

Migration associated databases for infectious diseases: the interface between home and destination countries

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**CONSENSUS CONFERENCE
for establishing a European level Migration Health Database
Pécs, 07-08 October 2019**

Definition : **Interface** is a **point** where two systems, subjects, organizations, etc. meet and interact.

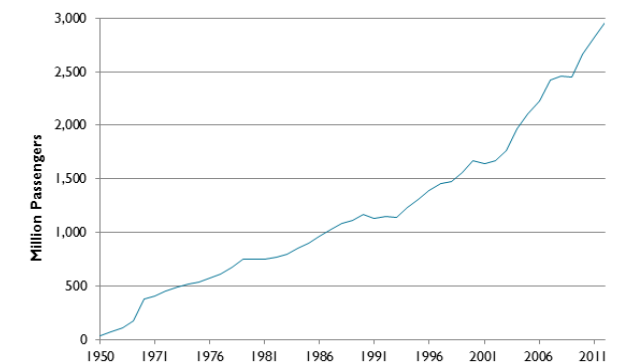
A **point in geometry** is a **location**. It has no size i.e. no width, no length and no depth. A **point** is shown by a dot.

Is it the same in migration? *Connection or gap?*

TIME AND DISTANCE: inversely proportional (globalizationn)



Figure 1. | World Passenger Air Travel by Volume, 1950–2012



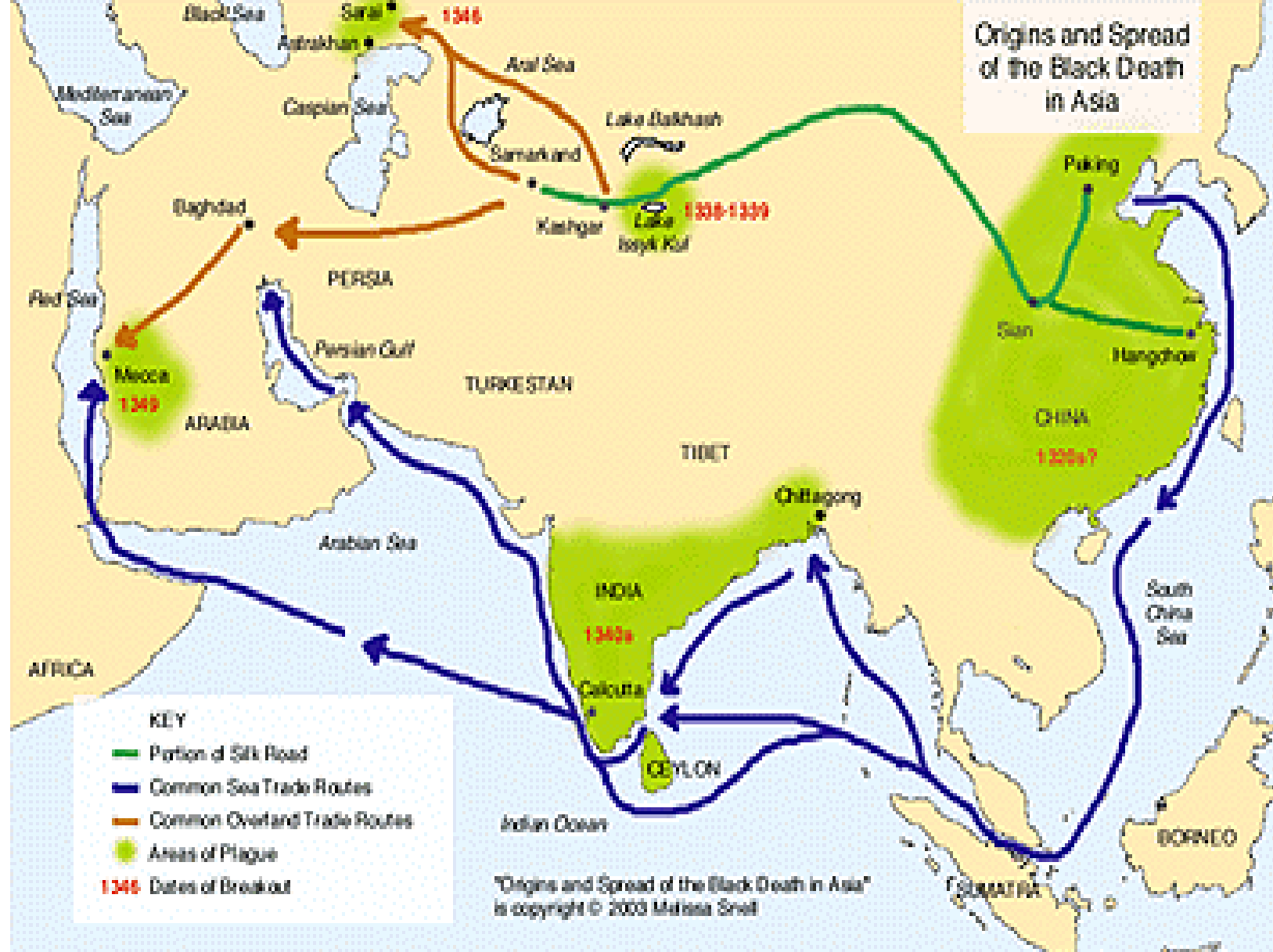
©Worldwatch Institute

Source: ICAO

Interfaces

Pre-laboratory	Laboratory	Post-laboratory
Case history - patient – doctor(s)– clinical microbiologist – doctor – patient		

