

Global and National Trends in Vaccine Preventable Diseases

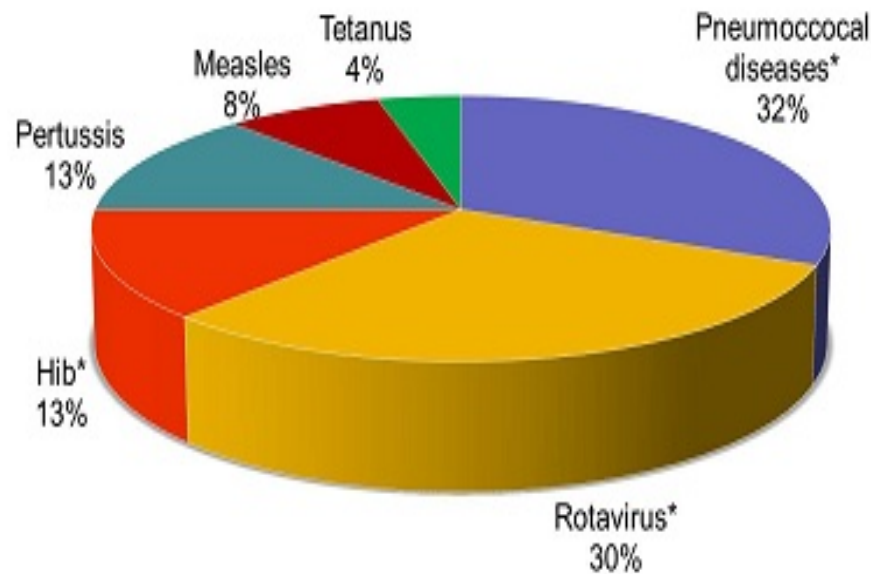
Dr Brenda Corcoran
National Immunisation Office



www.immunisation.ie

Global mortality 2008

Children under 5 years of age



1.5 million deaths
due to vaccine preventable
diseases

17% of global total mortality in
children under 5 years of age

Global picture

Annual number of deaths in children <5 years
~ 9.6 million in 2000



Immunisation
+
Clean water and sanitation
Better hygiene
Education



7.6 million in 2010

(despite an increase in the number of children born each year)




























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Global picture

25 vaccine preventable diseases

TABLE 1: VACCINE-PREVENTABLE INFECTIOUS AGENTS OR DISEASES

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

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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

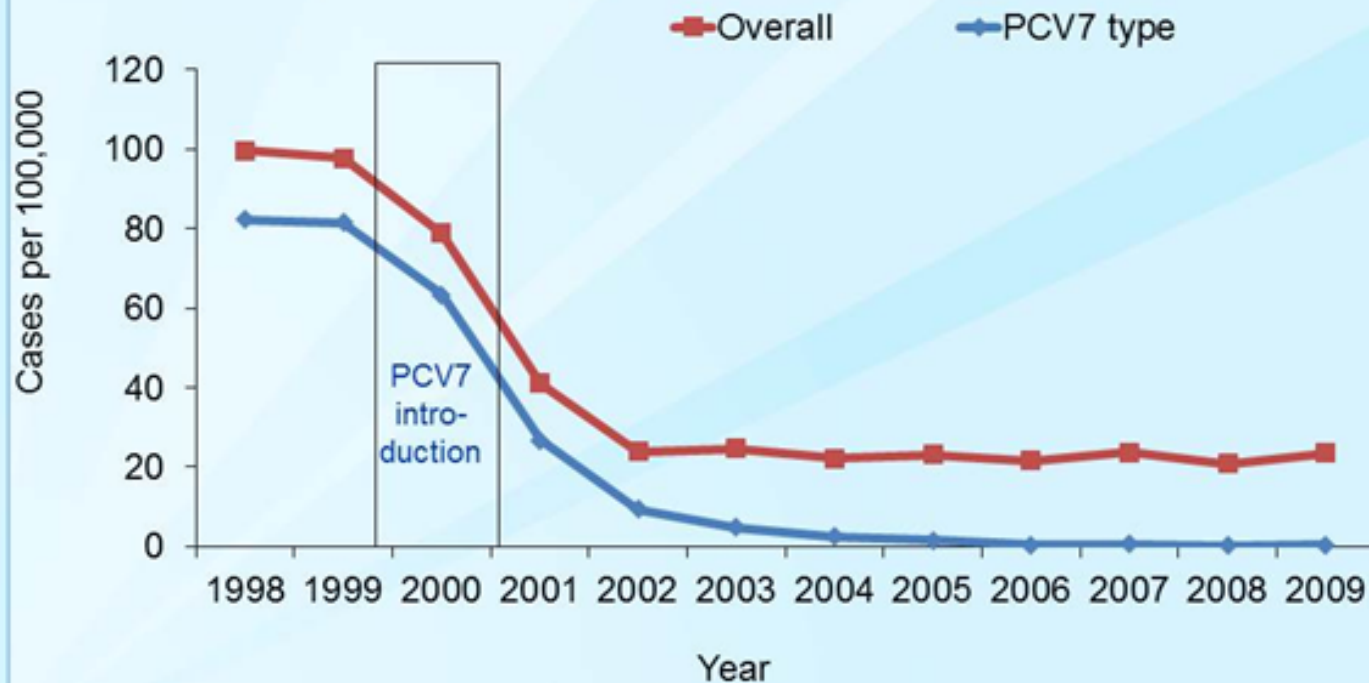
- 87% birth cohort in high income countries
- 2% birth cohort in low income countries



