



# Epidemiology of Hepatitis C infection in the Netherlands

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# Hepatitis C

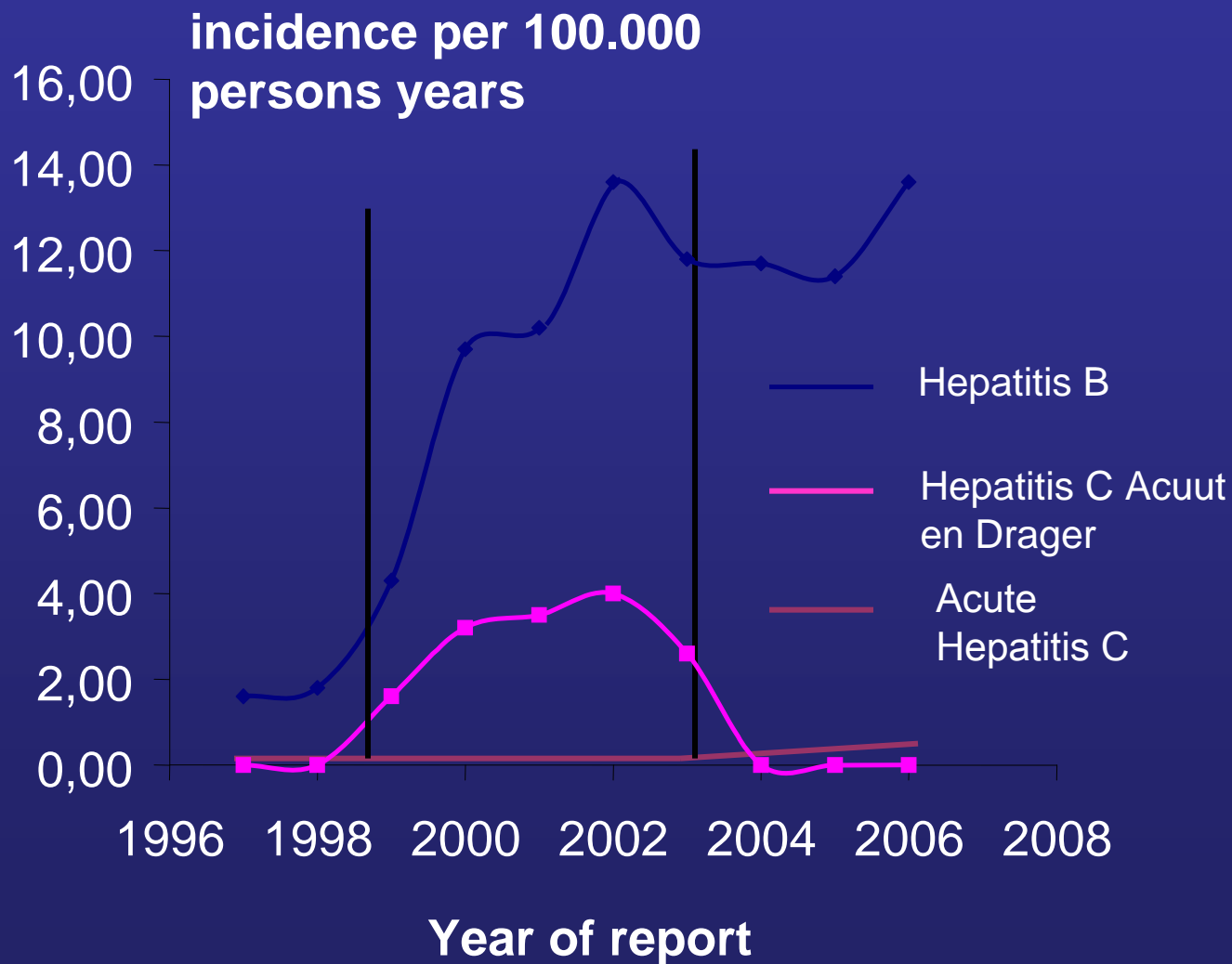
Hepatitis C can lead to chronic liver disease  Liver cirrhosis in 20-30%

## Transmission:

- Blood transfusion
- Anti-rhesus(D) immunoglobulin
- Haemodialysis
- Medical equipment
- Dentist
- Transplants
- Syringes
- Needles (IV drug use)
- Straw, spoon, tattoo, piercings
- Parenteral transmission
- Controversial: sexual transmission



