



Tuberculosis today: Where do we stand in Germany, Europe and globally? Analysis of surveillance data

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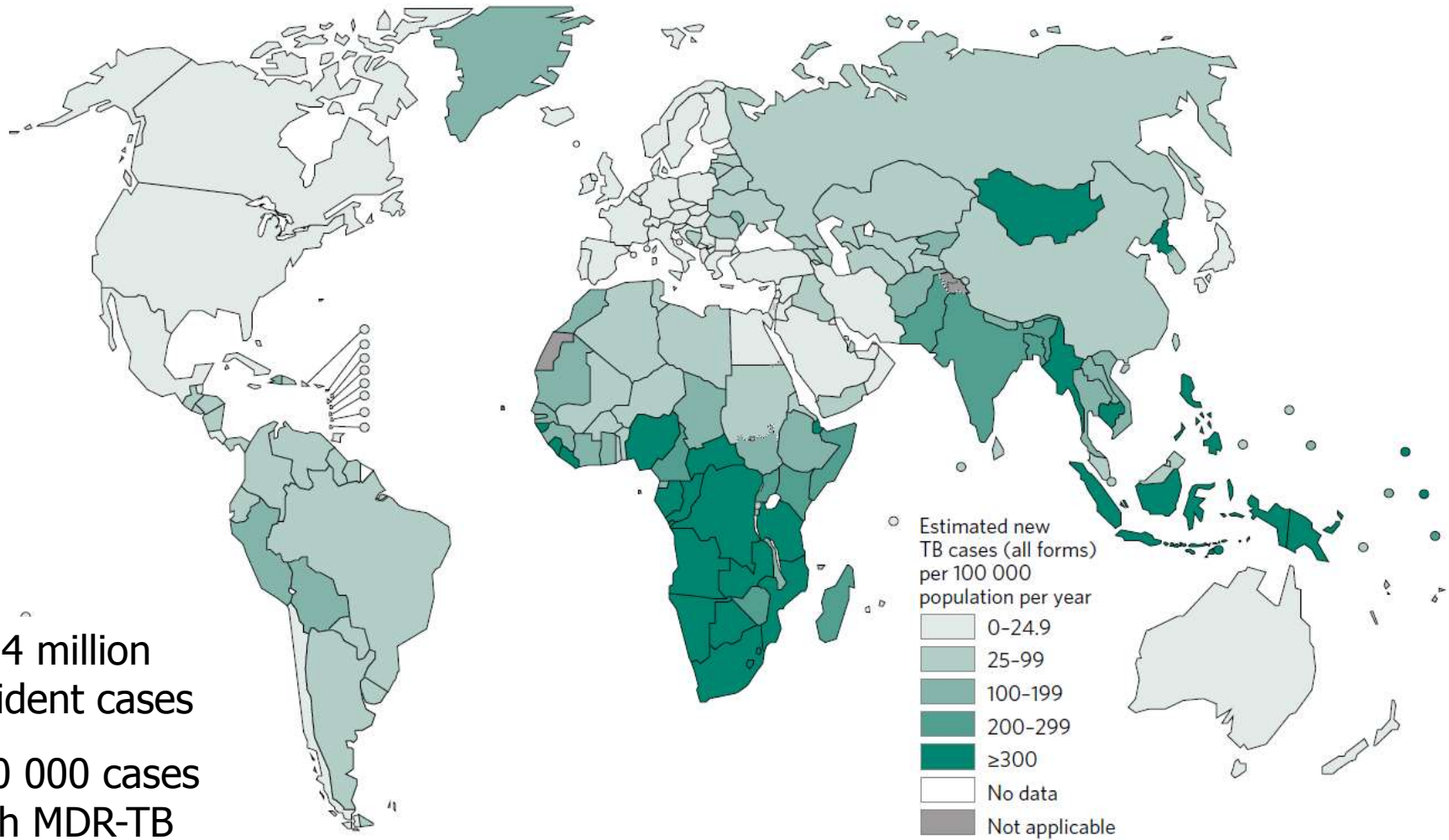
Düsseldorf, 14 February 2017

Outline

- TB in the world
- TB in Europe and Germany
 - EU/EEA surveillance
 - Key epidemiological findings
- Summary



Estimated TB incidence rates, 2015



- 10.4 million incident cases
- 480 000 cases with MDR-TB
- 11% HIV positive

EU/EEA surveillance of TB

- Annual collection of case-based data from 28 EU Member States, Iceland and Norway
Demographics, TB site, treatment history, lab confirmation, HIV status, drug susceptibility*, treatment outcome
- Harmonisation across countries through standard EU case definition (and WHO definitions), reporting protocol and lab EQA
- Thorough data validation with providers
- Dissemination through
 - ECDC Surveillance Atlas
 - Annual enhanced surveillance report (jointly with WHO/Europe)
 - Scientific articles



**EU28 +
2 EEA**



**Data
collection**

**TESSy &
WHO Global TB
database**

**Data
validation**



**Data
analysis**

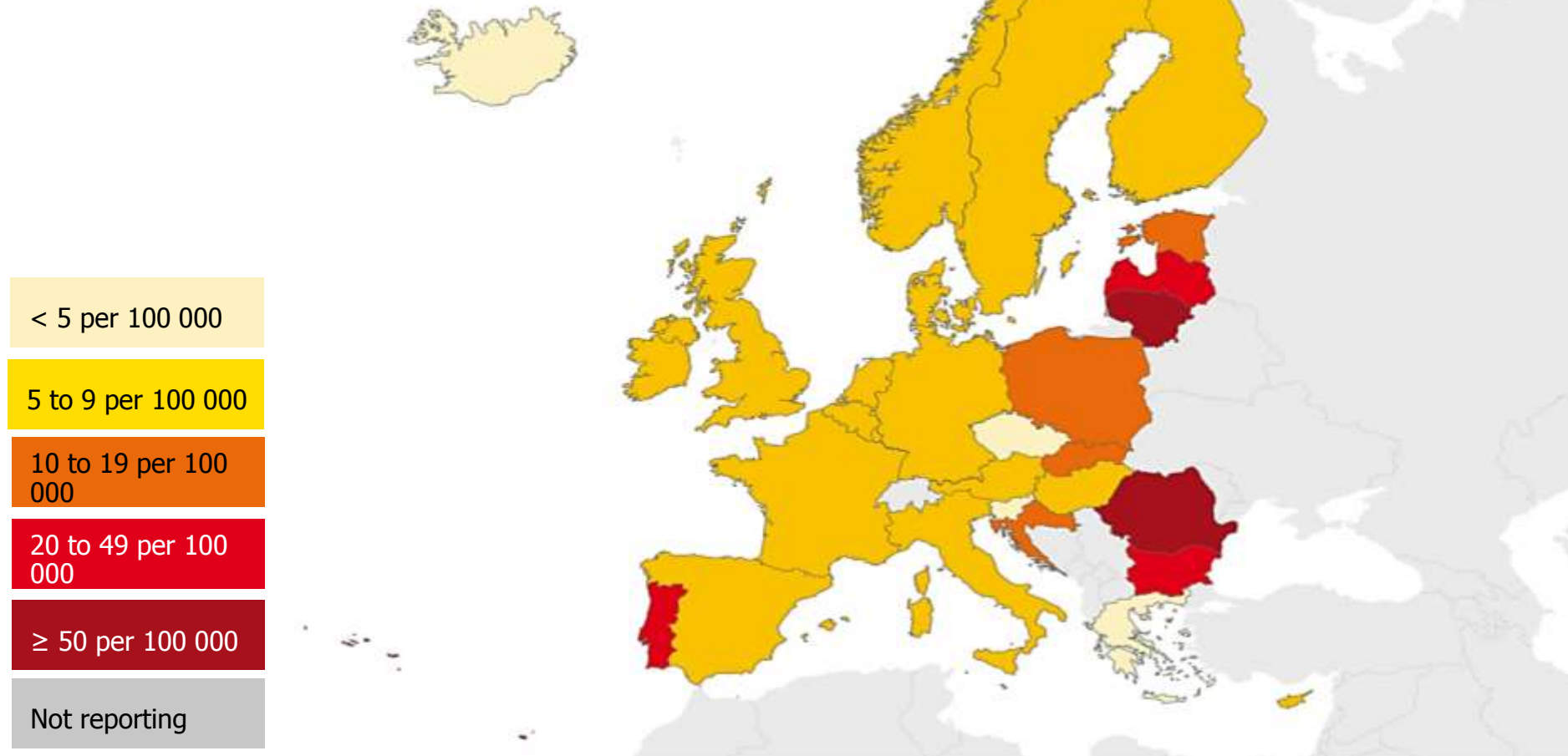


Reporting

* Some drug susceptibility data are collected via WHO database

TB notifications, EU/EEA, 2015

60 195 TB cases notified in 30 EU/EEA countries
Notification rate of 11.7 per 100 000 population
(range 2.1–76.5)

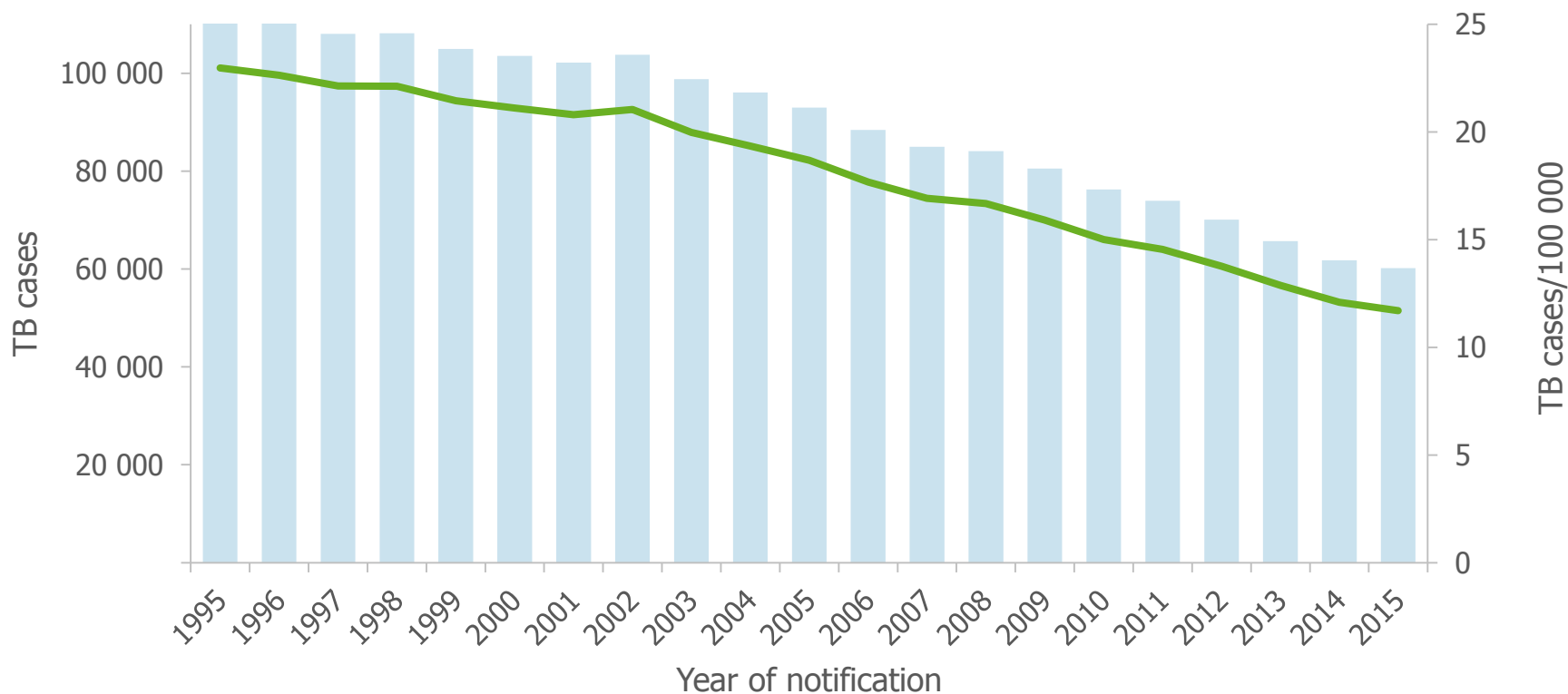


TB notifications (number and rate) by year, EU/EEA, 1995-2015



Steady decline between 1995 and 2015:

- number of TB cases decreased by **45%**
- notification rate decreased by **49%**



Annual change in TB notification rates, EU/EEA, 1995 - 2015

Average notification rate per 100 000 population declined **3.3** percent annually (range - 7.7% to 5.2%)

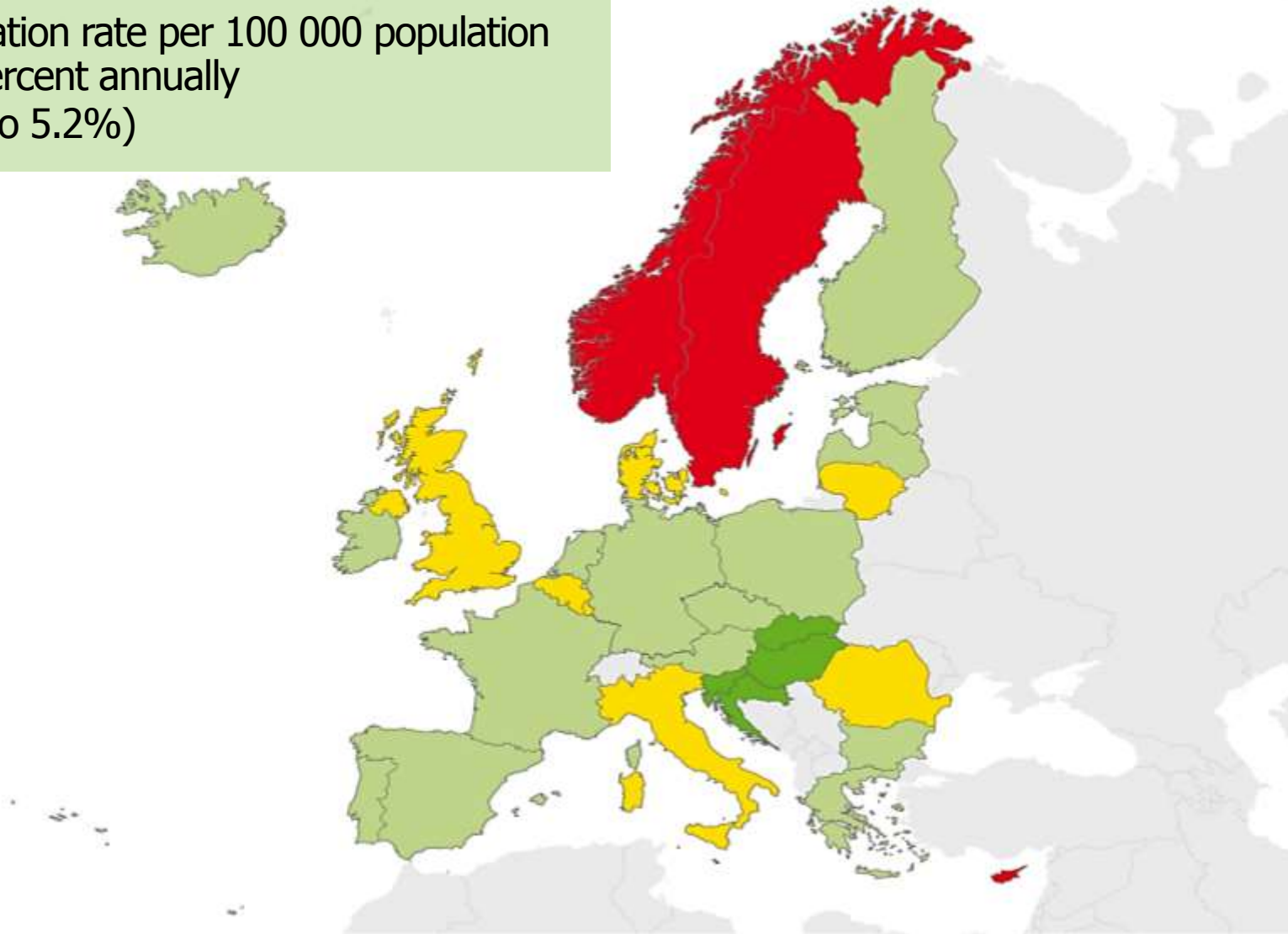
< -5%

-5 to -2%

-2 to 0%

> 0%

Not reporting



Confirmed TB cases*, EU/EEA, 2015

66.9% of the reported TB cases were laboratory confirmed (range 42.9–91.5%)

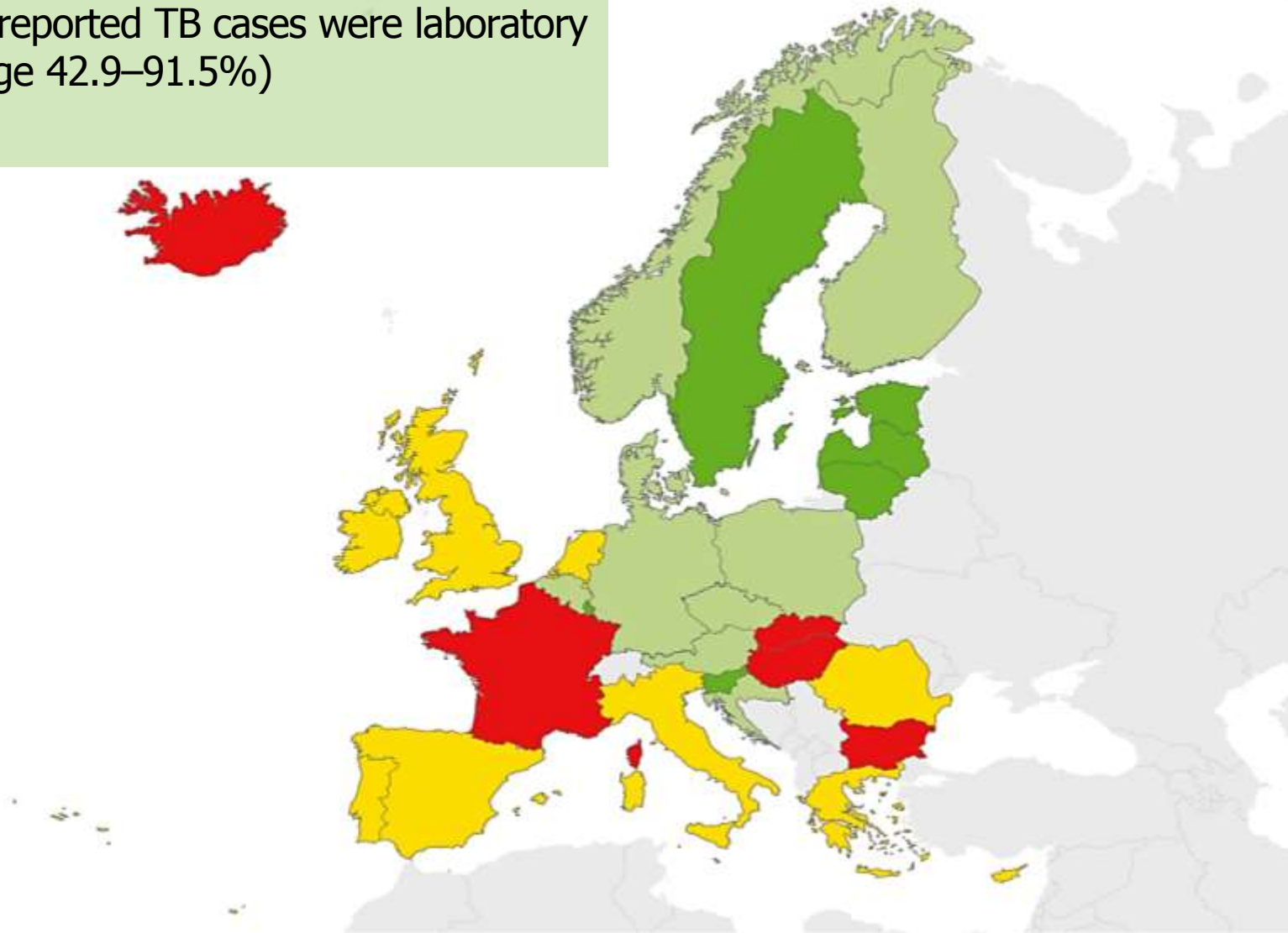
< 60%

60 to 69%

70 to 79%

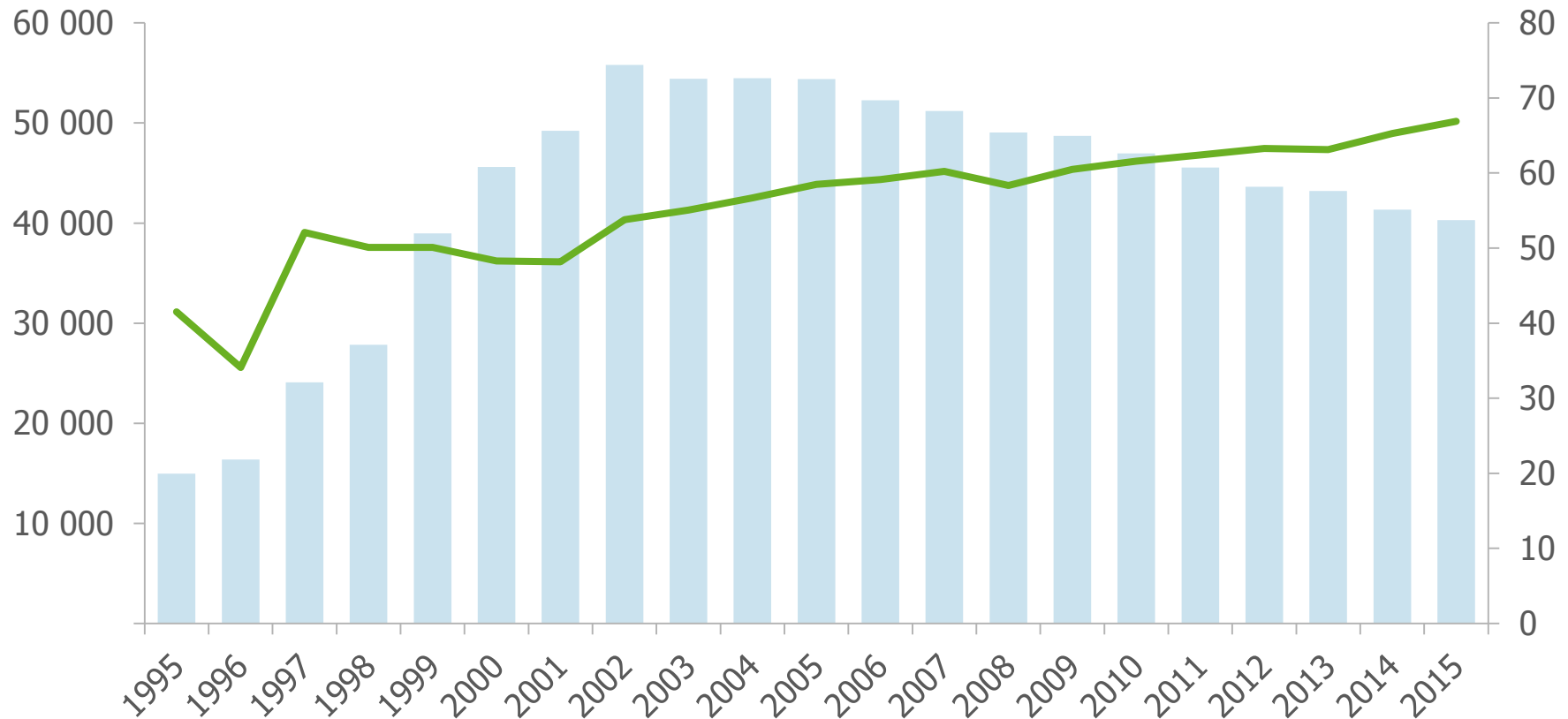
≥ 80%

Not reporting



Confirmed TB cases (number and %) by year *, EU/EEA, 1995-2015

Percentage of "laboratory-confirmed" cases increased from 41.5% in 1995 to 66.9 % in 2015