**Epidemiologist: data collection – processing – evaluation – communication
(to the profession and public)**



Medieval route of plague

SURGEON GENERAL WILLIAM H. STUART:

(1967, WASHINGTON, WHITE HOUSE) Eledged statement!

**IT'S TIME TO CLOSE THE BOOKS ON INFECTIOUS
DISEASES, AND TO TURN THE ATTENTION OF THE
NATION TO NEW DIMENSIONS OF HEALTH CARE,
NAMELY TO CHRONIC DISEASES**

1967. MARBURG DISEASE

AGE OF ANTIBIOTICS AND VACCINES –

FALSE FEELING OF SAFETY

CHANGING CONDITIONS:

SOCIAL CONDITIONS

CHANGES IN MICRO- AND MACROENVIRONMENT

TURISM, MIGRATION, TRADE: GLOBALISATION

CONVENTIONAL PATHOGENS IN NEW ROLE

APPEARENCE OF NEW PATHOGENS

NEW RISK GROUPS

RESISTANT OPPORTUNISTIC PATHOGENS

Global Examples of Emerging and Re-Emerging Infectious Diseases

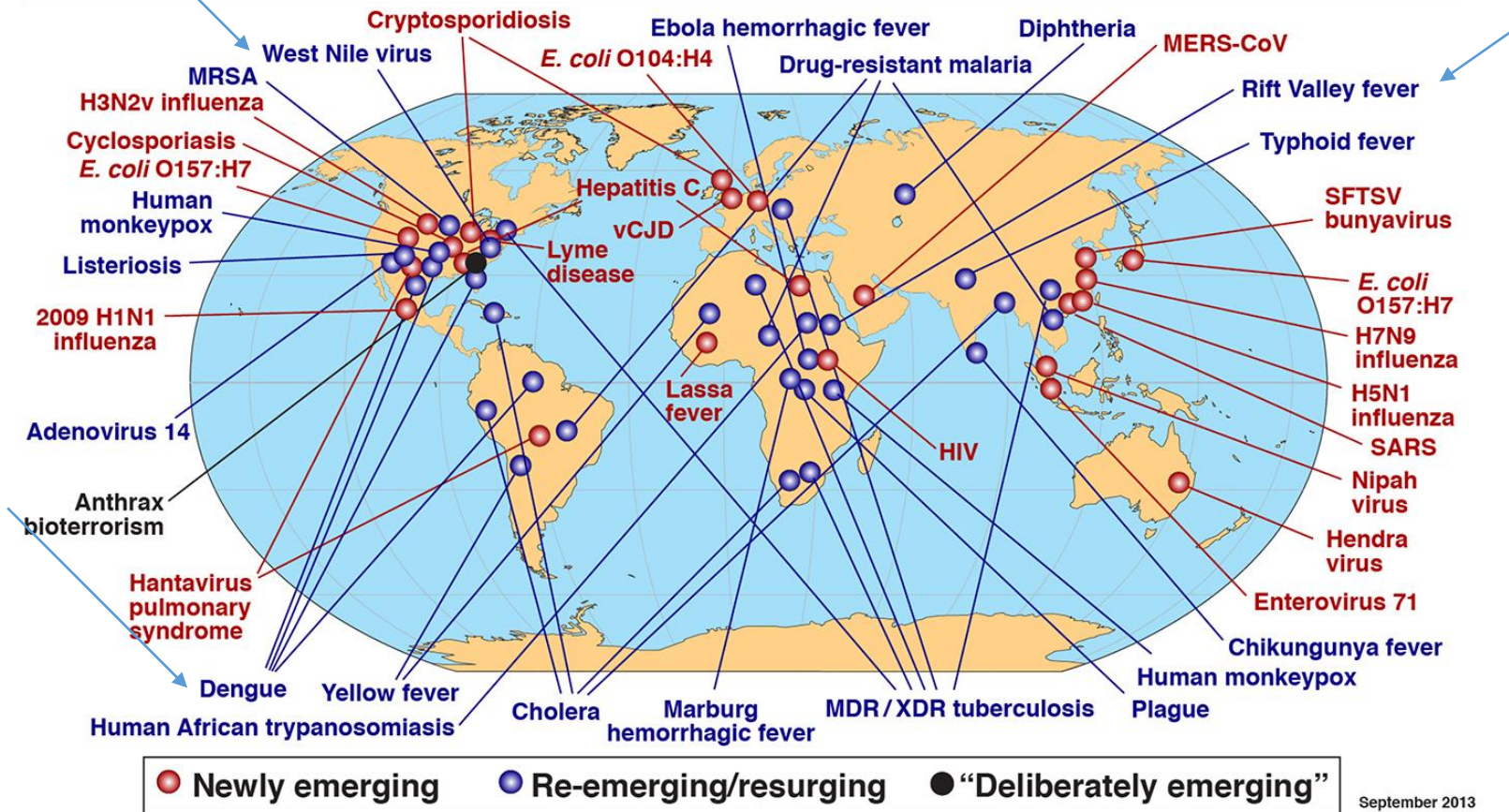


Figure without showing interfaces!

Ebola Fact Sheet



Where is it?

Guinea
Liberia
Sierra Leone
Democratic Republic of Congo