# Incidence of HCV in Netherlands (ISIS)



# Report of patients with acute HCV



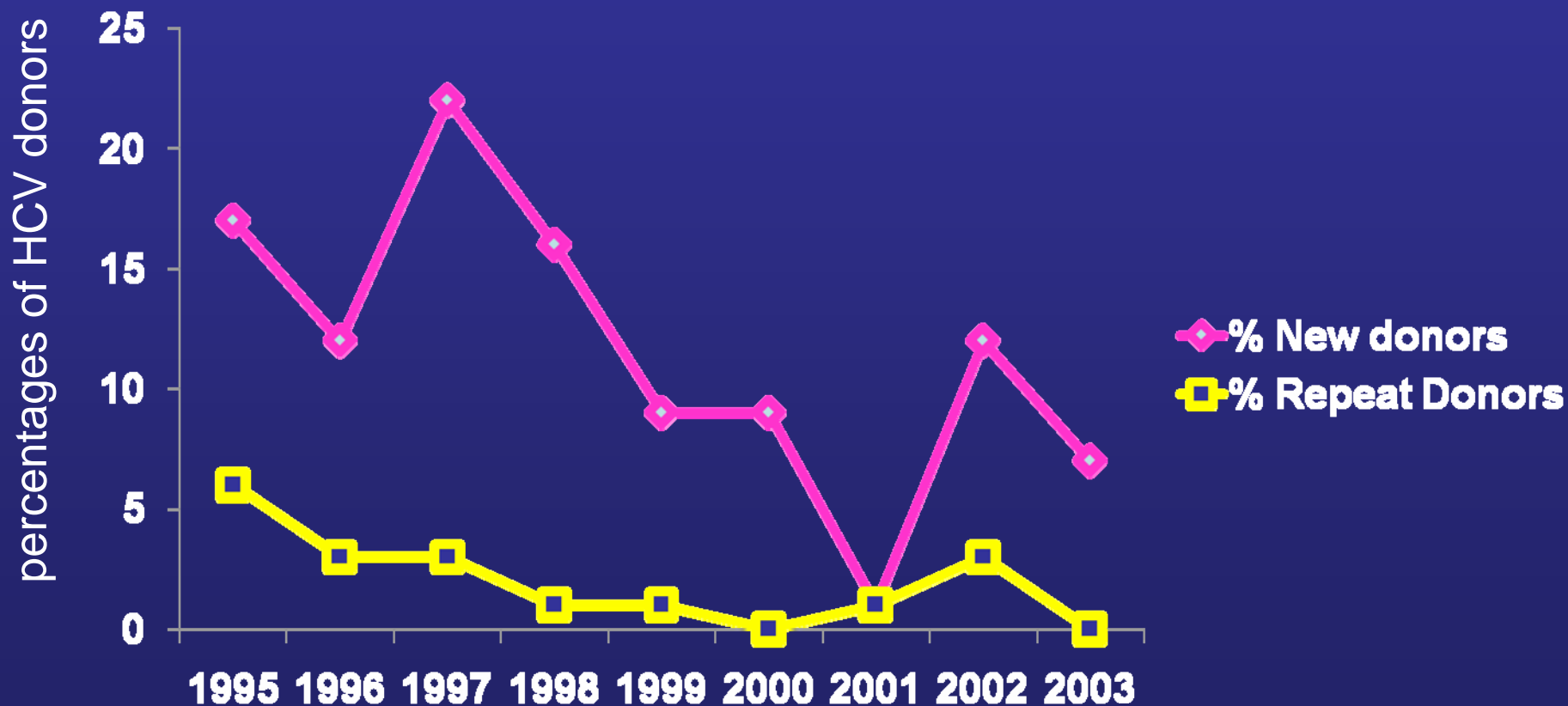
# Prevalence HCV general population

- Little known about seroprevalence in general population

Author	Population	Location	Study Year	Sample Size	HCV Prevalence
Slavenburg et al.	General population	Region Arnhem/Nijmegen	2006	2200	0.2%
Baaten et al.	General population	Amsterdam	2004	1355	0.6%
Veldhuijzen et al. Pienter Project	General population	Serumbank Netherlands	1996	7373	0.08%

