Estimating HIV incidence and the undiagnosed HIV population in the European Union/European Economic Area

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Introduction

- Each year, ca. 30,000 people are newly diagnosed with HIV in the European Union/European Economic Area (EU/EEA).

- 122,000 people living with HIV (PLHIV) estimated to be undiagnosed in 2015, or 15% of all PLHIV[1].

- <u>Aim</u>: estimate number undiagnosed by sub-region and stratified by CD4 cell count.

Luxembourg

Liechtenstein

Malta
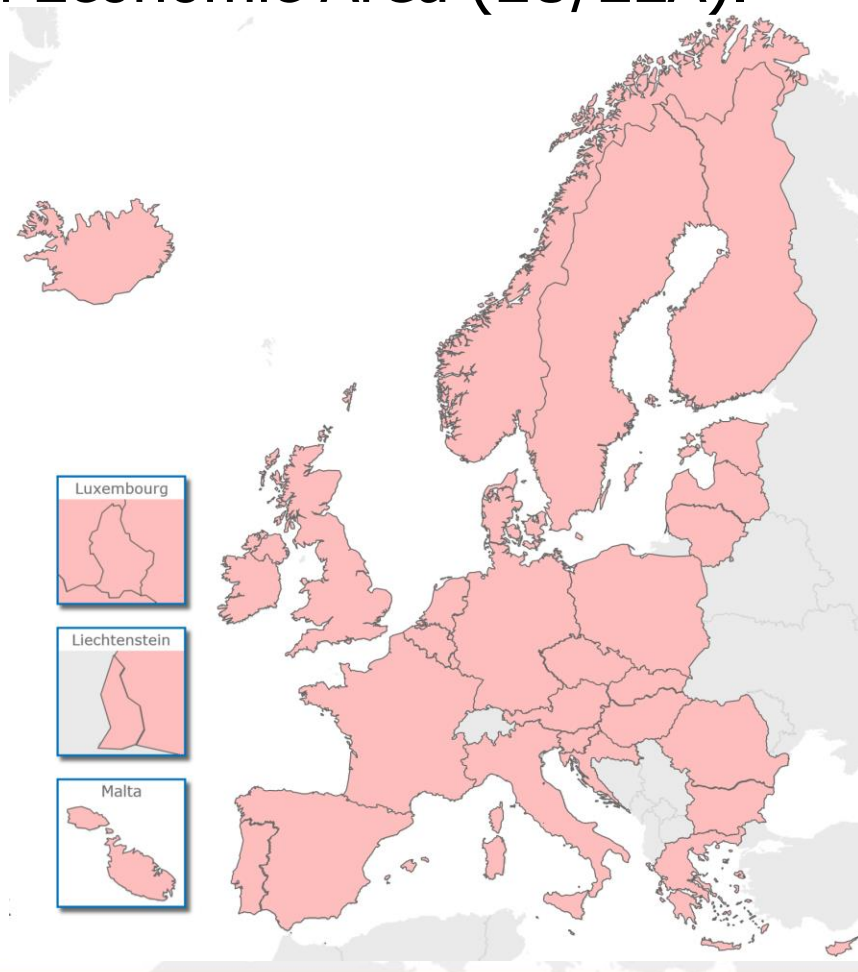
[1]Pharris *et al*, Euro Surveill. 2016

TESSy HIV/AIDS

- Joint database for reporting HIV and AIDS within The European Surveillance System (TESSy).

- Coordinated by the European Centre for Disease Prevention and Control (ECDC) and WHO Regional Office for Europe.

- Data on HIV and AIDS diagnoses from all 53 countries in the European Region.

