



# Drug use in Adelaide Monitored by Wastewater Analysis

Project commissioned by Drug and Alcohol Services  
South Australia (DASSA)

Analyses performed by:  
School of Pharmacy and Medical Sciences  
University of South Australia

February 2017

Please note that drug consumption levels may vary slightly from report to report due to adjustments made to sewerage flow rates in some of the treatment plants.



## Purpose of the project

- > To determine the prevalence of drug use in South Australia, initially in metropolitan Adelaide, through wastewater analysis.



## Wastewater analysis CAN tell us:

- > The pattern of drug use over the week.
- > The prevalence of drug use every two months over a five year period.



## Wastewater analysis **CANNOT** tell us:

- > The characteristics of drug users.
- > In what regions of metropolitan Adelaide drug consumption is occurring.
- > The form and way drugs were taken.

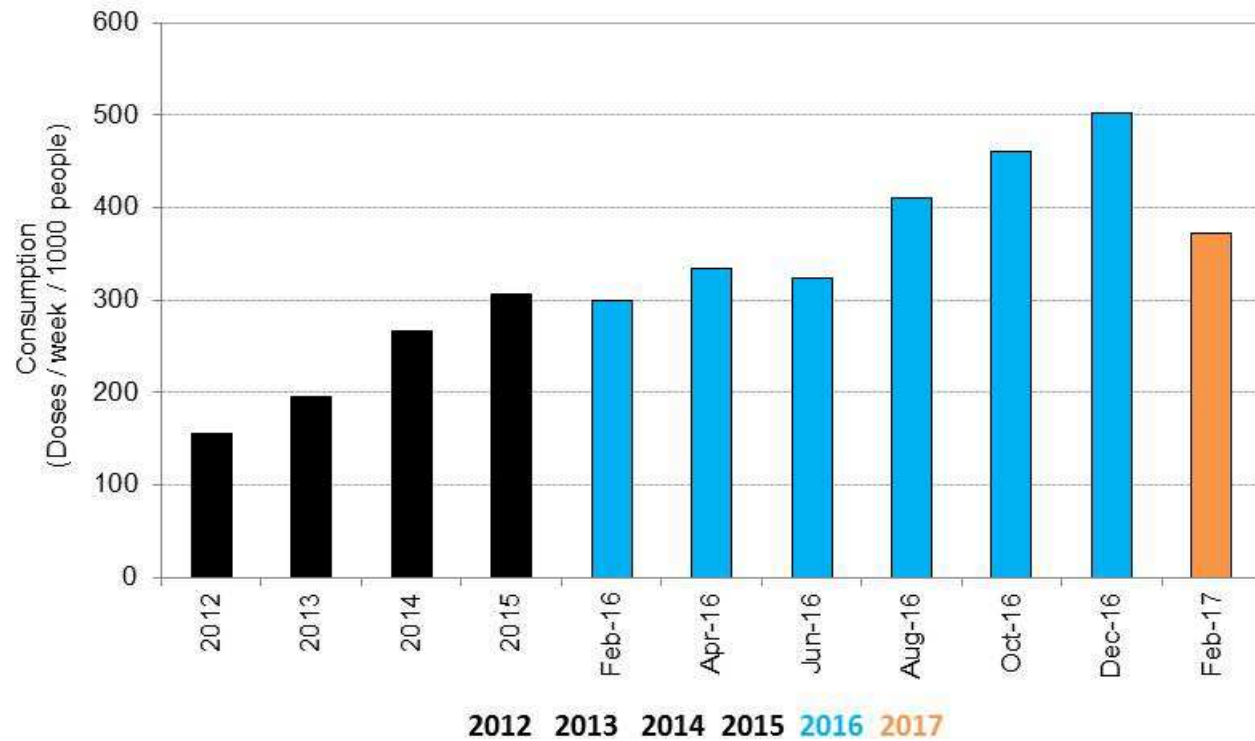


## Wastewater sampling

- > Sampling every two months from Adelaide Metropolitan wastewater, commenced in December 2011.
  
- > Drugs tested:
  - Stimulants: cocaine, MDMA, and methamphetamine.
  - Opioids: morphine, codeine, methadone, oxycodone, fentanyl and heroin.
  - Cannabis (THC).
  - Nicotine.
  - Testing for alcohol has commenced, and results will appear in future iterations of this report.

# Stimulants

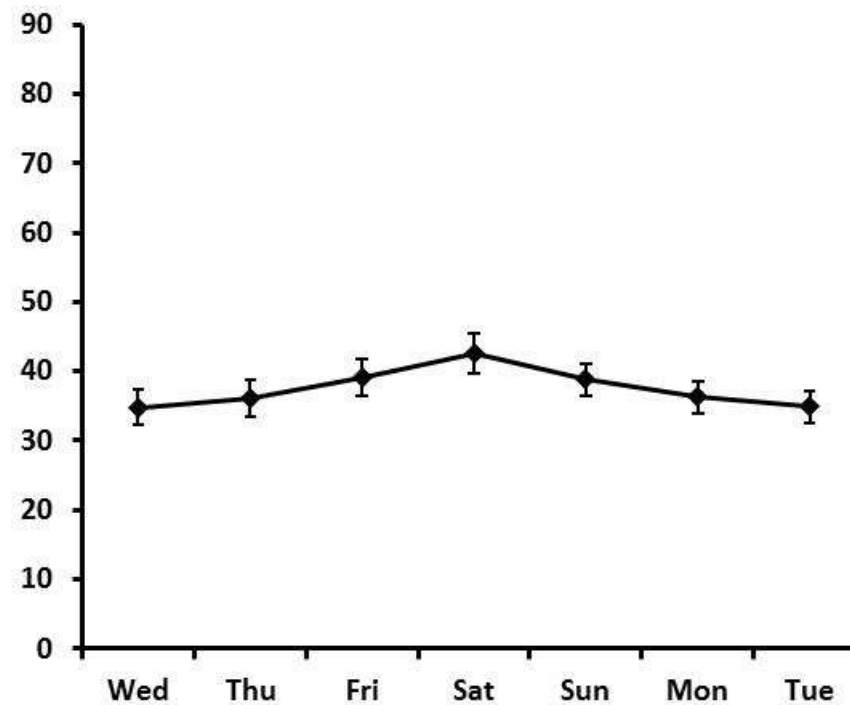
Methamphetamine consumption is increasing.



Average consumption (dose/week/1000 people) of methamphetamine for 2012-2015. Weekly consumption (dose/week/1000 people) bi-monthly from February 2016. Excretion ratio = 43%, dose for calculation = 30 mg/dose.