* Senegal and Nigeria have been declared free of Ebola

** There have been a total of 3 Ebola cases outside of Africa in Spain and USA. All 3 cases involved health workers caring for Ebola patients in Africa



Deaths (49%) Recovered (51%)

As of 17th October 2014
There have been

9191 Cases
4546 Deaths

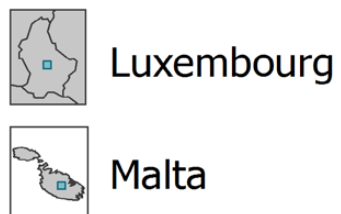
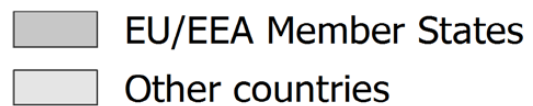
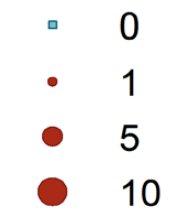
Multidrug resistant tuberculosis?

Measles?

**Multidrug resistant enteric bacteria,
Pseudomonas, Acinetobacter?**



Number of measles deaths,
February 2018–January 2019





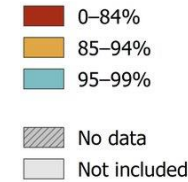
Measles vaccination coverage in EU/EEA

Blue/green countries are below/above the European average. Mandatory vaccination has been marked with a lined background

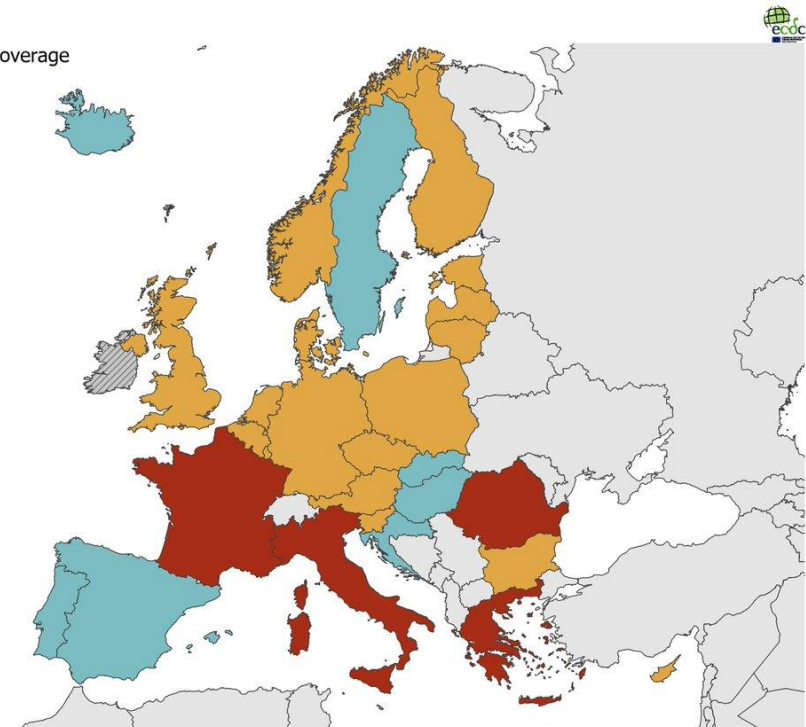
Latvia, where vaccinations are mandatory, does not reach better coverage than other Baltic countries



