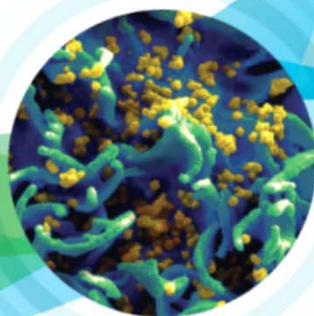




HIV/STI and viral hepatitis Update

Andrew Amato, Programme for HIV, STI and viral hepatitis (HSH)
HIV/TB/viral hepatitis CSF/Think Tank Meeting. May 2018

Developing tools that use surveillance data to estimate true HIV incidence and undiagnosed fraction



HIV/AIDS surveillance in Europe
2017
2016 data



HIV modelling tool

tool

14 Sep 2015



The HIV modelling tool is an application which uses evidence-based methods to calculate HIV incidence in a given population.

Version: 1.3.0

Download

 [HIV Modelling Tool v1.3.0 - EN - \[ZIP-4.12 MB\]](#)

The material herein is provided in a format for easy adaptation. See our Legal notice

 [HIV Modelling Tool Manual v1.3.0 - EN - \[PDF-1.57 MB\]](#)

The **HIV modelling tool** is an application which uses evidence-based methods to calculate HIV incidence in a given population.

With this tool you can estimate:

- the number of people living with HIV, including those not yet diagnosed;
- the annual number of new HIV infections;
- the average time between infection and diagnosis;
- the number of people in need of treatment according to CD4 cell counts.

ECDC address HIV.Modelling@ecdc.europa.eu for technical and methodological support

welcome models

new open save save as close run model cancel run

INPUTS GOODNESS OF FIT TABLES GRAPHS

POPULATION LIST

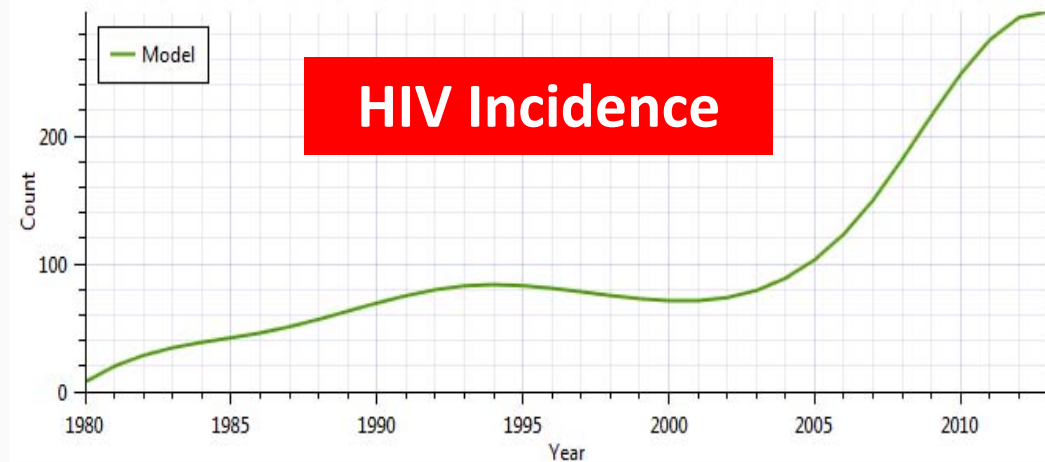
- Model 1
 - ALL
- Model 2
 - ALL



Risk group: ALL

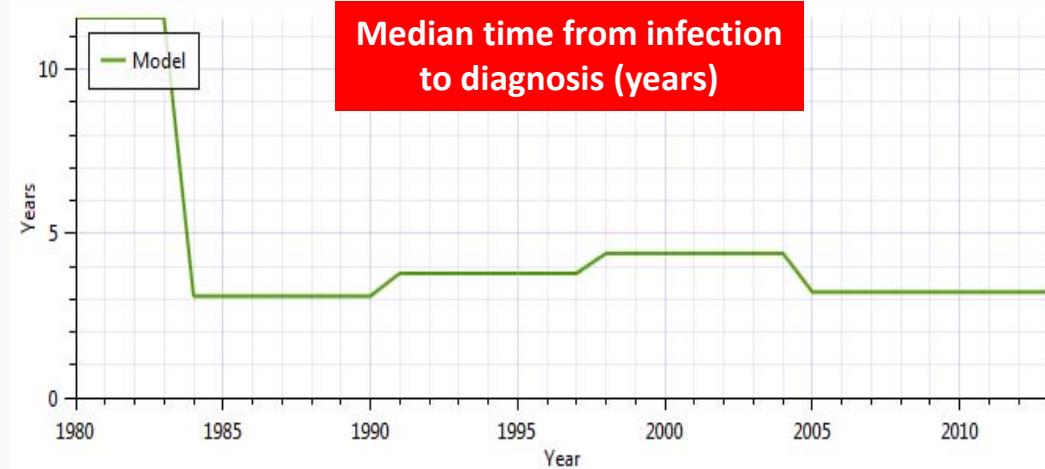
A. HIV infections per year

year	N_Inf_M
1980	7.57
1981	19.82
1982	28.46
1983	34.43
1984	38.71
1985	42.24
1986	46.00
1987	50.80
1988	56.66
1989	63.05
1990	69.42
1991	75.22
1992	79.90
1993	82.90
1994	83.86
----	----



B. Time to diagnosis

year	t_diag
1980	11.57
1981	11.57
1982	11.57
1983	11.57
1984	3.09
1985	3.09
1986	3.09
1987	3.09
1988	3.09
1989	3.09
1990	3.09
1991	3.79
1992	3.79
1993	3.79
1994	3.79



Elapsed time: 00:24

% PLHIV who are diagnosed (2016 data)



HIV prevalence

810 000 PLHIV, 0.2%

Undiagnosed

122 000; 15% (95% CI: 14-17%)



Target 90%

West 84%

Centre 84%

East 57%

>90%

80-90%

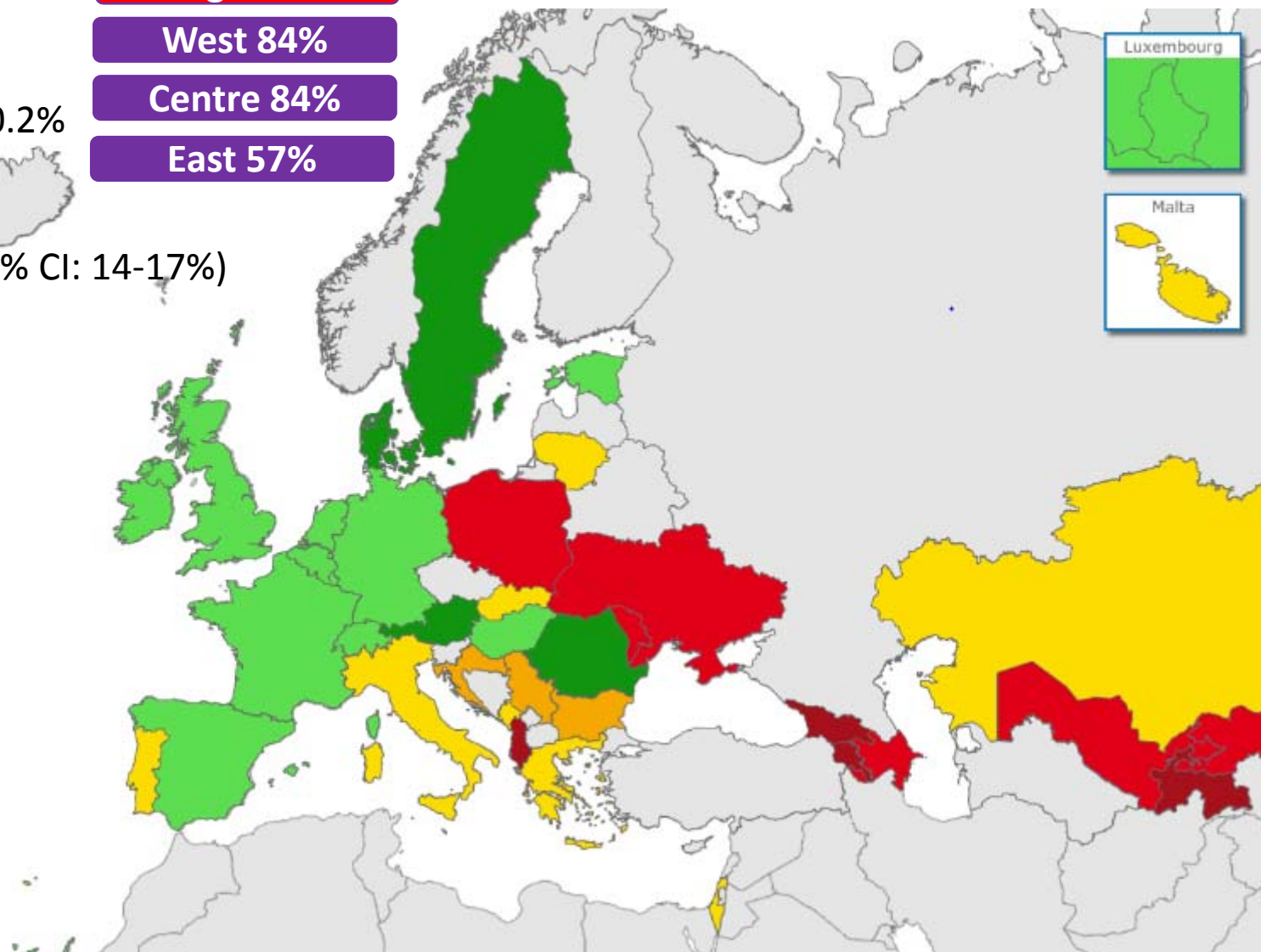
70-79%

60-69%

50-59%

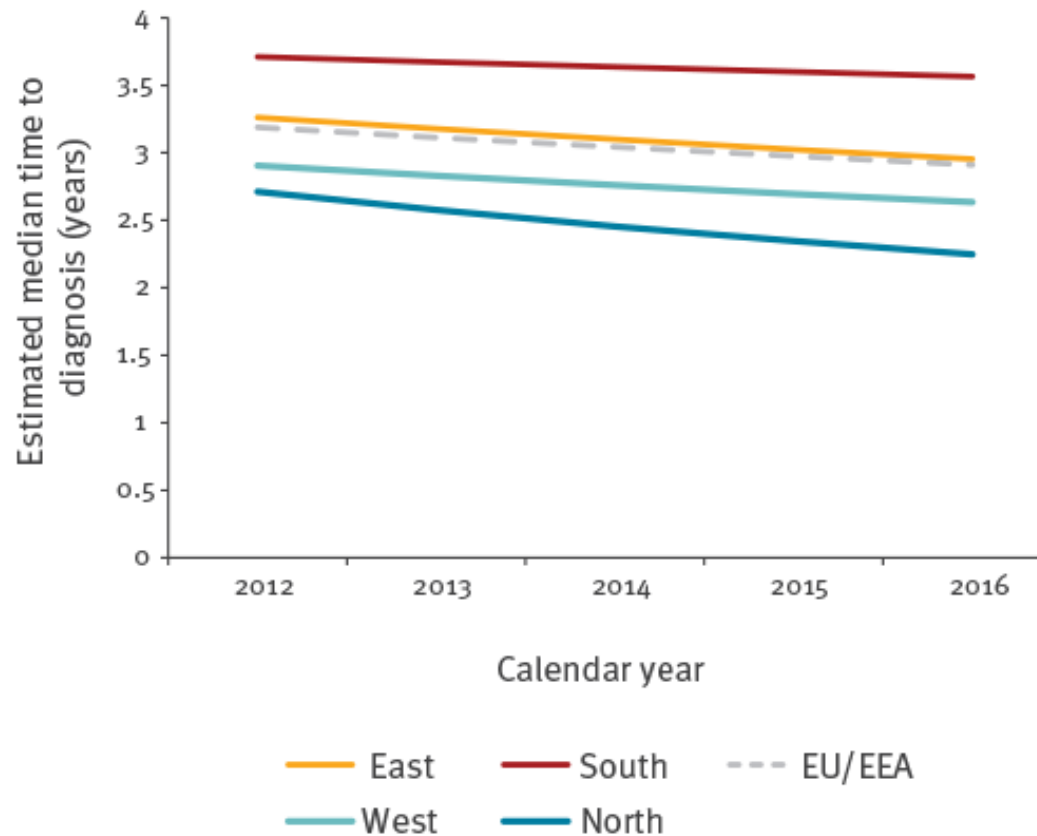
<50%

**No/incomplete
data**

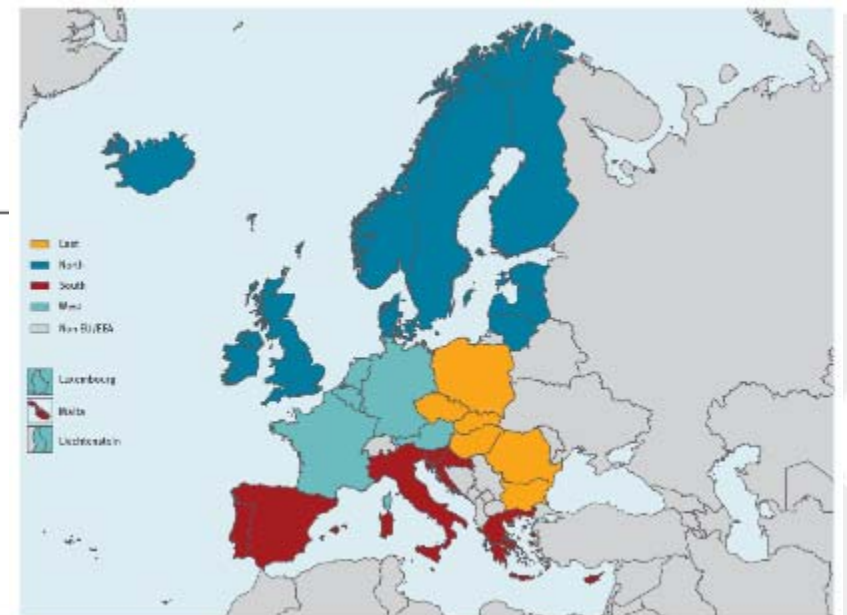


Source: ECDC. Thematic report: HIV continuum of care. Monitoring implementation of the Dublin Declaration on Partnership to Fight HIV/AIDS in Europe and Central Asia: 2017 progress report. Stockholm: ECDC; 2017.