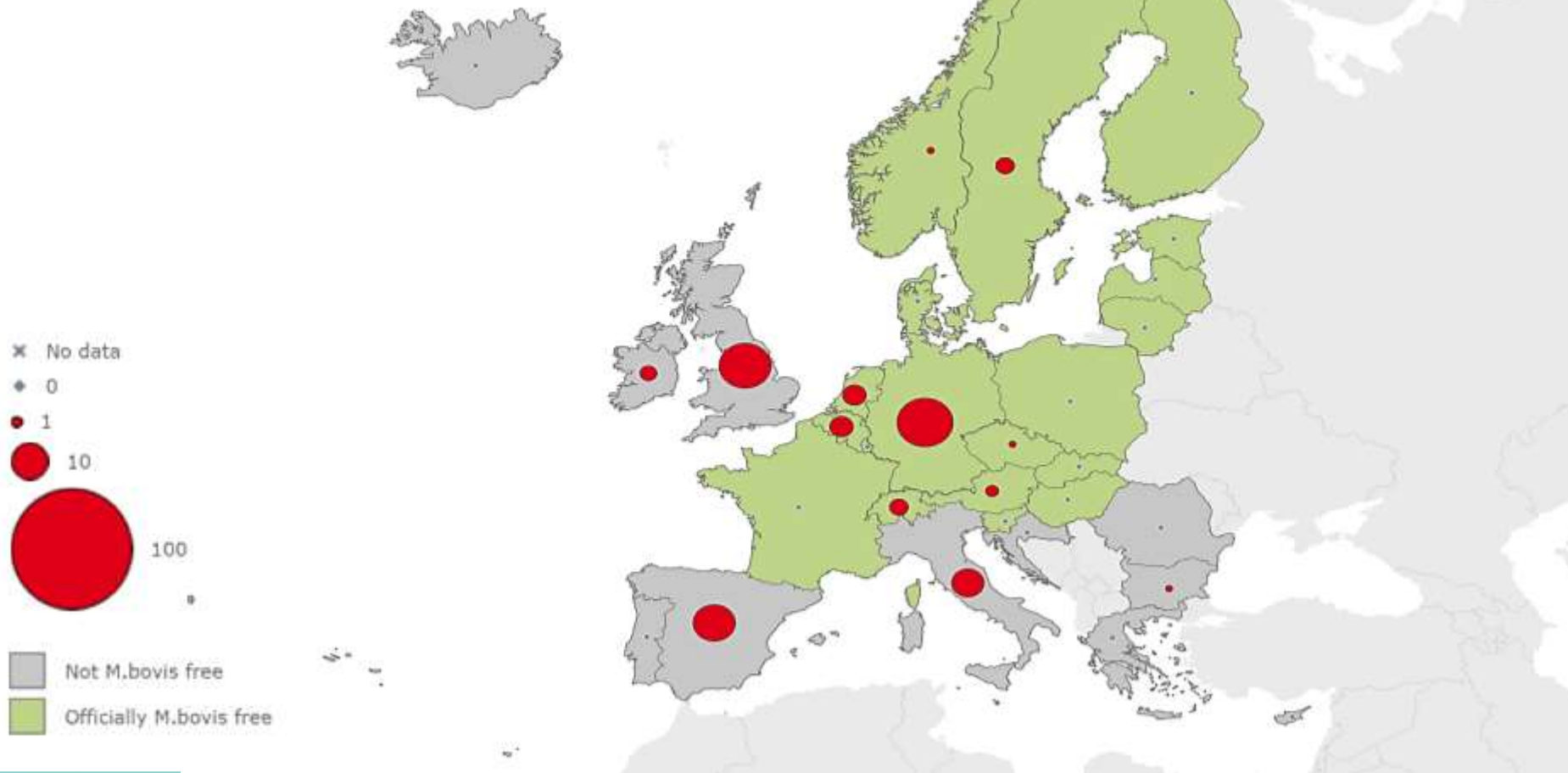
Tuberculosis caused by *M. bovis*, 2015



- 14 pathogens of human diseases are collected and analysed in the zoonoses report by ECDC including *M. bovis* human cases
- 171 confirmed human cases caused by *M. bovis* in 2015 in EU/EEA, 0.03 cases per 100 000 population
- There was no clear association between a country's OTF status (OTF; Officially bovine tuberculosis free in cattle) and its notification rate in humans

Tuberculosis caused by *M. bovis*, EU/EEA 2015

171 TB cases notified in 26 EU/EEA countries
Notification rate of 0.03 per 100 000 population
(range 0.01–0.11)



Extrapulmonary TB cases, EU/EEA, 2015

13 347 Extrapulmonary TB cases

22.2% of all TB cases (range 2.8–46.4%)

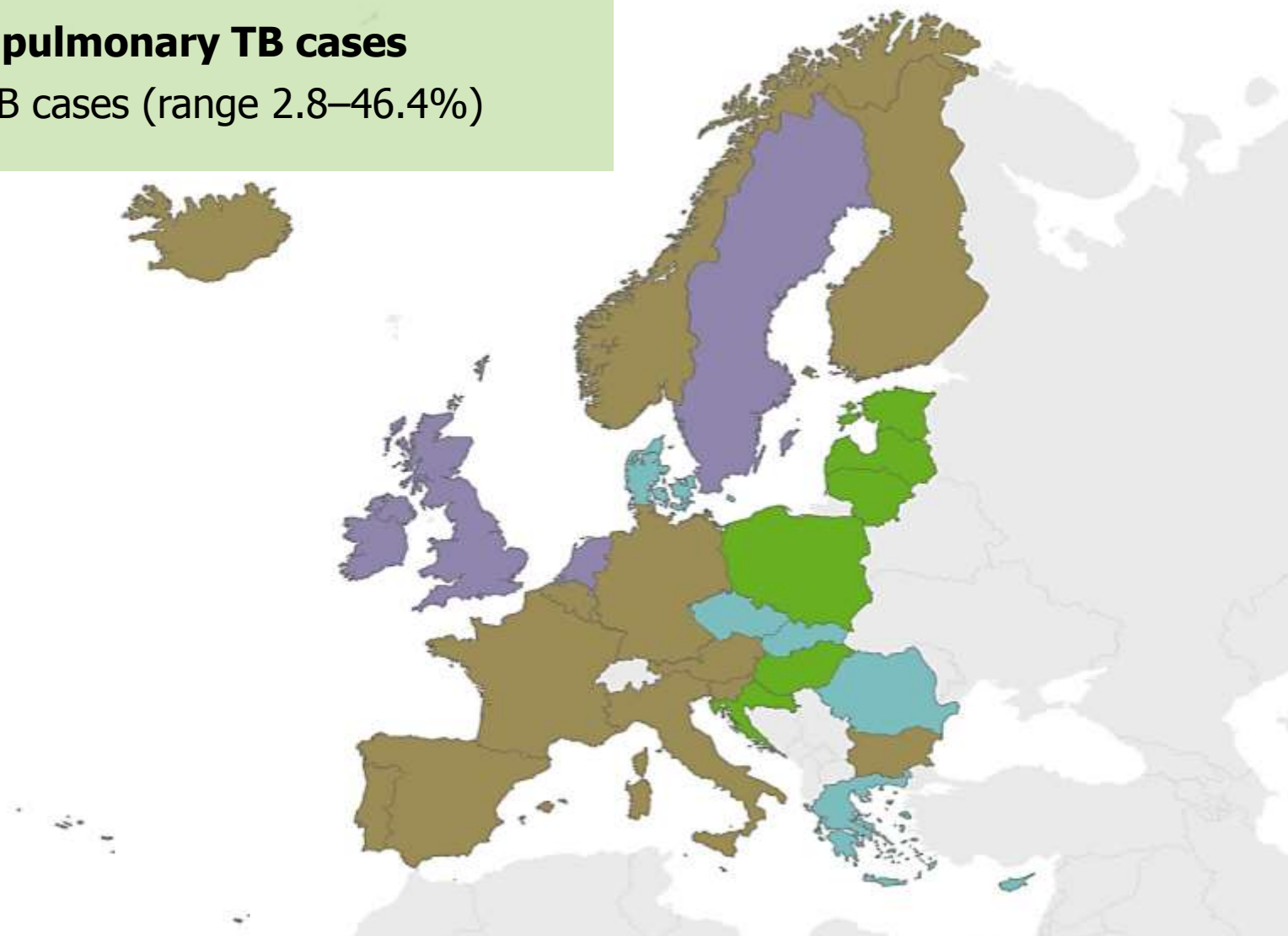
0 to 9.9%

10 to 19.9%

20 to 29.9%

≥ 30%

Not reporting



Percentage of previously treated TB cases by country, EU/EEA, 2015

11.1% of reported cases had been previously treated (range 0.0–21.7%)

