

# History and aims of immunisation

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National Immunisation Office



# Objectives

- To examine the history of immunisation
- To explain the aim of immunisation
- To develop an understanding of the role of the following agencies in relation to immunisation
  - The National Immunisation Advisory Committee (NIAC)
  - The Department of Health (DoH)
  - The Health Service Executive (HSE)
  - The National Immunisation Office (NIO)
  - The Health Protection Surveillance Centre (HPSC)
- To understand the importance of infectious disease surveillance in Ireland



# Smallpox



Edward Jenner (1749 –1823)

Variola virus

Infected humans 10,000 years ago

Known in China 11<sup>th</sup> century BC

Inoculation described 6<sup>th</sup> century BC

1796 vaccinia virus isolated



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

# Smallpox



“More mites die  
from vaccination  
than from the  
disease they are  
supposed to be  
inoculated against”

George Bernard  
Shaw 1929



# Smallpox



1977 Last reported case Somalia

1980 WHO declared eradication

CDC. Public Health Images Library (PHIL) id# 131. Source: CDC/Barbra Rice



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

# Polio

Endemic for thousands of years

1955 Inactivated polio vaccine

1962 Live oral polio vaccine

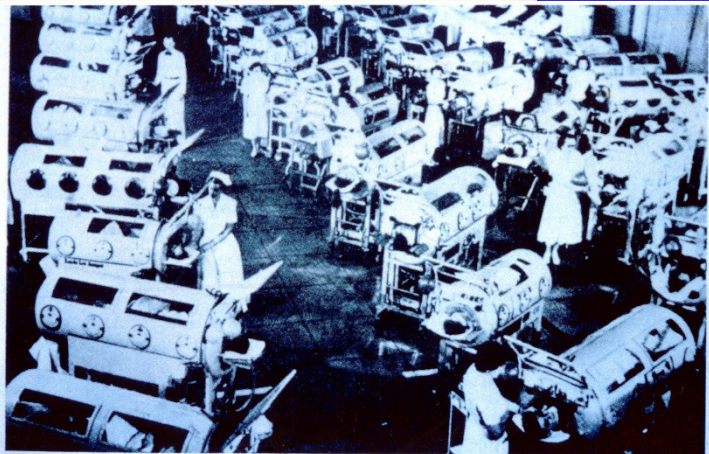
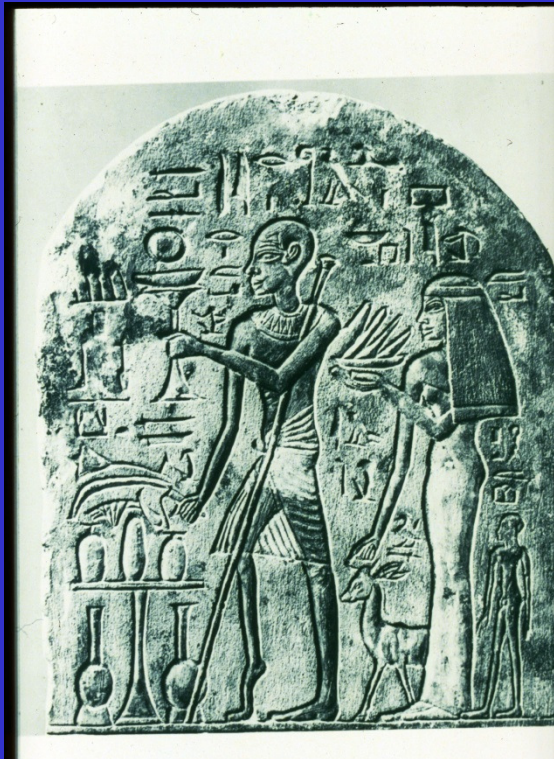


Figure 1.2 A ward of patients suffering from bulbar poliomyelitis



courtesy of [www.polioeradication.org](http://www.polioeradication.org)

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



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# Polio

Immunisation campaigns in  
Cuba and Eastern Europe

Wild polio virus eradicated  
in large areas

Basis for eradication

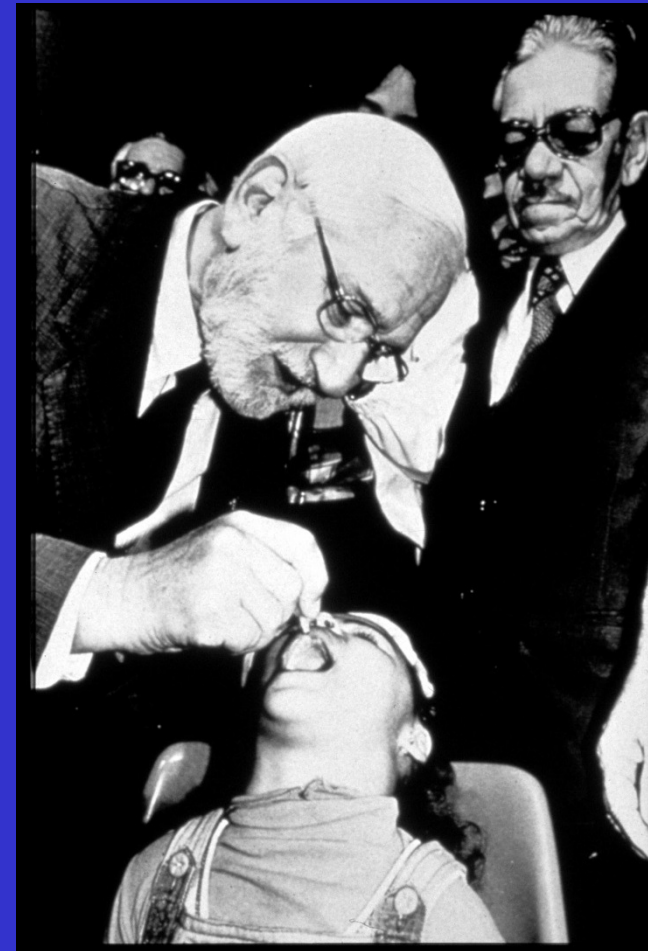


Photo courtesy of [www.polioeradication.org](http://www.polioeradication.org)



