

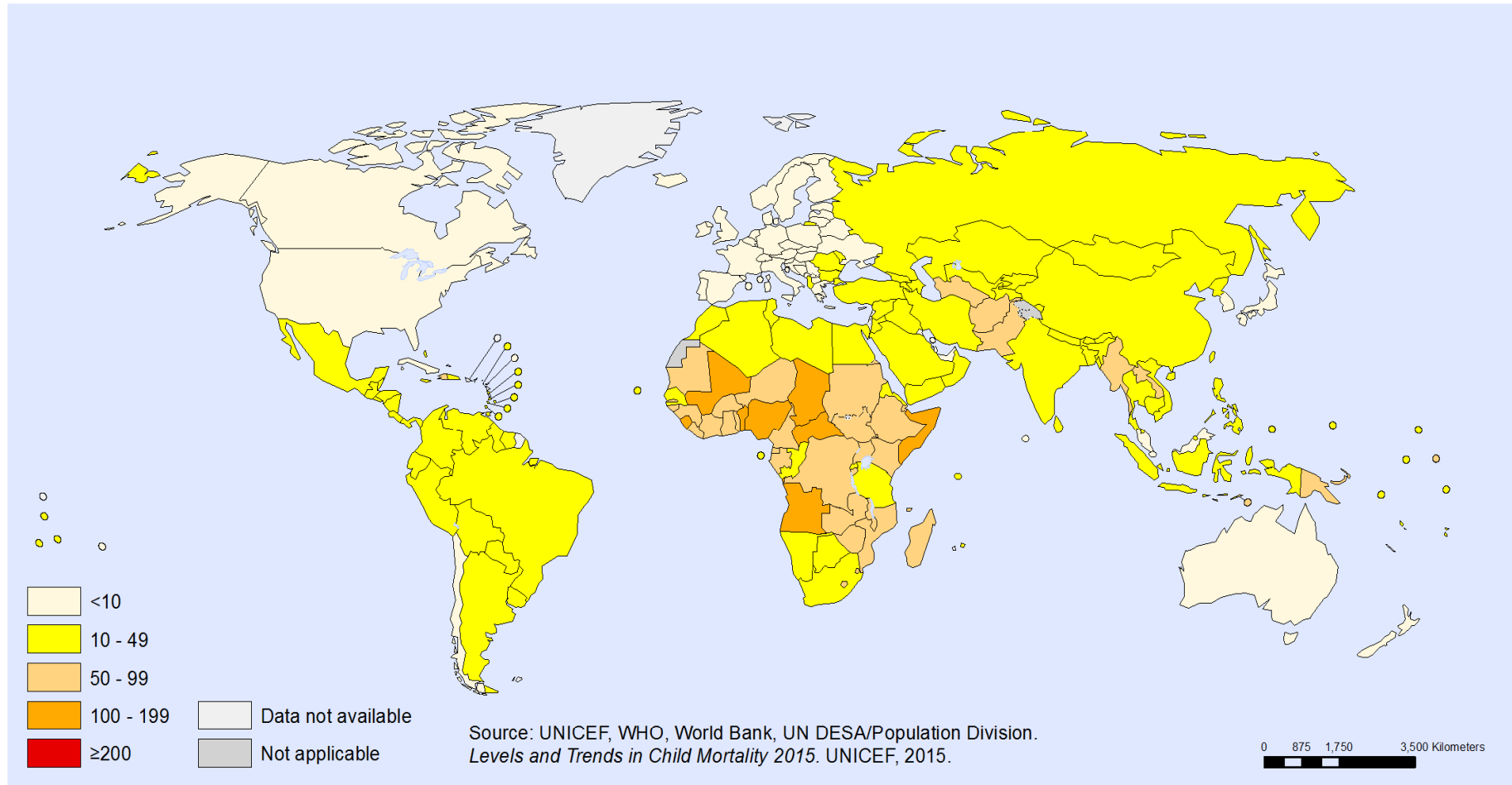
# Global and National Trends in Vaccine Preventable Diseases

Dr Anna Clarke  
National Immunisation Office



[www.immunisation.ie](http://www.immunisation.ie)