Decreasing estimated time from infection to diagnosis in the EU/EEA



Median time from infection to diagnosis is 2.9 years



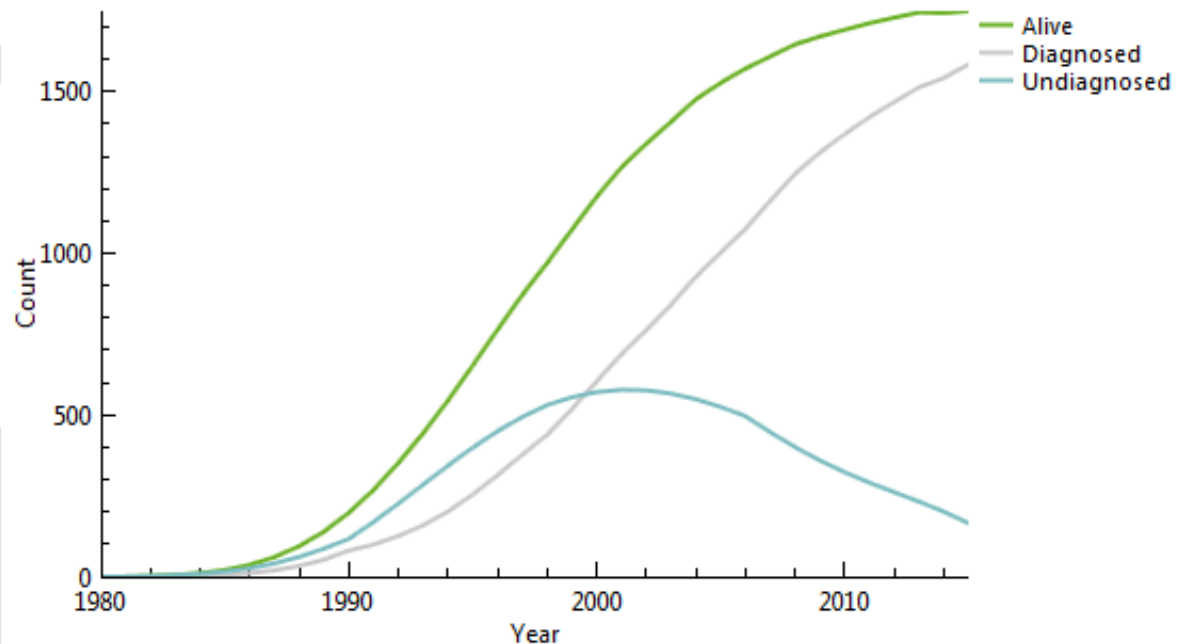
Outputs – Graphs and Tables of key indicators



Total number of alive HIV-infections persons
(diagnosed and undiagnosed)

C. Total number of HIV-infected

year	N_Alive	N_Alive_Diag_M	N_Und
2003	1,406.81	840.55	566.25
2004	1,476.27	927.50	548.76
2005	1,526.97	1,002.04	524.94
2006	1,571.24	1,075.03	496.21
2007	1,608.88	1,162.23	446.65
2008	1,646.14	1,245.45	400.69
2009	1,670.60	1,311.31	359.29
2010	1,691.40	1,368.61	322.79
2011	1,711.76	1,421.24	290.52
2012	1,728.95	1,467.97	260.98
2013	1,745.30	1,513.28	232.02
2014	1,743.21	1,542.25	200.95
2015	1,749.11	1,584.43	164.68



Improving case based surveillance data to improve accuracy



- ☐ Accurate case-based HIV surveillance data are key to estimate HIV burden and epidemic trends in Europe.
- ☐ Surveillance data limitations:
 - ☐ Underreporting
 - ☐ Double reporting
 - ☐ Delayed reporting
 - ☐ Missing information
 - ☐ Misclassification
- ☐ European surveillance data originate from different national surveillance systems.



ECDC Estimates Accuracy Tool (September)



v. 0.9.6

HIV Estimates

↑ Input data upload

📊 Input data summary

⚡ Adjustments

📄 Reports

📁 Outputs

The ECDC HIV Estimates Accuracy Tool is an application that uses advanced statistical methods to correct for missing values in key HIV surveillance variables as well as for reporting delay.

The tool accepts case based HIV surveillance data prepared in a specific format.

The outputs include results from pre-defined analyses in the form of a report containing tables and graphs, and datasets, in which the adjustments have been incorporated and which may be exported for further analysis.

Input data

File input:

Browse...

No file selected

Pre-defined report
Exportable datasets

Multiple imputations and reporting delay adjustment

Dataset in TESSy format or similar

Emerging issues for improved surveillance



- **Migration-related issues**

- “Previous positives”: transfer of care or previously diagnosed individuals
- Probable country of infection
- Recording of emigration

- **Mortality**

- Some countries have impartial linkage to death data/registries
- Some countries have no linkage
- Reporting around the time of diagnosis is reasonably good—longer term mortality is often not reported



Introducing Transmitted HIV Drug Resistance surveillance

HIV DR Transmitted Drug Resistance



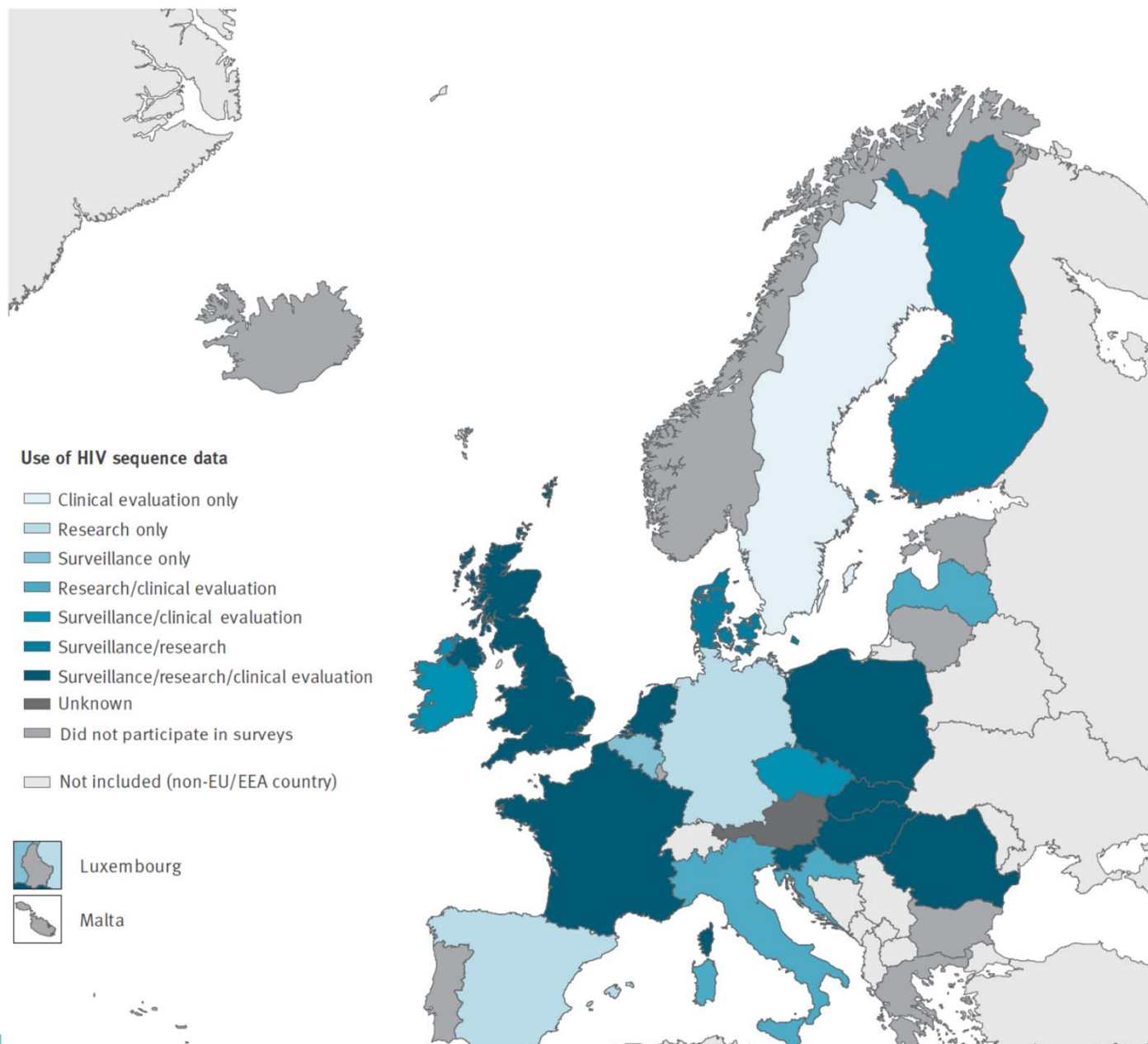
Genotypic resistance testing using sequencing

Monitoring resistance mutations against the main drug classes:

non-nucleoside reverse transcriptase inhibitor (NNRTI),
nucleoside reverse transcriptase inhibitor (NRTI),
protease inhibitor (PI) and
integrase inhibitors (INI).

Closely aligned with the
WHO Global Action Plan





Source: Keating Patrick, Pharris Anastasia, Leitmeyer Katrin, De Angelis Stefania, Wensing Annemarie, Amato-Gauci Andrew J, Broberg Eva. Assessment of HIV molecular surveillance capacity in the European Union, 2016. Euro Surveill. 2017;22(49):pii=17-00269.

Aggregate HIVDR data (2015) submitted by 6 countries, case-based reporting from the HIVDR surveillance pilot study



Gender / Transmission	Male					Female				Total
	MSM	HSX	IDU	UNK	OTH	HSX	IDU	OTH	UNK	
Number Tested	865	208	34	231	7	256	5	6	62	1674
NRTI	35	4	2	8		4			3	56
NNRTI	57	12	4	26	1	15			3	118
PI	18	1			9	4				32
INI	5			1		4				10
NRTI+NNRTI	13	1		5		6			2	27
PI+NRTI	1									1
PI+NNRTI		1								1
PI+NRTI+NNRTI	1									1
TDR overall	130	19	6	40	10	33	0	0	8	246
%	15,0%	9,1%	17,6%	17,3%	14,2%	12,9%	0,0%	0,0%	12,9%	14,7%

[1] As these are aggregate data results, there is no detailed information available about the level of resistance. As per protocol, countries considered scores over 15 as 'resistant' (thus grouping Low, Intermediate, and High resistance)

Reacting to the increasing data demands for monitoring the response – beyond surveillance

Dublin Declaration monitoring 2018



Contract awarded to:

- National AIDS Trust (UK)



Team:

- Yusef Azad (NAT)
- Rosalie Hayes (NAT)
- Alison Brown (PHE)
- Valerie Delpech (PHE)