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



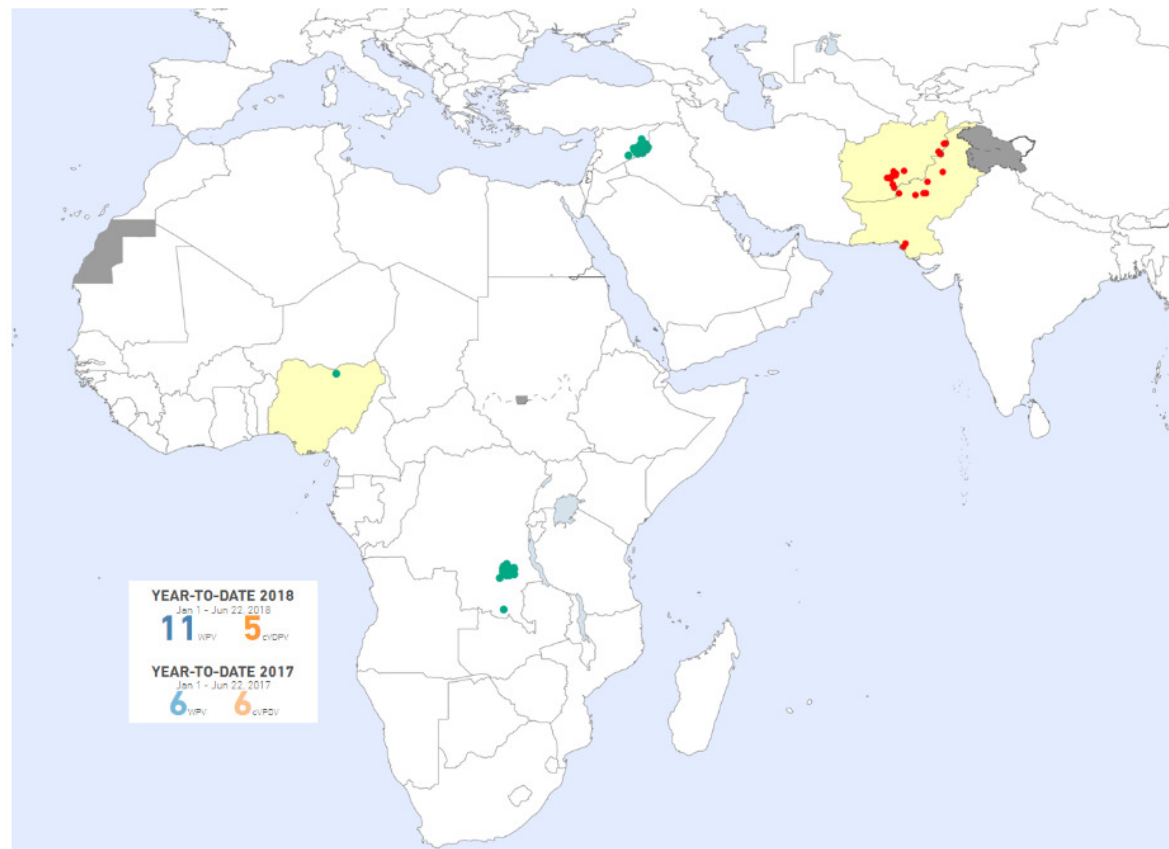
# Polio

## POLIO NOW

This interactive map shows polio cases and disease surveillance indicators worldwide within the desired timeframe and available data, as well as environmental samples in endemic countries.

Find out the latest information on polio [this week](#).

**Global wild poliovirus and circulating vaccine-derived poliovirus cases – last 12 months – as of 22 June 2018**



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# Polio

- 22 cases in 2017
- 11 cases to date in 2018
- 0 in non endemic countries
- Pakistan/ Afghanistan



This vaccine delivery in the mountains of Afghanistan illustrates the challenges to the cold chain.

## Global Polio Eradication Initiative



### CIRCULATING VACCINE-DERIVED POLIOVIRUS TYPE 1 CONFIRMED IN PAPUA NEW GUINEA

Outbreak response to be launched to stop further spread of the virus

22 June 2018



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## Average USA Annual Morbidity Due to Vaccine Preventable Diseases in the 20th Century compared with Morbidity in 2013 (for pre-1990 vaccines)

**Comparison of 20<sup>th</sup> Century Annual Morbidity & Current Morbidity**

Disease	20 <sup>th</sup> Century Annual Morbidity*	2013 Reported Cases <sup>†</sup>	% Decrease
Smallpox	29,005	0	100%
Diphtheria	21,053	0	100%
Pertussis	200,752	28,639	86%
Tetanus	580	26	96%
Polio (paralytic)	16,316	1	>99%
Measles	530,217	187	>99%
Mumps	162,344	584	>99%
Rubella	47,745	9	>99%
CRS	152	1	99%
<i>Haemophilus influenzae</i>	20,000 (est.)	31 <sup>§</sup>	>99%

**Sources:**

\* JAMA. 2007;298(18):2155-2163

† CDC. MMWR August 15, 2014;63(32):702-715. (MMWR 3013 final data)

§ *Haemophilus influenzae* type b (Hib) <5 years of age. An additional 10 cases of Hib are estimated to have occurred among the 185 reports of Hi (<5 years of age) with unknown serotype.



