



Kirby Institute

Decline in Hepatitis C Virus (HCV) incidence among repeat respondents in the Australian NSP Survey 1995-2010

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Background

- HCV infection endemic among people who inject drugs (PWID) in developed countries
- **Prevalence of HCV >50% in Australia (1995-2010)**
- **Estimating incidence of HCV:**
 - Prospective observational studies of PWID
 - Costly & challenging

Primary Aim:

“Estimate HCV incidence among PWID who participated to Australian Needle and Syringe Program Survey (ANSPS) at multiple time points during the period of 1995-2010”

Australian Needle and Syringe Program Survey

- Cross sectional survey & conducted annually since 1995 (Implemented over a 1-2 week period, ~50 sites)
- Annual number of participants are ~ 2,200
- **Behavioural component:** (using self administered questionnaire)
 - Demographics, injecting and sexual behaviour
- **Biological component:** (using capillary dried blood spot)
 - HCV antibody testing



QUESTIONNAIRE

Thank You for Your Help
Australia's national blood research for HIV and blood-borne viruses
Please return this questionnaire and return it to the
address on the back of the questionnaire.
You may use a pen or ballpoint pen.
Open the questionnaire and return it to the
address on the back of the questionnaire.
You may use a pen or ballpoint pen.

BLOOD SPOTS
When you have finished the questionnaire,
please scratch a blood spot.

1. Are you:
 Male
 Female
2. Do you identify as:
 Heterosexual
 Bisexual
 Transgender
 Other
3. How did we get you?
 You first injected drugs
 How was the LAST drug
you injected?
 Heroin
 Cocaine
 Amphetamine
 Methamphetamine
 Synthetic stimulants
 Other (specify)
4. How often do you use:
 Heroin
 Cocaine
 Amphetamine
 Methamphetamine
 Synthetic stimulants
 Other (specify)
5. How often do you use:
 Heroin
 Cocaine
 Amphetamine
 Methamphetamine
 Synthetic stimulants
 Other (specify)
6. How often do you use:
 Heroin
 Cocaine
 Amphetamine
 Methamphetamine
 Synthetic stimulants
 Other (specify)

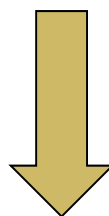
Study No: 2011-70100110
COMPLETELY FILL EACH CIRCLE WITH BLOOD
BLOOD MUST SOAK RIGHT THROUGH PAPER
ALLOW SPOTS TO DRY

Coverplast
Latex-free
BSN

HAZARD
PLACE SPECIMEN CONTAINERS IN SEALED COMPARTMENT
AND REQUEST FORM IN THIS SECTION

Australian Needle and Syringe Program Survey

“Monitors HCV prevalence and associated risk behaviour of people who inject drugs attending NSP services across the country”

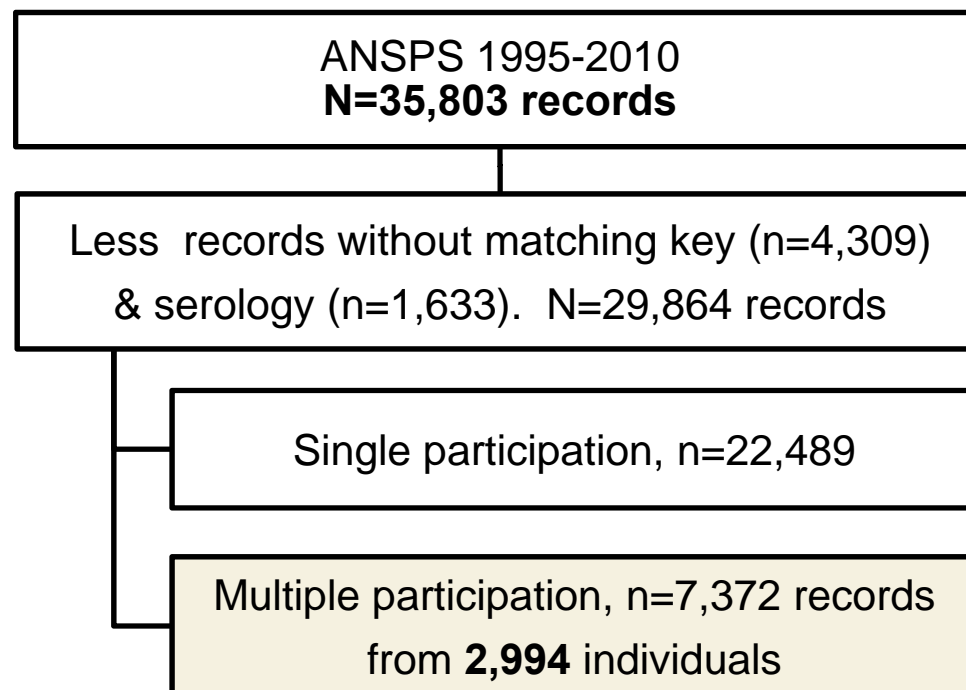


“Create HCV negative cohort”

