

# Global and National Trends in Vaccine Preventable Diseases

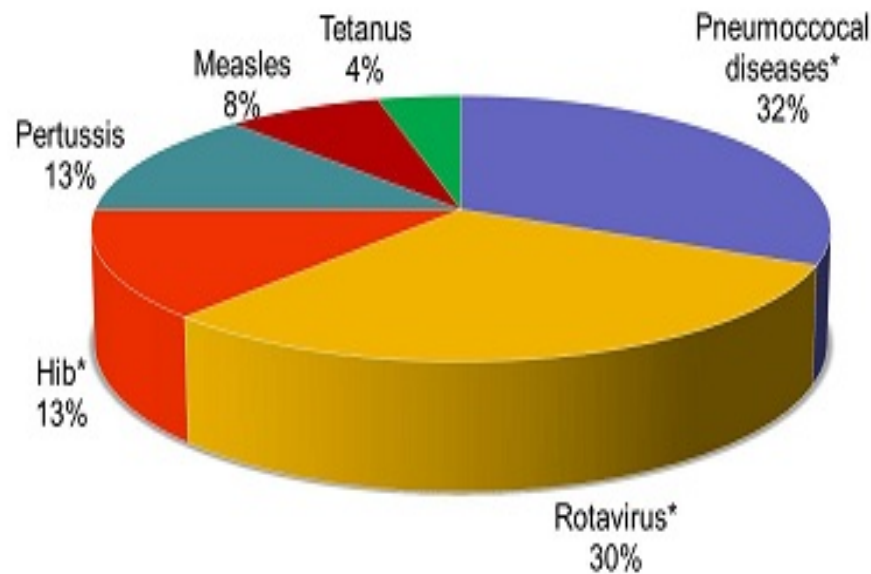
Dr Brenda Corcoran  
National Immunisation Office



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

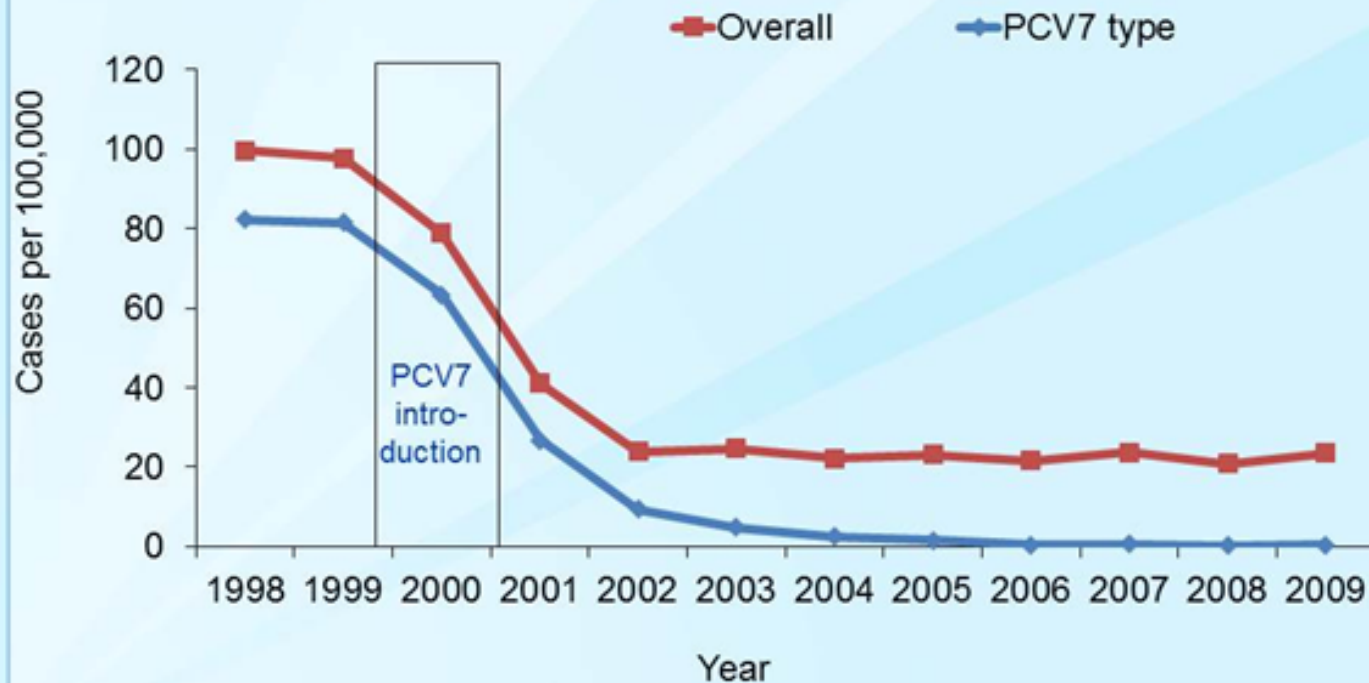
- 87% birth cohort in high income countries
- 2% birth cohort in low income countries



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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



