Vaccine preventable diseases and vaccination programs
Adherence of the Public and stakeholders: ups and downs

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Brussels, May 2018

European Immunization Week (EIW)
23-29 April 2018

Prevent
Protect
Immunize

« Vaccination is a right and responsibility for all »(and at all ages)

Global Vision of a national vaccination program

Vaccine

Vaccine Recommendation

Vaccine coverage rate
Respect of schedule

Vaccine Reimbursment

Information / formation /
Education/communication
Around Vaccine/Vaccination

Vaccination Campaign
Support of health authorities

Vaccination coverage follow-up

Surveillance of the targeted disease

Components of success of a vaccination programme

Population households

Health Professionnals

Publique health Politics

Adherence / Communication

+

Information

+

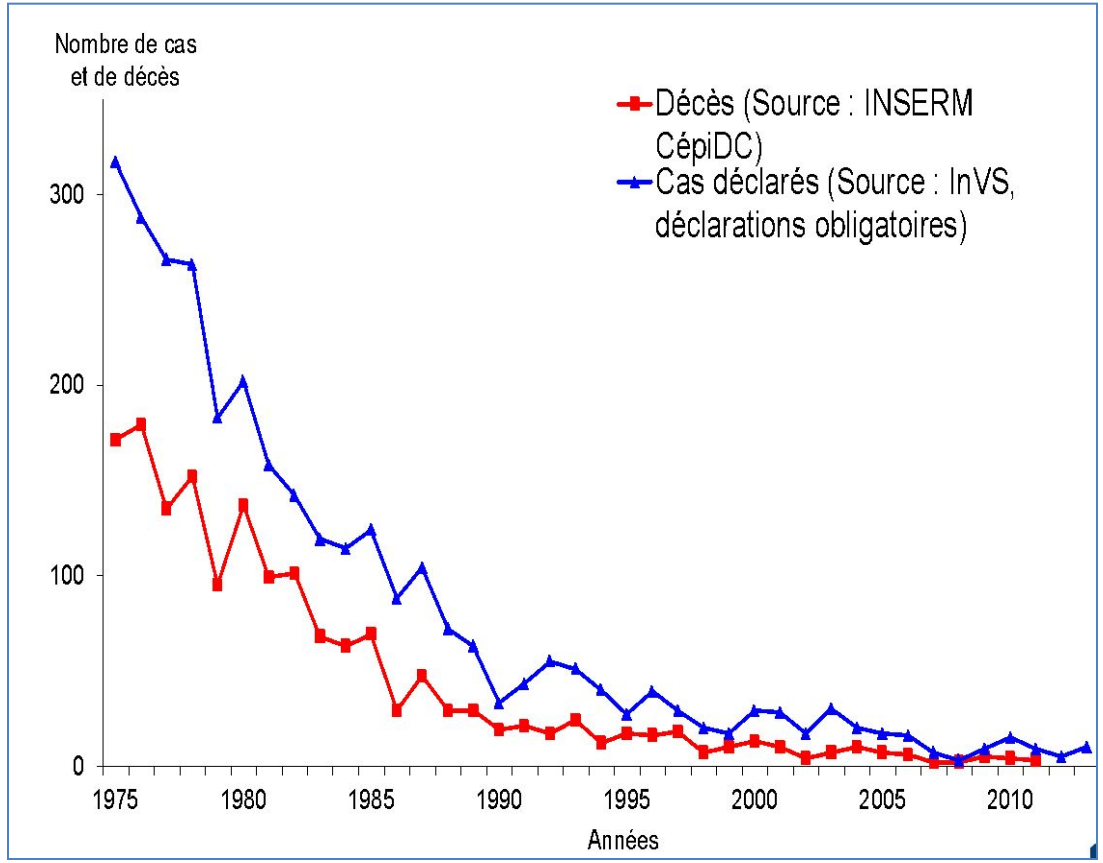
Formation, Education of health professionnals

+

Clear Support from authorities

Chen RT, & al.Vaccine1994;12(6):542–50

Tetanus, Diphtheria France 1975-2013 Morbidity, mortality



Diphtheria in 2014 (EU/EEA Member States, latest data)

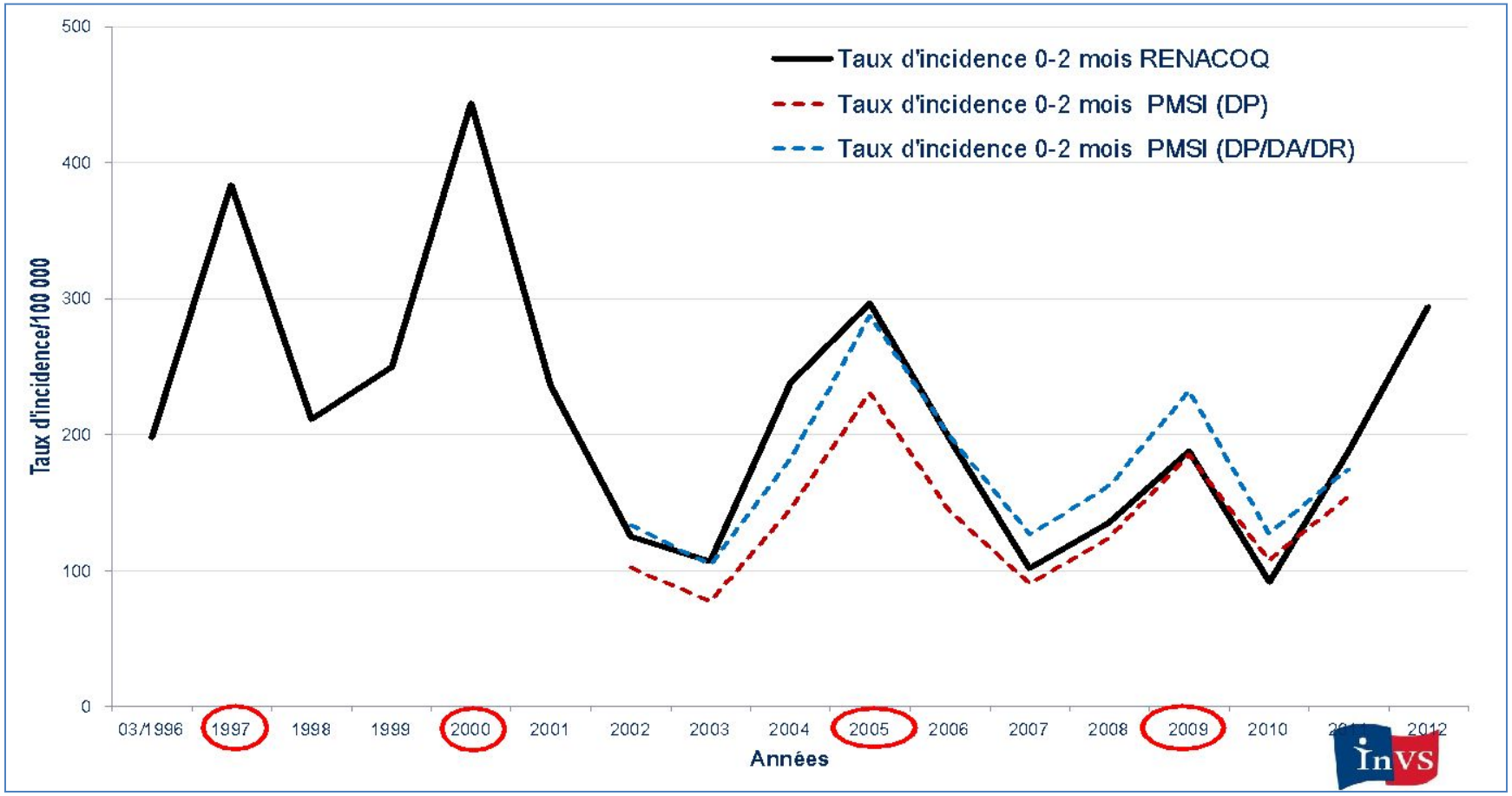
- ✓ 38 reported cases
- ✓ Notification rate 0.01 / 100 000 population
- ✓ Majority of cases due to *C. diphtheria* between 45 and 64 years (n=5)
- ✓ 65+ years cases mostly due to *C. ulcerans* (pets)

http://ecdc.europa.eu/en/press/news/_layouts/forms/News_DispForm.aspx

http://www.invs.sante.fr/Dossiers-thematiques/Maladies-infectieuses/Maladies-a- prevention-vaccinale/Tetanos
ECDC report 2016 (data 2014)

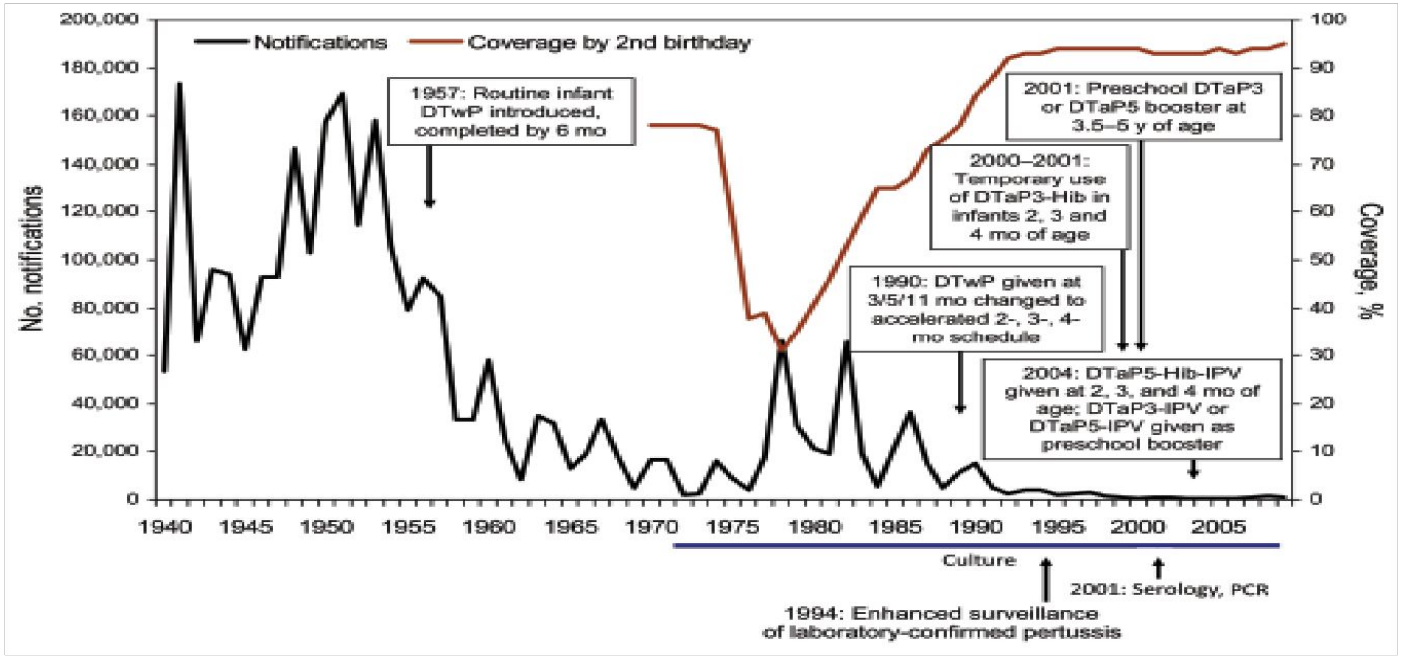
Pertussis
Infants < 3 months = THE risk group

Incidence rate of pertussis cases in infants 0-2 months, Renacoq, 1996-2012



Wooping cough
The risk not to vaccinate

Changes to routine childhood pertussis immunization programs and notifications of pertussis disease (all ages) and vaccine coverage among children <2 years of age, England and Wales, 1940– 2009.



