

A new method to estimate the first step in the HIV care continuum

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Presenter Disclosure Information

In compliance with the Conflict of Interest Policies, the European AIDS Clinical Society (EACS) requires the following disclosure from the presenters:

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Introduction

- The total number of individuals living with HIV, including those not yet diagnosed, is crucial information for national public health monitoring and planning.
- However, estimating this number remains a challenge.
- Methods based on prevalence surveys are less useful in concentrated epidemics.
- Many countries in Europe have implemented surveillance systems for HIV and AIDS diagnoses.
- No direct information on the undiagnosed population.

HIV surveillance in the Netherlands

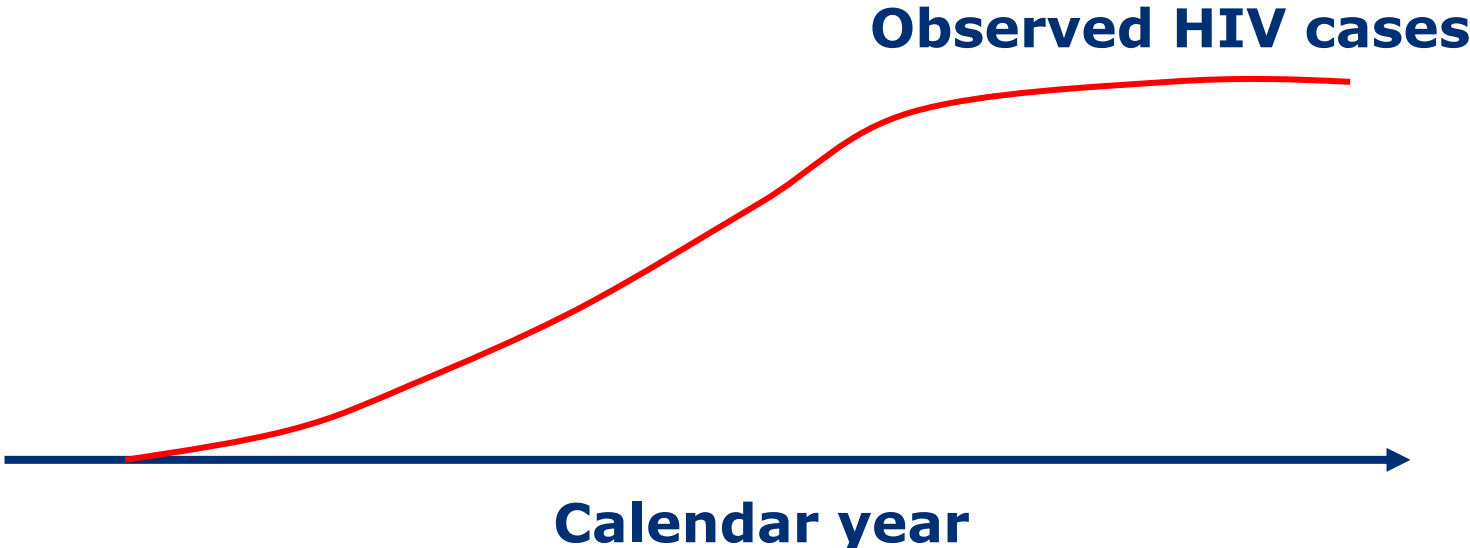
- ATHENA national observational HIV cohort:
 - HIV and AIDS diagnoses
 - CD4 at the time of diagnosis
 - emigration or death
 - ...
- National AIDS registry
 - AIDS cases before 1996
- Statistics Netherlands
 - deaths before 2002

Number living with HIV in 2013

- = number of infections since the start of the HIV epidemic
- number who died
- number who emigrated