Creation of HCV negative cohort

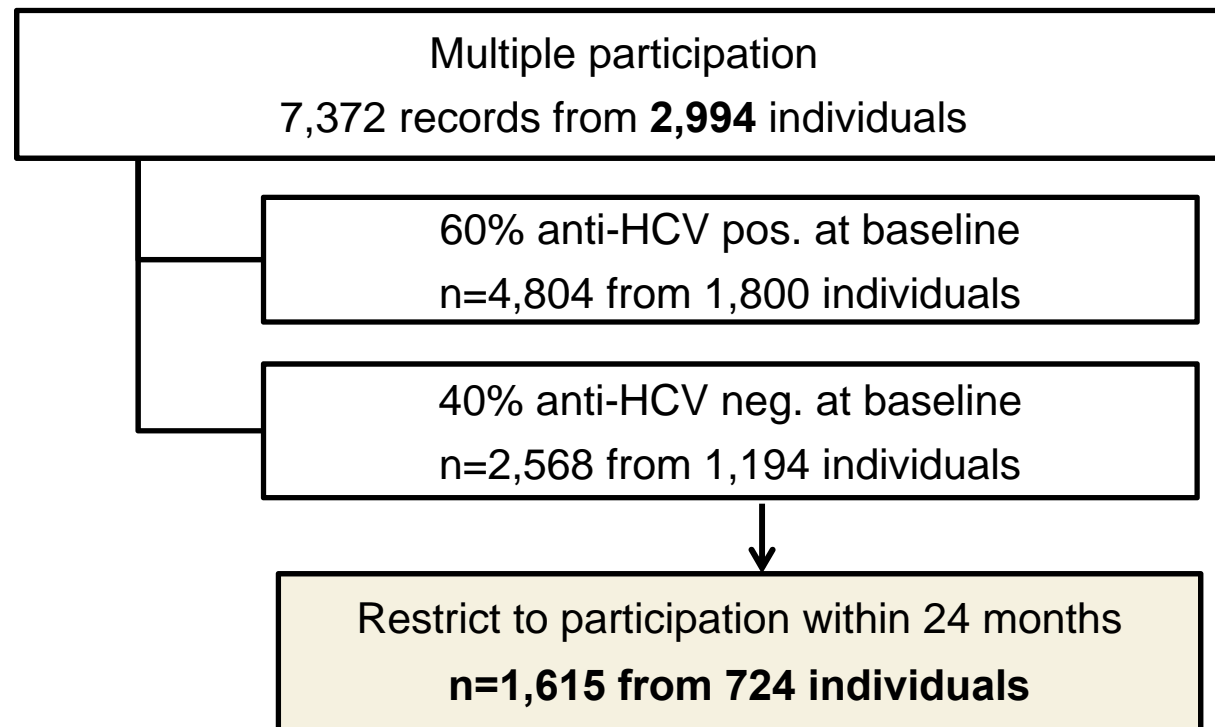
STEP 1: Identify repeated participants using a “matching rule”

(1) First 2 letters of first & last names, (2) month & year of birth, (3) gender (4) Indigenous status