## Under-five mortality rate (probability of dying by age 5 per 1000 live births), 2015



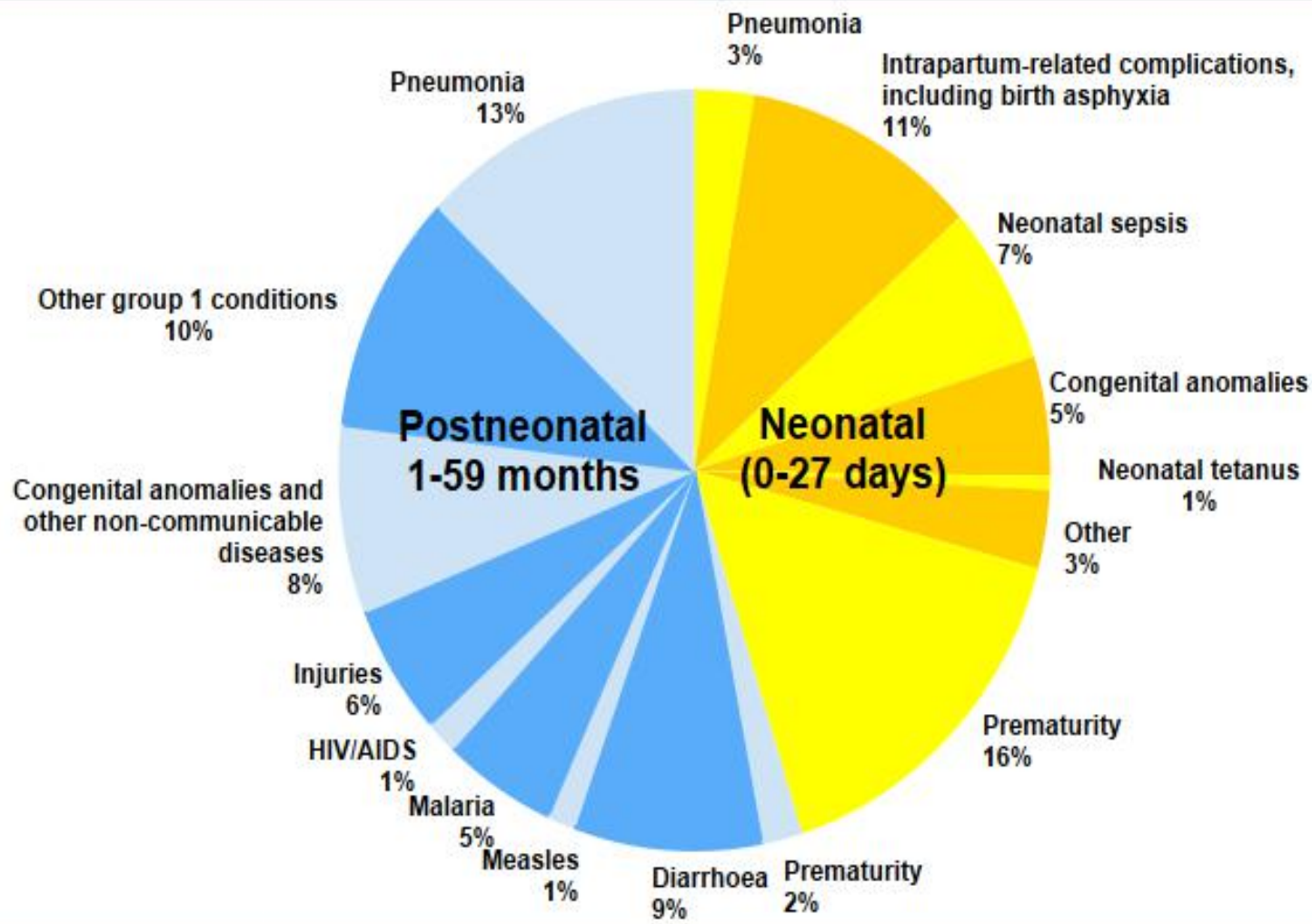
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Data Source: World Health Organization  
 Map Production: Health Statistics and  
 Information Systems (HSI)  
 World Health Organization



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# Causes of deaths among children under 5 years, 2015



Source: WHO-MCEE methods and data sources for child causes of death 2000-2015 (Global Health Estimates Technical Paper WHO/HIS/IER/GHE/2016.1)

# Global Child Mortality

2000- deaths <5 years  
~ 9.6 million



Immunisation  
Clean Water and Sanitation  
Better hygiene  
Education



2015- deaths <5 years  
~ 5.9 million  
(despite increase in number of  
children born)



Adapted from [www.immunisation.ie](http://www.immunisation.ie)




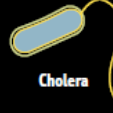























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Health Service Executive

# Global picture

## 25 vaccine preventable diseases

TABLE 1: VACCINE-PREVENTABLE INFECTIOUS AGENTS OR DISEASES

|   |  |  |   |  |
|---|--|--|---|--|
| <br>Anthrax                                  | <br>Measles                 | <br>Rubella                     | <br>Cholera                        | <br>Meningococcal Disease   |
| <br>Influenza                                | <br>Diphtheria              | <br>Mumps                       | <br>Tetanus                        | <br>Hepatitis A             |
| <br>Pertussis                                | <br>Tuberculosis            | <br>Hepatitis B                 | <br>Pneumococcal disease           | <br>Typhoid fever           |
| <br>Hepatitis E                             | <br>Poliomyelitis          | <br>Tick-borne encephalitis    | <br>Haemophilus influenzae type b | <br>Rabies                 |
| <br>Varicella and herpes zoster (shingles) | <br>Human papilloma-virus | <br>Rotavirus gastroenteritis | <br>Yellow fever                 | <br>Japanese encephalitis |

[www.immunisation.ie](http://www.immunisation.ie)



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# Pneumococcal disease - global

- Major cause of morbidity and mortality

2005

- 1.6 million deaths
- 0.7 – 1 million in children < 5years
- developing countries
- children <2 years

2010 PCV in immunisation schedules

- 87% birth cohort in high income countries
- 2% birth cohort in low income countries