Back-calculation



Van Sighem *et al*, Epidemiology 2015

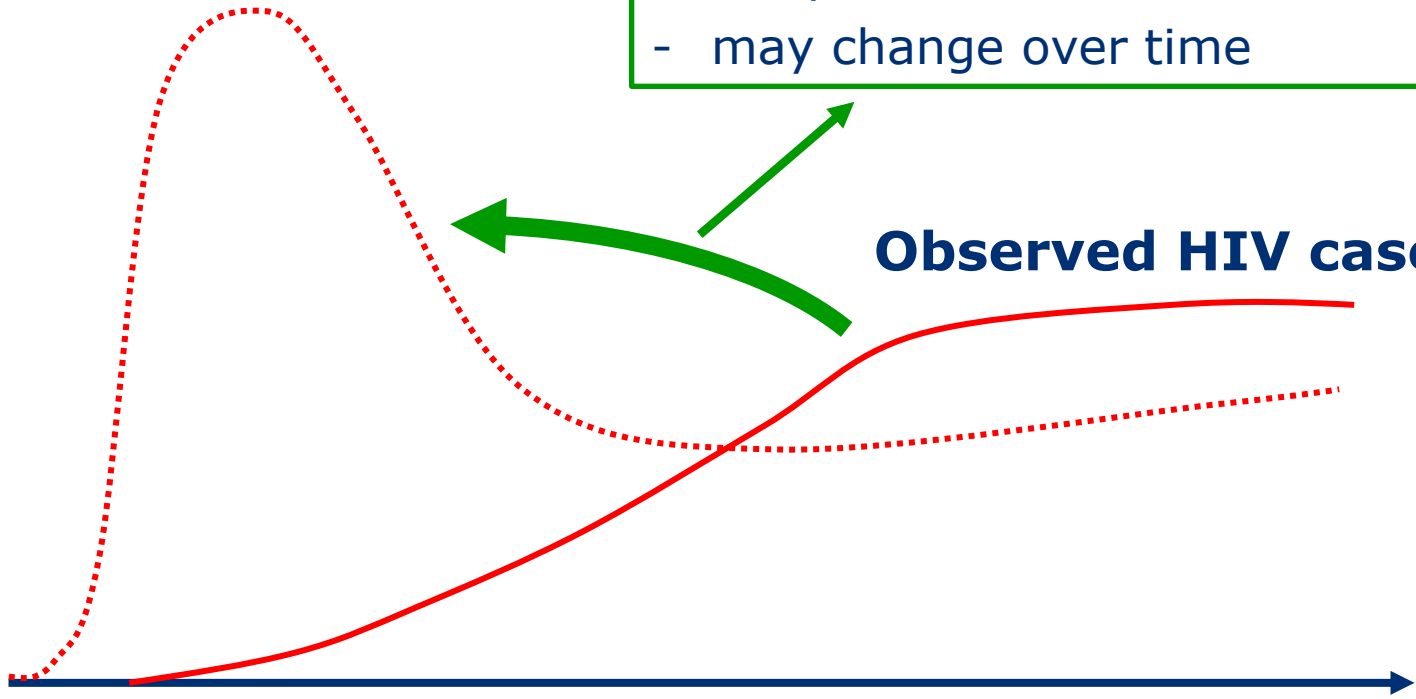
Back-calculation

HIV infections

Need to know the time between infection and diagnosis, which