# Stimulants

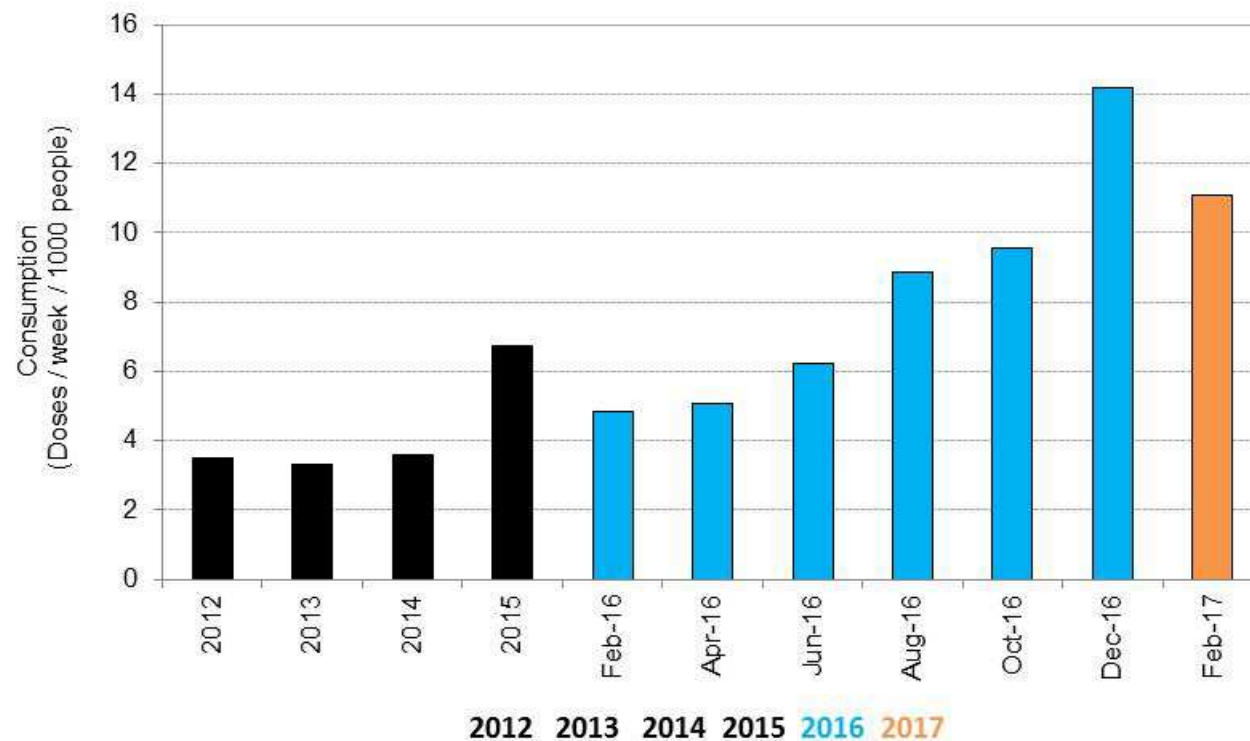
Methamphetamine consumption increases slightly on weekends.



Average consumption (dose/day/1000 people) of methamphetamine over the week.  
Dose = 30 mg.

# Stimulants

Cocaine consumption increased in 2015 and 2016.

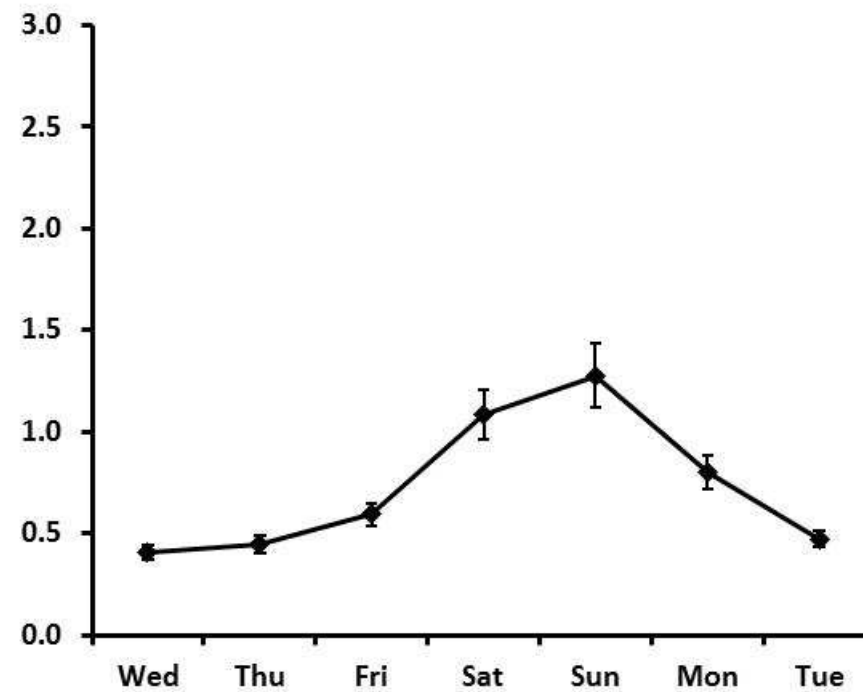


Average consumption (dose/day/1000 people) of cocaine for 2012-2015. Weekly consumption (dose/week/1000 people bi-monthly from February 2016. Dose = 100 mg.



