

# High percentage of undiagnosed HIV cases within a hyper-endemic South African community



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## Background

- Current treatment-as-prevention (TasP) strategies aim to reduce the size of the undiagnosed HIV population to the 10% level (or below) by the year 2020.
- Some mathematical models predict this target can be reached. However, real-world data is critically needed to evaluate progress.
- Using data from a population-based surveillance system, we calculated the percentage of undiagnosed HIV cases in a hyper-endemic South African setting between 2005 and 2016.

## Methods

- Following the Seattle method (Fellows et al. 2015. *PLoS One*), we assumed that the HIV infection occurred either one day after the latest HIV- date (upper bound) or at a random point between the latest HIV- and earliest HIV+ test dates (base case).
- From the distribution of infection times, we used a Poisson process to back-calculate the number undiagnosed infections per year.
- We then divided this result by the estimated number of HIV infections (diagnosed or not) per year.

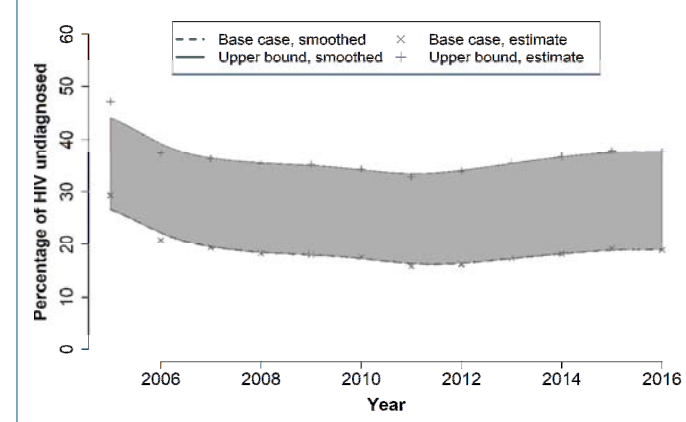
## Results

- 65,473 adults aged 16–55 years were tested for HIV between 2005 and 2016.
- Of these, 38,661 adults had one or more valid HIV tests, of which 12,039 (31.1%) tested HIV+.
- The bottom panel shows the number tested, the HIV prevalence, and the percentage HIV undiagnosed.

## Results

Year	Total Tested		HIV prevalence		HIV undiagnosed	
	N		%	(95% CI)	%	Upper %
2005	29,824		21.68	(20.83–22.53)	29.28	47.11
2006	21,817		21.40	(20.50–22.30)	20.77	37.42
2007	21,759		23.08	(22.13–24.03)	19.30	36.26
2008	24,971		23.65	(22.69–24.61)	18.25	35.30
2009	22,024		25.66	(24.63–26.69)	17.99	35.22
2010	22,227		28.66	(27.70–29.62)	17.56	34.24
2011	20,766		28.07	(27.09–29.06)	15.77	32.79
2012	18,527		30.06	(28.89–31.22)	16.13	33.89
2013	20,326		32.17	(31.11–33.24)	17.32	35.45
2014	20,064		34.82	(33.70–35.94)	18.10	36.72
2015	22,024		34.75	(33.81–35.69)	19.15	37.82
2016	22,576		36.59	(35.69–37.50)	18.86	37.60

The percentage of undiagnosed HIV infections between 2005 and 2016 in the study population



## Discussion

- Our results show that the percentage of undiagnosed cases was 18.9% in 2016, with an upper bound of 37.6%—much higher than the 10% target set by the Joint United Nations Programme on HIV/AIDS.
  - A high level of repeat HIV testing is needed to minimise the time from infection to diagnosis.
- We thank Jeanette Birnbaum and Martina Morris for assistance with application of the method.