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

Catherine Weil Olivier
Honorary Professor of pediatrics, University Paris 7, France
Member of the Scientific Committee and trustee
of the CLCI

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« Vaccination is a right and responsibility for all » (and at all ages)
Global Vision of a national vaccination program

- Vaccine
  - Vaccine coverage rate
  - Respect of schedule

- Vaccine Recommendation

- Vaccine Reimbursement

- 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

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://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
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.

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://www.euro.who.int/__data/assets/pdf_file/0017/84302/Seven_Key_Reasons.pdf)).

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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.pdf
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
Meningococcal invasive diseases
Nowadays care

With an early diagnosis
and an adapted emergency care

- Therapeutic
- Hemodynamic
- Intensive care
- Neurologic

A persistent 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

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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

<table>
<thead>
<tr>
<th>Serogroup</th>
<th>Cases</th>
<th>%</th>
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<tbody>
<tr>
<td>B</td>
<td>1,682</td>
<td>61</td>
</tr>
<tr>
<td>C</td>
<td>403</td>
<td>14</td>
</tr>
<tr>
<td>Y</td>
<td>290</td>
<td>10</td>
</tr>
<tr>
<td>W</td>
<td>317</td>
<td>11</td>
</tr>
<tr>
<td>Other</td>
<td>88</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>2,780</td>
<td>100</td>
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</table>

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

Direct and herd protection against MenC in the United Kingdom.

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

R. Borrow et al. J Inf 2017: 75, 1e11
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.
  - Amendment of the existing children’s immunisation information booklets and leaflets (new schedule reflected)

- **Training factsheet and video for health professionals**

Childhood PCVs vaccination impact on invasive pneumococcal disease (IPD)

Direct effect

Children < 5 years

Indirect effect

All age groups

Shiri T et Al. Lancet glob health 2017
AntiMicrobial Resistance rate in EOCD countries 2014 compared with 2005
Adolescent vaccination: HPV vaccines and Sites of HPV vaccination in different European Member Sates

<table>
<thead>
<tr>
<th></th>
<th>Gardasil®</th>
<th>Cervarix®</th>
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<tbody>
<tr>
<td>First Marketing Authorization in the world</td>
<td>01/06/2006</td>
<td>18/05/2007</td>
</tr>
<tr>
<td>2 dose schedule from 9 years</td>
<td>September 2014</td>
<td>September 2014</td>
</tr>
</tbody>
</table>

- **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 attributable to influenza

Pooled number of deaths by age groups; 2014 - 2018

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

Member States recommending seasonal influenza vaccine for children and adolescents

Member States recommending seasonal influenza vaccine for older age groups

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

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

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

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

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

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

- 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

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
Stockholm, April 2016

Major additional keyword: supporting HCPs

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
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
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