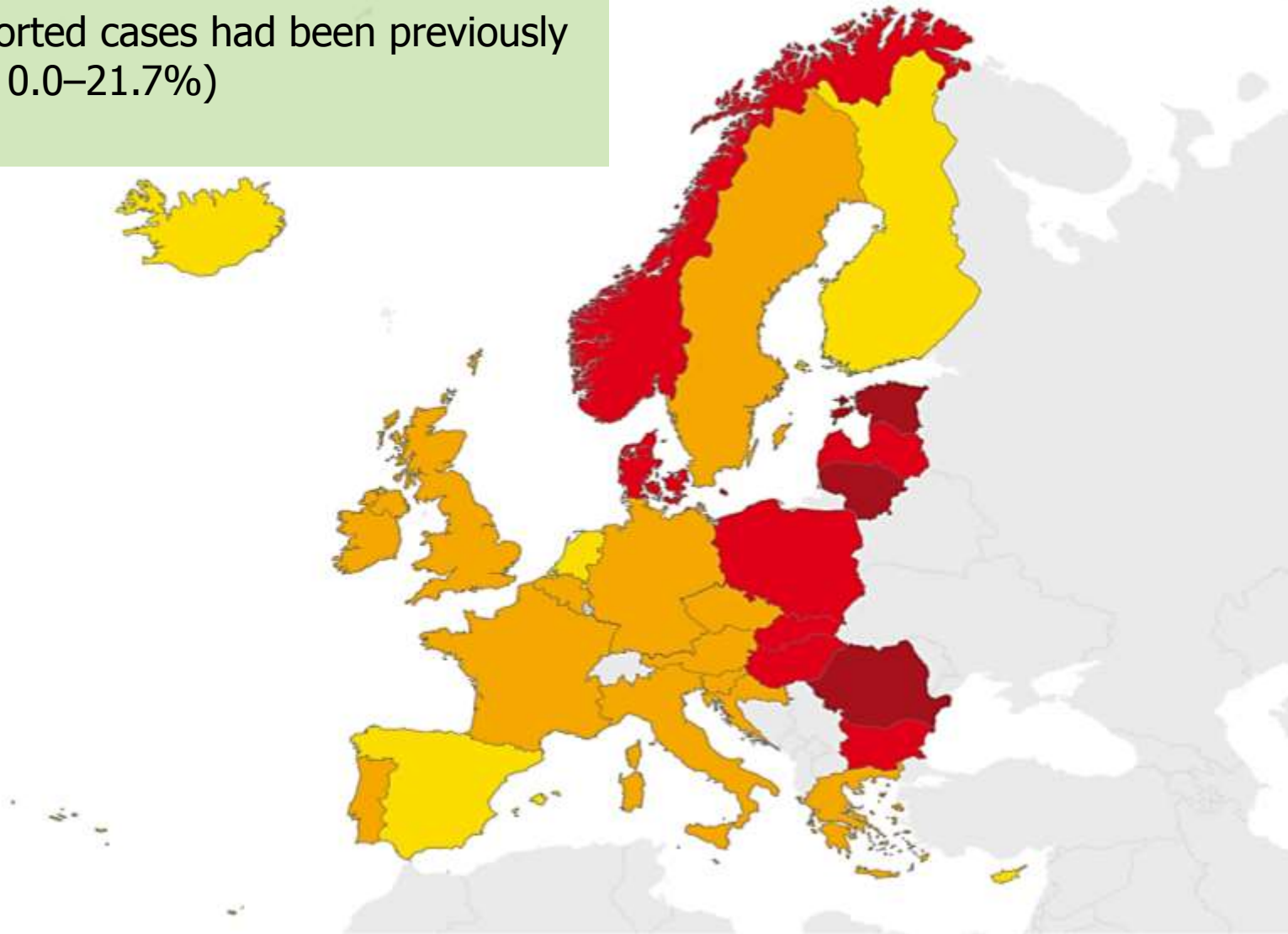
< 5%

5 to 9.9%

10 to 14.9%

≥ 15%

Not reporting



TB in children under 15, EU/EEA, 2015

2 444 TB cases reported in children under 15 years. That is
4.1% of all TB cases (range 0-21.1%) and
3.0 notifications per 100 000 child population (range 0–21.3)

Cases per 100 000 child

< 1

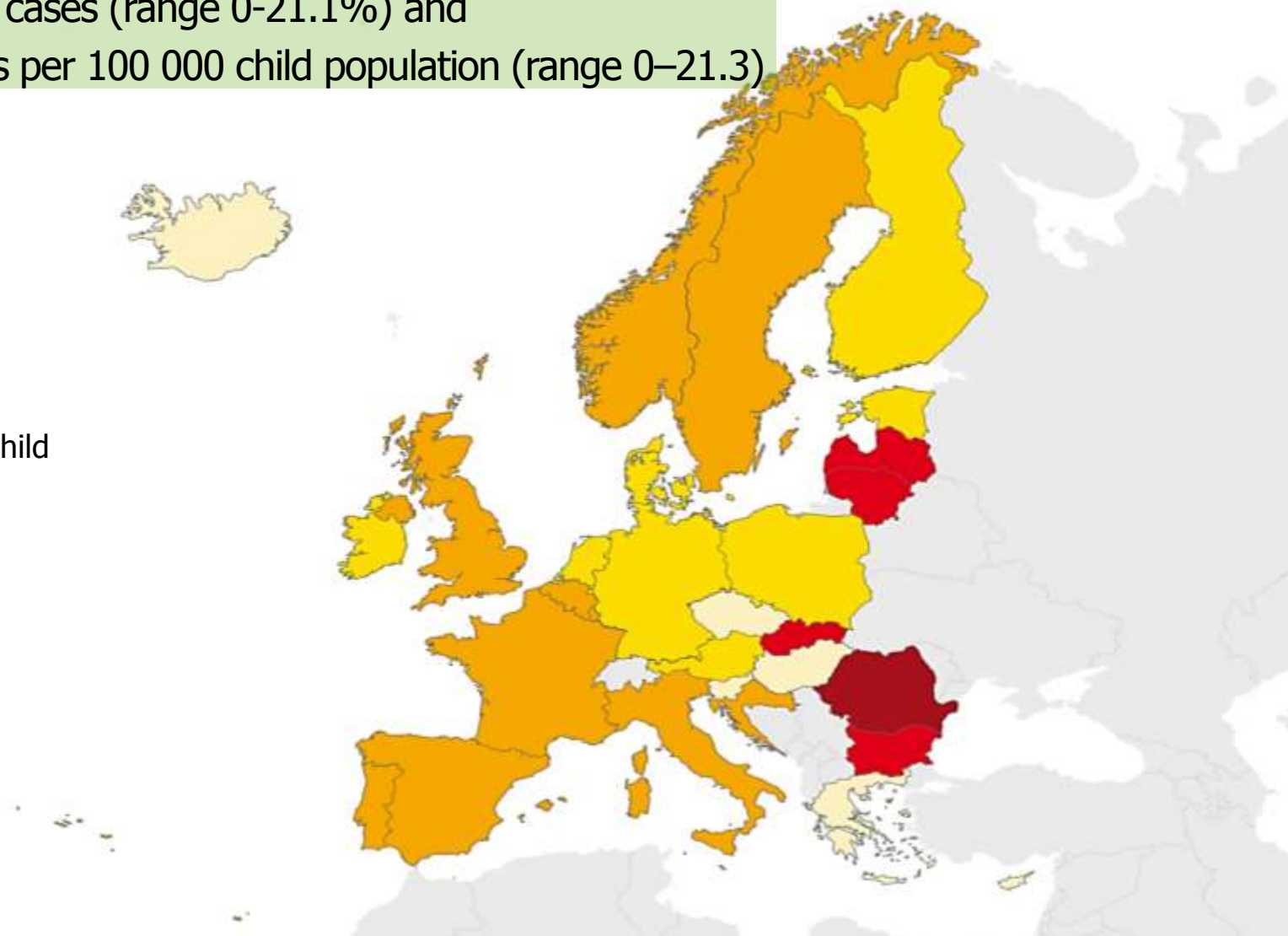
1 to 1.9

2 to 3.9

4 to 9.9

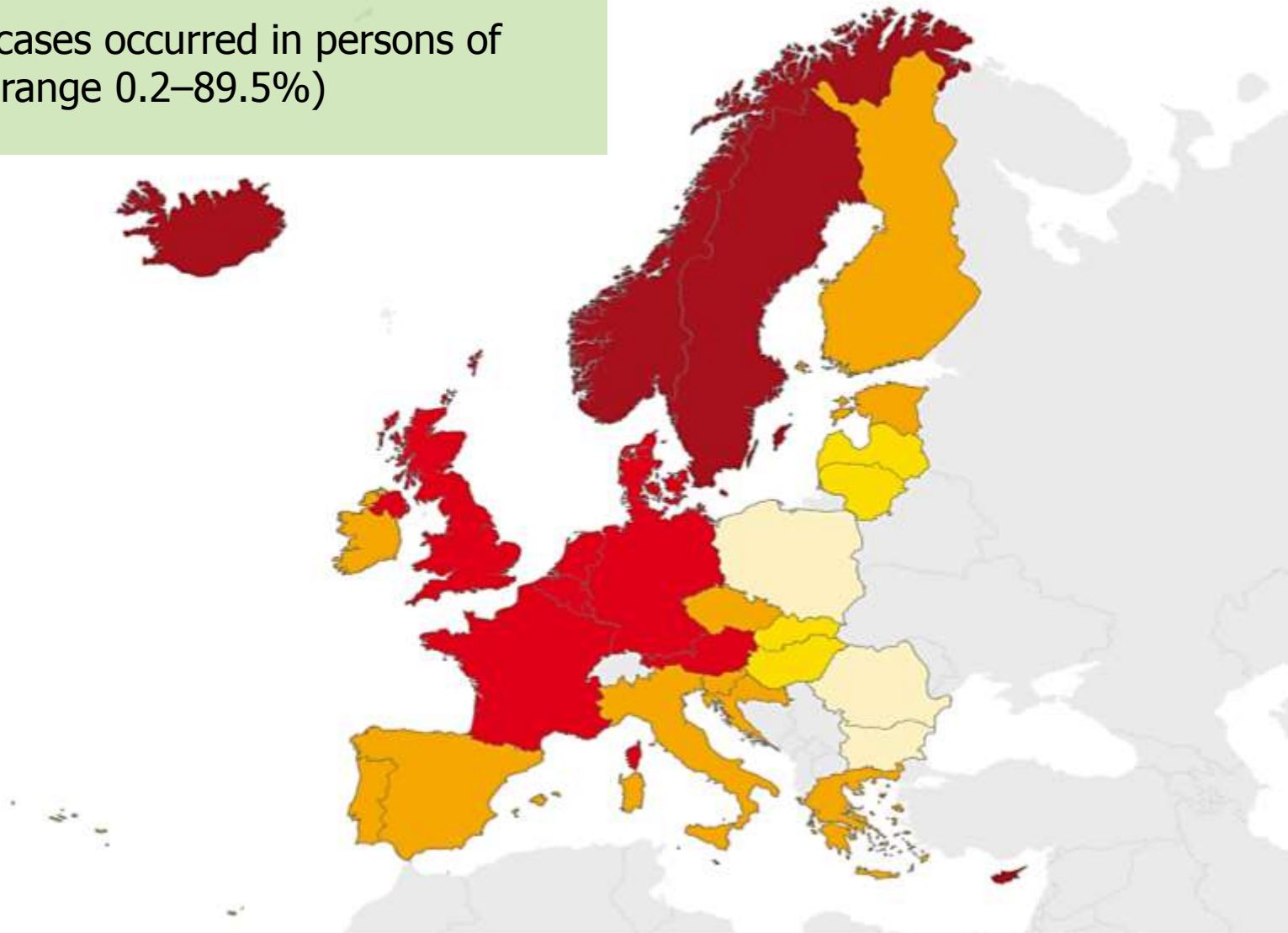
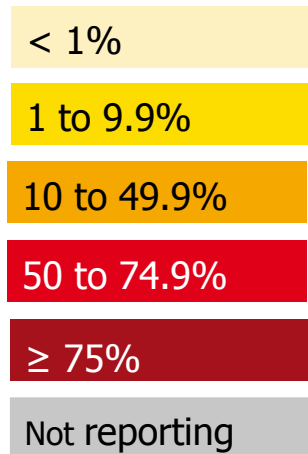
≥ 10