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## Comparison of Pre-Vaccine Era Estimated Annual Morbidity with Current Estimate

Disease	Pre-Vaccine Era Annual Estimate	2013 Estimate (unless otherwise specified)	% Decrease
Hepatitis A	117,333 <sup>*</sup>	2,890 <sup>†</sup>	98%
Hepatitis B (acute)	66,232 <sup>*</sup>	18,800 <sup>†</sup>	72%
Pneumococcus (invasive)			
All ages	63,067 <sup>*</sup>	33,500 <sup>¶</sup>	47%
<5 years of age	16,069 <sup>*</sup>	1,900 <sup>§</sup>	88%
Rotavirus (hospitalizations <3 years of age)	62,500 <sup>‡</sup>	12,500 <sup>**</sup>	80%
Varicella	4,085,120 <sup>*</sup>	167,490 <sup>††</sup>	96%

### Sources:

- \* JAMA. 2007;298(18):2155-2163
- † CDC. Viral Hepatitis Surveillance – United States, 2011
- ¶ CDC. Active Bacterial Core surveillance Provisional Report; *S. pneumonia* 2013.
- § CDC. Unpublished, Active Bacterial Core surveillance
- ‡ CDC. *MMWR*. February 6, 2009 / 58(RR02); 1-25
- \*\* New Vaccine Surveillance Network 2013 data (unpublished); U.S. rotavirus disease now has biennial pattern
- †† CDC. Varicella Program 2013 data (unpublished)



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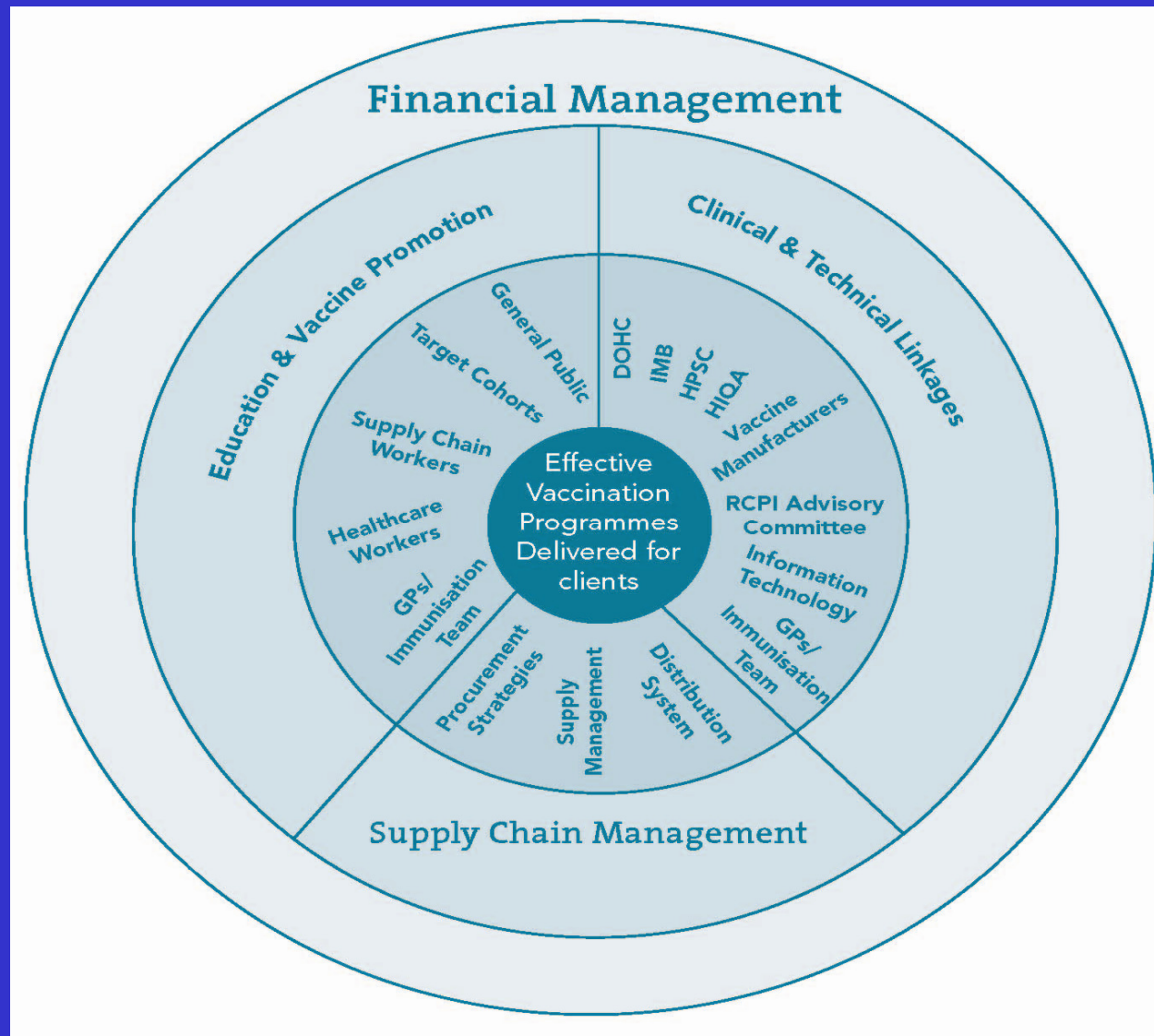
# Aim of immunisation

- The aim of immunisation is the prevention of disease in individuals or groups.
- Examples
  - 1980 elimination of smallpox (WHO)
  - 1991-Elimination of polio from the Americas
- Achieved by
  - a comprehensive immunisation programme achieving the World Health Organisation target uptake of 95% for childhood vaccines and 75% for influenza vaccines
  - intensive surveillance of these diseases