Creation of HCV negative cohort

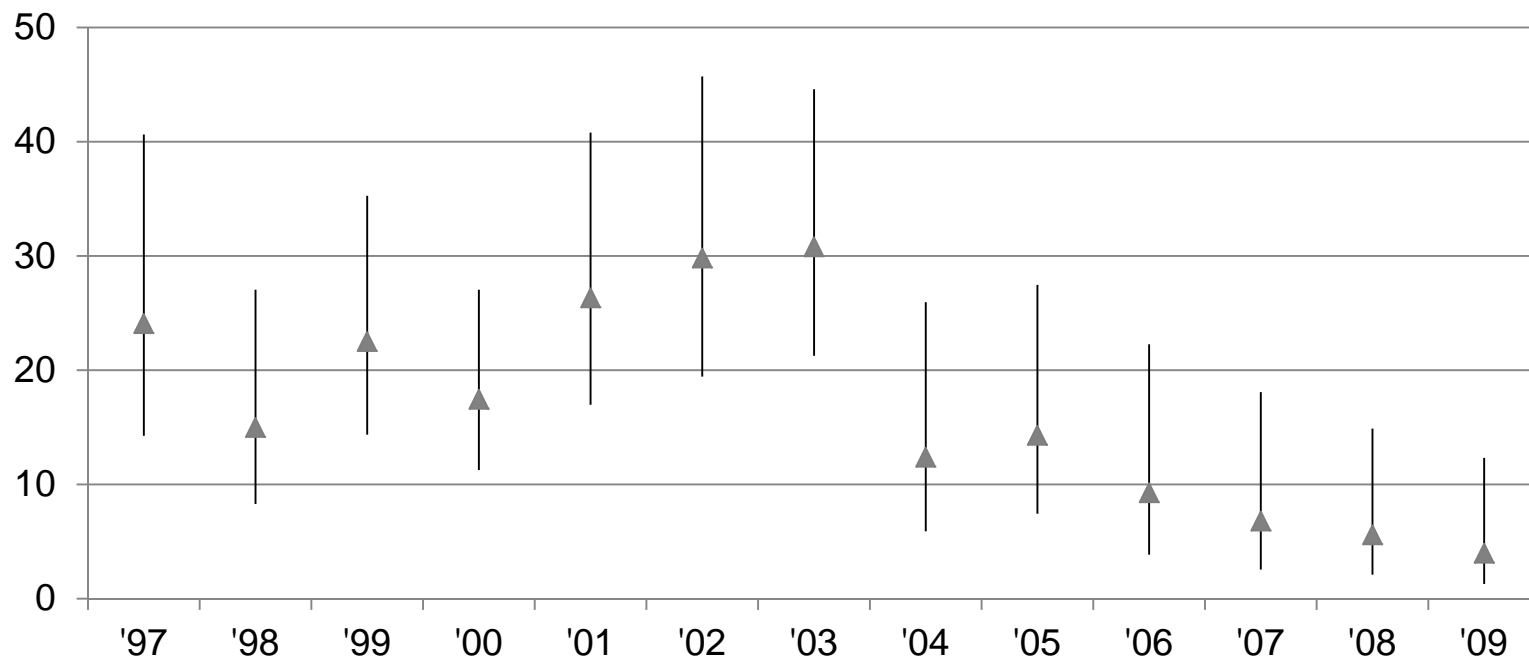
STEP 2: Repeat participants with anti-HCV negative serology identified; Cohort restricted to repeat participation within 2 years



HCV incidence

- 180 HCV sero-conversions in 724 individuals
- Incidence 17.0 per 100 PY (95% CI 15.0-20.0)