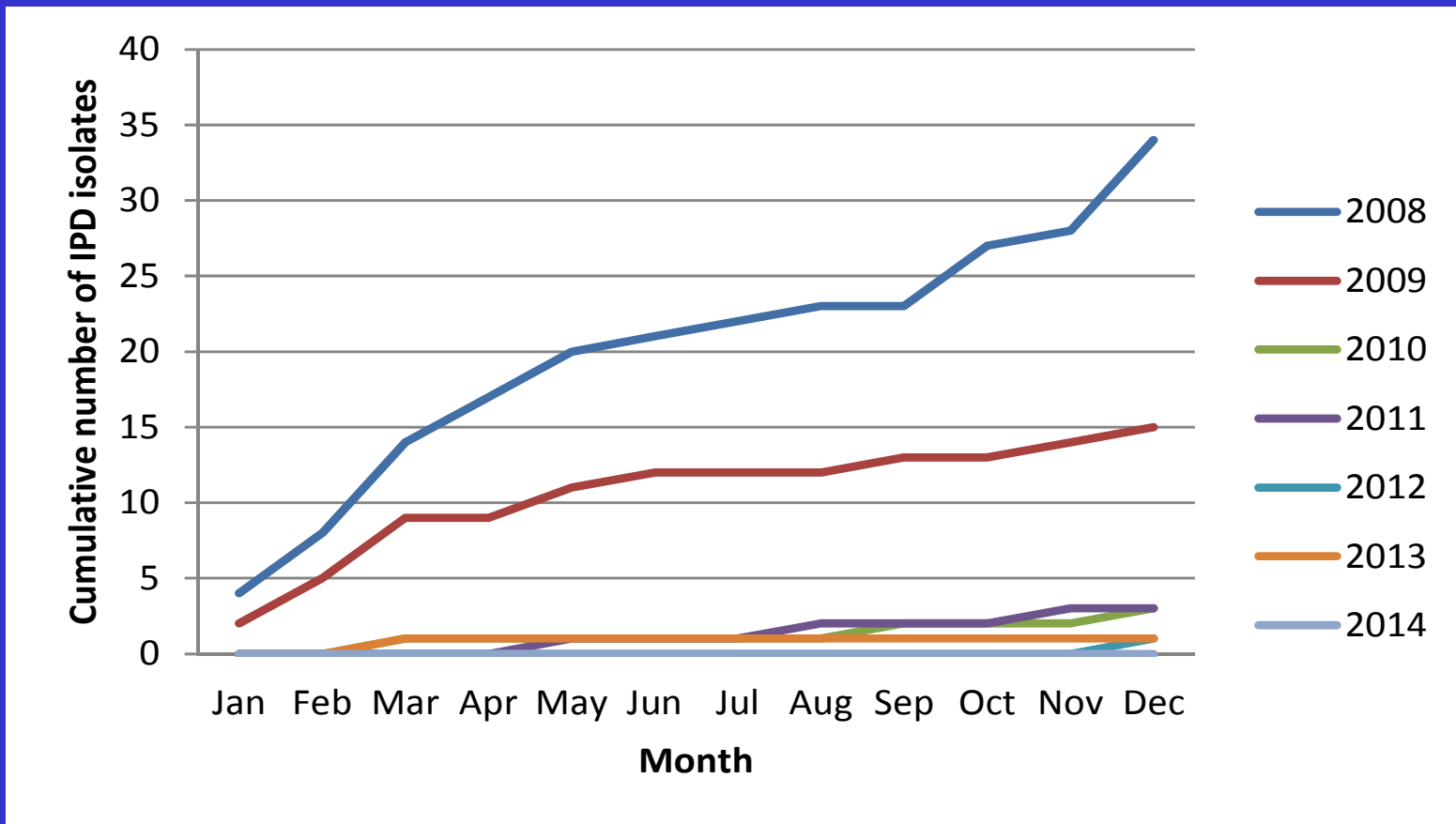
Moore, IDSA, 2009 & CDC Unpublished

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



# 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

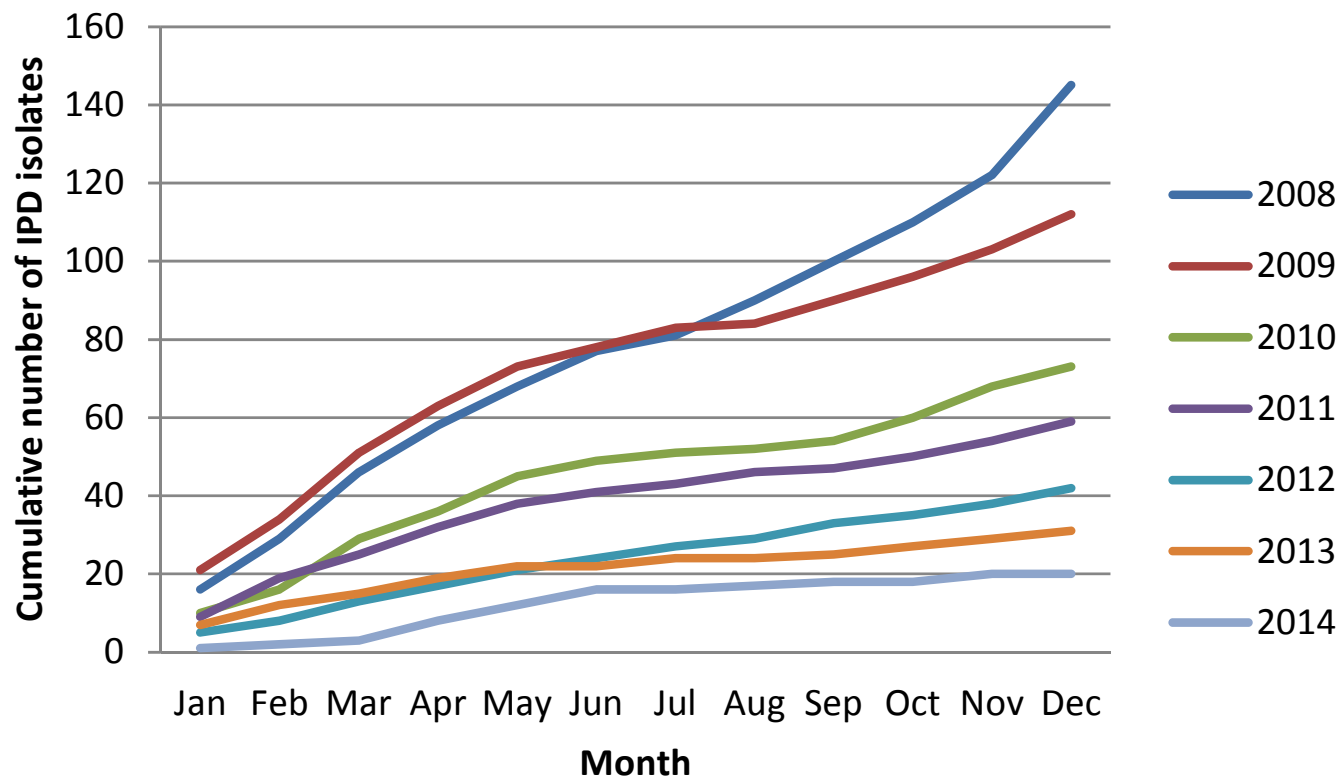
Data source: IPD Typing Project

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



# Pneumococcal disease Ireland

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



