THE UNIVERSITY OF MELBOURNE

Centre for Research Excellence into Injecting Drug Use

Reducing injection-related harm in recently released prisoners

A/Prof Stuart Kinner
Centre for Health Policy, Programs and Economics
Melbourne School of Population Health, The University of Melbourne

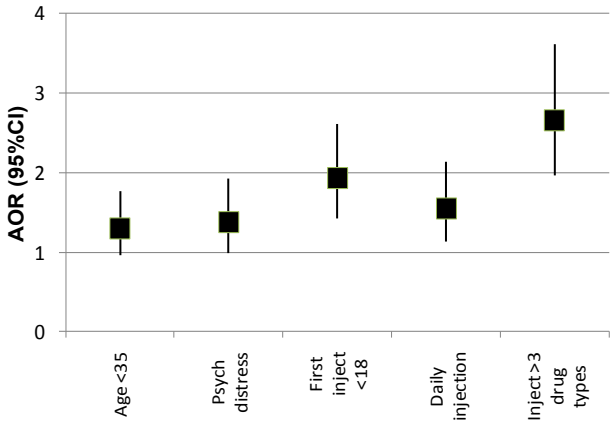
Centre for Research Excellence into Injecting Drug Use

OUTLINE

- IDU before and in prison (recap)
- IDU after release from prison
  - Epidemiology
  - Harms
- Responses
- Next steps

Centre for Research Excellence into Injecting Drug Use

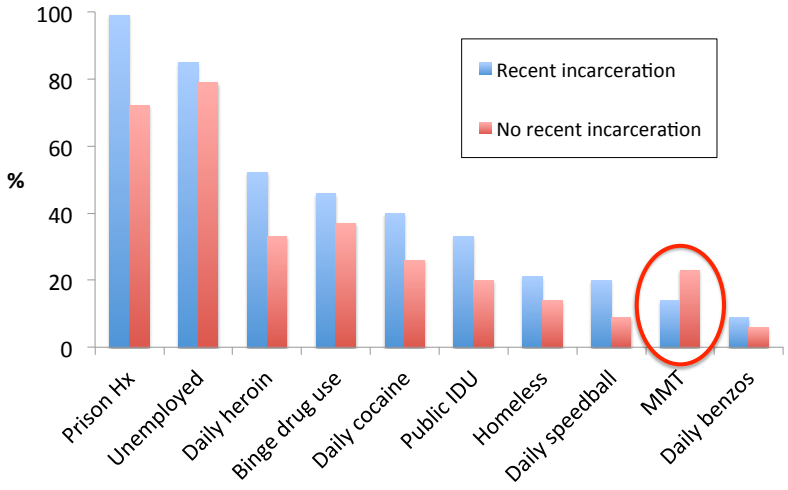
IDU and crime



Sources: Kinner et al (2009). Drugs, crime and distress: Patterns of drug use and harm among criminally involved IDU in Australia. *ANZJPH*. 33, 223-227.

Centre for Research Excellence into Injecting Drug Use

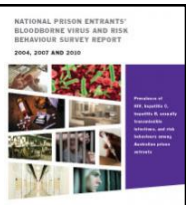
Drug use & incarceration

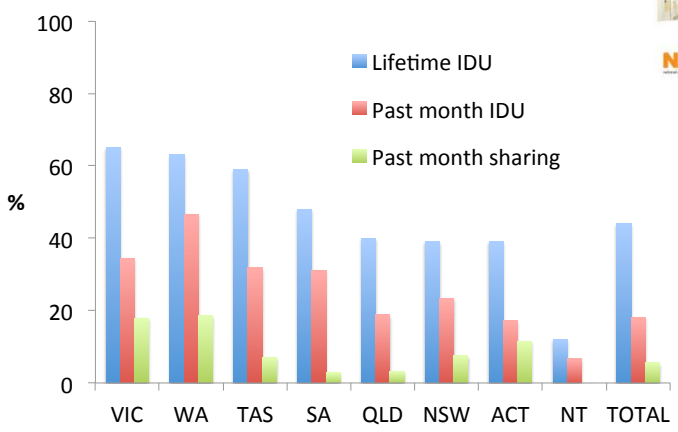


Kinner, Milloy, Wood, Qi, Zhang & Kerr (2012). Incidence and risk factors for non-fatal overdose among a cohort of recently incarcerated illicit drug users. *Addictive Behaviors, 37(6), 691-696.*