# Multidisciplinary components of an immunisation system



# The National Immunisation Advisory Committee (NIAC)

- Independent committee of the RCPI
- Variety of experts
- Advises the Department of Health
- Produces the National Immunisation Guidelines for Ireland
  - Based on
    - best evidence regarding the safety and efficacy of vaccines
    - the disease burden
    - pharmacoeconomic analyses



## The Department of Health (DoH)

- Responsible for making policy decisions regarding the immunisation programme including changes to the current immunisation programme

## The Health Products Regulatory Authority (HPRA) (formerly the Irish Medicines Board)

- Regulatory body responsible for licensing of vaccines and ensuring their quality and safety and efficacy
- Responsible for monitoring and evaluation of adverse events following immunisation



# HSE

- Responsible for the implementation of the primary childhood, school immunisation and seasonal influenza vaccination programmes
- Delivered by general practitioners (GPs), practice nurses, pharmacists, community health doctors and public health nurses and support staff





# The National Immunisation Office (NIO)

## Coordinating Unit

- Standardised implementation of all publicly funded immunisation programmes
- Protocols and immunisation training
- Information materials for the general public
- National immunisation website [www.immunisation.ie](http://www.immunisation.ie)
- Vaccine contracts and the HSE National Cold Chain delivery Service to provide vaccine deliveries to all GPs, hospitals and HSE clinics
- Development of a national IT database
  - Currently different PCI IT systems modified with any changes to schedule
  - School immunisation system

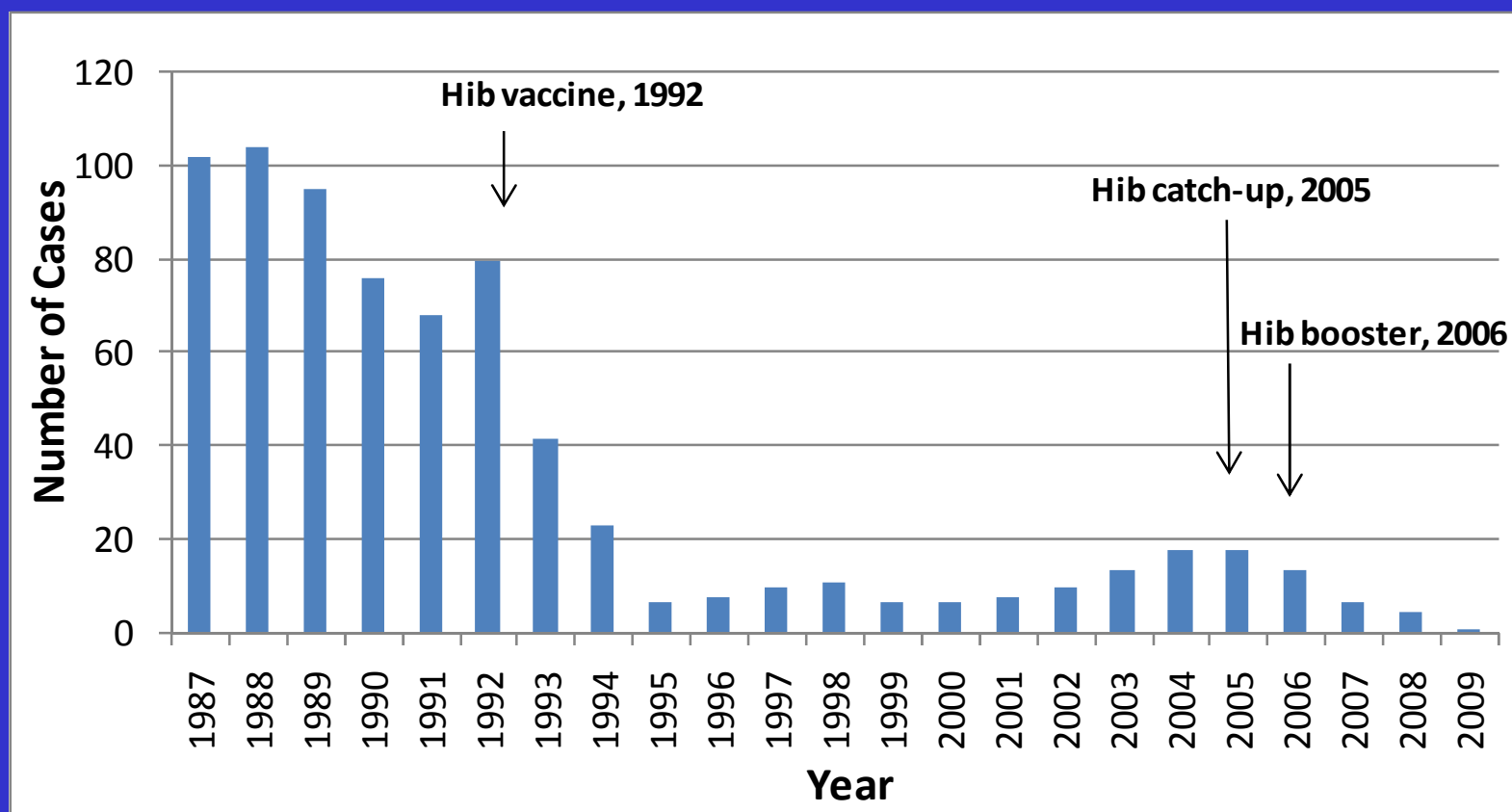


# Health Protection Surveillance Centre (HPSC)

- Responsible for surveillance of vaccine preventable diseases
- Monitors immunisation uptake data from each HSE area and reports on uptake rates