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Pneumococcal disease USA

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



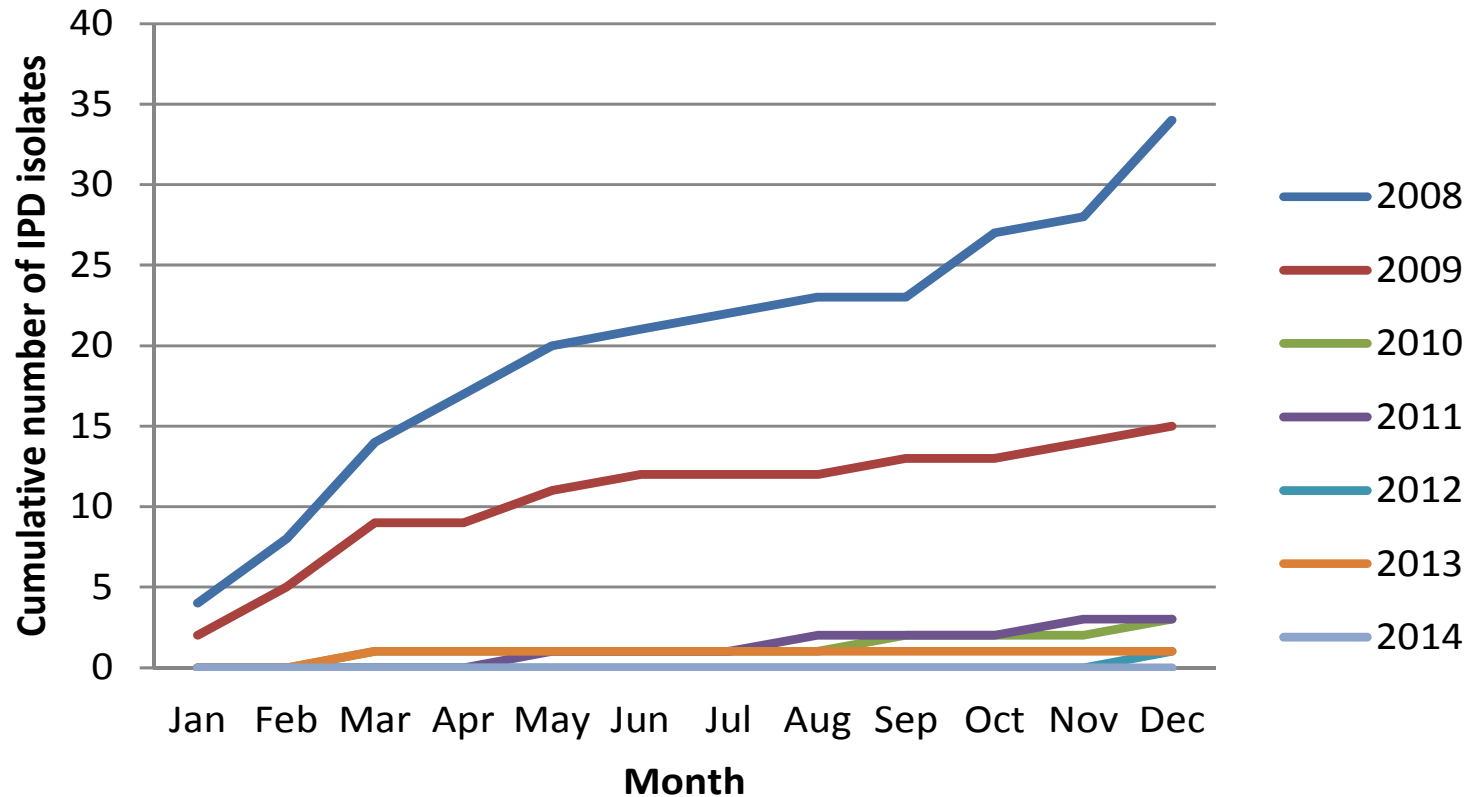
Moore, IDSA, 2009 & CDC Unpublished

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Pneumococcal disease Ireland

Impact of PCV on the burden of IPD
caused by PCV7 vaccine serotypes in <2 year olds