- Data collection is focussed on:
    - surveillance of HIV and AIDS
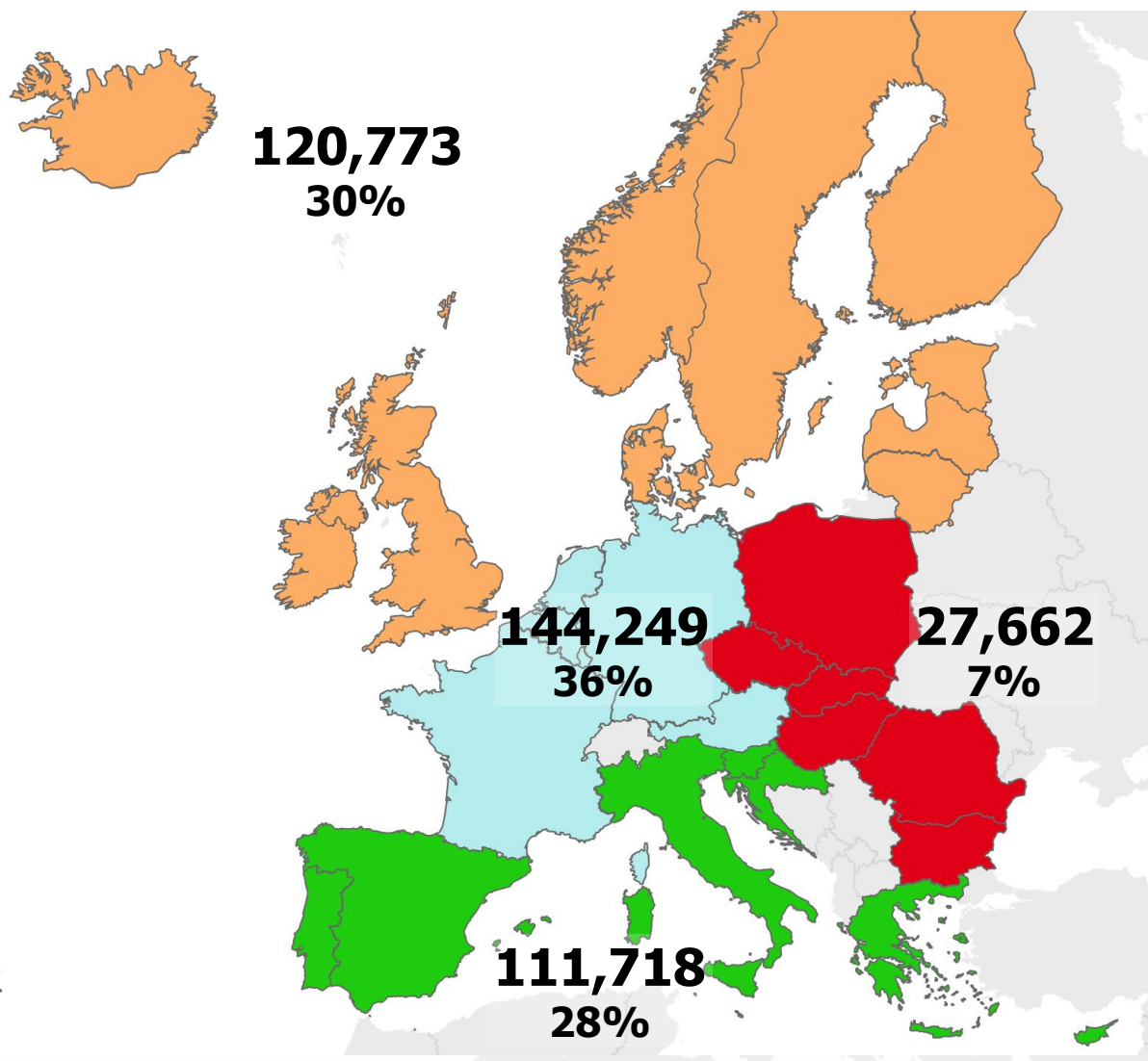   - monitoring of the HIV care continuum

Surveillance data

- Annual data on HIV diagnoses in 2003-2015[1], stratified by:
  - presence of a concurrent AIDS diagnosis (≤3 months)
  - CD4 cell count category at diagnosis in people with no concurrent AIDS

- Adjusted for reporting delay and underreporting.

- Countries were grouped in four sub-regions based on the definition used by United Nations[2].