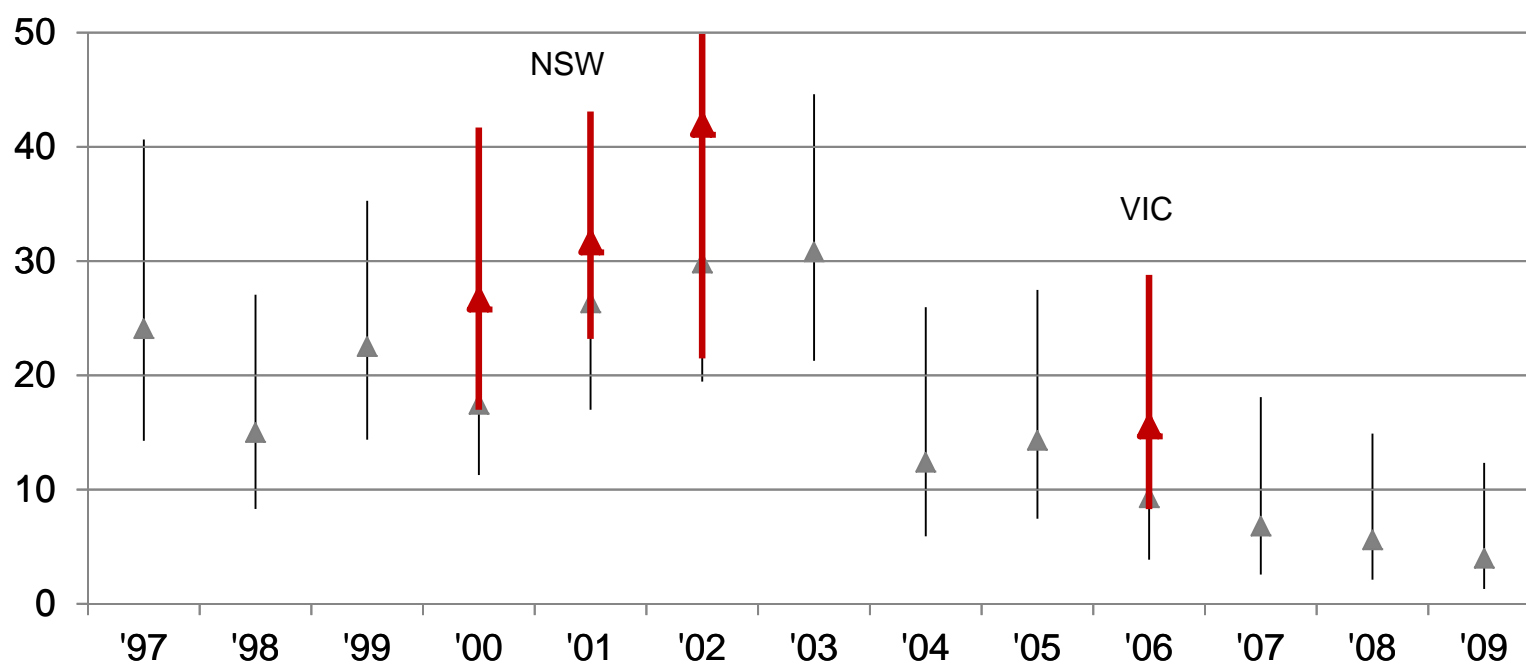
Annual incidence



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Annual incidence

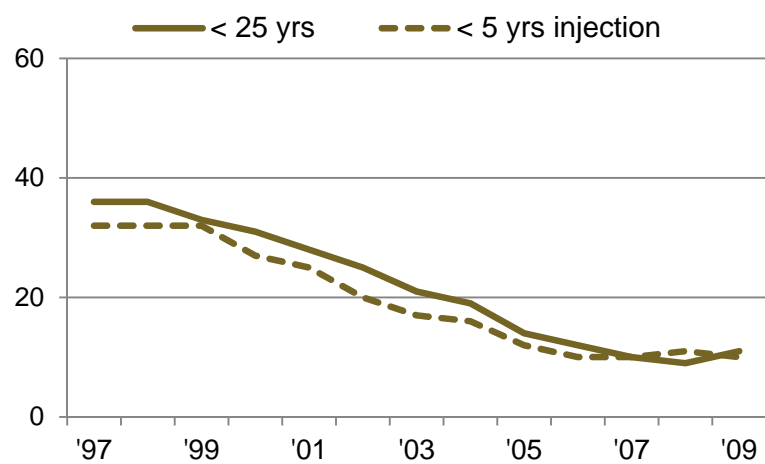


Factors associated with HCV incident infection

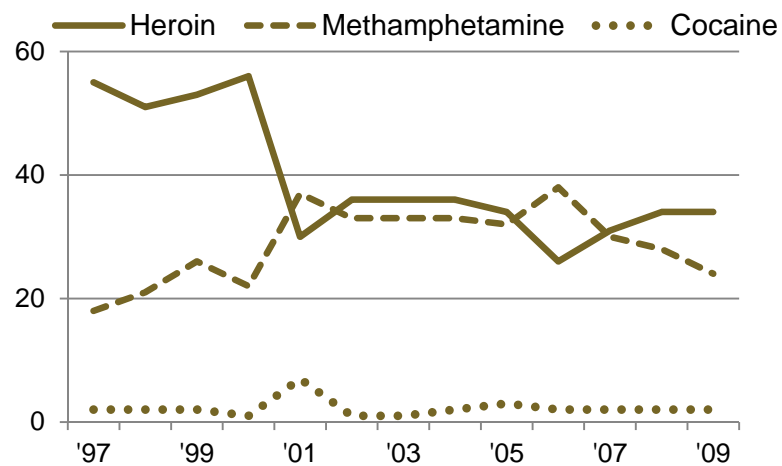
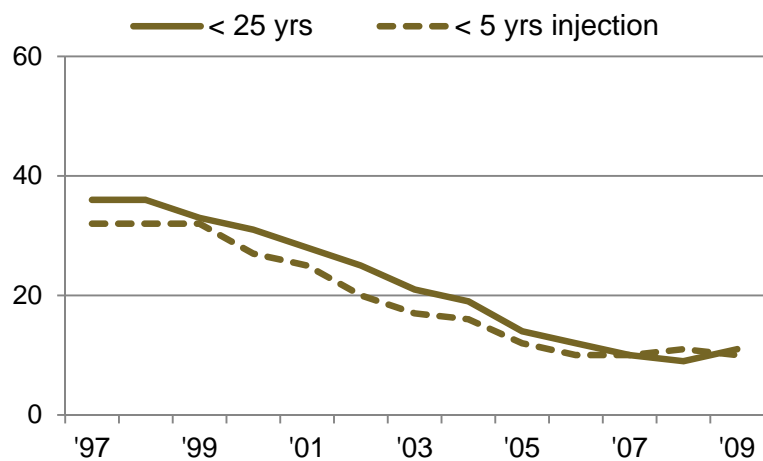
| Characteristic | Adjusted hazard ratio (95% CI) | P value |
|----------------------------------|-----------------------------------|------------------|
| Last drug injected | | |
| Methamphetamine | 1.0 (Reference) | |
| Heroin | 1.80 (1.18-2.75) | 0.006 |
| Cocaine | 3.78 (1.96-7.28) | <0.001 |