Centre for Research Excellence into Injecting Drug Use

Prison receptions



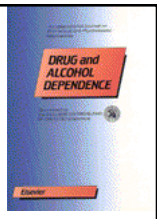


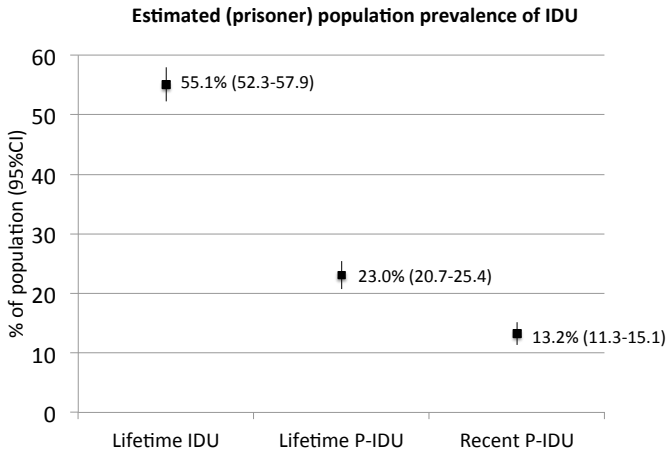
Butler, T, Lim D, & Callander D. National Prison Entrants' Bloodborne Virus and Risk Behaviour Survey Report 2004, 2007, and 2010. Kirby Institute (University of New South Wales) and National Drug Research Institute (Curtin University). 2011.

Prison = public health opportunity

Centre for Research Excellence into Injecting Drug Use

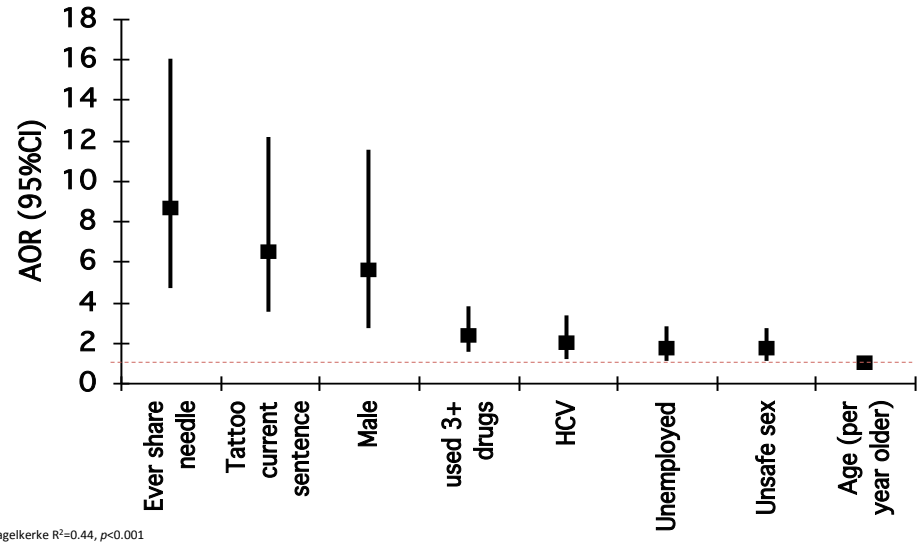
IDU in prison





Kinner, Jenkinson, Gouilou & Milloy (2012). High-risk drug-use practices among a large sample of Australian prisoners. *Drug and Alcohol Dependence, doi 10.1016/j.drugalcdep.2012.05.008.*

Independent correlates of in-prison IDU



Nagelkerke R^2=0.44, p<0.001

Centre for Research Excellence into Injecting Drug Use

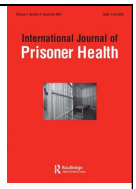
HCV transmission in prison

	NSW[1]	NSW[2]	SA[3]
Sample (HCV-)	120 lifetime IDU	488 lifetime IDU	148 prisoners (majority IDU Hx)
Incident HCV cases	16	94	3
Rate per 100 py (95%CI)	34.2 (19.6-55.6)	31.6 (25.6-38.7)	4.7 (3.4-6.1)

Ceiling effect?

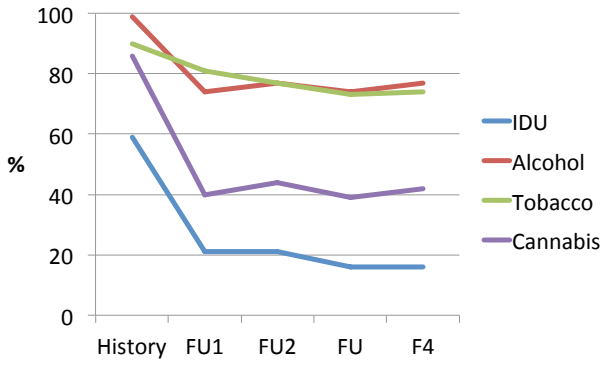
1. Dolan et al (2010). Eur J Epidemiol
2. Teutsch et al (2010). BMC Public Health.
3. Miller et al (2008). Int J Infect Dis

Centre for Research Excellence into Injecting Drug Use



IDU after release from prison

- 160 (ex-)prisoners in QLD
  - Baseline ≤4 weeks pre-release
  - Follow-up 1, 3, 6, 9 months post-release



Kinner (2006). *Int J Prison Health, 2(2), 101-113*

Centre for Research Excellence into Injecting Drug Use

IDU after release from prison

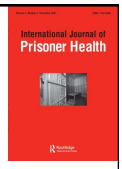


Table II. Association between pre-release and post-release health and substance use. Odds ratios with 95% confidence internal shown.

