



Global and National Trends in Vaccine Preventable Diseases

Dr. Regina Kiernan
Dept Public Health Galway

27/06/18

Causes of child mortality in 2013 and annual rate of reduction since 2000

Our World
in Data

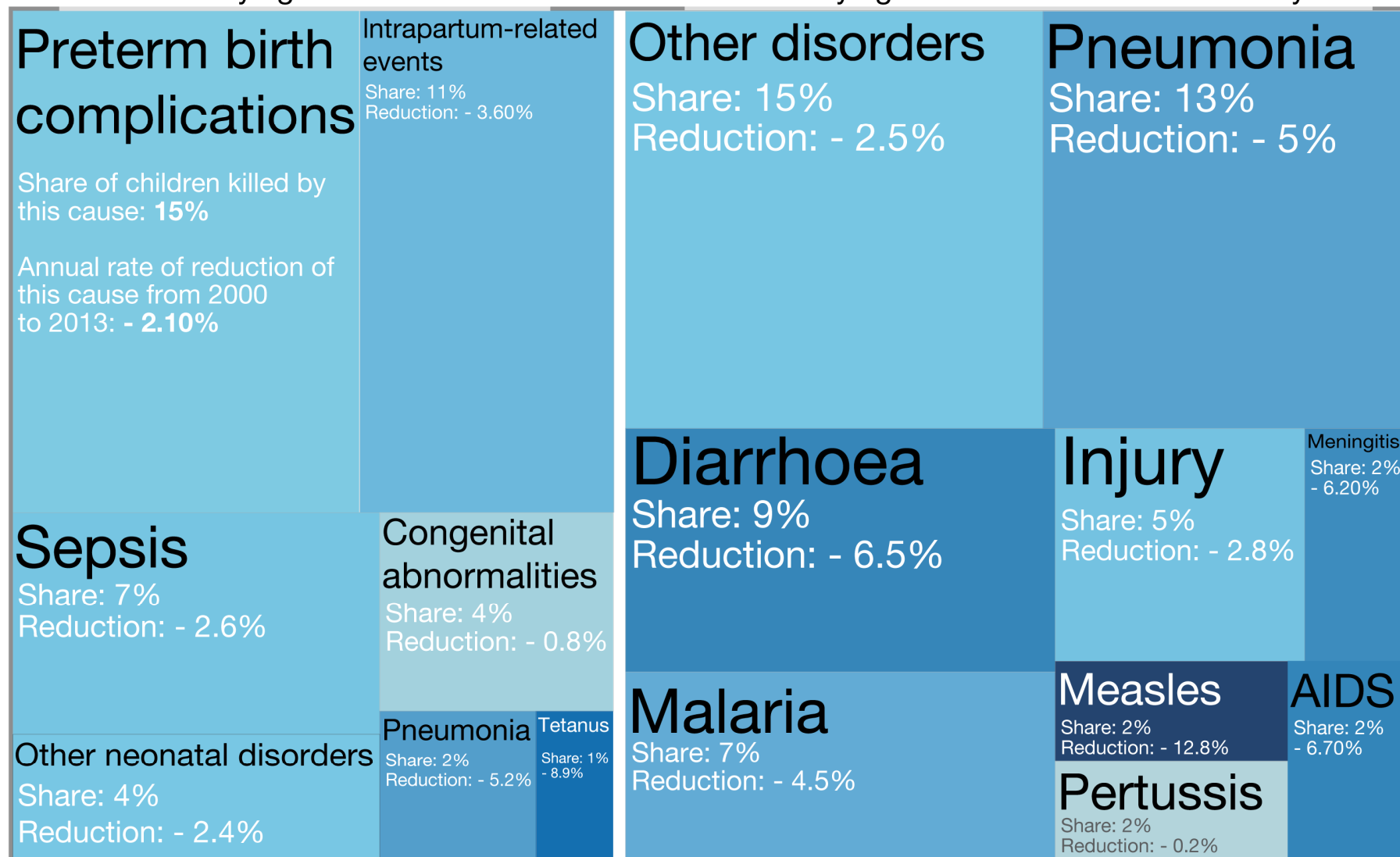
6.3 million children died before the age 5 years in 2013 (44% of which died in the first month of their life). In 2000 9.9 million children died.

– The size of the rectangle shows the share of children killed by each cause

– The color indicates the annual reduction of that cause since 2000 (child mortality from all causes declined). -0.2% -12.8%

Newborns dying in their 1st month

Children dying after 1st month and before 5 years



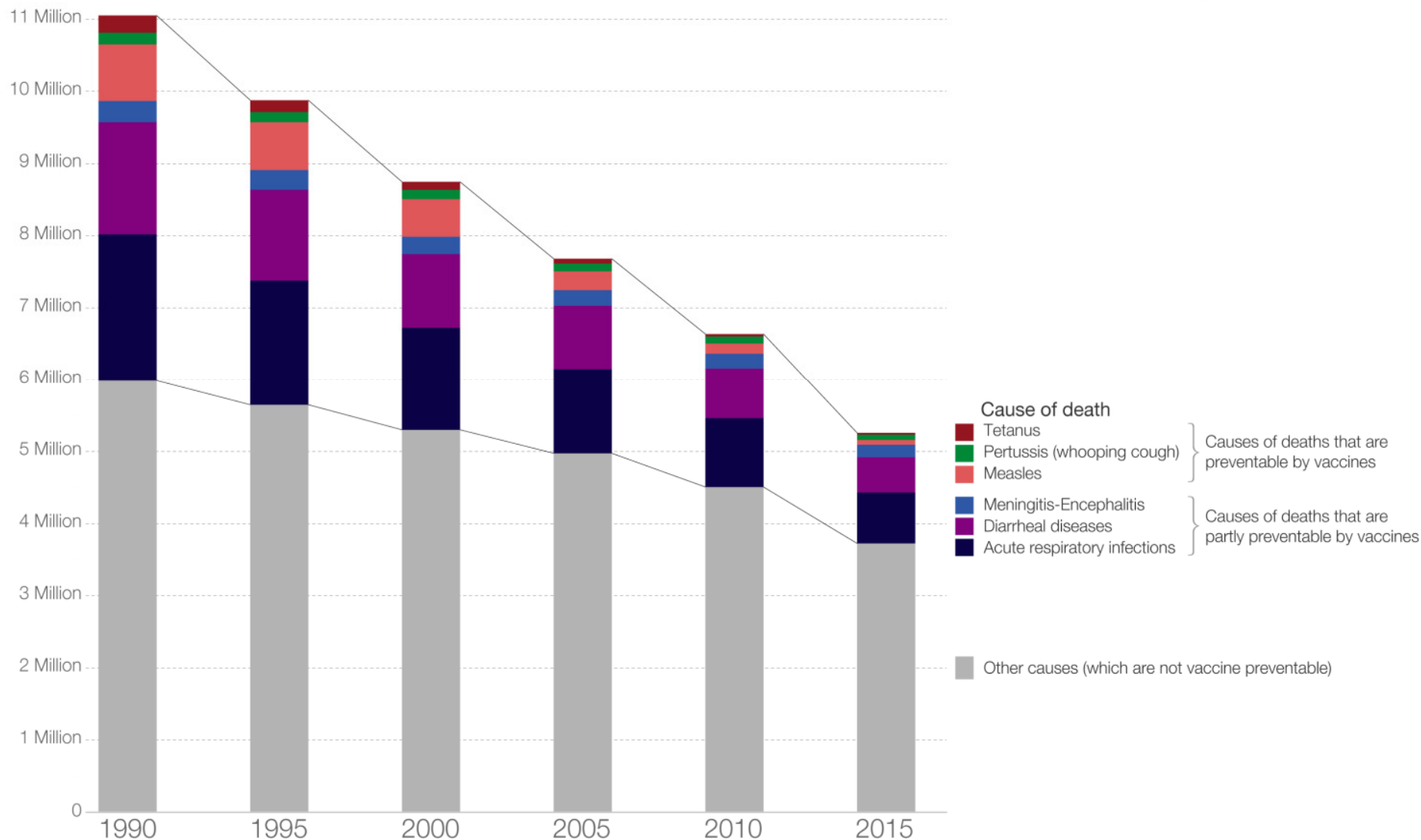
Data source: Liu et al. (2015) – Global, regional, and national causes of child mortality in 2000–13. Published in The Lancet Volume 385. The visualization is available at OurWorldinData.org. There you find the raw data and more visualizations on this topic.

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Global number of child deaths per year – by cause of death

Shown is the number of children younger than 5 years who died in a year. The height of the bar shows the total number of deaths with colored sections showing the number of children who died of diseases that are wholly or partially preventable by vaccines.

The number of child deaths for which there are vaccines available declined from 5.1 million deaths in 1990 to 1.5 million deaths 25 years later.