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

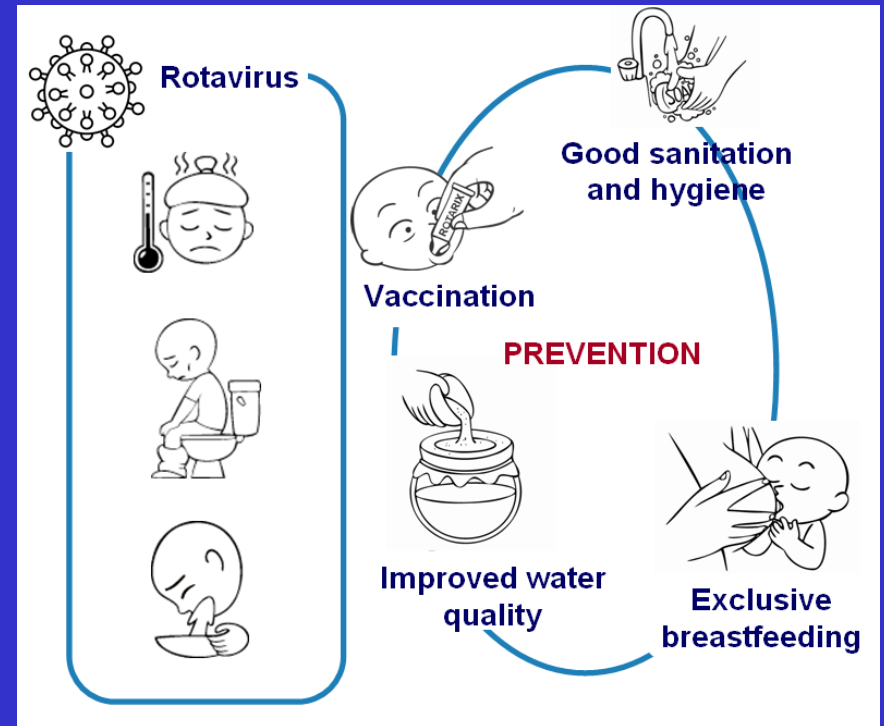
[www.immunisation.ie](http://www.immunisation.ie)





# Rotavirus - global

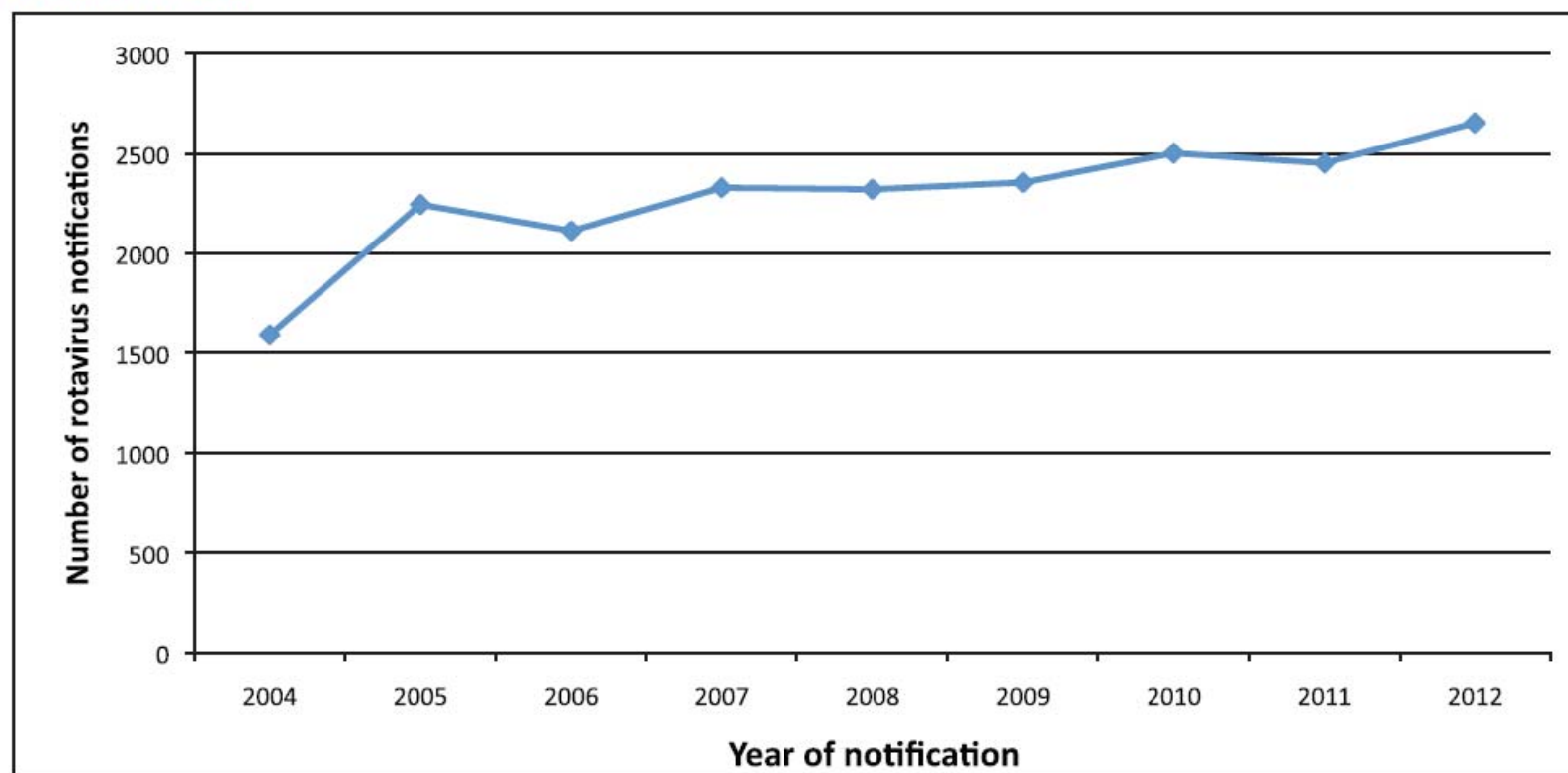
- Over 500,000 deaths /year
  - 85% in low income countries
- Over 2 million children hospitalised with dehydration
- 36% hospitalisations for diarrhoea in children <5 years