# Stimulants

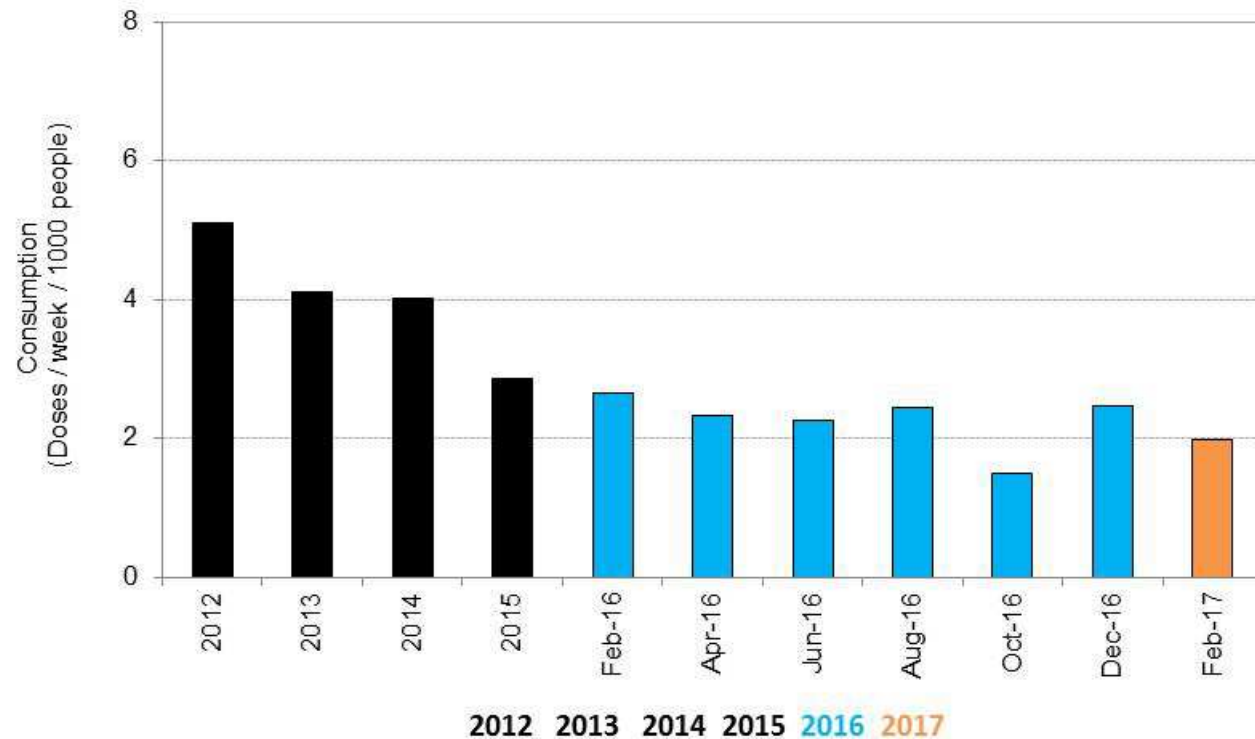
Cocaine consumption is higher on weekends.



Average consumption (dose/day/1000 people) of cocaine over the week. Dose = 100 mg.

# Stimulants

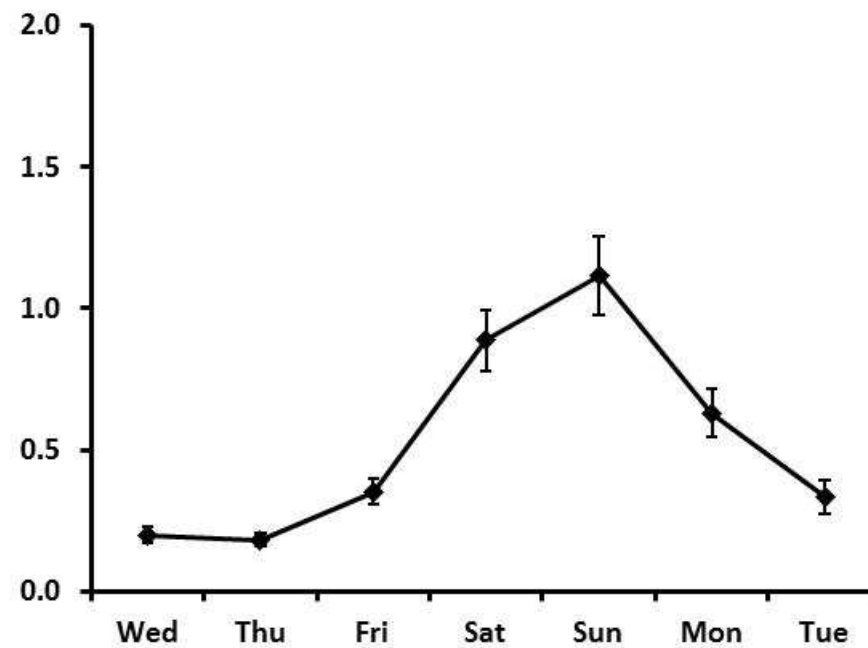
Ecstasy (MDMA) consumption is decreasing.



Average consumption (dose/day/1000 people) of MDMA for 2012-2015. Weekly consumption (dose/week/1000 people bi-monthly from February 2016. Dose = 100 mg.