2015 PCV in immunisation schedules

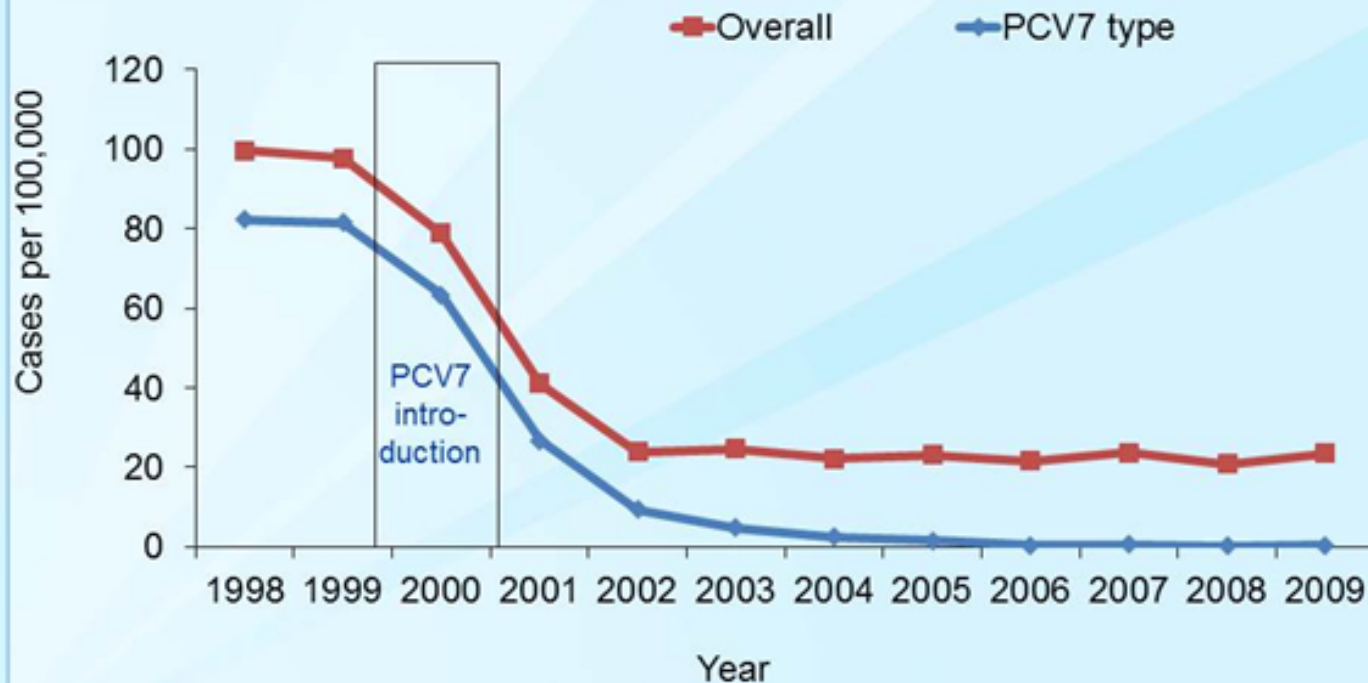
129 countries



[www.immunisation.ie](http://www.immunisation.ie)

# Pneumococcal disease USA

Impact of 7-valent pneumococcal conjugate vaccine on invasive pneumococcal disease among children <5 years old, 1998-2009

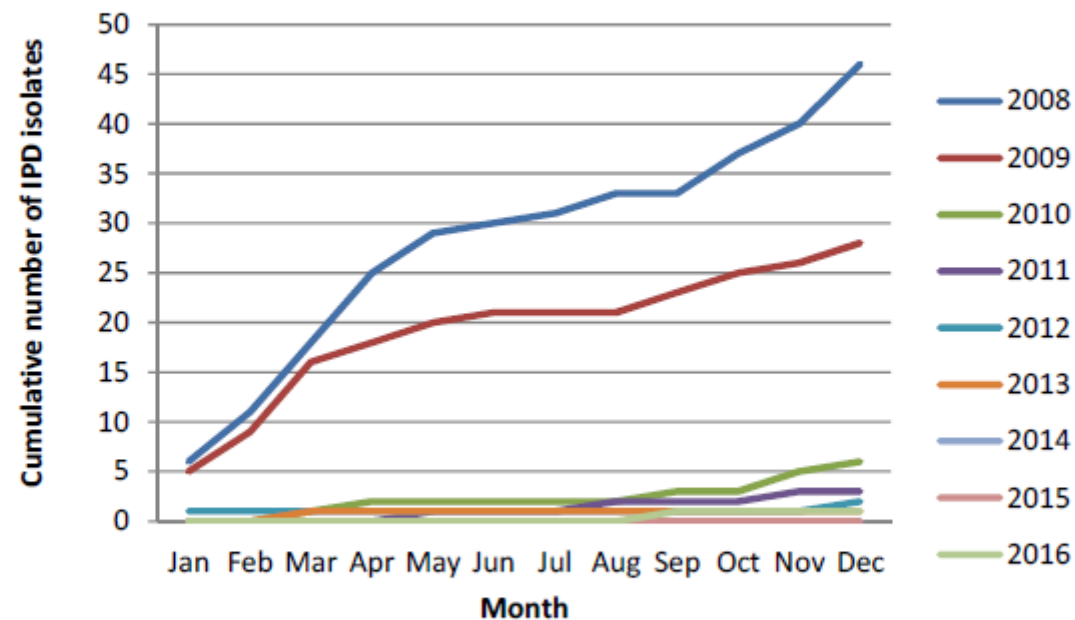


Moore, IDSA, 2009 & CDC Unpublished



[www.immunisation.ie](http://www.immunisation.ie)

## Impact of PCV on the burden of IPD caused by PCV7 vaccine serotypes in <5 year olds



98% reduction in IPD cases, comparing Jan-Dec 2016 with the same period in 2008

Data source: Irish Pneumococcal Reference Laboratory



[www.immunisation.ie](http://www.immunisation.ie)



# Diphtheria



Globally 2016

- 7097 cases
- 5-10% fatal

**FLANDERS NEWS.BE**

10 °C ☀ 43 km/h FILE

03 May 2016 14:25 NL FR DE

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## Toddler dies of diphtheria in Antwerp

🔗 🖨️ ✉️ 📱 🐦

Belga

🕒 Fri 18/03/2016 - 10:30 👤 Michaël Torfs

A 3-year-old girl succumbed in Antwerp's University Hospital (UZA) after having caught diphtheria. The news was announced by the Health and Care Agency yesterday. The toddler died as it took too long to find a counter-poison.