# Rotavirus - Ireland

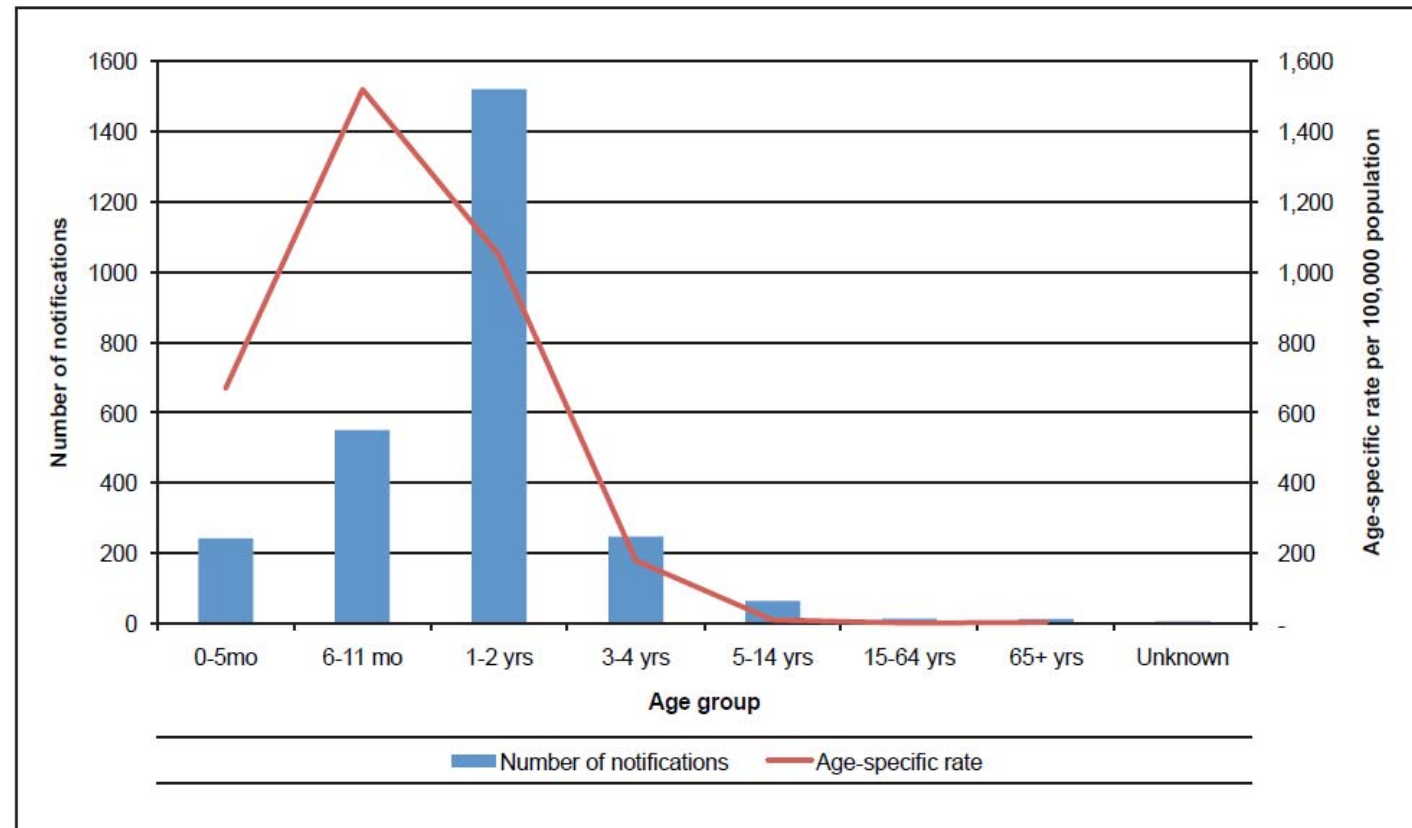
**Figure 19.1.** Number of cases of rotavirus by year, 2004 to 2012

(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 + 11 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

