

ECDC perspective on pertussis

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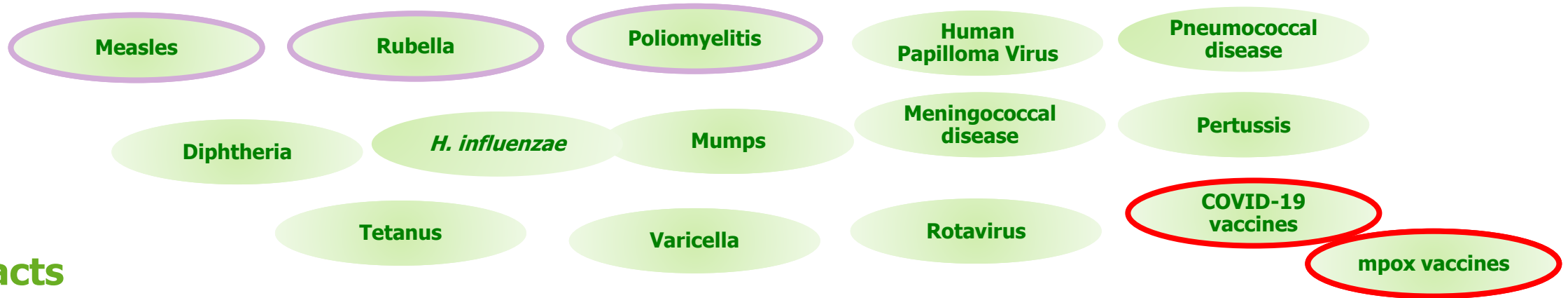
Journée du groupe Vaccination-Prévention de la SPILF

12 May 2023

Outline / work of ECDC

- Epidemiological overview in EU/EEA
- Overview of vaccination schedules and policies in EU/EEA
- Special studies: vaccine effectiveness studies (infants)
- Special studies: seroprevalence studies (adults)
- Other relevant ECDC activities

ECDC VPI Section



Key facts

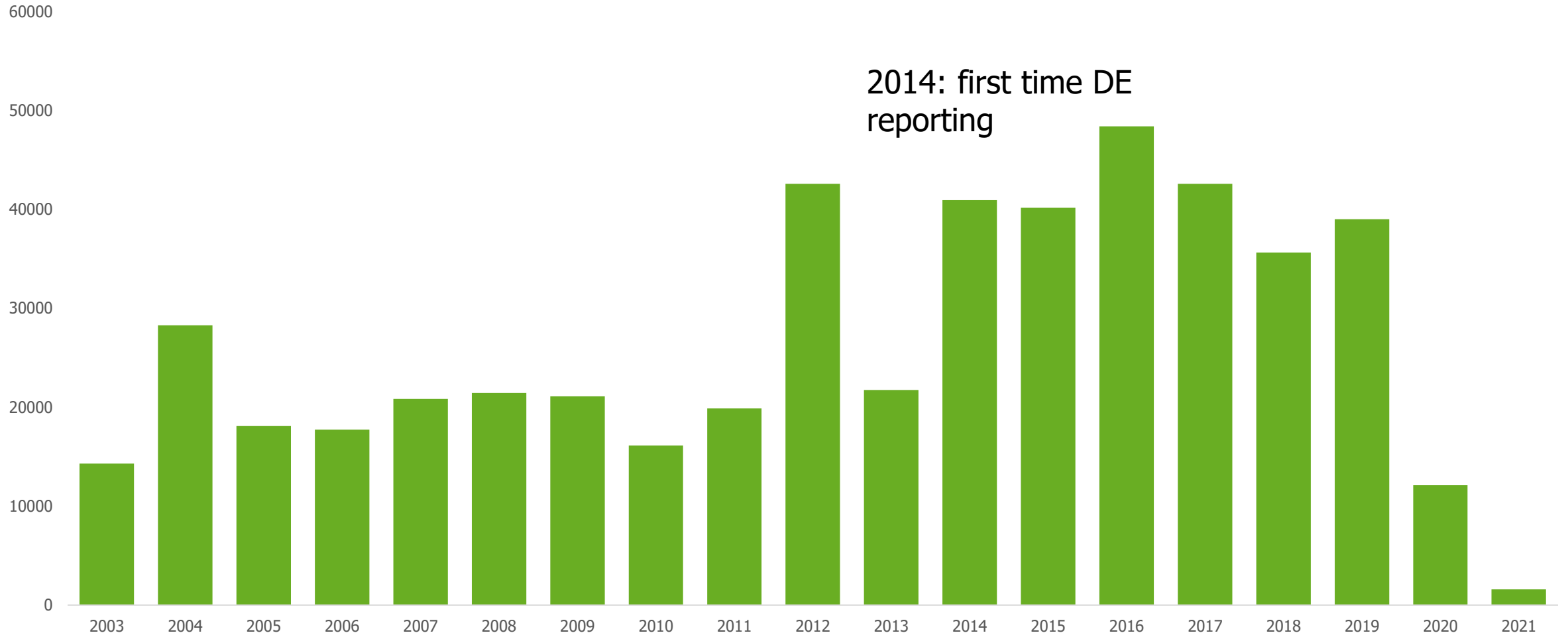
- 15 vaccines/vaccination programmes monitored, incl. COVID-19 and mpox
- Closer monitoring of diseases under elimination/eradication targets
- 12 vaccine-preventable diseases under EU surveillance

Key functions

- Epidemiological and laboratory surveillance
- Vaccine effectiveness studies on priority vaccines
- Scientific advice (incl. NITAGs and EMA liaison)
- Communications on immunisation
- Policy and programmes

