HIV care facility characteristics and the cascade of care in the Netherlands

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Background

- Engagement in several steps along a continuum of care is **crucial** for the **successful treatment of HIV**.
- These **cascade of HIV** steps include: retention in care, initiation of antiretroviral treatment (cART) and viral suppression.
- **Evidence** for policy makers on how to achieve optimal engagement in the cascade is **scarce**.
- Our aim: to identify **health facility characteristics** associated with these **cascade of HIV care** steps in the Netherlands.

Figure 1. HIV treatment centres in the Netherlands, in 2013. (n=26)
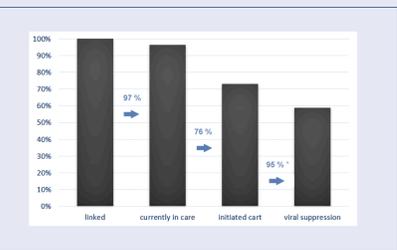
Figure 2. Cascade of care of HIV-infected patients linked to care between 2007 and 2013 in the Netherlands. *denotes percentage of patients using cART >6 months with HIV RNA<100 copies/μL.

Results

- All 26 HIV-treatment centres participated (Fig. 1).
- 7120 patients were linked to care from 2007 onwards (Table 1).
- 97% of patients were currently in care, 73% had initiated cART, and 59% (of the 7120 patients) had an undetectable viral load (Fig. 2).
- Variation between treatment centres was largest for 'cART initiation' (53 - 92%), followed by 'viral suppression' (81 - 100%) and 'currently in care' (92 - 100%).

Methods

- We included data from the ATHENA database of all adult HIV-1-infected patients who entered care in the Netherlands between 2007 and 2013 (Table 1).
- We calculated the proportion of patients who were 1) currently in care, 2) had initiated cART and 3) were virally suppressed (Fig. 2).
- We examined the variation in these outcomes across the 26 HIV treatment centres in the Netherlands.
- We used multivariate logistic regression (with generalized estimating equation) to examine the associations between health facility characteristics and the outcomes 'currently in care', 'initiated cART' and 'viral suppression' (Table 2).

Health facility characteristics

- Size (small:<300; medium: 300-600; large: >600 HIV – infected patients in care).
- Presence of: clinical pharmacologist, medical microbiologist, social worker, psychologist and/or psychiatrist in the HIV treatment team.
- Presence of a policy or organisation plan for the HIV treatment centre.
- Separate HIV outpatient clinic.
- Internally organised audit in the preceding 3 years.
- Voluntary accreditation of health facility in which the HIV treatment centre is embedded.

Outcomes

- Currently in care: clinical evidence of care after January 1, 2012.
- cART initiation: initiated cART during study period.
- Viral suppression: last documented HIV-RNA measurement of <100 copies/ml.

WE FOUND:

Currently in care

- A high proportion of patients 'currently in care' in all 26 treatment centres.
- No association between health facility characteristics and being currently in care.

Combination antiretroviral therapy initiation

- A positive association between the accreditation of the health facility and cART initiation.
- A positive association between the performance of an internal audit in the preceding 3 years and cART initiation.
- Higher odds of cART initiation in middle-sized and large HIV treatment centres compared with small centres (<300 HIV-infected patients).

Viral suppression

- A negative association between the presence of a social worker in the HIV treatment team and viral suppression.

Table 1

Characteristic	Total (N = 7120) no. (%)
Age, year, median (range)	42 (19–86)
Sex	
Male	6011 (84%)
Female	1109 (16%)
Region of origin	
Netherlands	4247 (60%)
Sub-Saharan Africa	849 (12%)
Other	2024 (28%)
Socioeconomic status	
High	1932 (27%)
Middle	2066 (29%)
Low	3009 (42%)
Unknown	113 (2%)
Transmission risk group	
MSM	4720 (66%)
Heterosexual contact	1966 (28%)
Intravenous drug use	68 (1%)
Other/unknown	366 (5%)
HIV RNA at linkage to care (copies/ml)	
<10000	1845 (26%)
10000–100000	2835 (40%)
>100000	2433 (34%)
Unknown	7 (0%)
CD4+ cell count at linkage to care (cells/μl)	
<200	1734 (24%)
200–350	1457 (20%)
350–500	1606 (23%)
>500	2314 (33%)
Unknown	9 (0%)
CDC category C at linkage to care	830 (12%)
Switched HIV treatment centre during study period	359 (5%)

Table 1. Demographic and clinical characteristics of the study population. (n=7120)