2000-2013

Vaccination

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

2013

- 146,000 deaths
- 16 deaths every hour
- 95% in low income countries



# Measles USA

## Measles Cases and Outbreaks

January 1 to September 18, 2015\*

**189**

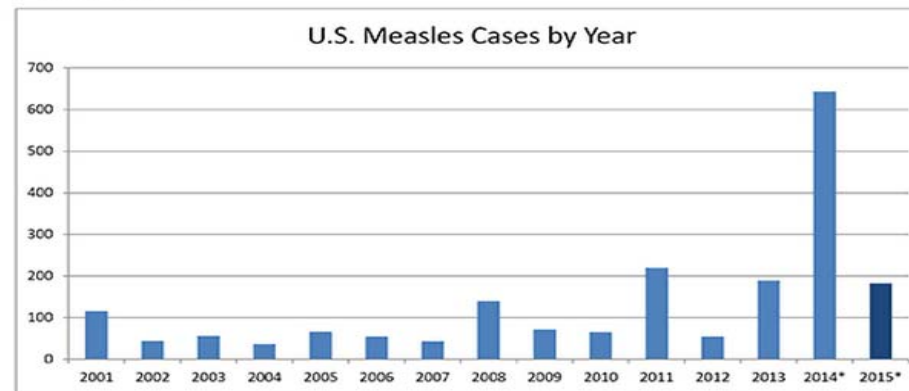
Cases

reported in 24 states and the District of Columbia: Alaska, Arizona, California, Colorado, Delaware, Florida, Georgia, Illinois, Massachusetts, Michigan, Minnesota, Missouri, Nebraska, New Jersey, New York, Nevada, Ohio, Oklahoma, Pennsylvania, South Dakota, Texas, Utah, Virginia, Washington

**5**

Outbreaks

representing 80% 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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Reithmeannacht na Seirbhíse Sláinte  
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



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



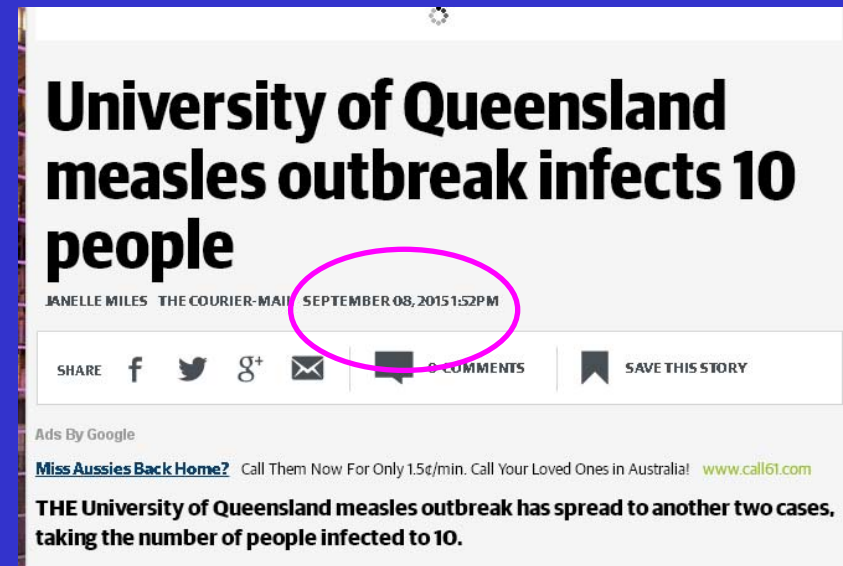
Reithmeannacht na Sárbhíse Sláinte  
Health Service Executive



# Measles EU

## August 2014 – July 2015

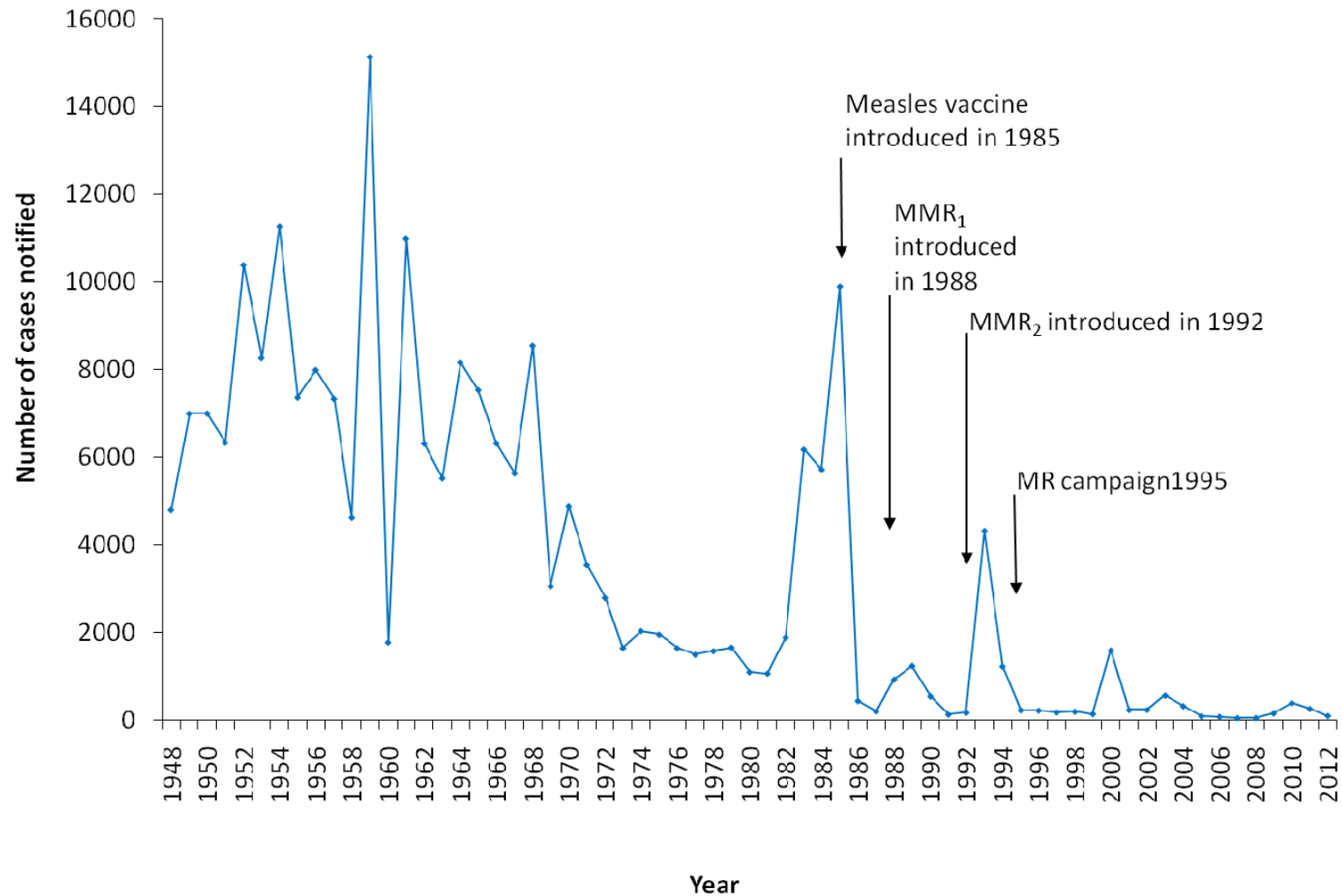
- 4352 cases reported
- 30 countries
- Germany, France, Italy and Austria
- Majority of cases not vaccinated (75%)
- 1 death and 9 cases of encephalitis