Campbell H & al, EID 2012;18:38-47

Measles in Europe (EU/EEA) year 2016

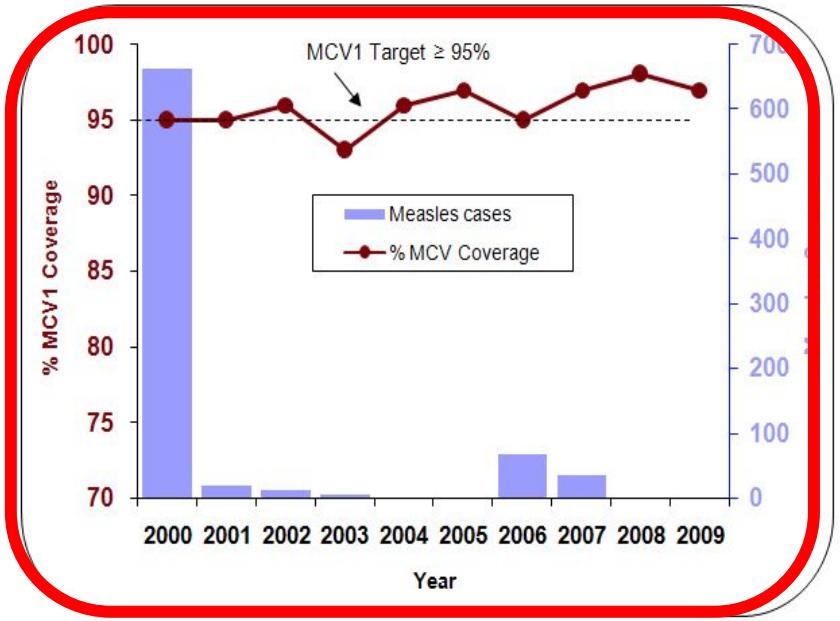
- **Over 14000 cases reported**
- Age of cases (when known)
  - Children under five: 35%
  - **Subjects 15+ years: 47%**
- Vaccination status (when known)): **86% unvaccinated**

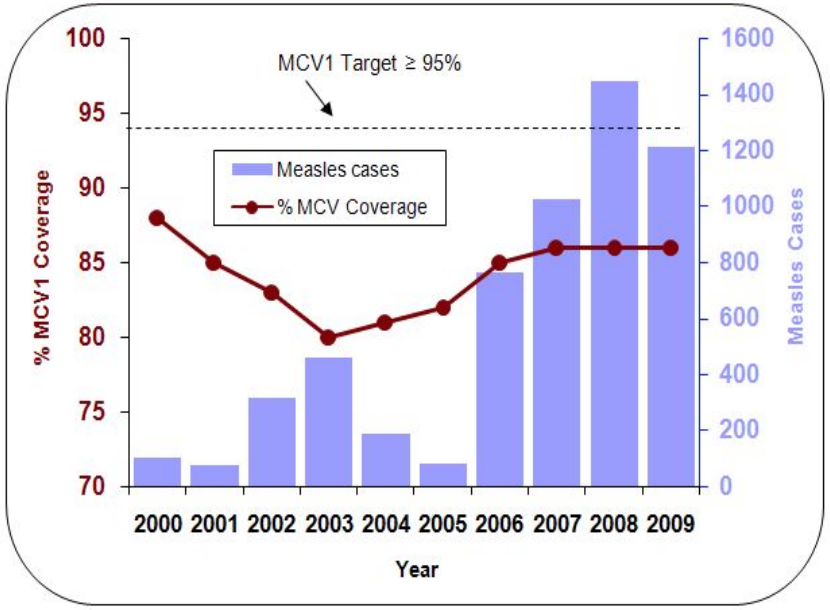
- *Comparisons between countries should be made with caution*
  - *Countries report on measles and other vaccine-preventable diseases to TESSy at their own convenience*
  - *because of dissimilar surveillance sensitivities, completeness of reporting and different reporting procedures*
  - *under-notification is a well recognised limitation of nationwide mandatory notification systems.*

https://ecdc.europa.eu/en/publications-data/number-measles-cases-eu-and-eea-countries-2016-data

Measles elimination in Europe

- **To reach elimination** and **protect those most vulnerable** to severe complications and death from measles such as infants, **95% coverage of the population vaccinated with two doses** of measles-containing-vaccine is needed.
- **Vaccination coverage below 95% in 22 out of 29 EU/EEA countries for the 2nd dose of a measles-containing vaccine** (WHO 2016)



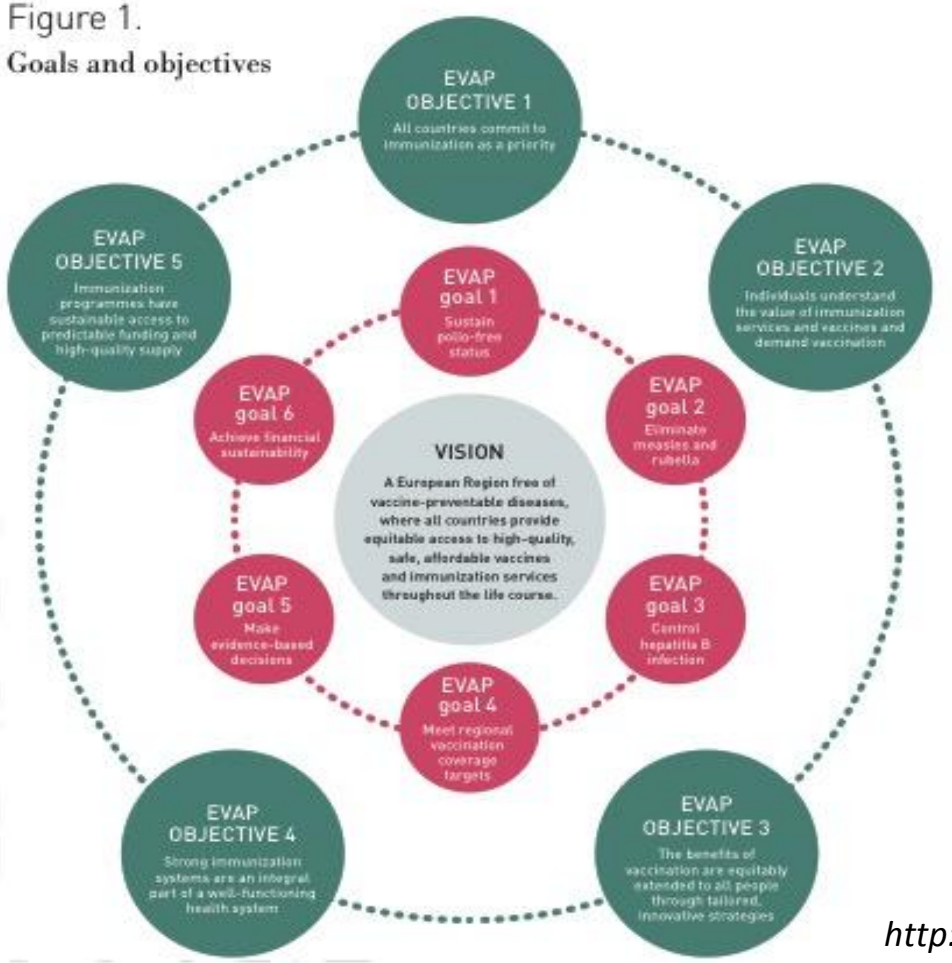


https://ecdc.europa.eu/en/publications-data/number-measles-cases-eu-and-eea-countries-2016-data

WHO. Why immunization must remain a priority in the WHO European region. http://www.euro.who.int/ data/assets/pdf_file/0017/84302/Seven_Key_Reasons.

the European Vaccine Action Plan 2015-2020 (EVAP)

Figure 1.
Goals and objectives

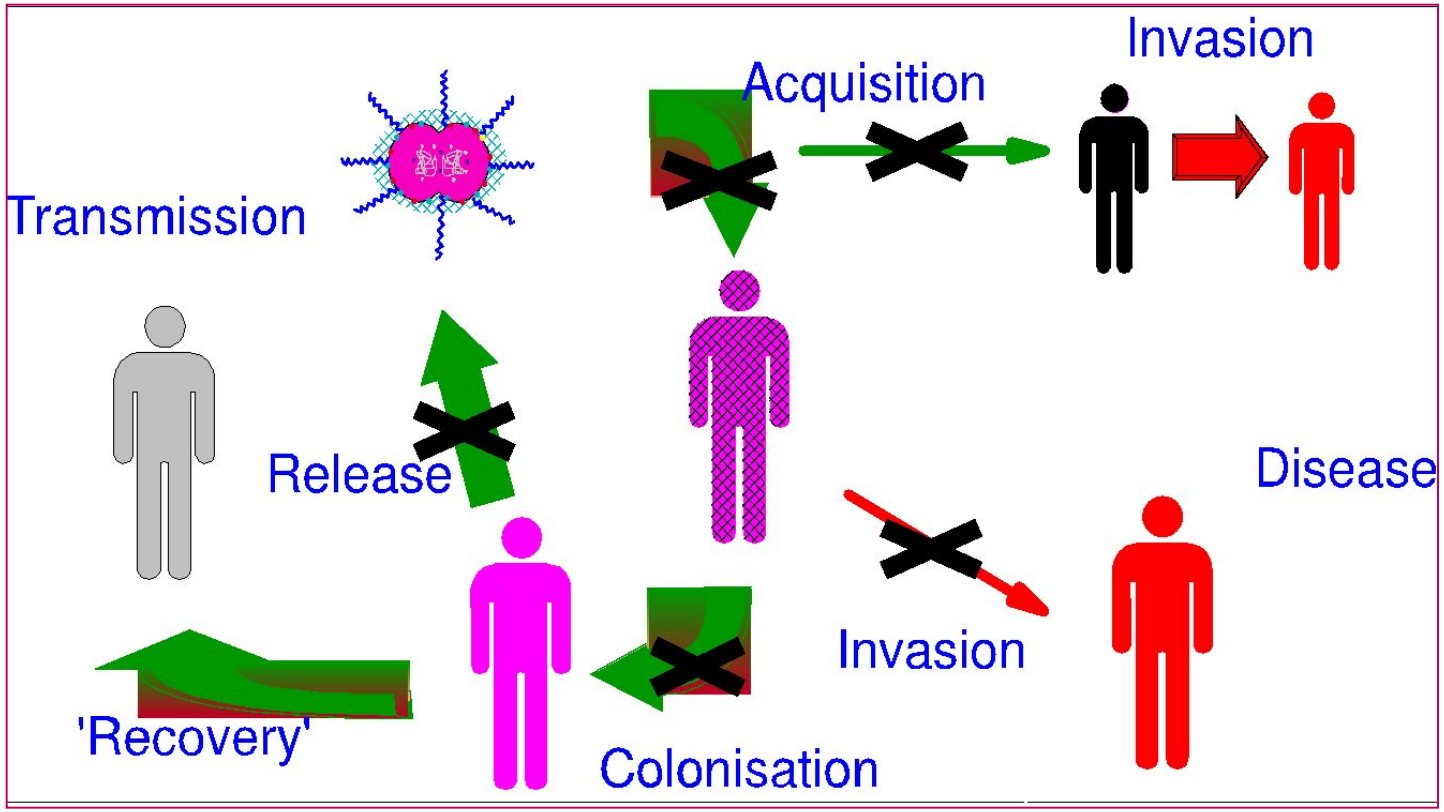


« **Interruption of endemic measles and rubella virus transmission for > 12 months**, with **high-quality surveillance** (**2015: all countries**)

• **Measles and rubella elimination** verified by the Regional Verification Committee (**2018: all countries**) »

http://www.euro.who.int/__data/assets/pdf_file/0008/276659/EVAP-factsheet.pdf?ua=1

Meningococcal invasive diseases
Transmission – acquisition



Role of MenCC vaccine

From M.Maiden

Meningococcal invasive diseases
Nowadays care

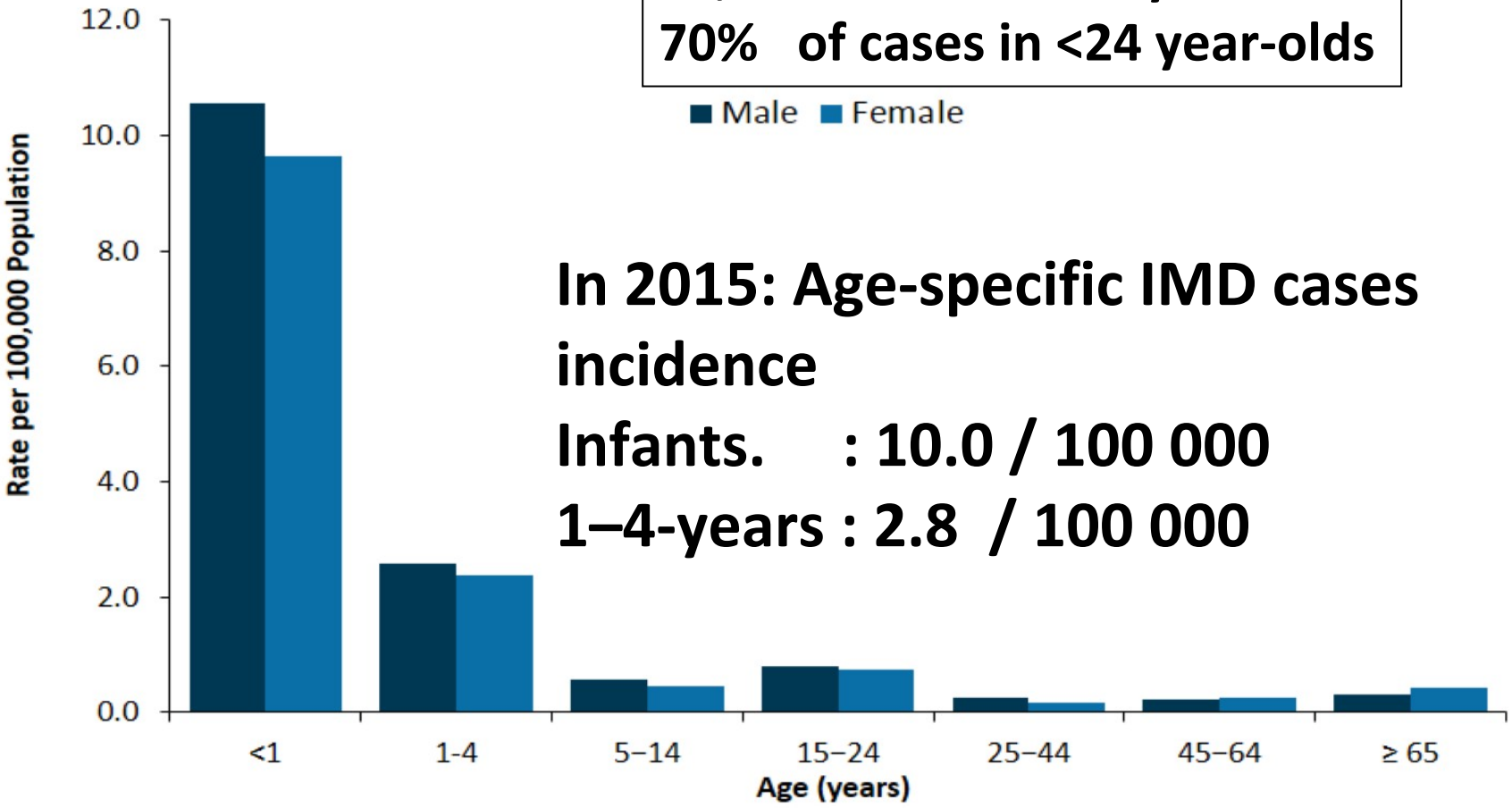
With an early diagnosis
and an adapted emergency care