| Methadone/Bupe | 1.67 (0.94-2.96) | 0.081 |
| Pharmaceutical opioids | 1.62 (0.85-3.07) | 0.140 |
| ≥ Daily injection | 1.38 (1.02-1.87) | 0.037 |
| Imprisonment last 12 mths | 2.68 (1.88-3.83) | <0.001 |
| Mainland eastern states | 2.37 (1.49-3.77) | <0.001 |
| Study period | | |
| 1995-1999 | 1.0 (Reference) | |
| 2000-2003 | 1.79 (1.27-2.52) | 0.001 |
| 2004-2010 | 0.70 (0.45-1.09) | 0.117 |

* adjusted for time since first injection & last drug injected 'other'

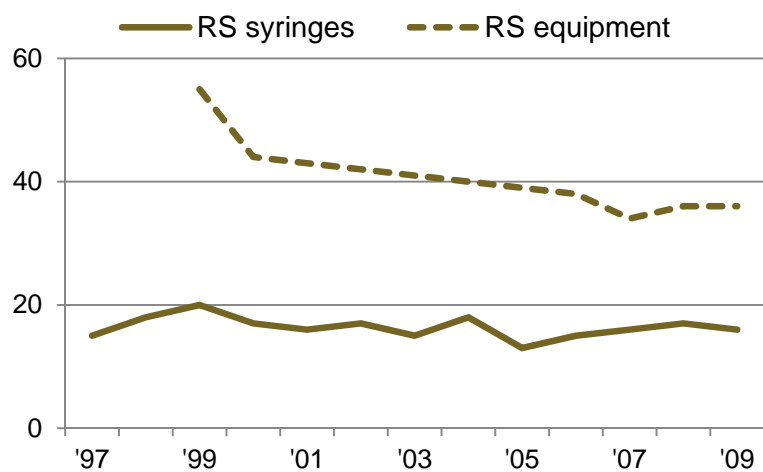
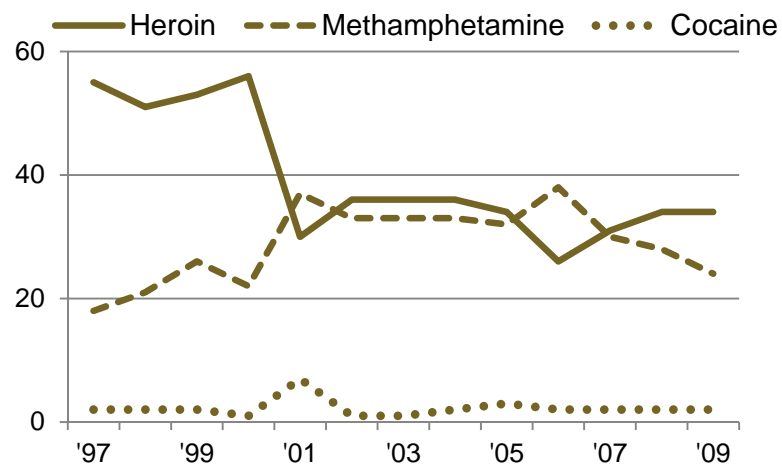
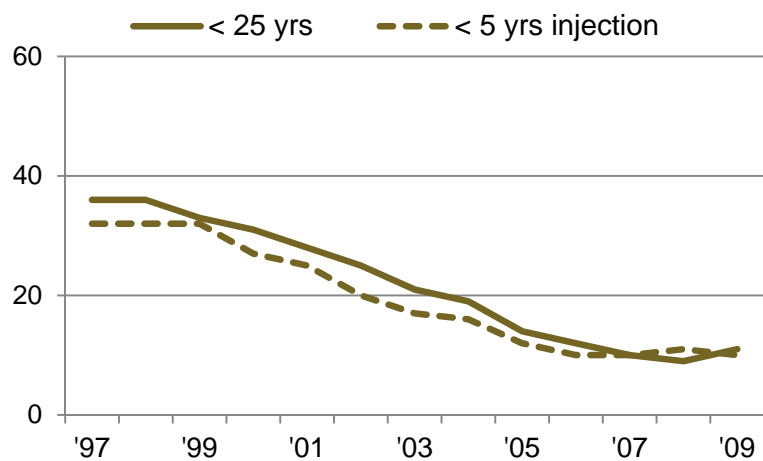
Temporal trends 1995-2010