100% reduction in IPD cases, comparing Jan-Dec 2014 with the same period in 2008

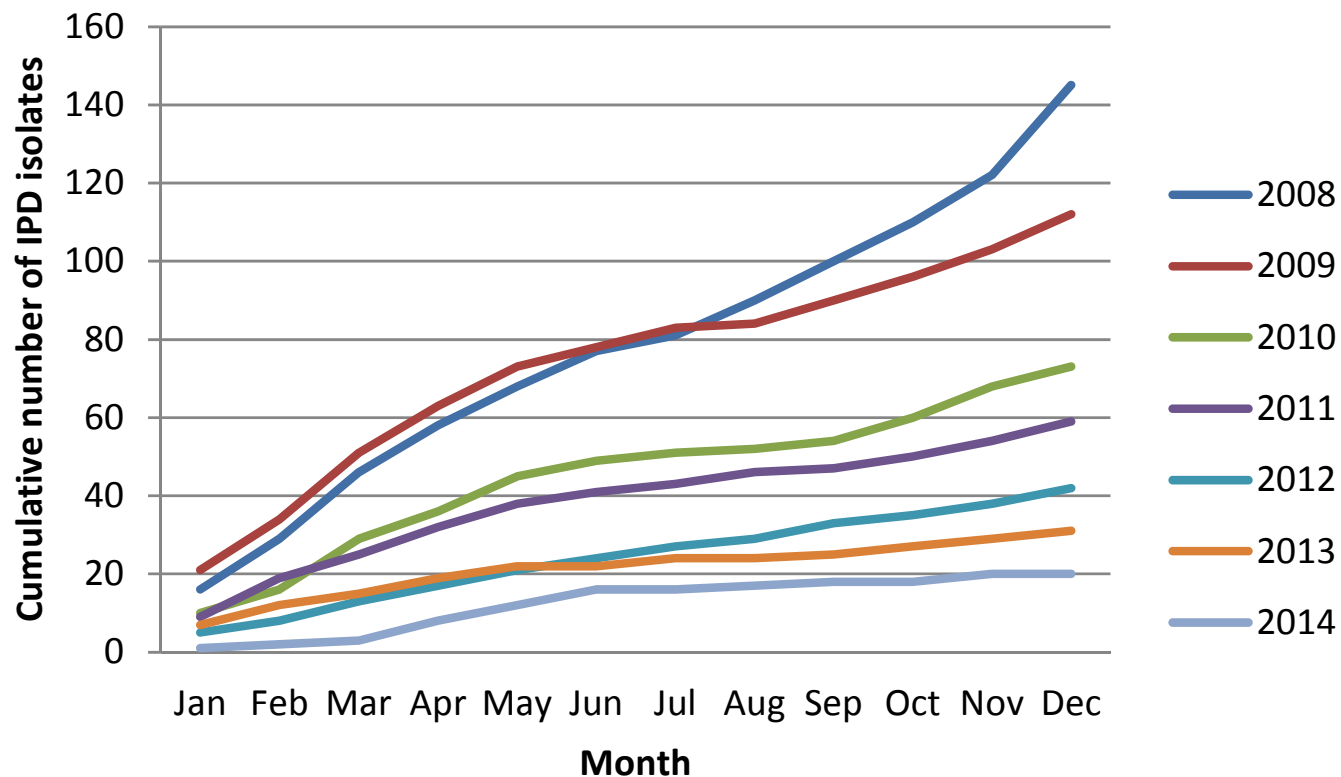
Data source: IPD Typing Project

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Pneumococcal disease Ireland

Impact of PCV on the burden of IPD
caused by PCV7 vaccine serotypes in ≥ 2 year olds



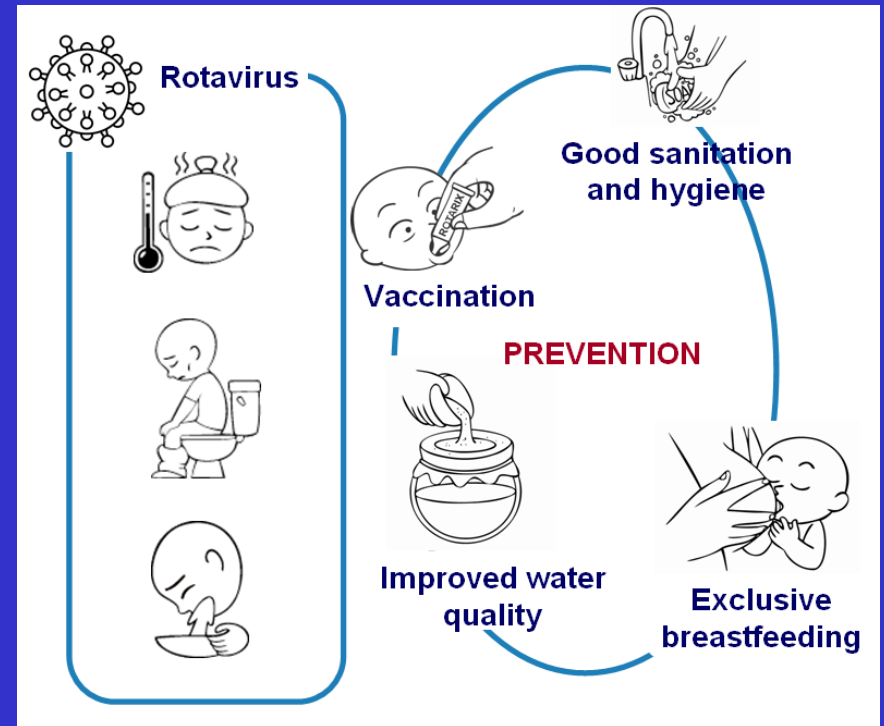
88% reduction in IPD cases, comparing Jan-Dec 2014 with the same period in 2008
Data source: IPD Typing Project