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



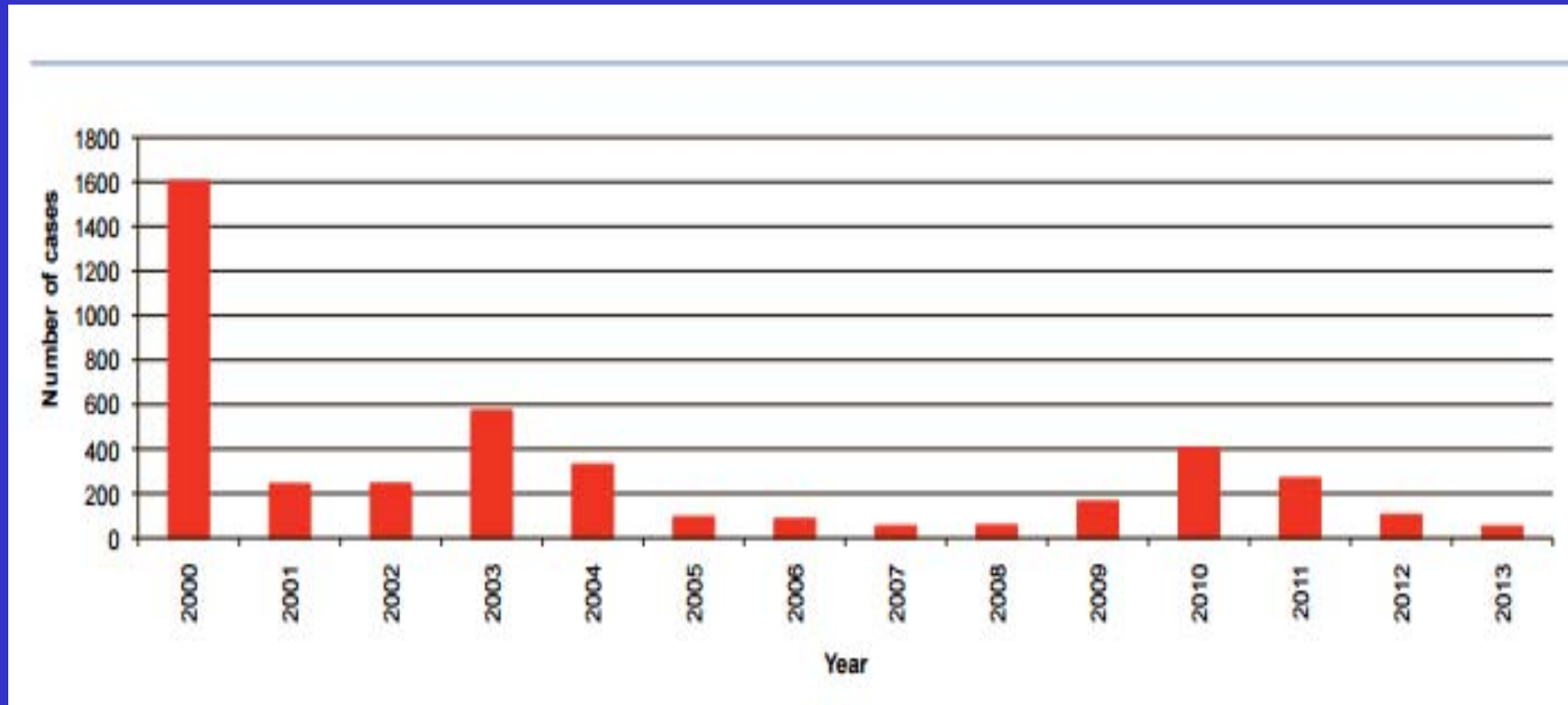
# Measles - Ireland



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



# Measles - Ireland



Source: HPSC

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



# Measles Ireland

- 7 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

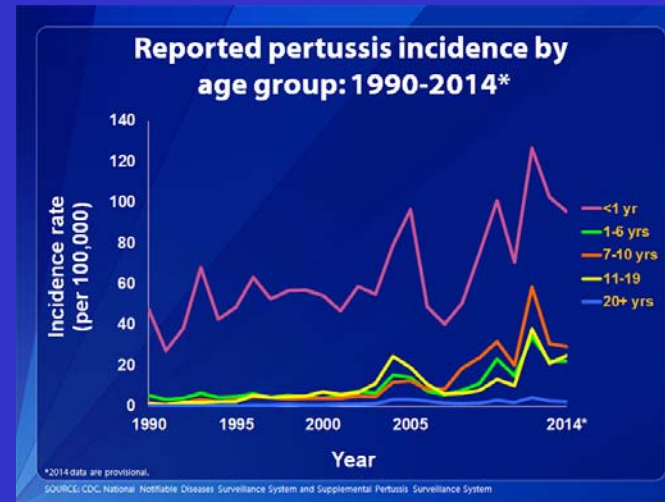
*Why killer  
infection  
whooping  
cough  
is back*



