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## Recent non-fatal opioid overdose: the effects of health service utilisation, alcohol and other drug and demographic factors

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# Background

- Longitudinal analyses of non-fatal opioid overdose among PWID are rare
  - Cross sectional
  - Broad definitions of overdose (not opioid specific)
  - Not PWID specific
    - Recruited through treatment (OST<sup>1,2,3</sup>/ambulance<sup>4,5</sup>)
    - Recruited through prison<sup>6,7</sup>
- Health service utilization (cross sectional)
  - PWID are frequent users of health services – emergency departments<sup>8,9</sup>, ambulance services<sup>10,11</sup>
  - PWID-specific services set up around Melbourne<sup>12</sup>

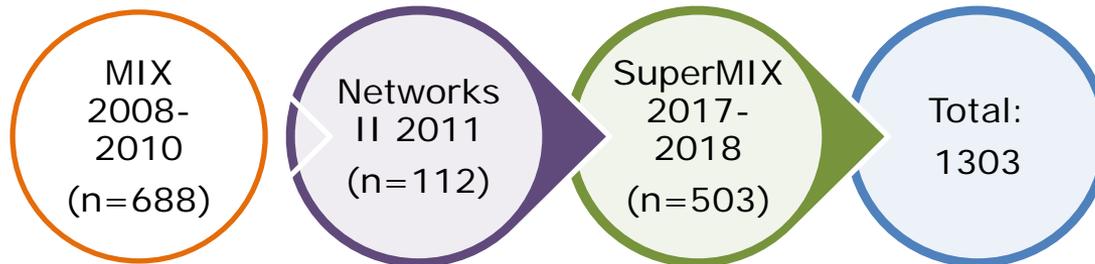
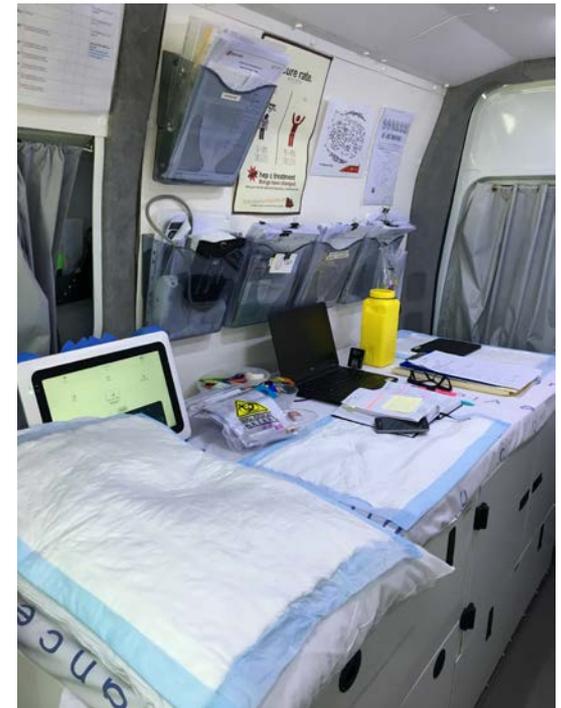
1. Vajdic et al 2015; 2. Kelty & Hulse 2017; 3. Ngo et al 2008; 4. Dietze et al 2005; 5. Stoope et al 2009; 6. Spittal et al 2017; 7. Winter et al 2015; 8. Kerr et al 2005; 9. Aitken et al 2013; 10. Darke et al 1996; 11. Warner-Smith et al 2002; 12. Victorian Government, 2000

# Aims

- Calculate the incidence of non-fatal opioid overdose in the SuperMIX cohort
- To investigate longitudinal predictors of opioid overdose among PWID by examining associations between self-reported non-fatal opioid overdose and various:
  - socio-demographic characteristics,
  - health service use,
  - and other drug use through survival analysis.

# The Melbourne Injecting Drug Use Cohort Study: SuperMIX

- Aim** To improve understanding of trajectories of injecting drug use
- Design** Prospective cohort of younger, mostly out-of-treatment PWID
- Recruitment** Street outreach, Respondent Driven Sampling (RDS)
- Cohort** Annual interview with bloods and record linkage



# Participants

- Participant eligibility:
  - **SuperMIX study:**
    - Injecting regularly
    - $\geq 18$  yrs
    - Currently residing in Greater Melbourne/Geelong
    - Willing to provide contact details and Medicare number
  - **Analysis:**
    - Using opioids at baseline
    - Completed at least 1 follow up interview
    - No missing data (complete case approach)