- **Therapeutic**
- **Hemodynamic**
- **Intensive care**
- **Neurologic**

A persistant and incompressible
« plateau » of deaths and sequelae

Distribution of IMD incidence by age Europe 2014 and 2015

43,6% of cases in <4 year-olds
70% of cases in <24 year-olds



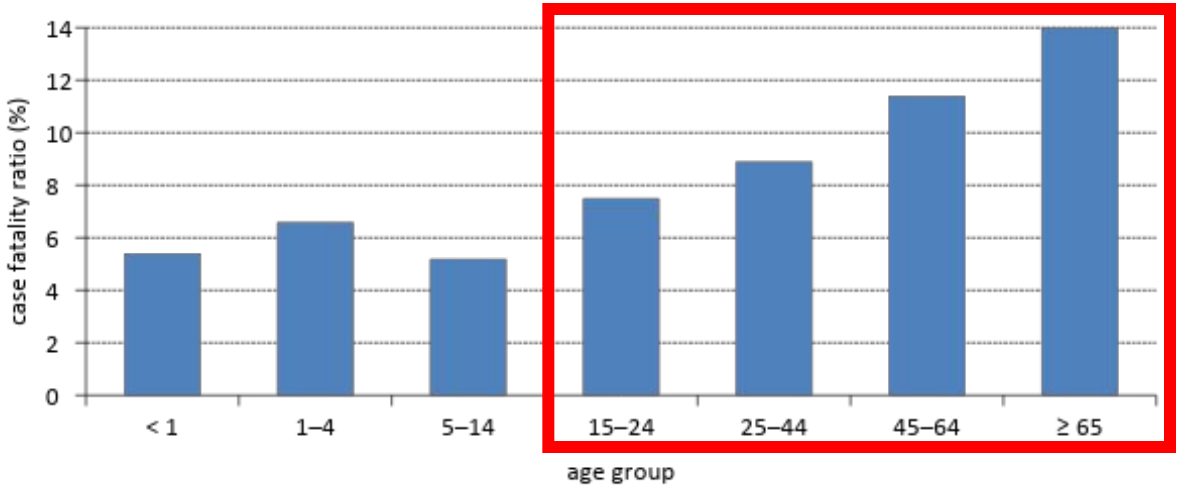
In 2015: Age-specific IMD cases incidence
Infants. : 10.0 / 100 000
1–4-years : 2.8 / 100 000

ECDC. 2016 annual epidemiological report. Invasive meningococcal disease.

IMD outcome in European Member States

- **Average case fatality in 2015: 9%[1] … unchanged since decades**

- **Higher CFR in adolescent and adults compared to infants, toddlers and children[2]**

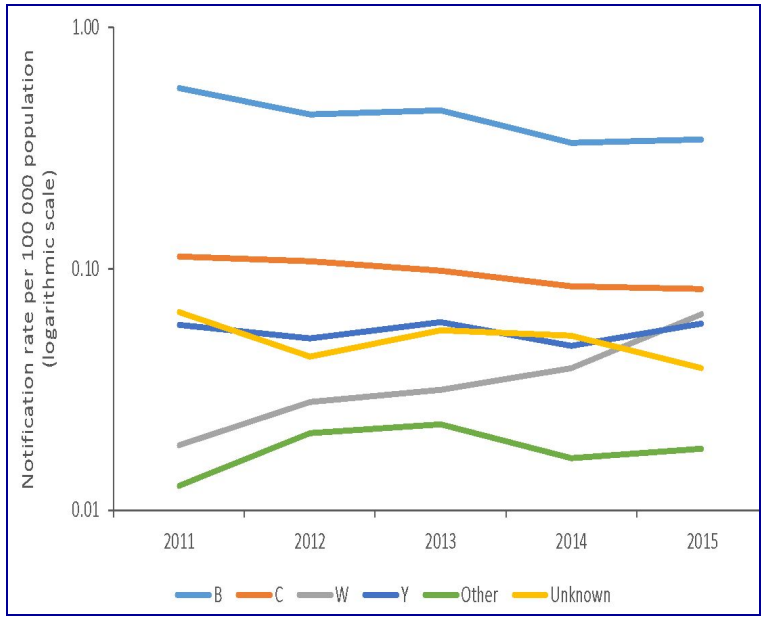


- **Sequelae*: up to 1/3 of survivors[3]**
  - life long impairment(6%): hearing loss, limb amputation, epilepsy; cognitive and/or behavioral disorders

1. *ECDC. Annual epidemiological report for 2015. Stockholm: ECDC; 2017* ***2****. ECDC. Annual epidemiological report for* 2012. Stockholm: ECDC; 2015. 3.

IMD by serogroup 2011-2015
ECDC report on IMD, 2015 data

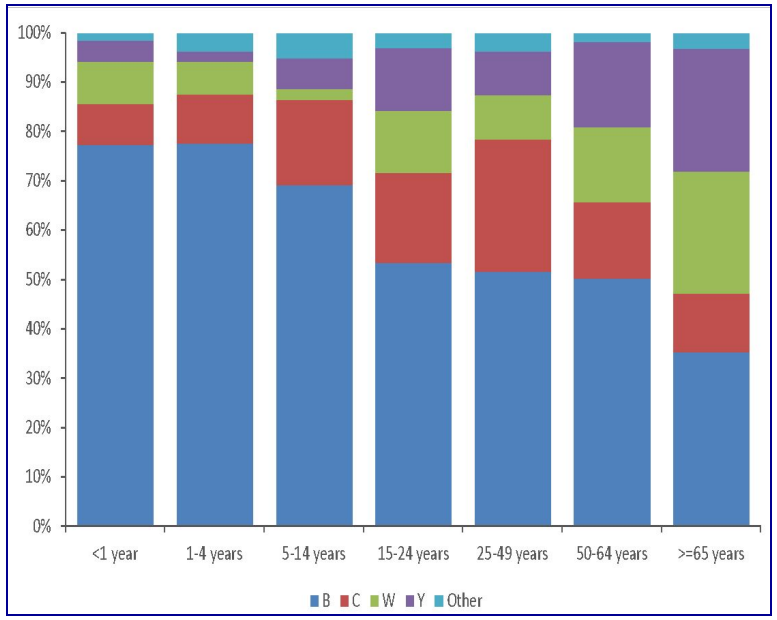
Notification rate of confirmed cases of IMD, by serogroup and year, EU/EEA, 2011–2015



Serogroup distribution of confirmed cases of IMD, EU/EEA, 2015

Serogroup	Cases	%
B	1 682	61
C	403	14
Y	290	10
W	317	11
Other	88	3
Total	2 780	100

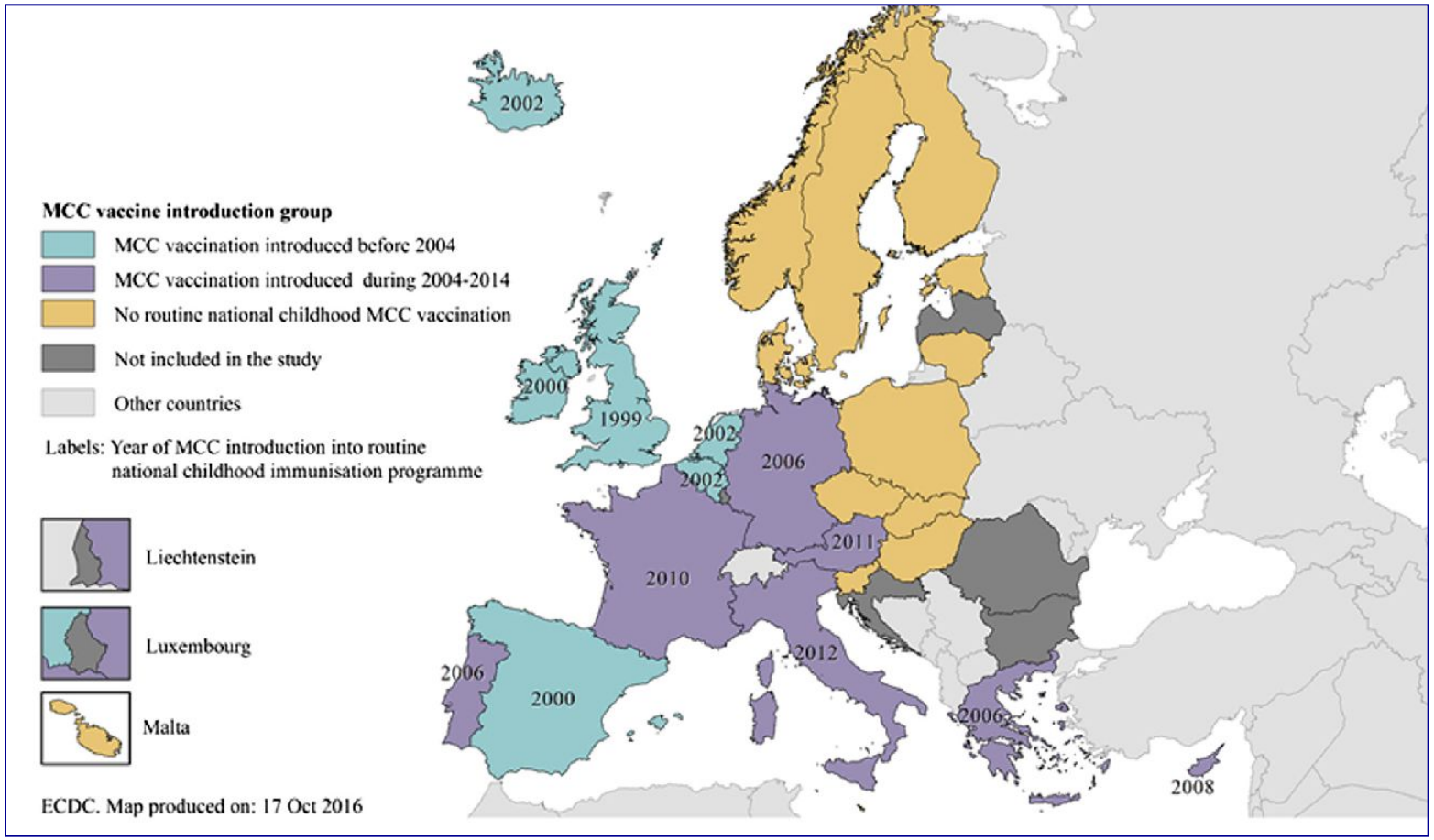
Serogroup distribution of confirmed cases of IMD, by age group, EU/EEA, 2015



2016-ECDC annual report on IMD, 2015 data

Men C conjugate routine policies in Europe

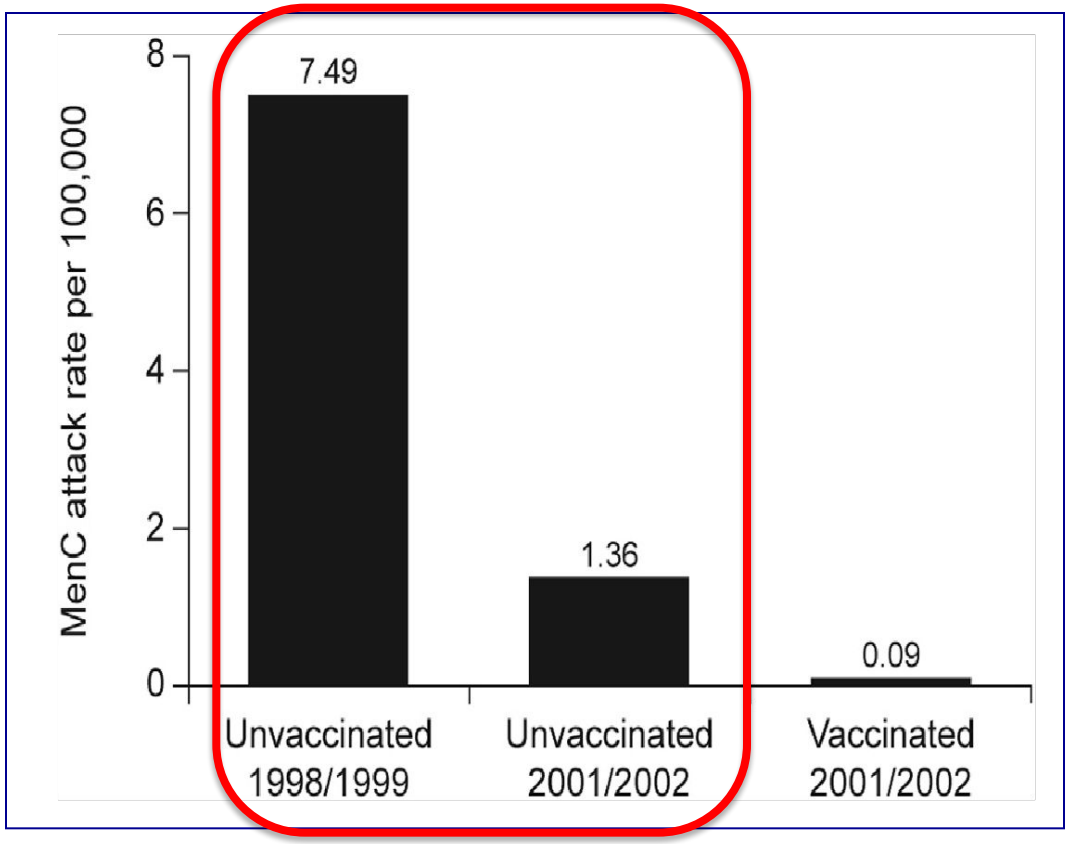
Year of introduction of routine childhood MCC vaccination among 25 European countries; respective MCC vaccine introduction group into which they were classified.