Tender Specifications

for

*Monitoring the HIV response in Europe and
Neighbouring countries*

Framework service contract

Publication Reference: OI/2017/OCS/9239

March 2017

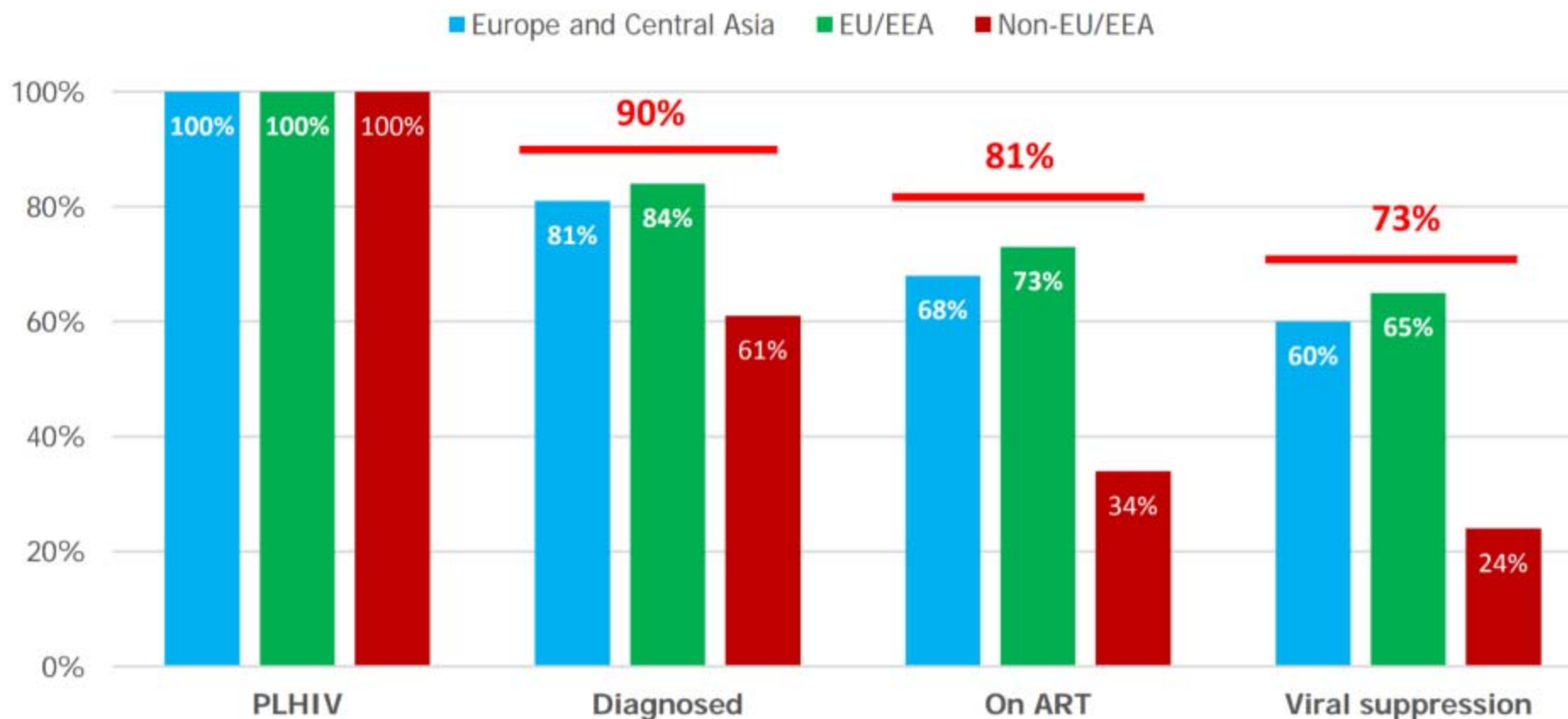


Key principles of Dublin monitoring



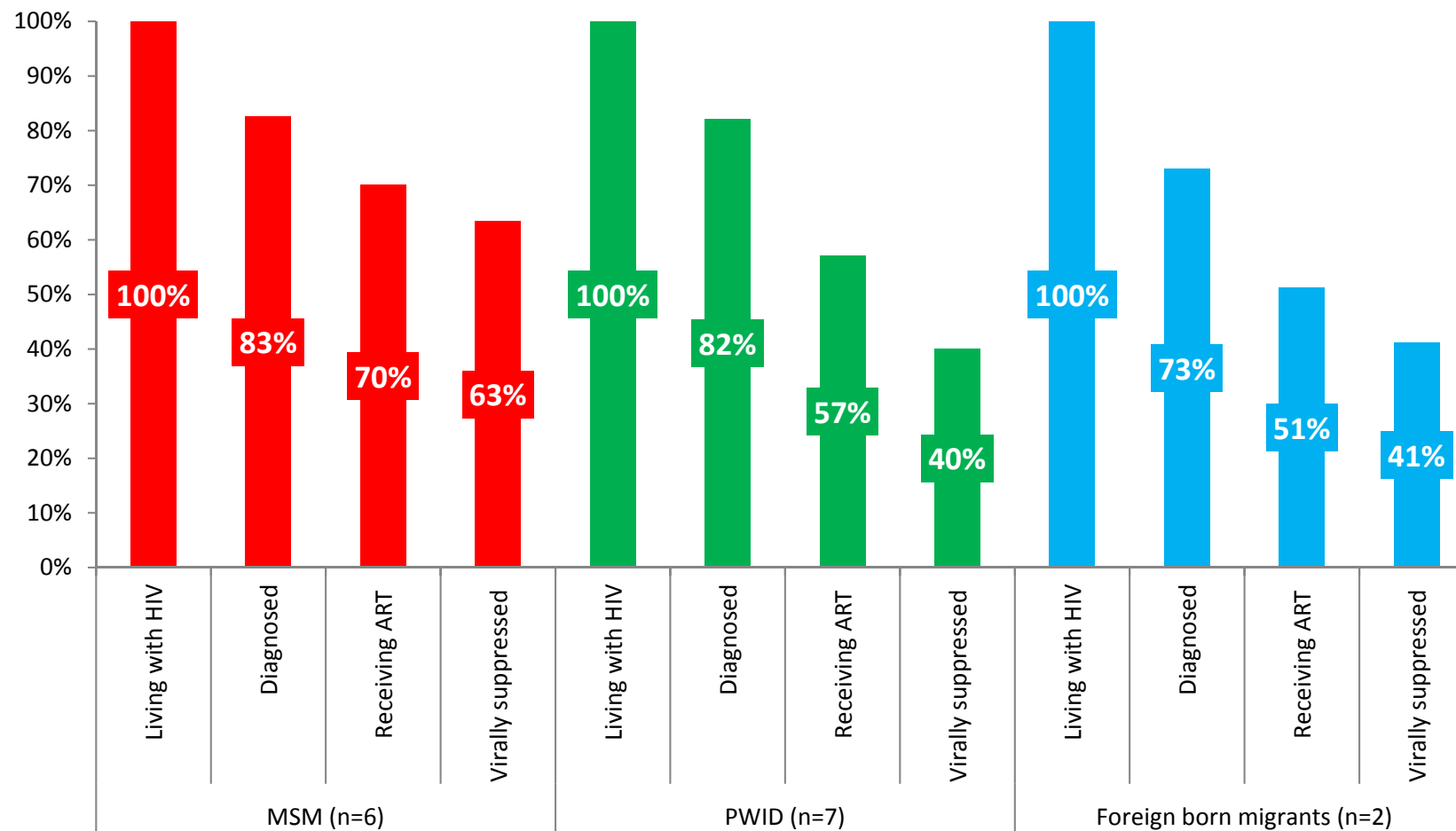
1. **Produce useful information** for action in the European context
 - Critically appraise previous outputs
2. **Seek guidance** from government and civil society representatives on what information to collect
3. **Remain relevant** by adapting indicators/questions in order to capture emerging issues important for the HIV response
4. **Minimise reporting burden**
 - Harmonising with existing monitoring frameworks (UNAIDS, WHO, EMCDDA)
 - Prioritising use of existing data (i.e. EU projects, EMCDDA)
 - Focusing on indicators relevant to the European and Central Asian context

Continuum of care estimates based on Dublin Monitoring data 2016



Source: Thematic report: Continuum of HIV care. Monitoring implementation of the Dublin Declaration on Partnership to Fight HIV/AIDS in Europe and Central Asia: 2017 progress report. Stockholm: ECDC; 2017

Continuum of care estimates for key populations EU/EEA, 2016



Source: Brown et al, HIV Medicine. 2017.

Minimise reporting burden: ECDC/UNAIDS GAM collaboration 2018



ECDC to collect a core set of GAM indicators through Dublin monitoring for EU/EEA Member States

No separate GAM reporting for EU/EEA Member States

2018

In return, ECDC will move toward annual data collation for a minimum core set of GAM indicators in alternate years: 2019, 2021 (i.e. 90-90-90 estimates)

Implications on timelines for validation (less flexible and much sooner - April)

Response rates: 2018 reporting round



Albania	Finland	Liechtenstein	Serbia
Andorra	France	Lithuania	Slovakia
Armenia	Georgia	Luxembourg	Slovenia
Austria	Germany	Malta	Spain
Azerbaijan	Greece	Moldova	Sweden
Belarus	Hungary	Monaco	Switzerland
Belgium	Iceland	Montenegro	Tajikistan
Bosnia & Herzegovina	Ireland	Netherlands	TFYROM
Bulgaria	Israel	Norway	Turkey
Croatia	Italy	Poland	Turkmenistan
Cyprus	Kazakhstan	Portugal	
Czech Republic	Kosovo	Romania	
Denmark	Kyrgyzstan	Russia	
Estonia	Latvia	San Marino	

**Highest
response rate
ever!!**

Overall submission rate: 51/55 = 93%

Process and timeline

	2017			2018												2019		
	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M
<u>1st advisory group meeting</u>																		
Data collection tool developed																		
Data collection																		
Country validation (GAM)																		
Data analysis and draft reports																		
<u>2nd advisory group meeting</u>																		
Final reports produced																		

Continuum of
care report
(TBD)

IAS

TBD

Planned outputs 2018 (TBD)



- Continuum of HIV care report – launched at IAS 2018 (TBD)
- Thematic report on combination prevention, incl.
 - Prevention interventions
 - PrEP
 - Testing
 - Treatment as prevention
- MSM and HIV – joint report with ESTICOM
- PWID and HIV
- Country dashboards (i.e. country fact sheets with key surveillance and response indicators), TBD
- Scientific manuscripts



AIDS 2018



ECDC-EACS Satellite Session: "Getting to 90: Addressing inequalities in the HIV continuum of care in Europe and Central Asia"

Time: Monday 23 July 2018 – 12:30-14:30h

Venue: Emerald Room, RAI Convention Centre

Objective: identify facilitators and barriers to achieving the 90-90-90 targets, and promoting collaboration between public health, clinical and community sectors in addressing these barriers.

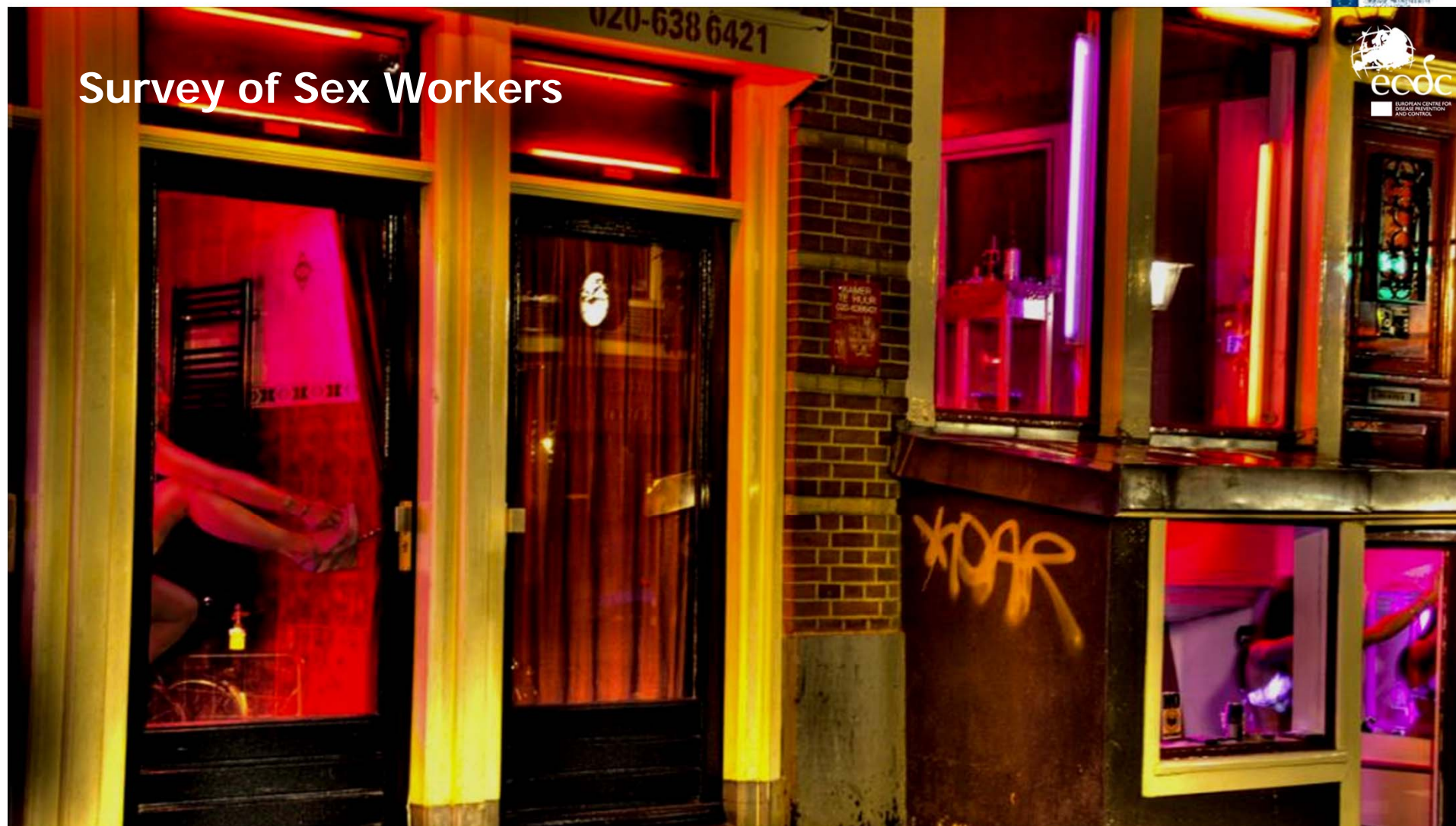
PHE-ECDC-EATG Leadership workshop: "Eliminating HIV transmission is now a reality for gay men: What has worked and how do we replicate our successes for all?"

STI pre-conference, CHAFAEA Satellite Sessions HA-REAP, EMIS, INTEGRATE

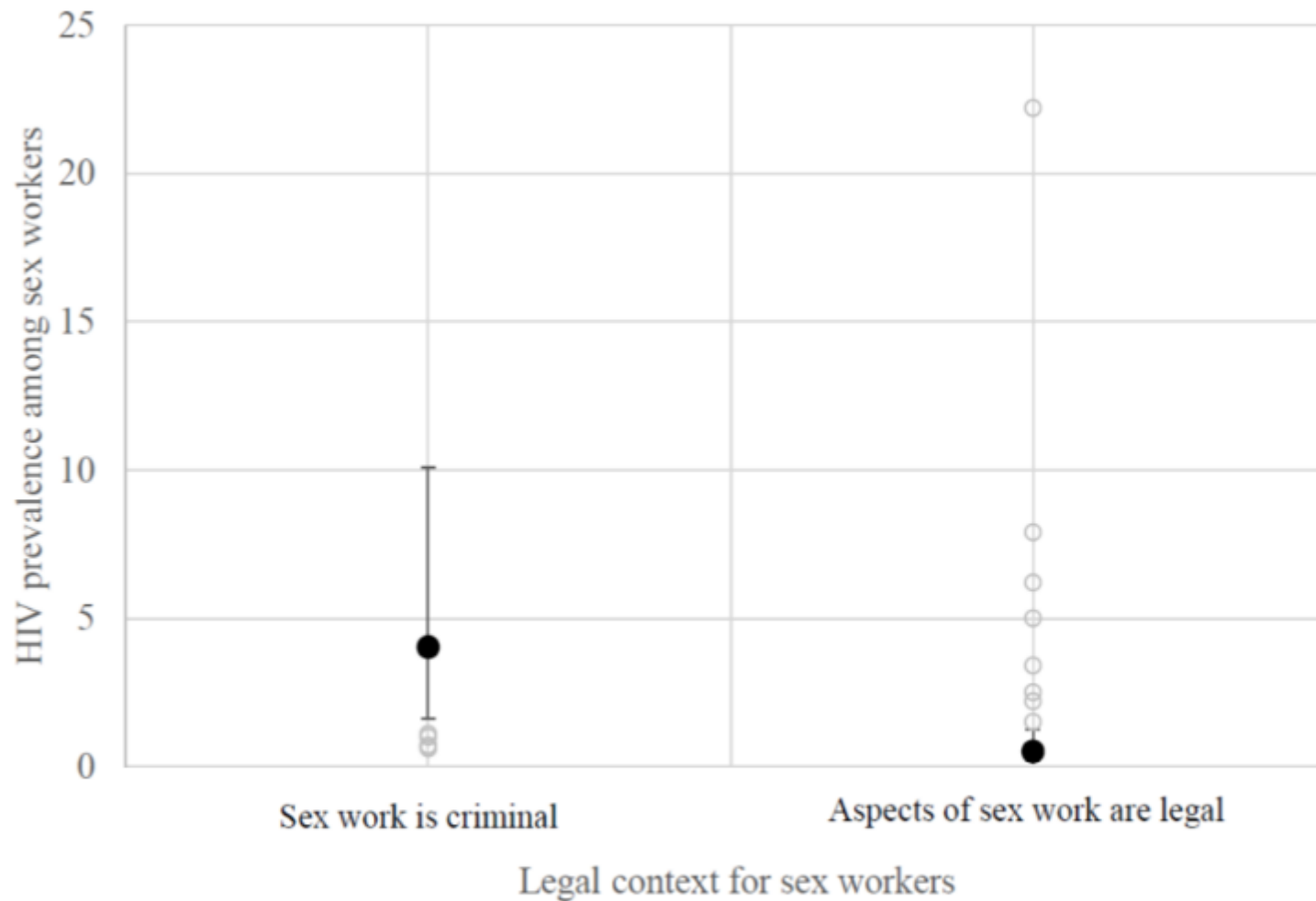
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Survey of Sex Workers



Distribution of HIV prevalence among sex workers by legal context



Notes: Solid black circle is the mean HIV prevalence among sex workers in each legal context. Vertical lines are the 95% confidence intervals. Hollow circles are country specific observations that are outside the 95% confidence intervals. Outliers above the upper limit are higher among countries that have legalized sex work.