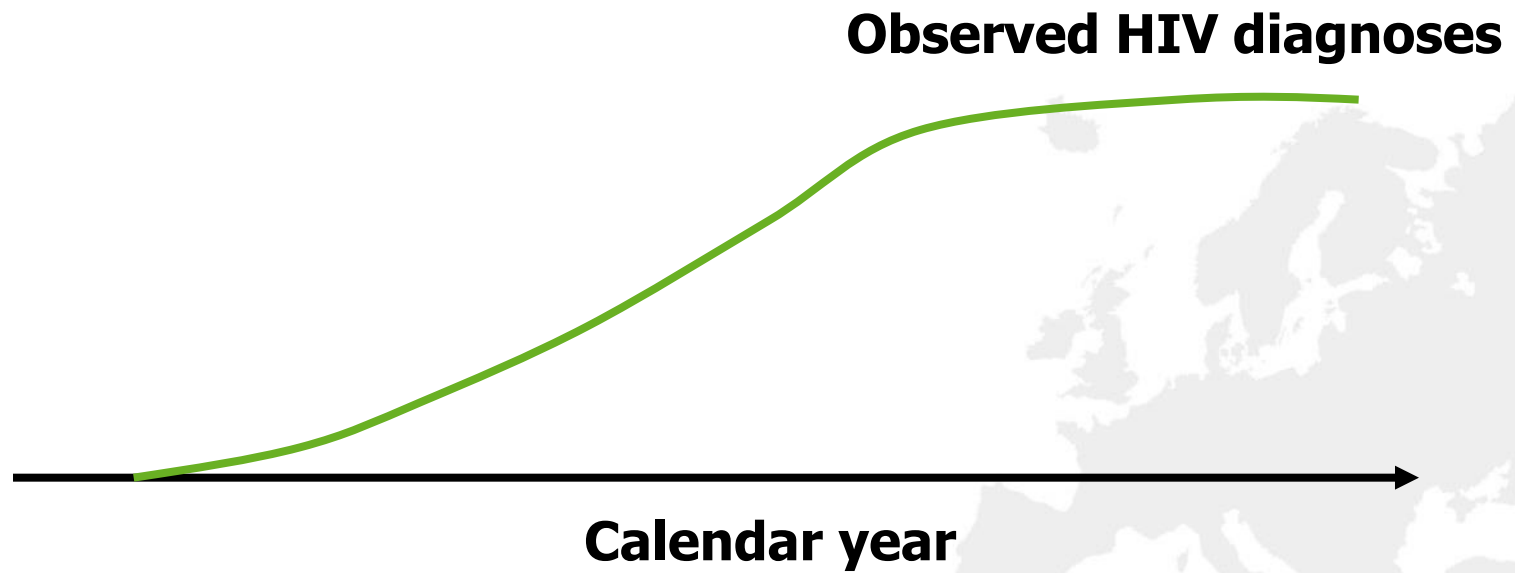- Assume measured CD4 distribution to be representative of entire sub-region.