- is *a priori* unknown
- may change over time

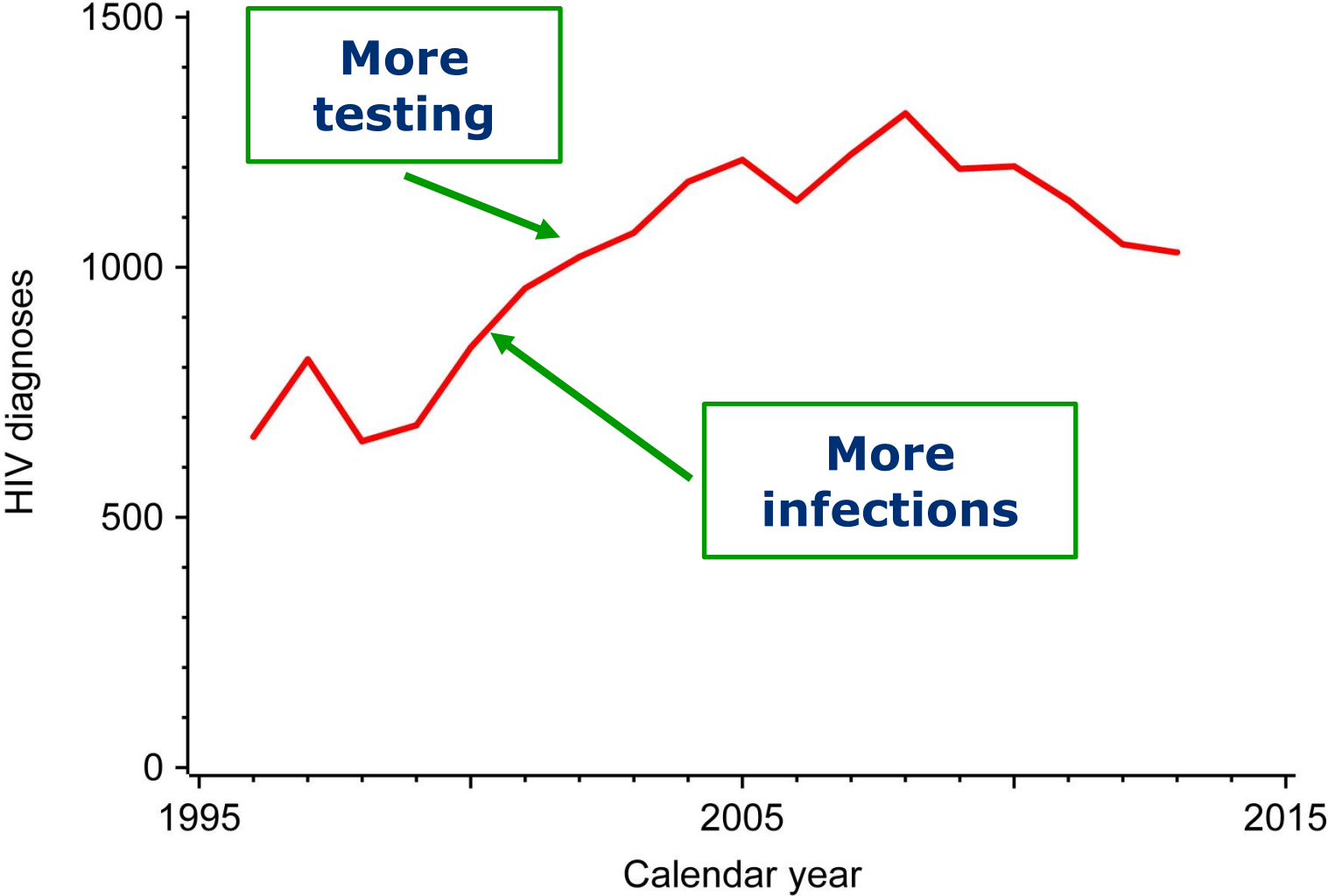
Observed HIV cases



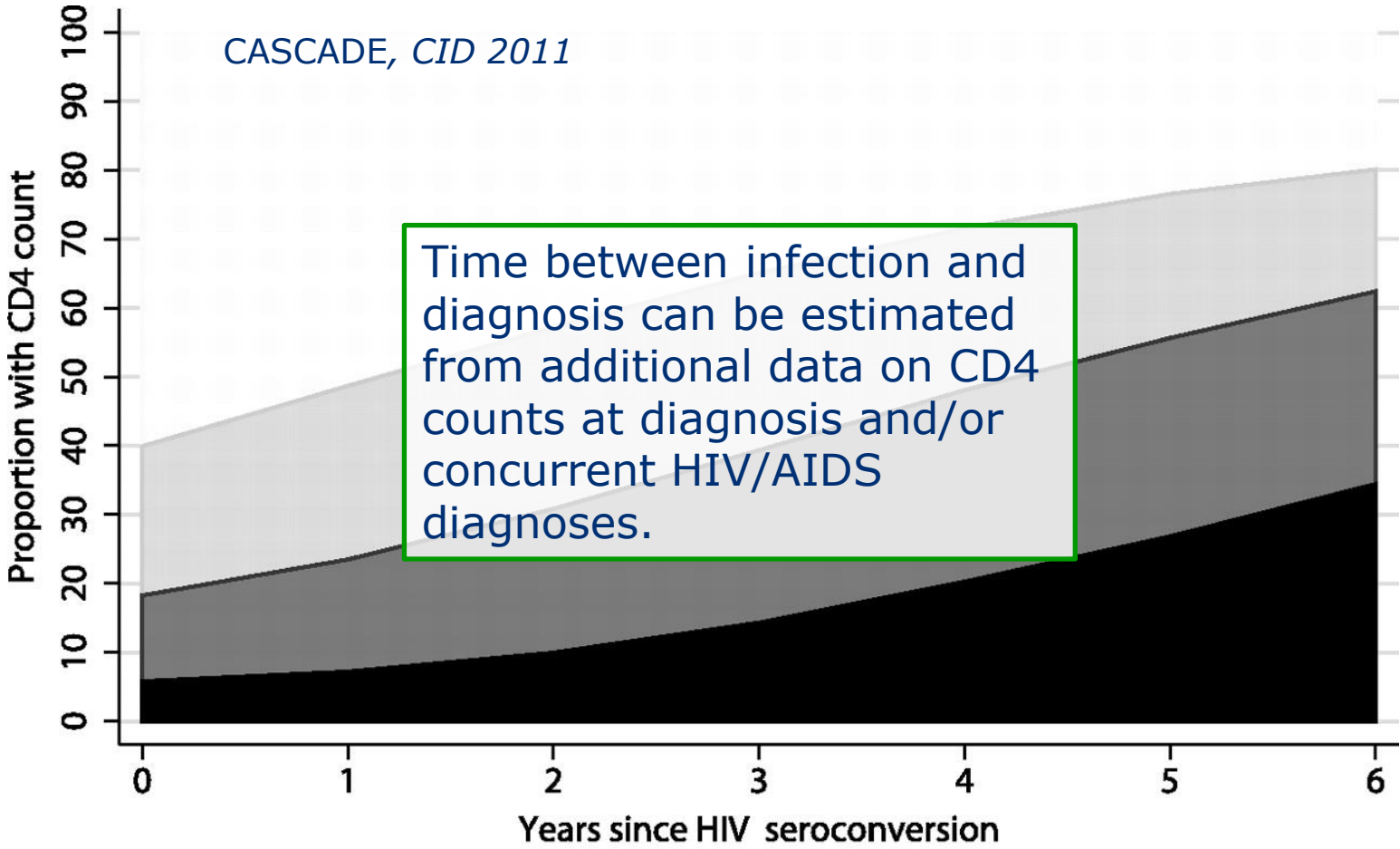
Calendar year



HIV diagnoses in the Netherlands