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Rotavirus - global

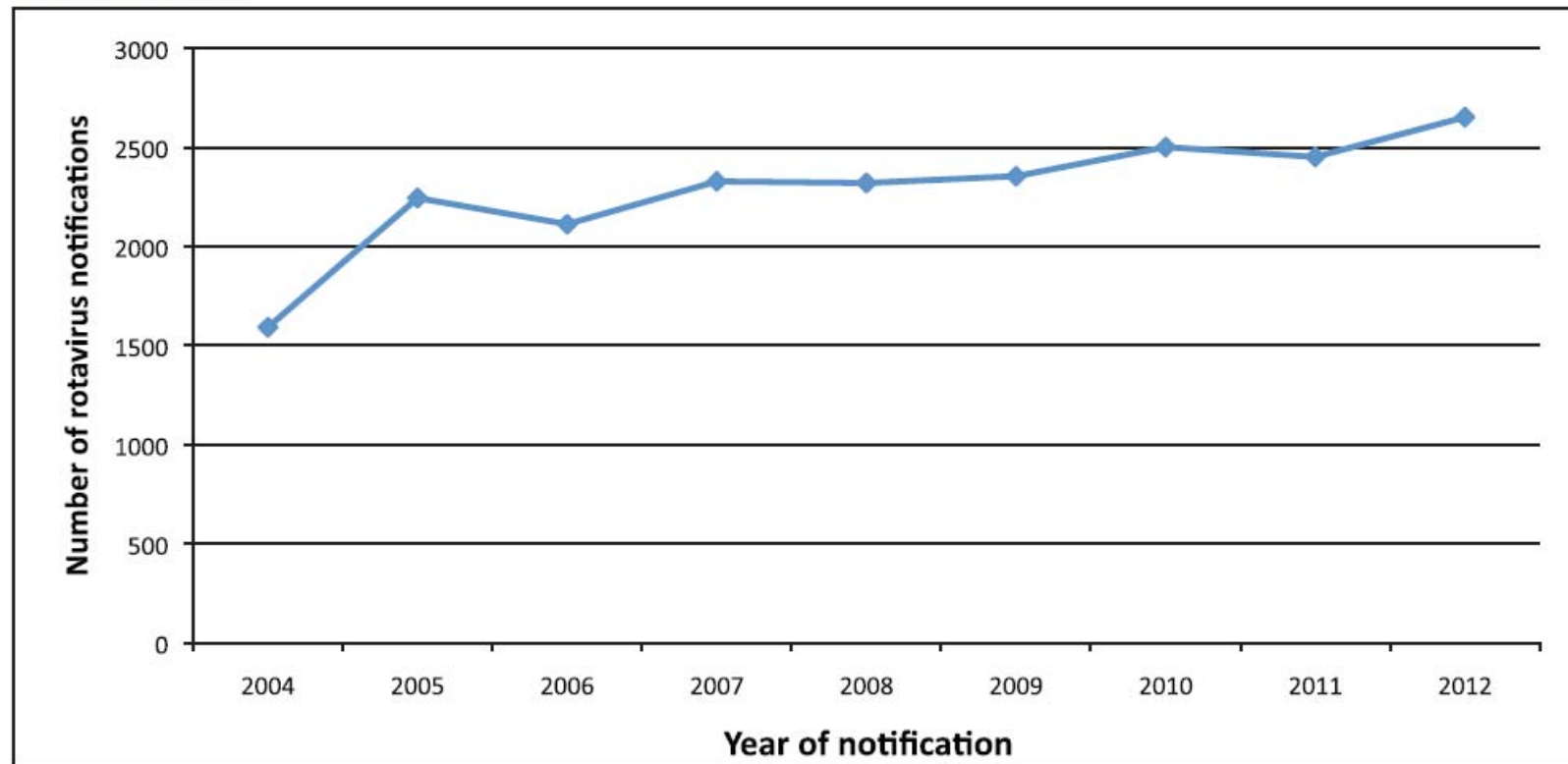
- Over 500,000 deaths /year
 - 85% in low income countries
- Over 2 million children hospitalised with dehydration
- 36% hospitalisations for diarrhoea in children <5 years



Rotavirus - Ireland

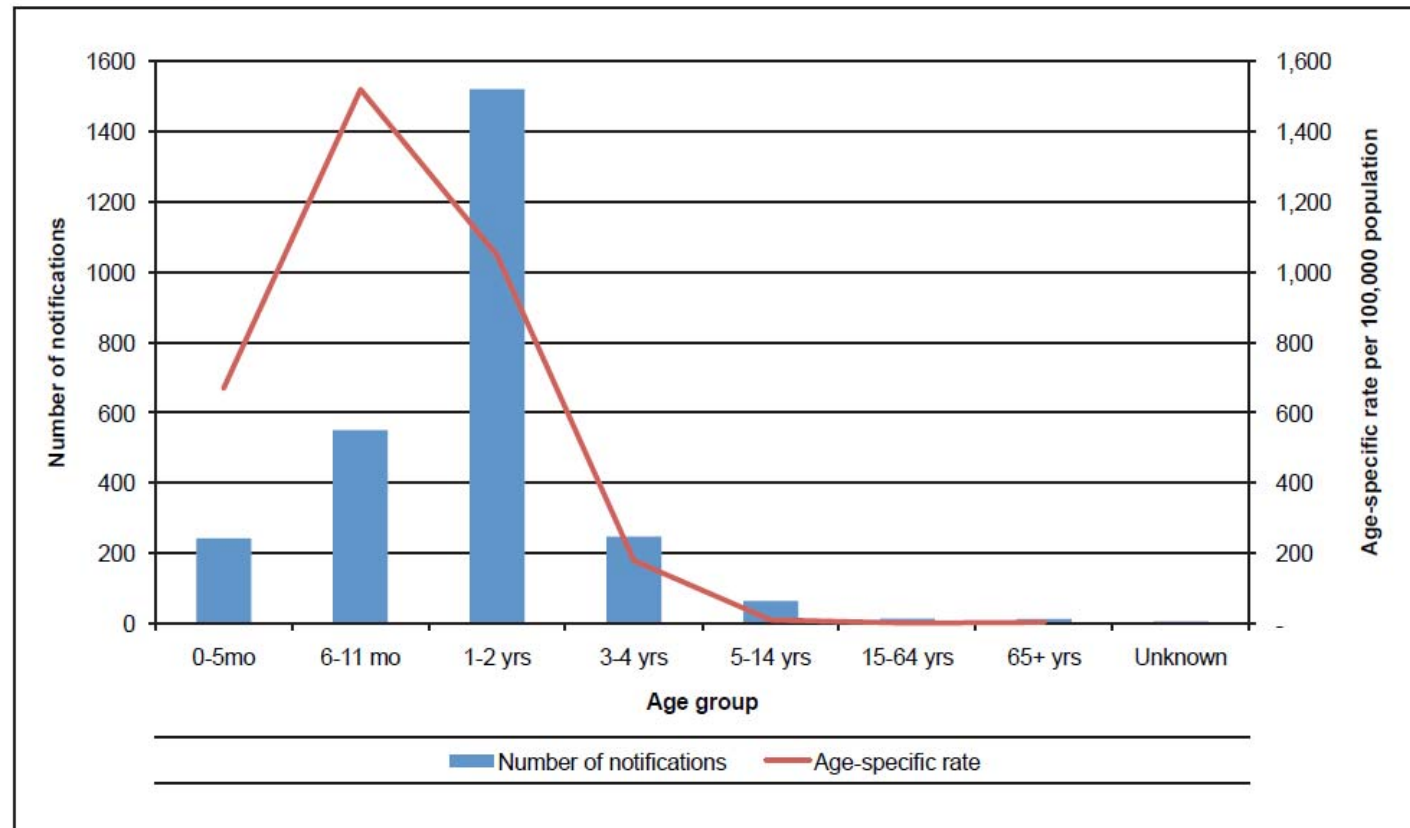
Figure 19.1. Number of cases of rotavirus by year, 2004 to 2012