Study sample n =  
1303

43 (3%) excluded as  
not using opioids at  
baseline

549 (42%) excluded  
as did not have at  
least one follow-up

150 (12%) excluded  
due to complete  
case approach

561 (43%) in the  
final sample for  
analysis

\*Majority of these participants were recruited in 2018 and had not yet become eligible for first annual follow-up

# Descriptive data of the cohort and rate of first overdose

- **Baseline characteristics**

<b>Sociodemographic factors</b>	
Age (mean)	28 years
Gender (male)	64%
Indigenous (yes)	11%
<b>Drug-related factors</b>	
Duration of injecting (median)	11 years
Recent use of other opioids (yes)	22%
Recent use of benzodiazepines (yes)	60%
Recent use of alcohol (yes)	66%

- **Rates of non-fatal opioid overdose**

- 3137.2 person-years observed from 561 eligible participants
- 151 (27%) of eligible participants reported 247 overdoses during the study
- Non-fatal overdose rate of 7.9 per 100 person-years
- 30% of those had experienced their first incident overdose in the first follow-up period (~12 months), max number of follow ups was 11

# Discrete-time survival model: Outcome and Exposures

- **Outcome:** survival analysis of multiple events of heroin or other opioid overdose (*'Have you overdosed on heroin/other opioids since we saw you last?'*)

- **Exposures:**

*Sociodemographic:*

- Age (<25, 25-29, -30-34, ≥35)
- Gender (male/female)#
- Indigenous (yes/no)#
- Country of Birth (Australia/other)#
- Education level (<Yr10, Yr11-12, ≥Yr12)#
- Current employment (yes/no)
- Stable accommodation (yes/no)
- Main income source (government pension, wage/salary, other)
- Number of available supports (1, 2, 3+)
- Arrested in past 12 months (yes/no)
- Incarcerated since last seen (yes/no)

*Drug related:*

- Baseline opioid overdose (yes/no) #
- Past month: heroin, crystal methamphetamine or cocaine injecting, cannabis, other opioid, benzodiazepine or non-prescribed methadone use (yes/no)
- AUDIT alcohol consumption (abstinent/<8/≥8)
- Cigarettes per day (0, 1-10, 11-30, ≥30)

*Health related:*

- Currently prescribed OST (yes/no)
- **Past month attendance of: ambulance services, emergency department, hospital inpatient/outpatient services, PWID-specific services, GP services, mental health professionals (GP, psychologist, psychiatrist) (yes/no)**

# time-constant variables

# Predictors of self-reported non-fatal opioid overdose

Recent use of ambulance services		3.98
Regular heroin injecting		2.27
Use of other opiates		1.71
Prior opioid overdose		1.29
Currently on opiate substitute treatment		0.73

\*aHR

# Discussion

- One third of cohort at overdosed during study, similar to other studies from Canada<sup>13</sup> and Mexico<sup>14</sup>
- Non-fatal overdose rate of 7.9 per 100 PYs
- Opioid use related variables predictably strongly associated with opioid overdose
- Also found a significant protective effect of OST, similar to longitudinal studies from Canada<sup>13, 15, 16</sup>
- Participants who reported overdose prior to study more likely to overdose, reinforces broader studies<sup>17-23</sup>
- Recent use of ambulance services a strong risk factor – majority of ambulance attendances were not for drug related matters

13. Kerr et al 2007 14. Rafful et al 2018 15. Lake et al 2015 16. Milloy et al 2008 17. Stoope et al 2009; 18. Kerr et al 2006; 19. Olfson et al 2018; 20. Kinner et al 2012; 21. Wines et al 2007; 22. Caudarella et al 2016; 23. Pavarin et al 2016

# Limitations

- Self-report data
- Timeframes did not always match outcome
- Exclusion of newer questions added in 2016-2018 on overdose prevention (tasting drugs, overdose awareness and enrollment in take-home naloxone programs)

# Conclusions

- Aim: to examine relationships between first-episode of opioid overdose with a broad range of exposures
- Findings:
  - recent utilization of ambulance services, along with opioid use related factors were risk factors of opioid overdose,
  - Current OST was protective

## Practical applications

- Rolling out overdose awareness and prevention training through ambulance and services for people who use opioids
- Reinforce importance of overdose and naloxone training through PWID and peer-based services

## Further analyses to be considered

- The relationship between health service utilization and the overdose event itself – further analysis with linked data
- Further analysis with linked data, incl mortality data

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## Conflicts of Interest

- PD has received an investigator-driven grant from Gilead Sciences for unrelated work on hepatitis C and an untied educational grant from Reckitt Benckiser for unrelated work on the introduction of buprenorphine-naloxone into Australia.

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