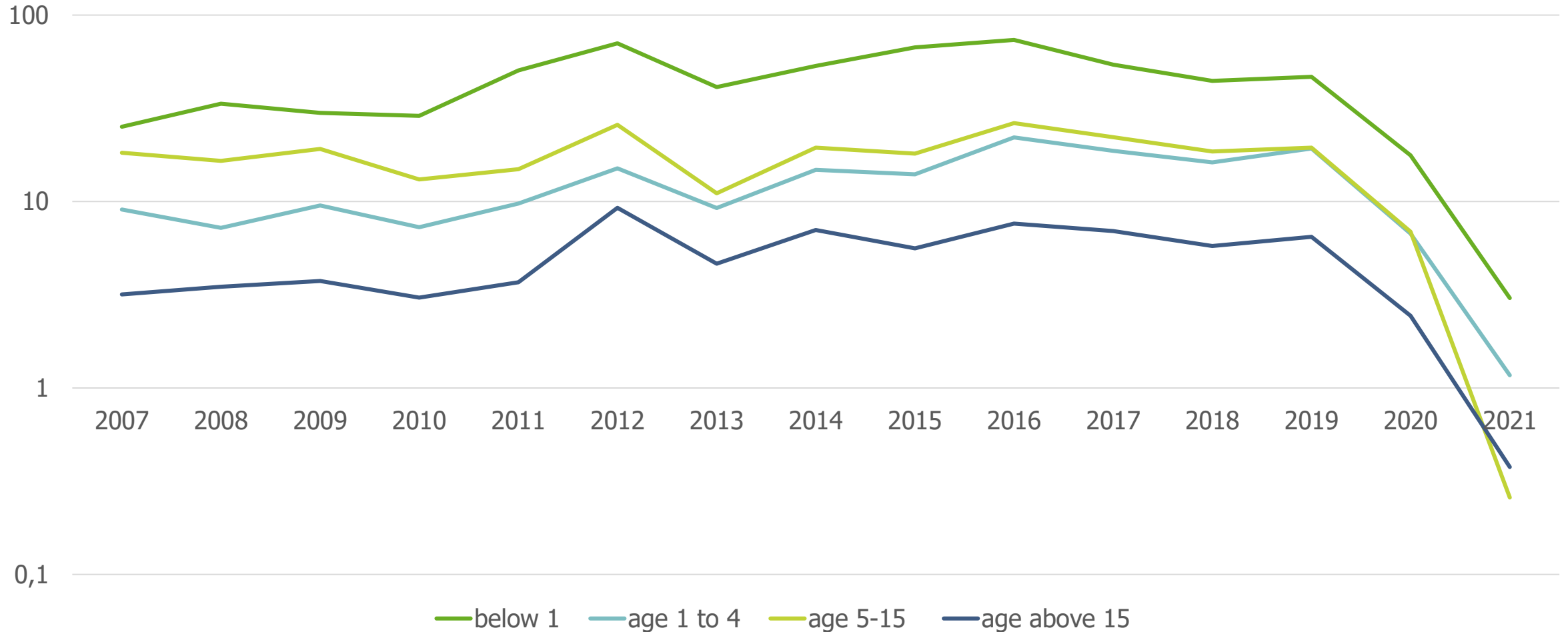


Number of reported pertussis cases, 2003-2021 (n=502 459)

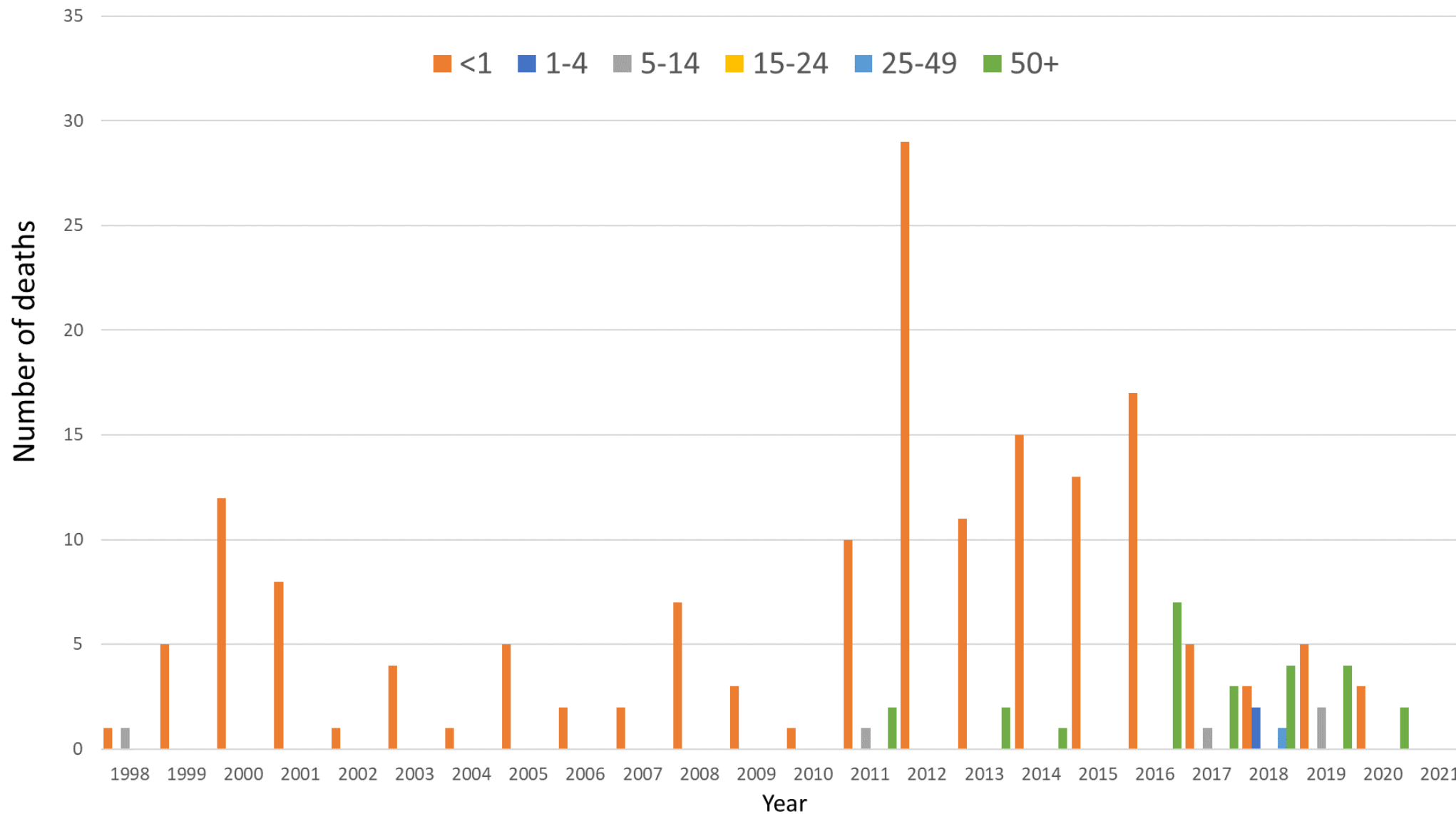


Source: TESSy. 2003-05: 28 countries; 2006-10: 29 countries; 2011: 28 countries; 2012-15: 29 countries; 2016-19: 30 countries; 2020-21: 29 countries