(Source:HPSC)



Rotavirus - Ireland

Figure 19.2. Number of Rotavirus Cases and Age specific rate by age group 2012
(Source:HPSC)



Rotavirus vaccine

- Recommended by WHO
- Implemented in USA, UK + 8 other EU countries
- Recommended by NIAC
- Live oral vaccine
- 2-3 doses at 2,4 or 2,4, 6 months
- Can be given at same time as other vaccines
- All doses by 8 months of age
- Small increase in intussusception (benefits >>>risks)
- Recent European study
 - vaccine effectiveness 68% to 98%
 - 65% to 84% reduction in rotavirus hospitalisations



Measles - global

2000-2012

Vaccination

- led to 78% drop in deaths
- prevented 13.8 million deaths

2012

- 122,000 deaths
- 14 deaths every hour
- 95% in low income countries



Measles USA

Measles Cases and Outbreaks

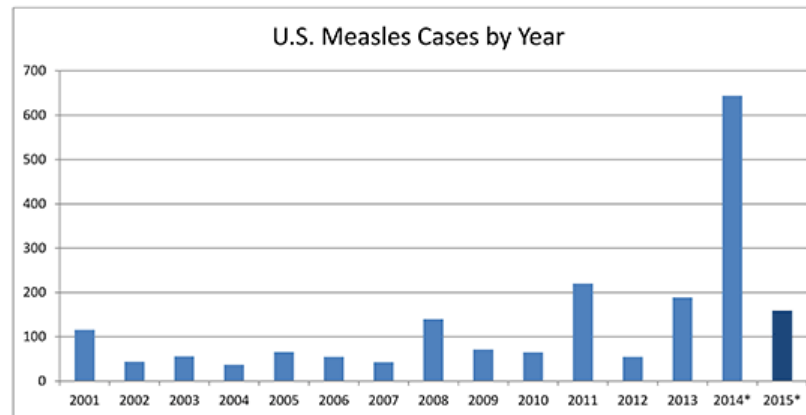
January 1 to April 3, 2015*

159
Cases

reported in 18 states and the District of Columbia: Arizona, California, Colorado, Delaware, Georgia, Illinois, Michigan, Minnesota, Nebraska, New Jersey, New York, Nevada, Oklahoma, Pennsylvania, South Dakota, Texas, Utah, Washington

4
Outbreaks

representing 91% of reported cases this year



*Provisional data reported to CDC's National Center for Immunization and Respiratory Diseases

Majority unvaccinated and many imported



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Health Service Executive

Measles USA 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



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Measles EU

February 2014 –January 2015

- 3528 cases reported
- 30 countries
- Italy, Germany and France
- Majority of cases not vaccinated (75%)
- 6 cases of encephalitis