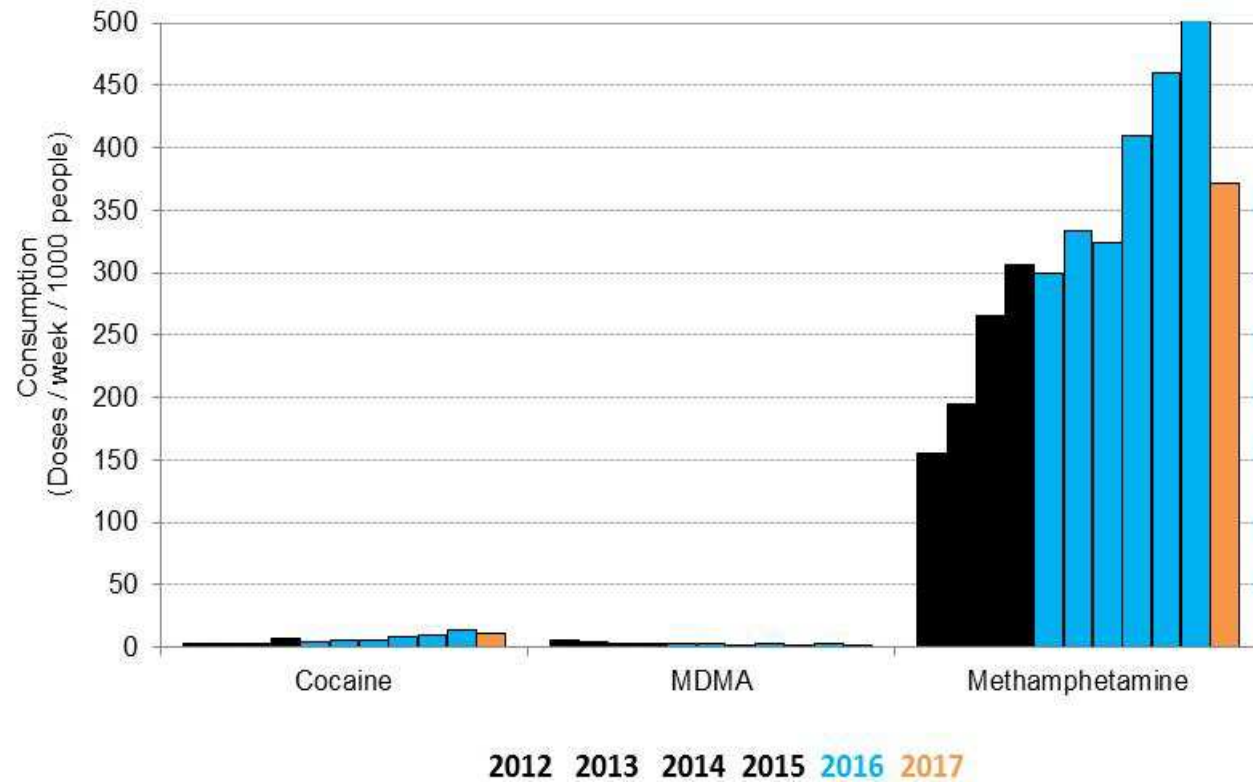
# Stimulants

Ecstasy (MDMA) consumption higher on weekends.



Average consumption (dose/day/1000 people) of MDMA over the week. Dose = 100 mg.

# Stimulants



Average consumption (dose/day/1000 people) 2012-2015 . Weekly consumption (dose/week/1000 people) of cocaine (100mg dose), MDMA (100mg dose) and methamphetamine (30 mg dose) from Feb 2016.



## Stimulants - summary

- > **Methamphetamine:**
  - > Highest level of consumption of the stimulants.
  - > Steady increase in levels of consumption since December 2012.
- > **Cocaine:**
  - > Consumption increased in 2015 and 2016.
- > **Ecstasy (MDMA):**
  - > Consumption is decreasing.
  - > The December peak was not seen in 2016.

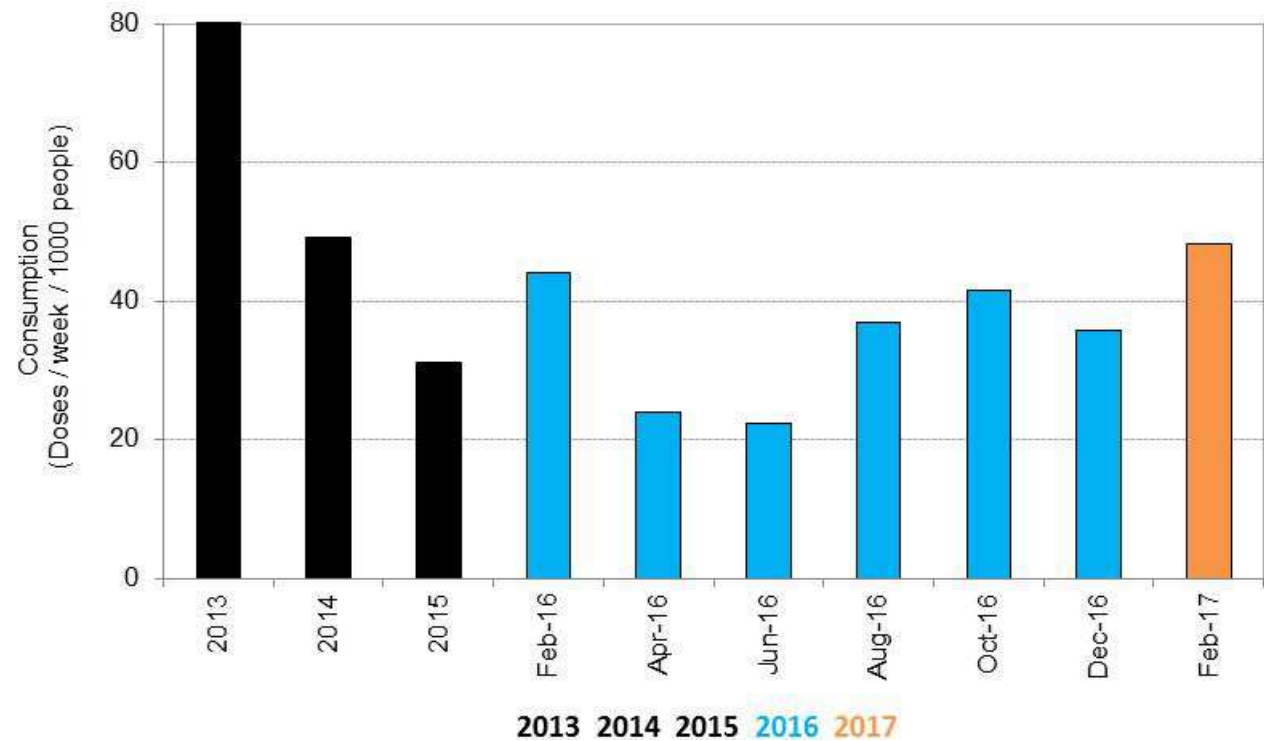


# Opioids

- > Opioids are a class of drugs that are used for pain relief (e.g. codeine, morphine) or for the treatment of opioid dependence (e.g. methadone).
- > Codeine in the samples can originate from prescription or over the counter medications.
- > Morphine, methadone, oxycodone and fentanyl can be used legally on prescription or may be sourced illegally.
- > The analysis of opioids, except for heroin, cannot differentiate illicit from licit use.

# Opioids

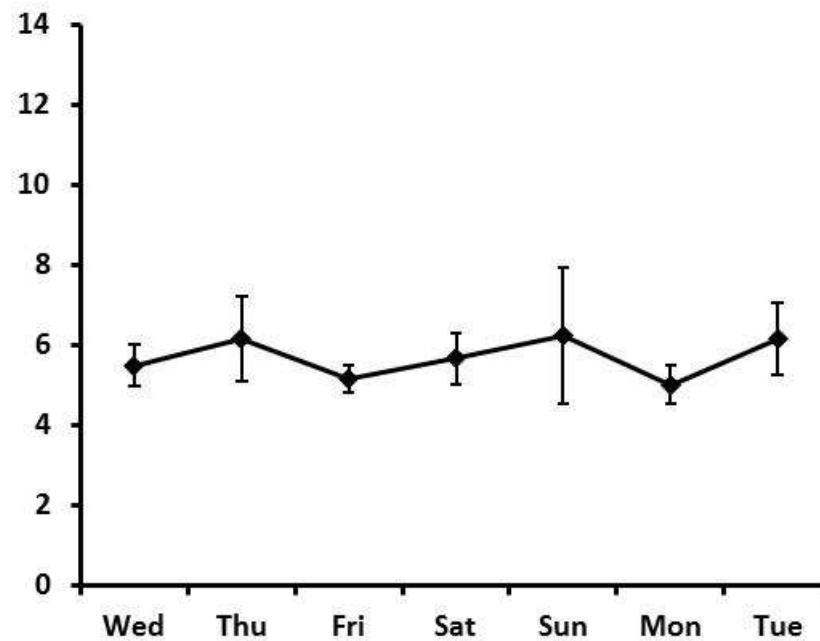
Heroin consumption has decreased since 2013.