	Follow-up 1 ($n=91$)				
Pre-release	K10 high/ very high	SF8PCS < norm	SF8MCS < norm	Illicit drug use	Injecting drug use
K10 high/very high	7.56 (2.75–20.77)	2.04 (0.83–5.02)	9.14 (3.05–27.43)	1.74 (0.84–3.59)	2.53 (1.07–5.95)
SF8PCS < norm	0.73 (0.29–1.85)	2.13 (0.90–5.02)	1.44 (0.62–3.31)	1.31 (0.66–2.61)	0.92 (0.38–2.20)
SF8MCS < norm	5.33 (1.89–15.09)	2.12 (0.90–5.01)	4.00 (1.67–9.61)	1.88 (0.96–3.70)	2.07 (0.88–4.85)
Illicit drug use history	3.51 (0.42–29.57)	2.53 (0.50–12.95)	2.15 (0.50–9.21)	6.19 (0.78–48.94)	2.58 (0.32–20.71)
Injecting drug use history	1.60 (0.61–4.21)	1.22 (0.51–2.90)	1.33 (0.57–3.10)	1.79 (0.88–3.69)	9.09 (2.07–39.97)

Kinner (2006). *Int J Prison Health, 2(2), 101-113*

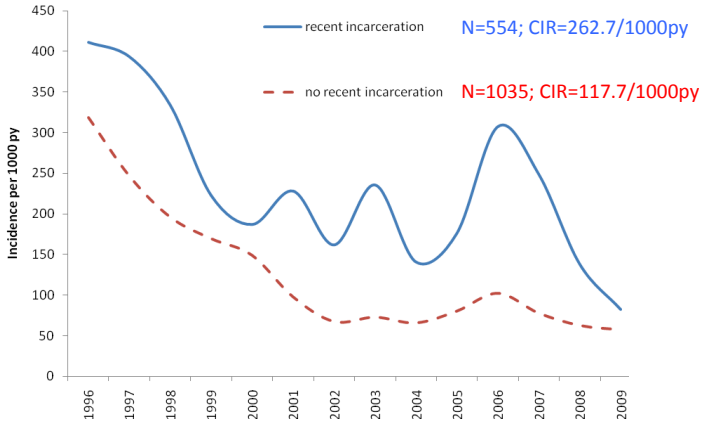
Centre for Research Excellence into Injecting Drug Use

How does incarceration impact IDU?

- increased syringe sharing [1]
- non-adherence to ARV [2]
- virologic failure [3]
- nonfatal overdose [4]

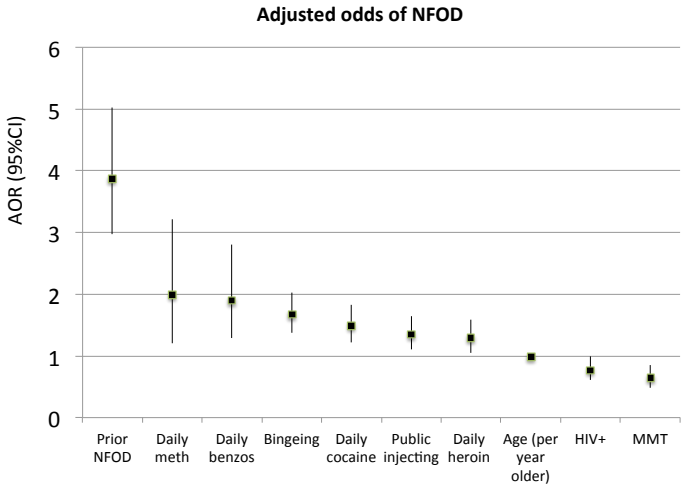
[1] Milloy et al (2009). BMC Public Health 9(1), 156.
[2] Milloy et al (2011). J Inf Dis 203(9), 1215-21.
[3] Westergaard et al (2011). CID 53, 725.
[4] Kerr et al (2007). Drug Alcohol Depend 87(1), 39-45.

Nonfatal overdose



Kinner, Milloy, Wood, Qi, Zhang & Kerr (2012). Incidence and risk factors for non-fatal overdose among a cohort of recently incarcerated illicit drug users. *Addictive Behaviors, 37(6), 691-696.*