R. Whittaker et al. / Vaccine 35 (2017) 2034–2041

Direct and indirect protection
MenC conjugate vaccine routine program e.g. in the UK

Direct and herd protection against MenC in the United Kingdom.



R. Borrow et al. J Inf 2017: 75, 1e11

Two major prerequisites

- **Large catch-up campaign**
- **High coverage rate (> 90%), quickly achieved, maintained**

Men C conjugate vaccines in France

Incidence of IMD C per age groups, France 2005-2012

- Recommendation (and reimbursment) since 2010
  - One dose any age between one and 24 years of age
- Coverage rate: 70 % at 2 years of age

  32 % in the 10-14 years

  7 % in the 20-24 years

2016-Rapport sur la concertation citoyenne

Barret et al., BEH,2013

Meningococcal B vaccine program (Public Health England): the background of success

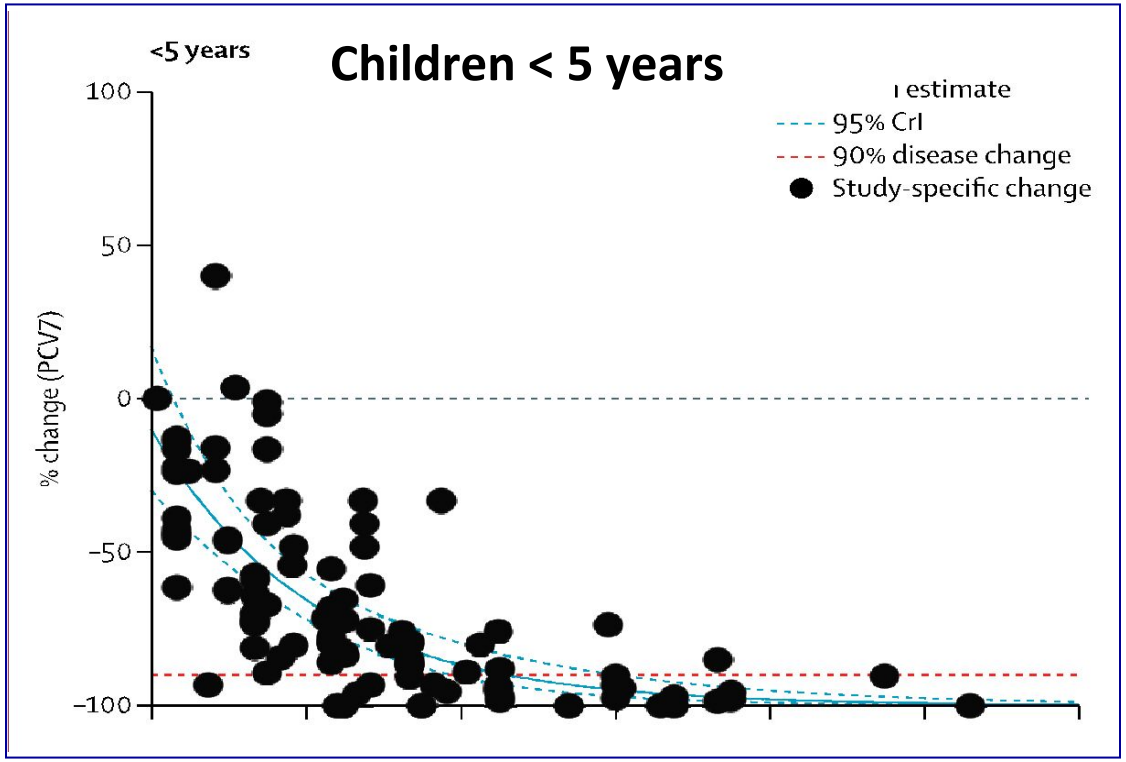
Introduction of MenB immunisation has been supported by:

- **Comprehensive media and communications campaign**
  - partnership with health partners and meningitis charities,
  - leading to significant reporting in national, local and parenting media and social media.
- **New patient information leaflets and posters**
  - Comprehensive guidance added to the NHS Choices website.
  - Amendement of the existing children's immunisation information booklets and leaflets (new schedule reflected)
- **Training factsheet and video for health professionals**

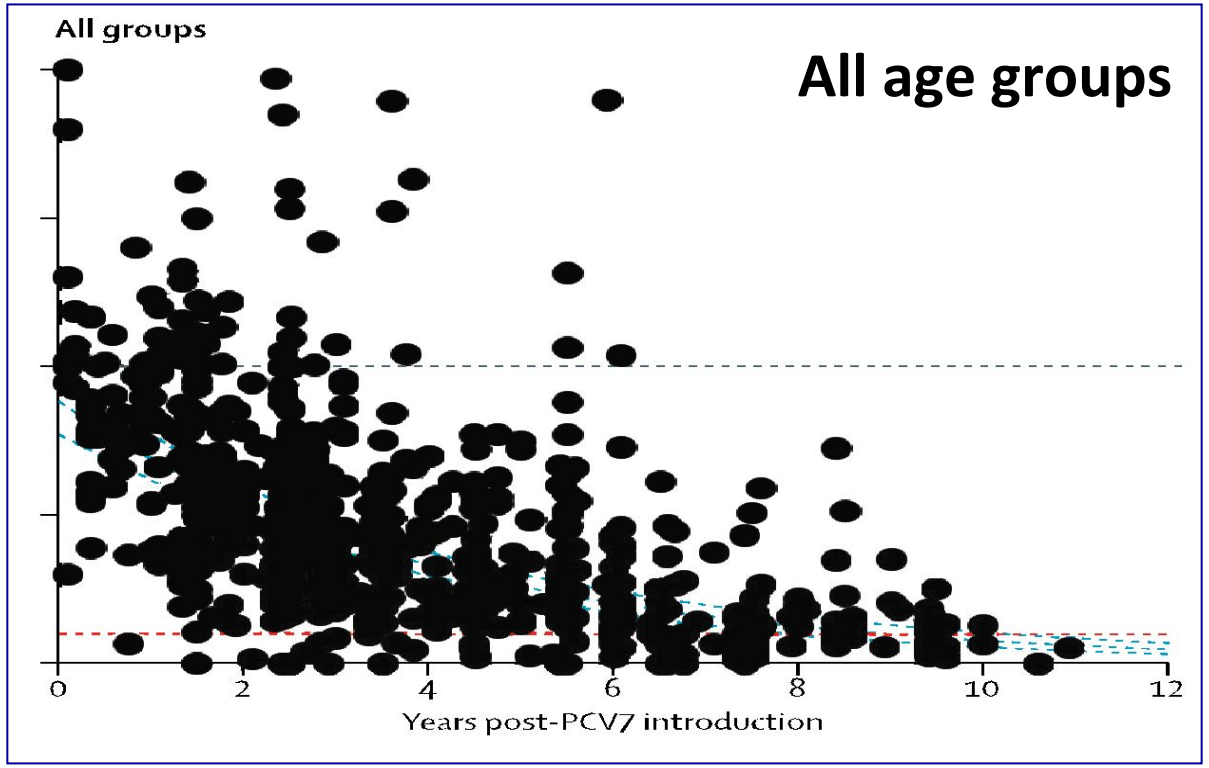
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/677275/hpr0318_menb.pdf

Childhood PCVs vaccination impact on invasive pneumococcal disease (IPD)

Direct effect



Indirect effect



Shiri T et Al. Lancet glob health 2017

AntiMicrobial Resistance rate in EOCD countries 2014 compared with 2005

EOCD report on antimicrobial resistance, 2016

Adolescent vaccination: HPV vaccines and Sites of HPV vaccination in different European Member Sates

	Gardasil®	Cervarix®
First Marketing Authorization in the world	**01/06/2006**	**18/05/2007**
European Marketing Authorization 3 dose schedule from 9 years	**20/09/2006**	**20/09/2007**
2 dose schedule from 9 years	**September 2014**	**September 2014**

- **In the public sector**
  - in public health centres (Denmark, Italy, Netherlands and Portugal)
  - school health services (Ireland, Norway, Slovenia, Sweden)
  - or both (Latvia, Romania, Spain and United Kingdom).
- **Through the private sector**: 5 countries (France)
- **Both public and private structures:** 1 country

Dorleans F et Al. Euro Surveill. 2010;15(47)

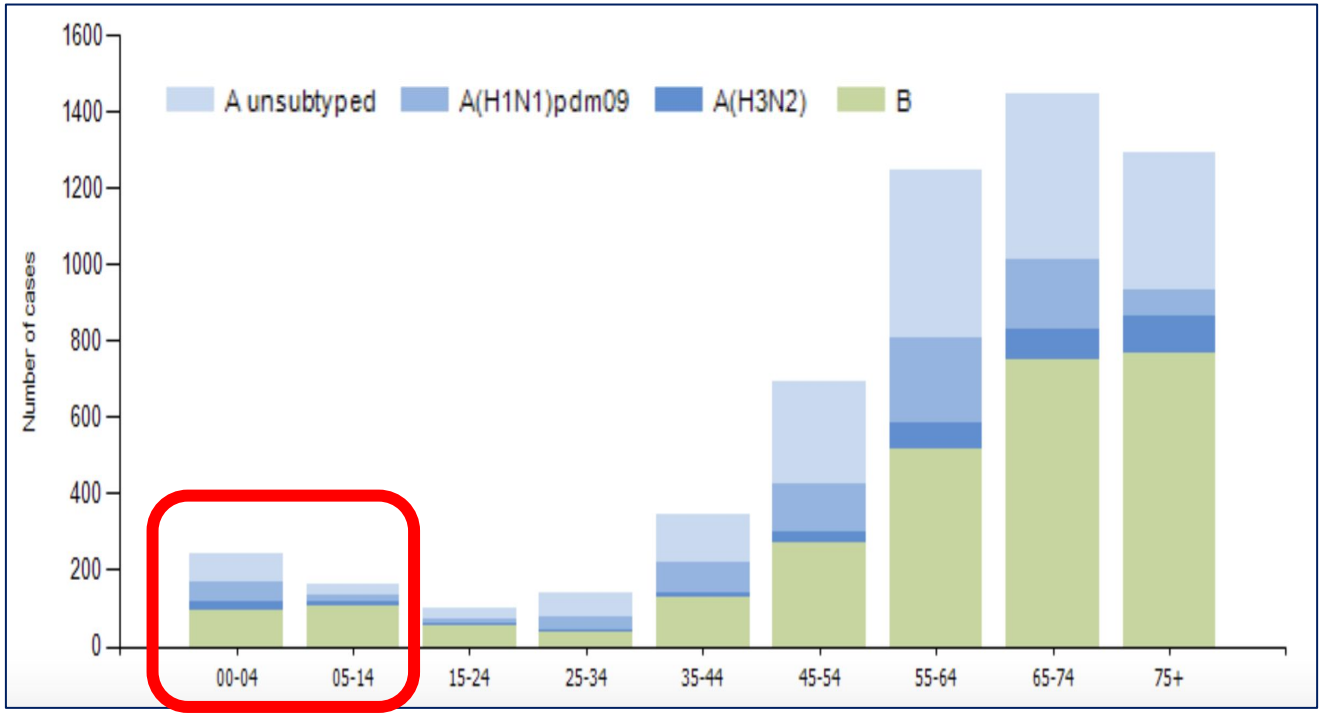
ANSM, A.Jacquet, 8th REIVAC day, Paris 2014