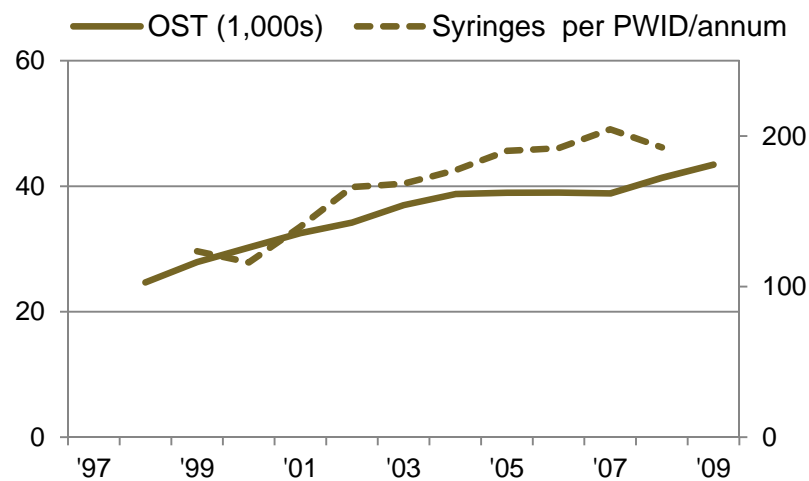
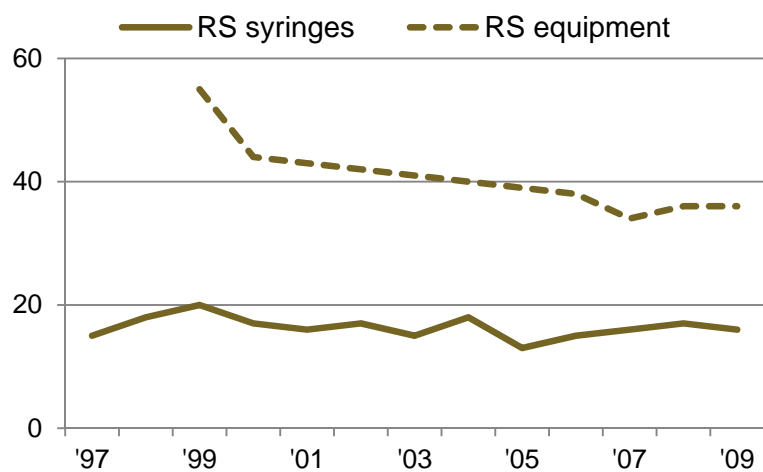
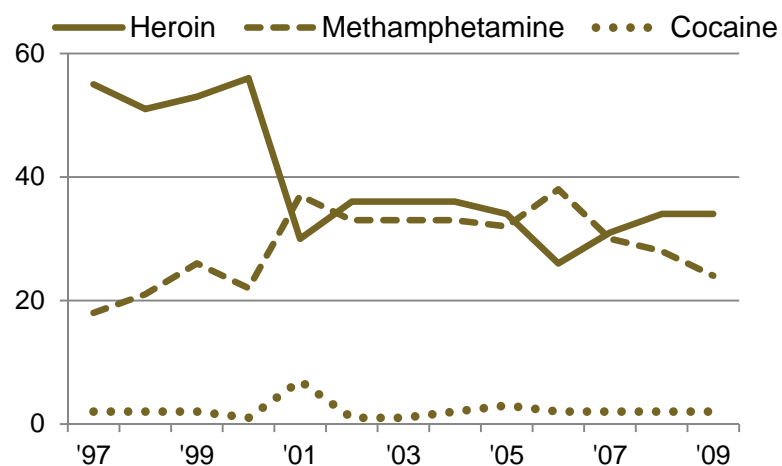