Notification rate of pertussis by age group and year in the EU/EEA, 2007-21 (log scale)



Pertussis – Number of deaths by age group, EU/EEA, 1999-2021

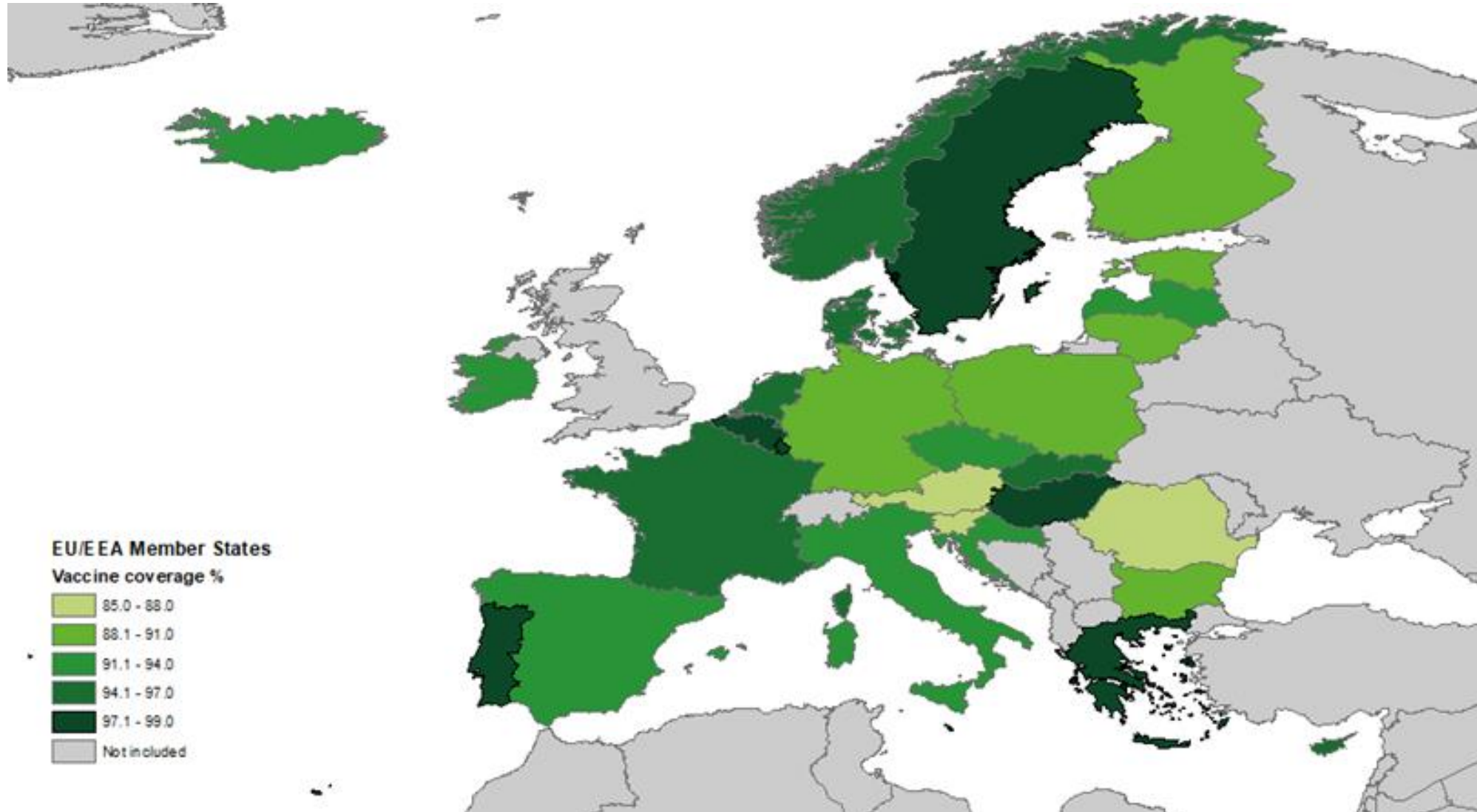


Pertussis – vaccine schedules, EU/EEA

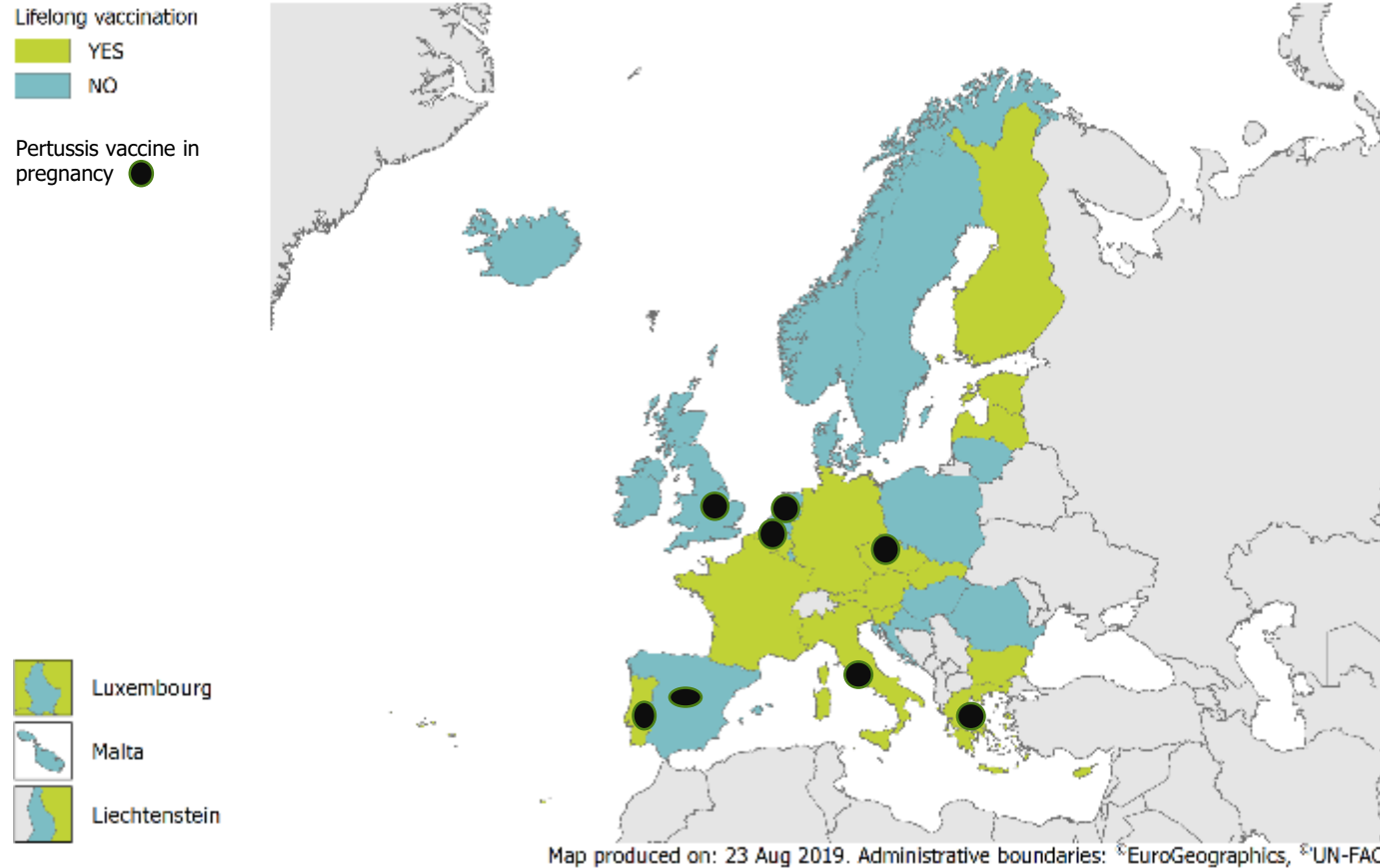
-  General recommendation
-  Recommendation for specific groups only
-  Catch-up (e.g. if previous doses missed)

	Months																			Years																					
	2	3	4	5	6	8	10	11	12	13	15	16	18	19-2	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	18	19	25	45	60	61	64	65	>= 6			
Austria		acP	acP					acP (1)											acP										acp (2)										acp (3)		
Belgium	acP	acP	acP							acP							acP										acp													acp (4)	
Bulgaria	acP	acP	acP								acP (5)							acP					acp																		
Croatia	acP		acP		acP						acP							acP (6)	acP (7)																						
Cyprus		acP		acP		acP							acP					acP						acp																	
Czech Republic			acP (8)		acP				acP									acp						acp															acp (9)	acp	
Denmark		acP		acP					acP									acP																							
Estonia		acP		acP	acP									acP					acP									acp													
Finland		acP		acP					acP							acP											acp														
France	acP (10)		acP					acP										acP								acp														acp (11)	
Germany	acP	acP	acP					acP					acP					acp							acp															acp (12)	