**Top stories**

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- 02/05 "We presume it will get better"
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- 02/05 Have your say on the Brexit issue!
- 11:18 24 percent of Belgians flouting drink driving rules

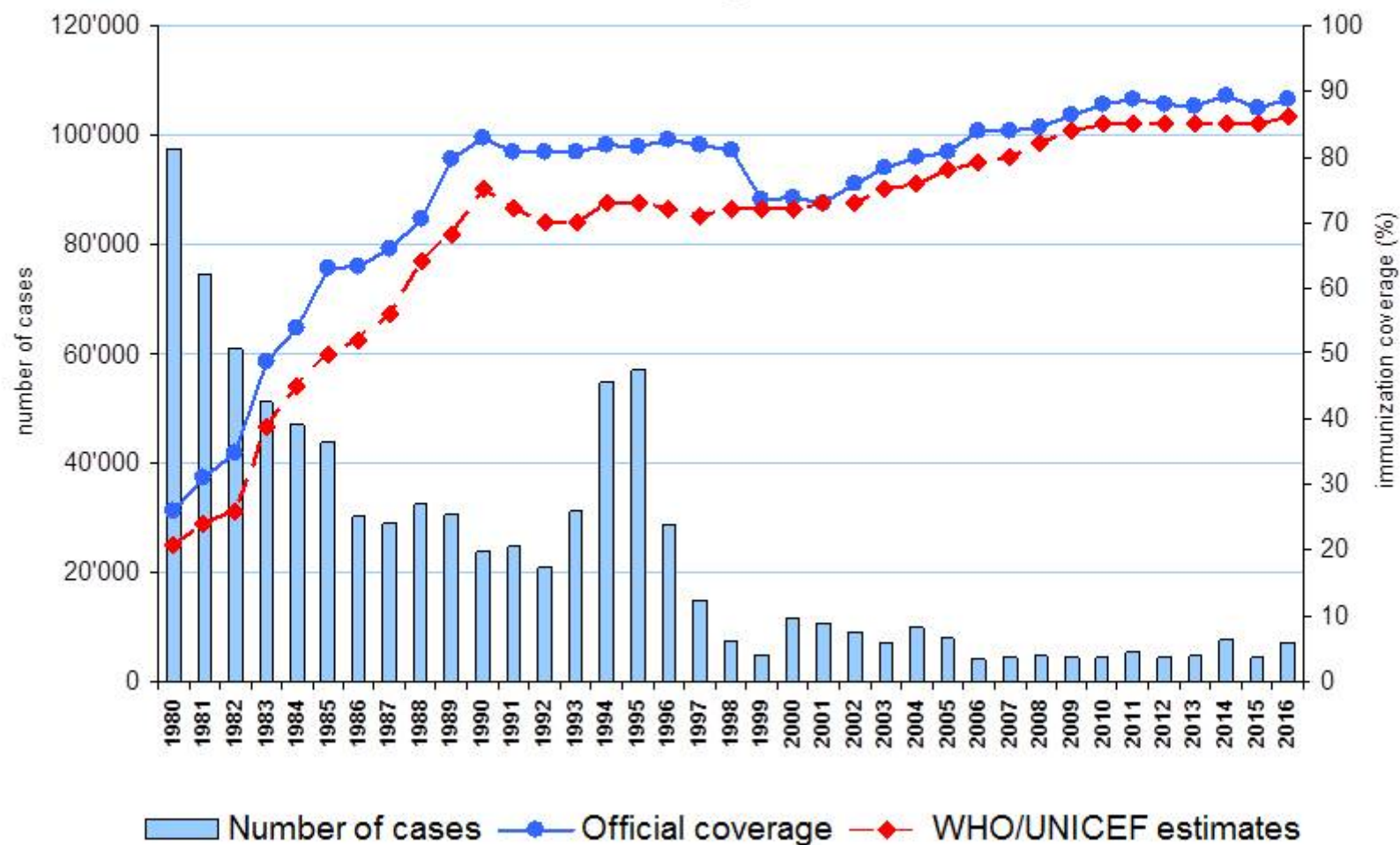
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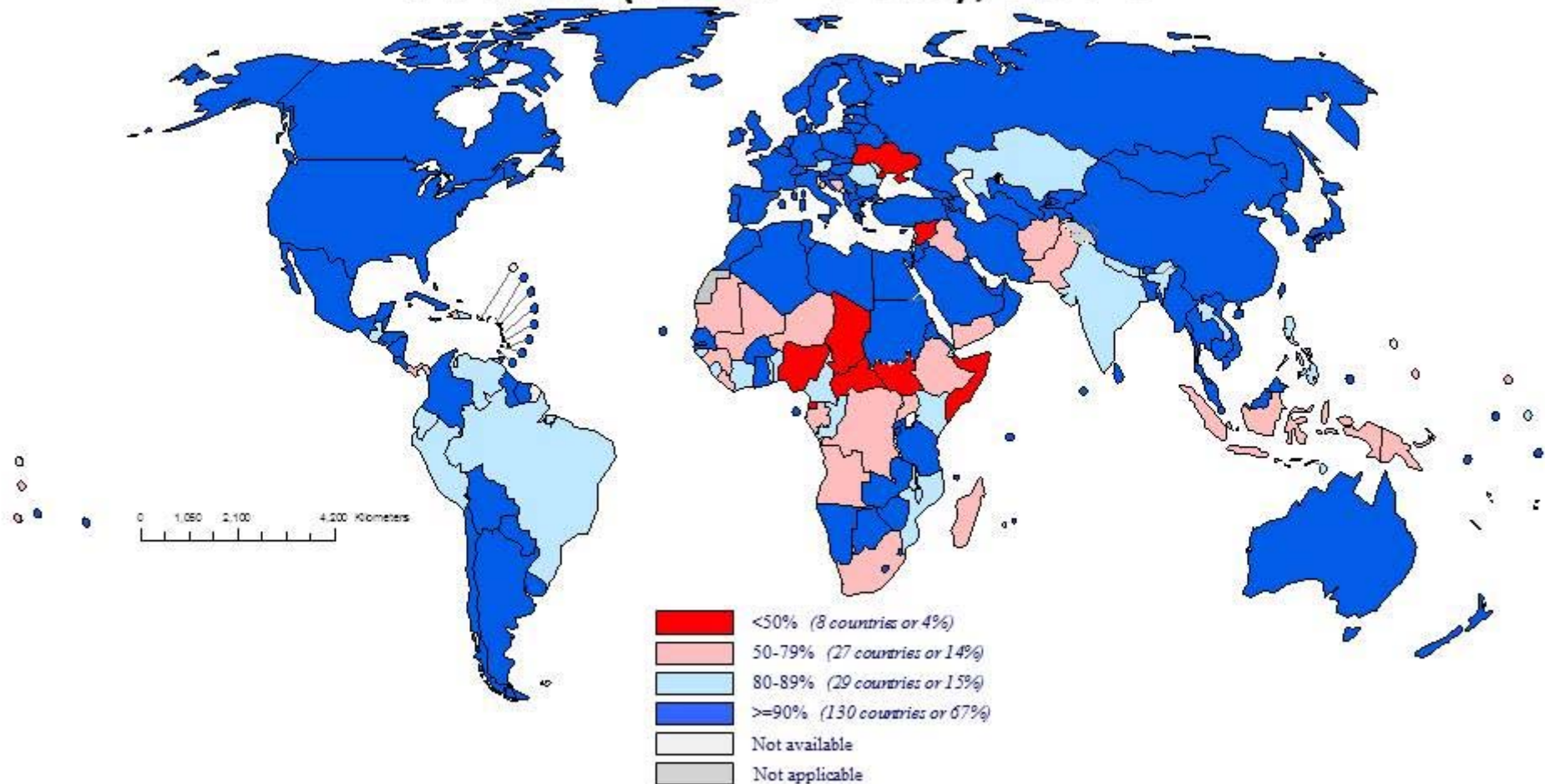
**Flandreinfo.be**