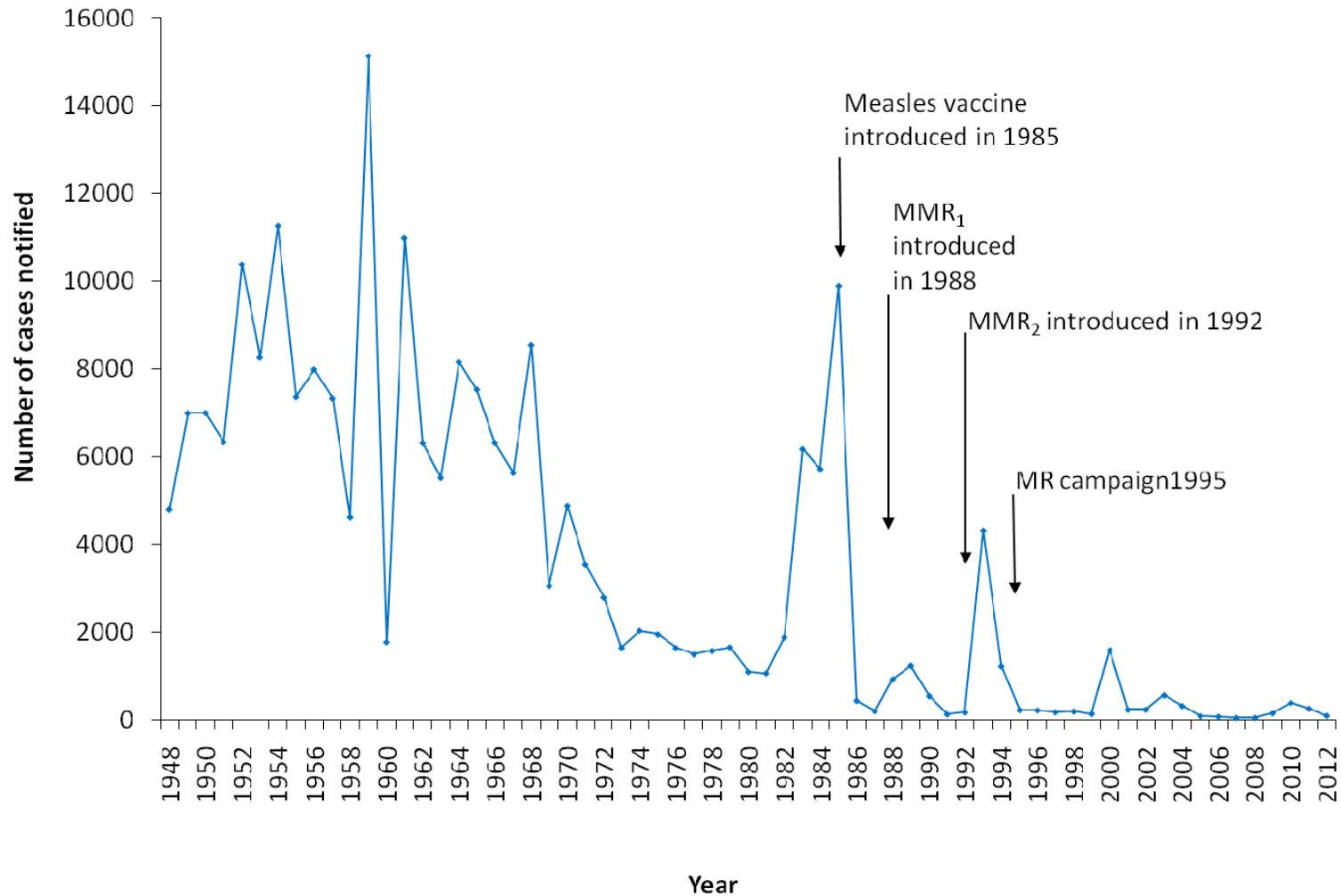


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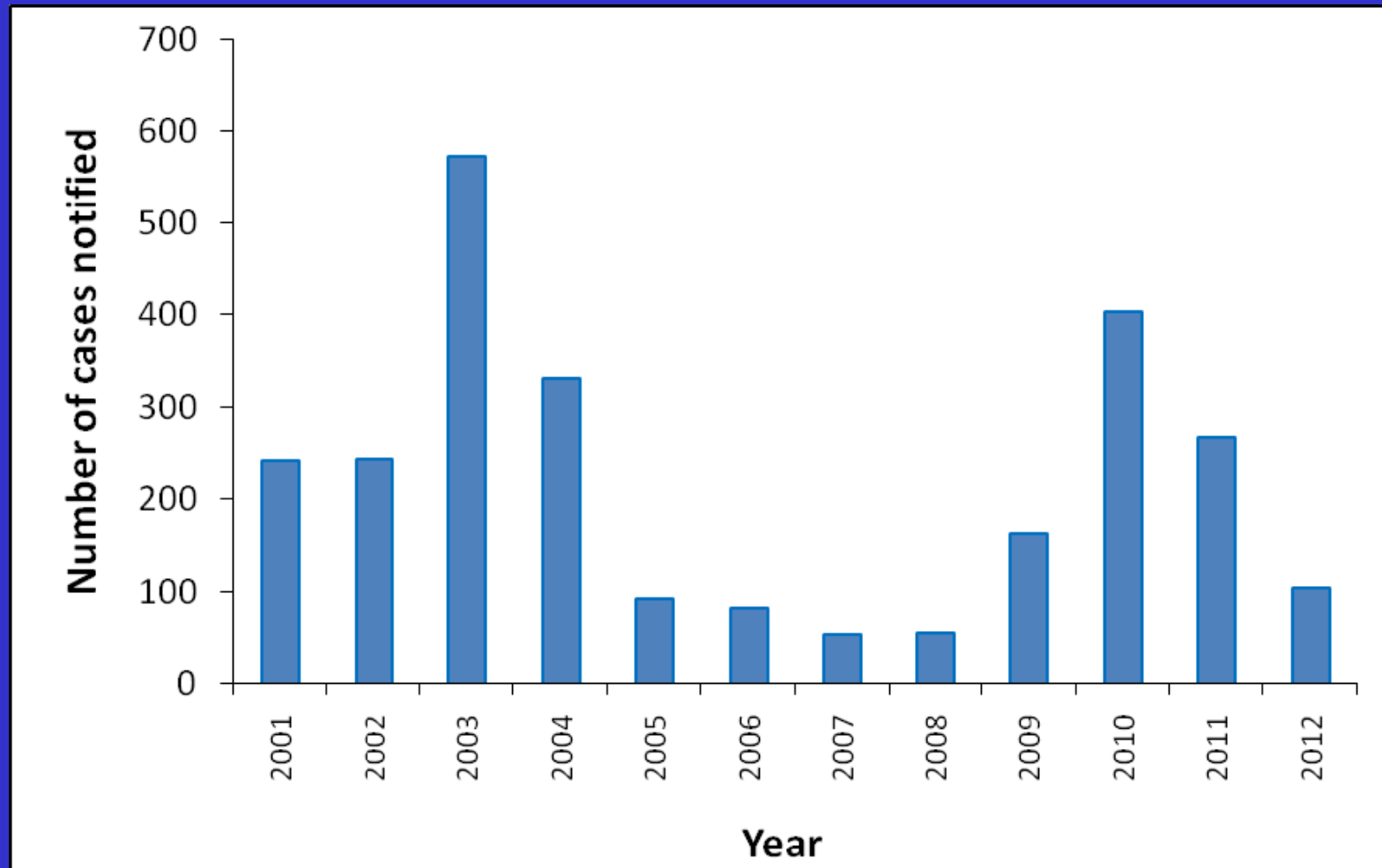
Measles - Ireland



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Measles - Ireland



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Measles Ireland

- 6 cases to date in 2015

Students told to get MMR jab as campus hit with measles

15 cases in 2014



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

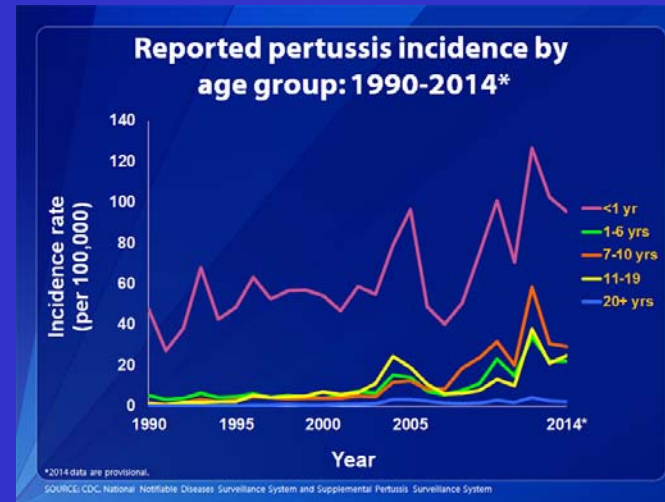
*Why killer
infection
whooping
cough
is back*