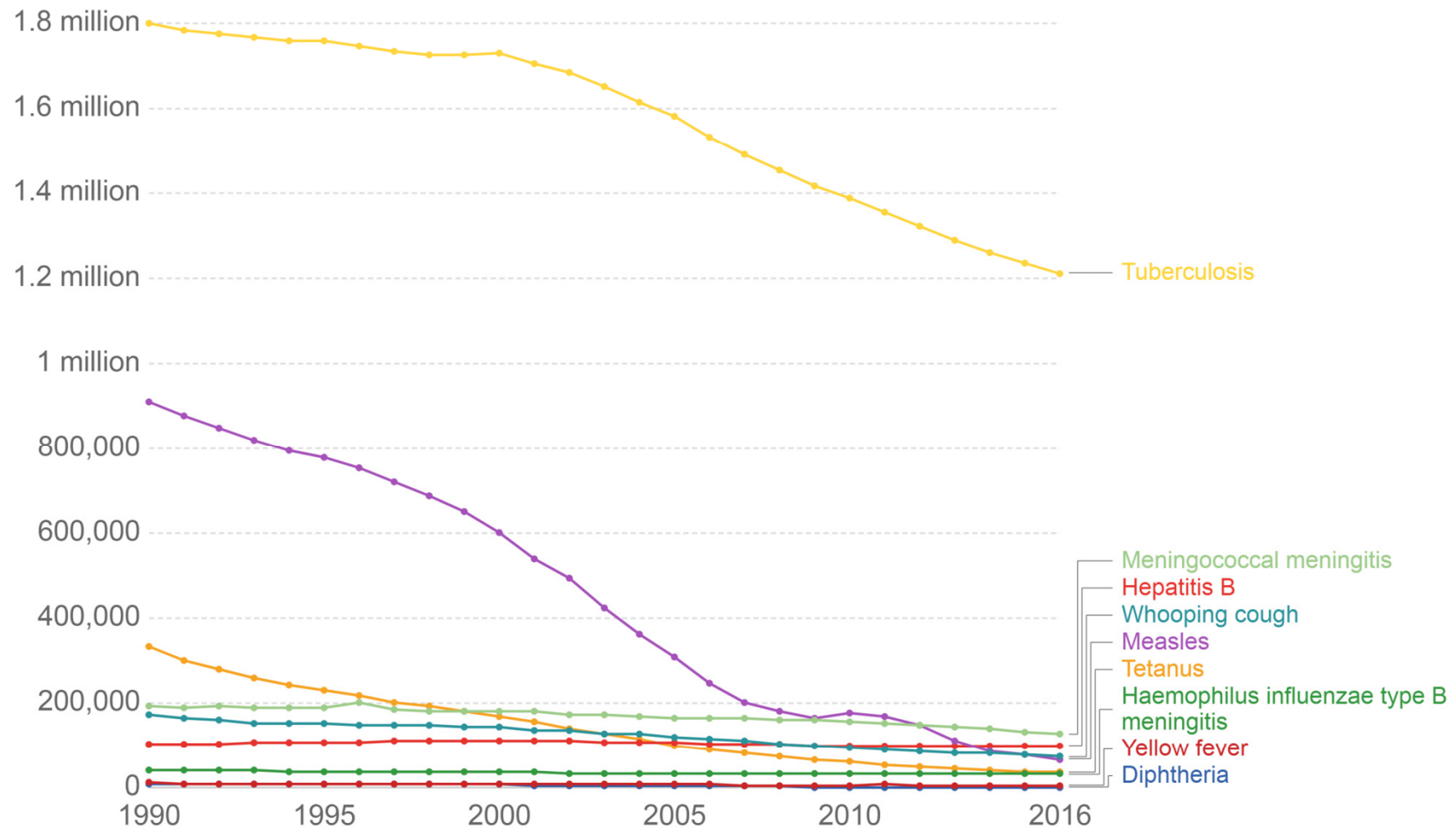
Data source: based on data from the *Institute for Health Metrics and Evaluation* (IHME)

The data visualization is available at OurWorldinData.org. There you find research and more visualizations on global development.

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Deaths caused by vaccine-preventable diseases, World

Our World
in Data



Source: Diphtheria, Tetanus, H influenzae type B meningitis, Hepatitis B, Measles, Meningococcal meningitis, Tuberculosis, Yellow fever, Whooping cough
OurWorldInData.org/vaccination/ • CC BY-SA



25 vaccine preventable diseases

- Anthrax
- Cervical cancer (HPV)
- Diphtheria
- Haemophilus influenzae Type b (Hib)
- Hepatitis A
- Hepatitis B
- Herpes Zoster
- Influenza (seasonal flu)
- Japanese encephalitis
- Measles
- Meningococcal disease
- Mumps
- Pertussis
- Pneumococcal disease
- Poliomyelitis
- Rabies
- Rota virus gastroenteritis
- Rubella
- Smallpox
- Tetanus
- Tick-borne encephalitis
- Tuberculosis
- Typhoid fever
- Varicella
- Yellow fever

Diseases for which vaccination is recommended in early childhood in Ireland

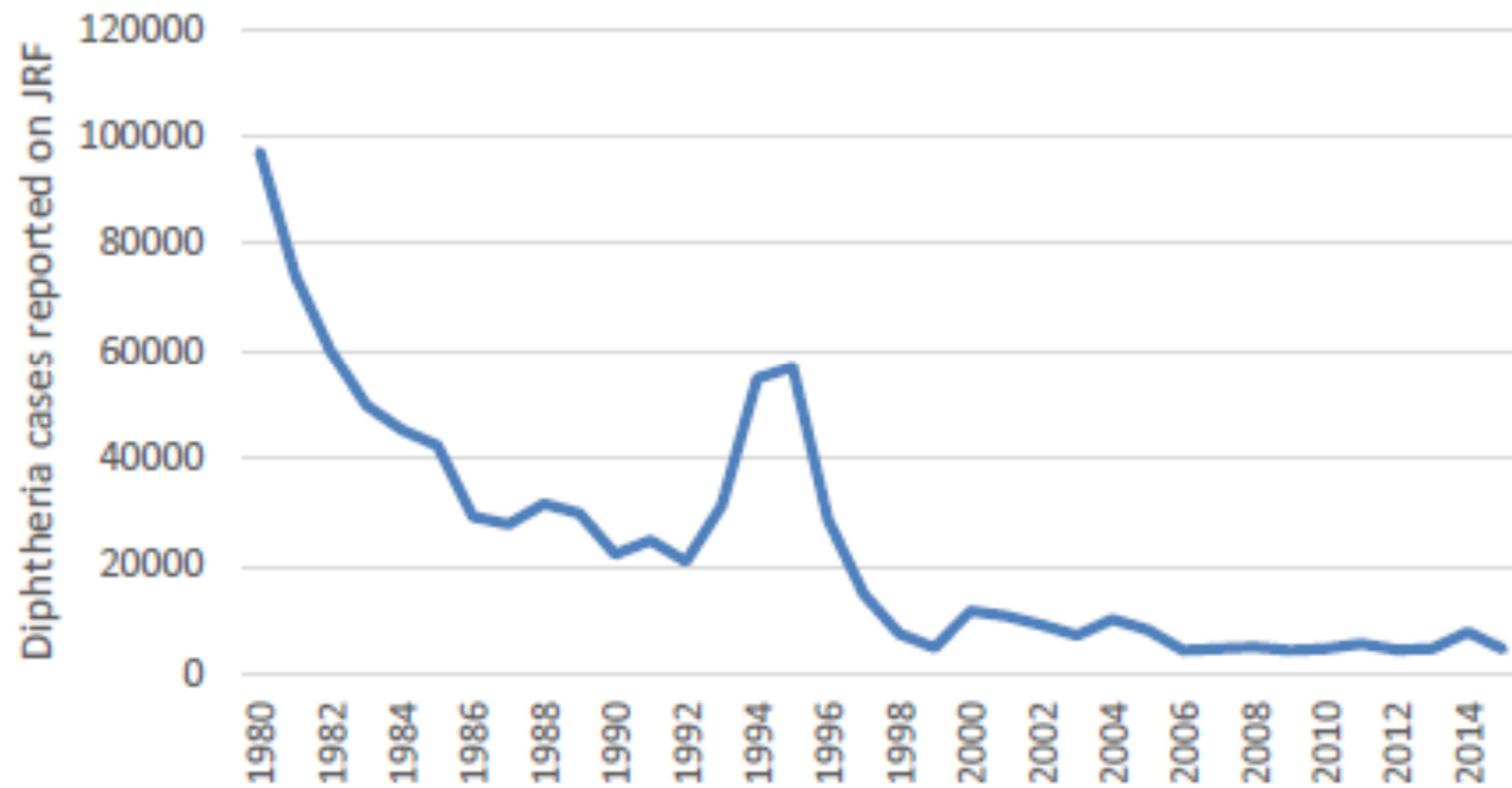
- Diphtheria
- Tetanus
- Pertussis
- Polio
- *Haemophilus influenzae* type b (Hib)
- Hepatitis B
- Meningococcal disease (B & C)
- Measles
- Mumps
- Rubella
- Pneumococcal disease
- Rotavirus

Diphtheria



- Diphtheria was one of the leading causes of childhood death in the pre-vaccine era
- Incidence fell dramatically after introduction of the diphtheria toxoid vaccine in 1940s – 1950s
- Globally: 7,097 cases in 2016
- Death rate: 5 – 10%

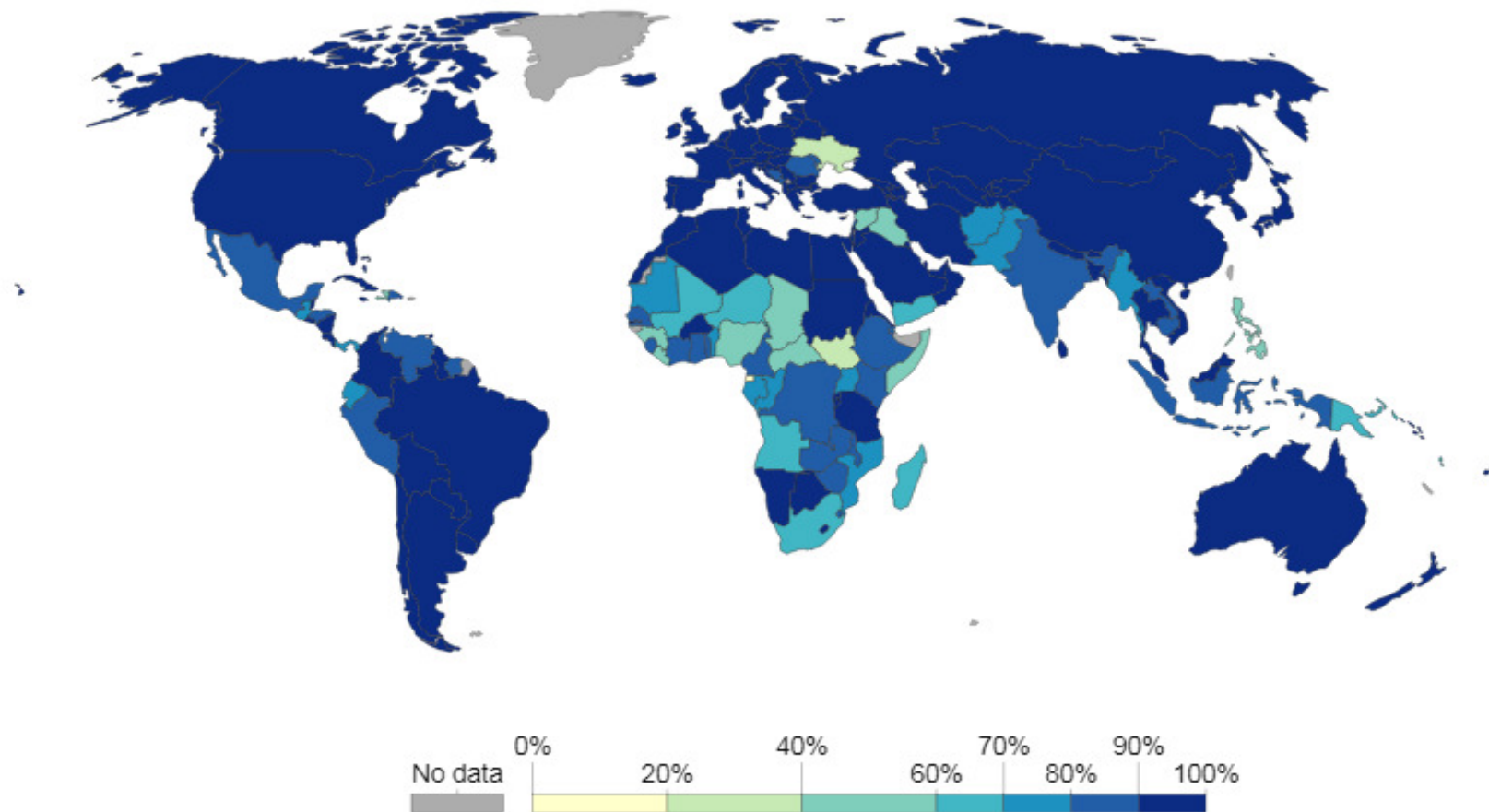
Reported cases of diphtheria worldwide- 1980 -2015