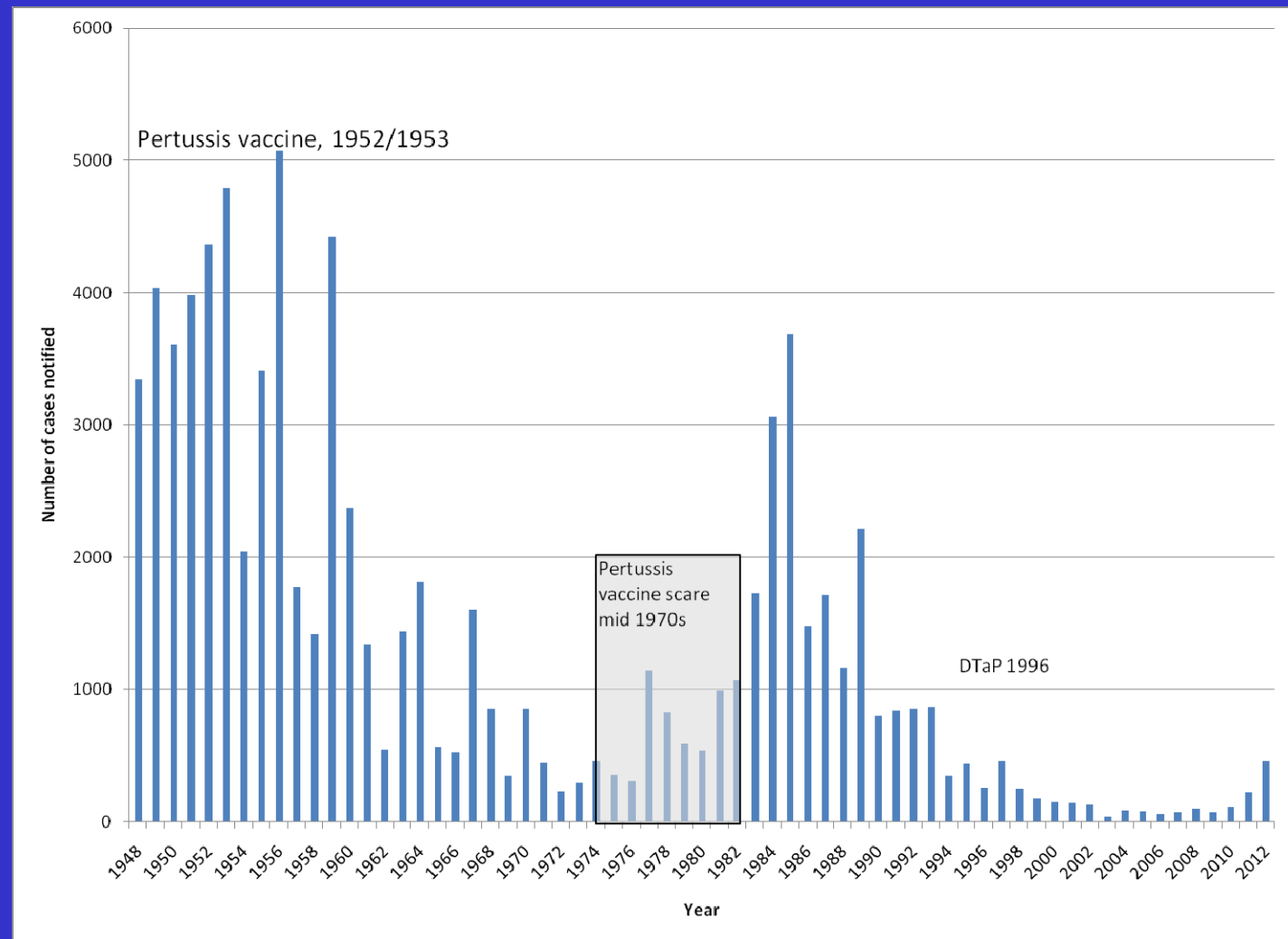
[www.immunisation.ie](http://www.immunisation.ie)