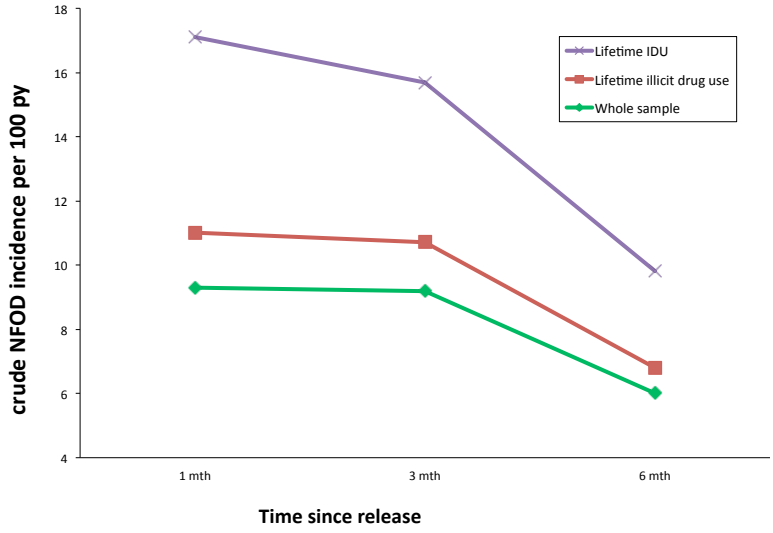
Nonfatal overdose



Kinner et al (2012). *Addictive Behaviors, 37(6), 691-696.*

Centre for Research Excellence into Injecting Drug Use

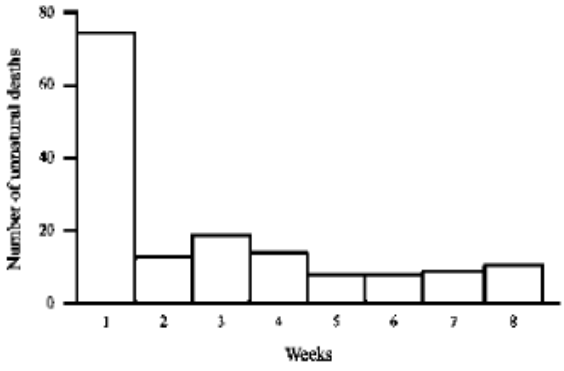
Nonfatal overdose



Winter, Kinner, Jenkinson & Degenhardt (in prep).

Centre for Research Excellence into Injecting Drug Use

Fatal overdose



Source: GRAHAM, A. (2003) *Australian and New Zealand Journal of Criminology*, 36, 94-108.

Centre for Research Excellence into Injecting Drug Use

Post-release mortality

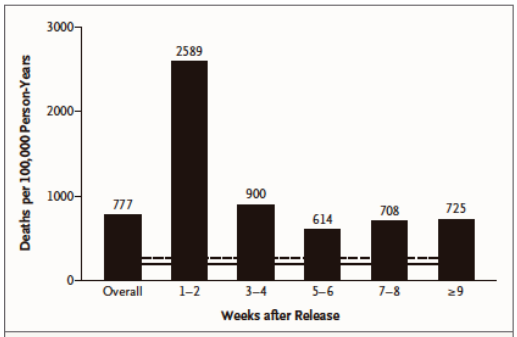


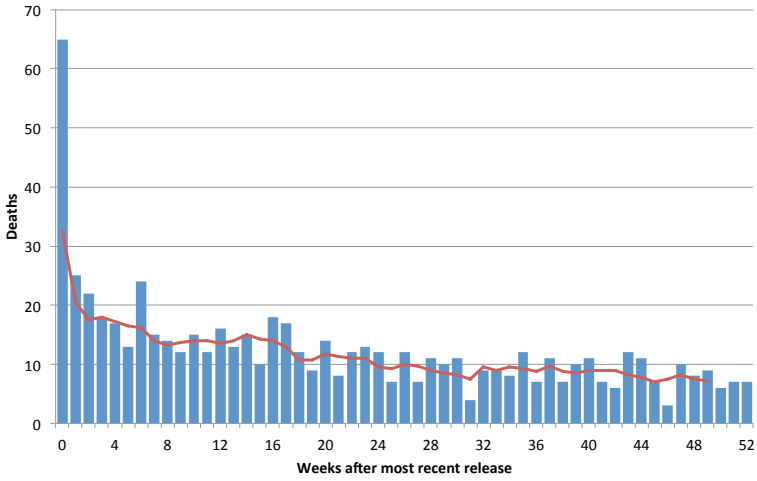
Figure 1. Mortality Rates among Former Inmates of the Washington State Department of Corrections during the Study Follow-up (Overall) and According to 2-Week Periods after Release from Prison.

The dashed line represents the adjusted mortality rate for residents of the State of Washington (223 deaths per 100,000 person-years), and the solid line represents the crude mortality rate among inmates of the state prison system during incarceration (201 deaths per 100,000 inmate person-years).

Source: Binswanger et al (2007) N Engl J Med, 356(2), 157.

Centre for Research Excellence into Injecting Drug Use

Deaths in year after most recent release, by week



Source: Forsyth & Kinner (in preparation). MARC project data.

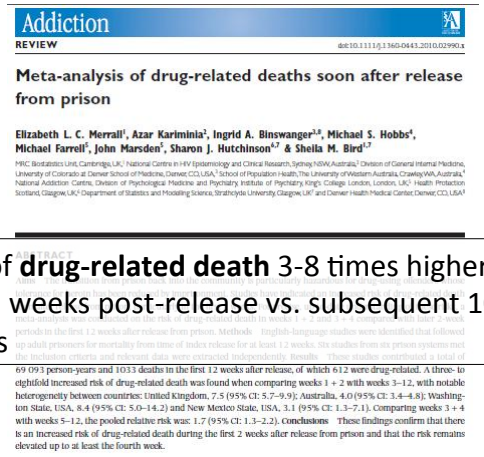
Centre for Research Excellence into Injecting Drug Use

Causes of death in first year

	Time since release			
	0 to 30 days		31 to 365 days	
All cause	133	100%	522	100%
AOD related	51	38%	157	30%
Suicide	23	17%	117	22%
Unnatural	82	62%	358	69%

Source: Forsyth & Kinner (in preparation). MARC project data.