## Diphtheria global annual reported cases and DTP3 coverage, 1980-2016



# Immunization coverage with DTP3 vaccines in infants (from <50%), 2016



Source: WHO/UNICEF coverage estimates 2016 revision, July 2017. Map production: Immunization Vaccines and Biologicals, (IVB). World Health Organization. 194 WHO Member States. Date of slide: 19 July 2017

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# Measles - global

Since 2000 vaccination has

- led to 75% drop in deaths
- prevented 15.6 million deaths

Every year

- 20 million cases each year
- 146,000 deaths
- 16 deaths every hour
- 95% in low income countries



# Measles Outbreak USA 2015

2015

117 cases linked to measles outbreak

74% of all cases reported in 2015

Index case

- unvaccinated 11 year old
- rash onset December 2014

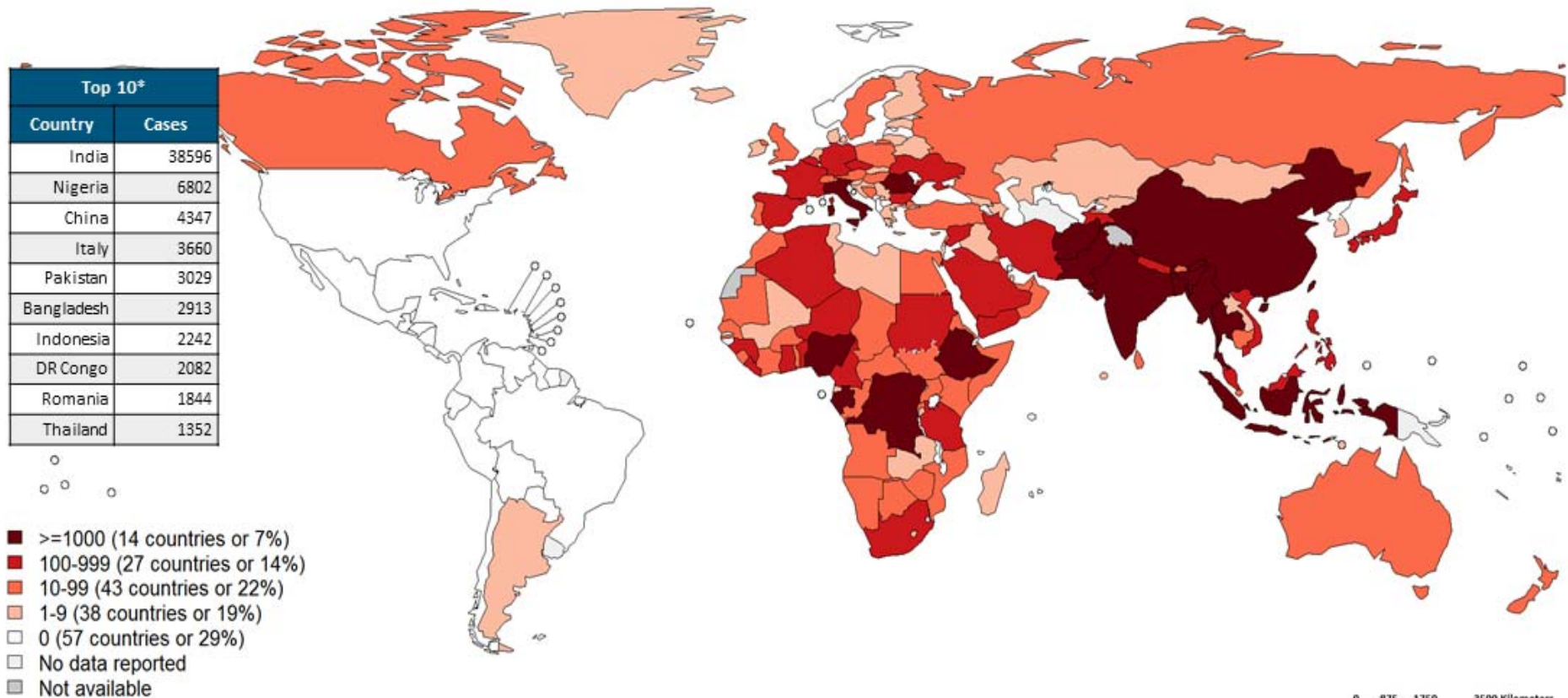
24 million visitors annually



[www.immunisation.ie](http://www.immunisation.ie)