Average consumption (dose/week/1000 people) of heroin for 2013-2015. Weekly consumption (dose/week/1000 people) bi-monthly from February 2016. Dose for calculation = 20 mg.

# Opioids

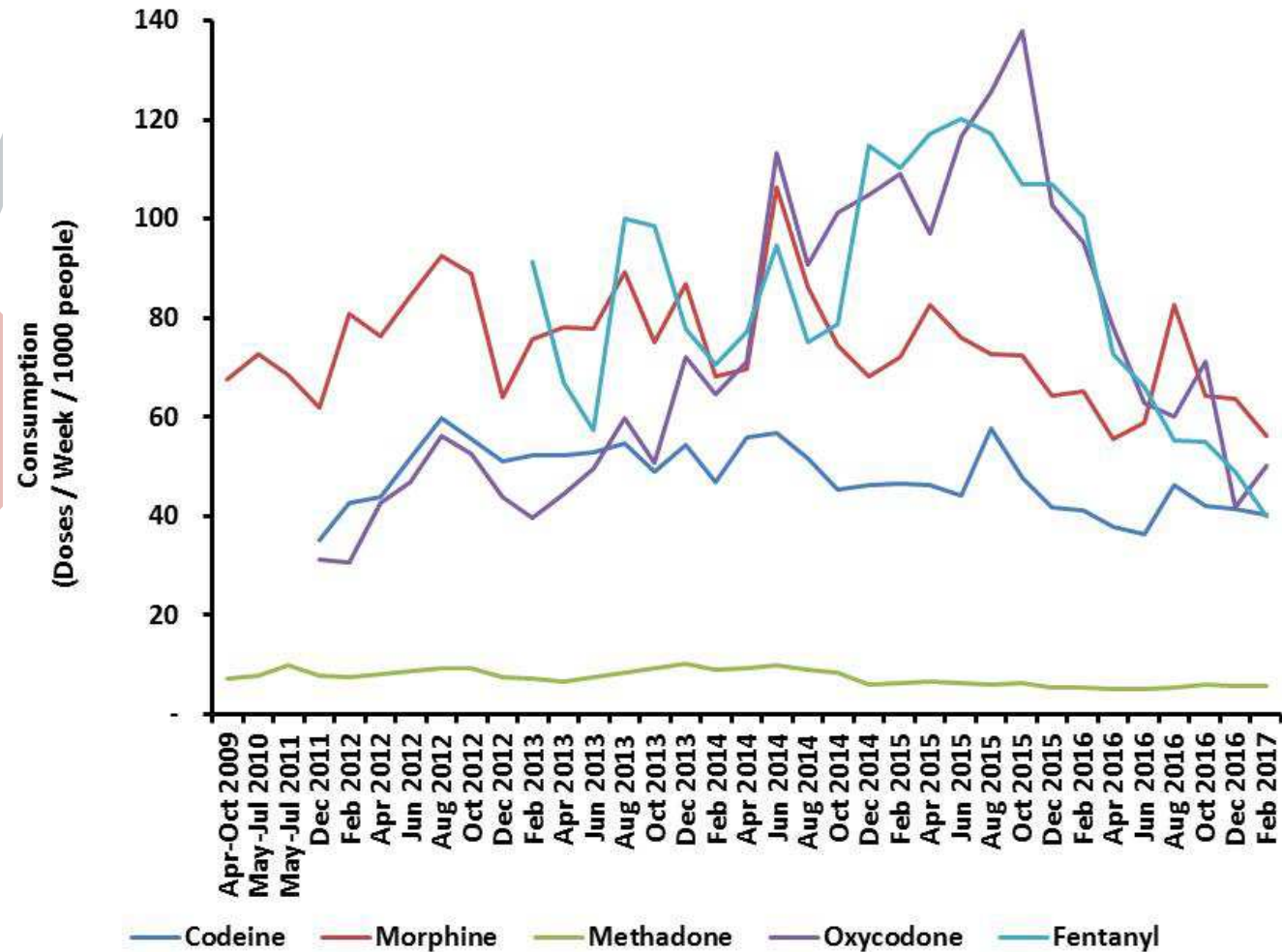
Heroin consumption is constant over the week.



Average consumption (dose/day/1000 people) of heroin over the week. Dose = 20mg.



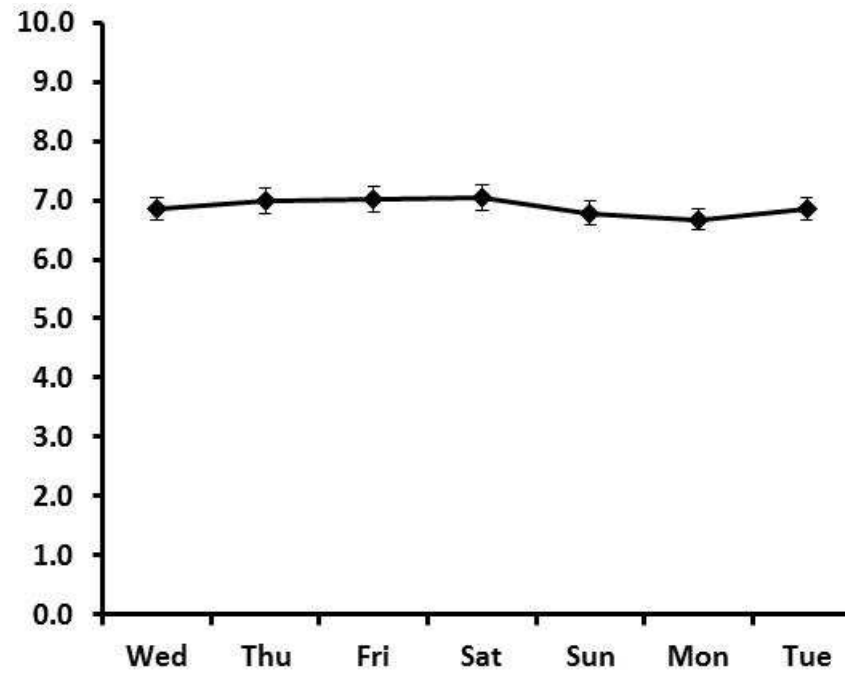
# Medicinal Opioids



Daily consumption (dose/day/1000 people) of codeine (200mg dose), morphine, methadone (100mg dose), oxycodone (10mg dose) and fentanyl (0.2mg dose) from Dec 2011.

