



The impact of immediate initiation of combination antiretroviral therapy on the HIV epidemic among MSM

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Background

The new guidelines for HIV treatment in the Netherlands recommend the initiation of combination antiretroviral therapy (cART) as soon as possible after diagnosis. Besides the benefits for the treated individual, immediate cART might reduce HIV incidence, by reducing HIV viral load and infectivity.

Objective

To assess the impact of immediate initiation of cART on the incidence of HIV infection among men who have sex with men (MSM) in the Netherlands.

Methods

- We developed a transmission model that describes HIV and gonorrhoea transmission among MSM.
- Model parameters were estimated from data from the Amsterdam Cohort Studies, the MSM Network Study in Amsterdam, the national database of HIV-infected individuals, and the national database of STI clinics.
- The model was fitted to the number of HIV diagnoses in 2007-2014.
- The time from entry to care until initiation of treatment in the years until 2011 was estimated from data from the national database of HIV-infected individuals. This was used in the model in the years until 2011, reflecting the situation with the old guidelines about treatment initiation (before introduction of immediate cART). In the model, we included a gradual switch from the old to the new treatment guidelines during the years 2012-2014. From 2015 onwards, it was assumed that all HIV treatment centres in the Netherlands follow the new guidelines, providing cART immediately after entry to care.
- We carried out the calculations for ten years after complete implementation of the new treatment guidelines (until 2025) with and without immediate initiation of cART and compared the HIV incidence in the years 2015-2025.

Results

- Ten years after the complete introduction of immediate cART, the projected HIV incidence is reduced by 34% (interquartile range (IQR), 12% – 50%), from 0.45 infections per 100 person-years (PY) without immediate cART to 0.29 infections per 100PY with immediate cART (figure 1).

- In 2025, the reduction in HIV incidence, due to immediate cART, is significant in all sexual risk groups (MSM with 0-2, 3-20, or 20+ partners in the preceding six months). MSM with 20+ partners in the preceding 6 months had a much higher incidence (1.41 infections per 100PY) than men with 3-20 (0.33 infections per 100PY) or 0-2 partners (0.19 infections per 100PY) (Figure 2).
- The incidence of HIV in 2025 is significantly lower with immediate treatment than without immediate treatment regardless of gonorrhoea history in the preceding 12 months (figure 3). In 2025, after introducing immediate cART, HIV incidence is higher among MSM who had gonorrhoea in the preceding 12 months (2.56 infections per 100PY) than among MSM who did not (0.21 infections per 100PY) (Figure 3).

Acknowledgements

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Conclusions

Starting treatment with cART as soon as possible after diagnosis can result in a considerable reduction in HIV incidence, both in low risk and in high risk MSM. However, even with immediate cART, the incidence of HIV may remain substantially high among MSM with many sexual partners and among MSM with gonorrhoea.

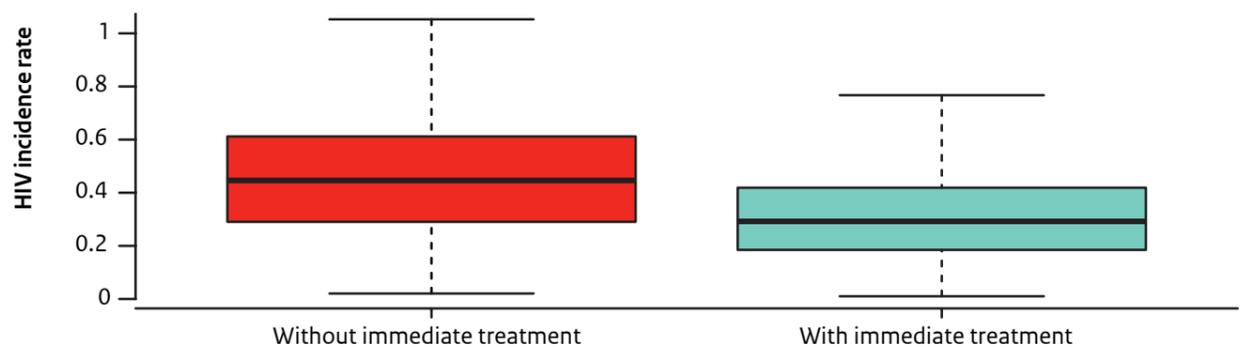


Figure 1: HIV incidence rate (number of new HIV infections per 100 person-years) in the Dutch MSM population in 2025. The left boxplot shows the incidence in 2025 if immediate treatment had not been introduced. The right boxplot shows the incidence in the same population in the same year with immediate treatment (introduced gradually in 2012 and completely in 2015).