Solution: CD4 counts

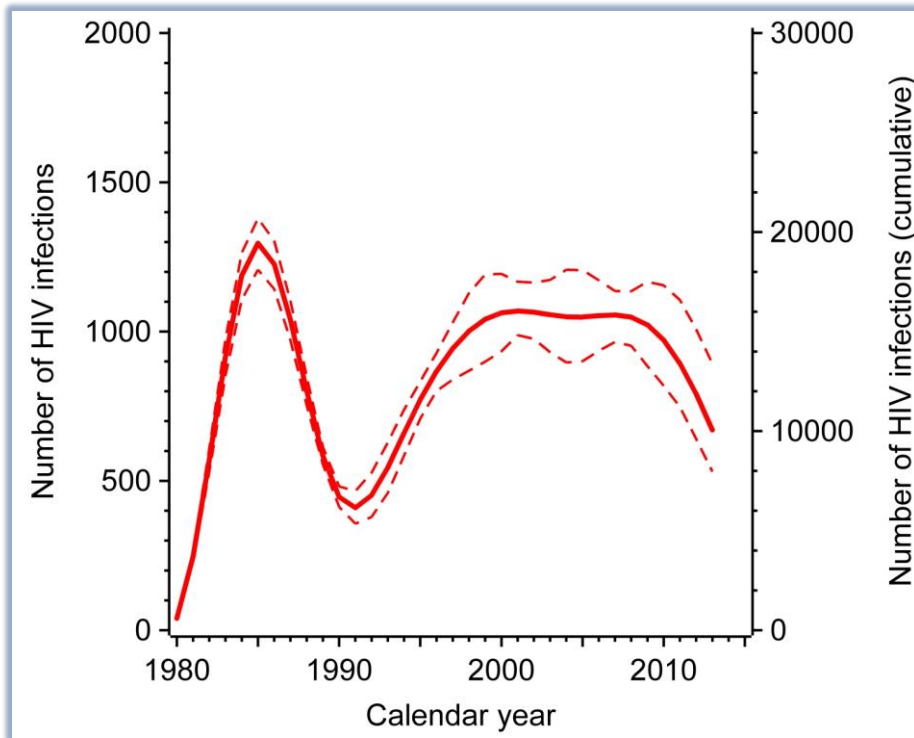


Time between infection and diagnosis can be estimated from additional data on CD4 counts at diagnosis and/or concurrent HIV/AIDS diagnoses.