# Opioids

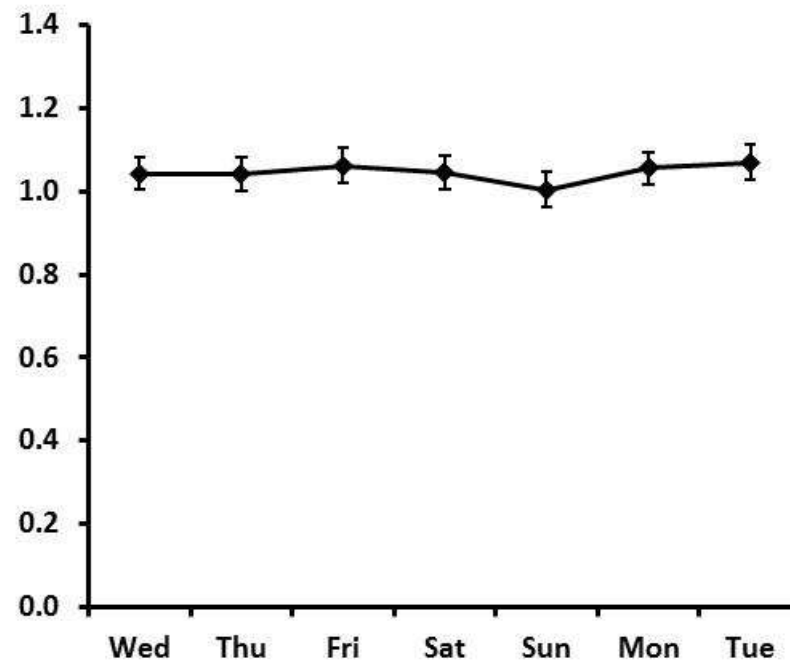
Codeine consumption is constant over the week.



Average consumption (dose/day/1000 people) of codeine over the week. Dose = 200 mg.

# Opioids

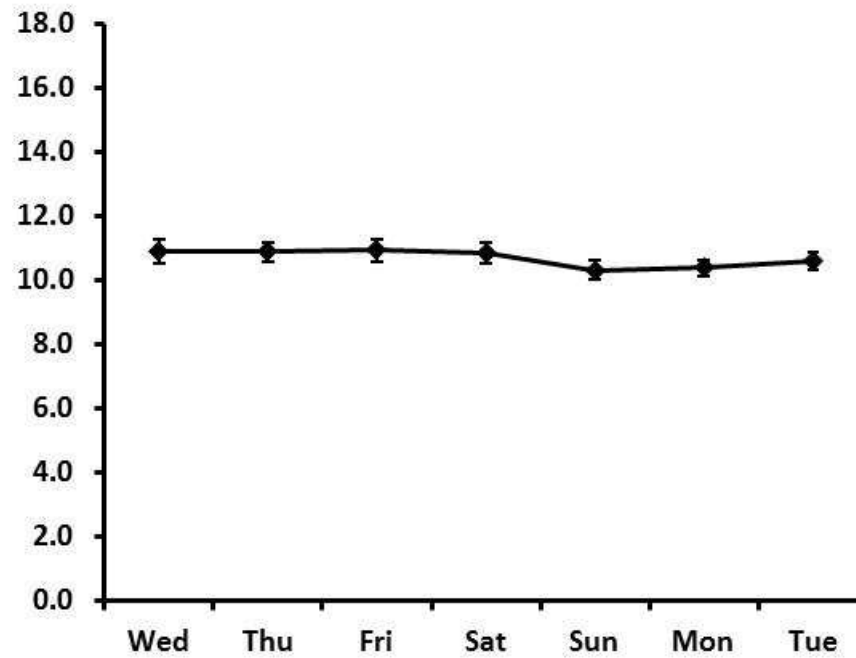
Methadone consumption is low and constant over the week.



Average consumption (dose/day/1000 people) of methadone over the week. Dose = 100 mg.

# Opioids

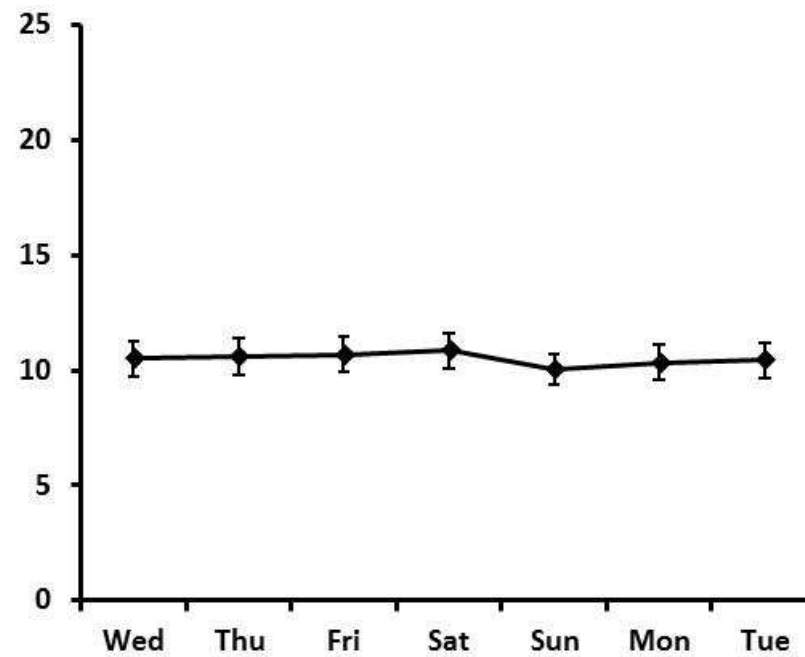
Morphine consumption is constant over the week.



Average daily consumption (dose/day/1000 people) of morphine over the week.