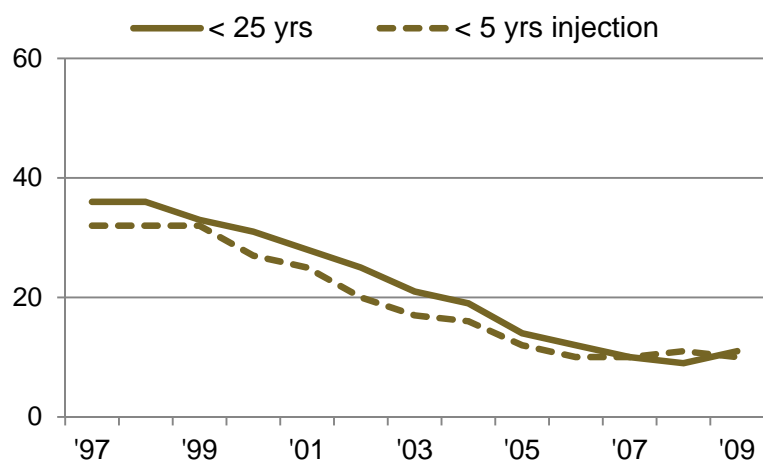
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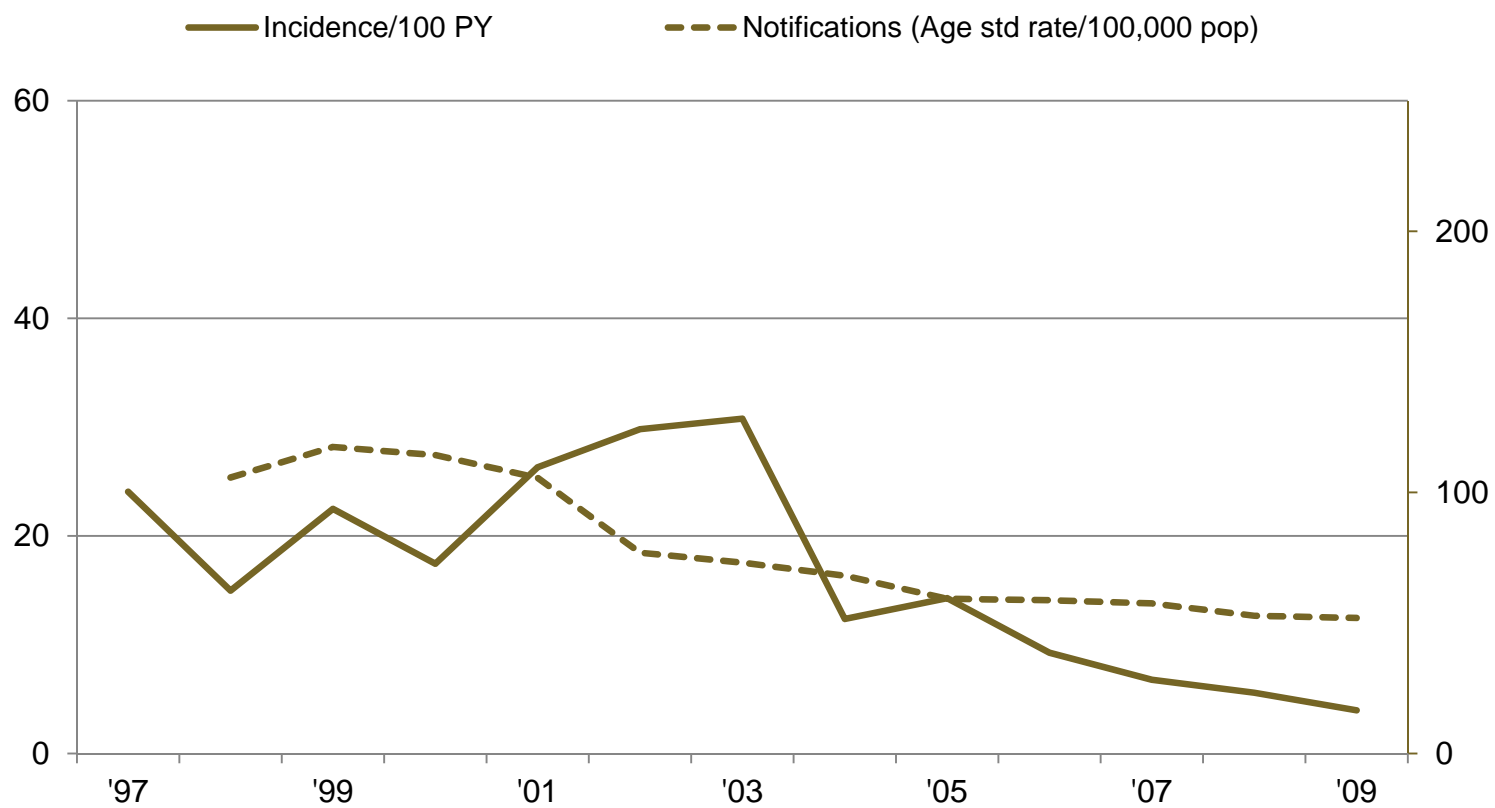
Temporal trends 1995-2010