# Importance of surveillance - Hib catch up 2006



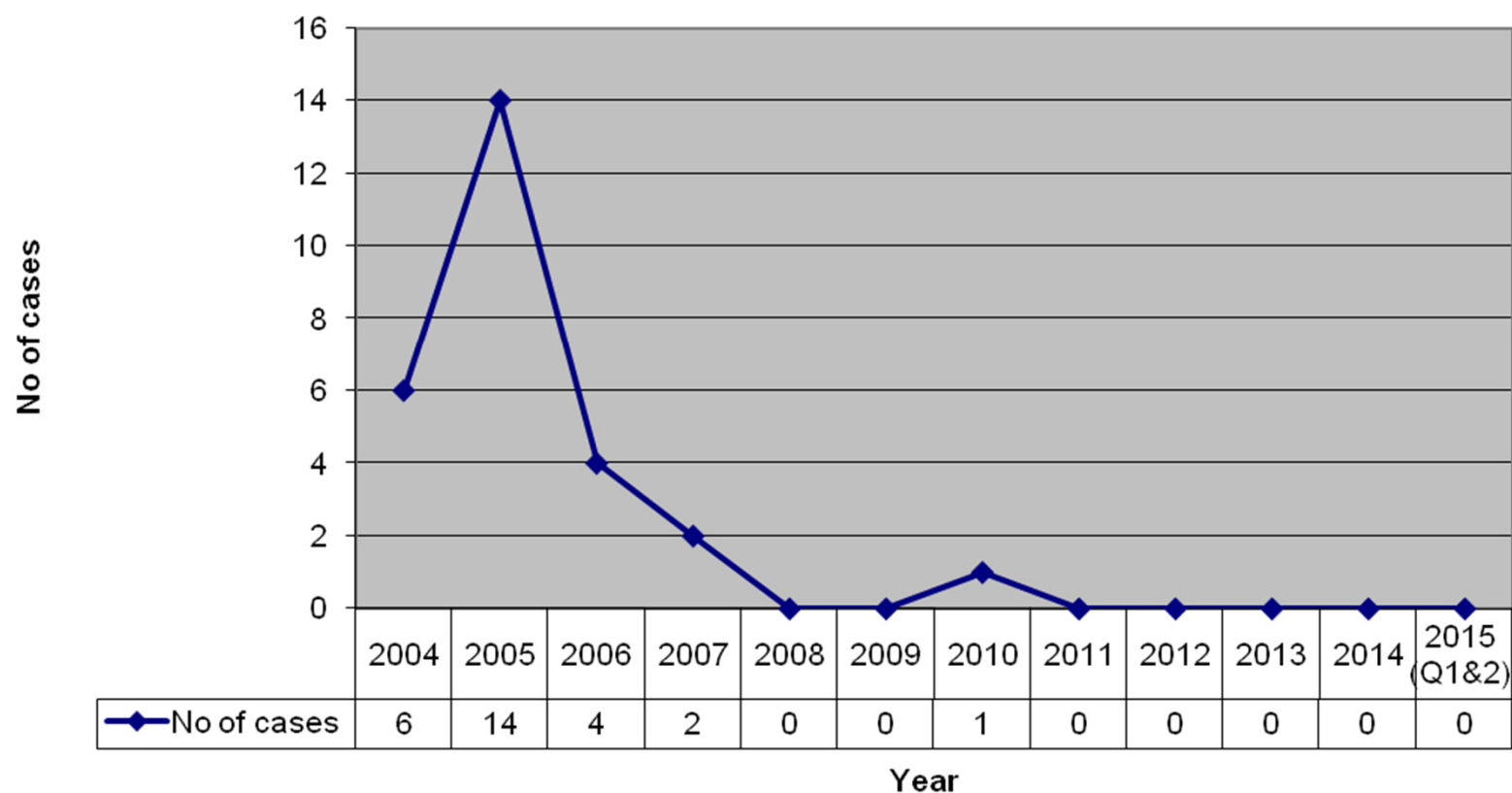
Source: HPSC



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# Impact of Hib campaign

Number of cases of Hib disease in fully vaccinated children 2004-2015



Source: HPSC



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



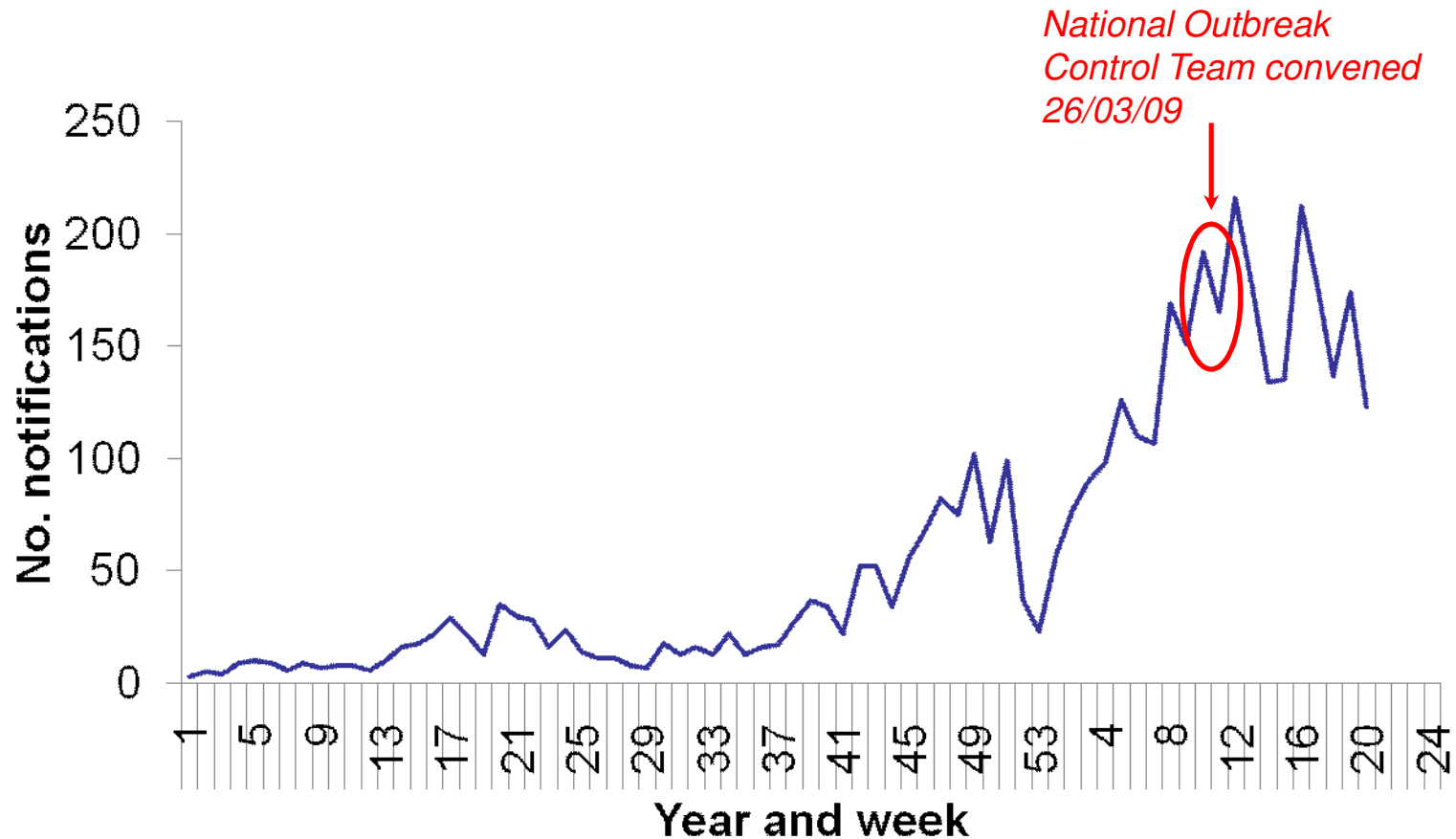
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# Importance of surveillance