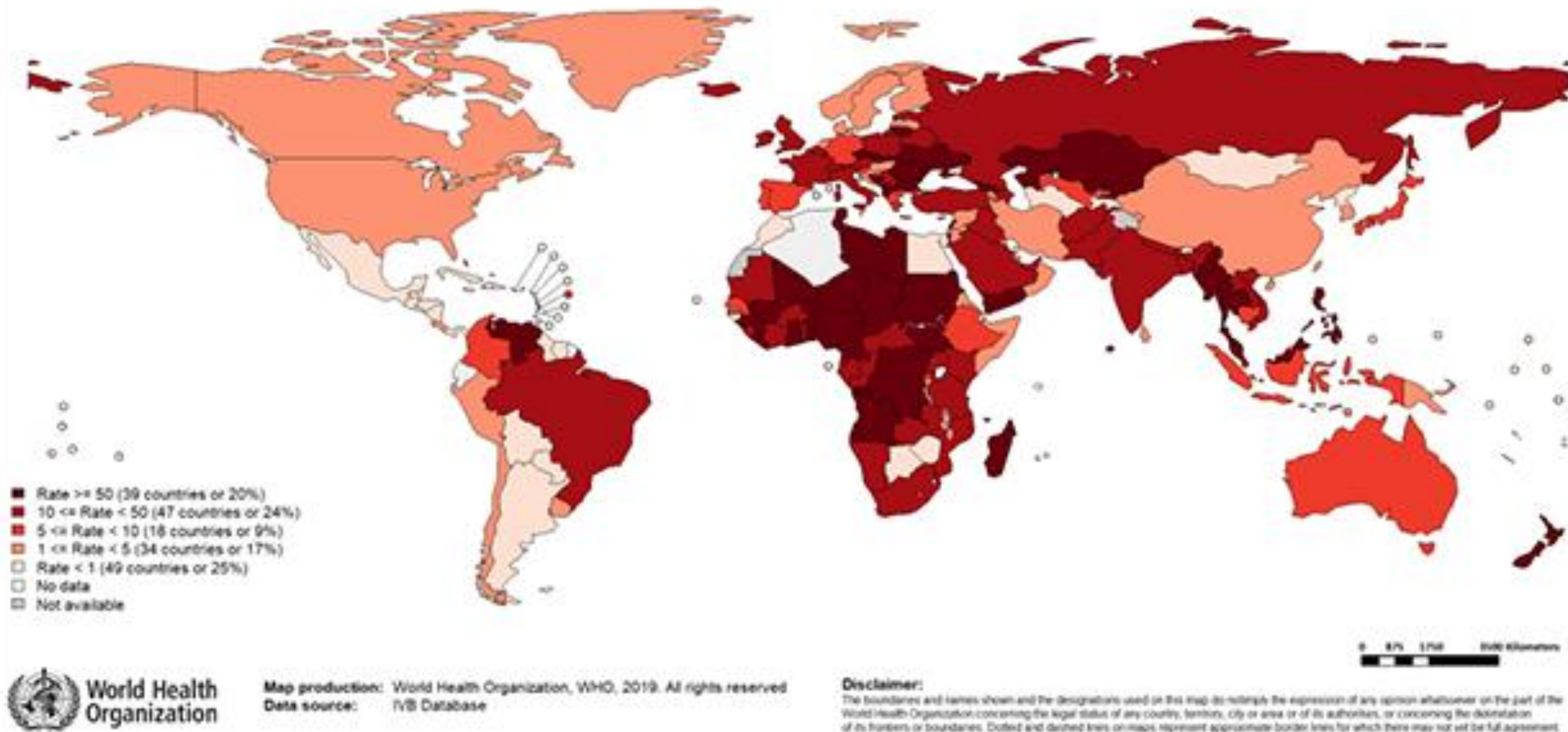
Measles containing vaccine coverage second dose*, 2016



*WHO, reported estimates



ECDC. Map produced on: 26 Mar 2018
ECDC map maker: <https://emma.ecdc.europa.eu>



New measles surveillance data from WHO

The reasons for people not being vaccinated vary significantly between communities and countries including — **lack of access to** quality healthcare or **vaccination services**, conflict and displacement, **misinformation about vaccines**, or low awareness about the need to vaccinate.

Anti-vaccine movement: media, public, profession
The Lancet paper 1994

TABLE 1

Modality of implementation of childhood vaccination programme by country, the European Union countries, Iceland and Norway, 2010 (n=29)