Result summary



- Countries that have legalised aspects of sex work (n=17) have significantly lower HIV prevalence
- *than*
- countries that criminalise some or all aspects of sex work (n=10);
- $\beta = -2.09$, 95% CI -0.80 to -3.37 ; $p = 0.003$
- even after controlling for
- level of economic development ($\beta = -1.86$; $p = 0.038$) and
- the proportion of sex workers who are injecting drug users
- ($\beta = -1.93$; $p = 0.026$)

Results summary



	Unadjusted model (n=27; r ² =0.48)		Adjusted for country-level GDP (n=27; r ² =0.49)		Adjusted for prevalence of IDU in sex workers (n=22; r ² =0.52)	
	β (95% CI)	p value	β (95% CI)	p value	β (95% CI)	p value
Countries that legalise or decriminalise some or all aspects sex work (n=17)*	-2.09 (-0.80 to -3.37)	0.003	-1.86 (-0.11 to -3.62)	0.038	-1.93 (-0.26 to -3.61)	0.026

	Unadjusted model (n=27; r ² =0.54)		Adjusted for country-level GDP (n=27; r ² =0.54)		Adjusted for prevalence of IDU in sex workers (n=22; r ² =0.56)	
	β (95% CI)	p value	β (95% CI)	p value	β (95% CI)	p value
Legalise or decriminalise selling sex but not brothels (n=16)*	-1.83 (-0.38 to -3.27)	0.015	-1.84 (-0.012 to -3.68)	0.049	-1.72 (-3.72 to 0.28)	0.088
Legalise or decriminalise selling sex and brothels (n=1)*	-3.00 (-2.06 to -3.94)	<0.0001	-3.04 (-1.63 to -4.45)	<0.0001	-2.75 (-1.66 to -3.83)	<0.0001

Source: Reeves et al. National sex work policy and HIV prevalence among sex workers: an ecological regression analysis of 27 European countries. Lancet HIV. 2017 Mar;4(3):e134-e140. .

Limitations



- Sex workers are often extremely **heterogeneous**, both in the settings that they work and the control that they have over their working conditions
- HIV prevalence estimates are based on **unrepresentative samples** of hard to reach groups.
- Measuring sex work policy is difficult because two countries might differ in how strongly they **enforce** specific laws.
- Reform of sex work policy has occurred at **different times** in different countries and our analysis does not account for these temporal differences.

Survey

- The survey has 12 multiple-choice questions
- It is anonymous, and all questions are voluntary to answer
- There is no identifying information collected
- Answers are completely confidential



Survey questions



- Demographics
- Access to health care
- Drug use
- Condom use
- Exposure to violence
- STI
- Laws regarding sex work



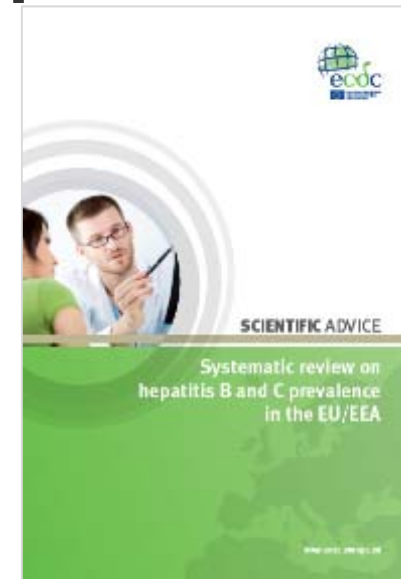


Viral hepatitis

Supporting countries to develop estimates of prevalence

- Systematic review of prevalence of hepatitis B and C among general population and key risk groups published in 2016

=many countries lacked robust estimates and many studies were undertaken using weak Methodology



- Launch of sero-prevalence project (SPHERE-C) in 2016 to develop standardised protocols for estimating hepatitis C in the general population
 - Formation of expert panel to steer the project - December 2016
 - Protocol under pilot in three countries (Bulgaria, Italy, Finland)
 - Project will be completed early 2019 – then
 - support to countries in adopting protocol and developing prevalence estimates

Prevalence database



Hepatitis B - Prevalence Database



[Introduction](#)

[General population](#)

[First time blood donors](#)

[Migrants](#)

[Men who have sex with men](#)

[Pregnant women](#)

[Prisoners](#)

[Overview and Instructions](#)

[Glossary](#)

[Back to home](#)

General population

[Study Characteristics](#)

[Prevalence Estimates](#)

[Sampling Methods](#)

[Data Sources](#)

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Year of publication

- 2015
- 2014
- 2013
- 2012
- 2011
- 2010
- 2009
- 2008

Country

- Belgium
- Croatia
- Czech Republic
- France
- Germany
- Greece
- Hungary
- Ireland

Geographical coverage

- Afragola
- Arkalochori
- Arsita
- Bagnacavallo
- Bari
- Catalonia
- Cittanova
- Flanders

Year of publication	Country	Geographical coverage	Final year of recruitment	Sampling method	Total sampled	Response rate (%)	Minimum age, years	Maximum age, years	Age group
2007	Belgium	Flanders	2002	Random	6000	30.60%	.	.	Adult
2009	Belgium	Unspecified	2003	Convenience	.	.	1	>40	Adult

The development of an EU monitoring platform for hepatitis B and C

Aims:

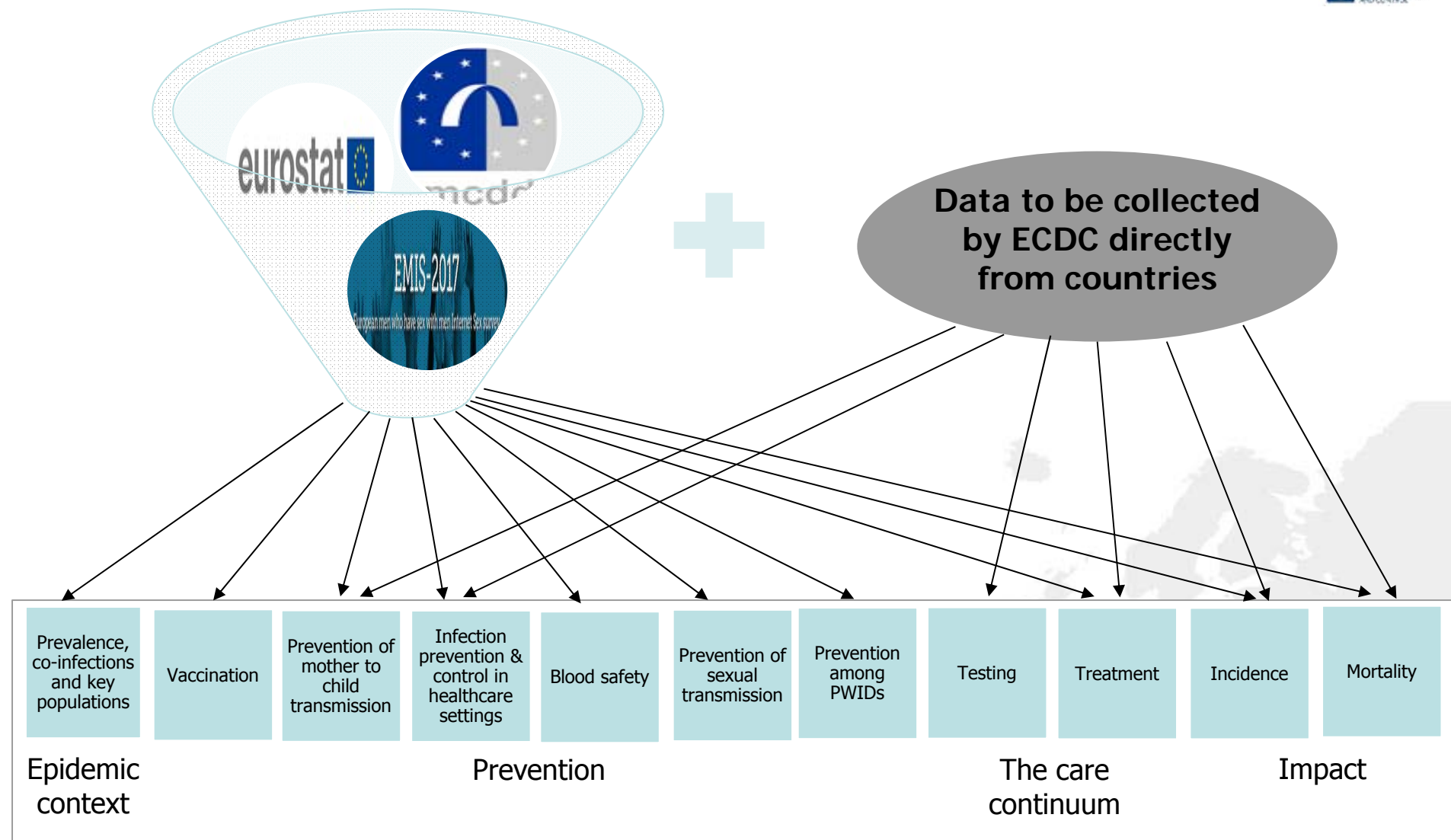
1. To support EU/EEA countries in monitoring their responses to tackling the epidemics of hepatitis B and C
2. To collect robust information to guide the European Commission, European Agencies and other organisations in working together to support countries achieve the goal of elimination

Timeline:

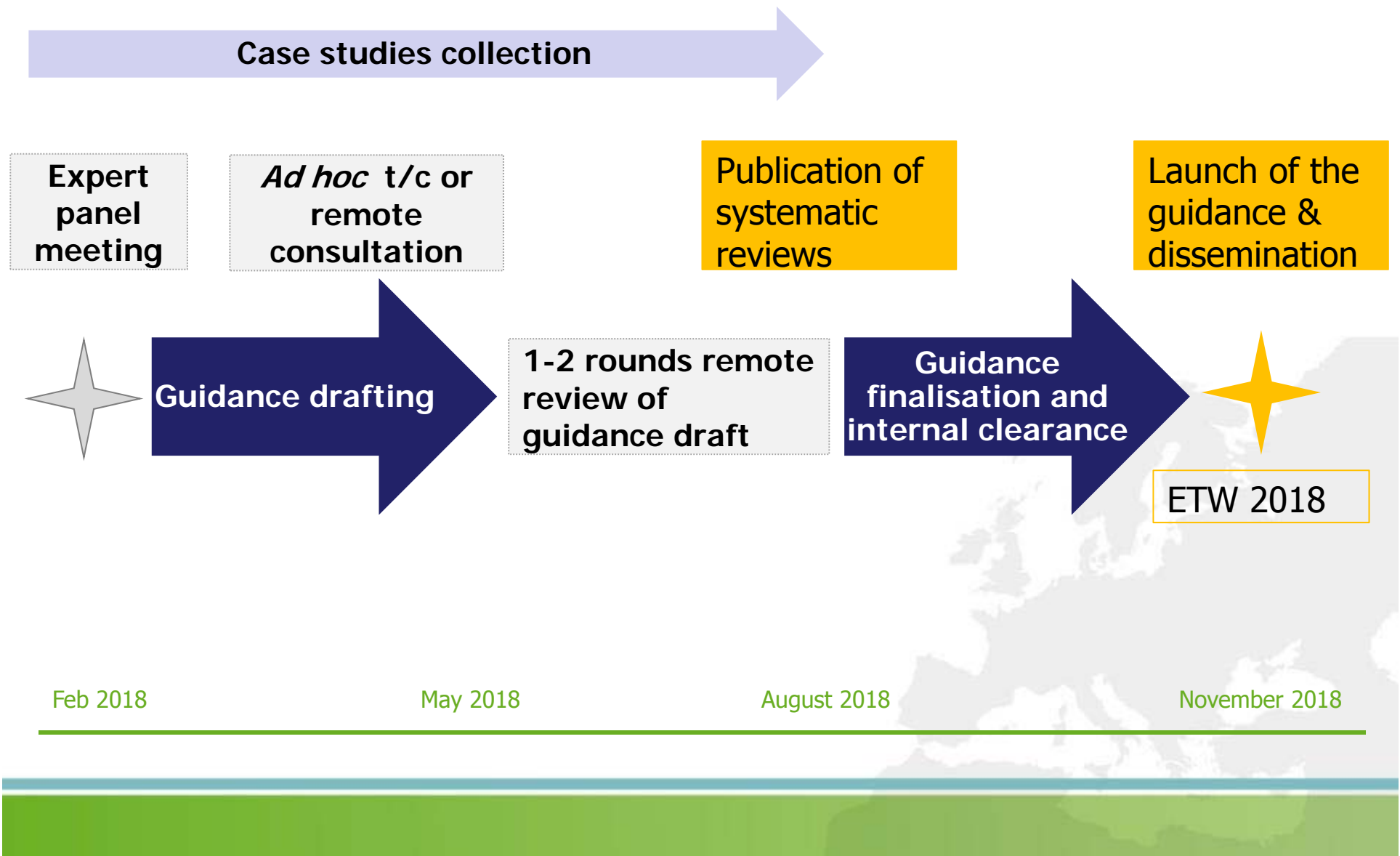
- Pilot the data collection tool - May 2018
- Collecting data from all EU/EEA countries - September 2018
- Publication of outputs – Early 2019