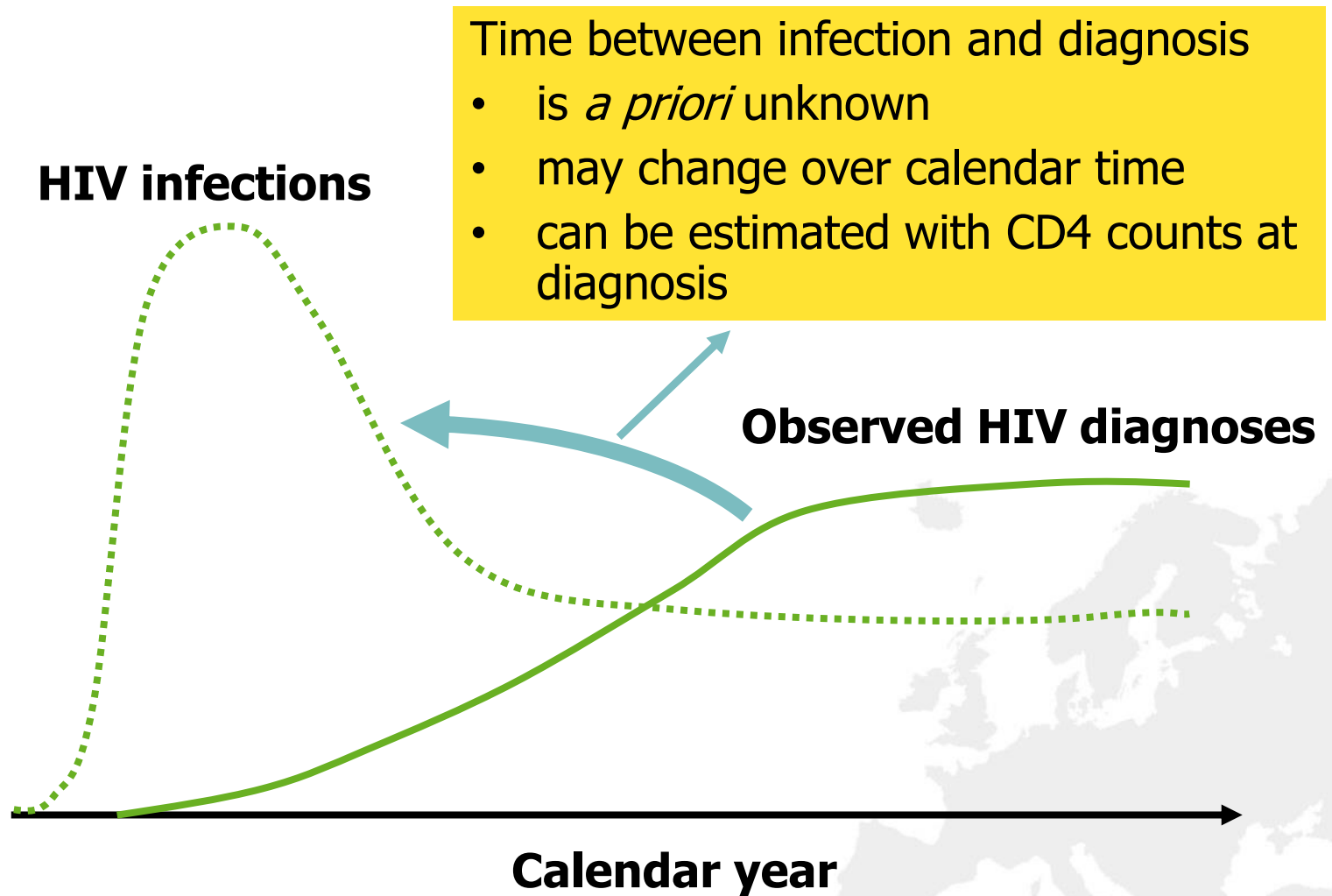
[1]ECDC/WHO. HIV/AIDS surveillance in Europe 2015; [2]https://unstats.un.org/unsd/methodology/m49/