Summarising the evidence



Addiction

REVIEW

doi:10.1111/j.1360-0443.2010.02990.x

Meta-analysis of drug-related deaths soon after release from prison

Elizabeth L. C. Merrall[1], Azar Kariminia[2], Ingrid A. Binswanger[3,4], Michael S. Hobbs[4], Michael Farrell[5], John Marsden[5], Sharon J. Hutchinson[6,7] & Sheila M. Bird[1,7]

MRC Biostatistics Unit, Cambridge, UK,[1] National Centre in HIV Epidemiology and Clinical Research, Sydney, NSW, Australia,[2] Division of General Internal Medicine, University of Colorado at Denver School of Medicine, Denver, CO, USA,[3] School of Population Health, The University of Western Australia, Crawley, WA, Australia,[4] National Addiction Centre, Division of Psychological Medicine and Psychiatry, Institute of Psychiatry, King's College London, London, UK,[5] Health Protection Scotland, Glasgow, UK,[6] Department of Statistics and Modelling Science, Strathclyde University, Glasgow, UK[7] and Denver Health Medical Center, Denver, CO, USA[8]

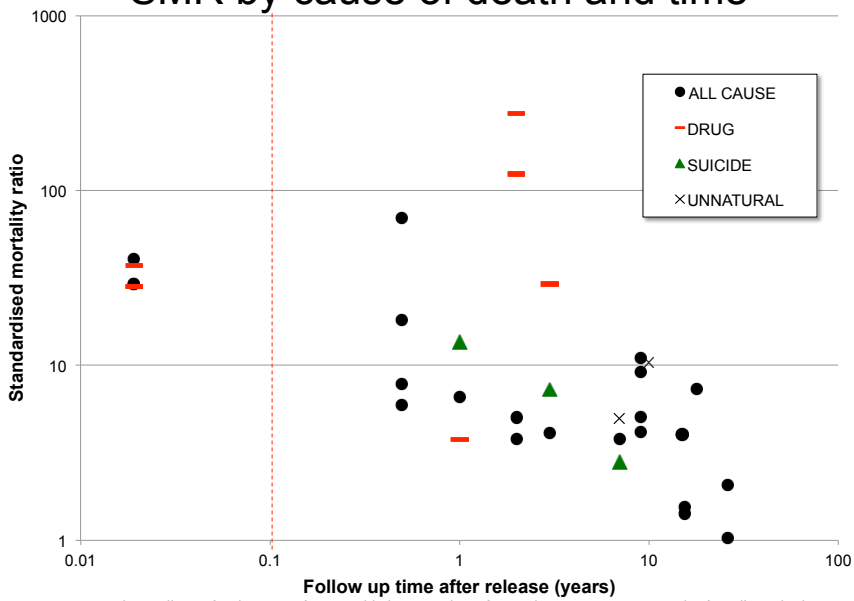
ABSTRACT

Aims The transition from prison back into the community is particularly hazardous for drug-using offenders. This meta-analysis was conducted on the risk of drug-related death in weeks 1 + 2 and 3 + 4 compared with later 2-week periods in the first 12 weeks after release from prison. Methods English-language studies were identified that followed up adult prisoners for mortality from time of index release for at least 12 weeks. Six studies from six prison systems met the inclusion criteria and relevant data were extracted independently. Results These studies contributed a total of 69 093 person-years and 1033 deaths in the first 12 weeks after release, of which 612 were drug-related. A three- to eightfold increased risk of drug-related death was found when comparing weeks 1 + 2 with weeks 3–12, with notable heterogeneity between countries: United Kingdom, 7.5 (95% CI: 5.7–9.9); Australia, 4.0 (95% CI: 3.4–4.8); Washington State, USA, 8.4 (95% CI: 5.0–14.2) and New Mexico State, USA, 3.1 (95% CI: 1.3–7.1). Comparing weeks 3 + 4 with weeks 5–12, the pooled relative risk was: 1.7 (95% CI: 1.3–2.2). **Conclusions** These findings confirm that there is an increased risk of drug-related death during the first 2 weeks after release from prison and that the risk remains elevated up to at least the fourth week.