Country	Diphtheria	<i>Haemophilus influenzae</i> type B	Hepatitis A	Hepatitis B	Human papillomavirus ^a	Influenza	Invasive disease caused by <i>Neisseria meningitidis</i> group C	Invasive pneumococcal disease	Measles-mumps-rubella	Pertussis	Polio	Rotavirus	Tetanus	Tuberculosis (with Bacillus Calmette-Guérin)	Varicella
Austria	RA	RA	RR	RA	R	RR	RA	RA	RA	RA	RA	RA	RA	A	RR
Belgium	RA	RA	RR	MR/RA ^b	R	RR	RA	RA	RA	RA	MA	RA	RA	A	RR
Bulgaria	MA	MA	RR	MA	R	RR	A	MA/RA ^c	MA	MA	MA	RA	MA	MA	A
Cyprus	RA	RA	RR	RA	A	RR	RA	RA	RA	RA	RA	A	RA	RR	RA/RR
Czech Republic	MA	MA	MR	MA	R	RR	RR	MR	MA	MA	MA	A	MA	MR	RR
Denmark	RA	RA	RR	RR	R	RR	RR	RA/RR ^d	RA	RA	RA	A	RA	A	RR
Estonia [6]	RA	RA	RA ^e	RA	R ^e	RA ^e	RR ^e	RR ^e	RA	RA	RA	RR ^e	RA	RA	RR ^e
Finland	RA	RA	RR	RR	A	RA	A	RA	RA	RA	RA	RA	RA	RR	A
France	MA/MR/RA ^f	RA	RR	MR/RA ^b	R	RR	RA	RA	RA	RA	MA/MR/RA ^g	A	MA/MR/RA ^h	MR/RR ^h	RR
Germany [7]	RA	RA	RR	RA	R	RR	RA	RA	RA	RA	RA	A	RA	A	RA
Greece	MA	RA	RA	MA ^h	R	RR	RA	RA	RA	RA	MA ^h	A	MA	RA	RA
Hungary	MA	MA	MR	MA	A	RR	A	RA	MA	MA	MA	A	MA	MA	A
Iceland	RA	RA	RR	RR	A	RR	RA	RR/RA ⁱ	RA	RA	RA	A	RA	A	RR
Ireland	RA	RA	RR	RA	R	RR	RA	RA	RA	RA	RA	A	RA	RA	RR
Italy	MA ⁱ	RA	A ⁱ	MA	R	RR	RA/RR ^k	RA/RR ^k	RA	RA	MA	A	MA	RR	RA/RR ^k
Latvia	MA	MA	RR	MA	MA	RR	RR	MA	MA	MA	MA	MA ⁱ	MA	MA	MA
Lithuania	RA	RA	RR	RA	A	RR	RR	RR	RA	RA	RA	A	RA	RA	RR
Luxembourg [8]	RA	RA	RR	RA	R	RR	RA	RA	RA	RA	RA	RA	RA	RR	RA
Malta	MA	RA	RR	RA	A	RA	A	RR ⁿ	RA ^m	RA	MA	A	MA	RA	RR
The Netherlands [9]	RA	RA	RR	RR	R	RR	RA	RA	RA	RA	RA	A	RA	RR	A
Norway	RA	RA	A	RR	R	RR	A	RA	RA	RA	RA	A	RA	RR	A
Poland	MA	MA	RR	MA	R	RR	RR	MR	MA	MA	MA	RA	MA	MA	RR
Portugal	RA/MR	RA	A	RA	R	RR	RA	RR	RA	RA	RA	A	RA/MR	RA	A
Romania	MA	MA	RR	MA	R	RR	A	A	MA	MA	MA	A	MA	MA	A
Slovakia	MA	MA	MR/RR ^p	MA	R	MR/RR ^o	RR	MA	MA	MA	MA	A	MA	MA	A
Slovenia	MA	MA	RR	MA	R	RR	RR	RR	MA	MA	MA	RA	MA	RR	RR
Spain	RA	RA	RR/RA ^k	RA	R	RR	RA	RA/RR ^k	RA	RA	RA	A	RA	A ⁱ	RA/RR ^k
Sweden	RA	RA	A	RR	R	RR	A	RA	RA	RA	RA	A	RA	RR	A
United Kingdom	RA	RA	RR	RR	R	RR	RA	RA	RA	RA	RA	A	RA	RR	RR

A: absence of recommendation, MA: mandatory for all; MR: mandatory for people at risk; R: recommended; RA: recommended for all; RR: recommended for people at risk.

^a Mostly recommended for girls 10-17 years of age.

^b Mandatory for healthcare workers.

^c RA: children born prior to 2010 and younger than five years of age.

^d RA: conjugated vaccine to children younger than two years of age.

RR: polysaccharide vaccine to older persons.

^e Not included in the national immunisation programme, but recommended by the Ministry of Social Affairs [10].

^f MA: children up to 18 months of age.

MR: healthcare workers.

RA: older than 13 years of age.

^g MA: children up to 13 years of age.

MR: healthcare workers.

RA: older than 13 years of age.

^h No penalty exists for non-compliance.

ⁱ RA: from 2011.

Number of measles cases by month and notification rate per million population by country, EU/EEA, 1 February 2018 to 31 January 2019