Not reporting



TB cases in persons of foreign origin, EU/EEA, 2015

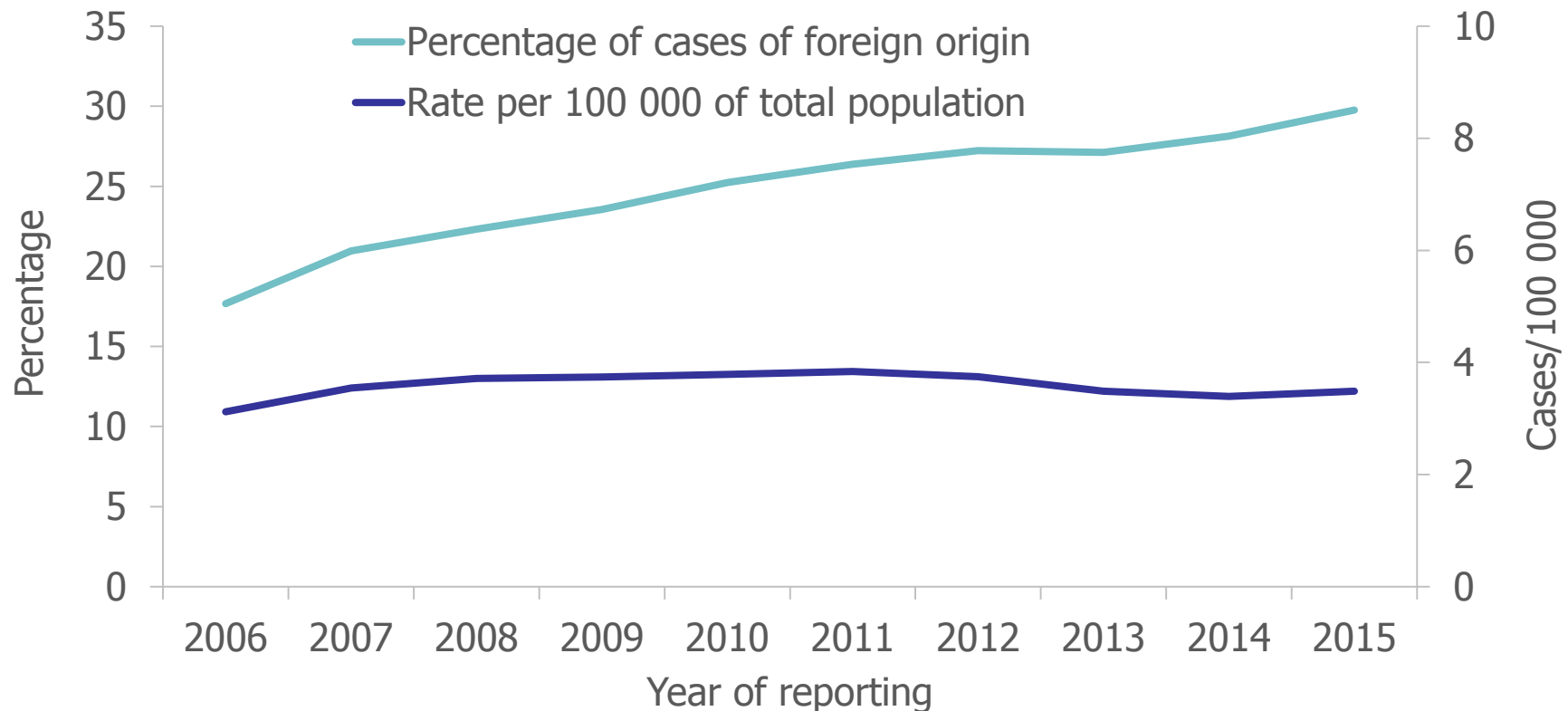
29.8% of TB cases occurred in persons of foreign origin (range 0.2–89.5%)



Notified TB cases in persons of foreign origin, EU/EEA, 2006 – 2015

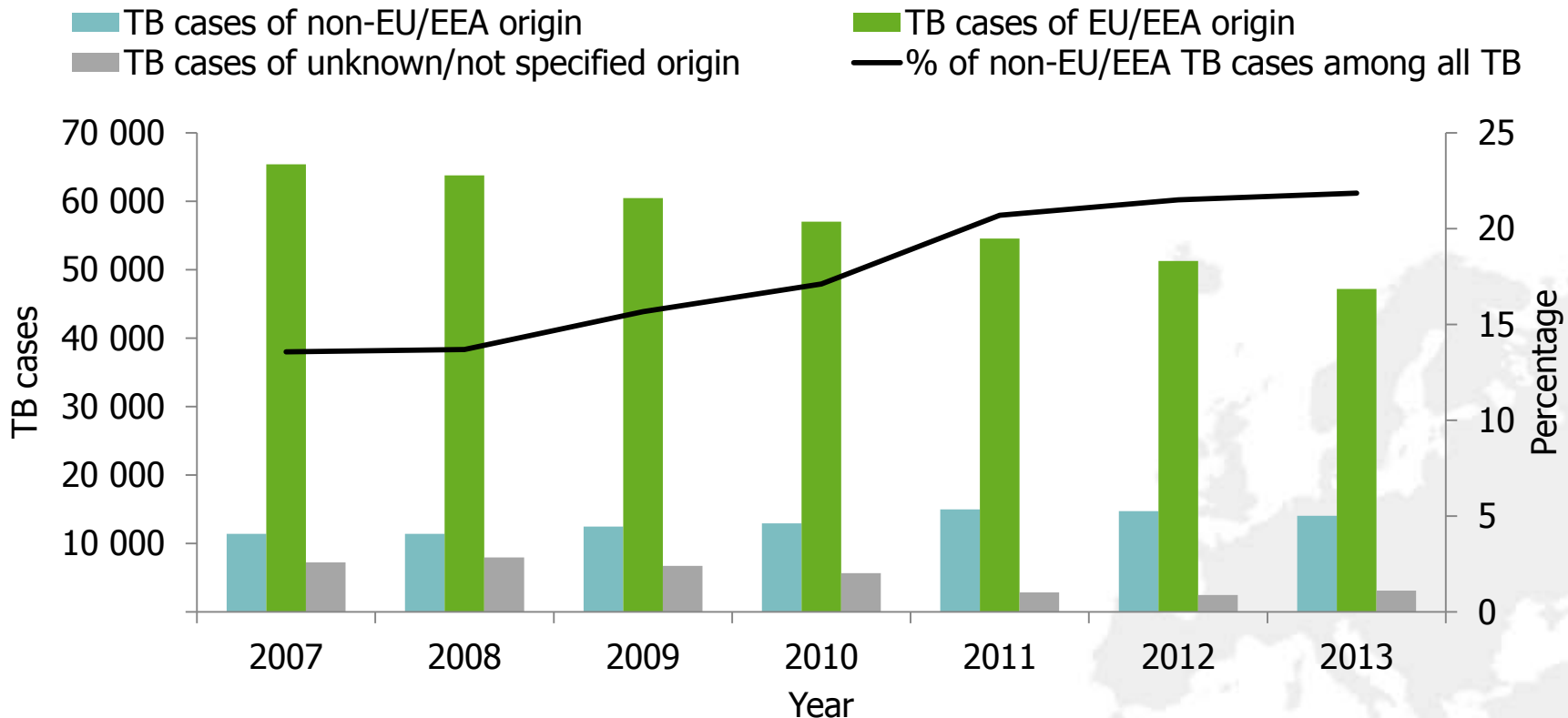
Percentage of cases in persons of foreign origin increased from **18%** in 2006 to **30%** in 2015.

Rate per 100 000 total population is stable between **3.1** and **3.5**



TB cases of EU/EEA, non-EU/EEA and unknown origin by year , 2007 – 2013

Percentage of TB cases of foreign origin outside of EU/EEA increased from **13.6%** in 2007 to **21.8%** in 2013

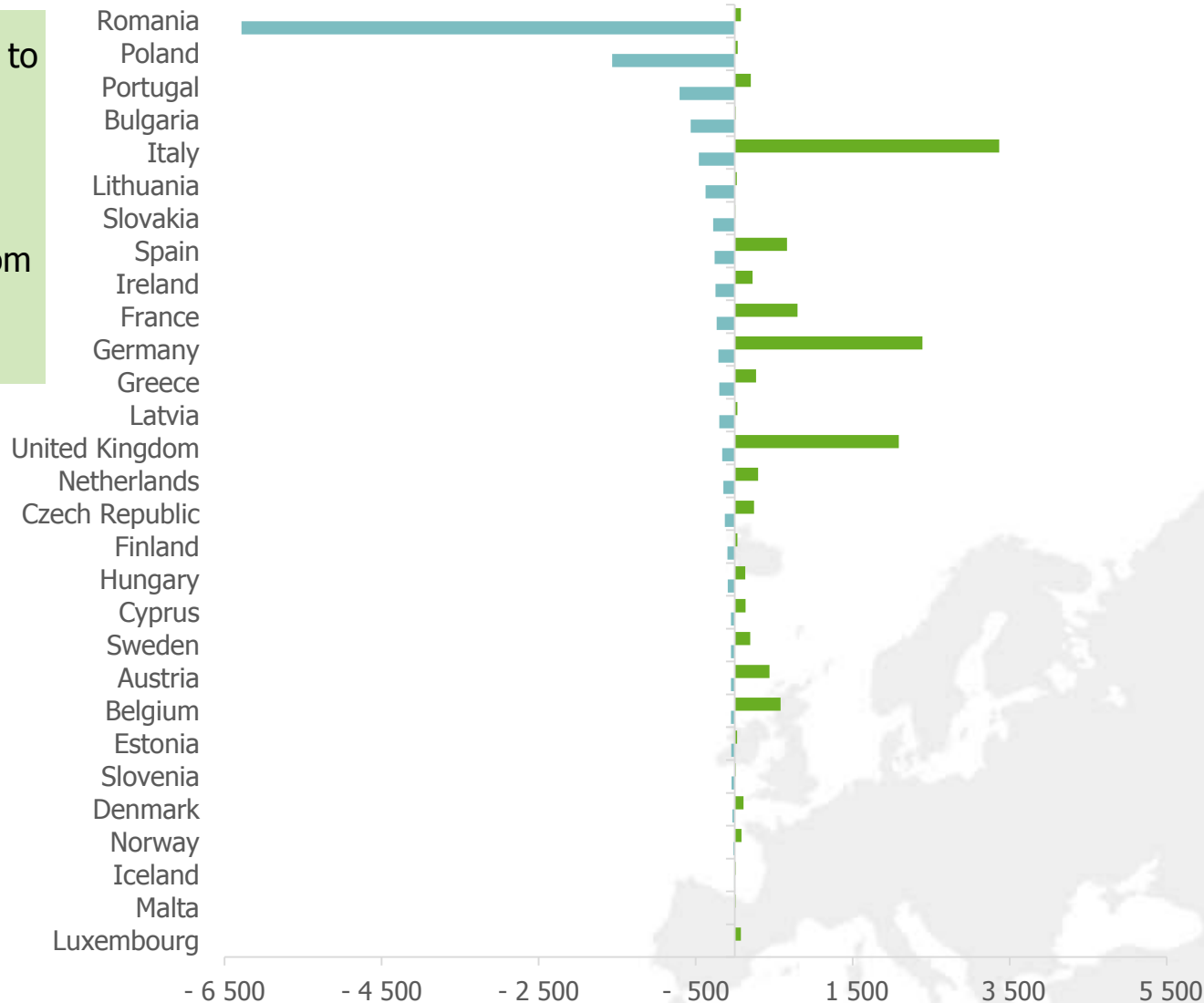


TB cases originating from other EU/EEA countries, 2007 – 2013

12 566 TB cases reported to originate from another EU/EEA country
 Percentage of cases diagnosed in persons of foreign origin increased from **1.7%** in 2007 to **3.3%** in 2013