Pharmacovigilance of vaccines in Europe
The HPV vaccine case

- **In terms of safety, European demands for vaccines are very high**, compared with other drugs
- **Pharmacovigilance is national, European, international**
- The **European Risk Management Plan** is mandatory and followed up precisely: **proactive, in « real life »**
- On a national basis, diminution of the under-reporting of adverse events
- **For HPV vaccines, anticipation of the risks** (auto immune disorders)

ANSM, A.Jacquet, 8th REIVAC day, Paris 2014

Distribution des virus influenza by age group (hospitalised cases) 2017-2018 Season



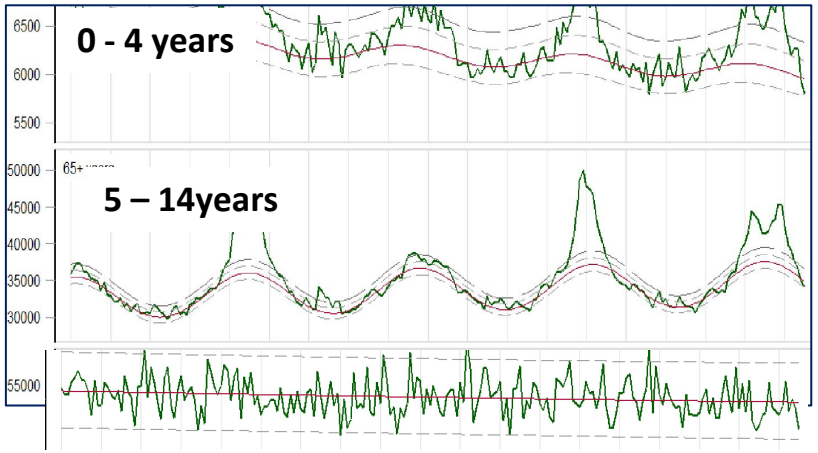
- https://flunewseurope.org/Severity

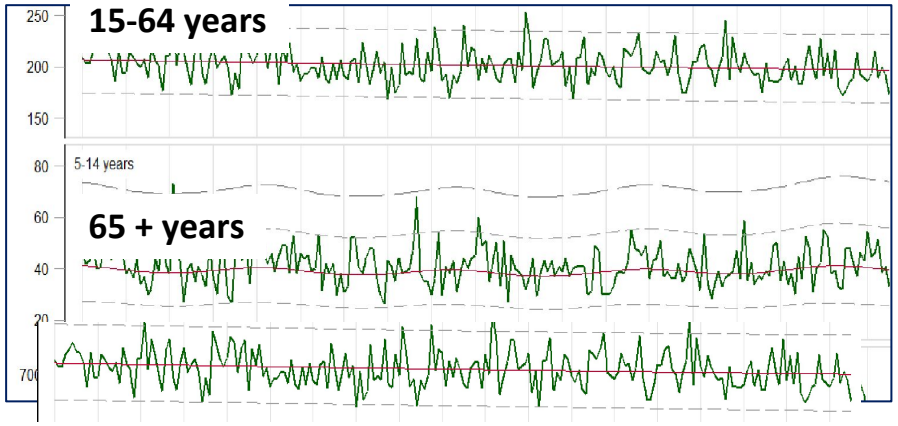
Mortality due to confirmed influenza
2017 / 2018 season in Europe

- **In Europe** (22 countries or regions included)
  - **mortality significantly elevated in many European countries**
  - **mainly affecting elderly people**

- **In France, (weeks 49/2017 to 12/2018) : mortality excess all causes and all ages estimated to 17 800 deaths of which 13 000 attribuable to influenza**

Pooled number of deaths by age groups; 2014 - 2018

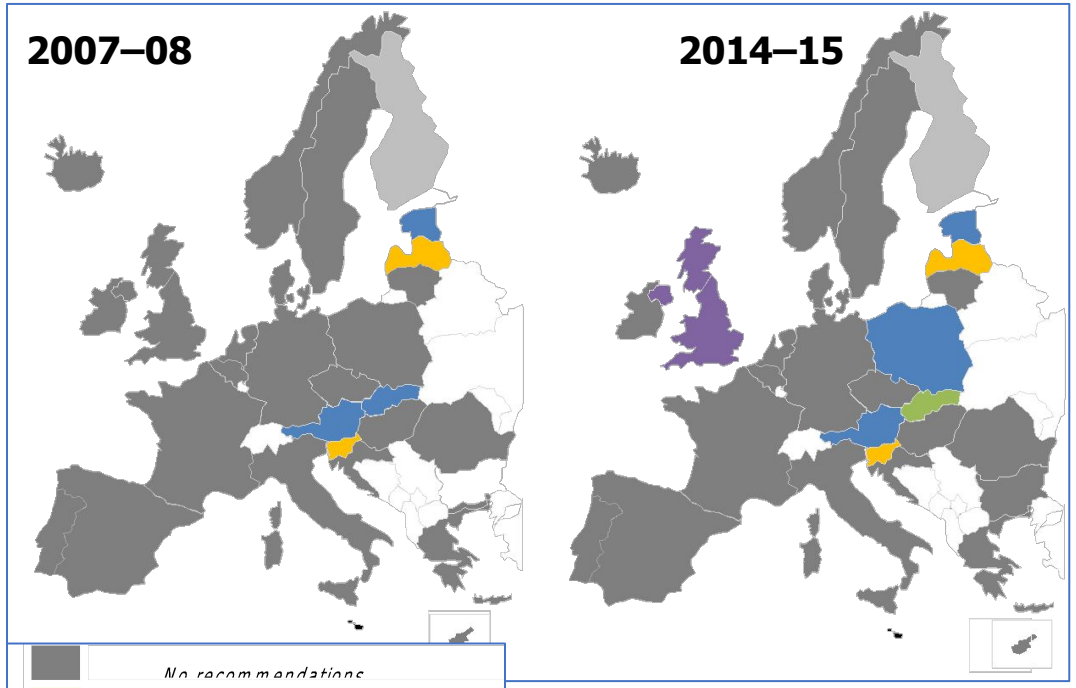




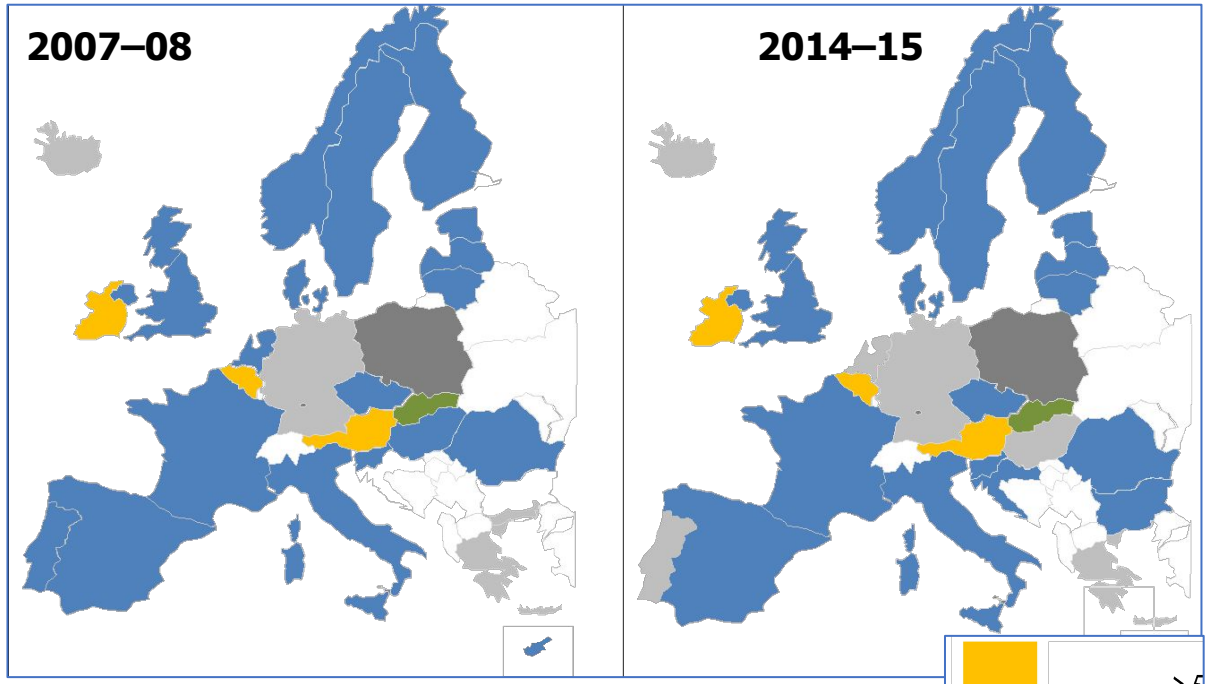
http://www.euromomo.eu; http://www.euromomo.eu/bulletin_pdf/2018/2018_17_bulletin.pdf

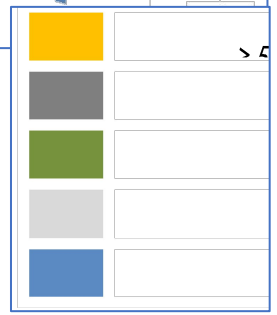
Influenza vaccine recommendations Europe 2007-08 up to 2014-15

Member States recommending seasonal influenza vaccine for <u>children and adolescents</u>



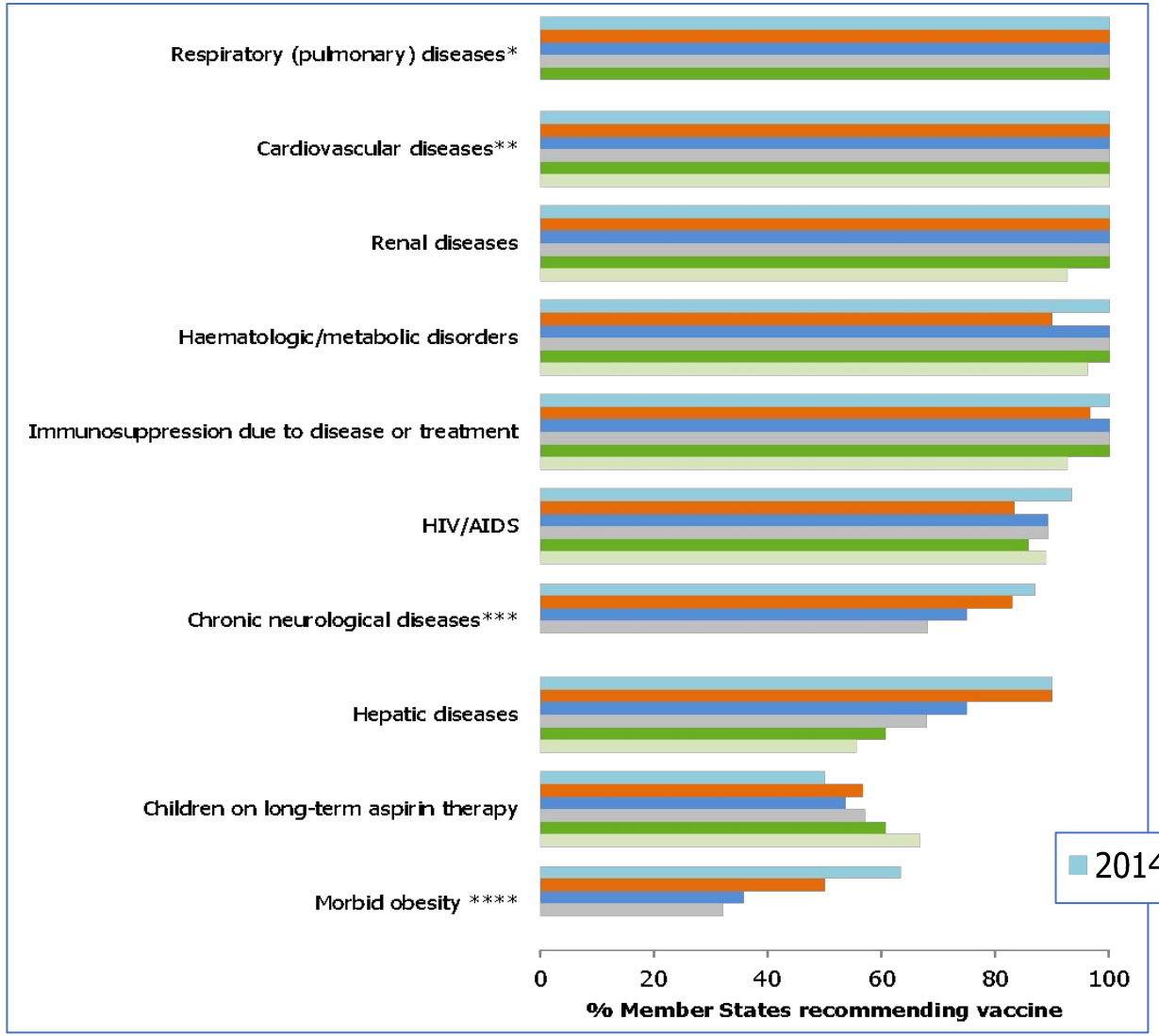
Member States recommending seasonal influenza vaccine for <u>older age groups</u>