# Pertussis

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



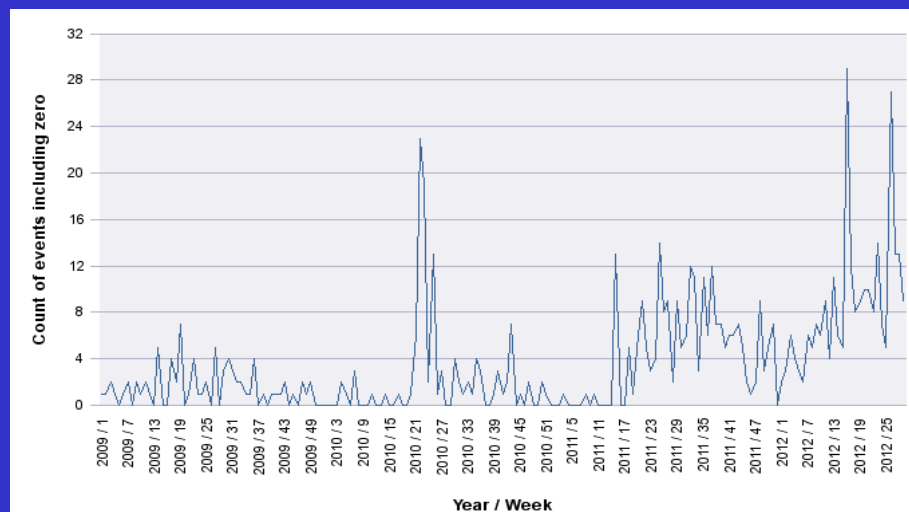
# Pertussis - Ireland



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



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



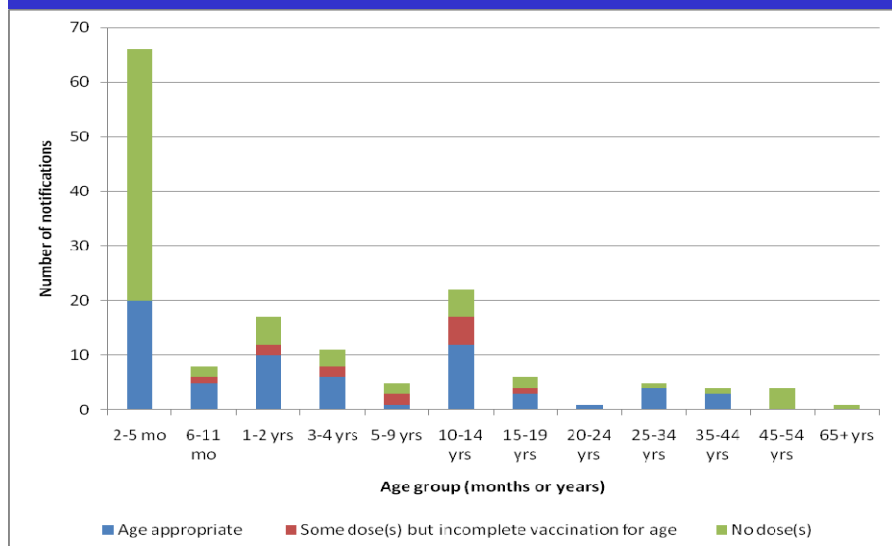
## Pertussis Ireland

2012

- Most < 5 years of age
- 48% unvaccinated

92 cases to date in in 2015  
(only 49 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](http://www.immunisation.ie)

Source: HPSC



# 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 1 INJECTION
2 months	GP surgery Visit 1	6 in 1 + PCV 2 INJECTIONS
4 months	GP surgery Visit 2	6 in 1 + MenC 2 INJECTIONS
6 months	GP surgery Visit 3	6 in 1 + PCV 2 INJECTIONS
1 year	GP surgery Visit 4	MMR + PCV 2 INJECTIONS
1 year 6 months	GP surgery Visit 5	MenC + Hib 2 INJECTIONS

Appointment for your child's next visit?  
NEXT APPOINTMENT  
Date:   
Location:   
Phone:



**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

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

PROTECT PREVENT IMMUNISE  
HeALTH SERVICE EXECUTIVE

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

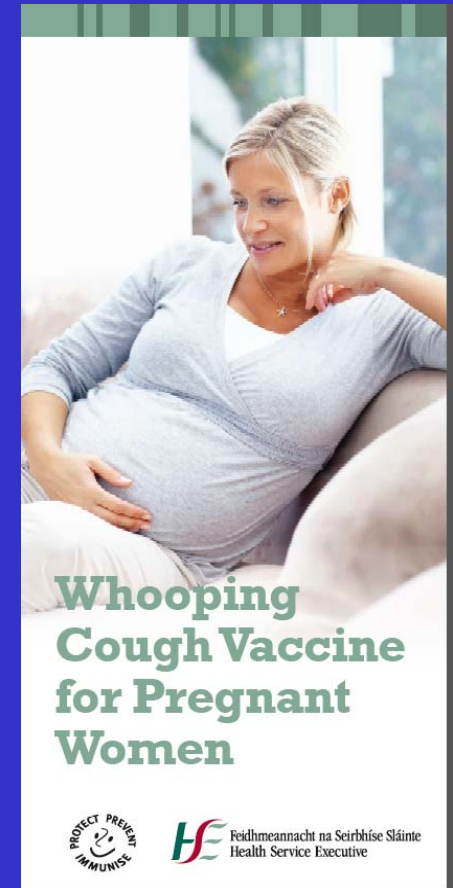




# Pertussis vaccination

- **Pregnant women**
  - between 27-36 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



Food & Drink ▾ | Motoring ▾ | Health & Wellbeing ▾ | Family ▾ | Home & Garden ▾ | City Cycling

Wednesday 30 September 2015

 Life Newsletter



Life Mothers & Babies

## Pregnant women are urged to get whooping cough jab

PUBLISHED  
04/09/2015 | 08:20

SHARE

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# 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



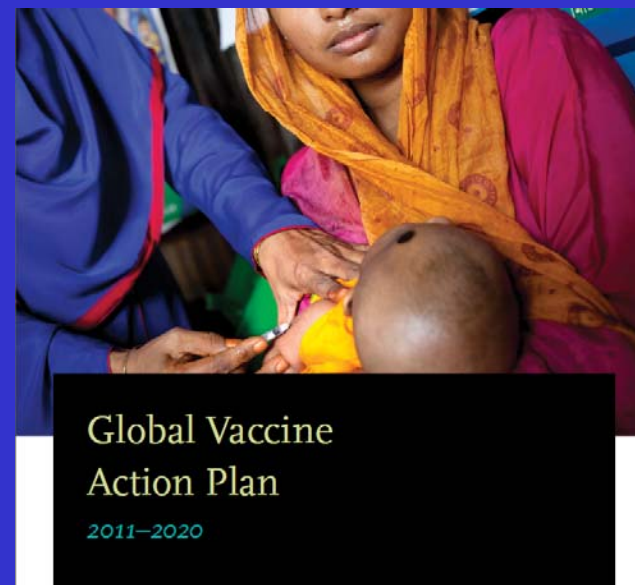
***Vaccine from HSE National  
Cold Chain Service***

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



# Summary

- ✓ Vaccines available to prevent 25 vaccine preventable diseases
- ✓ 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](http://www.who.int/immunization/global_vaccine_action_plan/GVAP_doc_2011_2020/en)

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