The model for monitoring hepatitis B and C



Hepatitis/HIV testing guidance





Thank you

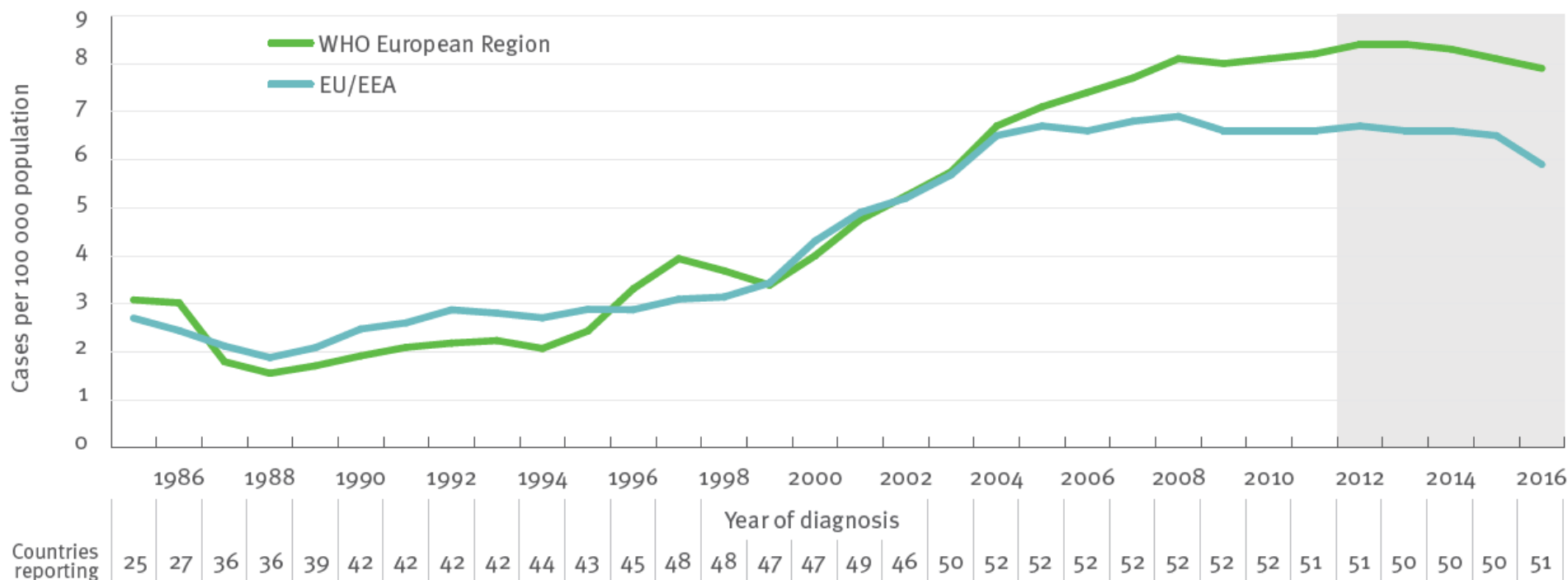
www.ecdc.europa.eu

Contact: stihivhep@ecdc.europa.eu



Strengthening the surveillance data and merging HIV and AIDS systems

Rate of new HIV diagnoses per 100 000 population, by year of diagnosis, EU/EEA and the WHO European Region*, 1985-2016



*Data are adjusted for reporting delay; data from Russia are not included

Source: ECDC/WHO (2017). HIV/AIDS Surveillance in Europe 2017– 2016 data

WHO European Region

>160 000 persons were diagnosed with HIV in 2016

West
Centre
East

17%

4%

80%



New HIV diagnoses per 100 000 population, 2016



European region: 18.2 per 100 000

New diagnoses per 100 000 population

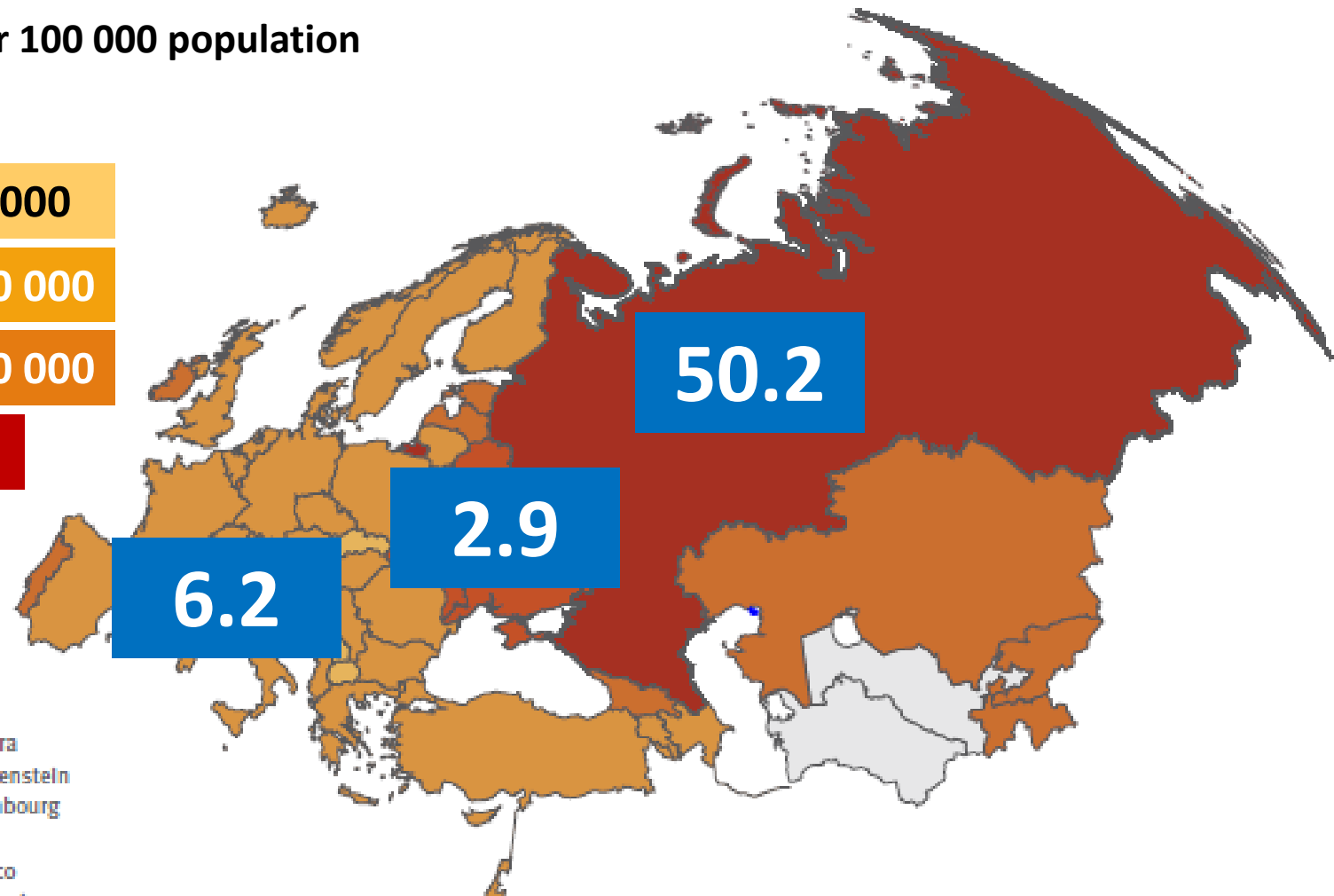
2 to <10 per 100 000

10 to <20 per 100 000

20 to <50 per 100 000

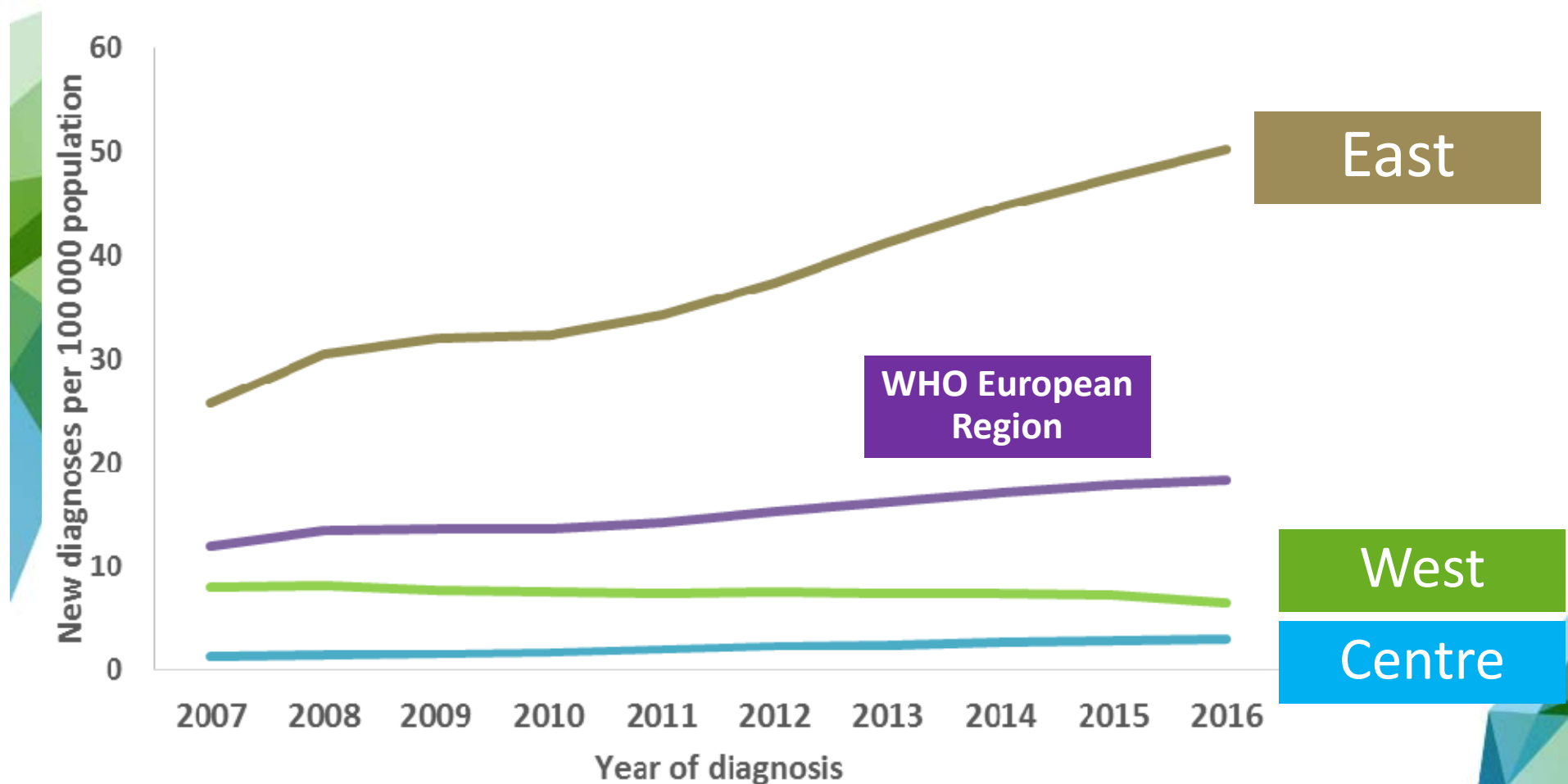
≥50 per 100 000

Andorra
Liechtenstein
Luxembourg
Malta
Monaco
San Marino



Source: ECDC/WHO (2017). HIV/AIDS Surveillance in Europe 2017– 2016 data

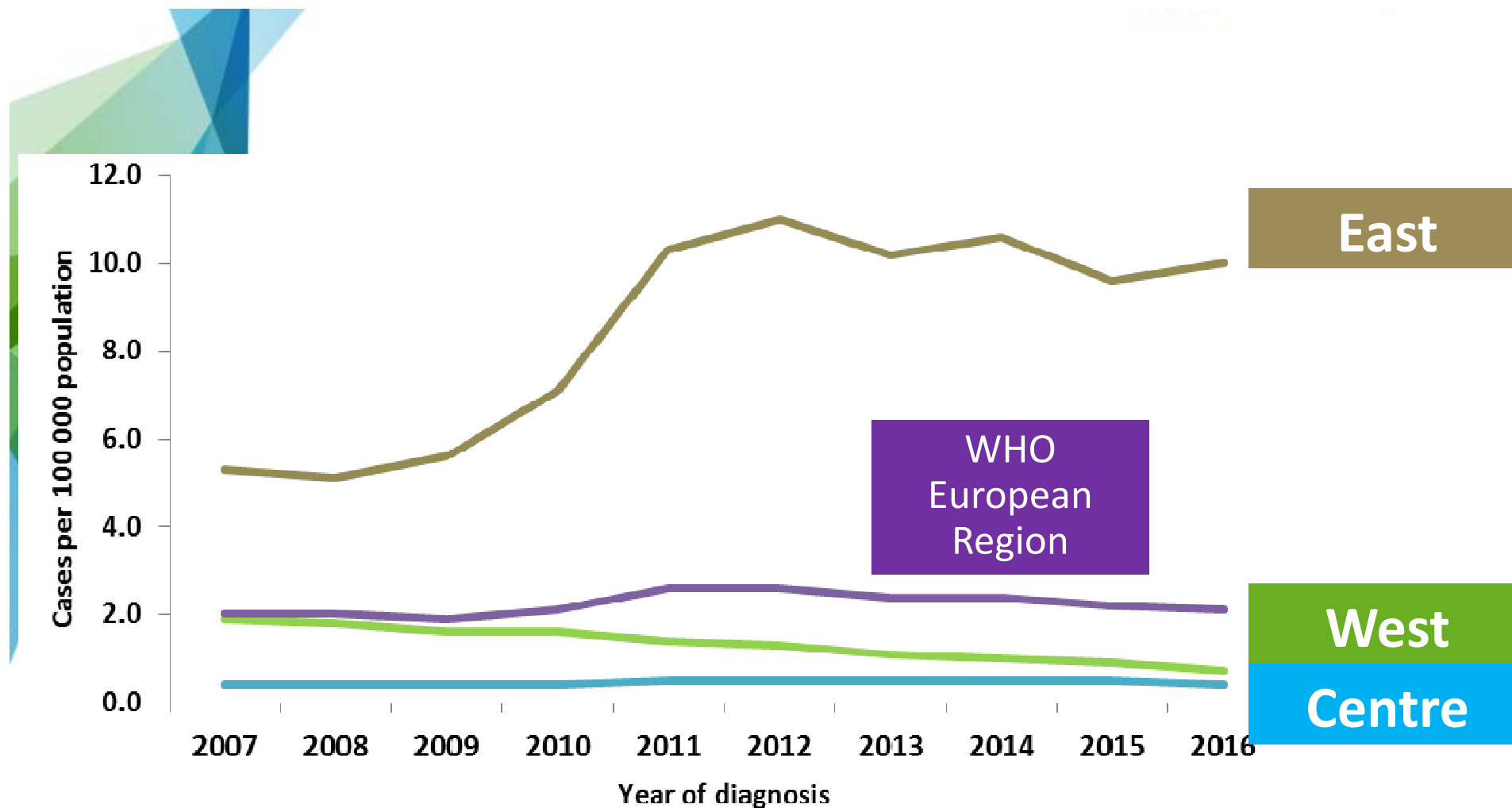
Rate of new HIV, by year of diagnosis, WHO European Region, 2007-16