Share of children that is vaccinated against Diphtheria, Tetanus, and Pertussis (DTP3), 2015

Vaccination coverage of 12 to 23 month old children.

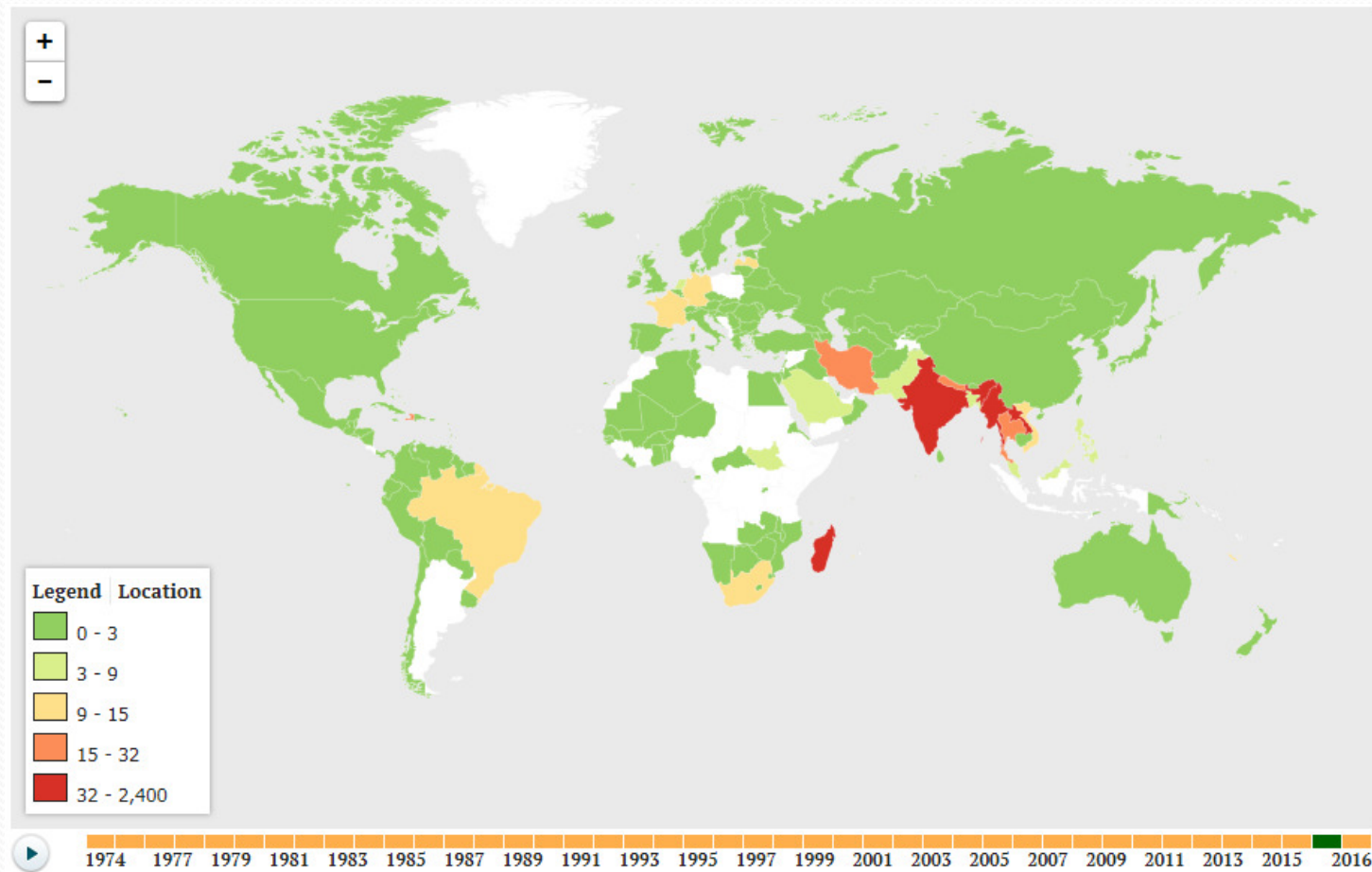
Our World
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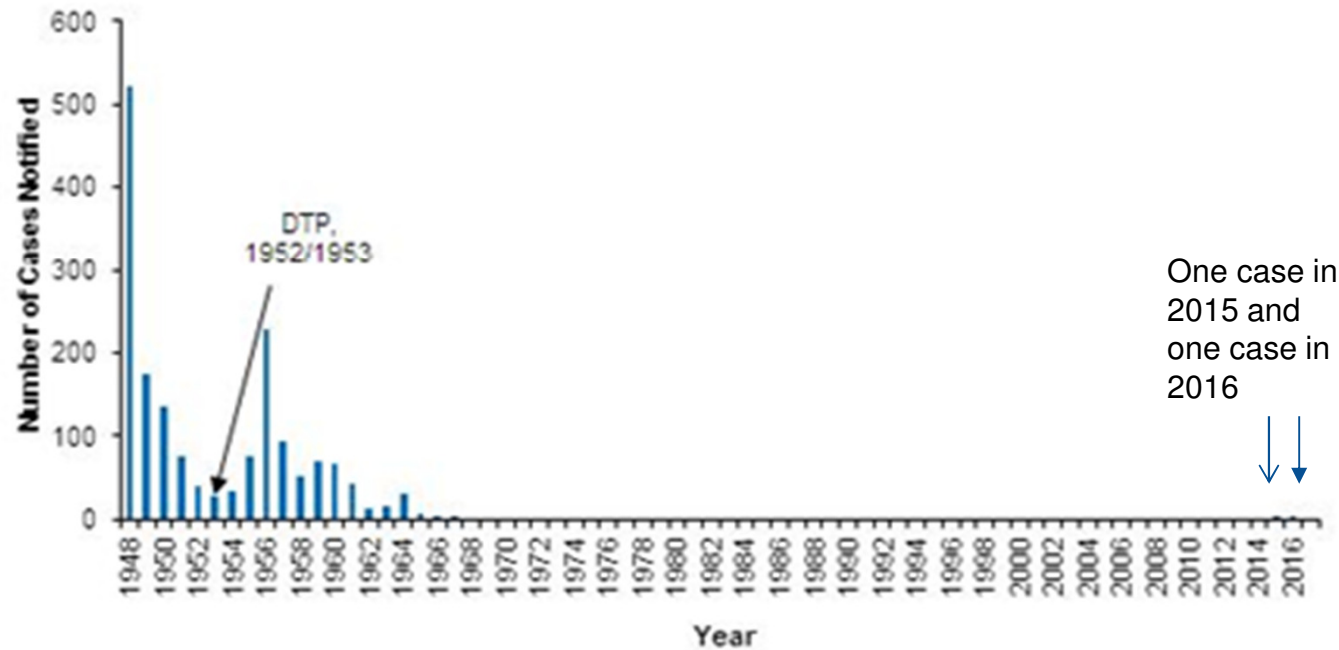
Source: Immunization against DPT – World Bank (WDI) (2016)