HIV diagnoses 2003-2015

120,773
30%

EU/EEA total
404,402

144,249
36%

27,662
7%

111,718
28%

Back-calculation

Observed HIV diagnoses

Calendar year

Van Sighem *et al*, Epidemiology 2015

Back-calculation

HIV infections

Time between infection and diagnosis
- is *a priori* unknown
- may change over calendar time
- can be estimated with CD4 counts at diagnosis

Observed HIV diagnoses

Calendar year

Van Sighem *et al*, Epidemiology 2015

Estimates

- Back-calculation similar to ECDC HIV Modelling Tool[1]:
    - annual number of newly acquired HIV infections
    - distribution of time between infection and diagnosis.

- For each calendar year of infection, we calculated the number of people still undiagnosed by the end of 2015.

- No data on HIV diagnoses before 2003:
    - small proportion of infections acquired before 2003 were still undiagnosed in 2015.
    - estimates of HIV infections and number undiagnosed only reliable for most recent calendar years.

[1]https://ecdc.europa.eu/en/publications-data/hiv-modelling-tool

Does it work?
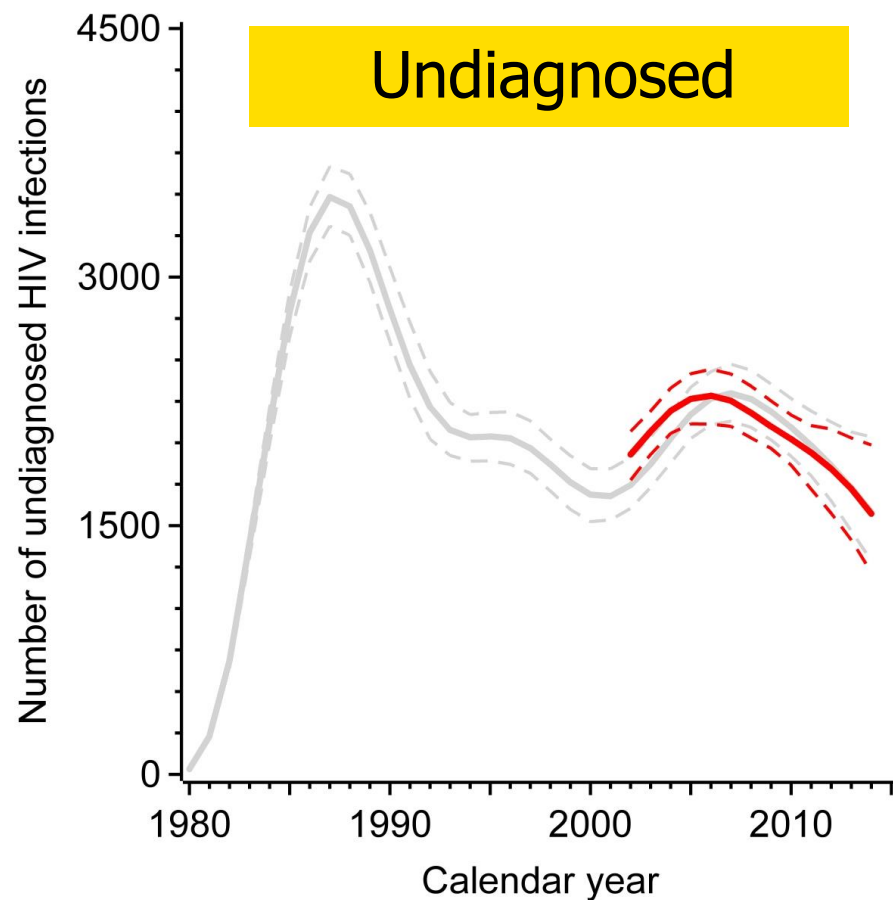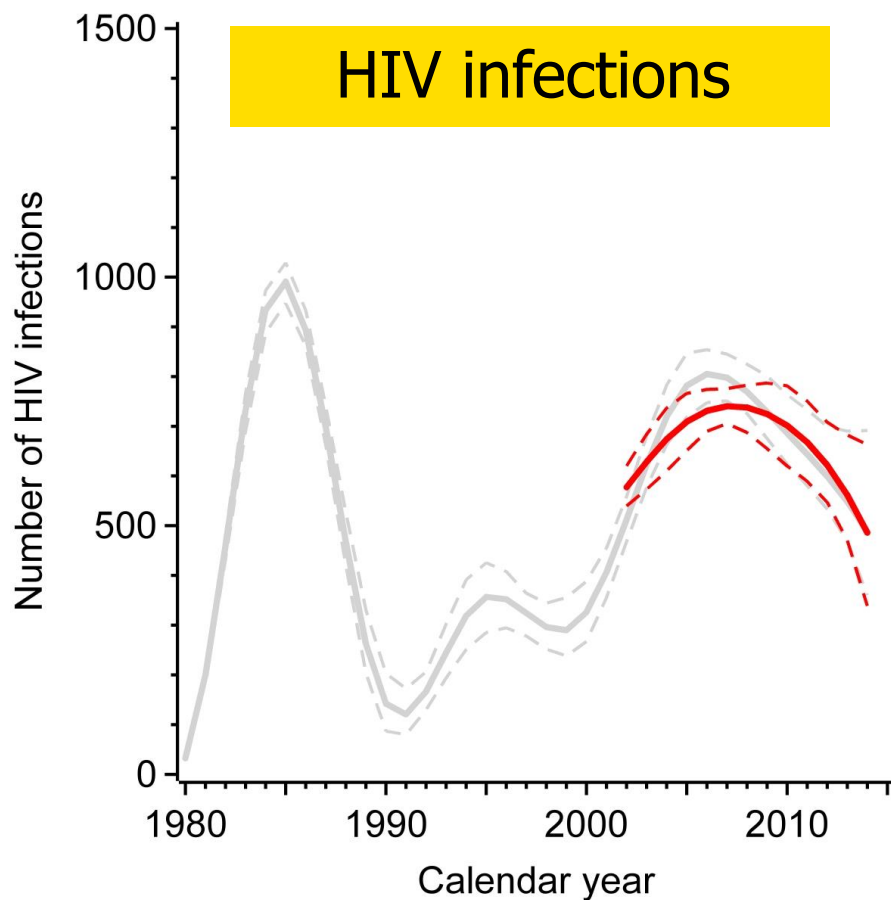
People living with undiagnosed HIV 2015
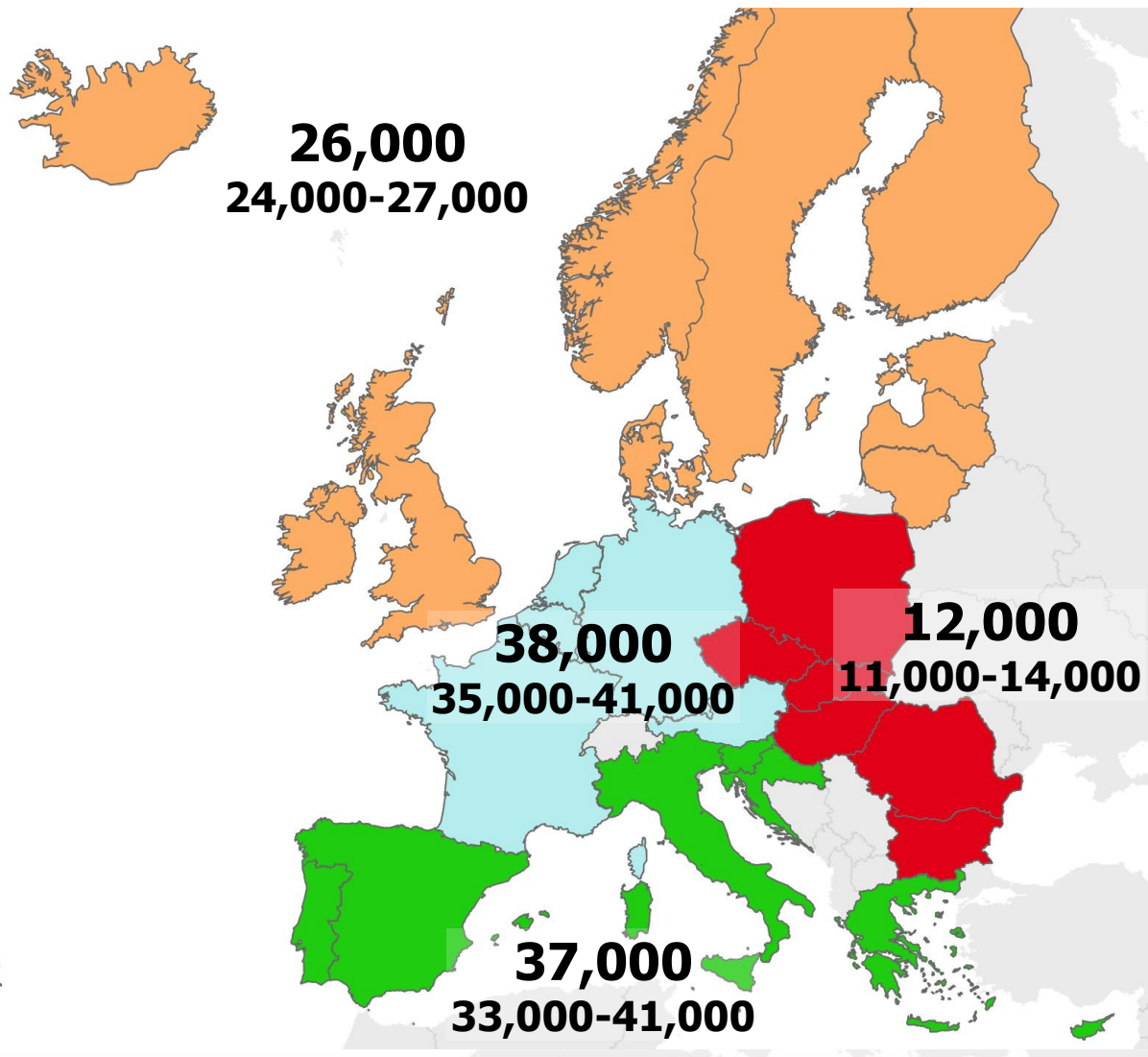
26,000
24,000-27,000