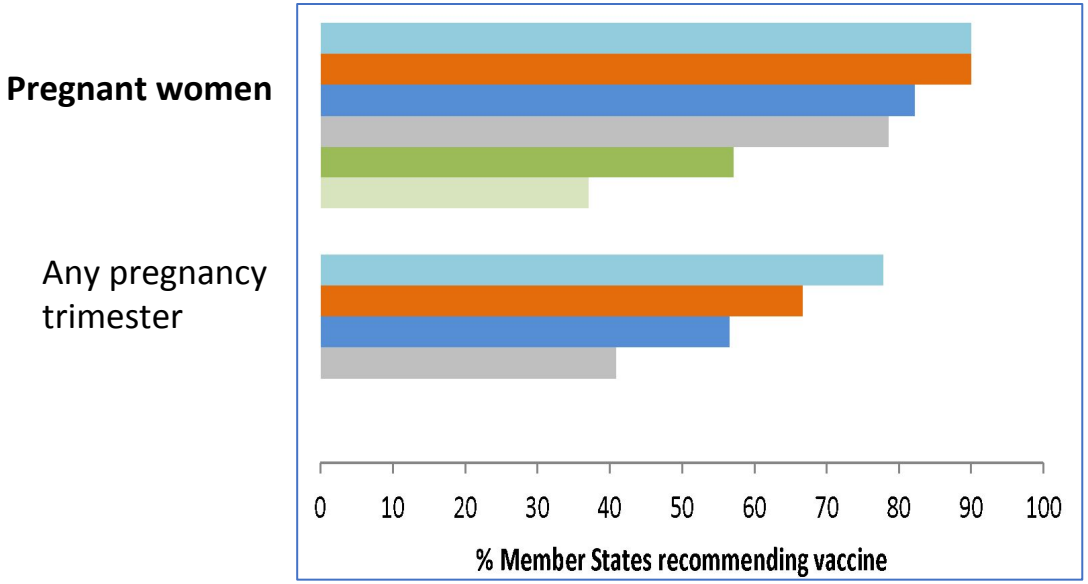


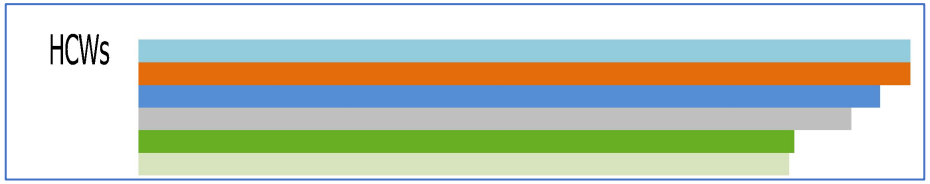


https://ecdc.europa.eu/sites/portal/files/documents/influenza-vaccination-2007–2008-to-2014–2015.pdf

Proportion of Member States recommending seasonal influenza vaccine by chronic medical condition and / or pregnancy and HCPs 2007–08 to 2014–15 influenza seasons



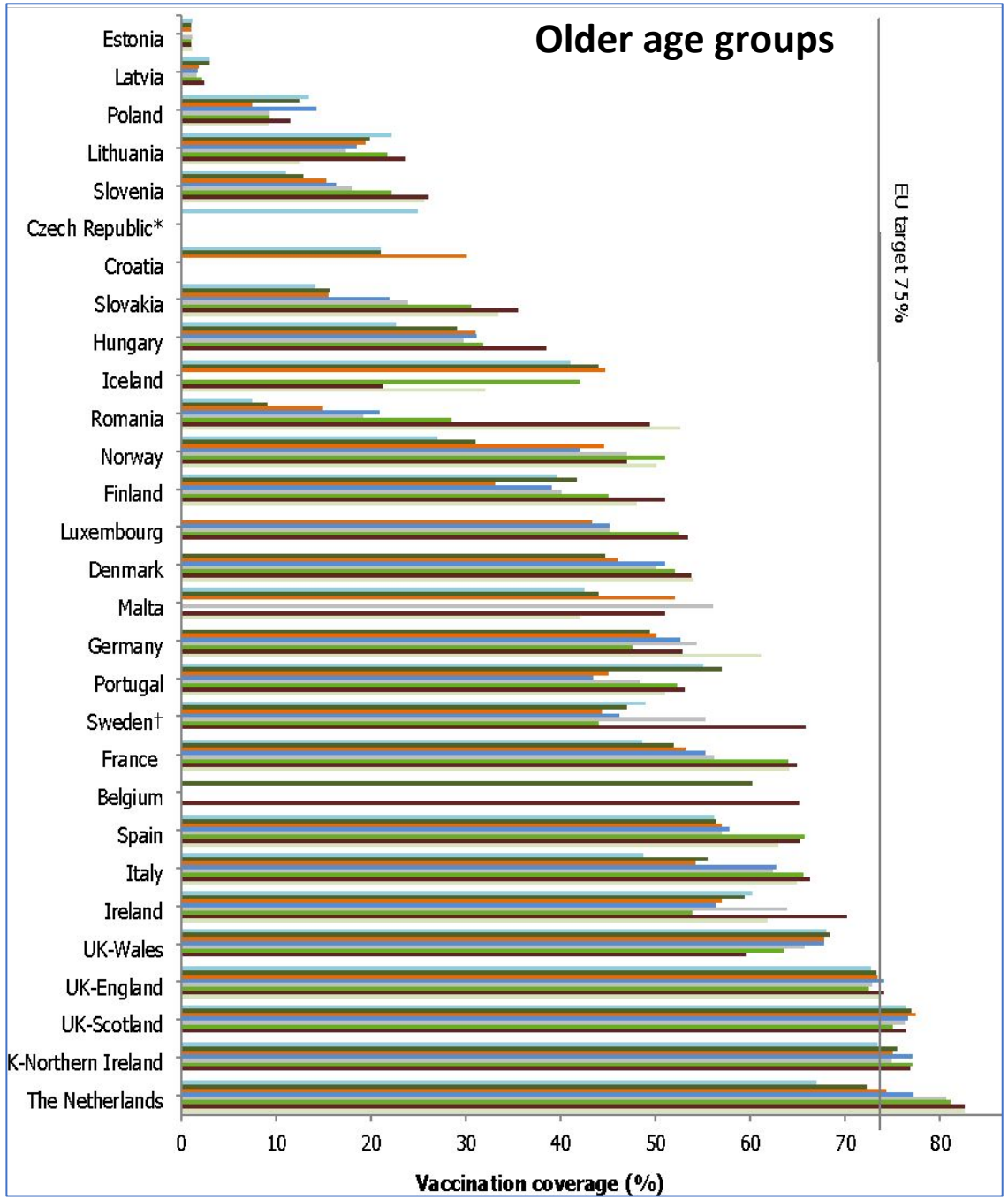




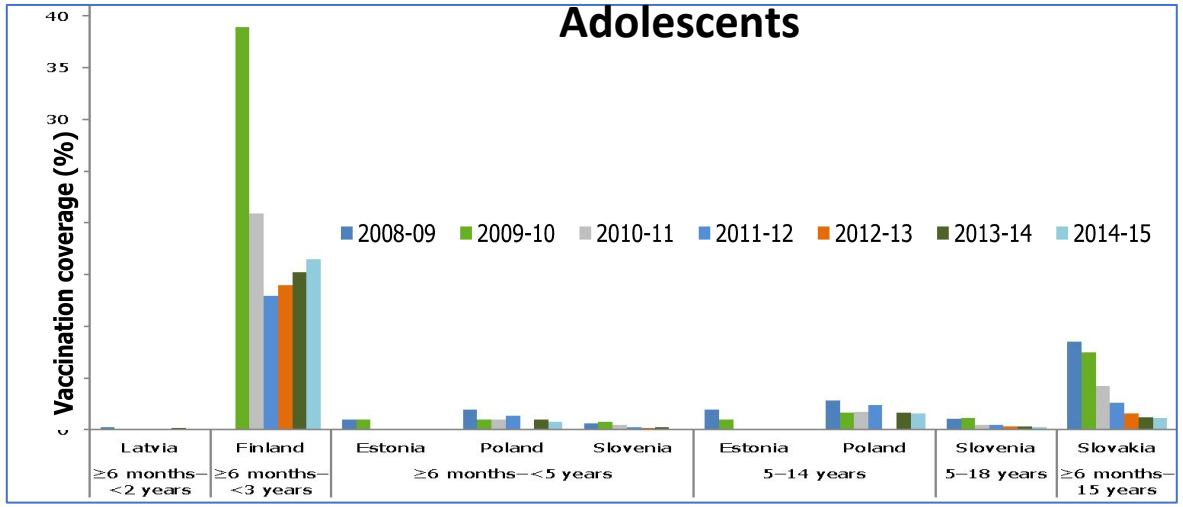
2014-15 | 2012-13 | 2011-12 | 2010-11 | 2009-10***** | 2007-08

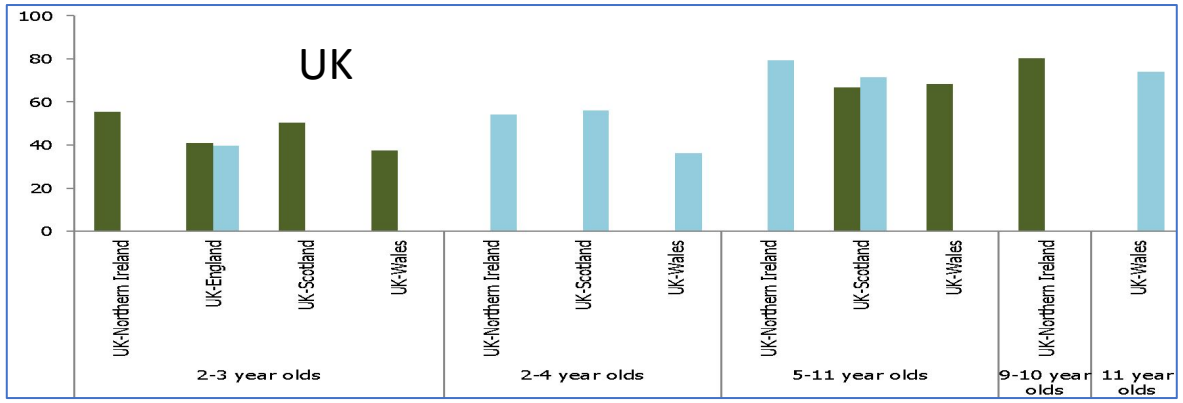
https://ecdc.europa.eu/sites/portal/files/documents/influenza-vaccination-2007–2008-to-2014–2015.pdf

Seasonal influenza vaccination coverage rates in 29 EU/EEA Member States, 2007–08 to 2014–15 influenza seasons