OurWorldInData.org/vaccination/ • CC BY-SA

Diphtheria cases worldwide 2015



Diphtheria in Ireland 1948 - 2017



Tetanus

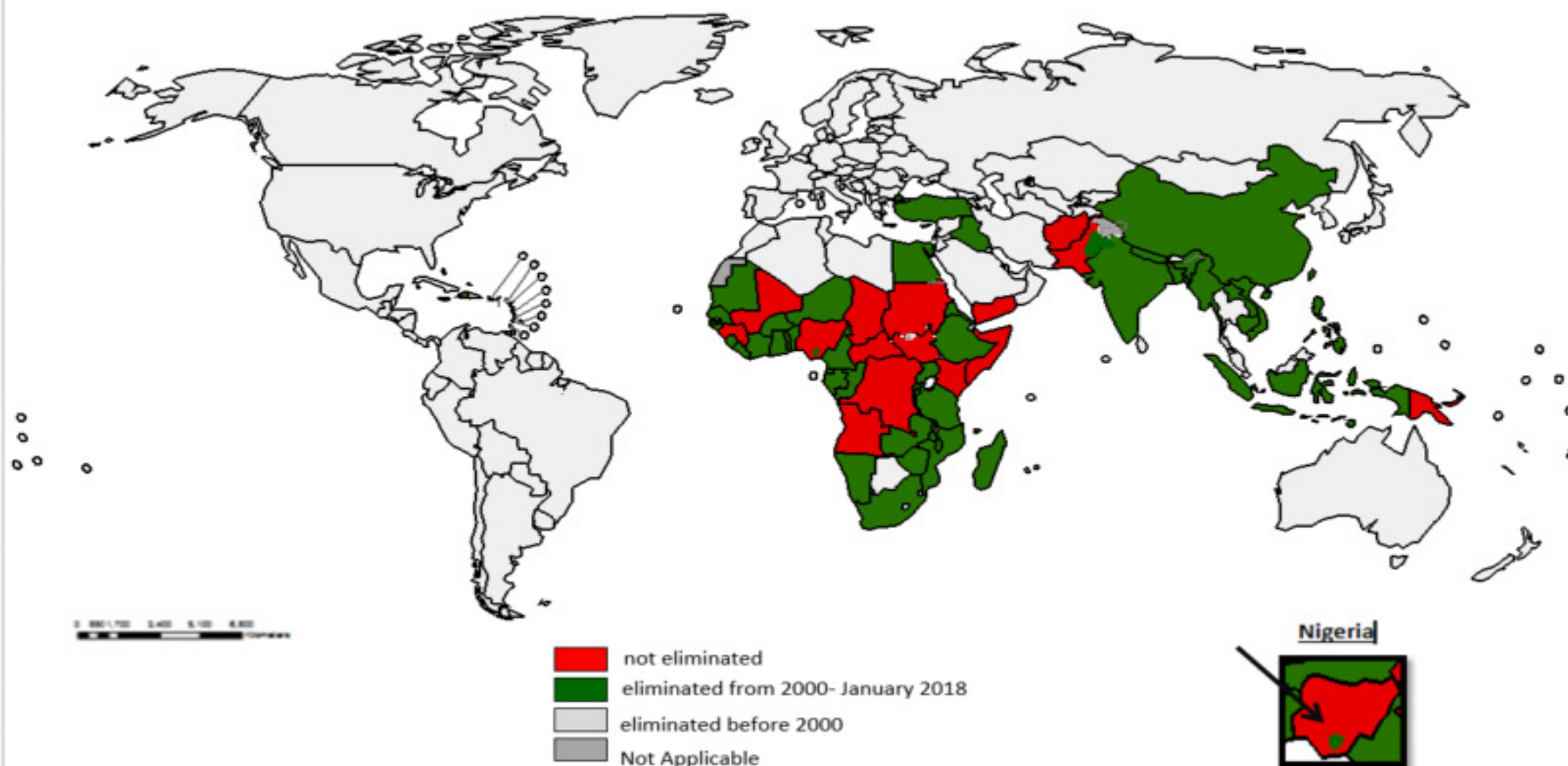
- This baby has neonatal tetanus.
- Most newborns who get tetanus die.
- Neonatal tetanus can be prevented by hygienic delivery practices, and/or by immunizing mothers against tetanus.



- Estimated 49,000 newborn babies died in 2013
- 94% reduction from 1988 when an estimated 787,000 newborn babies died within their first month of life

44 Countries eliminated MNT between 2000 & January 2018

*(Plus Punjab province of Pakistan and the South Eastern zone of Nigeria) leaving 15 countries yet to eliminate MNT



Source: WHO/UNICEF Database
Date of slide : 15 January 2018
Map production: Immunization Vaccines and
Biologicals, (IVB), World Health Organization

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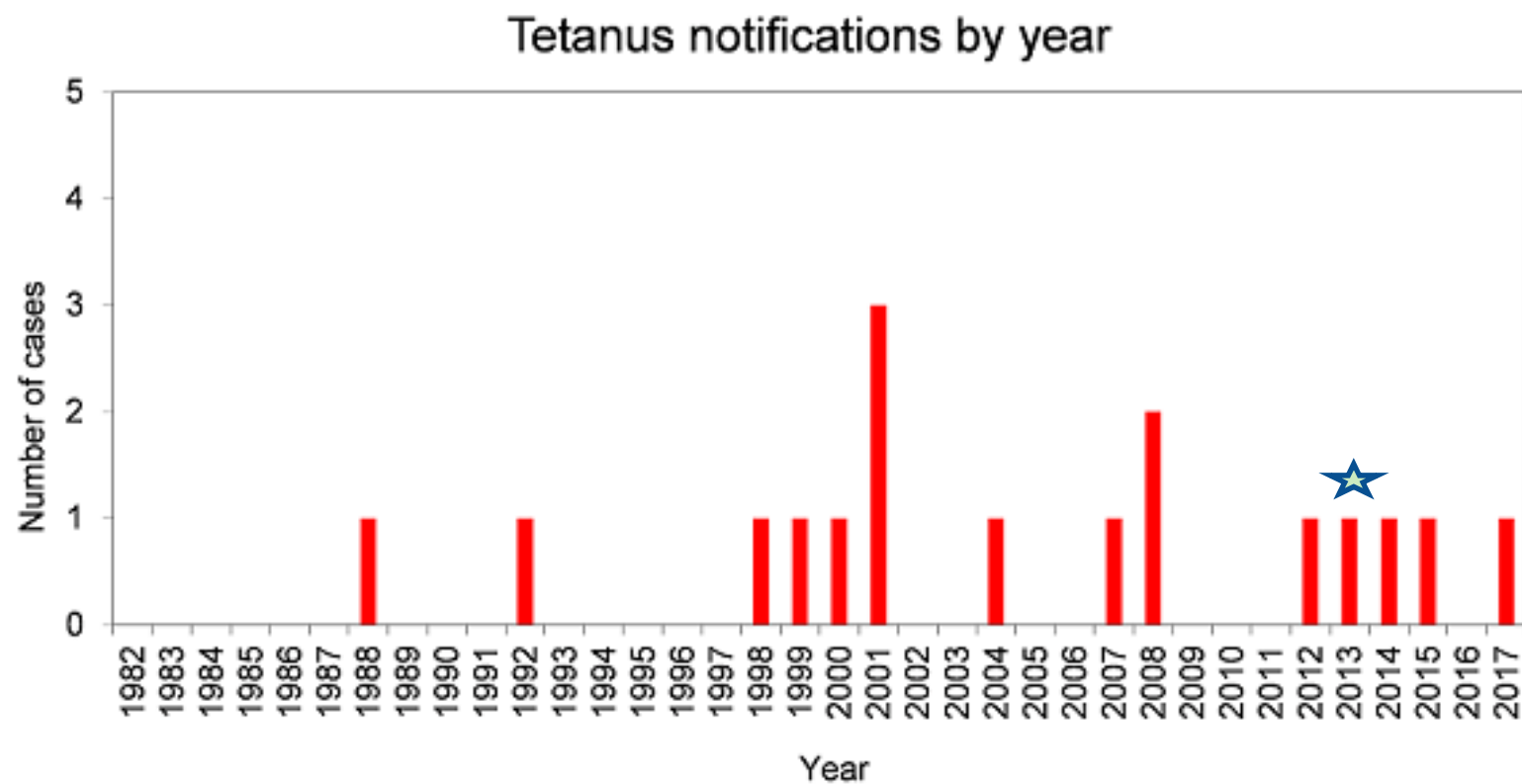




Tetanus: This person has tetanus. The muscles in his body are in spasm, making it nearly impossible for him to move. Tetanus bacilli live in the soil, and many types of injuries can allow the bacteria to enter the body. Tetanus is not contagious.

Photo courtesy of the Centers for Disease Control and Prevention (CDC)

Tetanus in Ireland



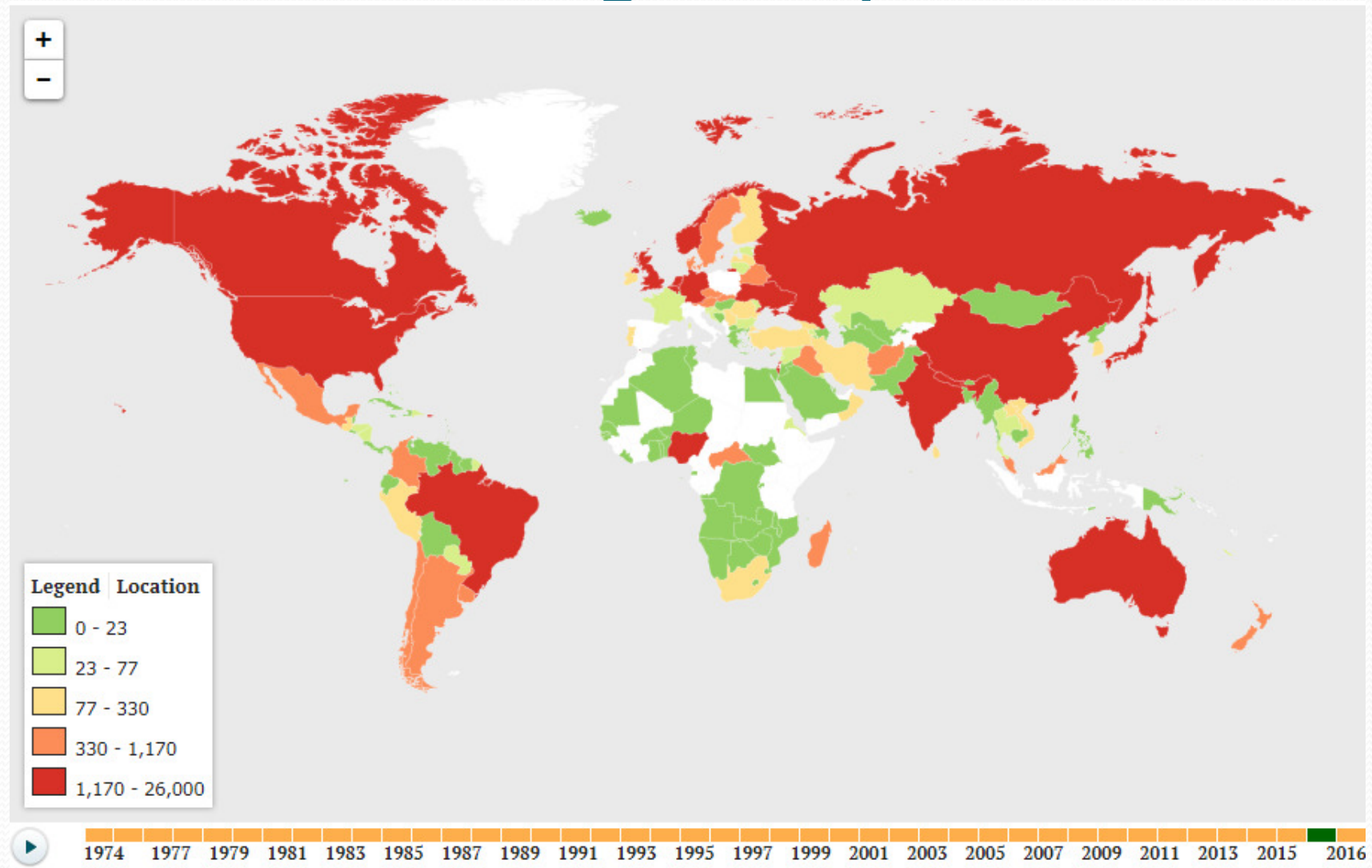
Pertussis



Every year

- 16 million pertussis cases
- 195,000 pertussis deaths in children
 - Most in unvaccinated or incompletely vaccinated young infants.
 - 95% in developing countries
- Highly contagious
- Recent increases in many developed countries
 - Australia 2009-2011
 - US 2010 – 2012
 - UK 2011- 2012
 - New Zealand 2012 – 2013
 - Ireland - 2012

Pertussis cases globally





- Cough lasting at least 2 weeks
- No other cause with
 - Paroxysms of coughing or
 - Inspiratory 'whoop' or
 - Vomiting post cough
- Babies are the most likely to die from pertussis and can have complications such as seizures and brain damage.