EU/EEA total
120,000
114,000-126,000

38,000
35,000-41,000

12,000
11,000-14,000

37,000
33,000-41,000

Infection rate per 100,000 population

8.3
7.6-9.0

EU/EEA total
5.3
4.9-5.9

6.1
5.4-6.9

3.1
2.4-4.0

2.7
1.6-3.9
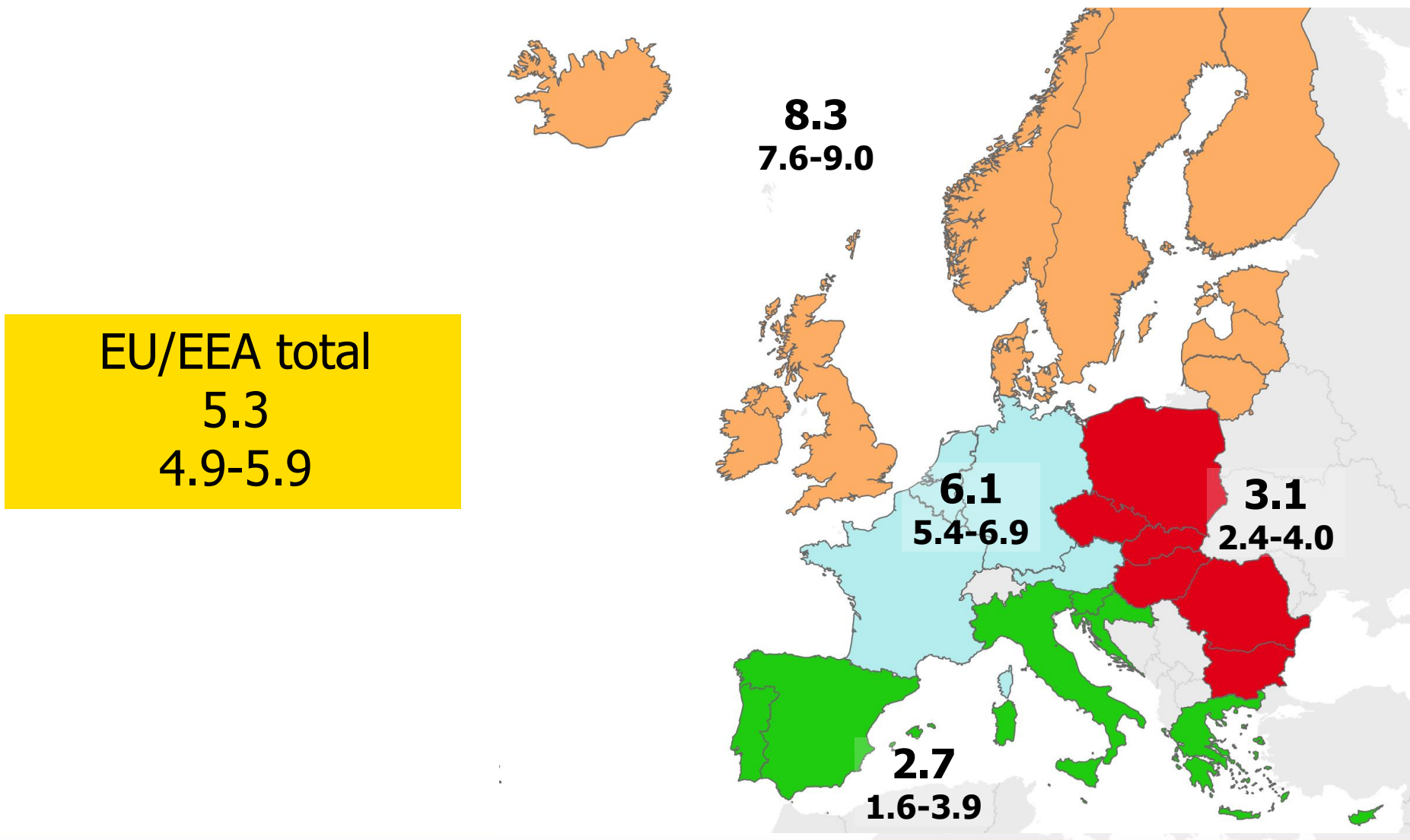
Time to diagnosis and CD4 cell distribution in undiagnosed PLHIV