Greece	acP		acP		acP				acP			acp		acp				acP		acp				acp		acp		acp												acp (13)	
Hungary	acP	acP	acP									acP						acP							acp (14)																
Iceland		acP		acP					acP									acp									acp (15)														
Ireland	acP		acP		acP												acP									acp (16)				acp (17)											
Italy		acP		acP				acP										acP									acp														acp (18)
Latvia	acP		acP		acP				acP										acP (19)							acp															acp (20)
Liechtenstein	acP		acP						acP									acP (21)		acp					acp															acp (22)	
Lithuania	acP		acP		acP							acP						acP									acp														
Luxembourg	acP	acP	acP							acP								acP										acP (23)													
Malta	acP	acP	acP																																						
Netherlands	acP (24)	acP		acP					acP									acP																						acp (25)	
Norway		acP		acP					acP											acP							acp														
Poland	acP (2)	wcP (26)	wcP (26)										wcP (26)						acP								acp														
Portugal	acP		acP		acP								acP					acP																							acp (27)
Romania	acP		acP						acP										acP									acp													
Slovakia	acP		acP					acP										acP																							acp
Slovenia		acP		acP						acP																															acp (28)
Spain	acP (29)	acP (29)							acP (29)										acp (29)																						acp (30)
Sweden		acP		acP						acP									acP																						acp (31)