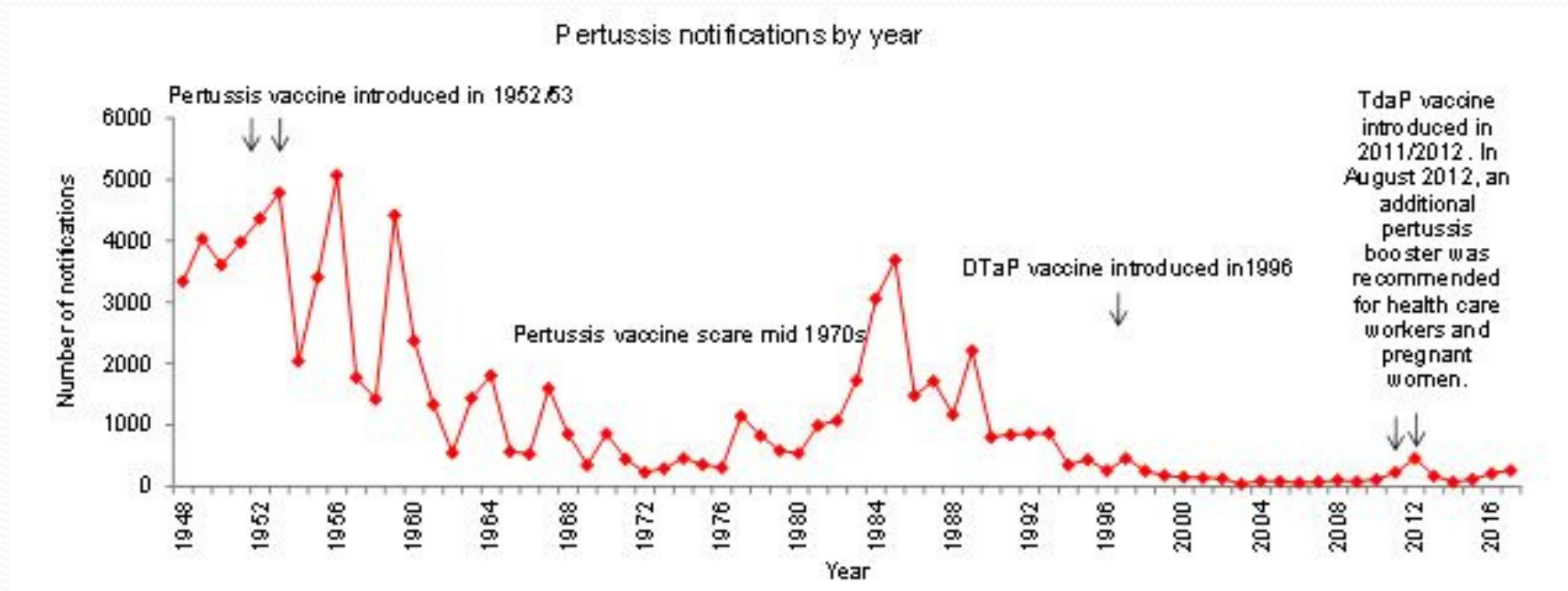
Photo courtesy of the Centers for Disease Control and Prevention (CDC)



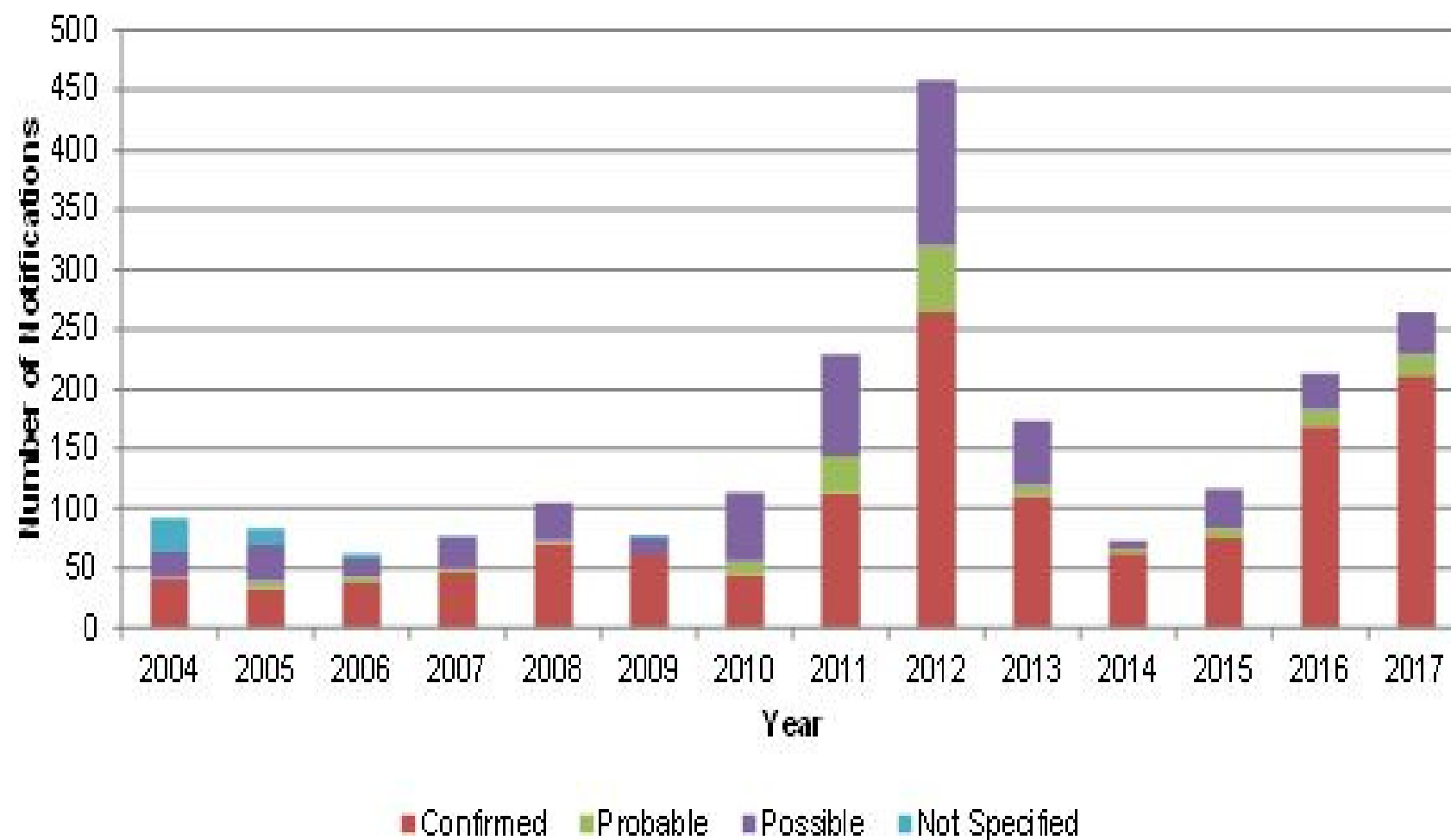
Pertussis: This child has broken blood vessels in his eyes and bruising on his face because of coughing from pertussis.

Photo courtesy of Thomas Schlenker, MD, MPH, Chief Medical Officer, Children's Hospital of Wisconsin