## Mumps notifications, in Ireland

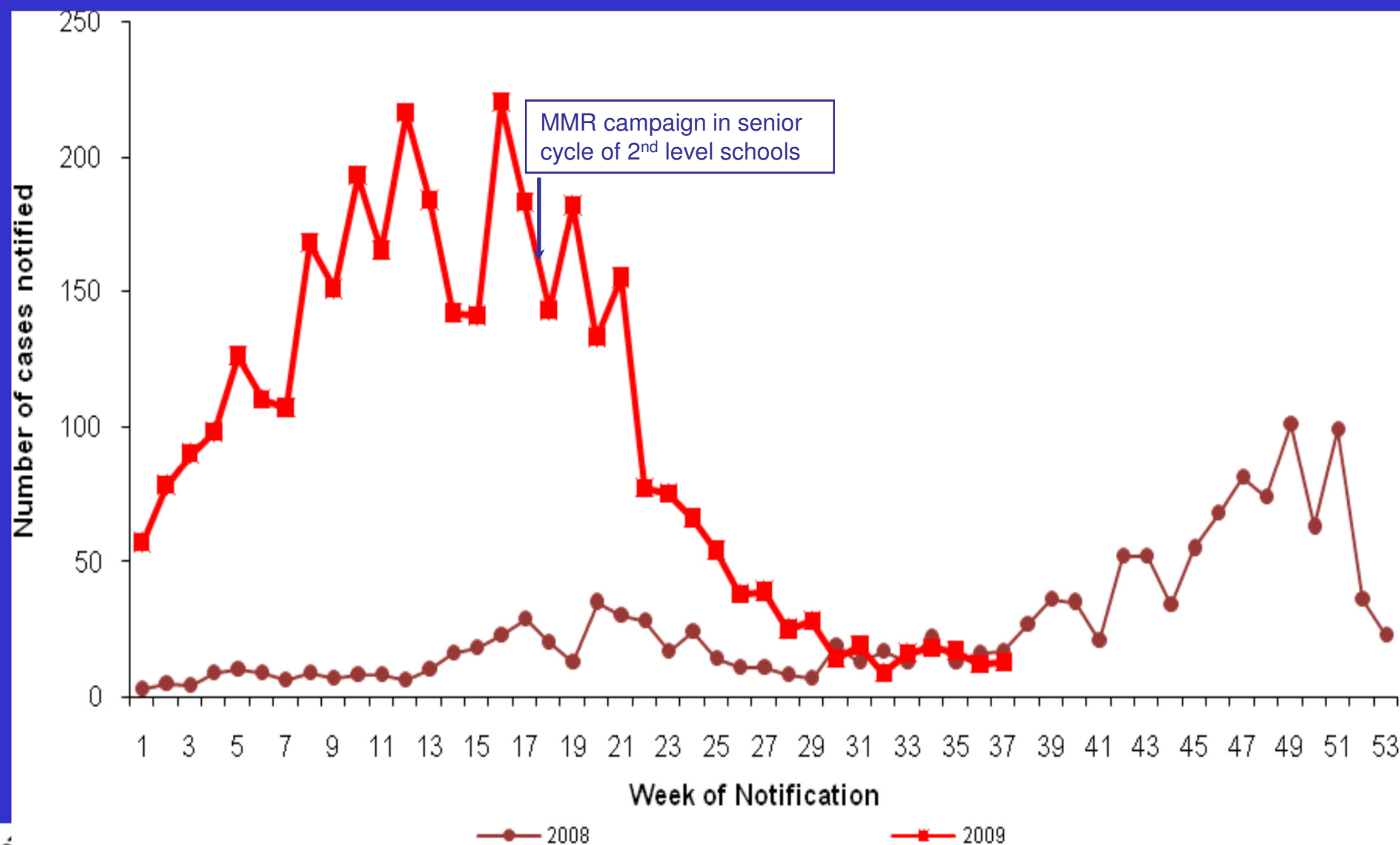
### 2008-week 20 2009\*



Source: HPSC

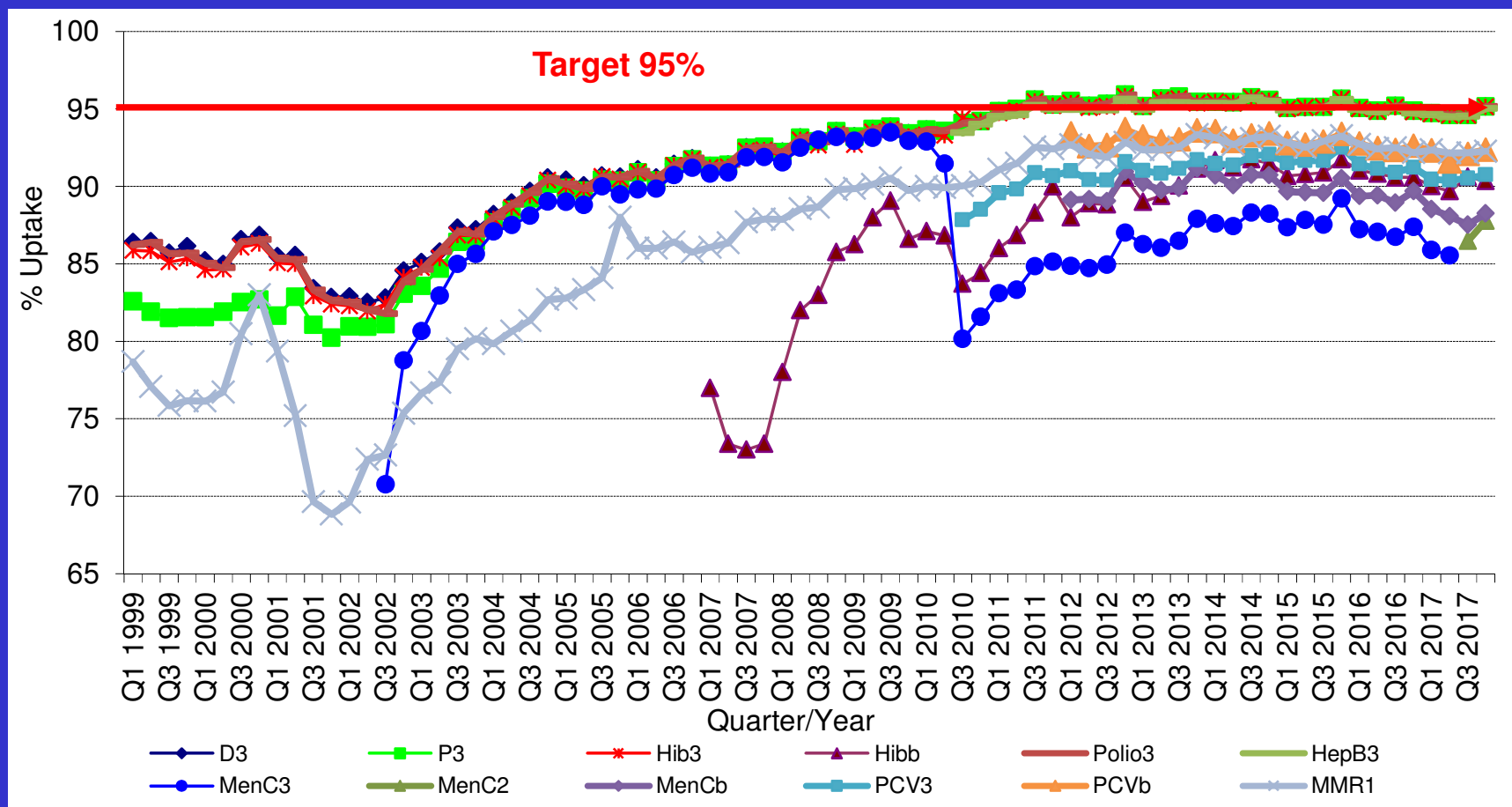


# Mumps notifications 2008 and 2009



Data were extracted from the Computerised Infectious Disease Reporting (CIDR) system on the 25/09/2009. 2009 data are provisional.

