



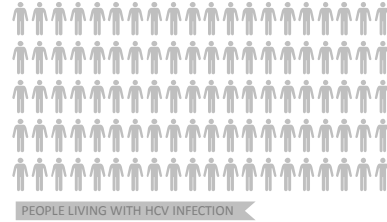
Declining Incidence of Hepatitis C Virus Infection among People Who Inject Drugs in a Canadian Setting, 1996-2012

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The majority of new HCV infections occur among PWID

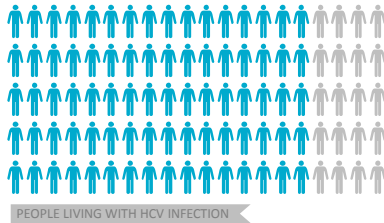


1) Hajarizadeh B, et al. *Nature Rev Gastroenterol Hepatol* 2013. 2) Grebely J and Dore GI *Antiviral Research* 2014.



The majority of new HCV infections occur among PWID

80% OF NEW INFECTIONS OCCUR AMONG CURRENT PWID

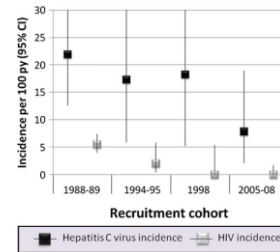


1) Hajarizadeh B, et al. *Nature Rev Gastroenterol Hepatol* 2013. 2) Grebely J and Dore GI *Antiviral Research* 2014.



Harm reduction interventions have been less effective for HCV

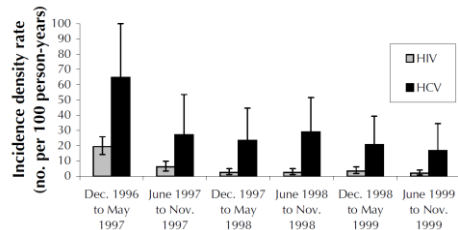
- Higher prevalence of HCV infection (67% vs. 20%)
- Higher risk of infection (3-5% for HCV vs 1-2% for HIV)



Mehta SH, *Journal of Infectious Diseases* 2011.



HCV incidence among Vancouver PWID during an HIV outbreak



- Factors associated with HCV infection
 - female sex and at least daily injecting drug use, specifically cocaine injecting

Patrick DM, et al *CMAJ* 2001



Many changes in Vancouver over the past 15 years....

- Changing drug markets
- Increased availability of harm reduction services
- Decrease in HCV incidence at the population-level
- Little is known about the trends in HCV incidence among PWID in this setting

British Columbia Centre for Disease Control 2010



Specific Aims

- 1) To investigate trends in HCV incidence among a cohort of PWID in Vancouver, Canada from 1996 to 2012
- 2) To evaluate factors associated with HCV infection

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Study population and design

Vancouver Injecting Drug Users Study (VIDUS, 1996-2012):

- Inclusion criteria: PWID residing in the greater Vancouver area who had injected at least once in the previous month

Recruitment:

- Subjects were recruited through self-referral and street outreach efforts

Instrument/Follow-up:

- Baseline and semiannual visits included serological screening for anti-HCV and anti-HIV antibodies
- A questionnaire covered information on subjects' characteristics, injection and non-injection drug use, borrowing and lending of syringes

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Statistical analyses

HCV incidence density

- Calculated by person-years methods
- Among those who were negative for HCV antibodies at study enrolment in:
 - i) Overall study population (those who reported injecting in the previous month at cohort entry); and
 - ii) Those who contributed injecting person-years during follow-up (previous six months)
- Trends in HCV incidence density were assessed by:
 - calendar year
 - calendar period (1996-1999, 2000-2005, and 2006-2012)
 - enrolment period (1996-1999, 2000-2005, and 2006-2012)

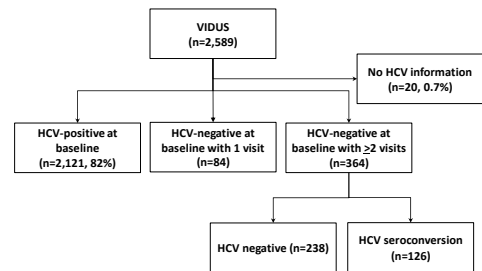
Statistical Analysis

- Cox proportional hazards analyses were used to identify factors associated with time to HCV seroconversion