Pertussis in Ireland



Pertussis notifications by case classification and year, 2004-2017



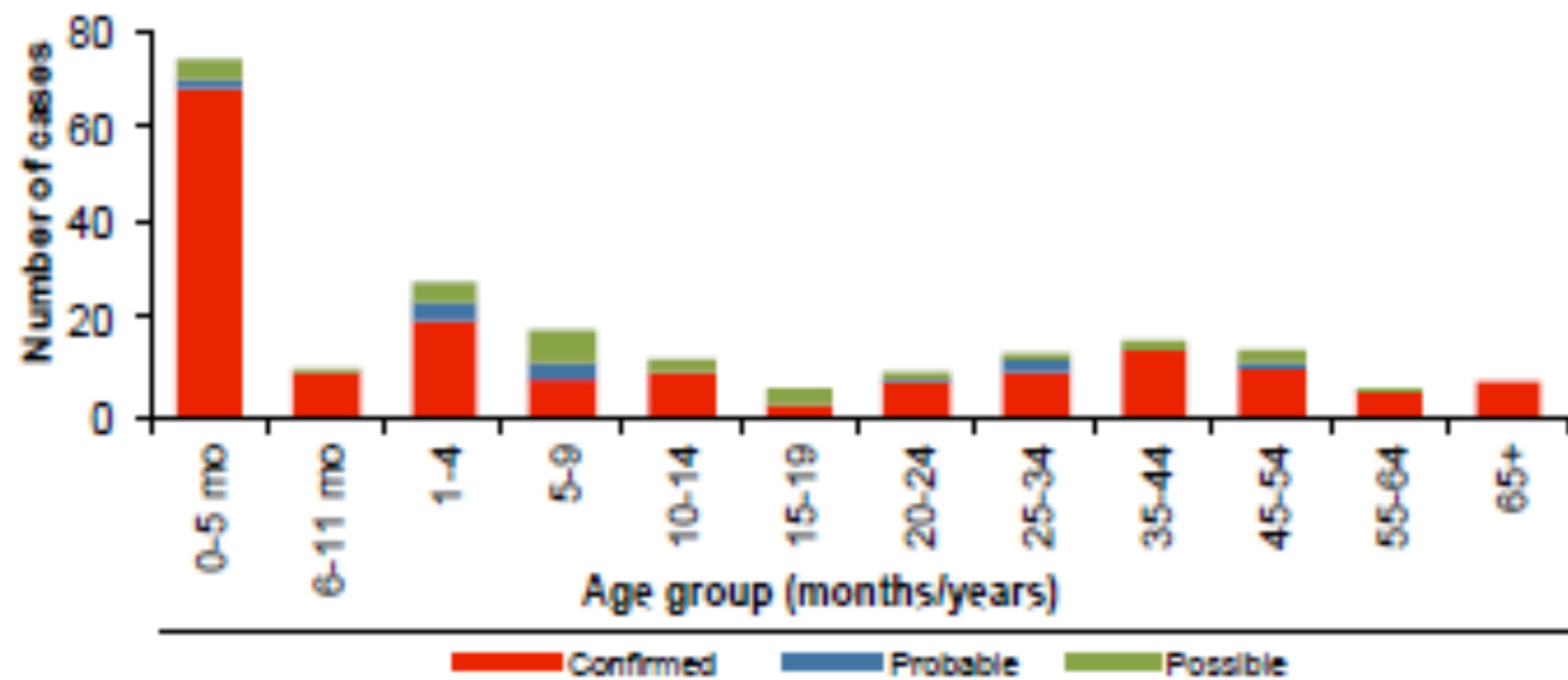




Figure 3. Number of notified pertussis cases in 2016 by age group and case classification.



Infant death reported from pertussis — HPSC

 By Niamh Mullen  15th June 2016

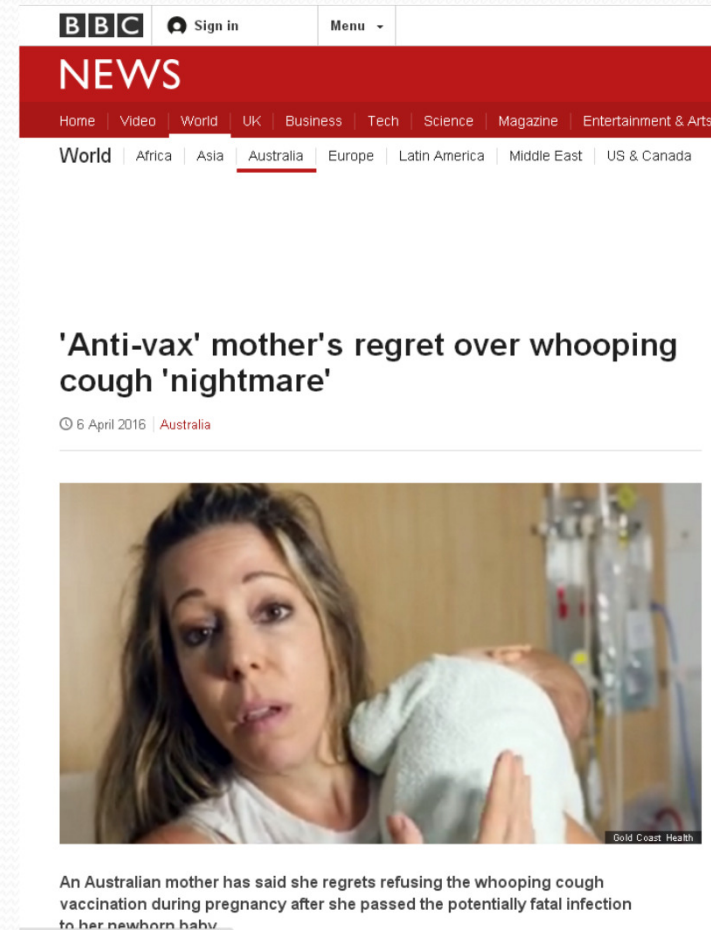
An infant died earlier this year after contracting pertussis, the Health Protection Surveillance Centre (HPSC) has confirmed.

In its latest report, it said it wanted to alert clinicians to an increase in pertussis notifications among babies younger than 12 months during the first four months of the year. It also said it wanted to raise awareness among pregnant women of the recommendation for a pertussis booster in the third trimester of pregnancy.

- **Pregnant women**

- between 16-36 weeks gestation
- every pregnancy
- can be given later or in 1st 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***



- **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***



- **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***



Measles globally



Since 2000 vaccination has

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

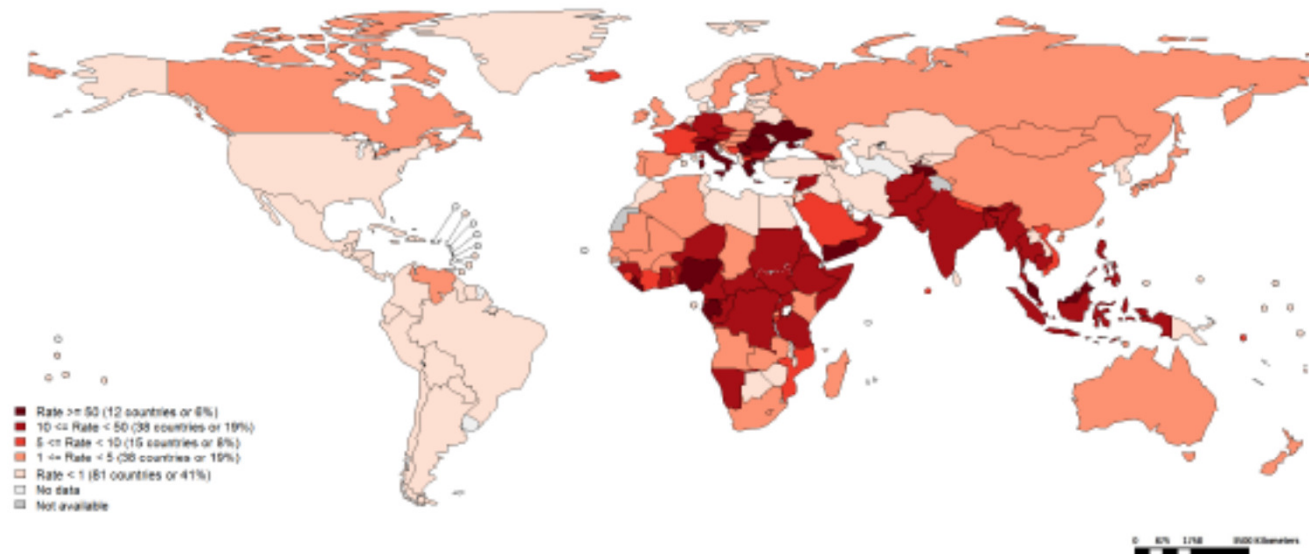
Every year

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

Measles Incidence Rate per Million (12M period)

| Top 10** | | |
|------------|-------|--------|
| Country | Cases | Rate |
| India | 55226 | 41.71 |
| Nigeria | 10793 | 58.04 |
| Indonesia | 6583 | 25.21 |
| Pakistan | 6437 | 33.32 |
| China | 5762 | 4.11 |
| Romania | 5562 | 281.22 |
| Italy | 5006 | 84.23 |
| Ukraine | 4767 | 107.27 |
| Bangladesh | 4176 | 25.63 |
| DR Congo | 3772 | 47.91 |

| Other countries with high incidence rates*** | | |
|--|-------|--------|
| Country | Cases | Rate |
| Gabon | 1084 | 347.33 |
| Greece | 967 | 86.46 |
| Liberia | 392 | 84.96 |
| Serbia | 702 | 79.59 |
| Tajikistan | 649 | 74.30 |
| Bhutan | 59 | 73.96 |
| Malaysia | 1924 | 61.69 |



Map production: World Health Organization, WHO, 2017. All rights reserved
Data source: F/R Database

Disclaimer:
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| Measles cases from countries with known discrepancies between case-based and aggregate surveillance, as reported by country | | | |
|---|------|--------|---|
| Country | Year | Cases | Data Source |
| DR Congo | 2017 | 45,147 | SITUATION EPIDEMIOLOGIQUE DE LA ROUGEOLE EN RDC, Week of 6/2/2018 |
| | 2018 | 574 | |
| Somalia | 2017 | 23,353 | Somali EPI/POL Weekly Update Week 5, 2018 |
| | 2018 | 1264 | |

Based on data received 2018-02 and covering the period between 2017-01 and 2017-12 - Incidence: Number of cases / population * 100,000 - * World population prospects, 2017 revision - ** Countries with the highest number of cases for the period - *** Countries with the highest incidence rates (excluding those already listed in the table above)



US measles outbreak 2015

- 117 cases linked to measles outbreak
- 74% of all cases reported in 2015
- Index case
 - unvaccinated 11 year old
 - rash onset December 2014
 - visited a well known theme park while infectious



Measles outbreaks in EU

- 2016
 - 3767 cases reported
 - 30 countries
 - Majority of cases not vaccinated (87%)
 - 9 deaths
- 2017*
 - 14, 393 in EU/EEA
 - 34 deaths
 - Romania 5,562 cases
 - 23 deaths
 - Italy 5,006 cases
 - 4 deaths





Irish outbreaks

- In 2011, there was a large measles outbreak in Dublin with 250 cases (285 cases in total in 2011).
- In 2016 forty confirmed cases were linked to an outbreak between April and September 2016.
- The source of infection for the index case (week 18) was identified as a fellow traveller (primary case) on a flight returning to Dublin.
- The primary case was symptomatic with measles at the time of travel but was unaware of the diagnosis. This primary case subsequently transmitted measles to non-immune individuals in the community and health care facilities (HSE South).
- Five of the eight public health regions of Ireland had measles cases linked to this outbreak.