# Number of Reported Measles Cases (6M period)



**Map production:** World Health Organization, WHO, 2017. All rights reserved  
**Data source:** IVB Database

**Disclaimer:**

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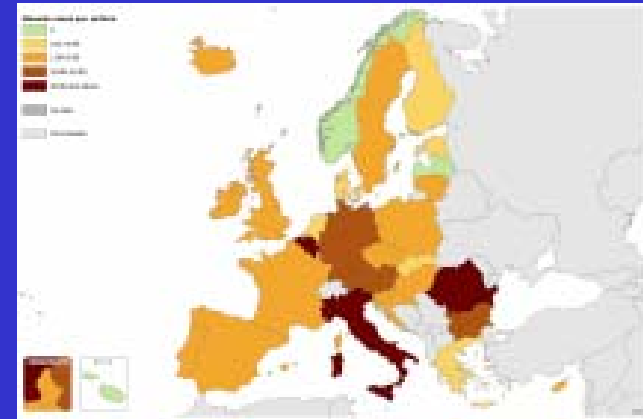
Based on data received 2017-08 - Surveillance data from 2017-01 to 2017-06 - \* Countries with highest number of cases for the period



# Measles Europe

## EU 2016

- 3767 cases reported
- 30 countries
- Majority of cases not vaccinated (87%)
- 9 deaths



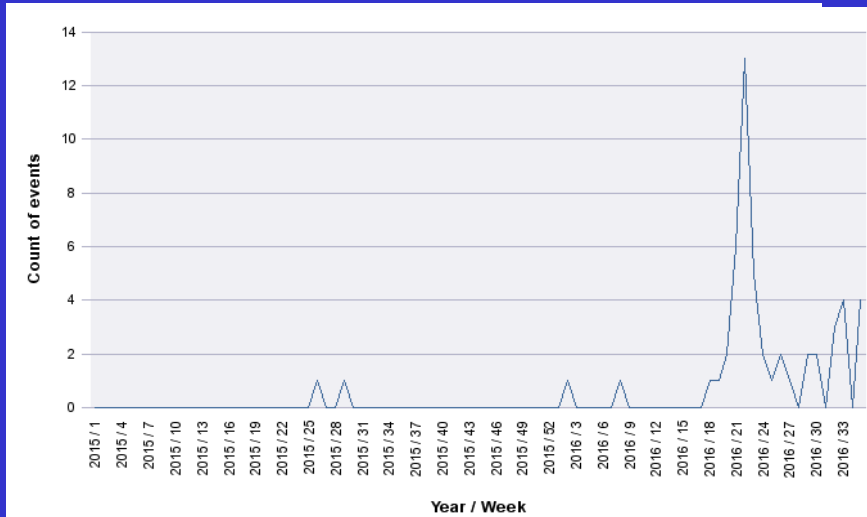
EU Measles notification rate  
June 2016 – May 2017

## 2017

- Italy 4328 cases
- Romania 6968 cases (end of Aug)



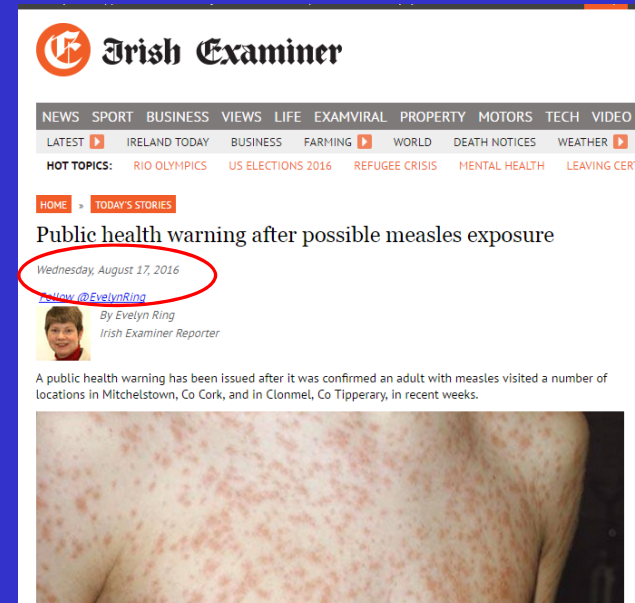
# Measles - Ireland



9 cases to date in 2017



Source: HPSC





# Pertussis - global

Every year

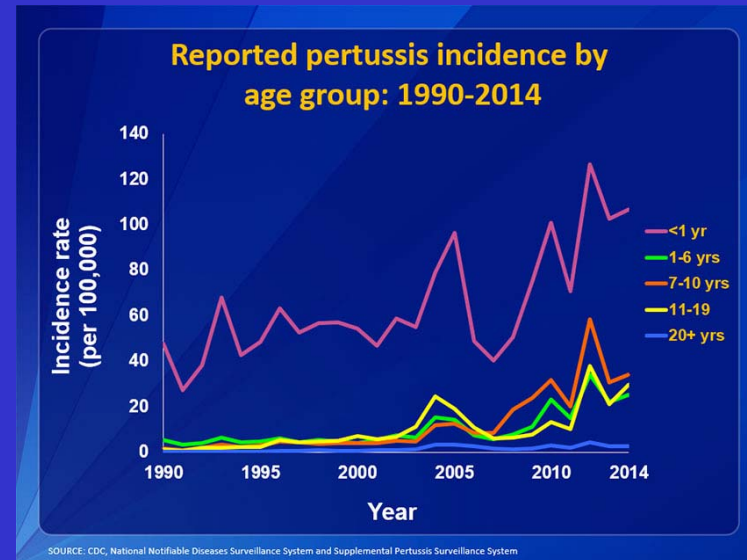
- 16 million pertussis cases
- 195,000 pertussis deaths in children
  - Most in unvaccinated or incompletely vaccinated young infants.
- Recent increases in many developed countries
  - Australia 2009-2011
  - US 2010 – 2012
  - UK 2011- 2012
  - New Zealand 2012 - 2013