Time to diagnosis

EU/EEA	
2.9 year	IQR, 1.4-5.4
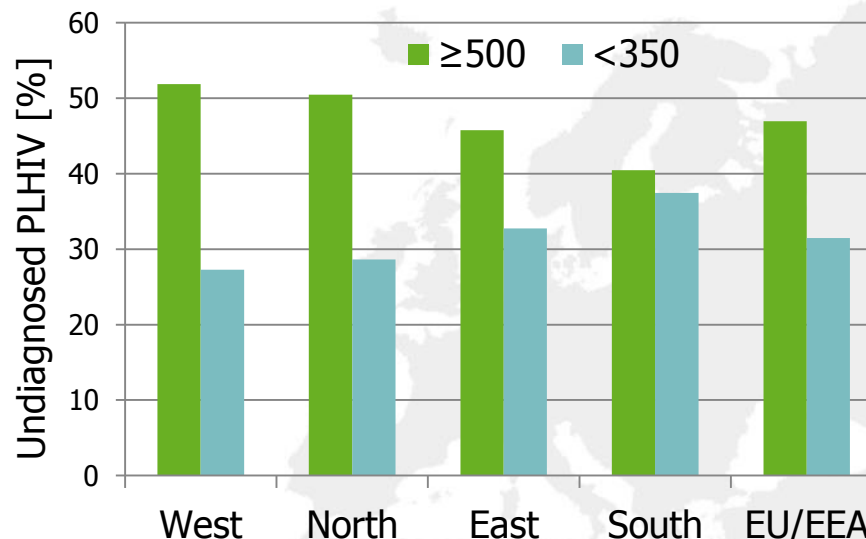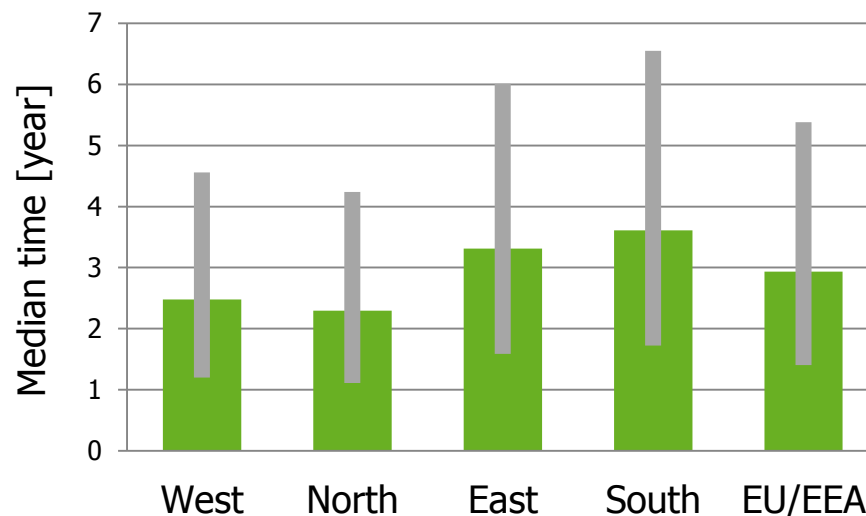
CD4 distribution

EU/EEA	
≥500	47%
<350	31%

Strengths and limitations

Strengths

- Only need routine surveillance data.

- No need for historical data.

- May be stimulus for countries to improve data collection.

Limitations

- No estimate of total HIV epidemic: need additional data to estimate all PLHIV.

- No adjustment done for incomplete coverage (Italy, Spain).

- Adjustment for underreporting could only be done for the most recent calendar years.

Conclusions

- A substantial number of people in the EU/EEA are living with undiagnosed HIV.

- Number of undiagnosed PLHIV highest in Western and Southern Europe.

- Infection rates highest in Northern Europe.

- The estimated CD4 distribution suggests that approximately half of them are in an early stage of infection.

- A significant proportion are estimated to have late stage infection, suggesting more efforts are needed to test and diagnose these people.

Acknowledgements

ECDC HIV/AIDS Surveillance and Dublin Declaration Monitoring Networks