# HCV in Blood donors

A total of 153 HCV blood donors in 9 years



# Infection Risks and unreported risks among new 404 blood donors confirmed positive for HBV, HCV

Infection risks	HBV (n = 222)	HCV (n = 105)
Born in endemic country	65 (29)	8 (8)
Sub-Saharan Africa in past 12 months†	1	0
Needle or laceration accidents	10 (5)	8 (8)
In past 12 months†	1	0
Injecting drug use†	0 (0)	20 (19)
Tattoo	14 (6)	27 (26)
In past 12 months†	2	3
Piercing	27 (13)	22 (21)
In past 12 months†	4	0
Acupuncture	20 (9)	19 (18)
In past 12 months, unhygienic circumstances†	1	2
Receiving blood products	32 (14)	38 (36)
In past 12 months†	1	0
Treatment in poor hygienic circumstances (e.g., in nonindustrialized country)	46 (21)	23 (22)
Endoscopy	23 (10)	2 (2)
In past 12 months†	2	0
Male-to-male sex†	5 (2)	7 (7)
>10 sexual partners in lifetime	29 (15)	31 (30)


# Infection Risks and unreported risks among 167 repeat blood donors confirmed positive for HBV, HCV

Infection risks	HBV (n = 57)	HCV (n = 18)
Born in endemic country	5 (9)	0 (0)
Sub-Saharan Africa in past 12 months†	0	0
Needle or laceration accidents	5 (9)	3 (17)
In past 12 months†	5	0
Injecting drug use†	0 (0)	3 (17)
Tattoo	3 (5)	2 (11)
In past 12 months†	1	0
Piercing	9 (16)	3 (17)
In past 12 months†	2	0
Acupuncture	3 (5)	0 (0)
In past 12 months, unhygienic circumstances†	0	0
Receiving blood products†	4 (7)	7 (39)
In past 12 months	1	0
Treatment in poor hygienic circumstances (e.g., in non industrialized country)	3 (5)	1 (6)
Endoscopy	3 (5)	0 (0)
In past 12 months†	1	0
Male-to-male sex†	8 (14)	2 (11)
>10 sexual partners in life-time	11 (19)	2 (11)
New sexual partner in past year	12 (21)	4 (22)