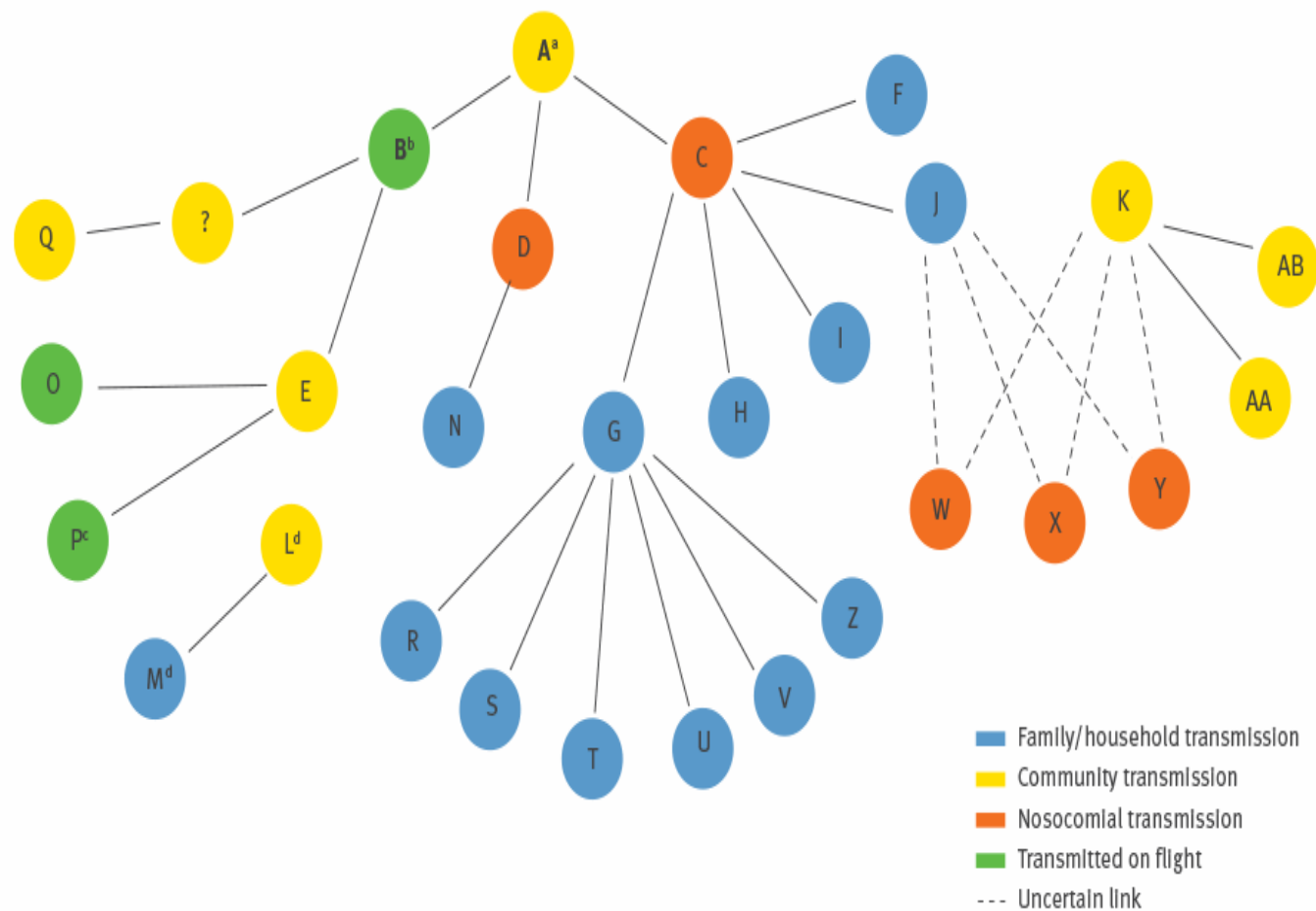
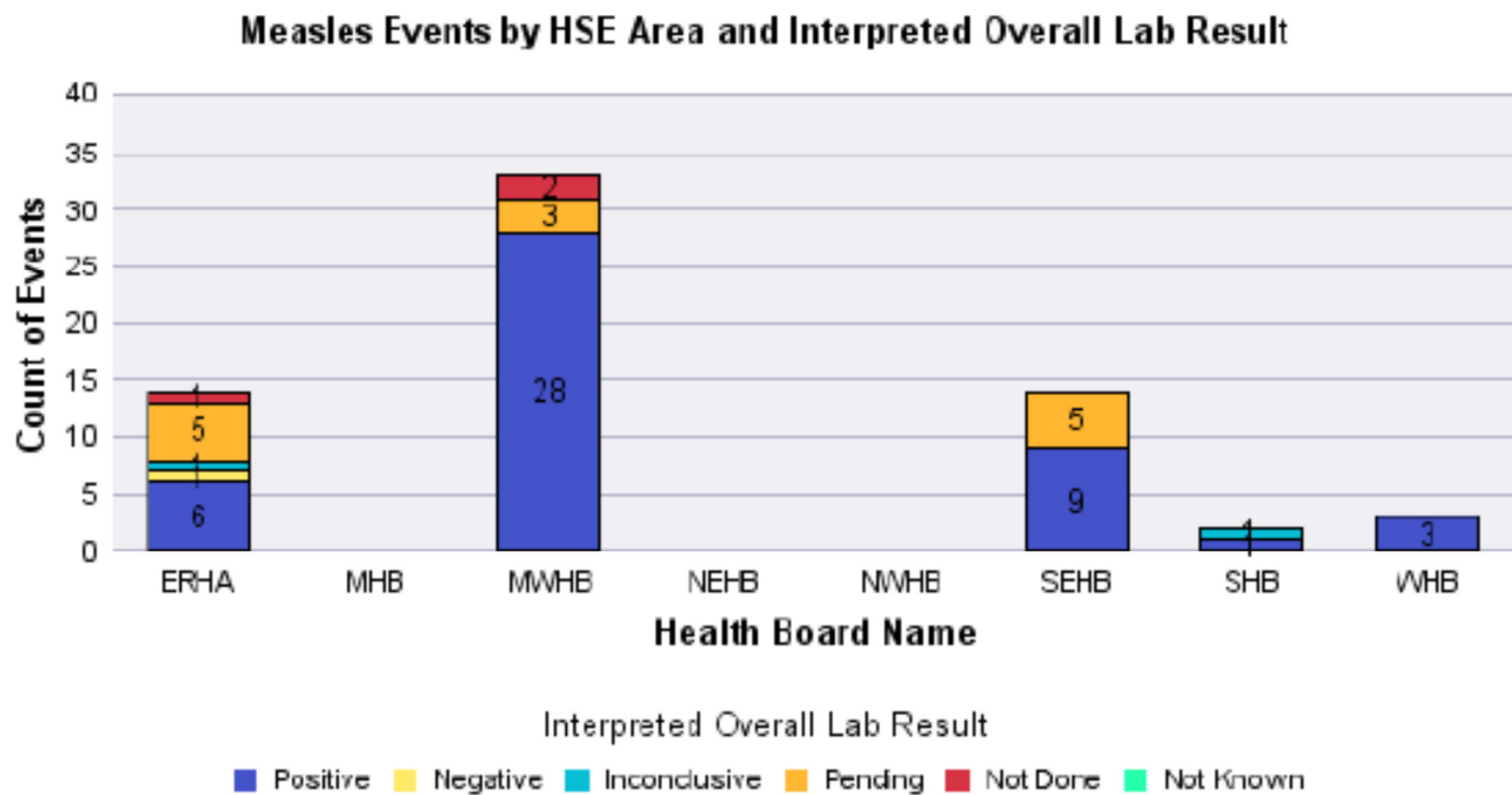


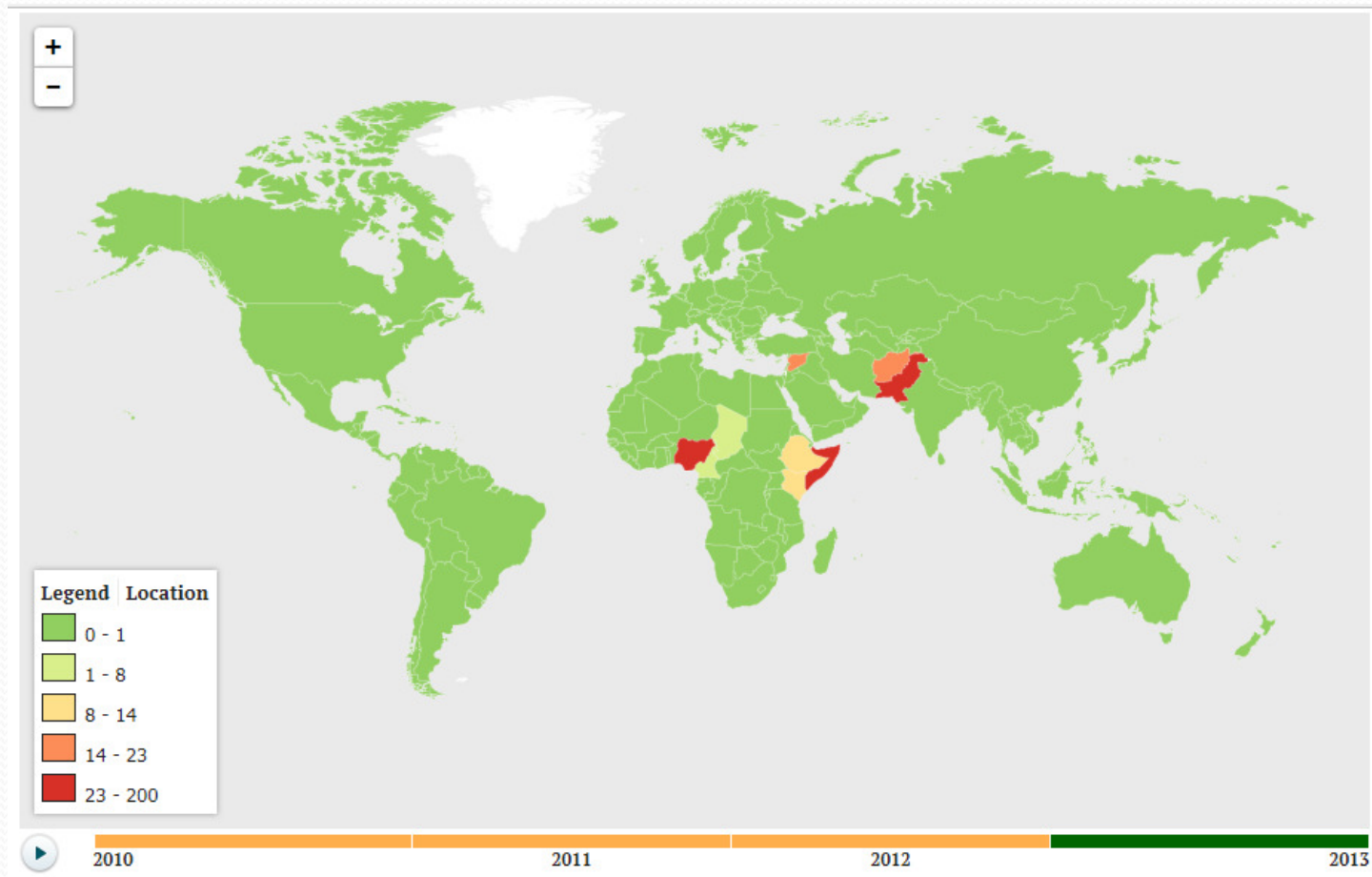
Figure 2. Epidemiological links between cases, measles outbreak, Ireland, April–June 2016 (n=27)