Risk of **drug-related death** 3-8 times higher in first 2 weeks post-release vs. subsequent 10 weeks

Centre for Research Excellence into Injecting Drug Use

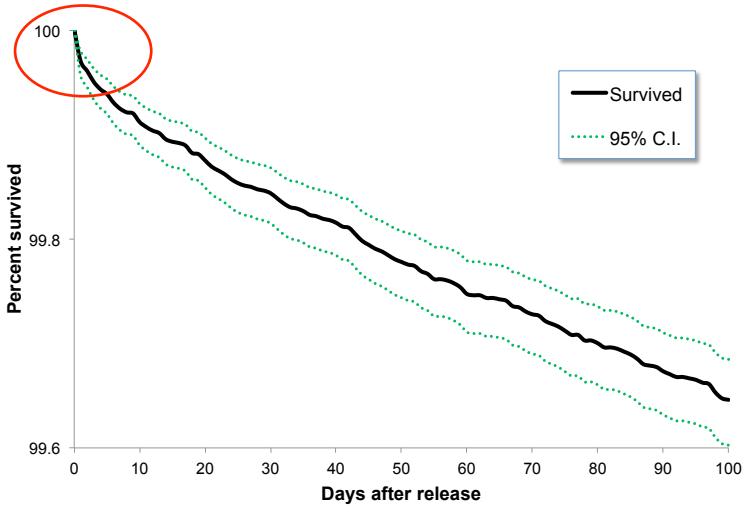
SMR by cause of death and time



Source: Kinner, Forsyth & Williams (under review). *Record linkage studies of mortality in ex-prisoners: Why (good) methods matter.*

Centre for Research Excellence into Injecting Drug Use

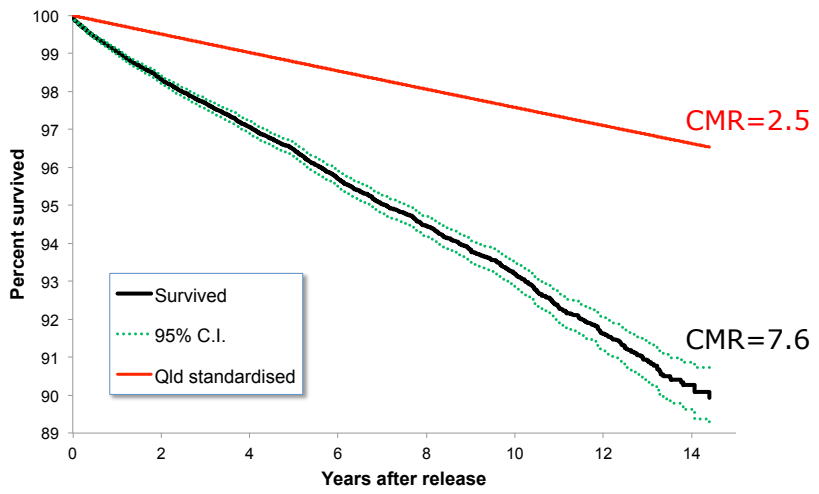
Survival after release (to 100 days)



Source: Forsyth & Kinner (in preparation). MARC study data.

Centre for Research Excellence into Injecting Drug Use

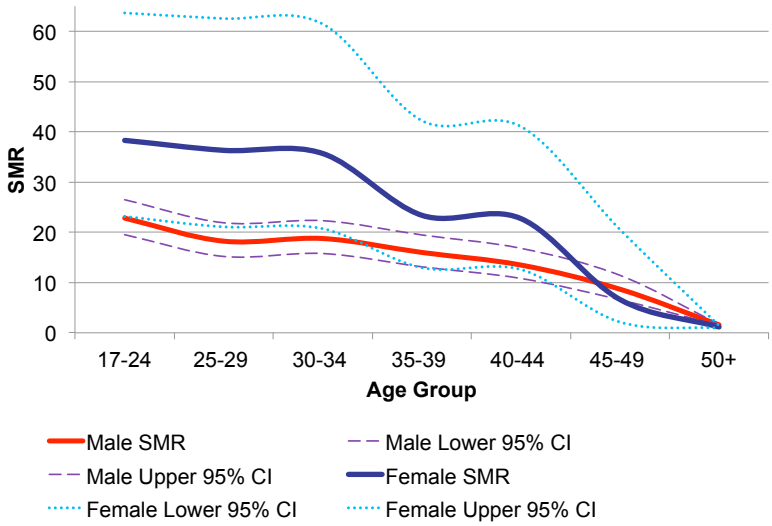
Survival after release (to 15 years)



Source: Forsyth & Kinner (in preparation). MARC study data.

Centre for Research Excellence into Injecting Drug Use

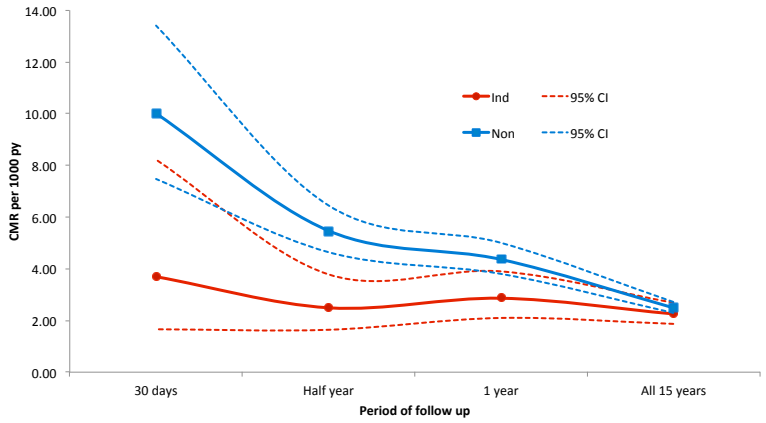
Mortality varies by age and sex



Source: van Dooren, Forsyth & Kinner (under review). *Young people have heightened risk of death in the year following release from adult prison.*