Table 2

	Currently in care			Initiated cART			Viral suppression		
	Population: patients linked to care: N = 7120			Population: patients currently in care: N = 6501			Population: patients on cART >6 months: N = 4401		
Patient or healthcare facility characteristic	(n)	OR[a]	95% CI	(n)	OR[a]	95% CI	(n)	OR[a]	95% CI
Age (per 10 years)		1.26**	(1.10, 1.45)		1.37***	(1.28, 1.47)		1.39***	(1.20, 1.59)
Region of origin									
Netherlands	(4247)	1		(4146)	1				
Sub-Saharan Africa	(849)	0.18***	(0.12, 0.32)	(710)	1.02	(0.10, 1.39)			
Other	(2024)	0.29***	(0.20, 0.40)	(1645)	0.83*	(0.69, 0.99)			
Sex and mode of transmission									
MSM	(4720)	1		(4421)	1		(2885)	1	
Heterosexual: male	(943)	0.30***	(0.21, 0.44)	(830)	0.73*	(0.57, 0.94)	(589)	0.52**	(0.34, 0.78)
Heterosexual: female	(1023)	0.97	(0.63, 1.49)	(907)	1.23	(0.96, 1.59)	(637)	0.40***	(0.28, 0.57)
Other/unknown: male	(348)	0.23***	(0.15, 0.36)	(278)	1.34	(0.85, 2.11)	(233)	0.38***	(0.23, 0.64)
Other/unknown: female	(86)	0.47	(0.20, 1.15)	(65)	4.03*	(1.58, 10.3)	(57)	0.79	(0.24, 2.61)
HIV RNA at linkage to care (copies/ml)[b]									
<10000	(1845)	1							
10000–100000	(2835)	1.61**	(1.19, 2.18)						
>100000	(2433)	2.37***	(1.58, 3.55)						
Unknown	(7)	NA							
CD4+ cell count at linkage to care (cells/μl)[b]									
<200	(1734)	1							
200–350	(1457)	0.58*	(0.38, 0.89)						
350–500	(1606)	0.67	(0.43, 1.04)						
>500	(2314)	0.61*	(0.40, 0.93)						
Unknown	(9)	NA							
CDC category C at linkage to care									
No		–		(5695)	1				
Yes		–	***	(806)	1.81**	(1.21, 2.72)			
HIV RNA at start cART/recent[c] (copies/ml)									
<10000		–		(1037)	1				
10000–100000		–		(2362)	1.77***	(1.46, 2.14)			
>100000		–		(2207)	2.97***	(2.38, 3.70)			
Unknown		–		(895)	8.26***	(6.02, 11.3)			
CD4+ cell count at start cART/recent[c] (cells/μl)									
<200		–		(1715)	1		(1479)	1	
200–350		–		(1899)	0.60**	(0.44, 0.84)	(1554)	1.91**	(1.30, 2.80)
350–500		–		(1169)	0.09***	(0.07, 0.10)	(548)	1.00	(0.64, 1.59)
>500		–		(1370)	0.03***	(0.02, 0.04)	(262)	0.70	(0.41, 1.20)
Unknown		–		(348)	0.71	(0.37, 1.38)	(558)	0.84	(0.56, 1.26)
Social worker in team									
No		–			–		(1778)	1	
Yes		–			–		(2623)	0.62*	(0.43, 0.91)
Accreditation of health facility									
No		–		(1526)	1			–	
Yes		–		(4975)	1.62**	(1.18, 2.23)		–	
Internal audit in the previous 3 years									
No		–		(4072)	1			–	
Yes		–		(2429)	1.36*	(1.02, 1.81)		–	
Size, patients in outpatient care									
Small (<300)		–		(505)	1			–	
Middle (300–600)		–		(1828)	2.00**	(1.25, 3.21)		–	
Large (>600)		–		(4168)	1.80*	(1.14, 2.84)		–	

CDC category C = presence of AIDS defining condition according to the 'Centres for Disease Control and Prevention' classification.' cART, combination antiretroviral therapy; OR, odds ratio.
[a]Odds ratios are adjusted for the variables in the table.
[b]Only in 'currently in care' model.
[c]Recent measurements (after 1 January 2012) in patients who had not initiated cART, only in 'cART initiation' model.
*P < 0.05.
**P < 0.01.
***P < 0.001.

Table 2. No. of patients, Adjusted odds ratios, and 95% confidence intervals for the outcomes 'currently in care', 'cART initiation' and 'viral suppression'.

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Conclusions

Our results confirm that:

- Appointing expert HIV treatment centres facilitates retention in care.
- A minimum volume requirement may be desirable.
- Quality assessment through accreditation and the measurement of performance benefits the delivery of HIV care.