# Opioids

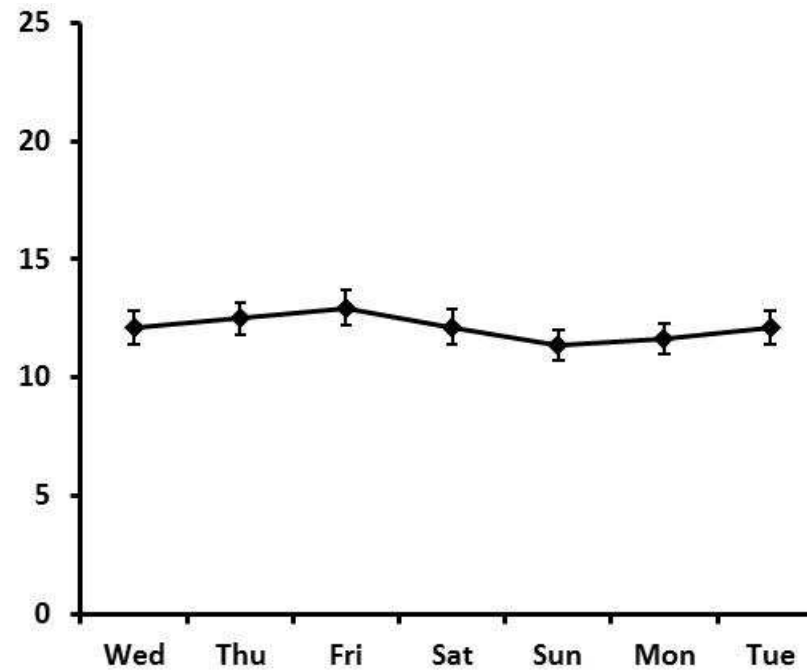
Oxycodone consumption is constant over the week.



Average consumption (dose/day/1000 people) of oxycodone over the week. Dose = 10 mg.

# Opioids

Fentanyl consumption is constant over the week.



Average consumption (dose/day/1000 people) of fentanyl over the week. Dose = 0.2mg.

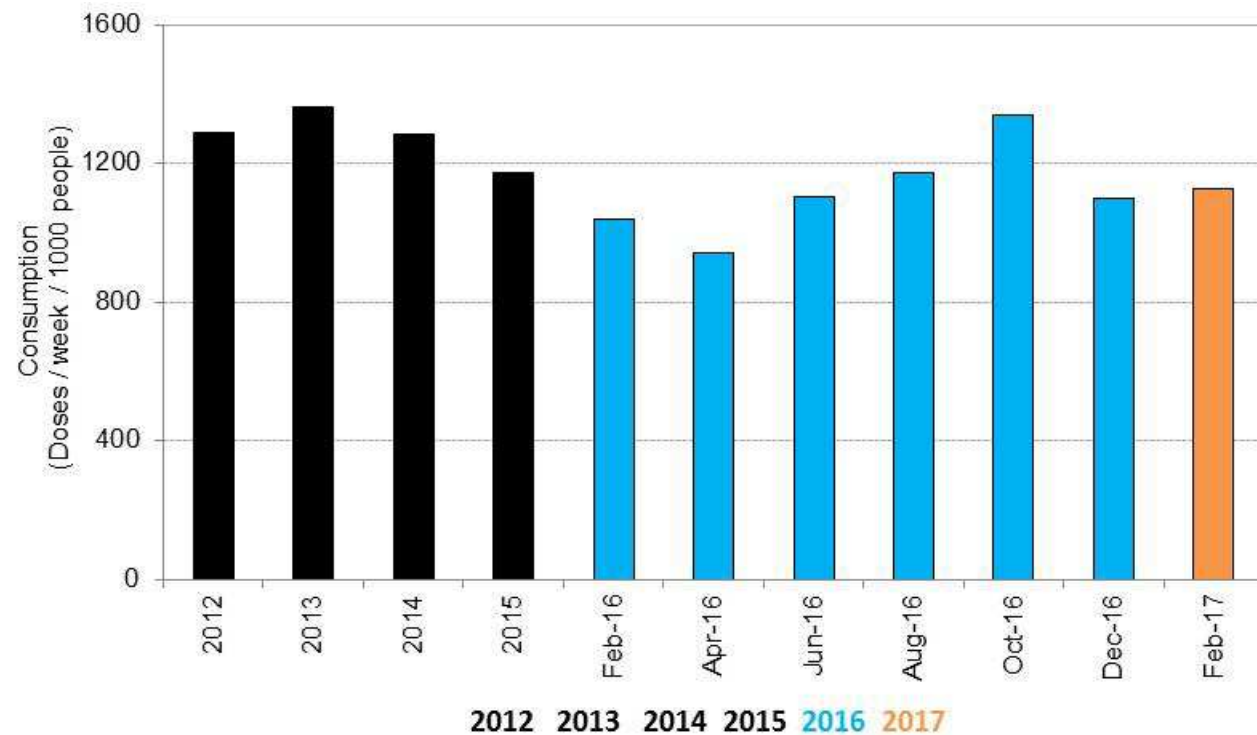


## Opioids - summary

- > Oxycodone and fentanyl have shown increases in consumption over the period of data collection, but have decreased in 2016 to levels at or lower than those seen in 2013 and 2014.
- > Heroin consumption has decreased since 2013 and has stayed relatively low.

# Cannabis

Cannabis consumption levels varied over the year but have been relatively stable since 2012.

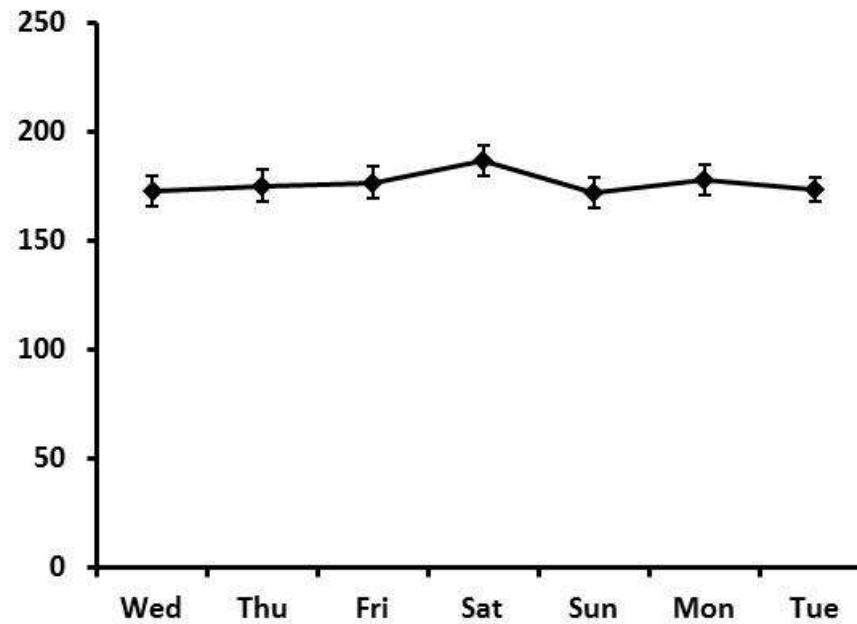


Average consumption (dose/week/1000 people) of THC for 2012-2015. Weekly consumption (dose/week/1000 people) bi-monthly from February 2016. Dose = 125 mg.