Healthy Children / Adolescents

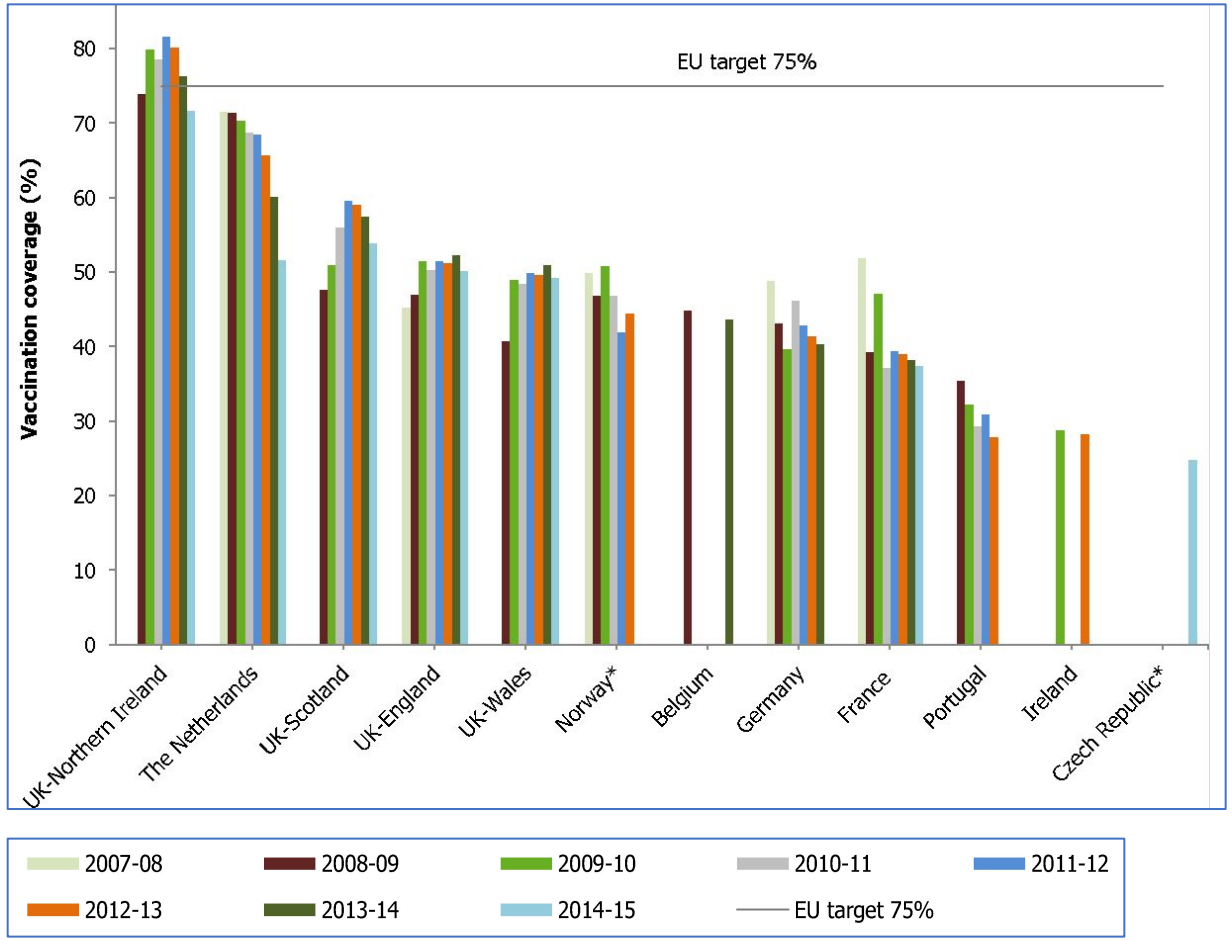




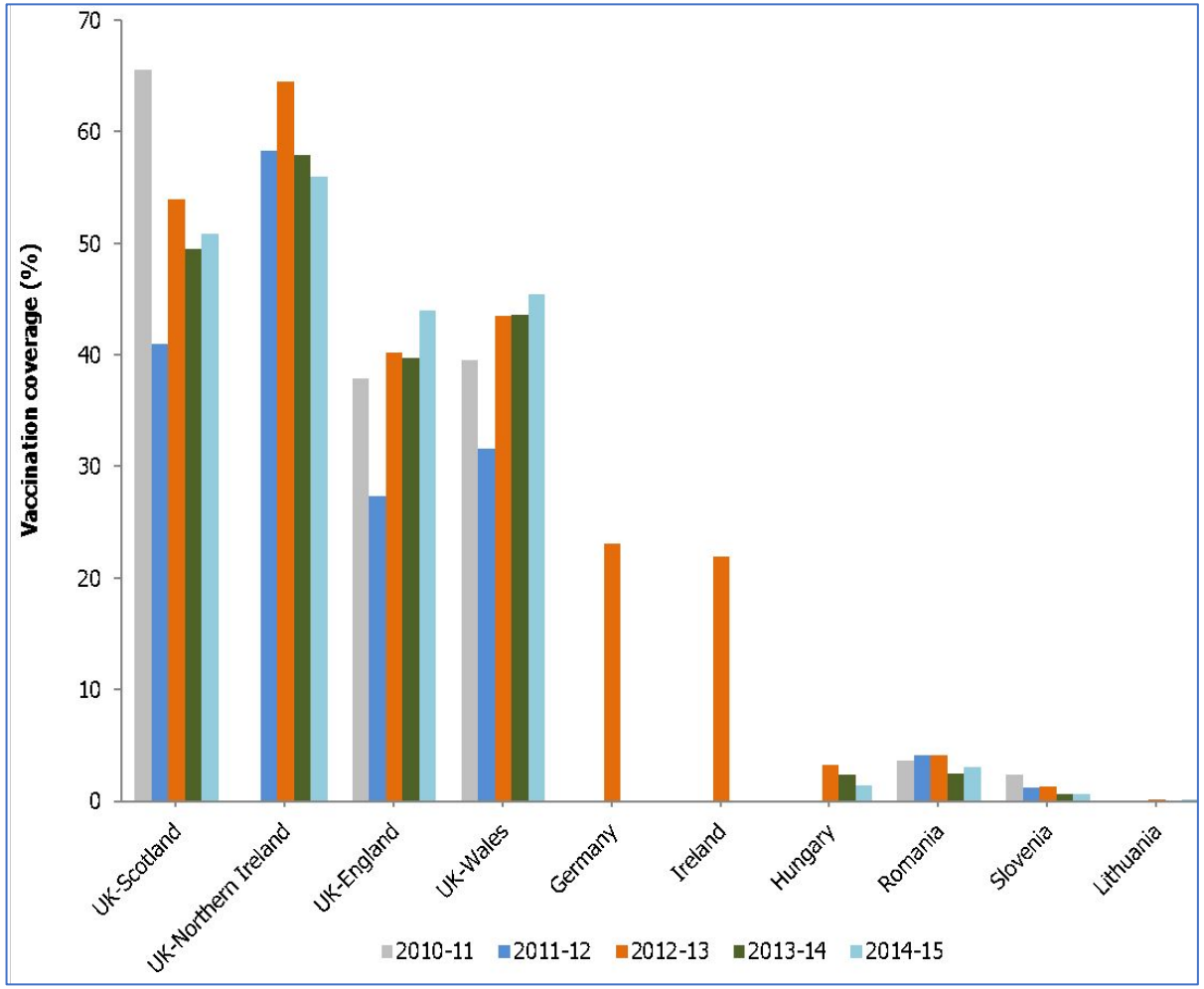
https://ecdc.europa.eu/sites/portal/files/documents/influenza-vaccination-2007–2008-to-2014–2015.pdf

Seasonal influenza vaccination coverage rates among individuals with chronic medical conditions and pregnant women

Chronic medical conditions, 9 EU/EEA Member States influenza seasons 2007–08 to 2014–15

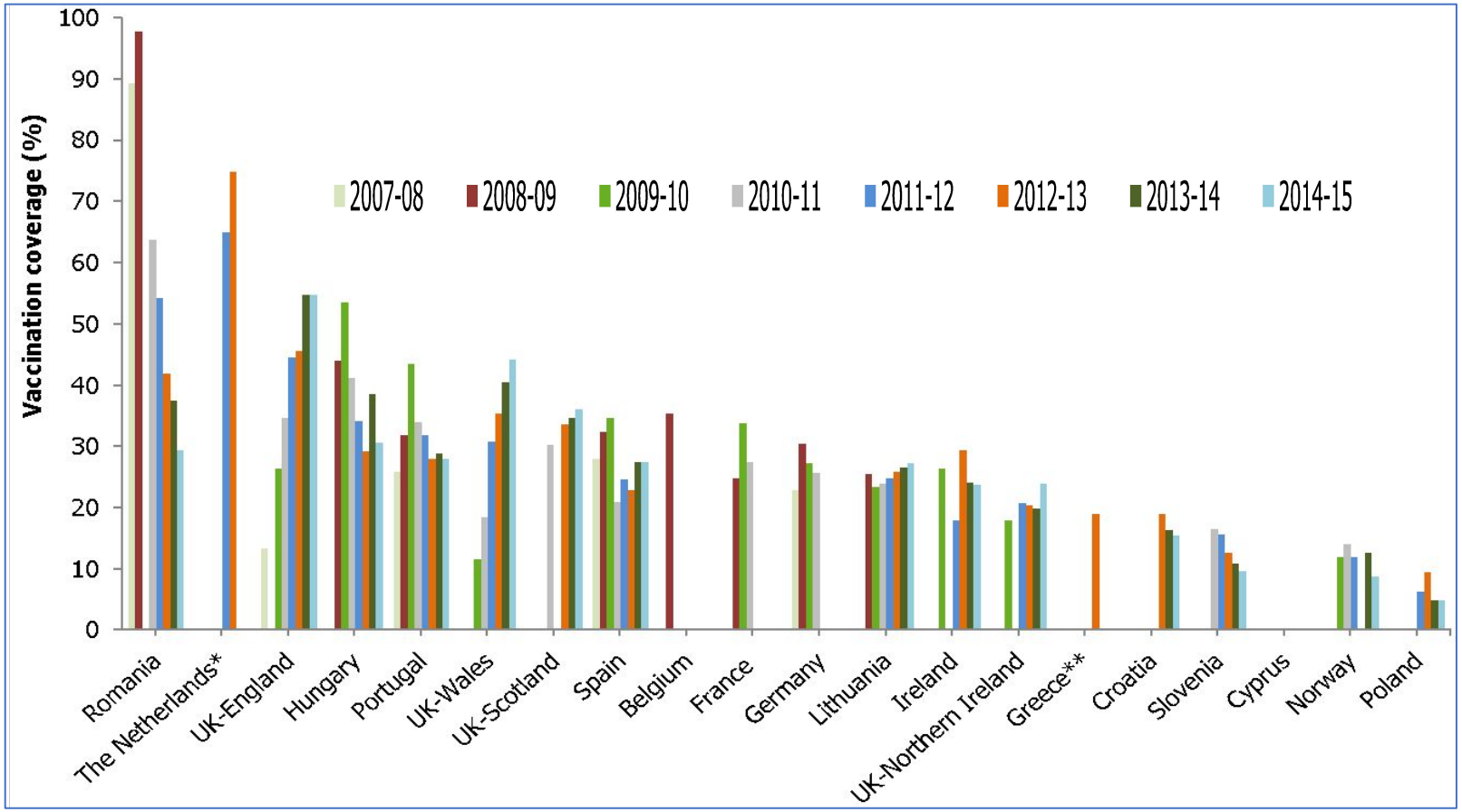


Pregnant women, 7 EU/EEA Member States, Influenza seasons 2010–11 to 2014–15



https://ecdc.europa.eu/sites/portal/files/documents/influenza-vaccination-2007–2008-to-2014–2015.pdf

Seasonal influenza vaccination coverage rates among healthcare workers, 17 EU/EEA Member States, influenza seasons 2007–08 to 2014–15



https://ecdc.europa.eu/sites/portal/files/documents/influenza-vaccination-2007–2008-to-2014–2015.pdf

Vaccine safety / side effects

- Vaccine side-effects and vaccine safety as the **most commonly-cited reservation amongst the public**
- **Vaccine safety sentiment is more negative in the European** and the Western Pacific regions, where 9/10 least confident countries are located (**France**, Bosnia & Herzegovina, Russia, Ukraine, Greece, Armenia, Slovenia, Japan, and Mongolia)
- Research stresses the **emerging shift away from access to vaccines as the primary barrier to vaccination in many countries**

Yaqub, O.et Al. Soc. Sci. Med. 112, 1–11. http://dx.doi.org/10.1016/j.socscimed.2014.04. 018.

Larson HJ et Al. EBioMedicine 12 (2016) 295–301

State of vaccine confidence 2016
67-country survey

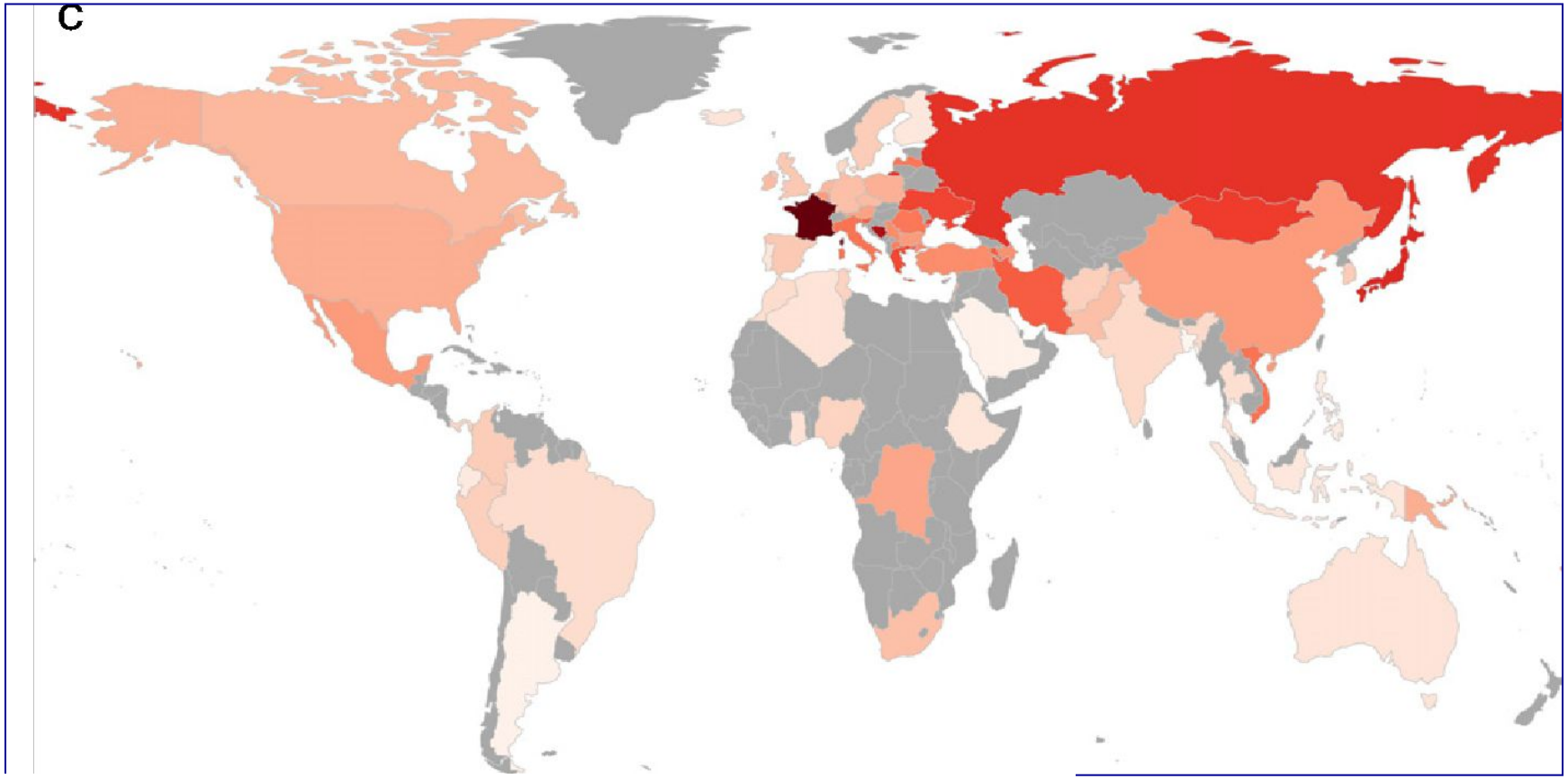
- **The European region performs poorly for vaccine importance, safety, and effectiveness-related skepticism**
  - with Southern and Eastern European countries performing notably poorly for vaccine safety,
  - **though France and Italy are notable exceptions**.