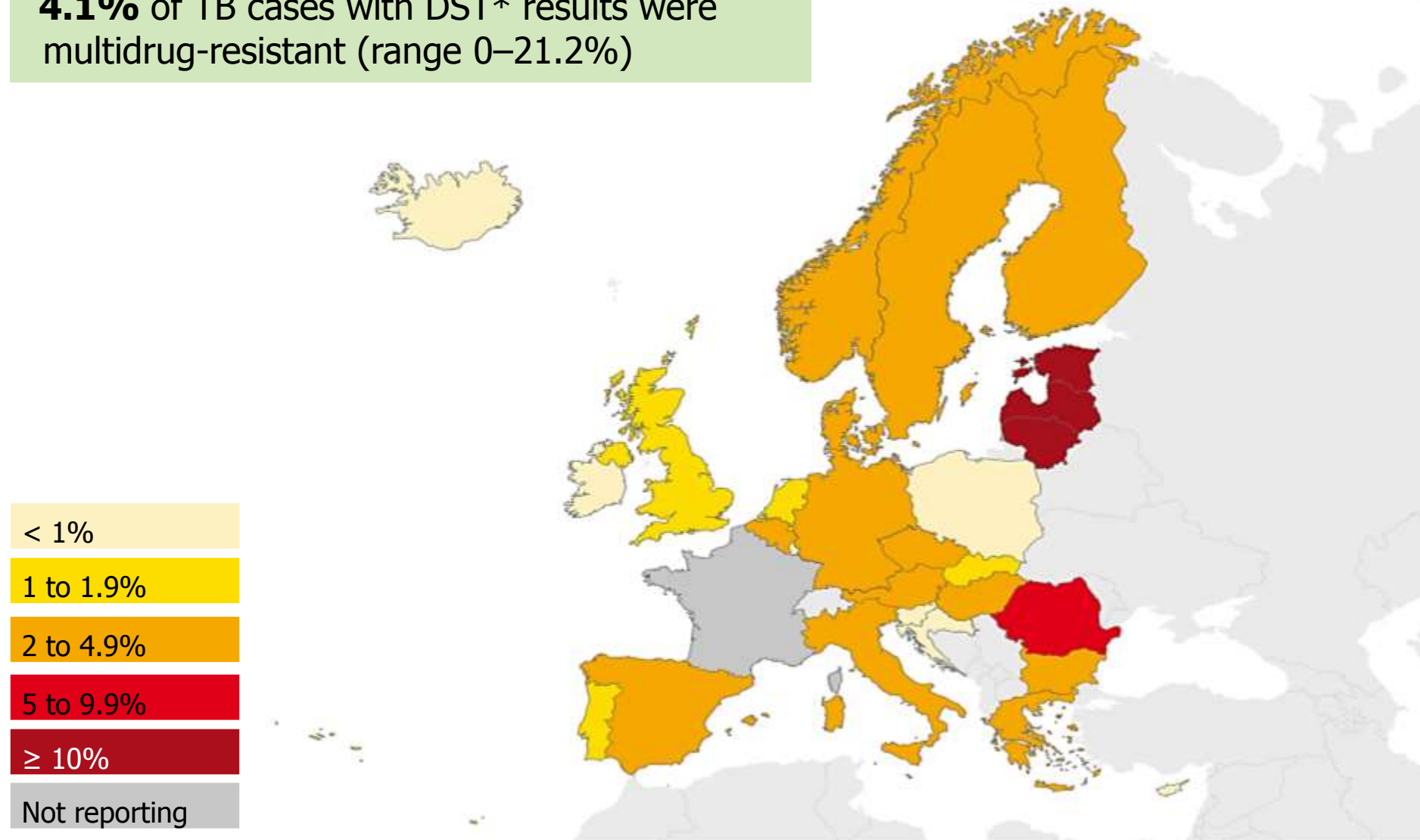
■ TB cases reported by country originating from other EU/EEA Member States

■ TB cases originating from country reported by other EU/EEA Member States



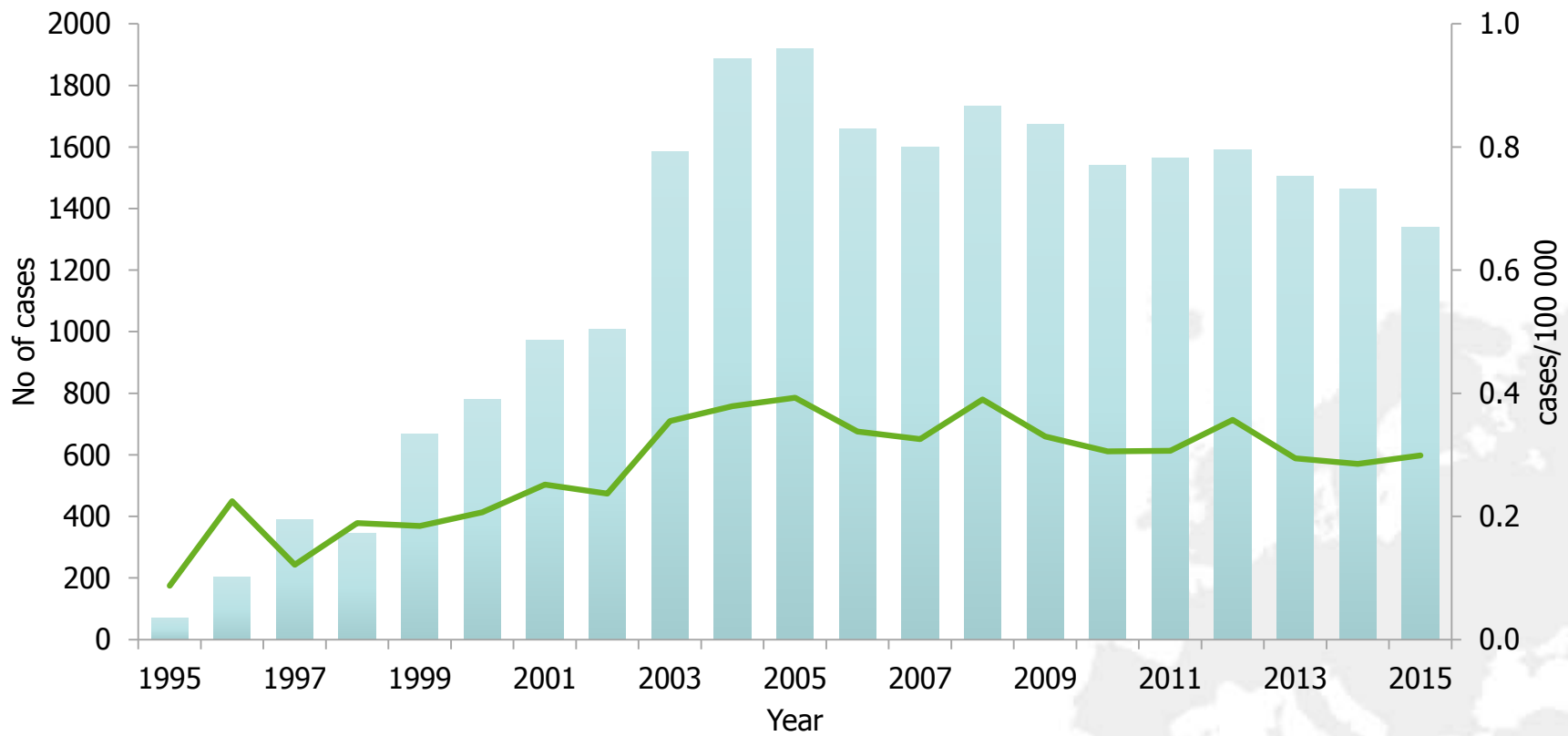
Percentage of multidrug-resistant TB by country, EU/EEA, 2015

4.1% of TB cases with DST* results were multidrug-resistant (range 0–21.2%)



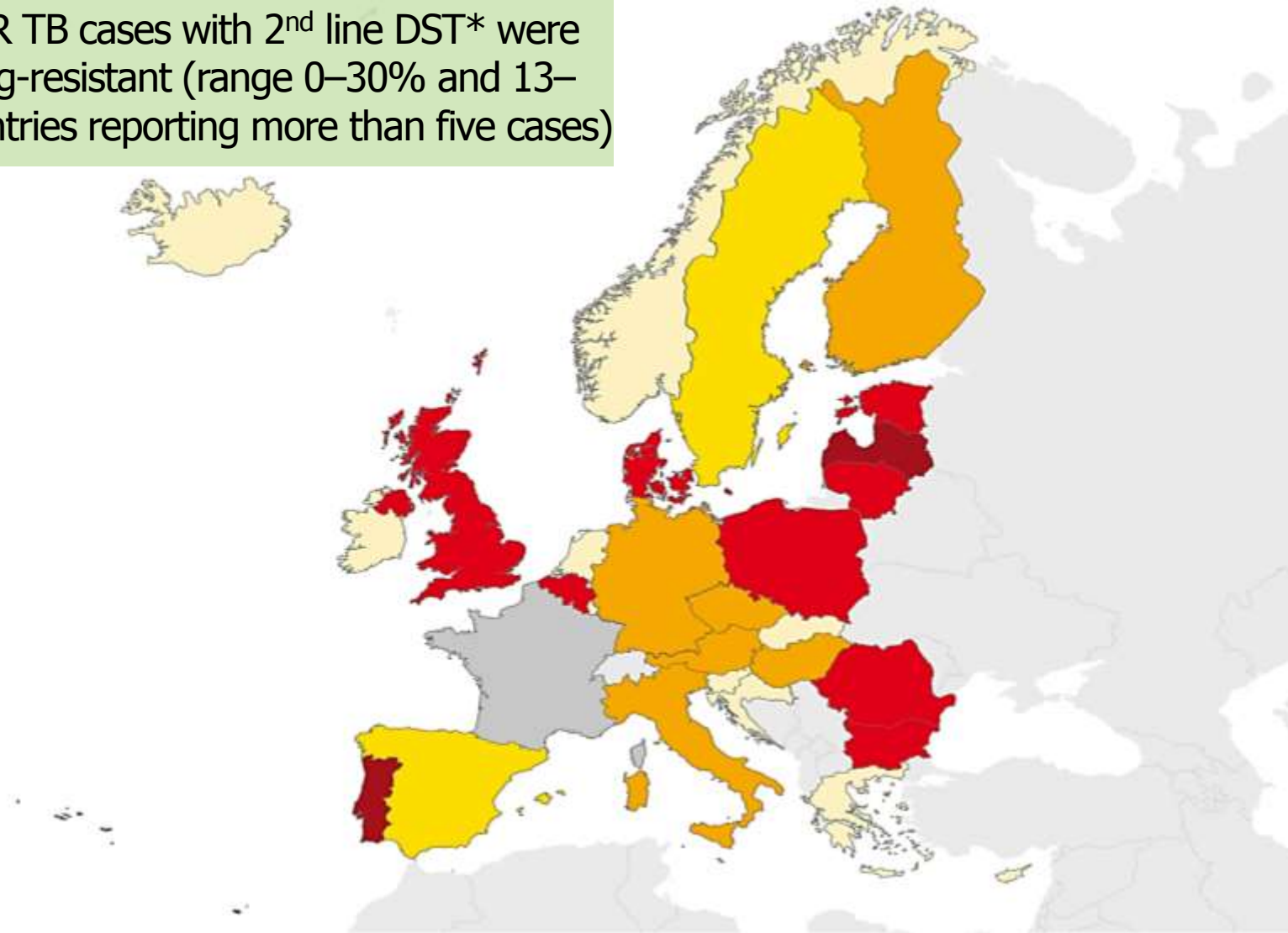
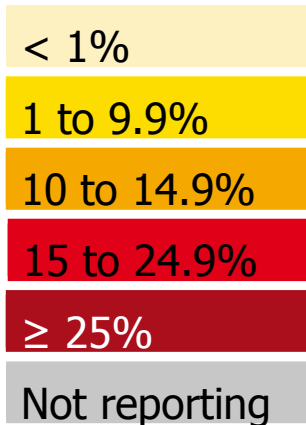
Multidrug-resistant TB cases (number and rate) by year, EU/EEA, 1995 – 2015