* Data for Russia were obtained through the Russian Federal Scientific and Methodological Center for Prevention and Control of AIDS; Sprakva; 2017

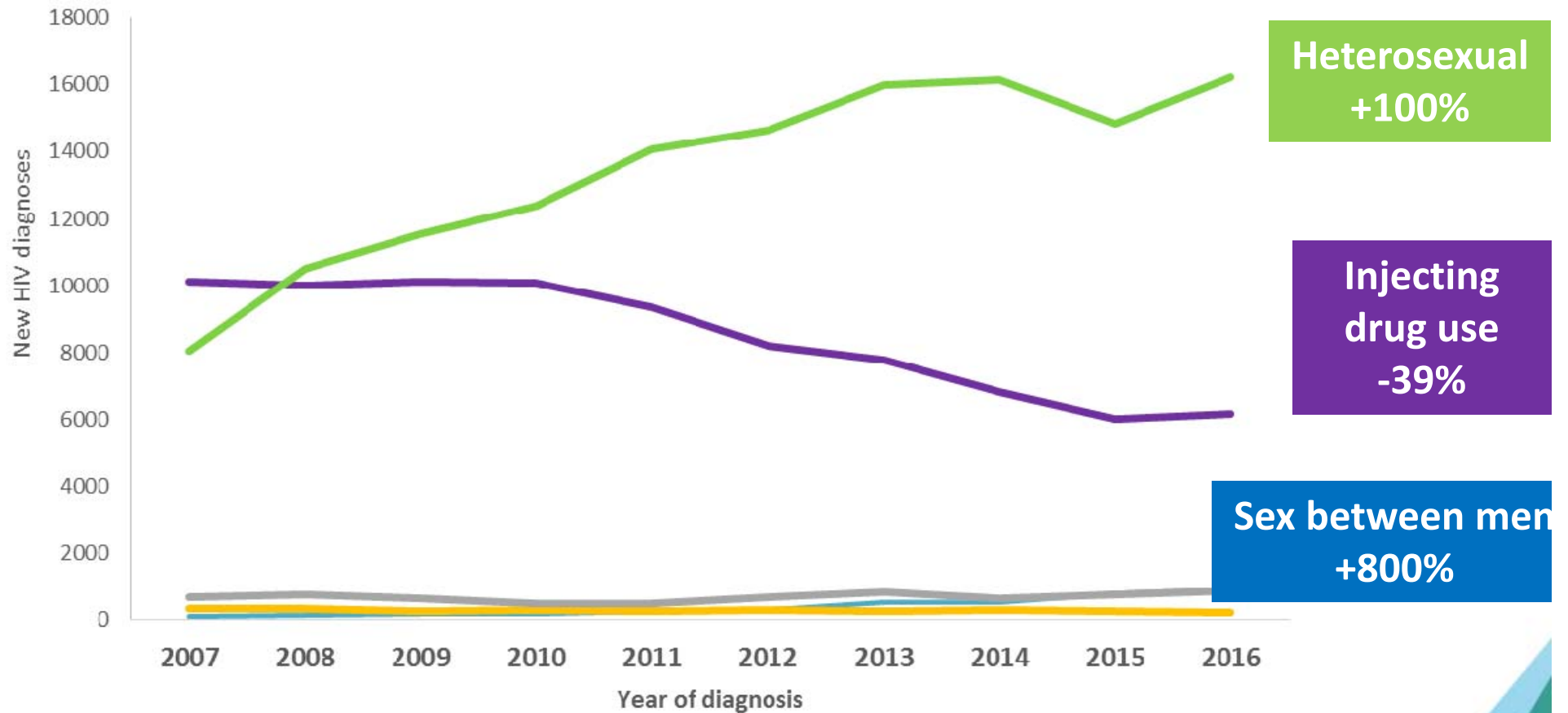
Source: ECDC/WHO (2017). HIV/AIDS Surveillance in Europe 2017– 2016 data

Rate of new AIDS, by year of diagnosis, WHO European Region, 2007-16



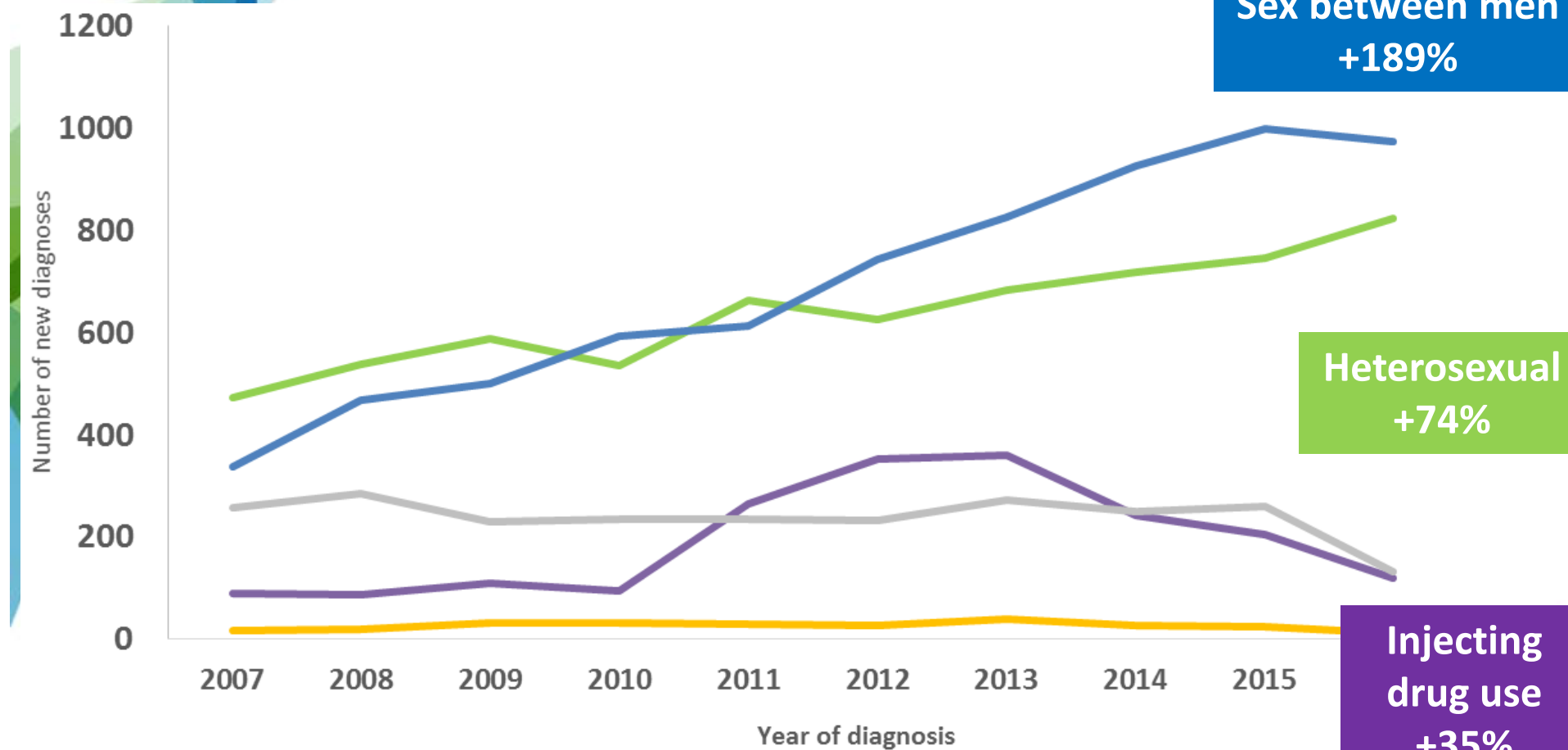
Source: ECDC/WHO (2017). HIV/AIDS Surveillance in Europe 2017– 2016 data

HIV diagnoses, Eastern Europe



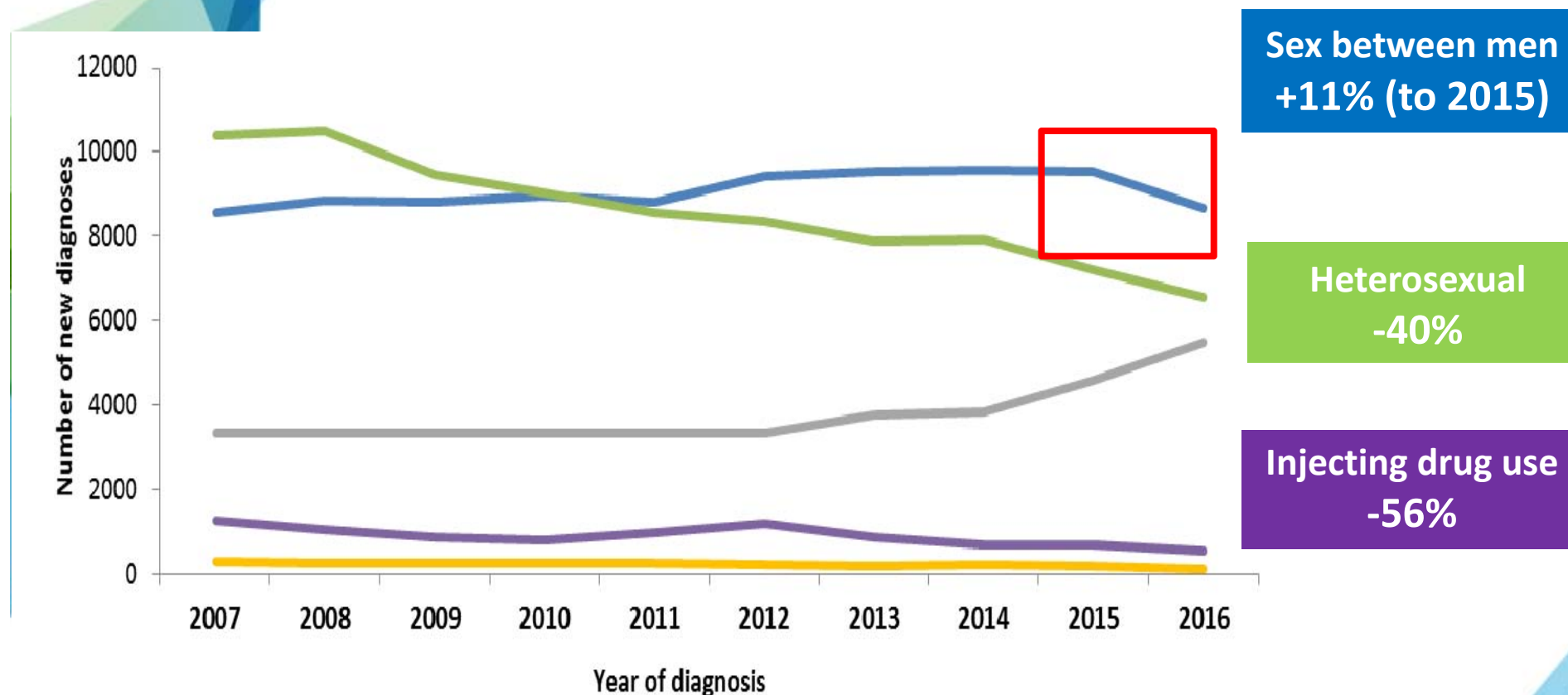
IDU-driven epidemic, with increasing heterosexual transmission