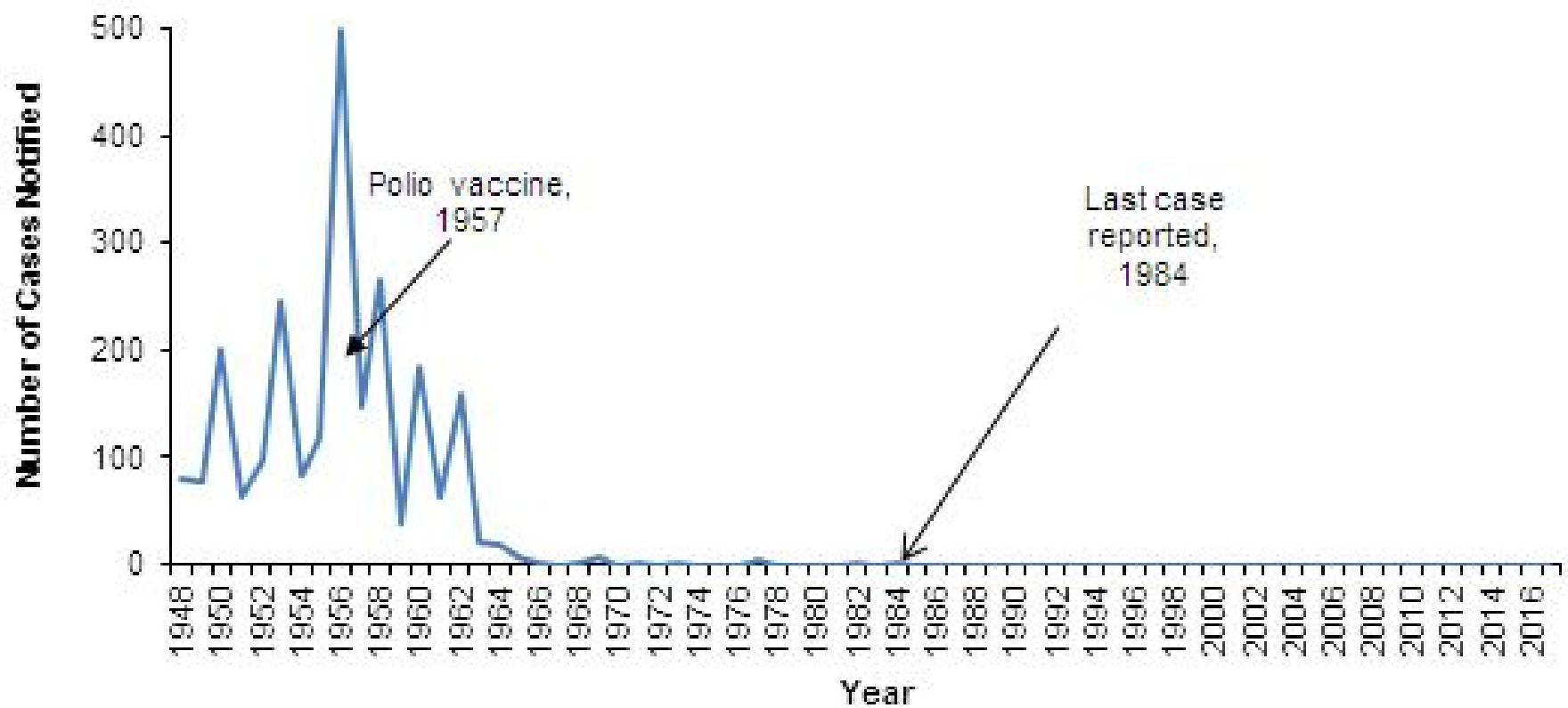
Citation style for this article: Barrett Peter, Chaintarli Katerina, Ryan Fiona, Cotter Suzanne, Cronin Anthony, Carlton Louise, MacSweeney Mary, McDonnell Mairead, Connell Jeff, Fitzgerald Rose, Hamilton Douglas, Ward Mary, Glynn Ronan, Migone Chantal. An ongoing measles outbreak linked to a suspected imported case, Ireland, April to June 2016. Euro Surveill. 2016;21(27):pii=30277. <https://doi.org/10.2807/1560-7917.ES.2016.21.27.30277> Received: 21 Jun 2016; Accepted: 07 Jul 2016

2018: Week 1 - 25



Polio globally



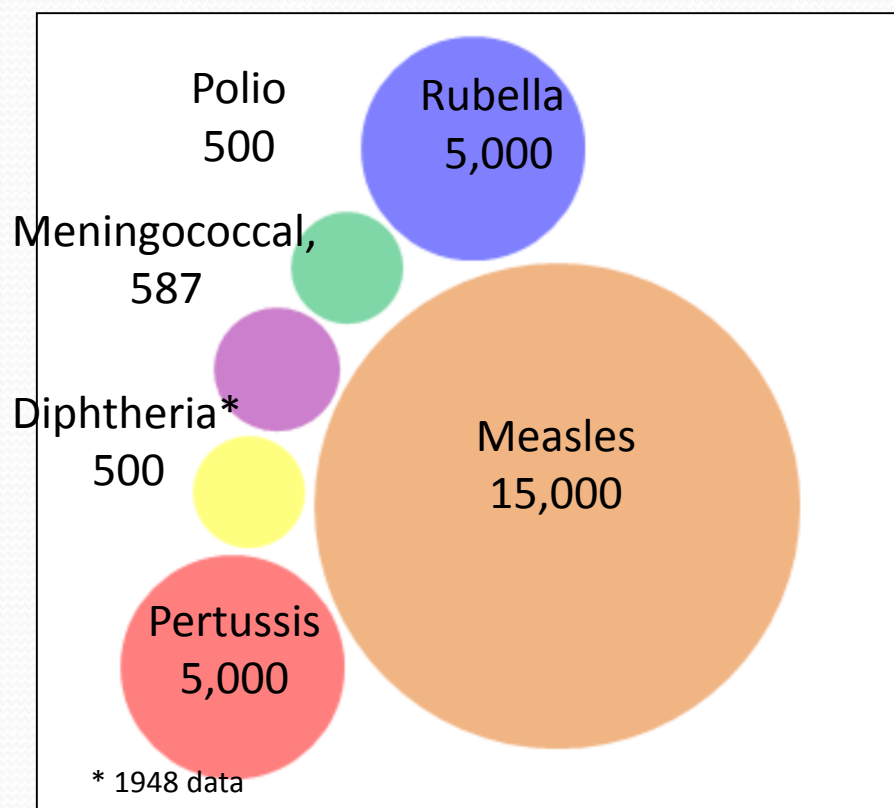




Vaccines Work – diagrams from NIO

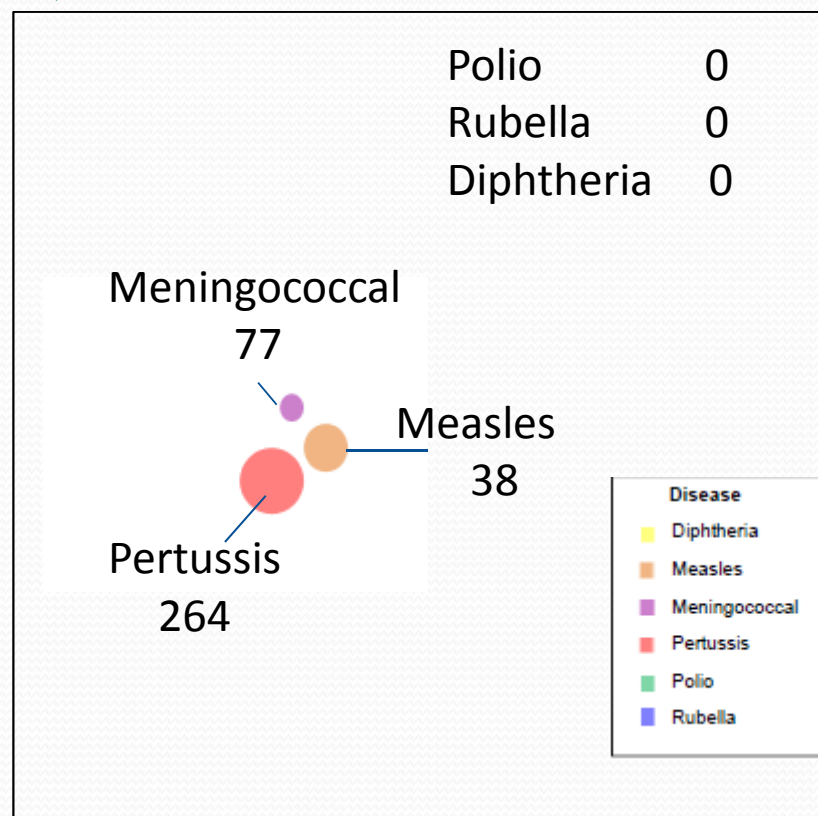
Ireland, 1950

(annual disease cases in Ireland)



Ireland, 2017

(annual disease cases in Ireland)





Serious diseases will come back if we do not vaccinate

- Vaccines given in Ireland prevent 13 diseases including measles, meningitis and pertussis (whooping cough). These diseases may result in serious complications including death. Outbreaks of these serious infectious diseases will occur if people are not vaccinated.
- These diseases are only a plane ride away.
- In the last 12 months there have been over 20,000 cases of measles in the WHO European region.
- There were 2 deaths from diphtheria in Belgium and Spain in the past 3 years.
- Polio continues to occur in Afghanistan and Pakistan.

Immunisation Uptake Statistics at 24 months –National