CountryName	2018-02	2018-03	2018-04	2018-05	2018-06	2018-07	2018-08	2018-09	2018-10	2018-11	2018-12	2019-01	Total	incidence	lab.conf	
Austria		5	15	17	12	6	1	3	6	0	4	1	25	95	10,8	91
Belgium		6	9	11	24	22	3	11	14	4	8	7	20	139	12,2	105
Bulgaria		1	2	1	1	1	7	0	0	0	0	0	0	13	1,8	13
Croatia		0	0	1	2	16	3	1	0	0	0	0	0	23	5,5	23
Cyprus		6	4	0	0	0	0	0	0	0	0	0	0	10	11,7	10
Czech Republic		23	32	40	33	12	4	7	4	7	16	32	29	239	22,6	237
Denmark		0	3	0	0	0	0	2	2	0	0	1	1	9	1,6	9
Estonia		0	2	7	1	0	0	0	0	0	0	0	3	13	9,9	13
Finland		0	0	0	4	0	0	3	0	0	1	7	3	18	3,3	18
France		515	761	619	251	191	81	29	38	76	61	54	124	2800	41,8	1369
Germany		30	49	98	105	94	54	29	24	13	10	10		516	6,2	432
Greece		453	549	352	290	155	38	18	4	2	0	1	0	1862	172,9	1041
Hungary		5	6	0	0	0	0	0	0	0	0	1	2	14	1,4	14
Iceland		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ireland		13	17	12	0	2	5	18	6	4	3	1	2	83	17,4	64
Italy		301	391	498	461	317	147	79	57	82	58	76	165	2632	43,4	2053
Latvia		7	1	0	2	3	1	1	0	0	1	2	0	18	9,2	18
Lithuania		0	0	0	0	0	1	1	0	0	8	20	12	42	14,8	42
Luxembourg		0	0	1	0	0	0	2	0	0	1	0	0	4	6,8	4
Malta		0	0	0	0	0	5	0	0	0	0	0	0	5	10,9	5
Netherlands		2	2	0	3	10	1	4	0	0	0	2	1	25	1,5	24
Norway		4	2	1	2	0	0	3	0	0	0	0	1	13	2,5	11
Poland		11	3	22	19	12	13	19	9	21	79	114	133	455	12	266
Portugal		4	106	13	0	3	1	3	3	2	24	12	2	173	16,8	162
Romania		102	105	111	104	111	100	92	63	54	74	70	261	1247	63,5	952
Slovakia		0	0	3	18	72	257	87	28	16	38	52	43	614	113	407
Slovenia		0	0	0	3	3	0	0	0	1	0	0	0	7	3,4	7
Spain		14	52	50	41	25	15	7	4	4	1	6	11	230	4,9	225
Sweden		2	2	2	4	3	3	2	4	1	0	3	0	26	2,6	24
United Kingdom		81	150	202	155	100	82	54	16	21	26	11	43	941	14,3	941
EU/EEA		1585	2263	2061	1535	1158	822	475	282	308	413	483	881	12266	23,7	8580

Mandatory measles vaccination and immune status in Hungary: interfaces

Vaccination:

Introduction: 1969

Single shot: 1969-1988 (bulk of the active population)

Double shot: 1989 –

Immune status

- 1969: immunity by acquiring the disease

1969-1988: certain level of immunity by a single shot (not too robust vaccine strain)

1989: mostly but not entirely high immunity by double shot (more robust vaccine strain)

The lesson of the recent measles cases in Hungary

Some special aspects: continental differences in epidemiological interfaces:

American trypanosomiasis in Europe

Latin-America: Trypanosoma cruzi – reduviid bug vector – man

Europe: pregnant women – foetus

Imported and autochton Dengue fever in Hungary:

Imported: virus acquired by mosquito bite in Thailand

Autochton: by needle when taking blood sample from the imported case

Cholera case in Hungary decades before: where is the pathogen from?

Carbapenemase-producing bacteria are here in Europe

How to treat the patients and the problem

Guidance/guideline/recommendation are available in many EU countries

**KPC *Klebsiella pneumoniae* carbapenemase
1996**

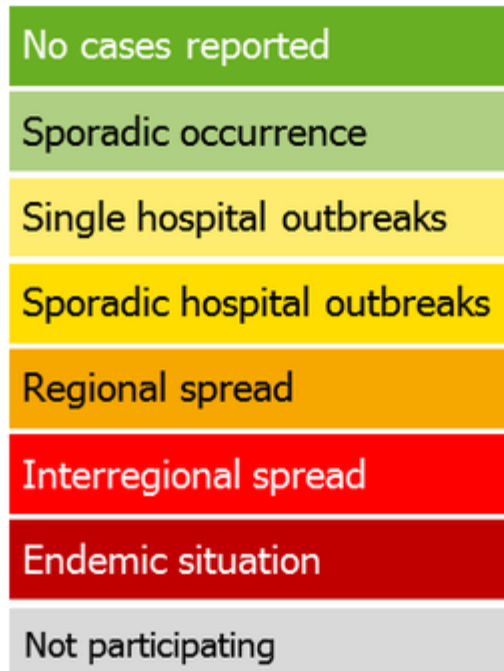
VIM Verona integron-encoded metallo-beta-lactamase 1997