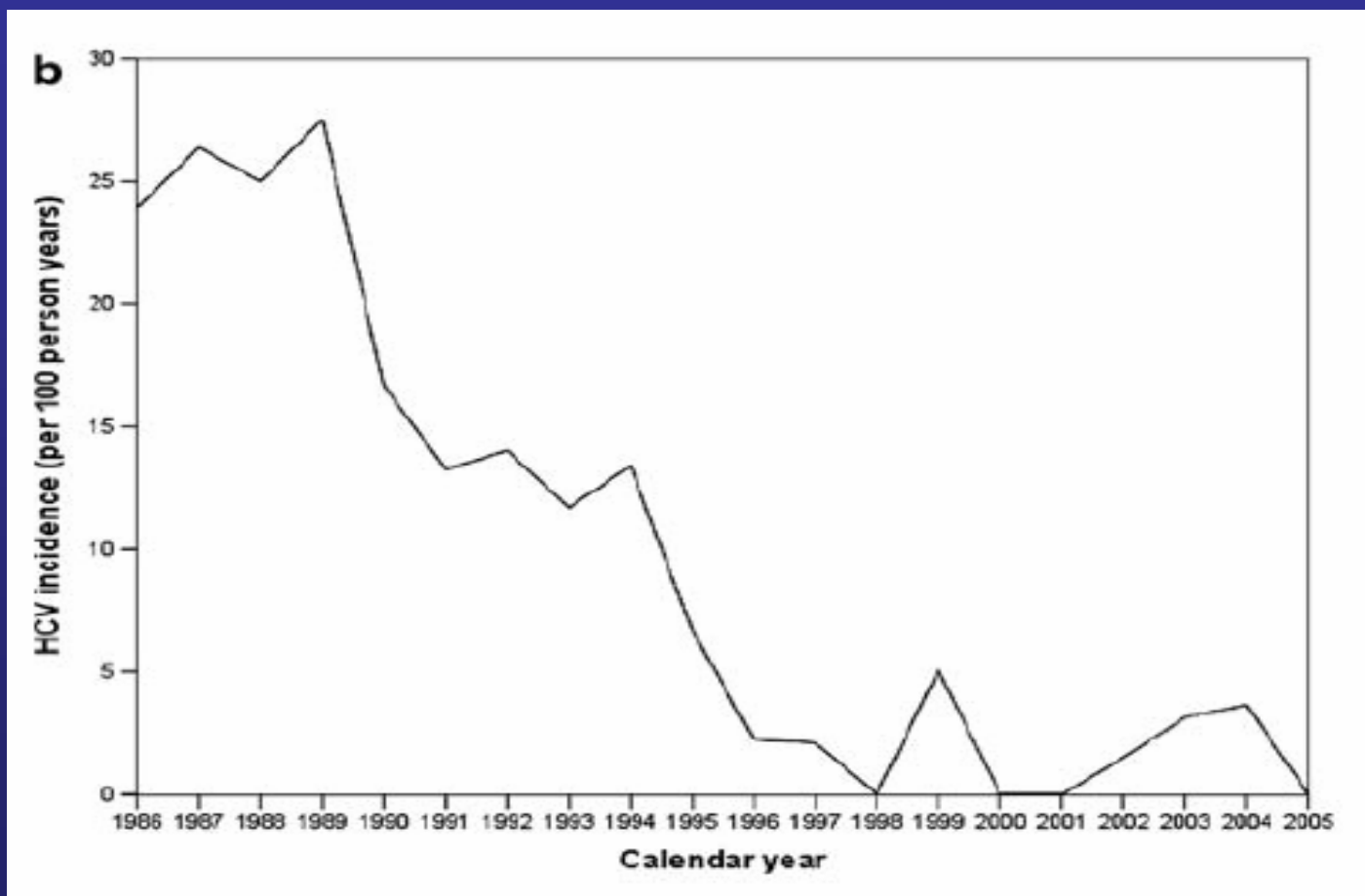
# Population at risk

- IDU (intravenous drug use)
- Haemodialysis patients
- Haemophilia patients
- Immigrants
- Men who have sex with men
- Transfusion before 1992

# Prevalence of HCV in IDU

- Amsterdam cohort study since 1985
  - Decreasing prevalence
    - 1986: 86%  2005: 44-64%
- 47% The Hague
- 79% Rotterdam
- Difference non-injecting vs injecting DU
  - 0.7%-6.5% vs 44-64%

# Incidence of HCV IDU



# Haemodialysis patients

Diagnosis	First round ( <i>n</i> = 2281)	Second round ( <i>n</i> = 2286)
Seropositive or HCV-RNA positive	67 (2.9)	76 (3.4)
Seropositive and HCV-RNA positive	53 (79.1)	59 (77.6)
Only seropositive	9 (13.4)	15 (19.7)
Only HCV-RNA positive	5 (7.5)	2 (2.6)
Paired serum samples	960 (42.1)	960 (42.0)
Seropositive or HCV-RNA positive	35 (3.6)	44 <sup>a</sup> (4.6)
Single serum sample only	1321 (57.9)	1326 (58.0)
Seropositive or HCV-RNA positive	32 (2.4)	32 (2.4)
Hemodialysis	1808 (79)	1837 (80)
Seropositive or HCV-RNA positive	60 (3.3)	67 (3.6)
Peritoneal dialysis	473 (21)	449 (20)
Seropositive or HCV-RNA positive	7 (1.5)	9 (2.0)

# Risk of HCV infection in Haemodialysis

Risk factor(s)	Odds ratio (95% CI)	Attributable risk (95% CI)	<i>P</i>
Hemodialysis before 1992	5.2 (1.4–20.3)	24 (5–38)	.011
Transplantation before 1994	5.9 (1.5–22.6)	26 (8–41)	.006
Foreign country of birth	3.4 (1.3–9.2)	40 (7–61)	.014
Dialysis in a foreign country	4.3 (1.3–14.6)	24 (5–40)	.015
Four risk factors combined	6.6 (2.5–17.3)	62 (35–78)	.001

NOTE. CI, confidence interval.