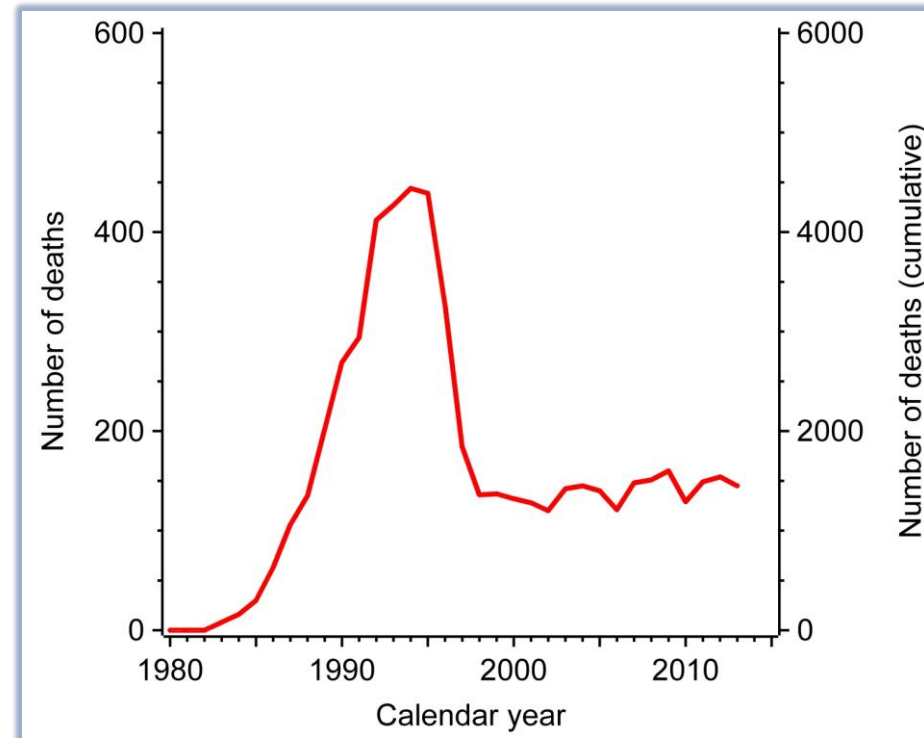


HIV population in the Netherlands

Infections (estimated*)



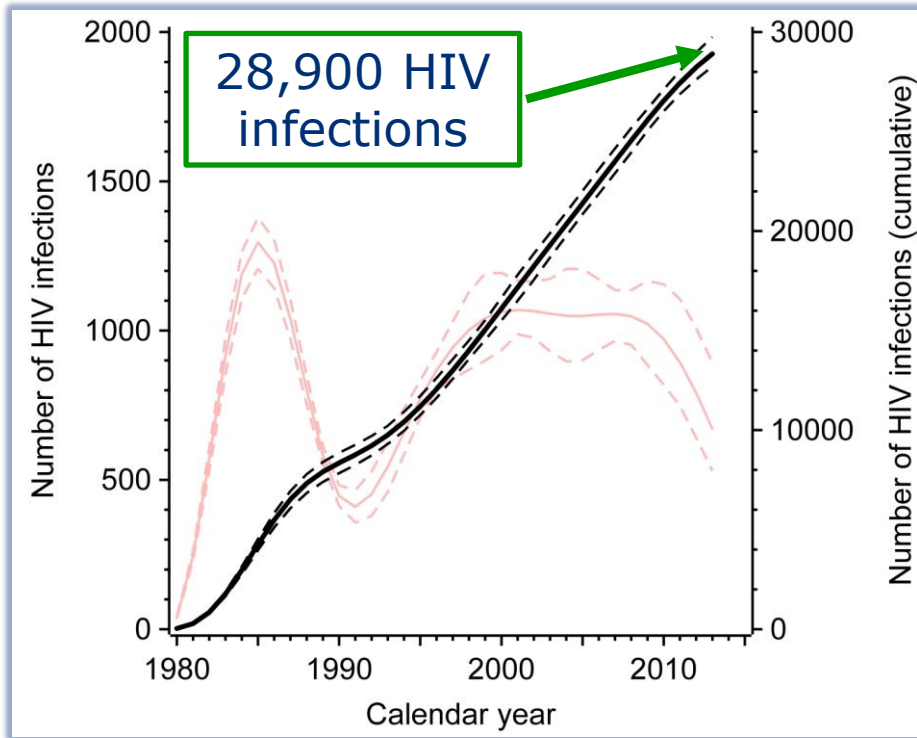
Deaths (observed)