- The South East Asian and Western Pacific Region have high levels of religious-based vaccine incompatibility, notably in Mongolia, Vietnam, and Thailand.

Larson HJ et Al. EBioMedicine 12 (2016) 295–301

Vaccine confidence by world region and differences between perceived safety

Vaccine World map of percentage negative ("tend to disagree" or "strongly agree") survey responses to the statement "overall I think vaccines are safe".



Larson HJ et Al. EBioMedicine 12 (2016) 295–301

0 overall I think vaccines are safe: % responding disagree 45.5

Worldwide levels of vaccine-safety skepticism Identified factors

- **Age**
  - **Aged 25–34 less likely to believe vaccines are safe** compared to 18–24 year olds (OR 0.88, *CI 0.77–1.00*)
  - **Over 65s are more likely to report that vaccines are effective** (OR 1.39, *CI 1.11–1.76*)
- **Level of education**
  - **Any level elevates positive views** towards immunizations for **vaccine importance, effectiveness, and religious compatibility**
  - **Notably, not for vaccine safety**

Larson HJ et Al. EBioMedicine 12 (2016) 295–301

Vaccine Hesitancy in France

The extreme negative sentiment around vaccine safety reported in France builds upon **multiple strands of vaccine controversies and distrust** that have evolved in France **over the past 2 decades**

- **Hepatitis B vaccine and multiple sclerosis** *(Marshall, 1998)*
  - ✓ Physician-led petitions disputing the hexavalent vaccine for infants (until reimbursment)
- **Aluminium and macrophage myofascitis**
- **HPV vaccine** *(Collange et al., 2016)*
- and **hesitancy amongst general practitioners:**
  - Nearly 1 / 4 consider that some vaccines recommended by the French public health authorities are not useful *(Verger et al., 2015)*
  - Many report doubt in immunization programmes *(Raude et al., 2016).*

Larson HJ et Al. EBioMedicine 12 (2016) 295–301

European Union initiatives

Written declarations of Sept 2015 on:

- Infectious diseases of early childhood
- Vaccination campaigns

Proposed resolution of April 2016

- Considering the increase of the numbers of deaths due to meningitis in Europe
- The CoMO proposes to the European Commission to think of an action to sensitize European citizens to vaccination

Council Conclusions on Vaccinations as an Effective Tool in Public Health, and the recent written declaration on vaccine campaigns that gathered 124 signatures of MEPs, the **time is right for civil society intervention**

European support by ECDC

ECDC TECHNICAL DOCUMENT

Communication on immunisation – building trust

Stockholm, April 2012

Major keywords: in immunisation programmes

- **Trust**
- **Transparency**
- **Communication.**

Let's talk about hesitancy

Enhancing confidence in vaccination and uptake

Major additional keyword: supporting HCPs

Stockholm, April 2016

http://ecdc.europa.eu/en/publications/publications/ter-immunisation-and-trust.pdf
http://ecdc.europa.eu/en/publications/publications/lets-talk-about-hesitancy-vaccination-guide.pdf

Acceptance, conclusion

- **Interconnectivity of vaccine confidence**, confidence in the health system, public trust in government more broadly, and socio-economic status alongside the influences of religious and philosophical beliefs

- **Measuring vaccine confidence** can be a valuable window on bigger issues at play in the evolving health and development landscape.

Larson HJ et Al. EBioMedicine 12 (2016) 295–301

Life Course Immunisation
Example of a parents' association : CoMO's directive line

Partnership: a major keyword

Public Health organisations

Parent Patient Advocates (stories) + Health Experts + Key Opinion Leaders = Opportunity for Change

CSAG

Life Course Immunisation Strategy

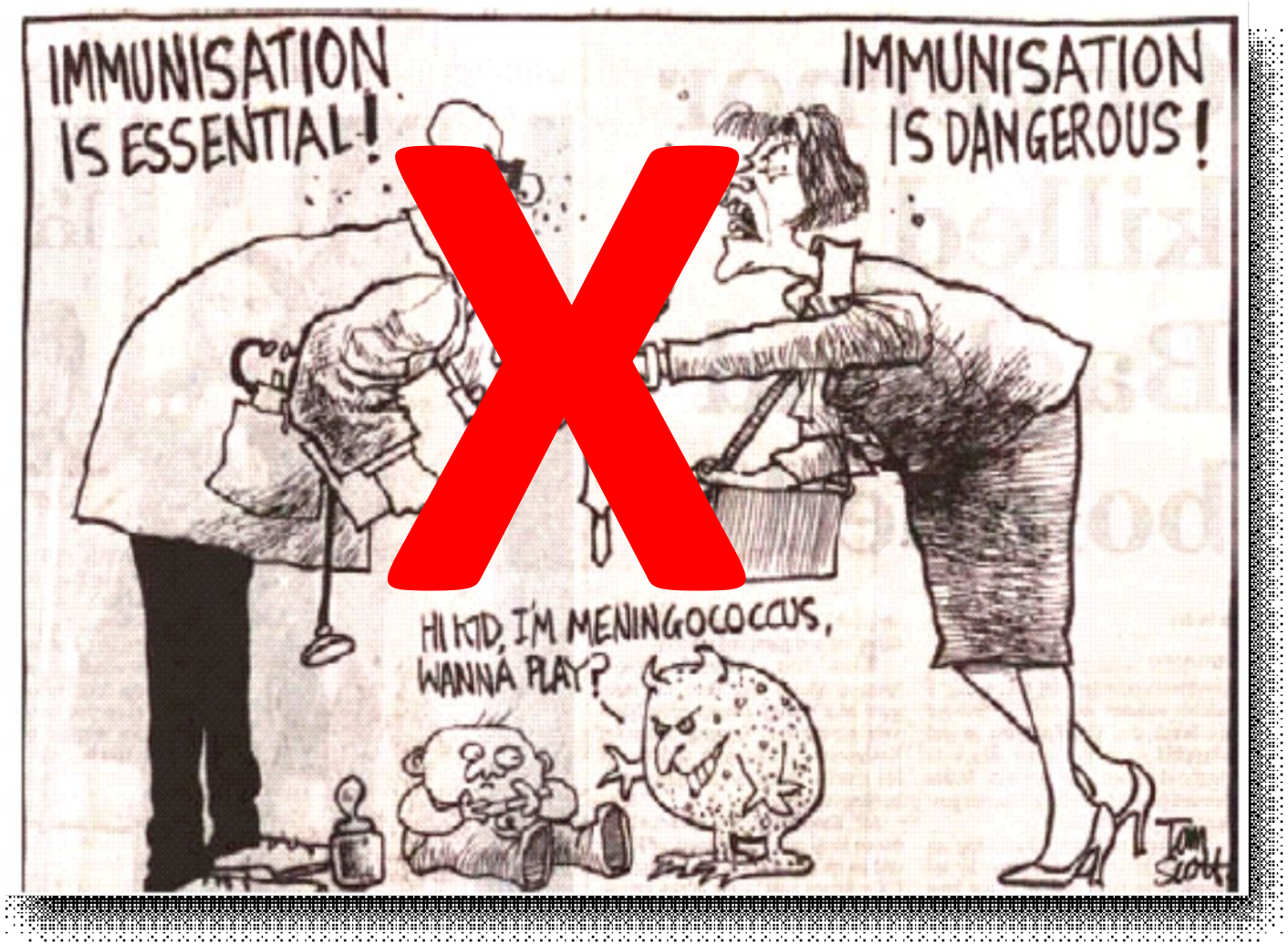
Change! – The outcome of the Change Equation

Conclusion

- To address hesitancy issues and build confidence
- Importance of continued worldwide monitoring of confidence in vaccines
- To monitor the effects of policymakers interventions on immunization attitudes and acceptance
- To more effectively allocate resources

Larson HJ et Al. EBioMedicine 12 (2016) 295–301

CoMO: Working Together



No fighting

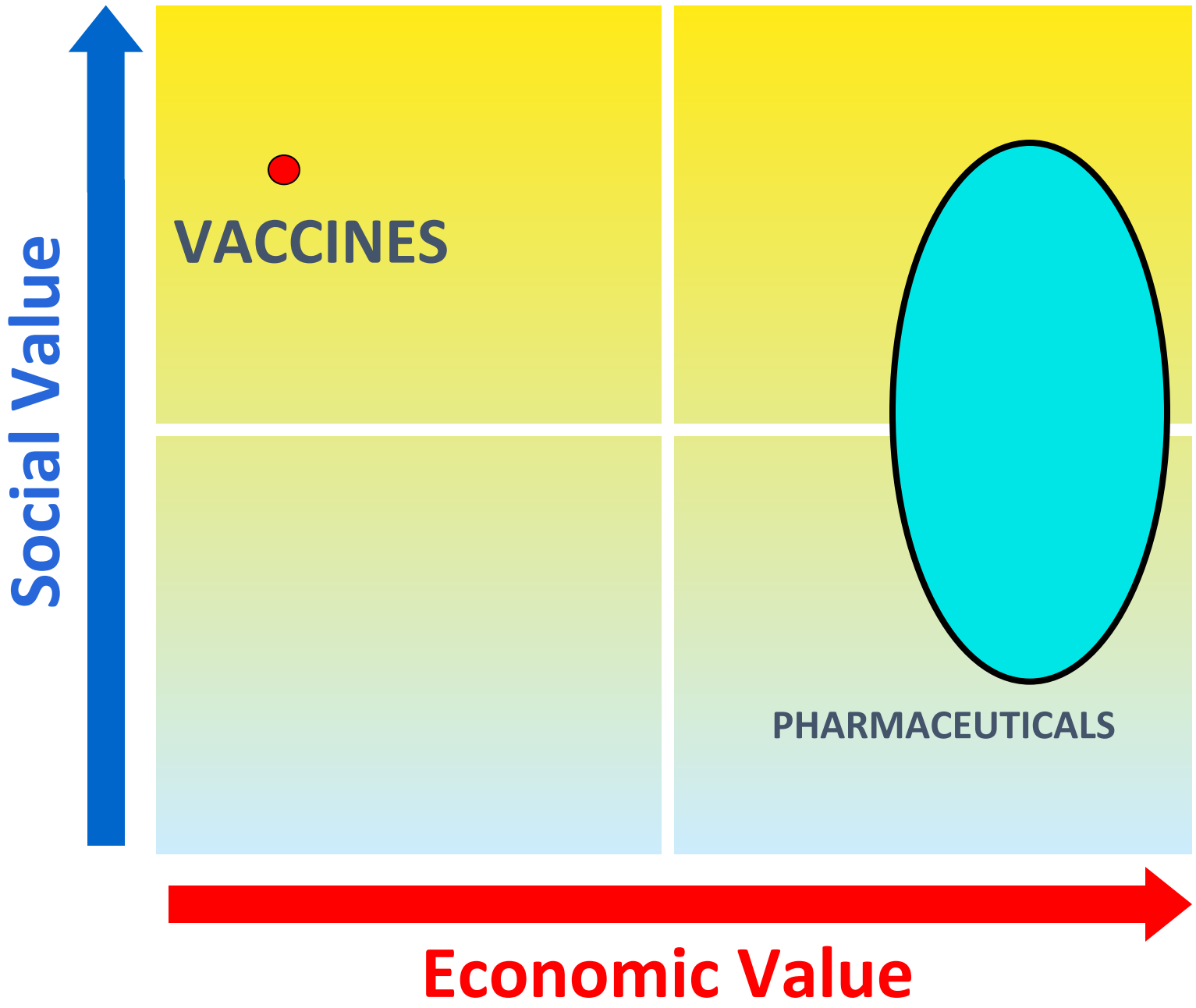
Work together

Take home messages

Depending on diseases, eradication, elimination or an excellent controle are possible strongly linked with

- **High, sustained vaccine coverage rates**
- **Respect of the vaccine schedule**

….. YES, WE CAN


Social Value
VACCINES
PHARMACEUTICALS
Economic Value