# Haemophilia patients

## Results

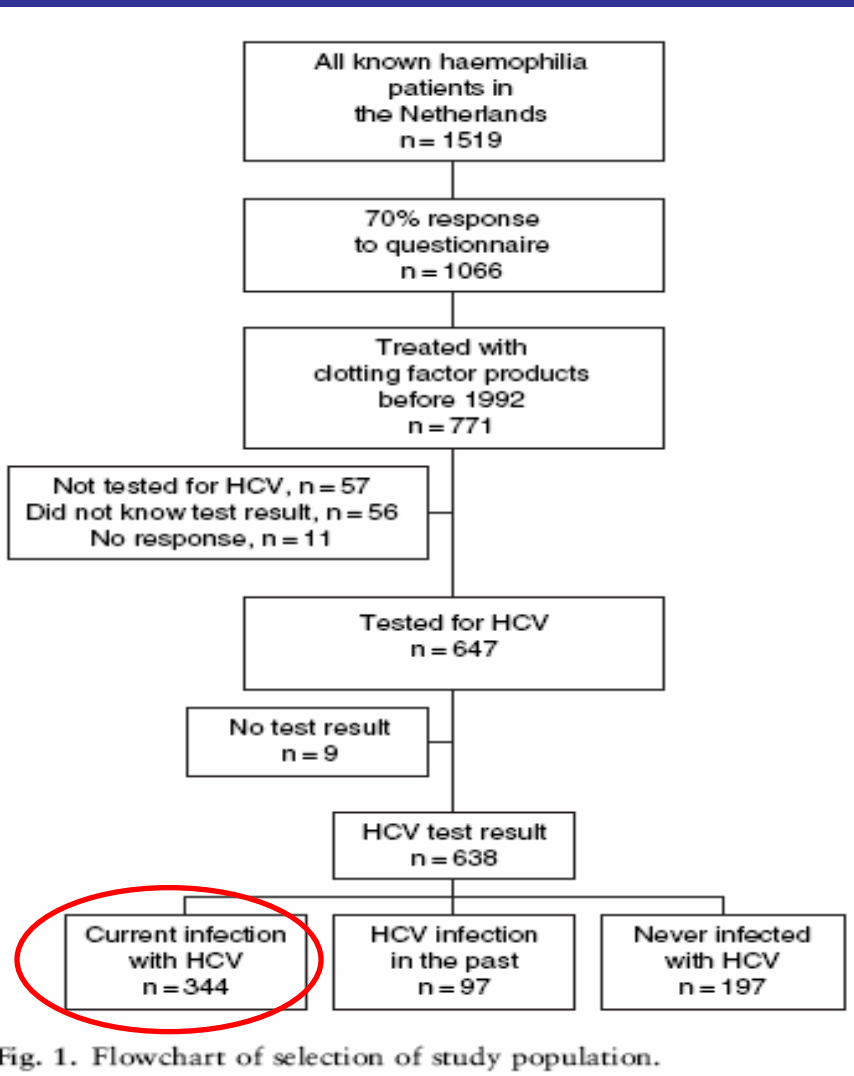


Fig. 1. Flowchart of selection of study population.

- 54% current HCV infection
- Higher HCV rate in Haemophilia B (84% vs 67%)

# Immigrants

~ 2.16% HCV infected

bevolkingsgroep	omvang van de 1e generatie <sup>18</sup>	omvang van de 2e generatie <sup>18</sup>	schatting van de HCV-prevalentie in het herkomstland (in %) <sup>13 19</sup>
Turks	195 100	173 500	1,5-2,9
Surinaams	186 000	147 500	1,0-5,5
Marokkaans	168 000	161 500	1,1-2,9
Indonesisch	126 000	263 900	2,1-2,9
Antilliaans/ Arubaans	78 900	51 000	1,0-1,9
algemene bevolking in Nederland	–	–	–

\*Op basis van een bevolkingsomvang van 16.357.992.<sup>18</sup>

# Men who have sex with men (MSM)

- Retrospective: MSM in Amsterdam Cohort Study 1985-2003
- HCV incidence: 0.18/100 person years (PY)
- HCV prevalence: 1.3% (24 of 1836)

# Transfusion before 1992

	incidentele bloed- transfusie
<b>Input parameters:</b>	
omvang	8000000
prevalentie	0,0017
fractie getest	0,05
<b>Output variabelen:</b>	
aantal HCV positief	13600
aantal tests	400000
aantal diagnoses	680
tests per diagnose	588,24
bijdrage risicogroep aan to- taal (in %)	22,03
gevonden gevallen in risico- groep (% van totaal aantal gevallen)	1,10

# Conclusion

- Prevalence of HCV found in different populations:
  - 44%-79% IDU
  - 54% Haemophilia patients
  - 2.9-3.4% Haemodialysis patients
  - ~ 2.16% Immigrants
  - 1.3% MSM
  - 0.08%-0.6% General population
  - ~ 0.008%-0.1% Blood donors