

# National estimate of HIV prevalence in The Netherlands: comparison of different tools

Estimates of the number of people living with HIV/AIDS (PLWHA) are used for advocacy and national planning of HIV prevention activities and treatment services. Moreover, estimates provide insight into the population undiagnosed and thus unaware of their HIV infection. Understanding the extent to which subpopulations are undiagnosed can help guide public health strategies. Different methods and tools are being developed for HIV/AIDS estimates and projections. The MPES method estimated 21,444 people aged between 15-70 years were living with HIV/AIDS in the Netherlands as of January 2008, compared to 19,115 and 23,969 using Spectrum and Workbook respectively. Of HIV infected persons, 40% were unaware of their HIV infection.

## Methods

Data from the Netherlands were used to explore the applicability, feasibility, strengths and weaknesses of three different estimation tools:

- Multi-Parameter Evidence Synthesis (MPES) approach adopted by the UK Health Protection Agency and Medical Research Council Biostatistics Unit;
- UNAIDS/WHO Workbook method;
- UNAIDS/WHO Estimation and Projection Package (EPP) & Spectrum.

All methods aim to estimate the number infected in mutually exclusive risk groups among 15-70 years old individuals. For each risk group, estimates of population sizes and HIV prevalence rates were used for each of three geographical regions (Amsterdam, Rotterdam, and remainder of the country) based on most recently available data. Furthermore, for MPES, data of registered cases in care were used, while for EPP & Spectrum data on cART coverage were used.

## Results

The MPES method estimated 21,444 people aged between 15-70 years to be living with HIV/AIDS in the Netherlands as of January 2008 (Table 1). The adult HIV prevalence was 0.2% (95% CI 0.15-0.24%, see Figure 1) and it was estimated that 60% (95% CI 45-75%) of HIV infected persons were diagnosed. The MPES approach recognised a variation across risk groups in the proportion diagnosed from 34% among sex workers to 87% among MSM attending STI clinics. High proportions of Caribbeans and Sub-Saharan Africans remained undiagnosed. Furthermore, an estimated 83% of the HIV infected population in Amsterdam characterised as diagnosed whereas in Rotterdam and the rest of the Netherlands this figure reduces to 54% and 53% respectively (Figure 2).

Table 1: MPES Posterior medians in the Netherlands, January 2008

	Risk group size (proportion)	Prevalence (proportion)	Diagnosed (proportion)	Numbers HIV-infected (95% credible interval)
MSM – STI clinic attendees	0.1%	21.1%	86.9%	1,800 (1,415 – 2,186)
MSM – non STI clinic attendees	3.9%	4.4%	62.2%	9,965 (6,829 – 15,789)
MSM – All	4.0%	5.1%	65.7%	11,758 (8,670 – 17,573)
Injecting Drug Users	0.1%	7.1%	72.4%	775 (603 – 1,017)
Female Sex Workers	0.3%	1.8%	33.8%	358 (171 – 640)
STI clinic attendees (heterosexuals, ecdemic)	0.4%	0.2%	73.1%	90 (75 – 114)
STI clinic attendees (SSA* heterosexuals)	0.01%	4.5%	67.1%	45 (38 – 56)
STI clinic attendees (CRB** heterosexuals)	0.03%	0.9%	70.5%	30 (24 – 41)
SSA immigrants* (no STI clinic)	1.2%	3.1%	49.9%	4,254 (3,370 – 5,463)
CRB immigrants** (no STI clinic)	3.1%	0.4%	54.8%	1,253 (1,023 – 1,535)
Remaining population	93.03%	0.02%	59.9%	2,651 (1,791 – 4,947)
Total – Male	100%	0.3%	57.5%	17,552 (13,321 – 24,743)
Total – Female	100%	0.1%	72.6%	3,910 (3,590 – 4,308)
<b>Total</b>	<b>100%</b>	<b>0.2%</b>	<b>60.3%</b>	<b>21,444 (17,204 – 28,694)</b>

\* SSA = immigrants of sub-Saharan ethnicity

\*\* CRB = immigrants of Caribbean ethnicity (Surinamese or Antillean)

Compared to MPES, the more straightforward Workbook method estimated that 23,969 PLWHA in the Netherlands, an increase of 10% compared to the recalculated previous Workbook estimate of 2005. Finally, Spectrum incorporates assumptions on how the use of anti-retroviral therapy influences the HIV survival rate. Furthermore, Spectrum applied gender-specific mortality and age structures to project the number of people living with HIV/AIDS, resulting in a somewhat lower estimate of 19,115 PLWHA for 2008 (Fig. 3).