Vaccination coverage of third dose of DTP, EU/EEA, 2021

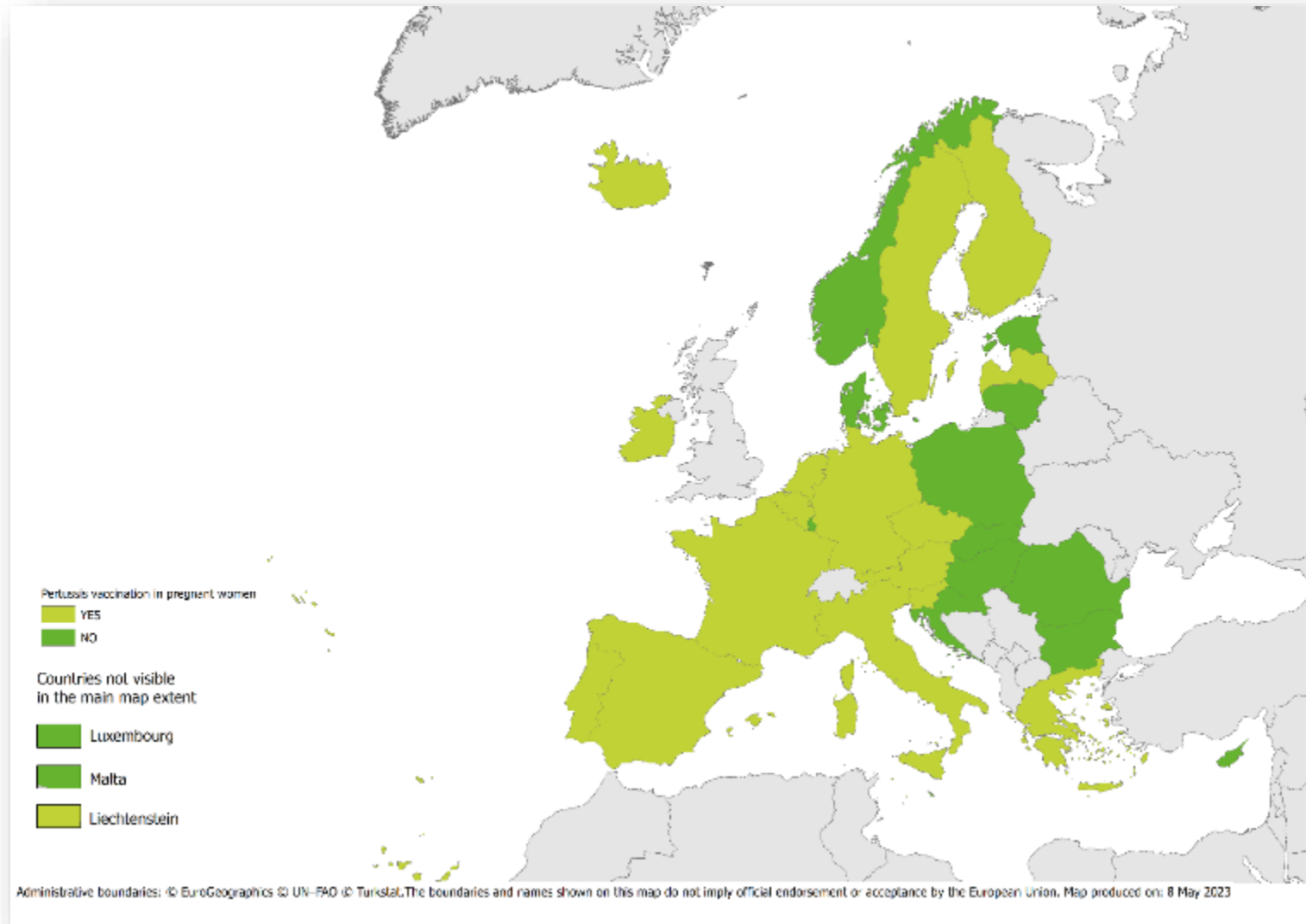


EU/EEA countries and the UK, with adult dT vaccination recommendation in place* and vaccination against pertussis during pregnancy - 2019



7 countries + UK

EU/EEA - vaccination against pertussis during pregnancy - 2023



17 countries

PERTINENT project

PERTINENT *Pertussis in Infants European Network*

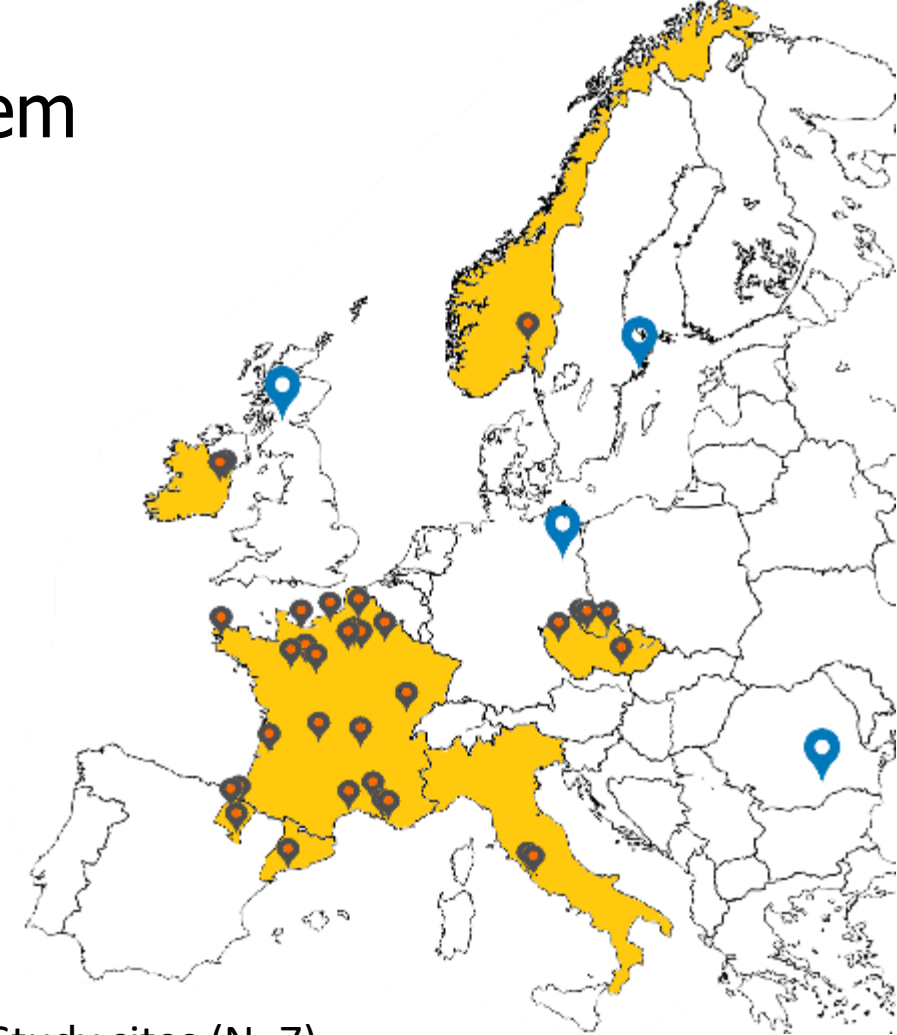


Active sentinel hospital-based surveillance system

- 2015-2019
- 37 hospitals in seven sites (six countries)
- ~6% of EU infants

Objective

- Assess the burden of whooping cough
- Assess vaccine effectiveness
- Pilot a model of sentinel surveillance



- Study sites (N=7)
- Hospitals (N=37)
- Expert partners (N=4)

Patients screened and cases reported by study site, PERTINENT, 1 December 2015 – 31 January 2019

Study sites	Protocol since	Screened patients	Pertussis cases	% of cases
Spain, Catalonia	01/01/2016	230 ^x	55	24%
Czech Republic	01/12/2015	112	52	46%
France	08/03/2016	623 ^{xx}	231 [*]	37%
Ireland	15/08/2016	163 ^{xxx}	391	24%
Italy	01/03/2016 + retro inclusion since 01/07/2015	559 ^{xxxx}	158 ^{**}	28%
Spain, Navarra	01/01/2016	136 ^{xxxxx}	15	11%
Norway	01/02/2016	523	7	1%
TOTAL		2,346	557	24%

^x number of patients including 1 unconfirmed case lost to follow-up and 6 other *Bordetella*.