*Why killer  
infection  
whooping  
cough  
is back*

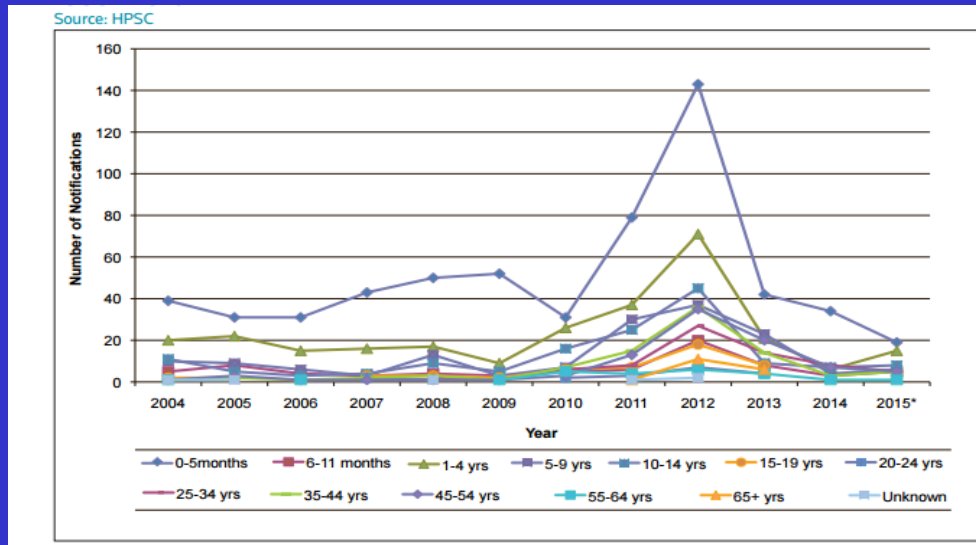


# Pertussis

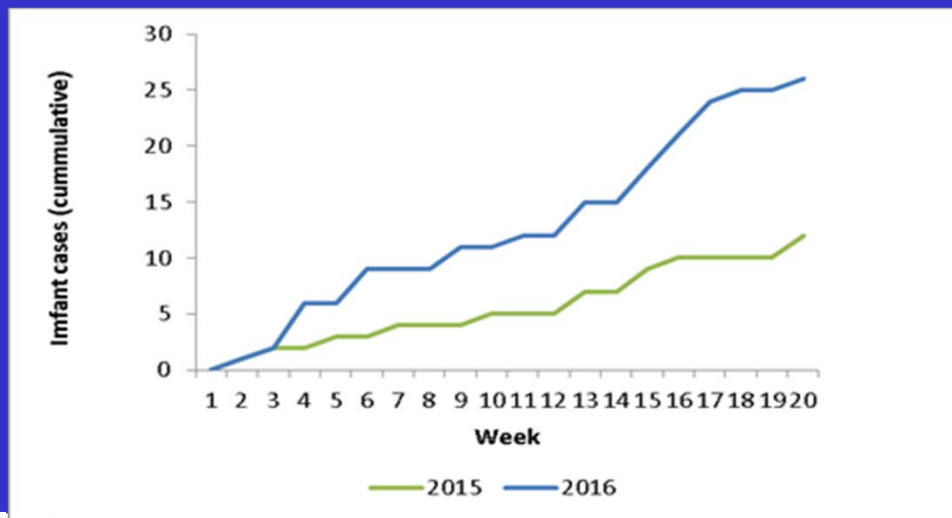
- Cough lasting at least 2 weeks
- No other cause
- +
- Paroxysms of coughing or
- Inspiratory 'whoop' or
- Vomiting post cough



## Number of notifications 1999- 2015



## No. of cases in under 6 month age group



# Pertussis Ireland

2012

- Most < 5 years of age
- 48% unvaccinated

2016

- 213 cases notified
- HSE East (70)
- 31 cases under 6 months
- Majority Mothers unvaccinated

• 2017

- 178 cases notified
- 38 cases under 6 months



Source: HPSC

[www.immunisation.ie](http://www.immunisation.ie)

# Pertussis vaccination

## Age appropriate vaccination

- 2,4, 6 months (6 in 1)
- Junior infants (4 in 1)
- 1<sup>st</sup> year (Tdap)
  - given with HPV (for girls)
  - no interval required between previous tetanus containing vaccine



### Immunisation Schedule

for children born on or after 1st July 2015

| AGE       | WHERE                            | VACCINATION                   |
|-----------|----------------------------------|-------------------------------|
| At birth  | HSE clinic or maternity hospital | BCG<br>1 INJECTION            |
| 2 months  | GP surgery<br>Visit 1            | 6 in 1 + PCV<br>2 INJECTIONS  |
| 4 months  | GP surgery<br>Visit 2            | 6 in 1 + MenC<br>2 INJECTIONS |
| 6 months  | GP surgery<br>Visit 3            | 6 in 1 + PCV<br>2 INJECTIONS  |
| 18 months | GP surgery<br>Visit 4            | MMR + PCV<br>2 INJECTIONS     |
| 5 years   | GP surgery<br>Visit 5            | MenC + Hib<br>2 INJECTIONS    |

Appointment for your child's next visit?