## Discussion

The contrasted methods produced three different outcomes as could be expected. The choice of a method will depend on the objectives, data availability, and time constraints. To obtain trends either method could be applied. Ultimately the Workbook method was selected on the grounds of its simplicity and data requirements, and because Workbook was also used in 2005. For a realistic reflection of the uncertainty inherent in both the estimation process and the data, we feel

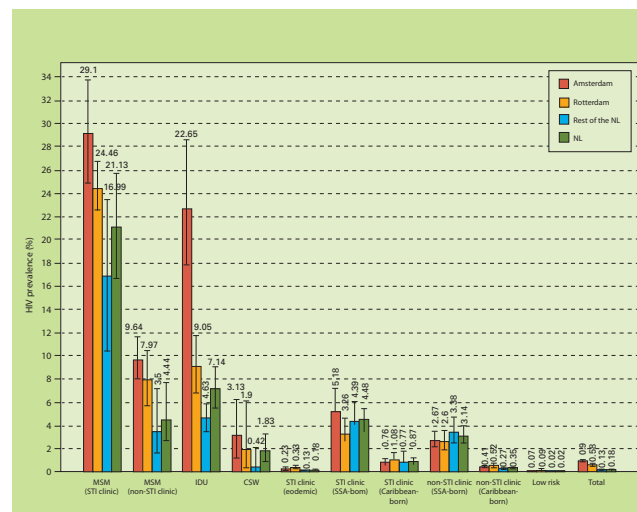


Figure 1: MPES posterior medians and 95% credible intervals for HIV prevalence by region and risk group.

MPES is more suitable. Resulting estimates are based on, and hence consistent with, all available information, with the uncertainty correctly propagated through to the estimates. Moreover, MPES produces subgroup- and region-specific estimates, highlighting the risk groups and regions with the highest proportions undiagnosed and therefore most in need of intervention measures. Finally, we recommend using Spectrum for short term projections of the HIV epidemic at national level, although it does not produce estimates of proportion diagnosed.

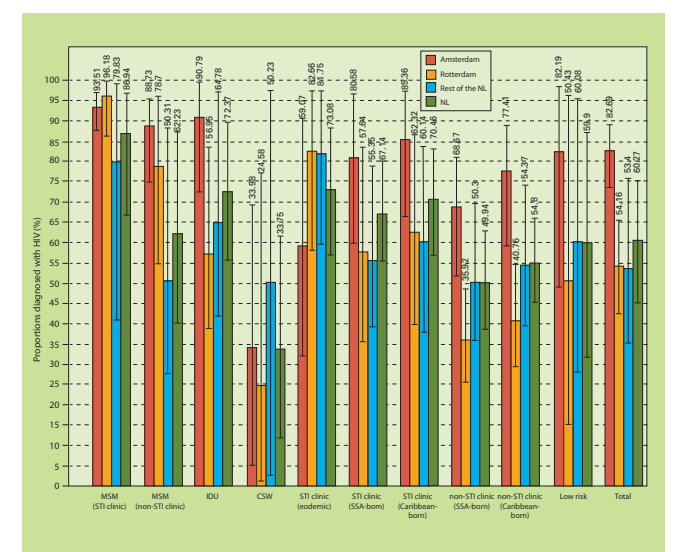


Figure 2: MPES posterior medians and 95% credible intervals for proportion diagnosed by region and risk group.

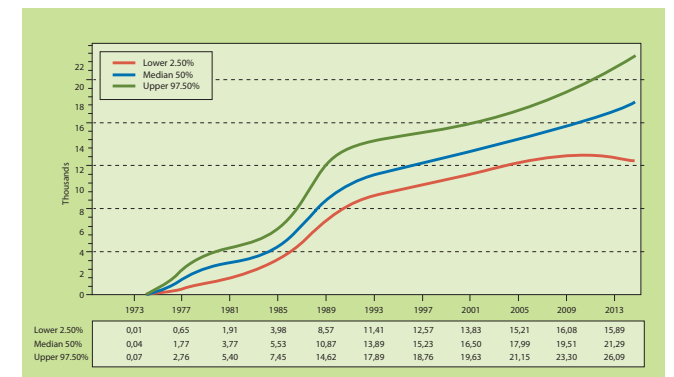


Figure 3: Spectrum projection number of people living with HIV in the Netherlands, 1973-2015

## Conclusions

- Using MPES, the number of PLWHA, aged 15-70 years, is estimated to be 21,444 (95% CI: 17,204 – 28,694), compared to 19,115 and 23,969 using Spectrum and Workbook respectively.
- The MPES method is best suited for efficient and accurate estimate of PLWHA. It relies on all data available to produce a more precise estimate consistent with all information.
- The adult HIV prevalence is 0.2%
- 40% of HIV infected persons were unaware of their infection status, ranging from 17% in Amsterdam to 54% in the rest of the Netherlands.
- A large proportion of HIV infected migrants in Rotterdam remained unaware of their HIV infection.
- It is important to increase awareness of the HIV status to initiate early treatment and to prevent HIV from spreading further. Therefore, the active HIV testing policy should be strengthened, especially in settings outside the capital. Partner notification may facilitate an increase in the knowledge of the HIV status as well.