Centre for Research Excellence into Injecting Drug Use

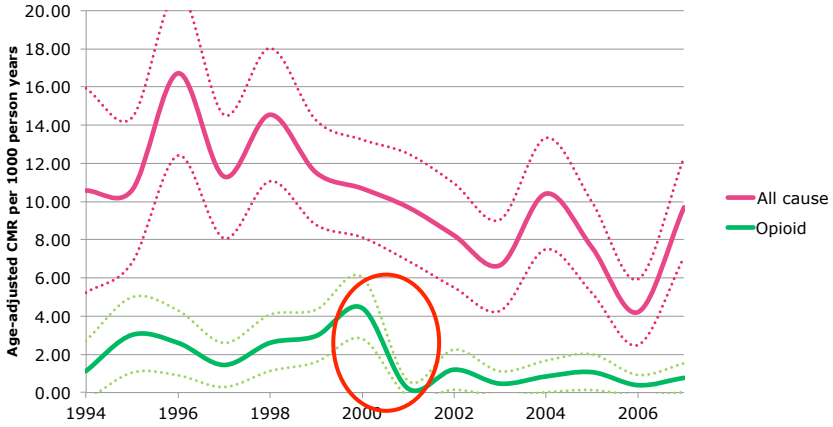
Mortality varies by Indigenous status



Source: Forsyth, Ober, Alati, Williams & Kinner (in prep). Divergent patterns of mortality in Indigenous and non-Indigenous ex-prisoners.

Centre for Research Excellence into Injecting Drug Use

Causes of death change over time



Source: Kinner, Forsyth, Andrews & Stoove (in preparation). *Impact of a sustained heroin shortage on fatal drug overdoses among adult ex-prisoners in Queensland, Australia*

Centre for Research Excellence into Injecting Drug Use

Where do DRDs in ex-prisoners occur?

Table 4 Location of death according to cause of death

Location of Death	Accidental drug related death n = 172 (%)	All other causes (n = 210) (%)	p-value
Residential property	116 (67.4)	108 (51.4)	0.015
Public place (includes car parks, railway stations and on streets)	27 (15.7)	77 (36.7)	0.043
Boarding house, hotel, backpackers hostel	16 (9.3)	7 (3.3)	0.615
Hospital/residential care facility	9 (5.2)	11 (5.2)	1.00
Caravan/mobile home/campground	4 (2.3)	5 (2.4)	0.992
Military institution/detention centres	0	2 (1.0)	-

Source: Andrews & Kinner (2012). BMC Public Health, 12, 270.

Centre for Research Excellence into Injecting Drug Use

What characteristics are associated with DRDs?

Table 2 Health, treatment and drug-use characteristics according to cause of death

	Accidental drug-related (n = 175) (%)	All other causes (n = 213) (%)	p-value
General health condition	45 (25.7)	53 (24.9)	0.795
Mental health condition	51 (29.1)	111 (52.1)	<0.001
Recorded risk of self-harm	9 (5.1)	58 (27.2)	<0.001
Health service use (around time of death)	30 (17.1)	42 (19.7)	0.502
General health	16 (9.1)	25 (11.7)	0.601
Mental health	17 (9.7)	19 (8.8)	0.339
Alcohol and other drug	28 (16.0)	22 (10.2)	0.101
Welfare	21 (12.0)	21 (9.8)	0.539
Drug overdose (ever)	17 (9.7)	10 (4.7)	0.031
Injecting drug use (around time of death)	134 (76.6)	31 (14.4)	<0.001
History of heroin use	84 (48.0)	38 (17.7)	<0.001
Opiate substitution treatment (around time of death)	11 (6.3)	10 (4.7)	0.491
Record of drug withdrawal/detox in previous 6 months	27 (15.4)	8 (3.7)	<0.001

Source: Andrews & Kinner (2012). BMC Public Health, 12, 270.

Centre for Research Excellence into Injecting Drug Use

What substances are involved in DRDs?