Next Appointment

www.immunisation.ie



## Tdap vaccine

Information for parents of children in First Year of second level school.



www.immunisation.ie

PROTECT PREVENT IMMUNISE

HSE  
Heilthseanárdú na Seirbhíse Sláimie  
Health Service Executive



## 4-in-1 & MMR vaccines

Information for parents of children in Junior Infants



www.immunisation.ie

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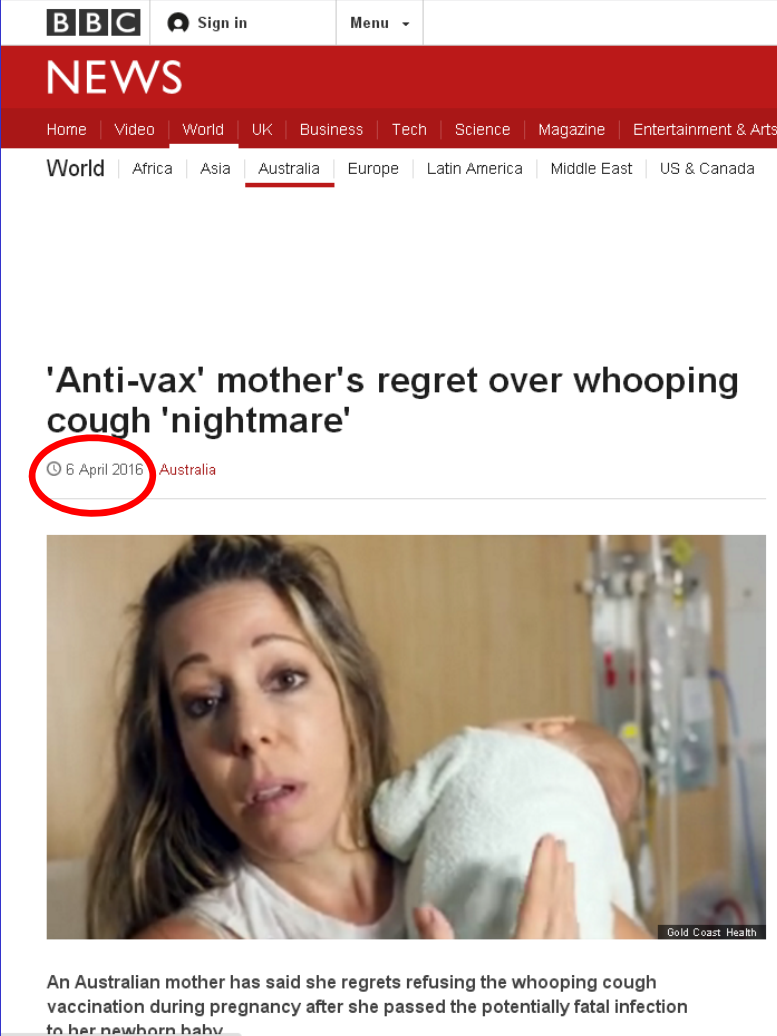
[www.immunisation.ie](http://www.immunisation.ie)



# Pertussis vaccination

- **Pregnant women**
  - between 16-36 weeks gestation
  - every pregnancy
  - can be given later or in 1<sup>st</sup> week post partum (may not be as effective)
  - **91% reduction in disease in first months of life compared with babies whose mothers had not been vaccinated.**

***Vaccine from HSE  
National Cold Chain  
Service***



The screenshot shows a BBC News article from April 6, 2016, about an Australian mother who regrets not vaccinating against whooping cough during pregnancy. The article includes a video of the mother holding her newborn baby. The date '6 April 2016' is circled in red in the original image.

**BBC** Sign in Menu


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### 'Anti-vax' mother's regret over whooping cough 'nightmare'

© 6 April 2016 Australia



Gold Coast Health

An Australian mother has said she regrets refusing the whooping cough vaccination during pregnancy after she passed the potentially fatal infection to her newborn baby.

<http://www.bbc.com/news/world-australia-35975011>

[www.immunisation.ie](http://www.immunisation.ie)



# Pertussis vaccination

## Cocooning

- for close contacts of infants born before 32 weeks gestation
  - age appropriate vaccinations
  - older adolescents and adults ideally 2 weeks before beginning contact with the infant



## *Private administration*



[www.immunisation.ie](http://www.immunisation.ie)

# Pertussis vaccination

- **HCWs** in contact with
  - infants
  - pregnant women
  - immunocompromised
- **WHY**
  - documented pertussis transmission to patients
  - health care workers exposed to pertussis much more frequently than the number of diagnosed cases suggests



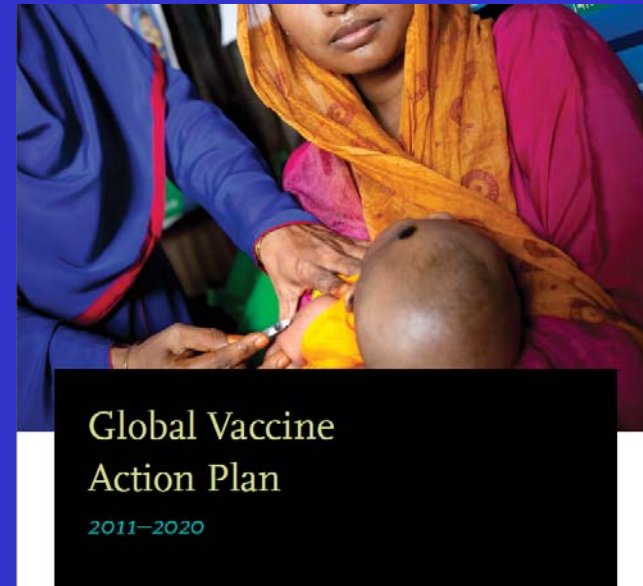
***Vaccine from HSE National  
Cold Chain Service***



[www.immunisation.ie](http://www.immunisation.ie)

# Summary

- ✓ Vaccines available to prevent 25 vaccine preventable diseases
- ✓ 3.7 million deaths prevented from 2000-2015
- ✓ High vaccine coverage and surveillance essential to prevent outbreaks



[http://www.who.int/immunization/global\\_vaccine\\_action\\_plan/GVAP\\_doc\\_2011\\_2020/en](http://www.who.int/immunization/global_vaccine_action_plan/GVAP_doc_2011_2020/en)



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