OXA-48 OXA-type carbapenemase 2001

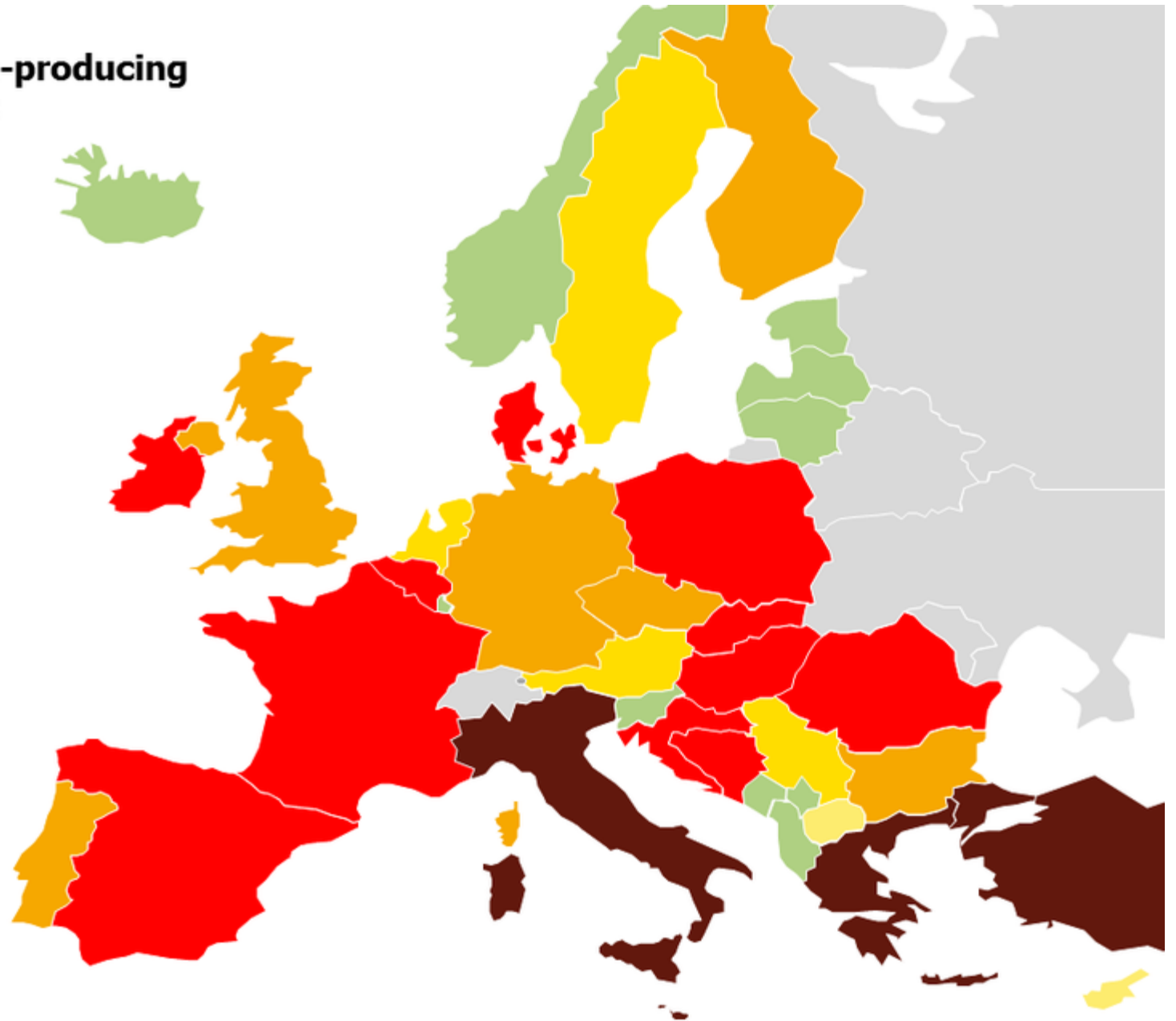
NDM-1 New Delhi metallo-beta-lactamase 2008

**Additional issues: coming and returning travellers (patients, healthcare workers) - foodborne pathogens – environment
Carbapenem consumption, appearance of resistance before the migrant crisis**