# Cannabis

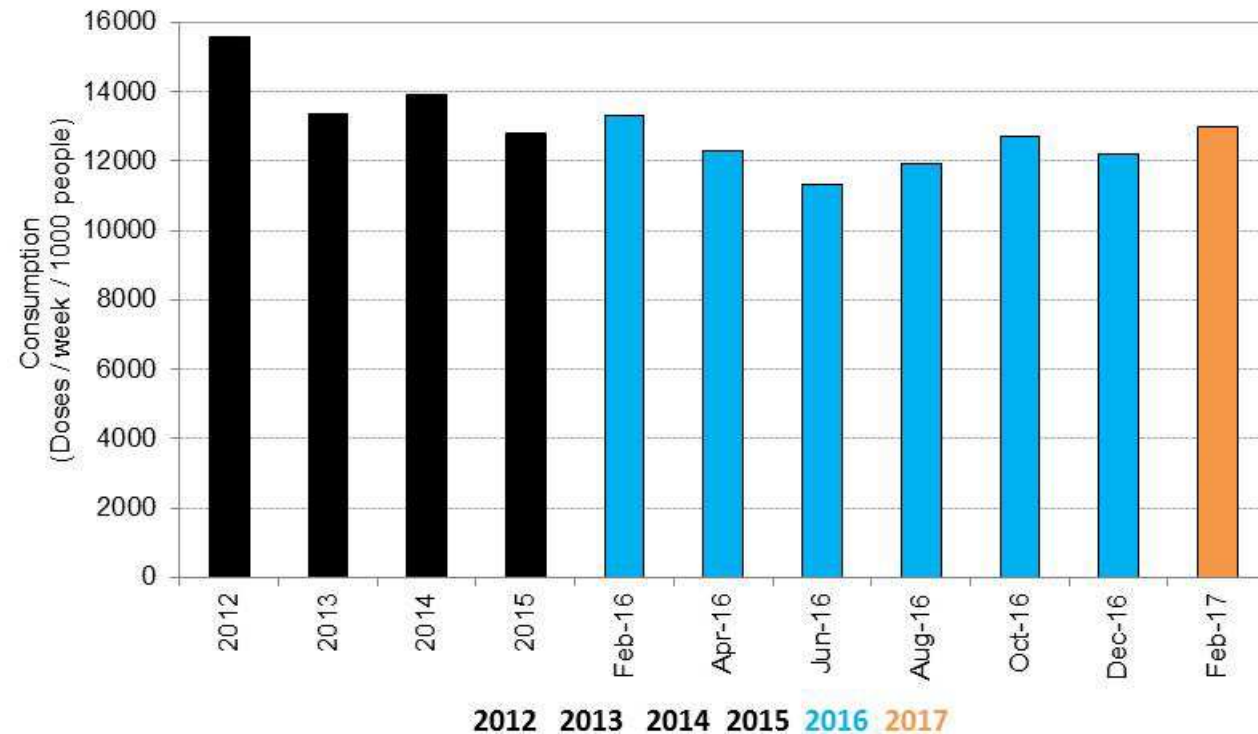
Cannabis consumption is fairly constant over the week.



Average consumption (dose/day/1000 people) of THC over the week. Dose = 125 mg.

# Nicotine\*

Nicotine consumption has shown a gradual decline since 2012.

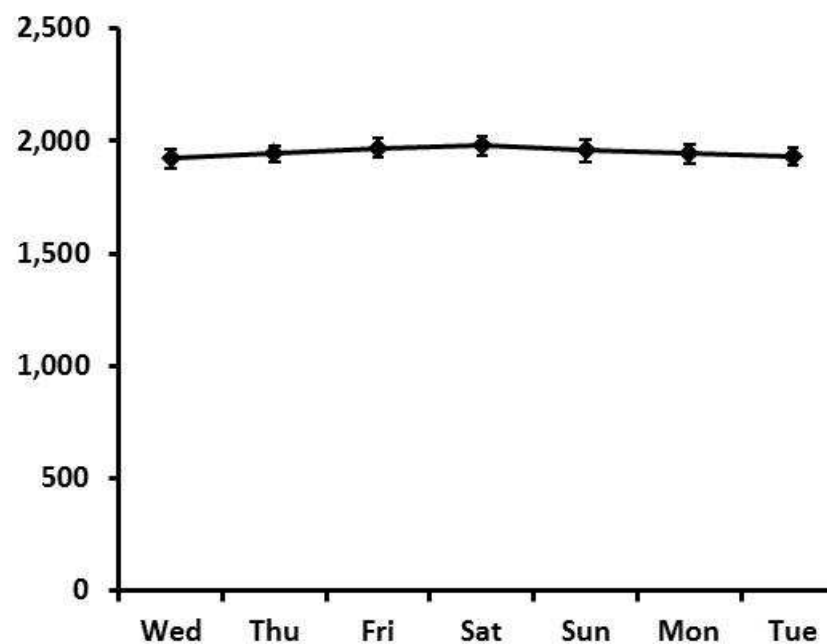


Average consumption (dose/day/1000 people) of nicotine for 2012-2015. Weekly consumption (dose/week/1000 people) bi-monthly from February 2016. Dose = 1mg.

\*Does not differentiate between tobacco and nicotine replacement therapy (NRT) use

# Nicotine

Nicotine consumption is fairly constant over the week.



Average consumption (dose/day/1000 people) of nicotine over the week. Dose = 1mg.



## Summary

- > Methamphetamine is the predominant stimulant consumed in metropolitan Adelaide and has shown a steady increase in levels since December 2012.
- > Other stimulants are consumed at much lower rates.
- > Stimulant consumption increases on the weekends.
- > Opioid consumption is relatively constant across the week.



## Summary (continued)

- > The increases seen in oxycodone and fentanyl consumption have moderated and have decreased in 2016.
- > Cannabis consumption levels have shown little change over the sampling period and it is used constantly over the week.
- > Nicotine consumption levels have shown a very gradual decline over the sampling period and are fairly constant over the week.