HIV diagnoses, Central Europe



MSM/heterosexual-transmission driven epidemic

HIV diagnoses, Western Europe

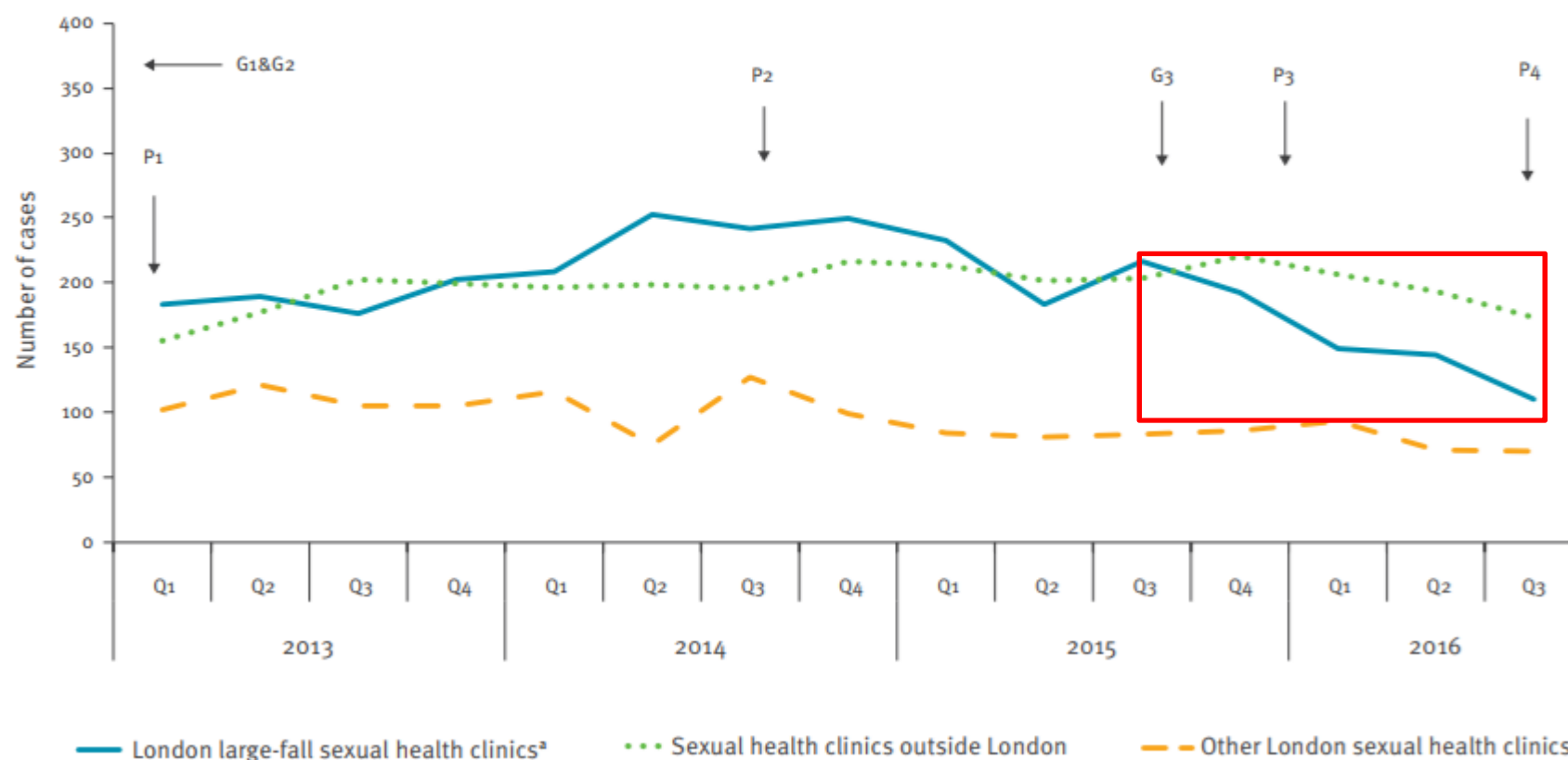


MSM are the only group where infections have increased, however....

Turning the tide?

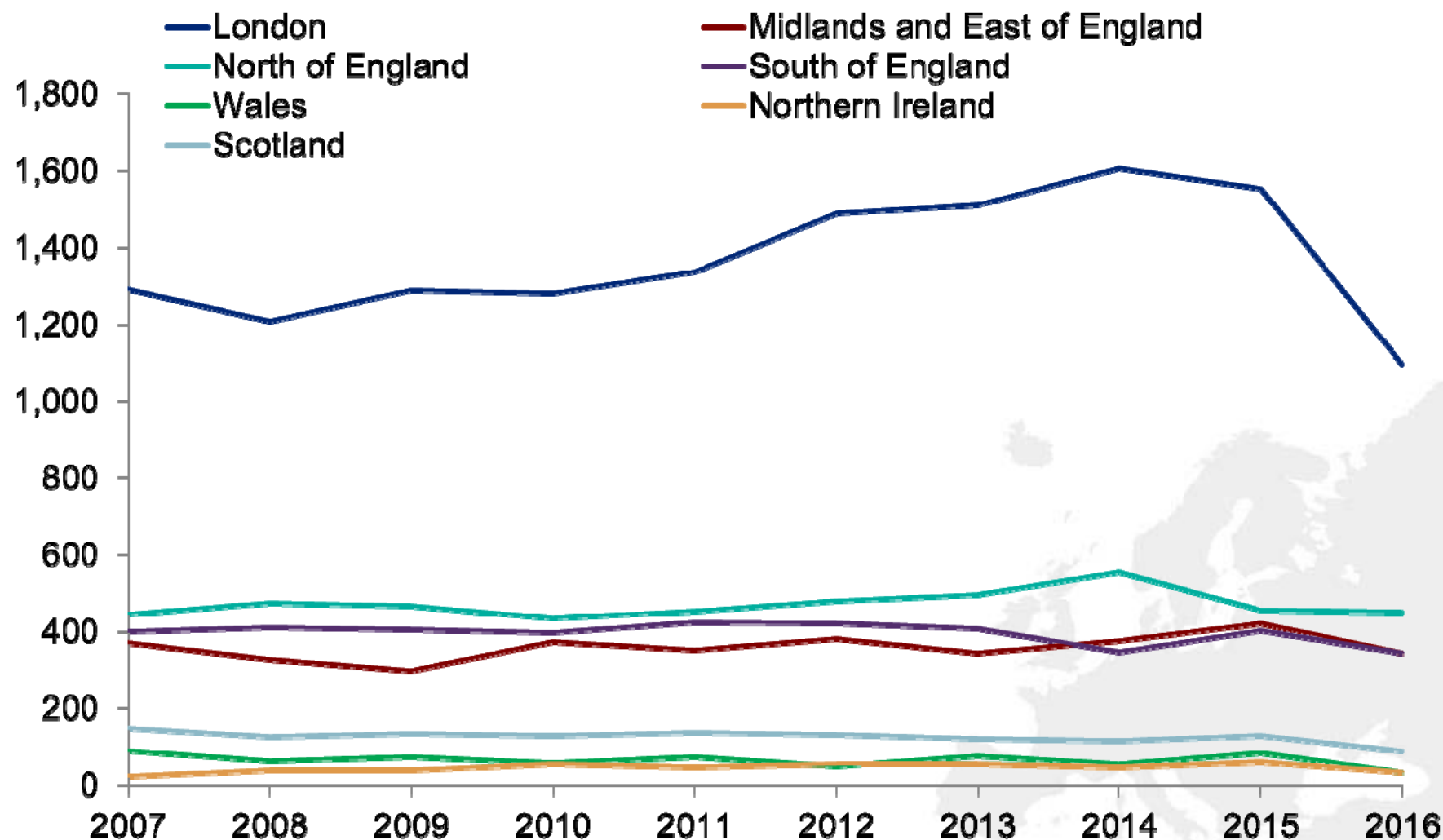
FIGURE 1

New HIV diagnoses among men who have sex with men attending sexual health clinics by year and quarter, England, 2013–2016 (n = 7,291 HIV diagnoses)

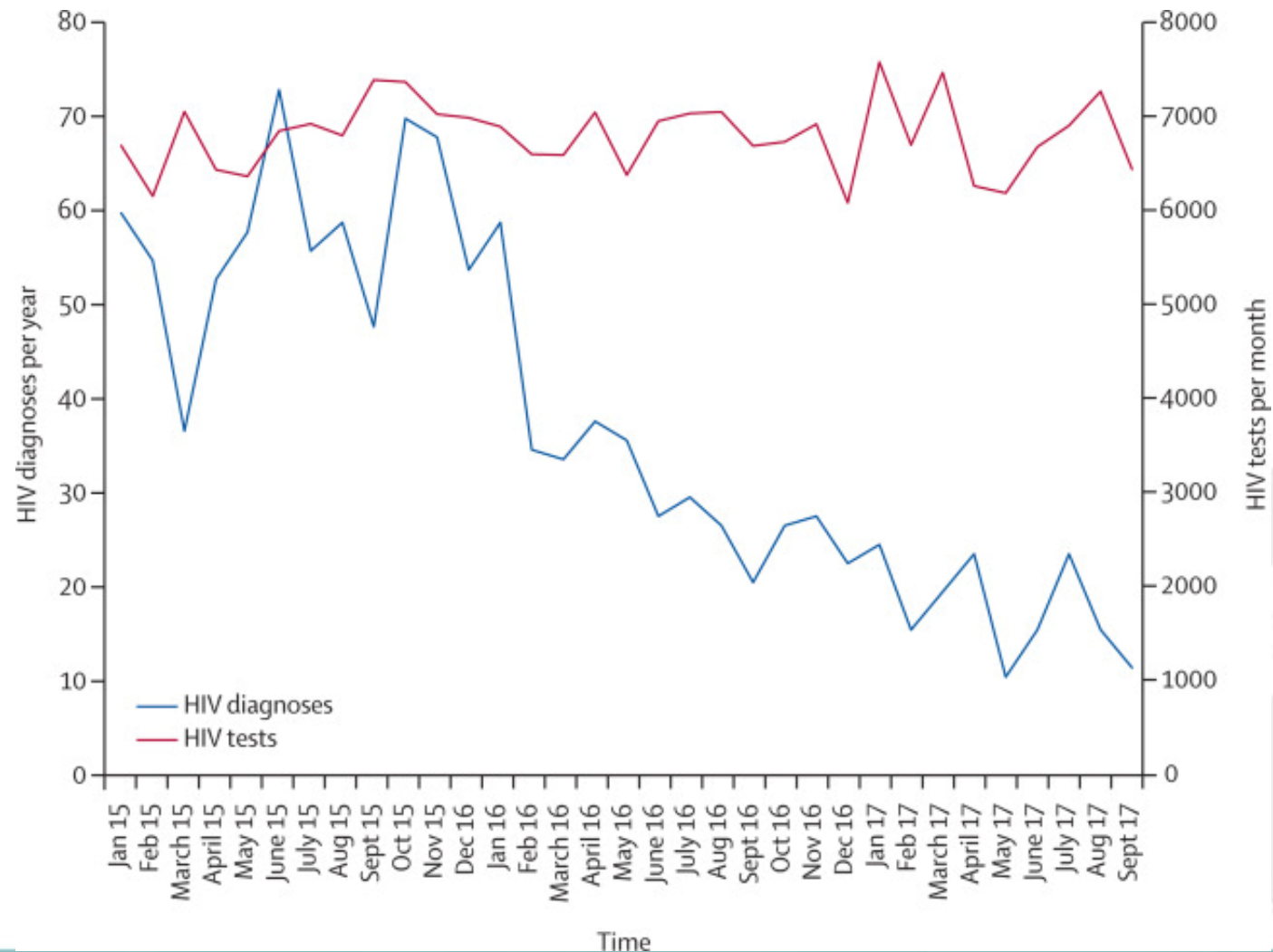


32% decrease in London infections linked to increased testing, immediate ART, PrEP

Geographical trends of new HIV diagnosis among gay/bisexual men: United Kingdom, 2007-2016

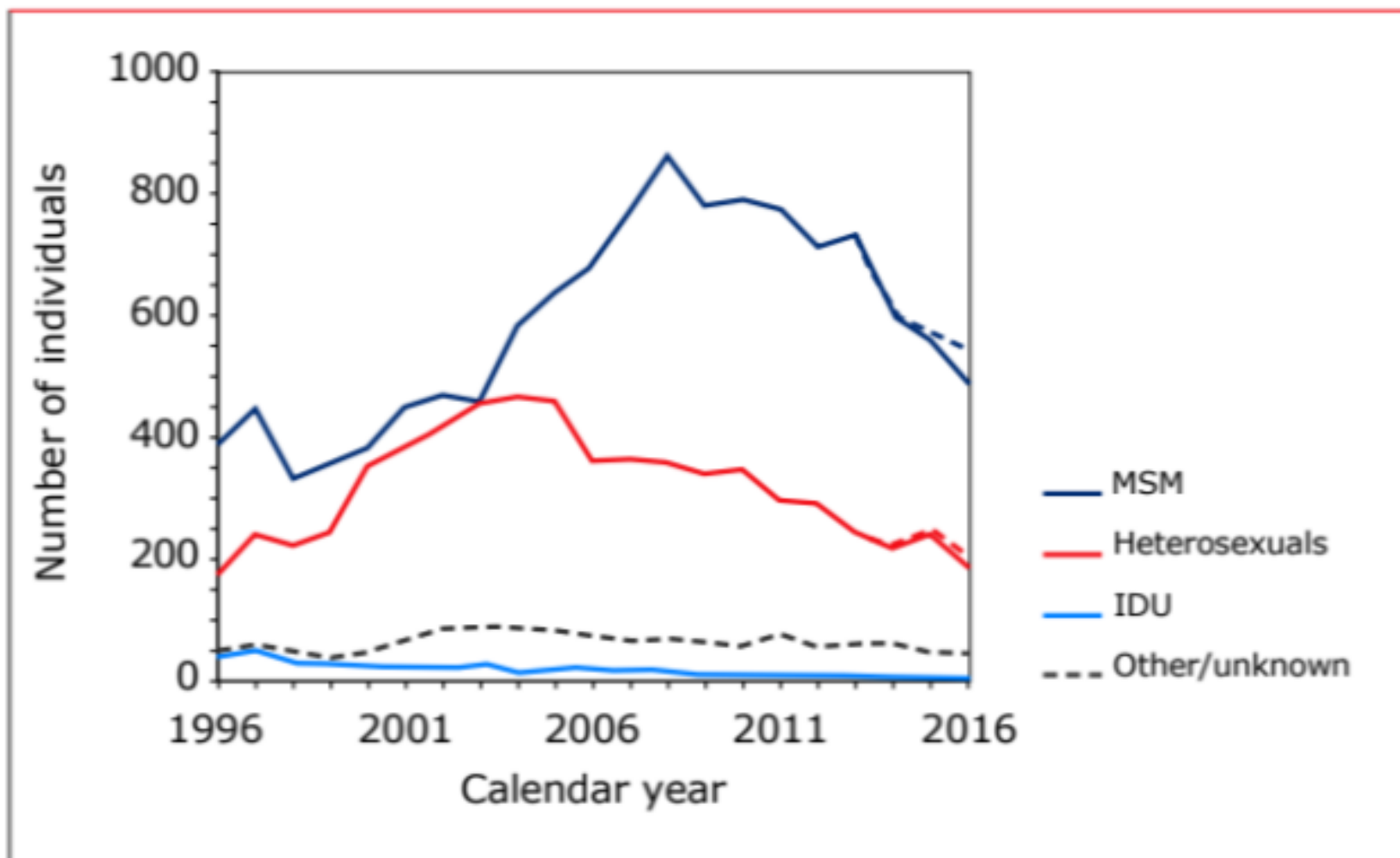


HIV diagnoses at the 56 Dean Street service in London, UK



Source: Nwokolo N, et al. Rapidly declining HIV infection in MSM in central London. Lancet. 2017

Number of HIV diagnosis, by mode of transmission. Netherlands.