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Participant disposition

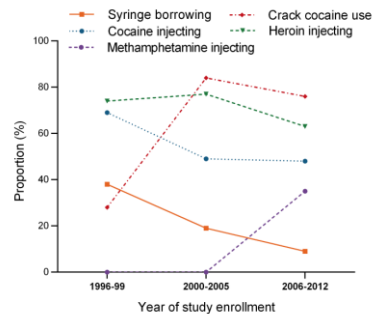


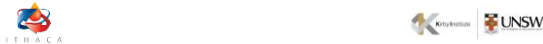
Participant characteristics

Variable	Year of Enrollment			p ^a	p ^b
	1996-1999 (n=198)	2000-2005 (n=69)	2006-2012 (n=97)		
Median age (25-75 th percentiles)*	25 (20-35)	23 (21-26)	39 (31-47)	<0.001	<0.001
Female sex	63 (32%)	32 (46%)	20 (21%)	0.002	0.144
High school education or higher*	45 (23%)	19 (28%)	40 (45%)	<0.001	<0.001
Unstable housing [†]	122 (62%)	44 (64%)	61 (64%)	0.924	0.724
HIV infection [†]	10 (5%)	1 (1%)	26 (27%)	<0.001	<0.001



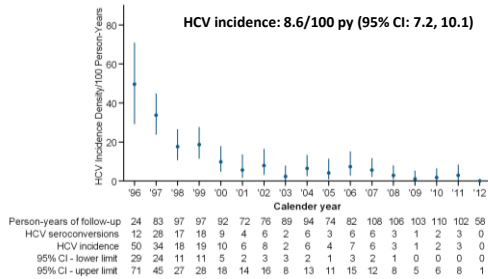
Trends in syringe borrowing and drug use at enrolment





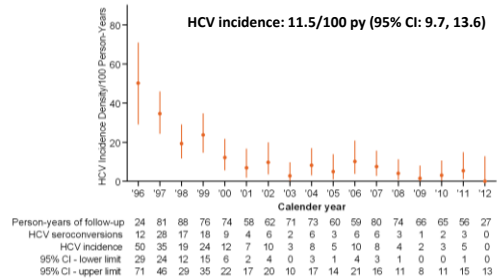
Annual incidence density of HCV among PWID in VIDUS

Injecting at baseline

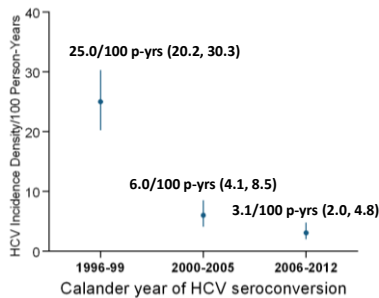


Annual incidence density of HCV among PWID in VIDUS

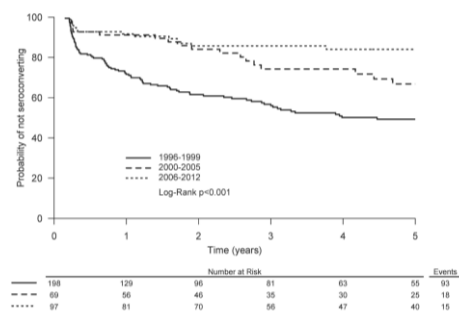
Injecting during follow-up



Annual incidence density of HCV by calendar year



Time to HCV seroconversion by calendar year of enrolment



Cox proportional hazards analysis of factors associated with time to HCV seroconversion among PWID in the VIDUS cohort

Variables	Unadjusted HR
Fixed	
Female sex (vs. male sex)	1.42 (0.95, 2.10)
High school education or higher (vs. less than high school)*	0.63 (0.47, 0.85)
Year of Enrolment	
1996-1999	1 (-)
2000-2005	0.76 (0.51, 1.13)
2006-2012	0.21 (0.14, 0.30)
Time-varying	
Age	1.01 (1.00, 1.03)
HIV infection (vs. none)*	0.96 (0.57, 1.60)
Unstable housing (vs. stable)*	1.66 (1.22, 2.28)
Crack cocaine use (smoking) (vs. none)*	0.78 (0.58, 1.04)
Any injection drug use (vs. none)*	8.43 (5.53, 12.85)
Syringe borrowing (vs. none)*	3.67 (2.66, 5.08)
Cocaine injecting (vs. none)*	4.04 (3.03, 5.38)
Heroin injecting (vs. none)*	4.39 (3.26, 5.93)
Methamphetamine injecting (vs. none)*	2.45 (1.74, 3.46)



Conclusions

- HCV incidence among PWID in this cohort from Vancouver has decreased significantly since 1996
- Decrease in HCV incidence associated with shifts in drug use in the region
 - decreases in syringe borrowing
 - increase in crack cocaine use
- Factors associated with HCV included unstable housing, HIV, and injecting of cocaine, heroin and methamphetamine
- Other unmeasured factors may have played a role in decline in HCV (e.g. such as NSP or OST; e.g. Nolan *Addiction* 2014)



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 - Viviane Dias Lima
 - Thomas Kerr
 - Julio Montaner



HCV incidence by calendar year and year of enrolment