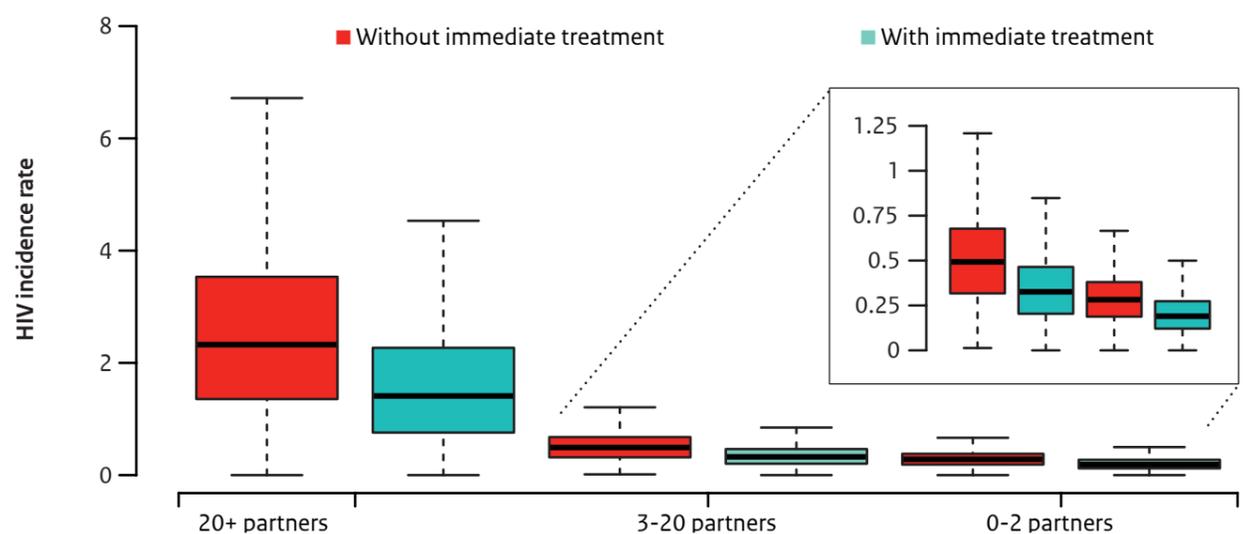


Figure 2: HIV incidence rate (number of new HIV infections per 100 person-years) with and without immediate treatment in 2025 for different risk groups. Red: Model results without immediate treatment, blue: model results with immediate treatment. The horizontal axis shows the total number of sexual partners in the preceding six months.

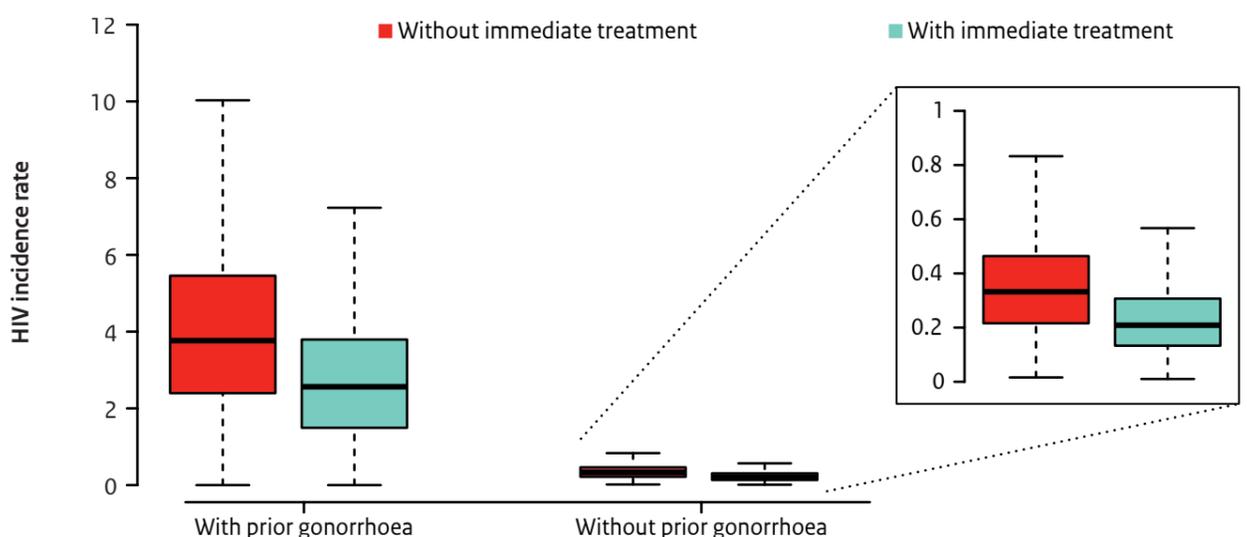


Figure 3: HIV incidence rate among MSM with or without prior gonorrhoea infection in the preceding twelve months. Red: model results without immediate treatment, blue: model results with immediate treatment. Incidence is presented as number of new HIV infections per 100 person-years.