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## Objectives

Since 2000, an epidemic of HCV emerged among HIV-infected men who have sex with men (MSM). An increase in HCV incidence was observed earlier in the Amsterdam Cohort Studies (ACS), between 2000 and 2003. Data collected during bi-annual surveys at the Amsterdam STI clinic, suggested that the HCV epidemic among HIV-infected MSM in Amsterdam has levelled off in recent years. We updated our previous ACS analysis to examine recent changes.

## Discussion

Among HIV-infected MSM, HCV incidence rates increased significantly between 2000 and 2005. Thereafter, incidence seems to have stabilized at around 12/1,000 PYs. No incident HCV infections were found among HIV-uninfected MSM, despite more than 10,000 years of follow-up.

Our findings are in line with findings from the Amsterdam STI clinic, and may be explained by an increase in HCV testing and treatment uptake, risk reduction, or a saturation-effect among MSM at highest risk for HCV infection.

## Background

- Since 2000, the incidence of HCV infection among HIV-positive MSM in high-income countries has increased substantially; among HIV-negative MSM, the prevalence of HCV remained low.<sup>1</sup>
- Previous analysis of ACS data showed that the HCV incidence among HIV-positive MSM increased from 0.78 per 1,000 person-years (PYs) before 2000, to 8.74 per 1,000 PYs in 2000-2003.<sup>2</sup>
- Data from the Amsterdam STI clinic showed a non-significant decline in prevalence of HCV among HIV-positive MSM after 2008.<sup>3</sup>

## Methods

### Participants

- HIV-negative and HIV-positive MSM with ≥2 study visits in the ACS between October 1984 and January 2012 were included.
- To update HCV status, linkage with clinical and laboratory databases took place from the Dutch HIV Monitoring Foundation, AMC, and Medical Center Jan van Goyen.
- HIV-positive MSM were tested for HCV antibodies at the last visit before 2012 if no negative HCV test result was available after 2008.
- HIV-negative MSM were tested for HCV antibodies at their first 6-monthly ACS visit after STI screening was introduced in October 2008.

### Statistics

- Risk factors for prevalent HCV were studied using univariate logistic regression models.
- Incidence rates were calculated per year, trends over time were analyzed using Poisson regression.
- Risk factors for incident HCV were studied using Poisson regression; variables subject to change were treated as time-updated covariates.

### Laboratory methods

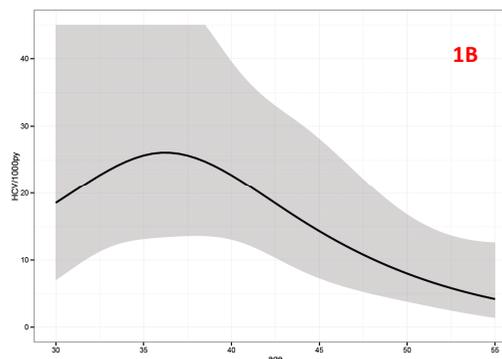
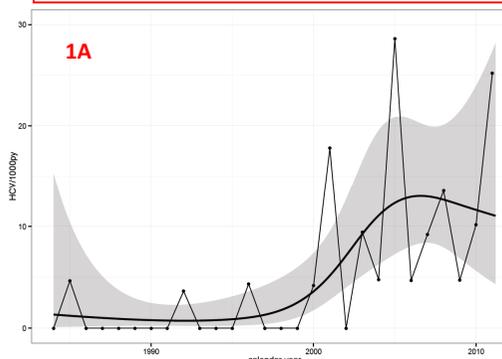
- HCV antibody tests were performed by AxSYM HCV 3.0 (Abbott); confirmation by immunoblot (Ortho-Clinical Diagnostics) and by HCV-RNA (TMA; Siemens).

**Figure 1:** Observed and fitted HCV incidence rate per 1,000 PYs of follow-up.

A) HCV incidence rate among 761 HIV-positive MSM participating in the ACS, 1984-2011.

B) HCV incidence rate by age, in 2008.

Restricted cubic splines allowed for smoothly varying trends in the modeled incidence. The shaded area is the 95% confidence interval.



## Results

### General characteristics

- 2,457 MSM were enrolled in the ACS between 1984 and 2012; 2,104 MSM had ≥2 study visits; the total follow-up was 17,310 PYs. At study entry, 539 were HIV-infected and 222 seroconverted during follow-up.

### Prevalent HCV infection

- 24/2,104 (1.1%) were HCV-positive at the first study visit. This was associated with history (Hx) of injecting drug use (OR: 84.6;  $P < .001$ ), HIV-coinfection (OR: 3.12;  $P = .006$ ); the effect of older age was borderline significant (OR per 10y increment: 1.52;  $P = .066$ ).
- Hx of blood transfusion, Hx of syphilis, number of sex partners ever, or in the 5 years preceding study entry, were not significantly associated with prevalent HCV.

### Incident HCV infection

- 29 incident HCV infections were documented among 2,080 MSM who were HCV-negative at study entry; all incident cases were HIV-infected (Figure 1A).
- Incident HCV was associated with younger age (RR for age 50 vs. age 35: 0.31, 95% CI: 0.11-0.89;  $P = .041$ ; Figure 1B).
- CD4 count, nadir CD4 count before infection, HIV viral load, and use of cART, were not significantly associated with incident HCV infection.

- A significant increase in HCV incidence was observed after 2000:

$$IR_{2005} \text{ vs } IR_{2000} \text{ -- IRR: } 3.41, 95\% \text{ CI: } 1.58\text{-}7.34; P = .002$$

- After 2005, HCV incidence stabilized at around 12/1,000 PYs:

$$IR_{2010} \text{ vs } IR_{2005} \text{ -- IRR: } 0.94, 95\% \text{ CI: } 0.38\text{-}2.36; P = .906$$

**CONTACT**



### References

<sup>1</sup> Bradshaw D et al. Sexually transmitted hepatitis C infection: the new epidemic in MSM? *Curr Opin Infect Dis* 2013; <sup>2</sup> Van de Laar et al. Increase in HCV incidence among men who have sex with men in Amsterdam most likely caused by sexual transmission. *J Infect Dis* 2007; <sup>3</sup> Urbanus et al. Trends in hepatitis C virus infections among MSM attending a sexually transmitted infection clinic, 1995-2010. *AIDS* 2014.