^{xx} number of patients including 23 other *Bordetella*.

^{xxx} number of patients including 2 other *Bordetella*.

^{xxxx} number of patients including 1 Italian negative patient enrolled retrospectively from October 2015

^{xxxxx} number of patients including 5 other *Bordetella*.

^{*} number of cases including 1 co-infection *B. pertussis* and *B. parapertussis* and six cases included retrospectively according to NRL advice

^{**} number of cases including 10 Italian cases enrolled retrospectively from July 2015

Pertussis incidence in infants (all cases), TESSy* (2016-17) and PERTINENT (2016-18)

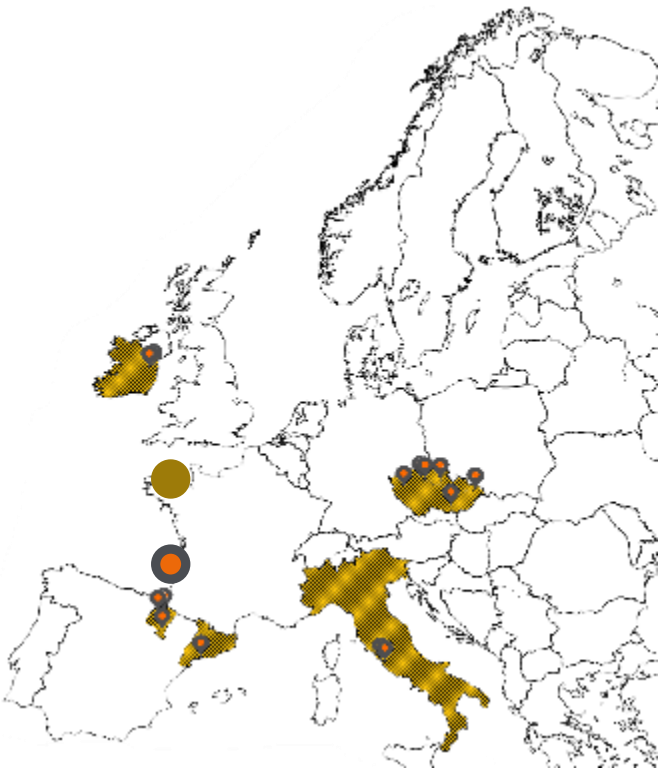


	incidence				
	TESSy (national)		PERTINENT		
	2016	2017	2016	2017	2018
Czech Republic	23	20	12	10	15
France			29	49	35
Ireland	135	127	57	90	12
Italy	40	50	212	139	88
Norway	47	78	17	12	0
Spain	167	111	120-157	85-207	18-52

*The European Surveillance System, ECDC

Vaccination in pregnant women

PERTINENT study sites



Study sites with vaccination
in pregnancy (N=5)
Hospitals (N=15)

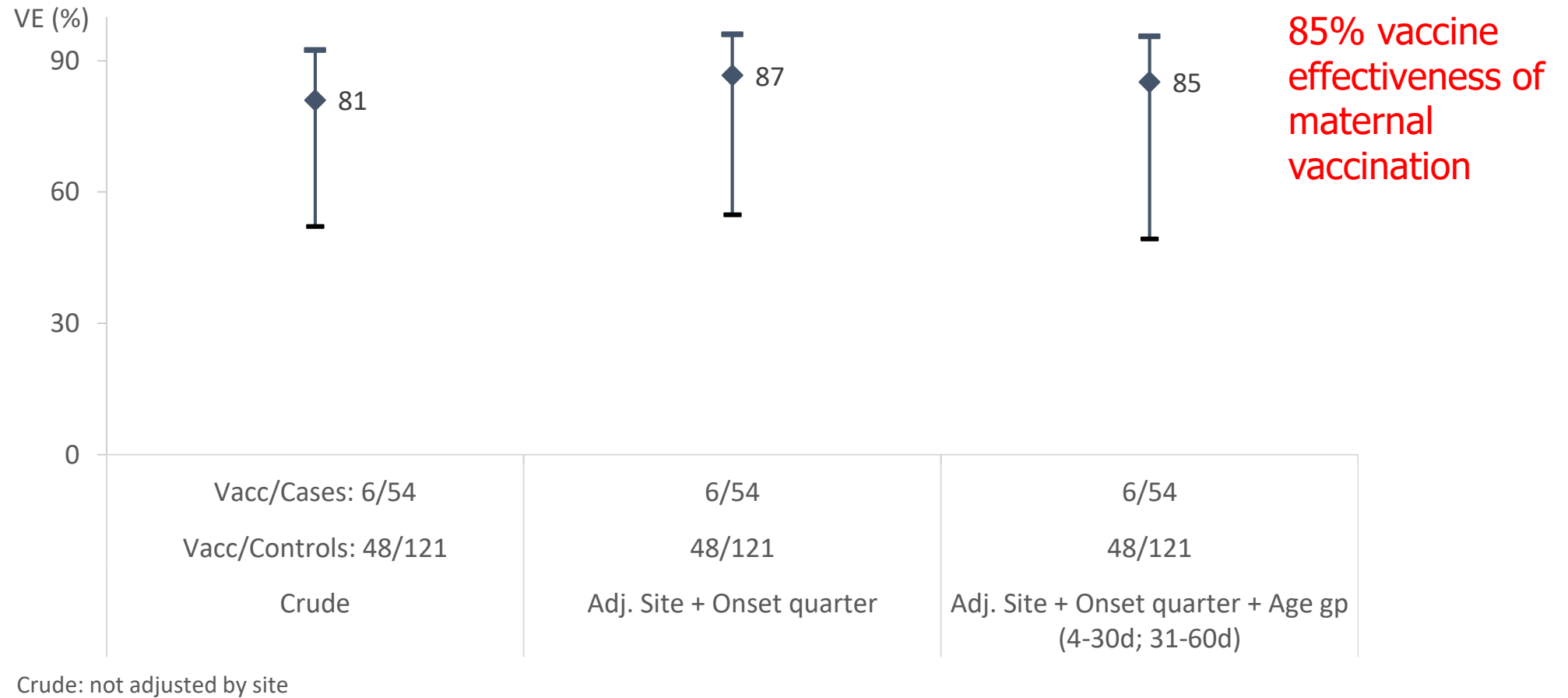
Study site	Year of start vaccination programme in pregnant women	Weeks of vaccination	Vaccination coverage (%)
Ireland	2013	16-36	50.0
Spain, Catalonia	2014	27-36	81.7
Spain, Navarra	2015	27-36	89.4
Czech Republic	2016	28-36	not available
Italy	2017	from 27	not available