Notification rate in MDR TB cases stabilized at 0.3 per 100 000 population



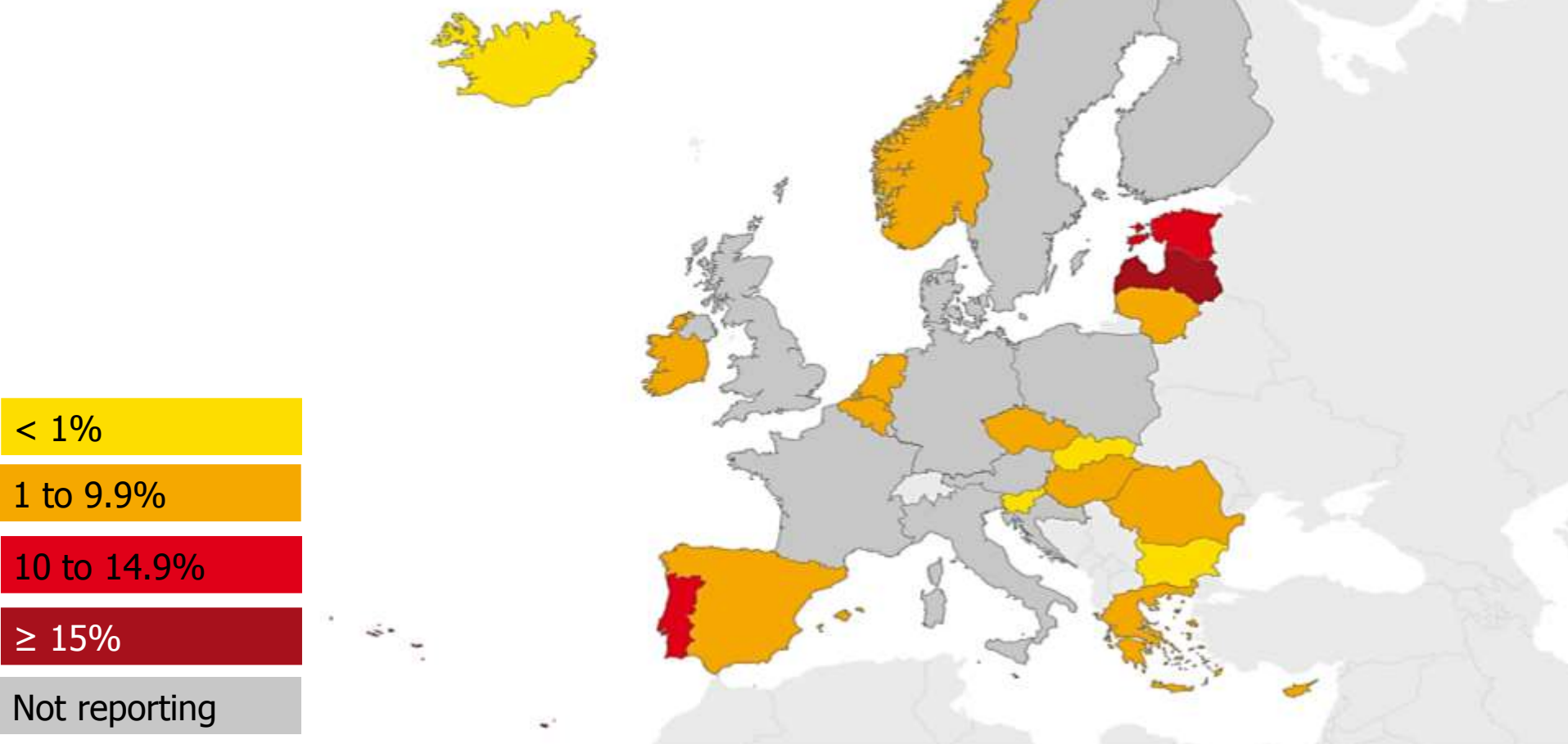
Extensively drug-resistant TB among MDR TB cases by country, EU/EEA, 2015

19.7% of MDR TB cases with 2nd line DST* were extensively drug-resistant (range 0–30% and 13–25.4% for countries reporting more than five cases)



Percentage of TB/HIV co-infection by country, EU/EEA, 2015

4.6% of TB cases with known HIV status* were HIV-positive (range 0–22.6%)



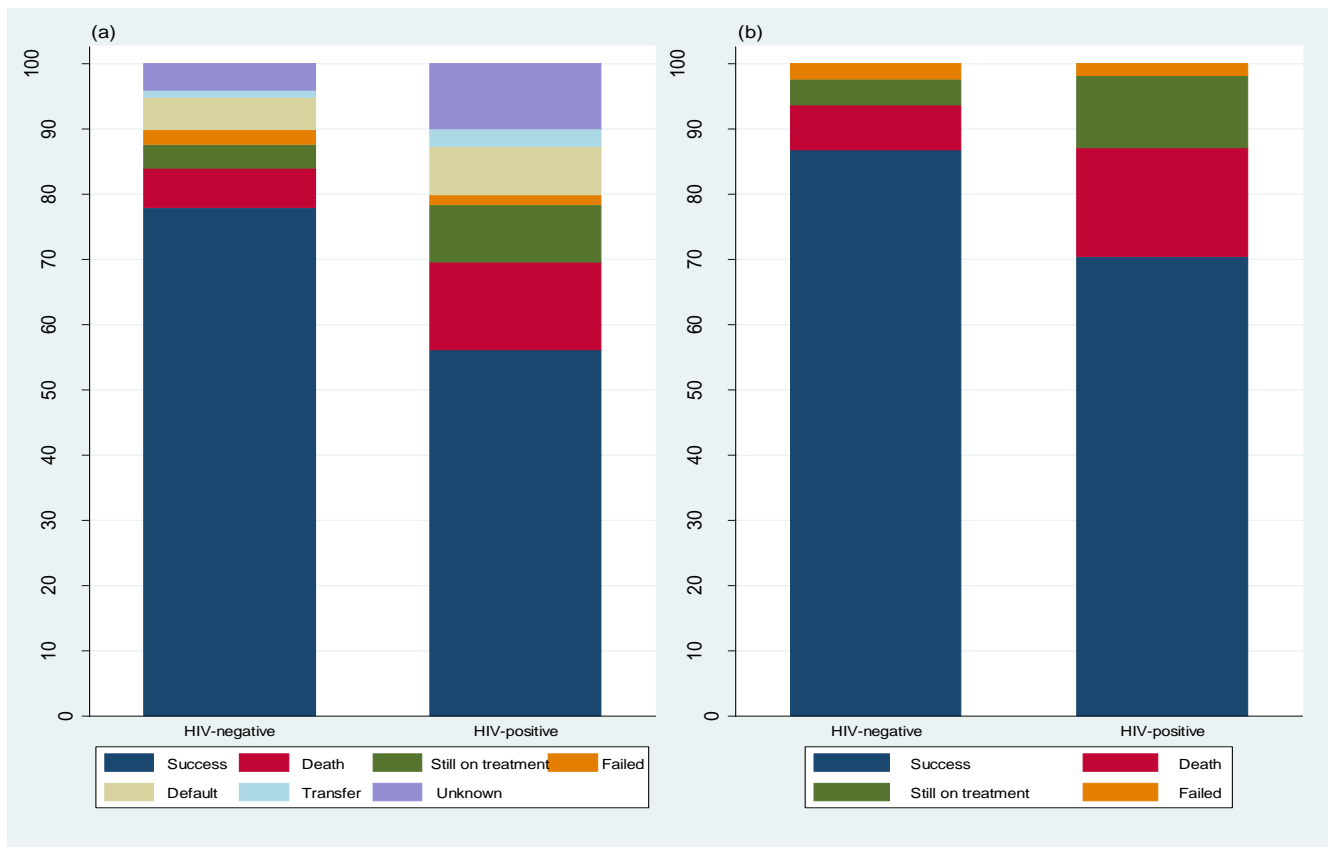
Tuberculosis and HIV co-infection in Europe: looking at one reality from two angles

Testing of TB cases for HIV and of HIV cases for TB of crucial importance, especially for:

Variable	HIV-positive TB cases N (%)	HIV-negative TB cases N (%)	Multivariable analysis, Odds Ratio (95% CI)
Total	1 028 (4.9)	19 791 (95.1)	
<i>Gender (N=20 810)</i>			
Male	Male	736 (5.2)	1.25 (1.07-1.46)
	Female	291 (4.3)	
<i>Age groups (N=20 815)</i>			
	0-14	2 (0.3)	0.03 (0.01-0.12)
	15-24	82 (3.6)	0.45 (0.35-0.57)
	25-44	641 (8.3)	1
	45-64	281 (4.0)	0.43 (0.36-0.50)
	≥65	21 (0.7)	0.07 (0.04-0.11)
<i>Region of origin (N=20 163)</i>			
Europe - Non EU/EEA Africa		787 (4.2)	1.91 (1.15-3.17)
		19 (8.5)	205 (91.5)
		56 (17.7)	260 (82.3)
		18 (8.1)	204 (91.9)
	Other regions	25 (3.7)	649 (96.3)
			0.64 (0.42-0.98)
<i>Previously treated (N=20 522)</i>			
Previously treated		796 (4.6)	1.39 (1.16-1.66)
		190 (5.8)	
<i>Extrapulmonary (N=20 522)</i>			
Extrapulmonary		781 (4.5)	1.81 (1.50-2.19)
		245 (7.3)	