Legend: MSM=men who have sex with men; IDU=injecting drug users.

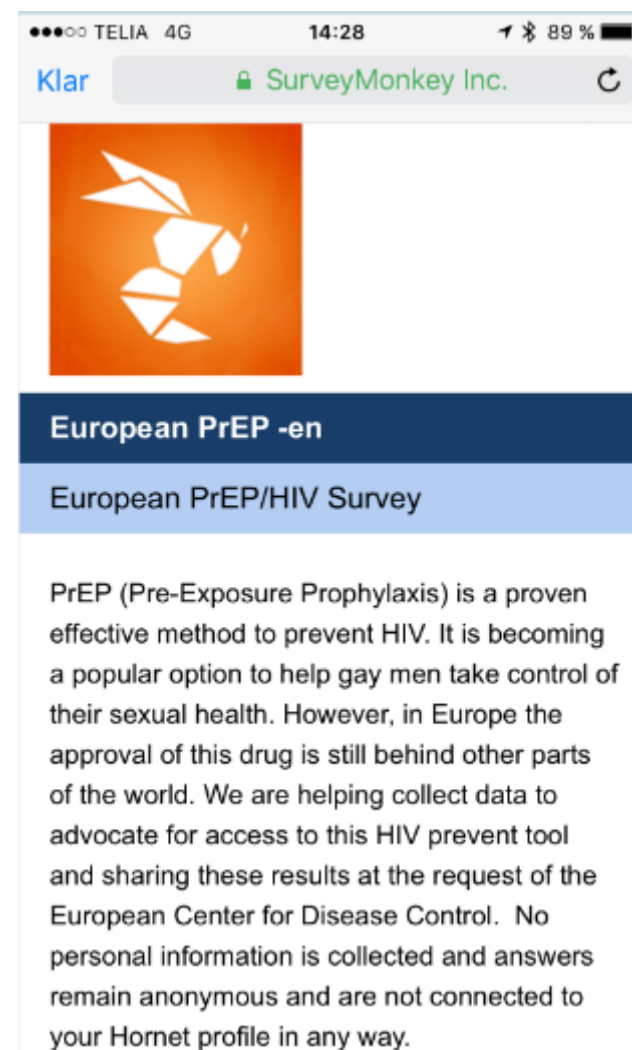
Supplementing surveillance data with data from non- traditional sources

Collaboration with dating apps



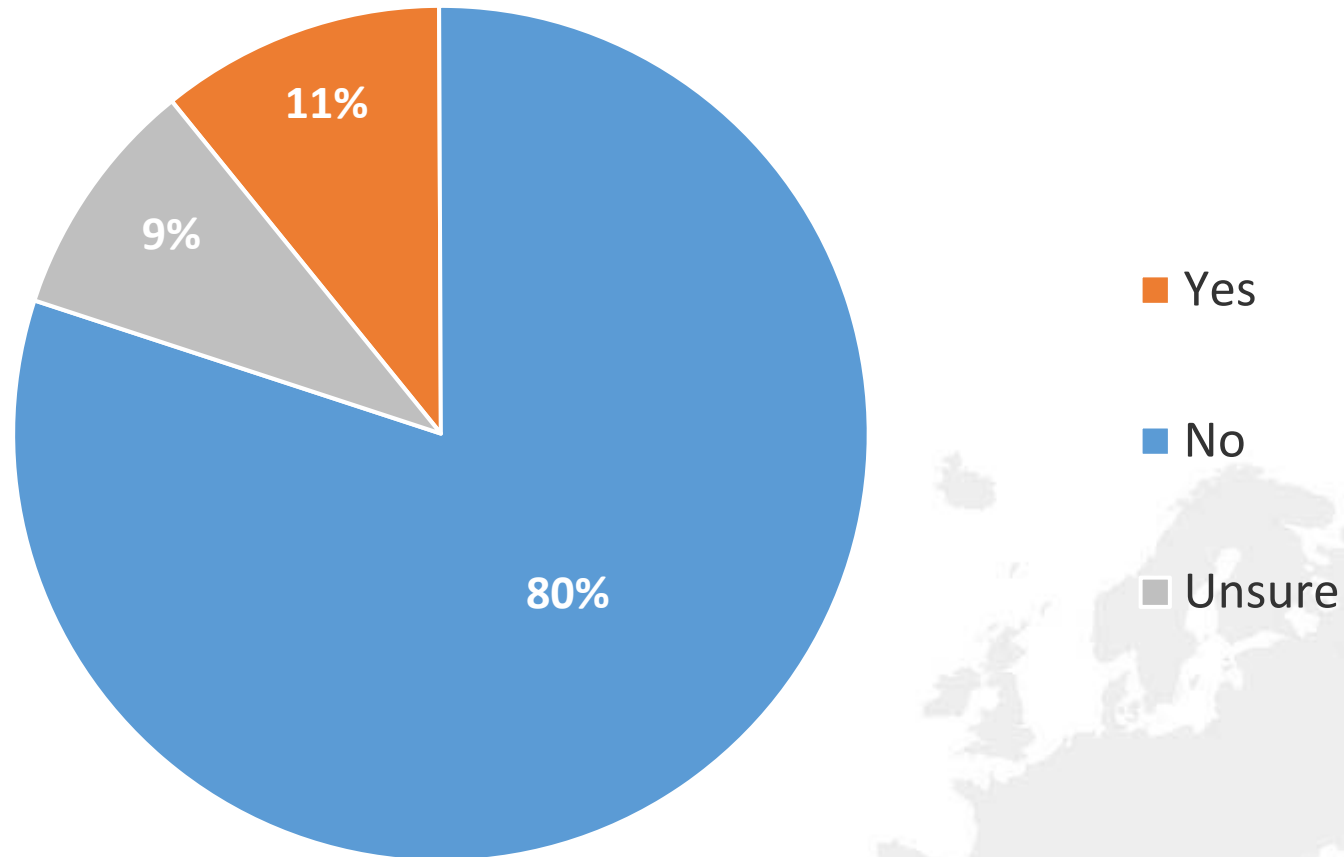
Hornet/ECDC survey on PrEP

(16 June –17 August, 2017)



Are you HIV positive?

11,973 MSM responded to this question

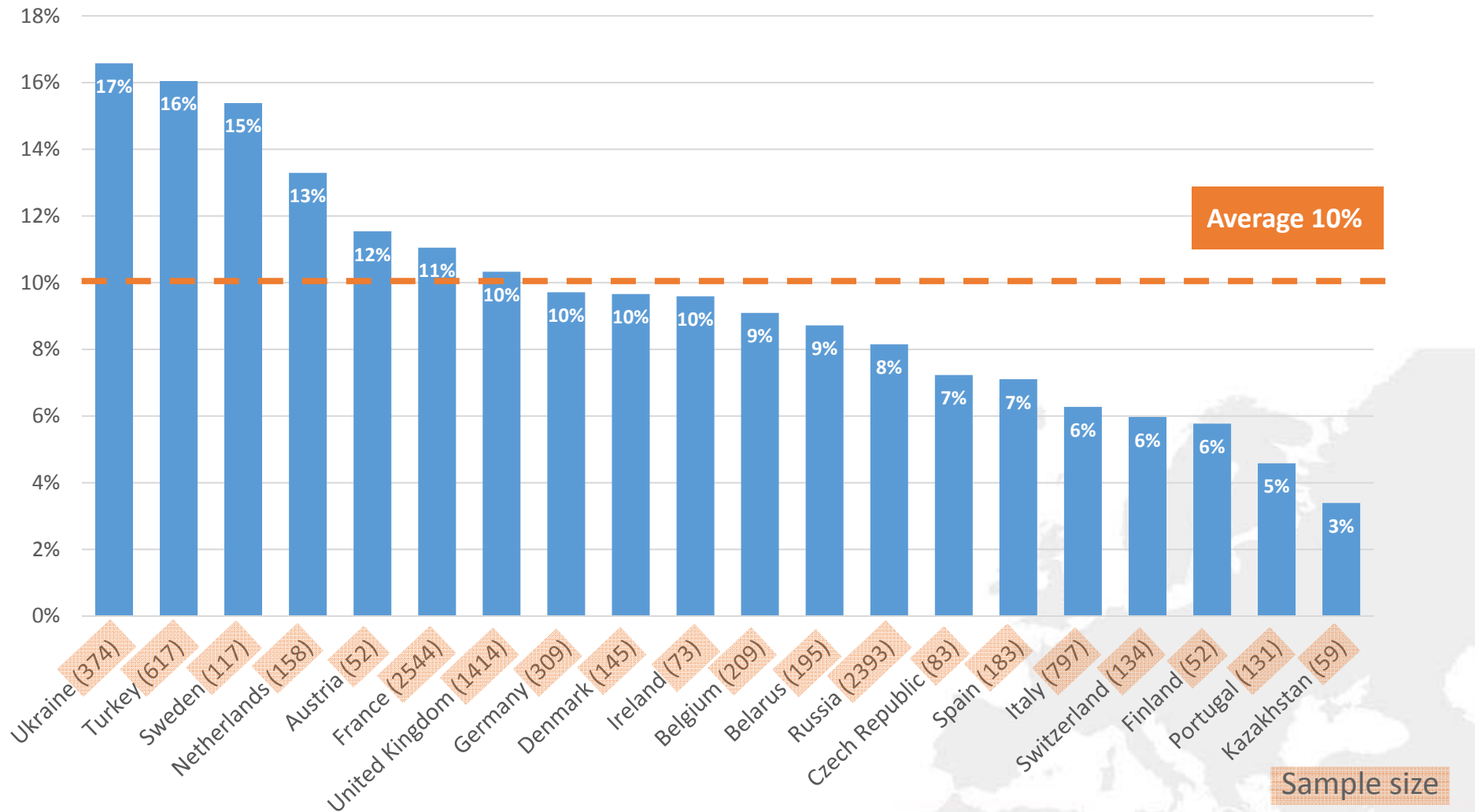


Are you currently taking PrEP?

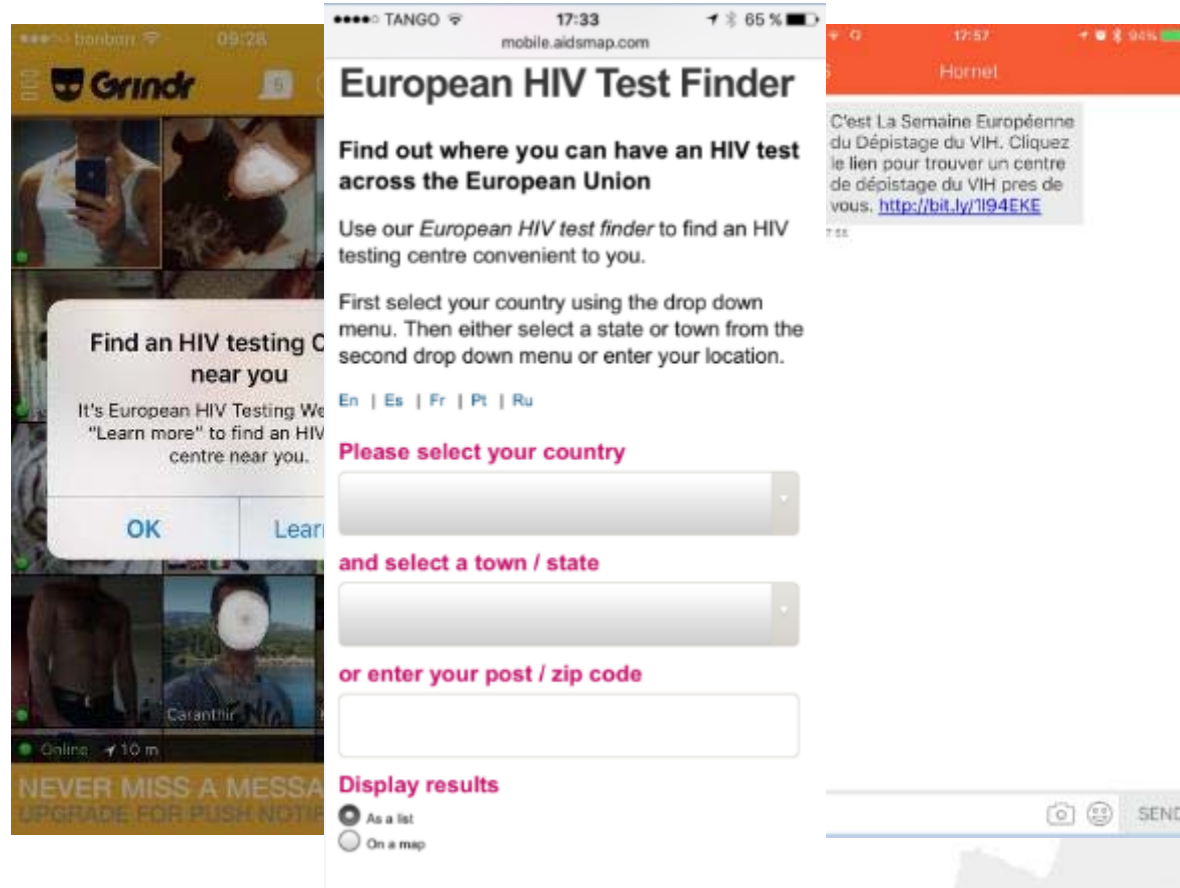
By country with >50 respondents taking PrEP



n= 10,039 (excludes HIV-positive respondents and non-responders)



Collaboration has other benefits e.g. promoting HIV Test Finder



Conclusions



- Case based surveillance in Europe is of a very high standard and provides acceptably good evidence (e.g. falling incidence in MSM in select countries)
- Surveillance must continue to evolve in order to remain relevant and useful
- The demand for data, indicators and targets is greater than ever – surveillance data is not enough and must be supplemented by other sources of data

Acknowledgements



Dublin Declaration focal points in Europe and Central Asia

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