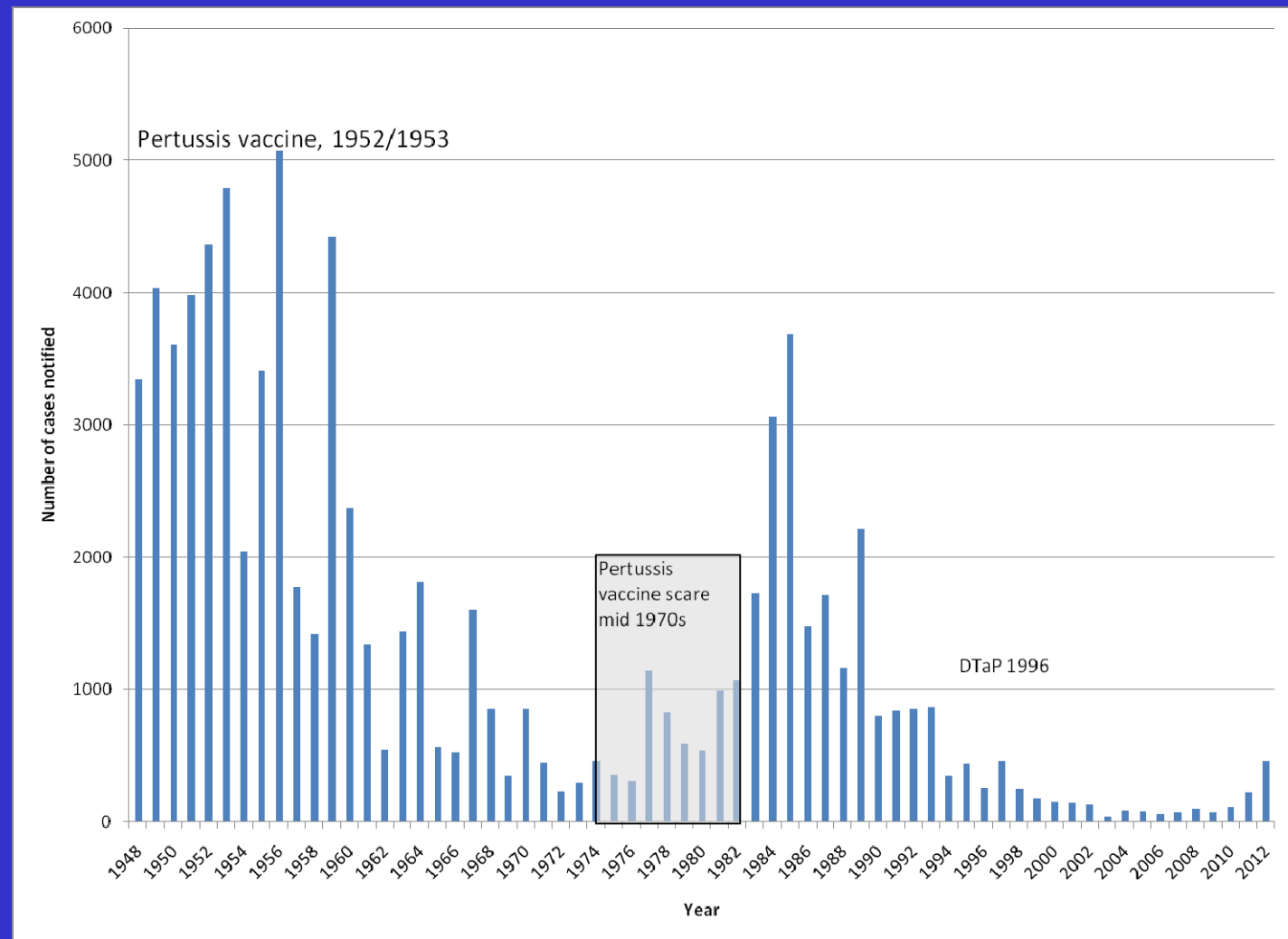
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Pertussis

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



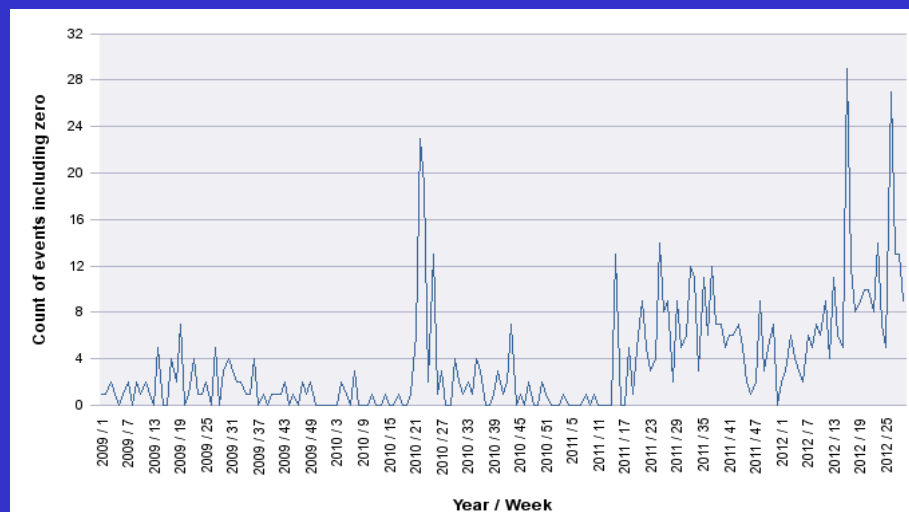
Pertussis - Ireland



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Number of pertussis cases notified by week
2009-2012 (up to week 29), Ireland