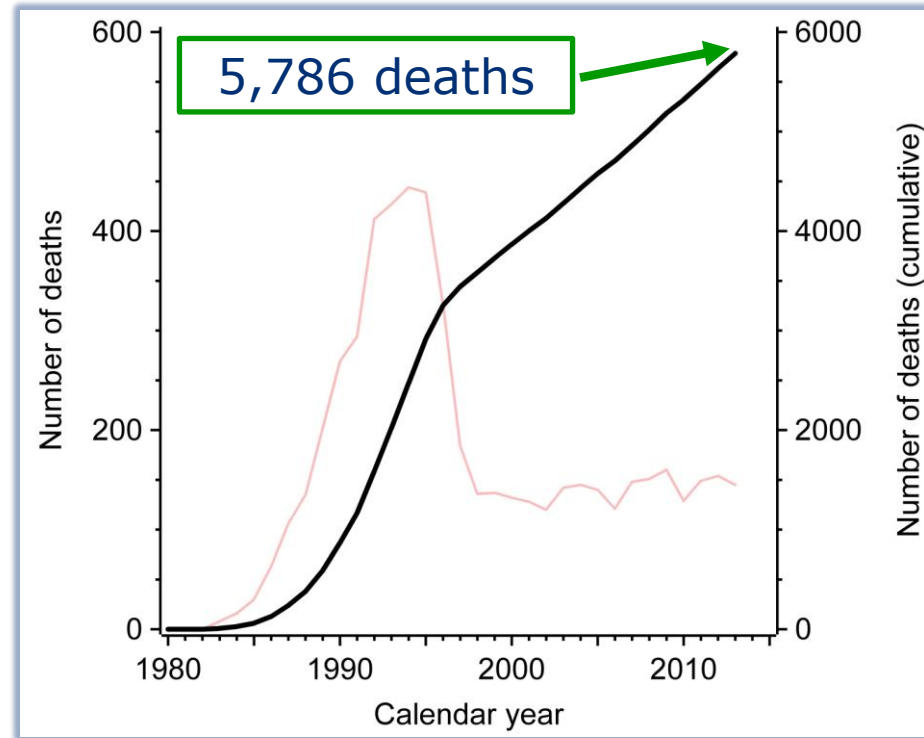
*including correction for reporting delay in 2013 (+3%)

HIV population in the Netherlands

Infections (estimated)



Deaths (observed)