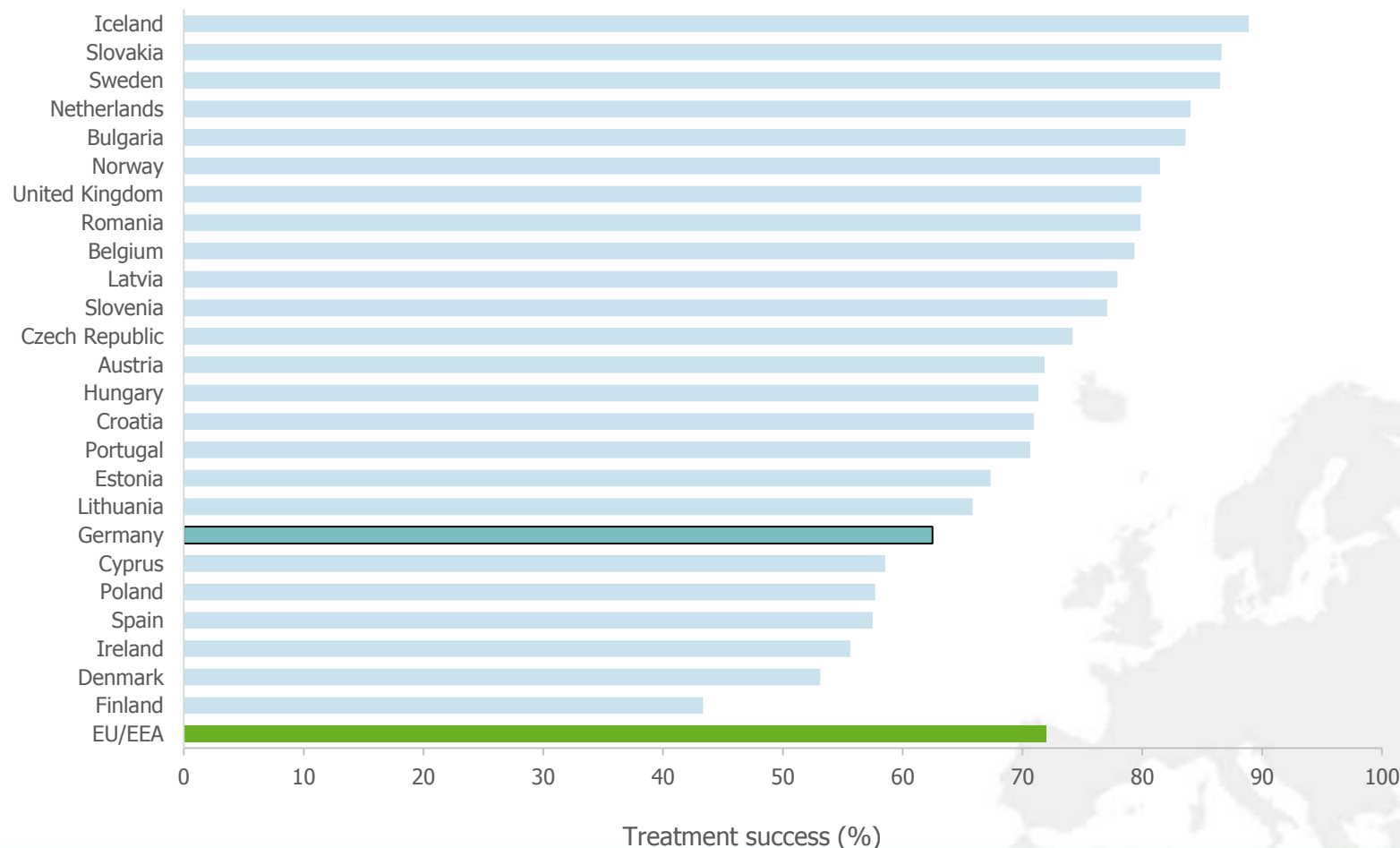
Impact of HIV infection on treatment outcome of tuberculosis in Europe

HIV co-infected cases had a lower TB treatment success rate compared to HIV-negative cases (56.9% vs. 78.7% respectively; $p < 0.001$).



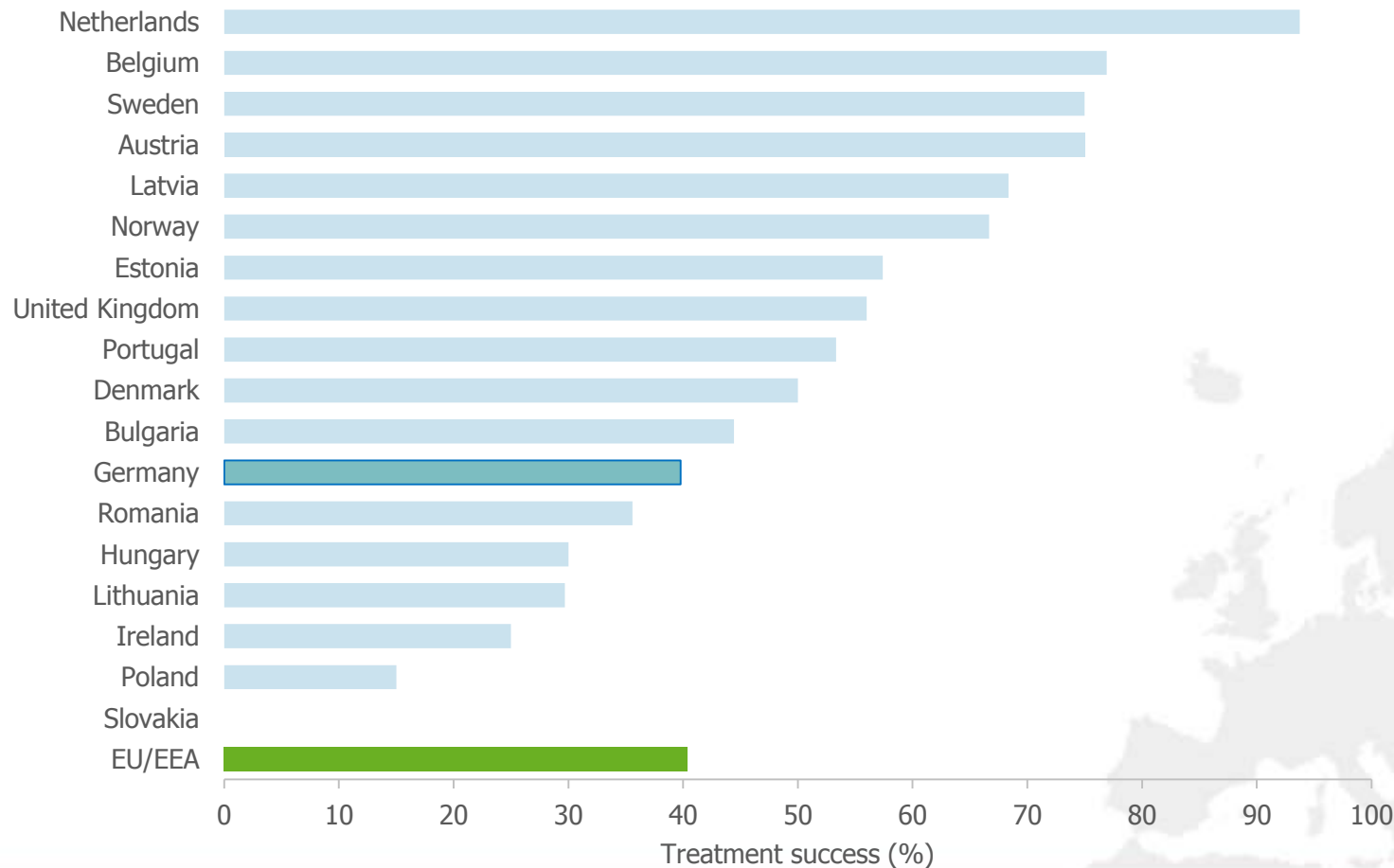
Treatment success of all TB cases notified in 2014, EU/EEA, 2015

72.0% of all TB cases* had a successful treatment outcome after 12 months (range 43.3–88.9%)



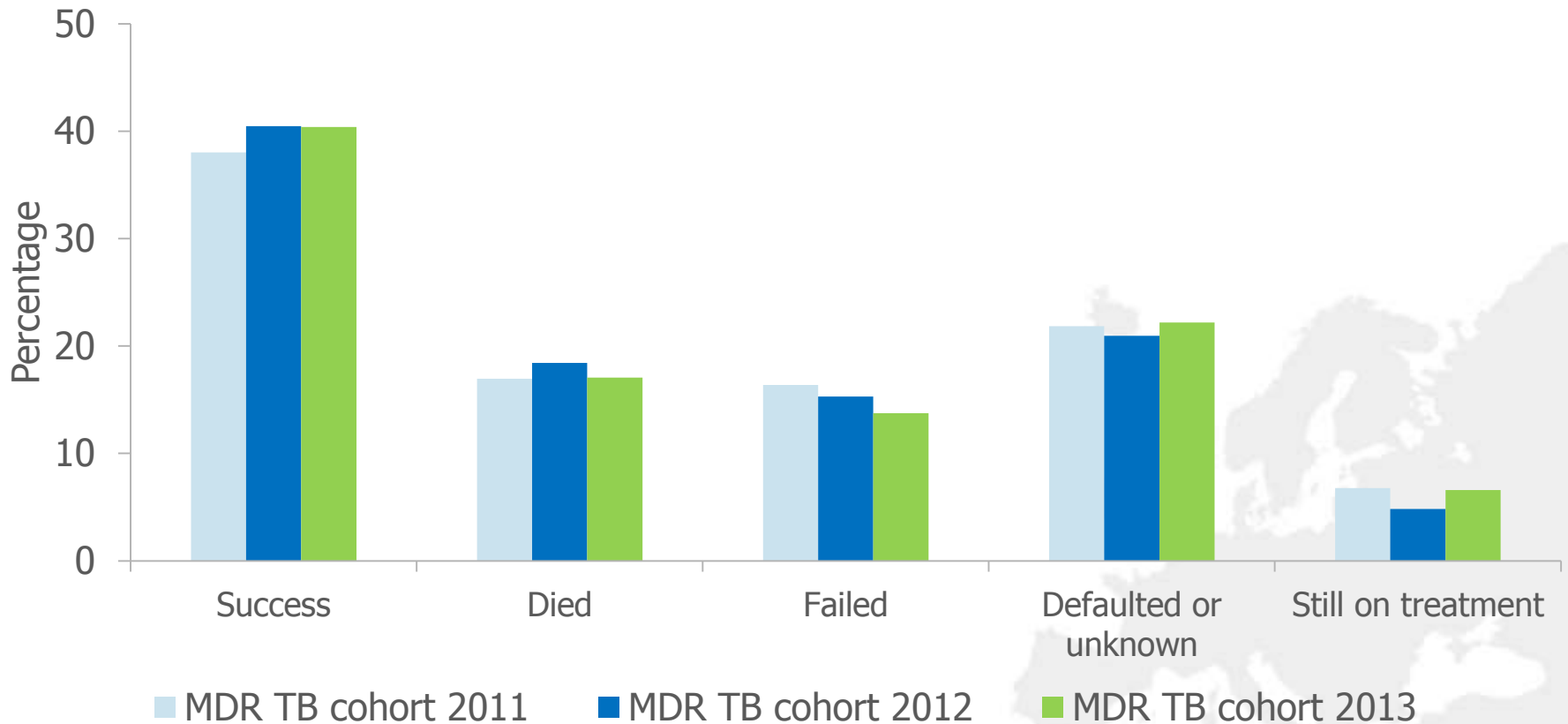
Treatment success in multidrug-resistant TB*, EU/EEA, 2015

40.4% was the success rate for all multidrug-resistant TB cases notified in 2013 (range 25.0–93.8%)



Treatment outcomes in MDR TB notified in 2011-2013, EU/EEA, 2015

Treatment success rates remained stable in the 2011, 2012 and 2013 cohorts



Summary

- Steady decrease of overall notification rate for past 20 years (3%/year), but increase in 5 countries (mainly in cases of foreign origin)
- Laboratory confirmation rate is 73% for new pulmonary, and 67% for all TB cases notified
- MDR TB: 4% of all TB cases reaching up to 21% in the Baltics
- Treatment success 72% for all TB cases reported in 2014
- MDR TB treatment success 40% for MDR TB cases reported in 2013

<http://atlas.ecdc.europa.eu/public/index.aspx?Instance=GeneralAtlas>

Nominated TB surveillance experts

Bernhard Benka, Maryse Wanlin, Tonka Varleva, Aleksandar Simunovic, Maria Koliou, Jiri Wallenfels, Peter Henrik Andersen, Piret Viiklepp, Hanna Soini, Jean-Paul Guthmann, Lena Fiebig, Ourania Kalkouni, Gábor Kovács, Thorsteinn Blondal, Joan O'Donnell, Francesco Paolo Maraglino, Dace Mihalovska, Edita Davidaviciene, Irene Demuth, Analita Pace-Asciak, Erika Slump, Trude Margrete Arnesen, Maria Korzeniewska-Koseła, Raquel Duarte, Domnica Chiotan, Ivan Solovic, Petra Svetina, Laura Sanchez-Cambronero Cejudo, Jerker Jonsson, Maeve Lalor