Table 3 Drugs types involved in deaths involving multiple drugs

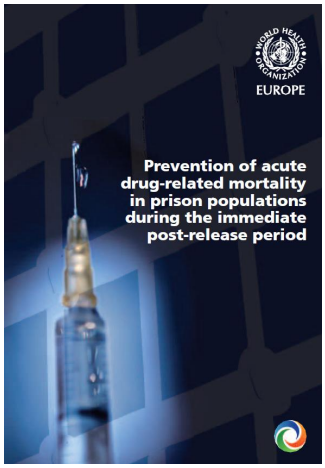
Drug combinations identified	Proportion of deaths (n = 126)* (%)
2 drug types	
Opioid(s) + one other drug type	51 (40.0)
Opioid(s) + benzodiazepines	19 (15.1)
Opioid(s) + alcohol	11 (8.7)
Opioid (s) + methamphetamine	6 (3.4)
Opioid(s) + cocaine	5 (4.0)
Opioid(s) + cannabis	4 (3.2)
Opioid(s) + antidepressants	3 (2.4)
Opioid(s) + antipsychotics	3 (2.4)
Two other drug types (excluding opioid(s))	1 (0.8)
3 or more drug types	
Opioid(s) + two or more other drug types	70 (56.6)
Opioid(s) + benzodiazepine + other drug type(s)	60 (47.6)
Three or more drug types (excluding opiod(s))	4 (3.2)
All multiple drug cases	
Opioid(s) + any other drug type(s)	121 (96.0)
Any two or more drug types (excluding opioid(s))	5 (4.0)

**data missing for 17 accidental drug-related deaths*

Source: Andrews & Kinner (2012). BMC Public Health, 12, 270.

Centre for Research Excellence into Injecting Drug Use

Reducing drug-related harm



- Diversion
- OST: post-release, retention
- Prevention incl. education
- 1st aid training incl. naloxone
- Transitional care
  - post-release
  - personalised
  - health-focussed
  - case management

Centre for Research Excellence into Injecting Drug Use

Current state of play

- IDU normative in prison receptions
- IDU in prison common and high risk
- IDU in ex-prisoners is common and:
  - Predictable
  - Harmful: overdose, infection, ↓adherence
  - A risk to public health
  - A risk to public amenity
- Preventable?

Centre for Research Excellence into Injecting Drug Use

Knowledge gaps

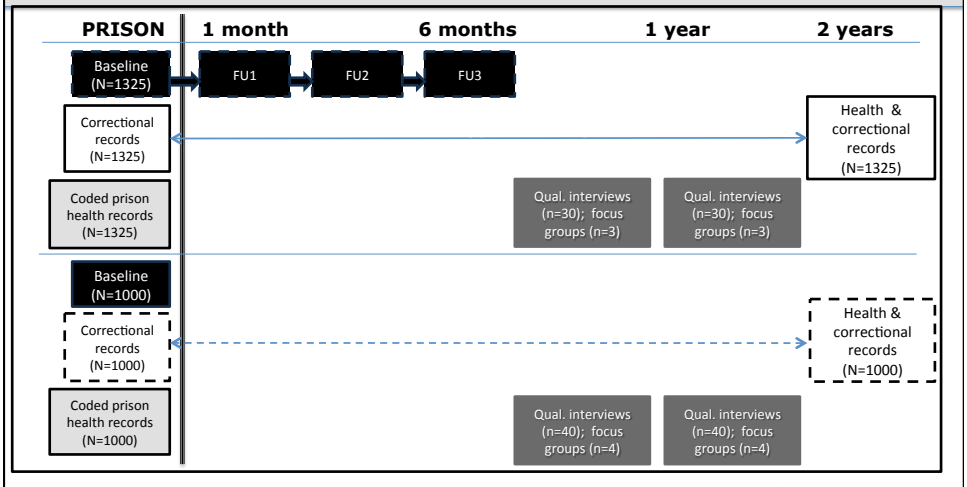
- Epidemiology of IDU in ex-prisoners
  - Who, when, where, how?
  - Outcomes?
- Effective (evidence-based) responses
  - Prevention
  - Harm reduction

Centre for Research Excellence into Injecting Drug Use

Next steps: Research

- Prospective studies
- Large, representative samples
- Mixed methods: self-report, bloods, record linkage, qualitative
- Focus on health services
- Rigorous evaluation (*vs*. 'description')
- Partnership with Corrective Services

HIP-Aus study: Improving the health of Indigenous and non-Indigenous ex-prisoners in Australia



The University of Western Australia · The University of Melbourne · The University Of Queensland · Burnet Institute · Australian Government National Health and Medical Research Council NHMRC · Queensland Corrective Services Queensland Government · Government of Western Australia Department of Corrective Services

Prison And Transition Health (PATH) Cohort Study

PATHways to Successful Transition

Stoove, Kinner, Butler, Ogloff, Aitken, Dietze (NHMRC 2012-2015)

- N=600 prisoners with IDU Hx
- Baseline ≤6 weeks pre-release
- Follow-up 3, 12, 24 months post-release
- In-depth interviews, blood specimens (HCV & HBV antibody/PCR)
- Linkage to health and law enforcement records
- AIMS
  - Identify typical **trajectories** of people with a history of IDU following release from prison
  - Determine the **incidence/timing** between health service utilisation/other exposures and drug use, health and criminogenic outcomes
  - Identify **intervention opportunities** to reduce drug-related and other physical and mental health morbidities, and reduce recidivism

Burnet Institute Medical Research. Practical Action. | The University of Melbourne | Australian Government National Health and Medical Research Council NHMRC | Centre for Research Excellence into Injecting Drug Use | Monash University