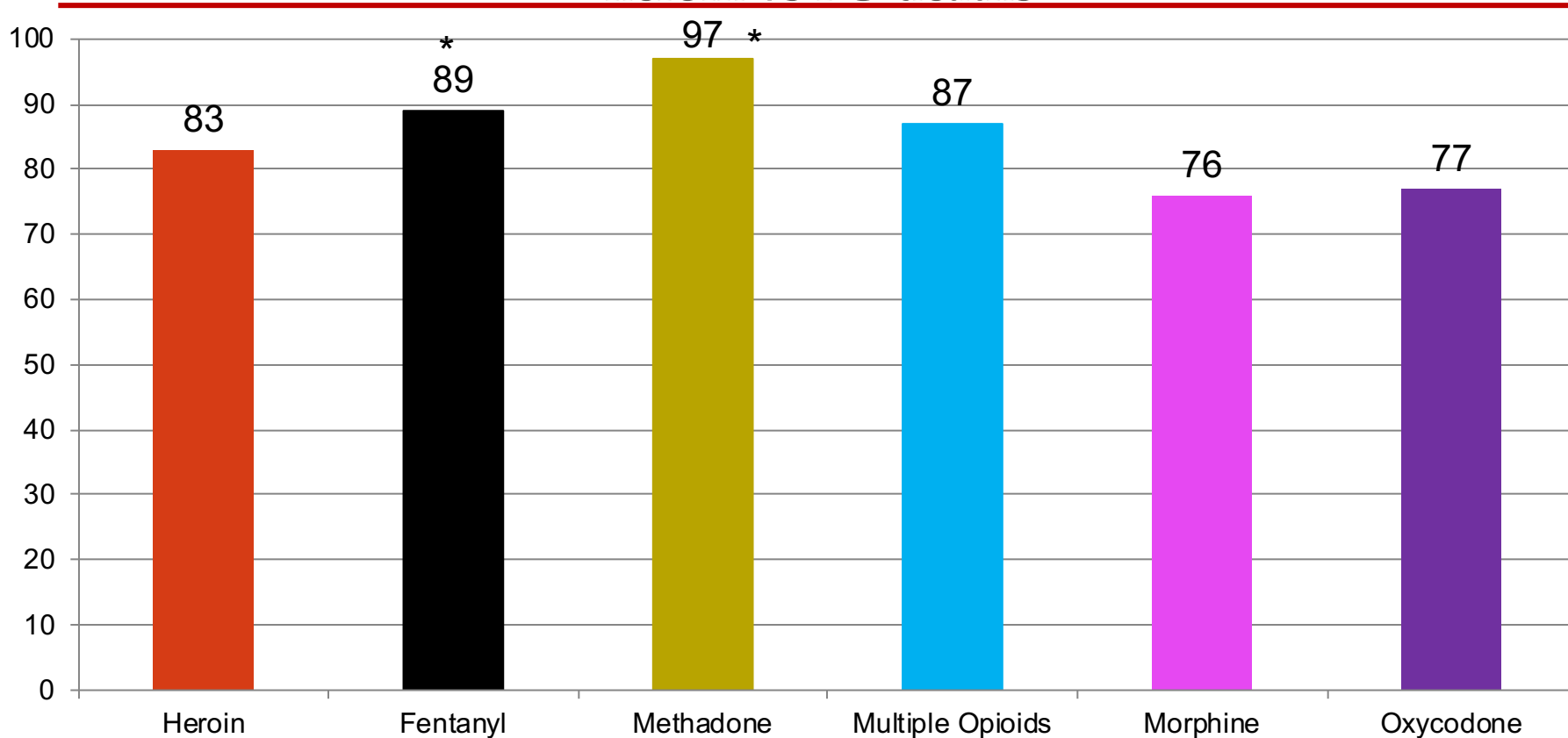
## Opioid injected prior to death – heroin vs PO deaths



**NB:** Couldn't test differences between heroin and PO deaths as there was an interaction effect between substance use problems & opioid injected prior to death

**Source:** Roxburgh et al, Drug and Alcohol Dependence (2019)

# History of substance use problems among those who injected prior to death heroin vs PO deaths



\* Significantly different to heroin deaths. **Source:** Roxburgh et al, Drug and Alcohol Dependence (2019)

## Conclusions

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- Continued increase in opioid deaths in Australia but not at the same level as seen in the late 90s
- PO deaths account for a larger proportion of opioid deaths
- Seeing a new group of Australians turning up in DRD statistics – PO deaths
  - Older, being treated for chronic pain; no hx of injecting but developing problems (e.g. dependence) with opioid use
- However, heroin deaths are also on the rise again in Australia



## Conclusions– continued

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- Differentiating heroin vs PO deaths:
  - Heroin deaths more likely among younger males with a hx of injecting drug use
  - Fentanyl and methadone deaths had a very similar profile to heroin deaths
  - Heroin decedents more likely to have injected prior to death
  - PO deaths more likely to occur outside major cities – particularly fentanyl deaths
  
- Substance use problems were present across heroin and PO deaths
  - BUT In the context of having injected prior to death, substance use problems were higher among fentanyl & methadone than heroin deaths

## Implications

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- Australia – relatively good coverage for tx of opioid dependence
  - Need to engage those developing problems with POs
  - Need to enhance tx coverage in areas outside of cities
- Increase uptake and accessibility of take-home naloxone (THN) – for those with heroin and PO dependence
- Treatment for dependence and provision of THN important irrespective of whether heroin or PO involved in the death
- POs are still readily available in Australia
  - Should that change we would need to monitor opioid harms closely
  - Particularly in the context of fentanyl analogue deaths occurring internationally



**Thank you**

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