Temporal trends 1995-2010



Temporal Trends 1995-2010 *(Annual Surveillance Report, 2011)*



Limitations

- Anti-HCV serology was used; we were unable to determine reinfection/superinfection
- Unable to determine the exact date of infection
- Repeat respondents more likely to inject daily and last inject heroin → possible overestimation of incidence
- Participants attending prevention service
→ possible underestimation of incidence
- Generalisation to broader PWID population

Conclusions

- Utility of repeated cross-sectional sero-surveys to create HCV negative retrospective cohorts to assess trends in incidence over time

Substantial decline in HCV incidence in recent years

- Consistent with HCV notifications

Likely related to:

- Increased coverage of harm reduction programs (NSP and OST)
- Substantial changes in drug markets
- Decline in proportion of new/young PWID

Acknowledgements

- Department of Health and Ageing
- NSP attendees
- Australian NSP Survey National Advisory Group
- Australian Collaboration of Needle and Syringe Programs (NSP)
- St Vincent's Centre for Applied Medical Research and NSW State Reference Laboratory for HIV at St Vincent's Hospital (Philip Cunningham and Beth Catlett)
- The late Dr Margaret McDonald.

Sample characteristics repeat vs non-repeat

| Characteristic | Overall N (%) | Non-repeat N (%) | Repeat N (%) | P value | HCV neg. non-repeat N (%) | HCV neg. repeaters N (%) | P value |
|---------------------------|------------------|---------------------|-----------------|------------|---------------------------------|--------------------------------|------------|
| Total respondents | 25,483 | 22,489 | 2,994 | | 10,631 | 724 | |
| Male | 16,664 (65) | 14,802 (66) | 1,862 (62) | <0.001 | 7,134 (67) | 453 (63) | 0.009 |
| Indigenous Aust. | 2,295 (9) | 2,112 (9) | 183 (6) | <0.001 | 868 (8) | 45 (6) | 0.062 |
| Anti-HCV negative | 11,825 (46) | 10,631 (47) | 1,194 (40) | <0.001 | | | |
| Last drug injected | | | | | | | |
| Methamphetamine | 7,411 (29) | 6,798 (30) | 613 (20) | <0.001 | 4,409 (41) | 185 (26) | <0.001 |
| Heroin | 10,389 (41) | 8,939 (40) | 1,450 (48) | <0.001 | 3,463 (33) | 318 (44) | <0.001 |
| Methadone/bupe | 2,253 (9) | 1,906 (8) | 347 (12) | <0.001 | 526 (5) | 69 (10) | <0.001 |
| Pharm. Opioids | 2,095 (8) | 1,850 (8) | 245 (8) | 0.936 | 754 (7) | 75 (10) | 0.001 |
| Daily+ injection | 12,500 (50) | 10,902 (49) | 1,598 (54) | <0.001 | 4,544 (43) | 360 (50) | <0.001 |
| Current OST | 8,817 (35) | 7,540 (34) | 1,277 (43) | <0.001 | 2,209 (21) | 240 (33) | <0.001 |

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No differences:

Age, time since first injection, re-use syringes, receptive sharing syringes or drug preparation equipment