Cases and controls by protective factors

PERTINENT Dec 2015-Aug 2019

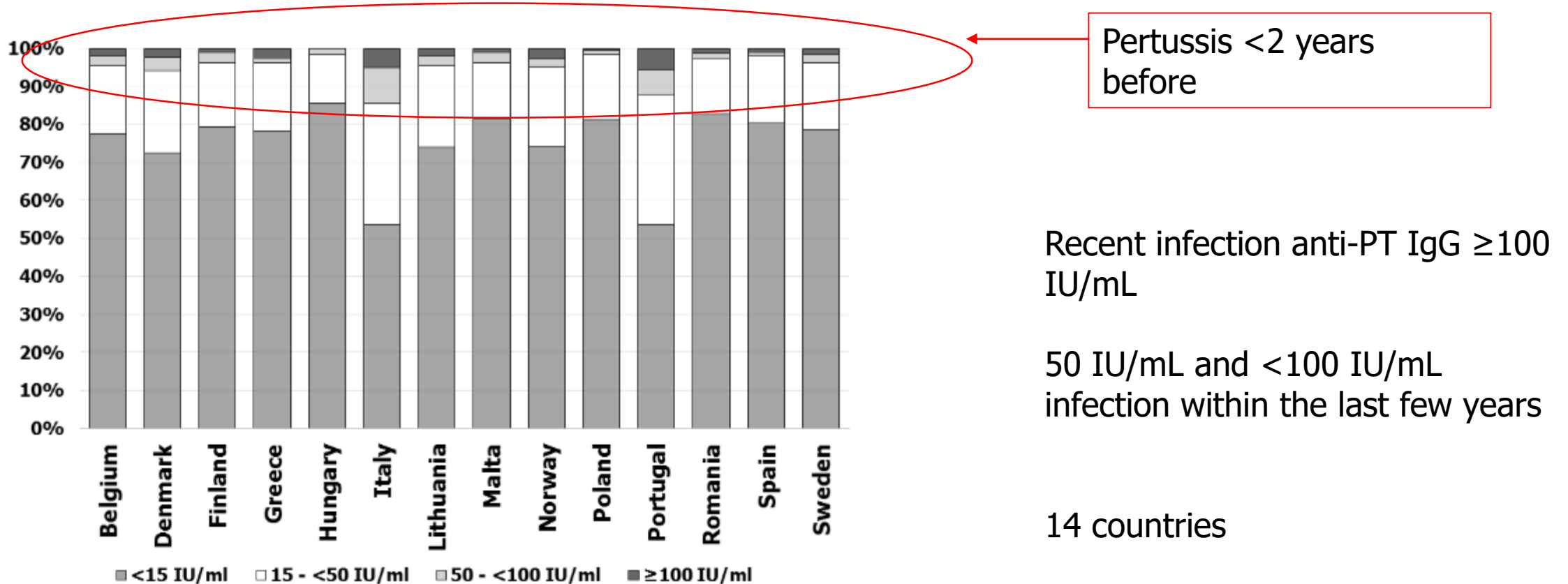
		Cases N=70	Controls N=190	p-value
Breastfeeding	Yes	52 74%	148 78%	0.507
	No	18 16%	41 22%	
Mother vaccination	Yes	9 13%	86 45%	<0.001
	No	61 87%	104 55%	
Median gestational week at vaccination		30.4	30.2	0.729

VE of pertussis vaccination during pregnancy in infants too young to be vaccinated, restricted to aspirates (N=175), Dec 2015 – Aug 2019

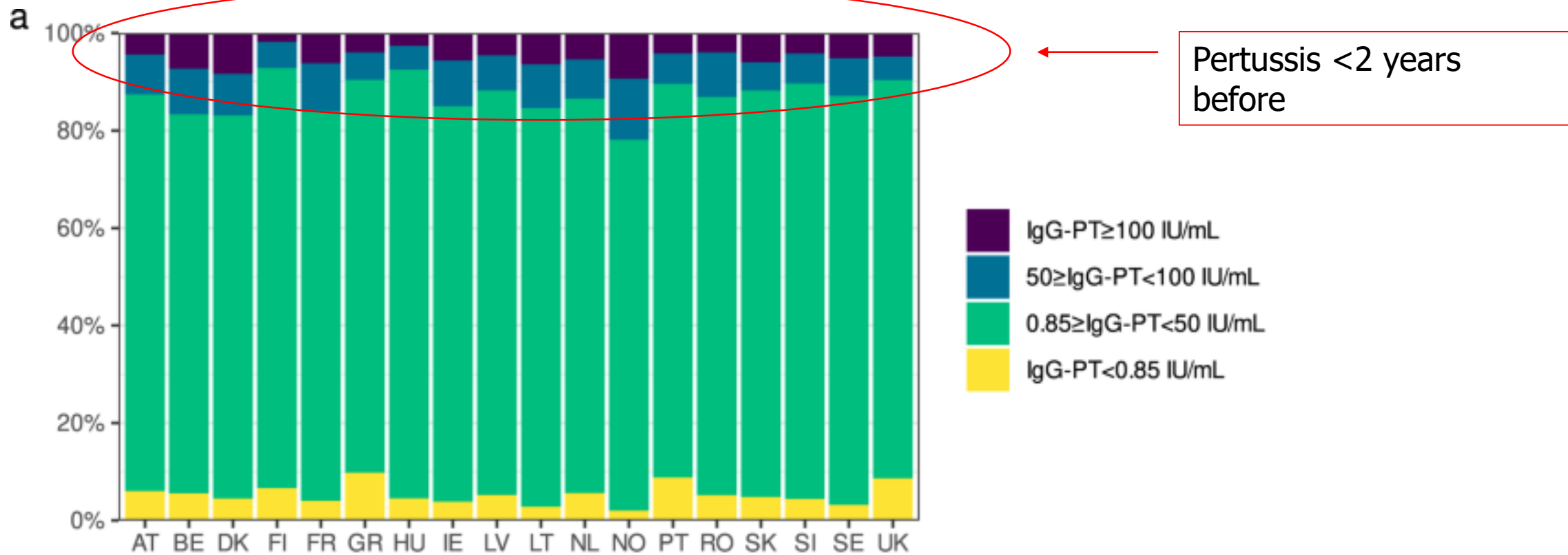


ECDC Seroprevalence studies in adults

Relative distribution of samples by anti-PT IgG interval and by country, 2010-13, age 20-39 years