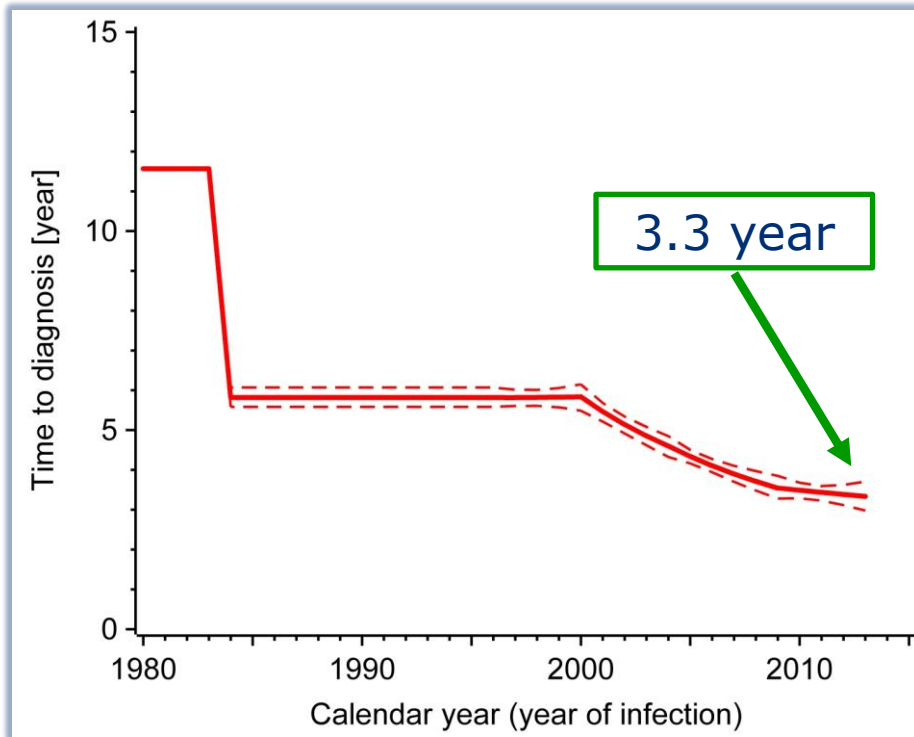


Living with HIV : $28,900 - 5,786 - 1,104 \approx 22,000$

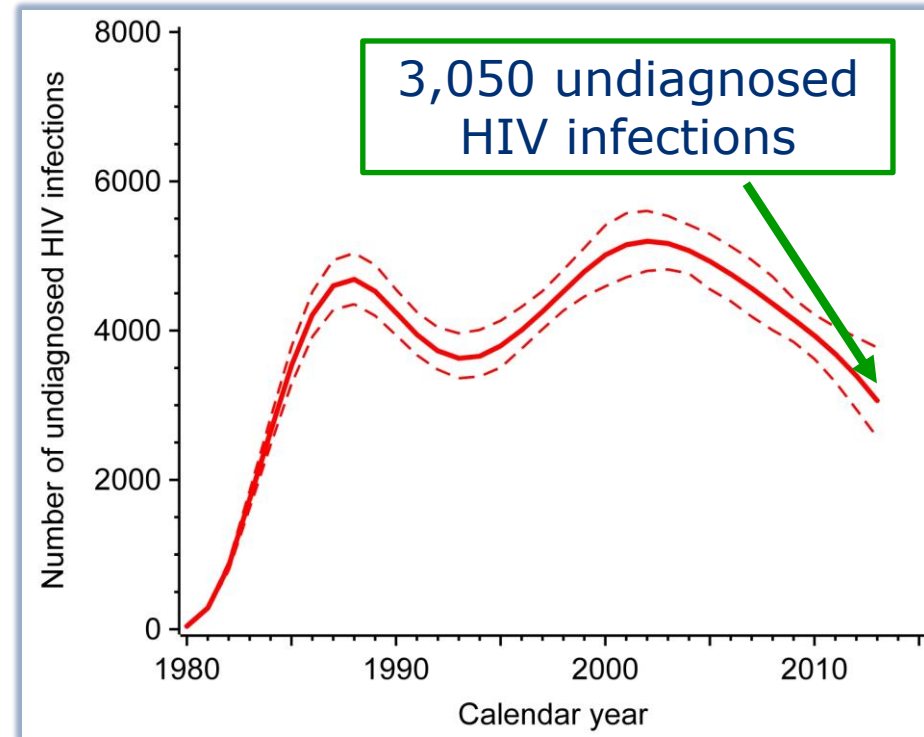
moved abroad

Other estimated key outcomes

Time to diagnosis



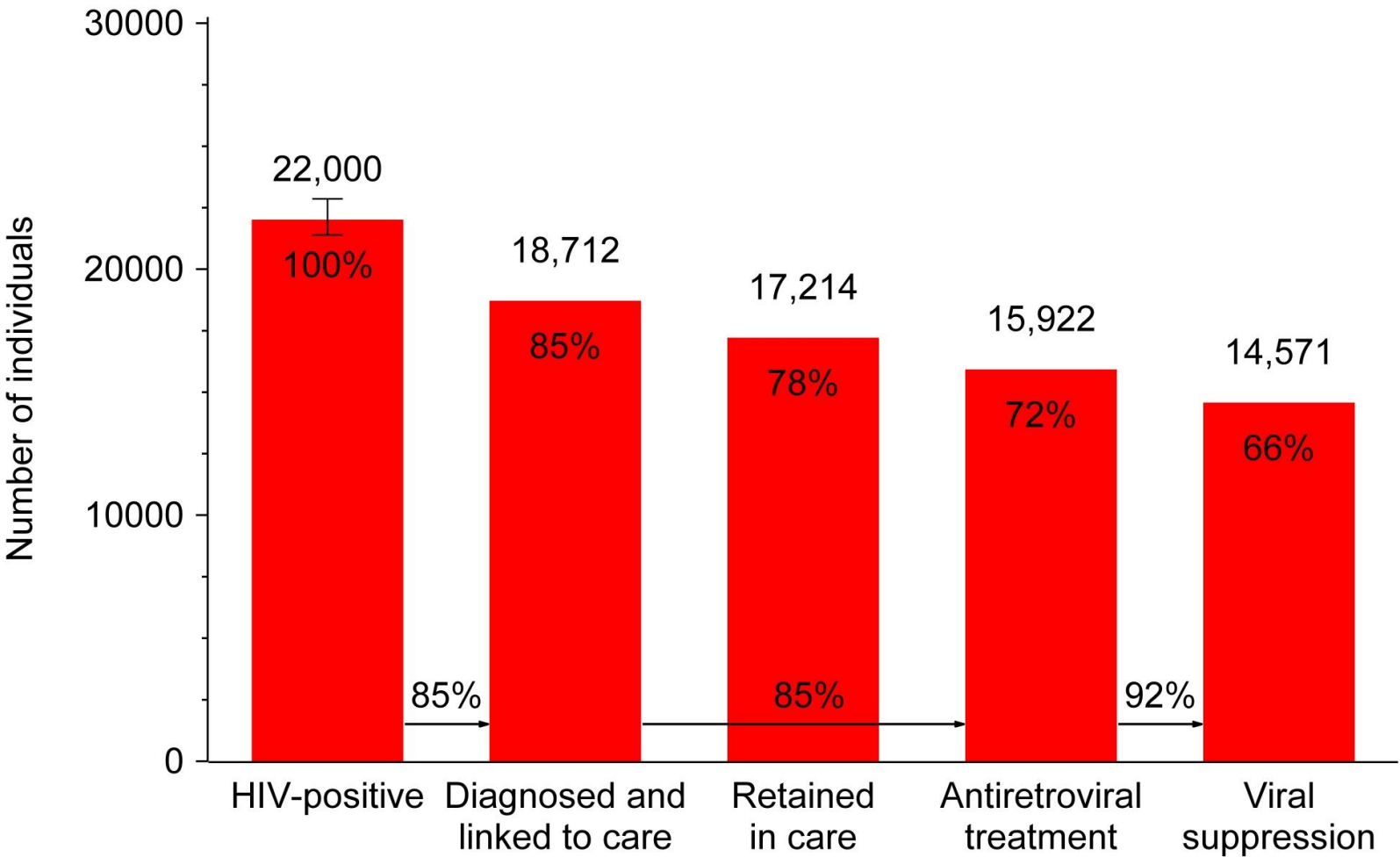
Undiagnosed infections



Constructing a continuum of HIV care

1. Living with HIV: 22,000 individuals
2. Diagnosed (and linked to care) by the end of 2013
3. Retained in care
 - clinic visit or CD4 or RNA measurement in 2013
4. Combination antiretroviral treatment (cART)
 - *ever* started a combination of at least 3 drugs from at least 2 classes
5. Viral suppression
 - latest RNA measurement in 2013 <100 copies/ml, irrespective of treatment

Continuum of HIV care in 2013



Conclusion & discussion

- The estimated proportion of HIV-positive individuals with viral suppression is 66%, close to the UNAIDS' 90-90-90 goal of 73%.
- Our method only uses routine surveillance data on HIV diagnoses, migration, and deaths.
- Limitations:
 - underreporting may affect estimates
 - 1.5% opt out of registration
 - 18,712 observed compared to 18,950 estimated to be diagnosed
 - if a large fraction of the HIV cases are found in migrants, estimated numbers will be less straightforward to interpret.
 - need extensive historical data

ECDC HIV Modelling Tool

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ecdc.europa.eu/en/healthtopics/aids/Pages/hiv-modelling-tool.aspx

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