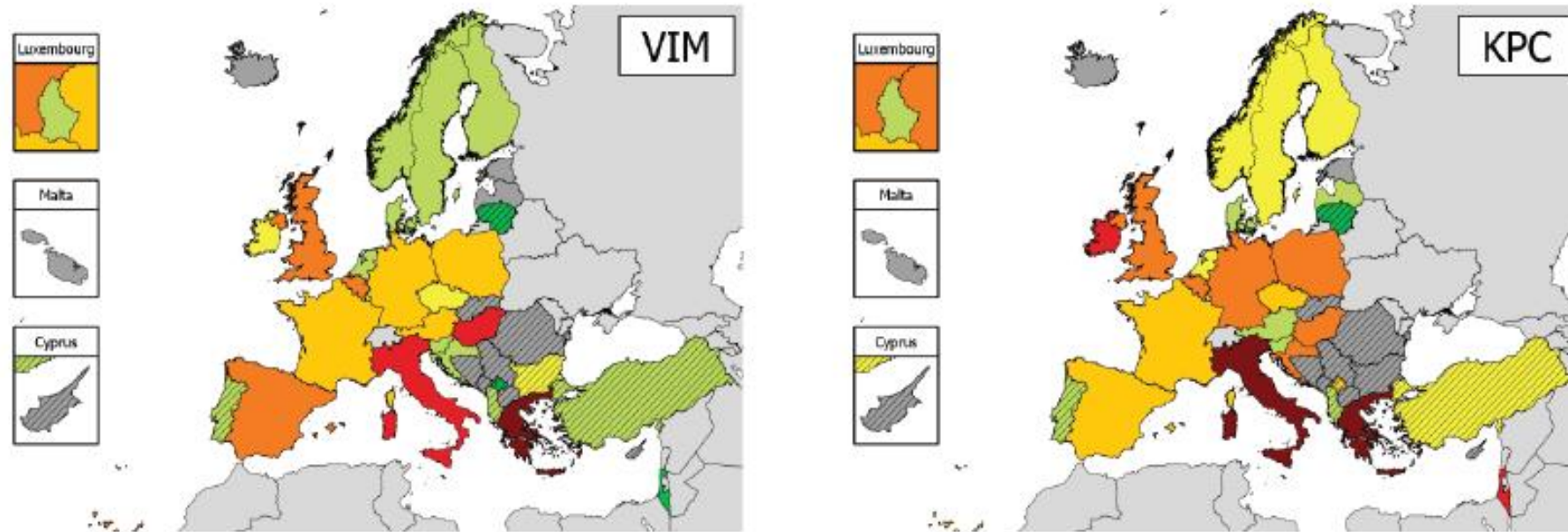
Spread of carbapenemase-producing Enterobacteriaceae, 2018



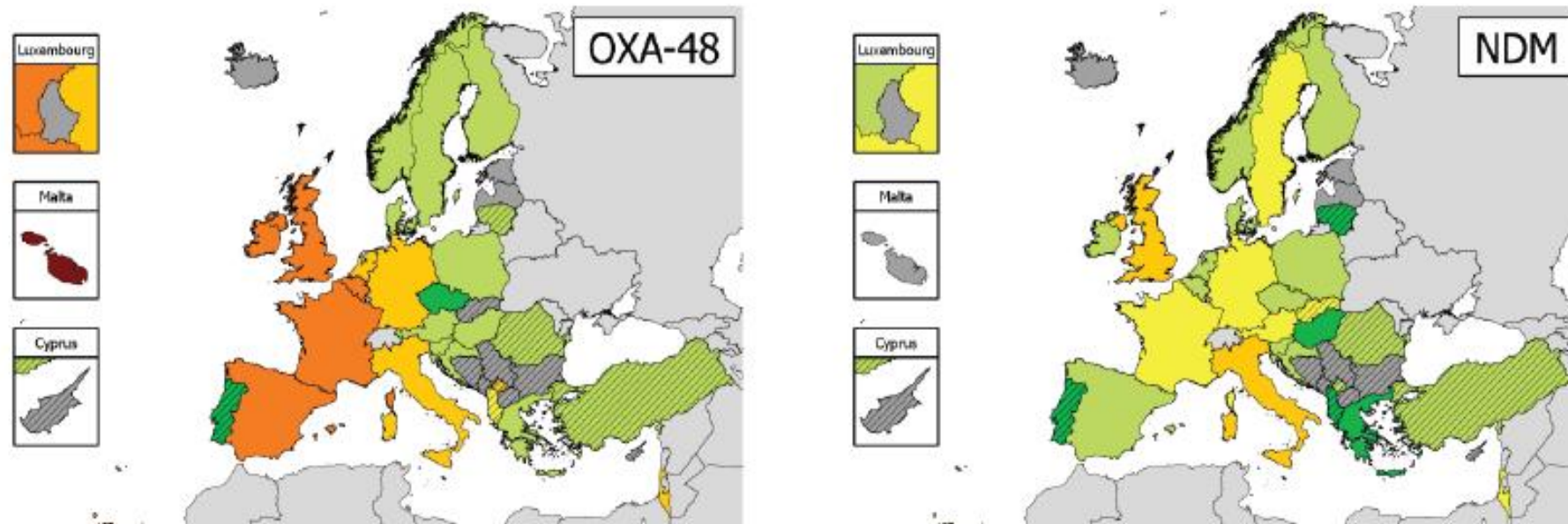
Source: Brolund *et al.* Eurosurveillance 2018



Country self-assessment of stages for spread of carbapenemase-producing Enterobacteriaceae (all isolates), 2013



ECDC, 2013



Communication to the public!

Fake, real, truth

Attila József Hungarian poet:

Welcome to Thomas Mann: „Tell us the truth, the real is not enough”: non-aggregated vs. aggregated data

By the Danube: „The surface is blattering, the depth is silent”
Very loud boulevard media



Thank you for your attention!

Tettye hill in Pécs:
Last plague epidemic in Pécs: 1690-91.
Erection of the votive chapel: 1697
In front: European tree of 2019