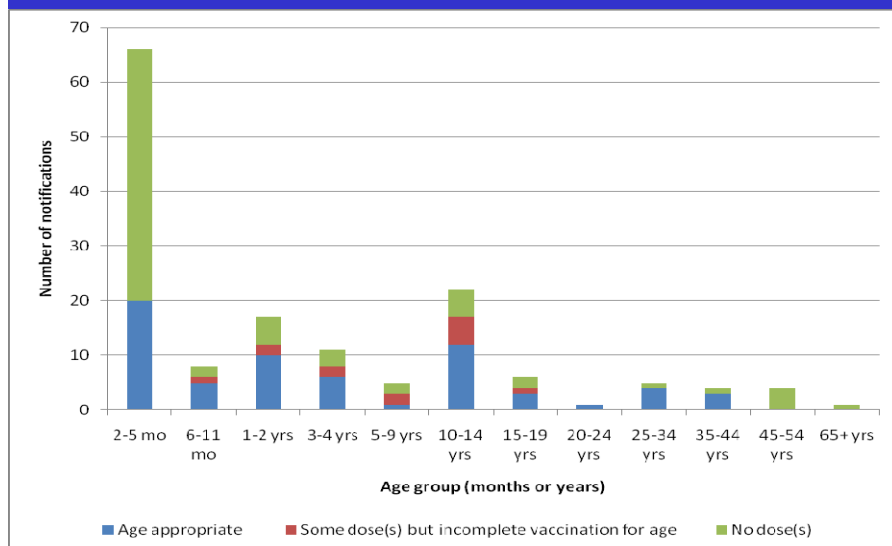
Pertussis Ireland

2012

- Most < 5 years of age
- 48% unvaccinated

28 cases to date in in 2015
(only 8 cases in same period in 2014)

Vaccination status (where known) by age group



Publication: Irish Independent Health & Living
Date: Monday, August 25, 2014
Page: 2
Extract: 1 of 1
Circulation: 121,120
Author: Eilish O'Regan
Headline: Whooping cough rates on the rise

Whooping cough rates on the rise

www.immunisation.ie

Source: HPSC



Pertussis vaccination

Age appropriate vaccination

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



Primary Childhood Immunisation Schedule

AGE	WHERE	VACCINATION
At Birth	Hospital or clinic	BCG
2 months		6 in 1 + PCV
4 months		6 in 1 + Men C
6 months		6 in 1 + PCV + Men C
1 year		MMR + PCV
1 year 6 months		Men C + Hib

Information for your child's next visit?

Next appointment



Tdap vaccine

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

4-in-1 & MMR vaccines

Information for parents of children in Junior Infants

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Pertussis vaccination

- **Pregnant women**
 - between 27-36 weeks gestation
 - every pregnancy
 - can be given later or in 1st week post partum (may not be as effective)

Private administration



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



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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***

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Polio

Goals of the Decade of Vaccines (2011–2020)

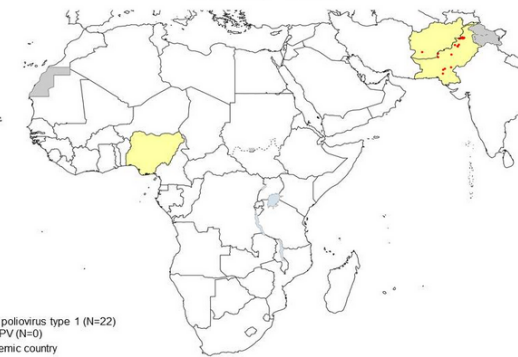
Achieve a world free of poliomyelitis



Meet global elimination targets



Wild Poliovirus & cVDPV¹ Cases², 2015
01 January – 07 April



¹cVDPV is associated with ≥ 2 AFP cases or non-household contacts. VDPV2 cases with ≥ 6 (≥ 10 for type1) nucleotides difference from Sabin in VP1 are reported here.²Excludes viruses detected from environmental surveillance.
Data in WHO HQ as of 07 April 2015



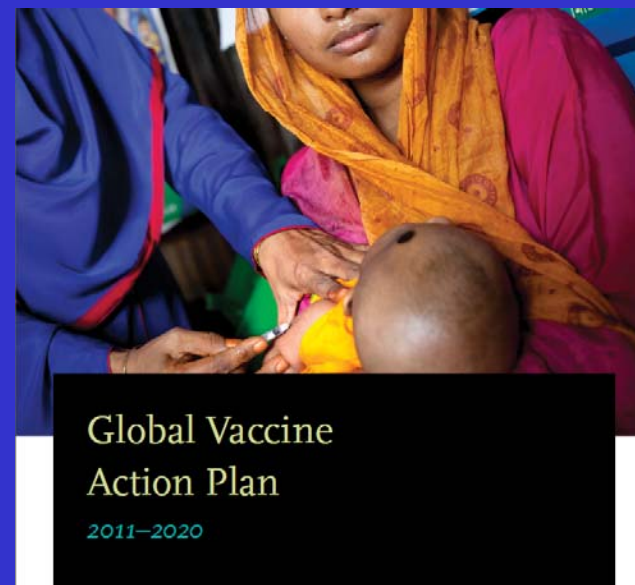
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Health Service Executive

Summary

- ✓ Vaccines available to prevent 25 vaccine preventable diseases
- ✓ 2 million deaths prevented from 2000-2010
- ✓ High vaccine coverage and surveillance essential to prevent outbreaks



http://www.who.int/immunization/global_vaccine_action_plan/GVAP_doc_2011_2020/en

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