Relative distribution of samples by IgG intervals and by country (40-59 years), 18 countries, 2015-18



Concluding remarks

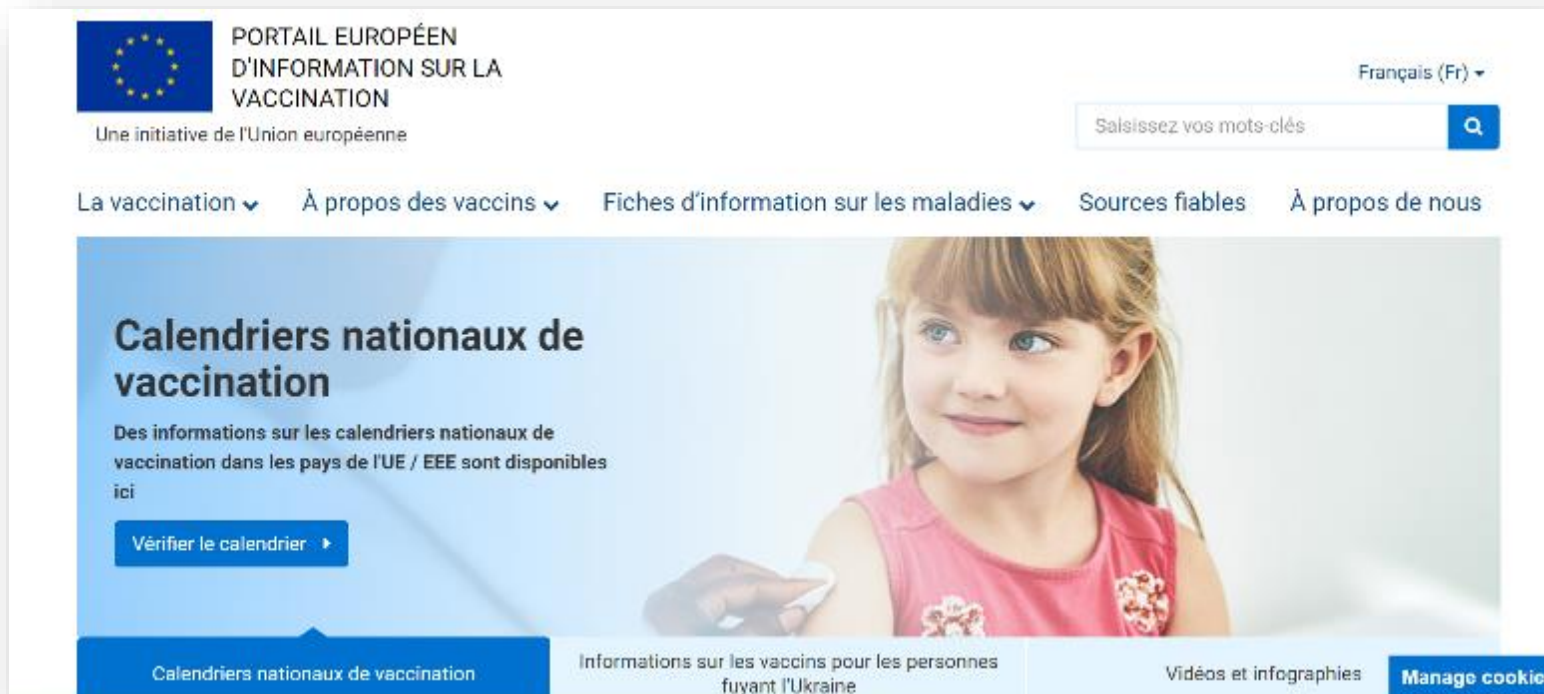
Health care professionals

- crucial role in delivering facts based on scientific evidence
- and increase public awareness about the benefits of immunisation

- are and continue to be ranked to be top most trustworthy source of information. This must be leveraged as
 - Provide reliable and trustworthy answers to genuine questions and concerns
 - Promote understanding of vaccine-preventable diseases risks
 - Play a critical role in fighting misinformation and fake news

Resources

- At EU level, work with healthcare professionals association is critical part of the EU Commission's vaccination strategy
 - o Coalition for Vaccination, <https://coalitionforvaccination.com/about/coalition-for-vaccination>
- At ECDC, we develop training tools and materials for healthcare professionals to build continued skills and knowledge on vaccination
 - o European Virtual Academy, [ECDC Virtual Academy \(europa.eu\)](https://europa.eu)
 - o European Vaccination Information Portal (EVIP), [European Vaccination Information Portal / Home page | European Vaccination Information Portal \(vaccination-info.eu\)](https://vaccination-info.eu)



The screenshot shows the homepage of the European Vaccination Information Portal (EVIP). At the top left is the European Union flag and the text "PORTAIL EUROPÉEN D'INFORMATION SUR LA VACCINATION" and "Une initiative de l'Union européenne". On the top right, there is a language selector set to "Français (Fr)" and a search bar with the placeholder "Saisissez vos mots-clés". Below the header is a navigation menu with items: "La vaccination", "À propos des vaccins", "Fiches d'information sur les maladies", "Sources fiables", and "À propos de nous". The main content area features a large banner with a photograph of a young girl in a pink dress. The banner text reads "Calendriers nationaux de vaccination" and "Des informations sur les calendriers nationaux de vaccination dans les pays de l'UE / EEE sont disponibles ici". A blue button labeled "Vérifier le calendrier" is positioned below the text. At the bottom of the page, there is a footer with four links: "Calendriers nationaux de vaccination", "Informations sur les vaccins pour les personnes fuyant l'Ukraine", "Vidéos et infographies", and "Manage cookies".

Final remarks

Increasing number of countries with maternal vaccination programmes

Circulation of pertussis in the community, even if not captured by official data

Fatal cases in infants too young to be protected by vaccination

High maternal vaccine effectiveness in European study – consistent with other literature

Aknowledgments



ECDC VPI team

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PERTINENT

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ECDC seroprevalence studies

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