# Vaccine uptake rate at 24 months 1999-2017

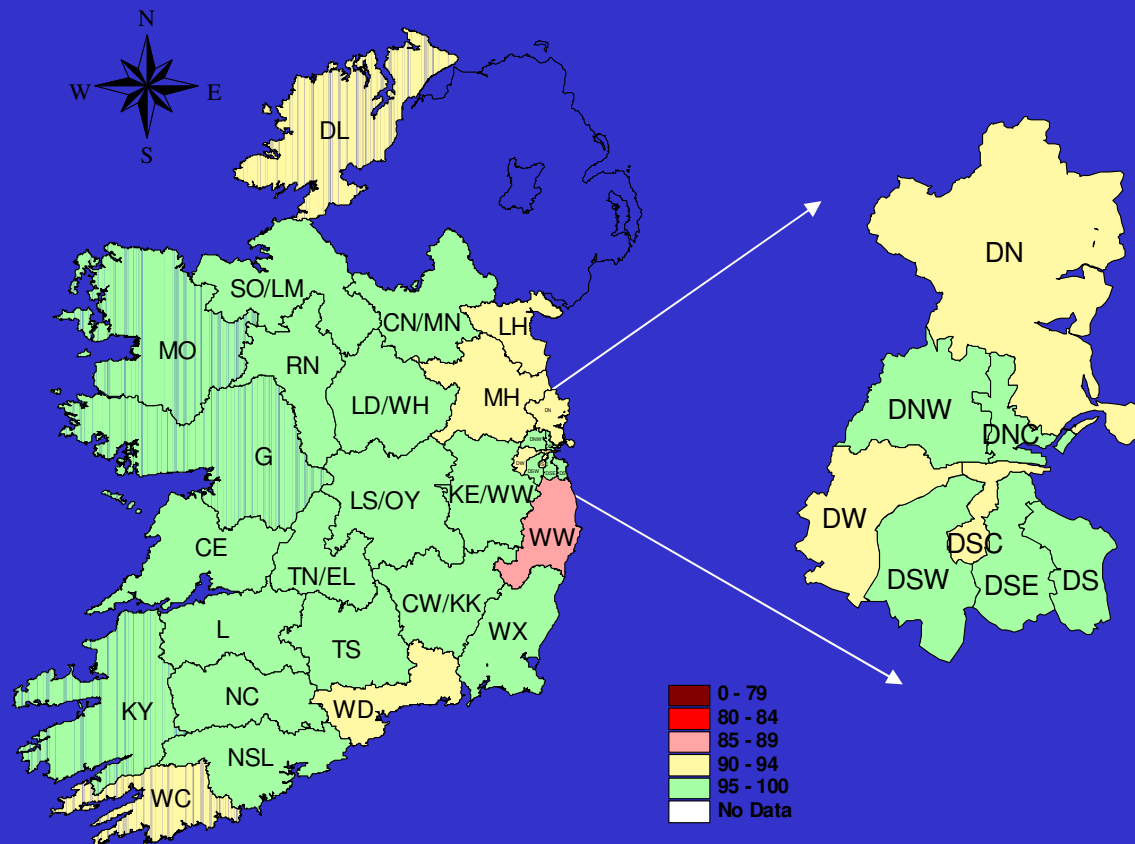


Source: HPSC



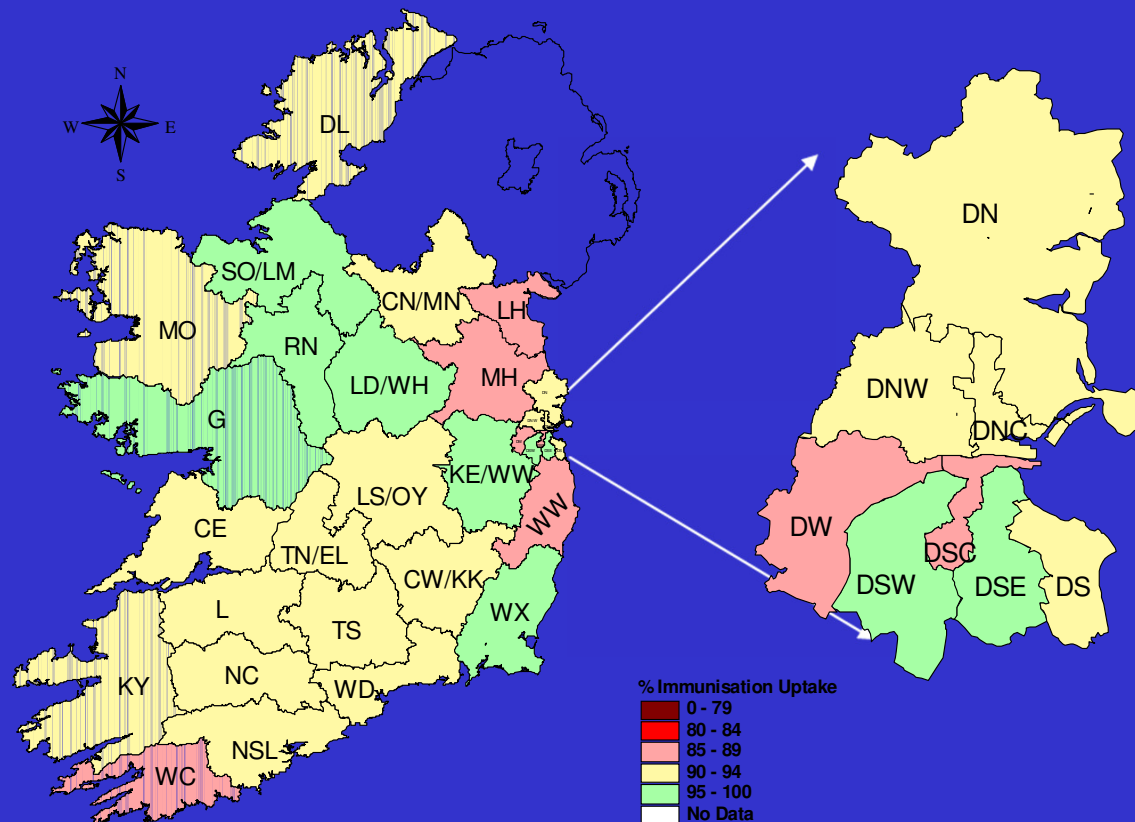
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# Quarter 4 2017 D3 immunisation uptake rates (%) by LHO, in those 24 months of age in Ireland and Dublin (source HPSC)





# Quarter 4 2017 MMR immunisation uptake rates (%) by LHO, in those 24 months of age in Ireland and Dublin (source HPSC)



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



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- ✓ “The economic benefits of immunisation have been greatly underestimated”

The Value of Vaccination: Harvard School of Public Health

- ✓ “Recent outbreaks emphasize the regional responsibility we all share to keep vaccine-preventable diseases under control. Immunization saves millions of lives every year and this public health success story must be sustained.”

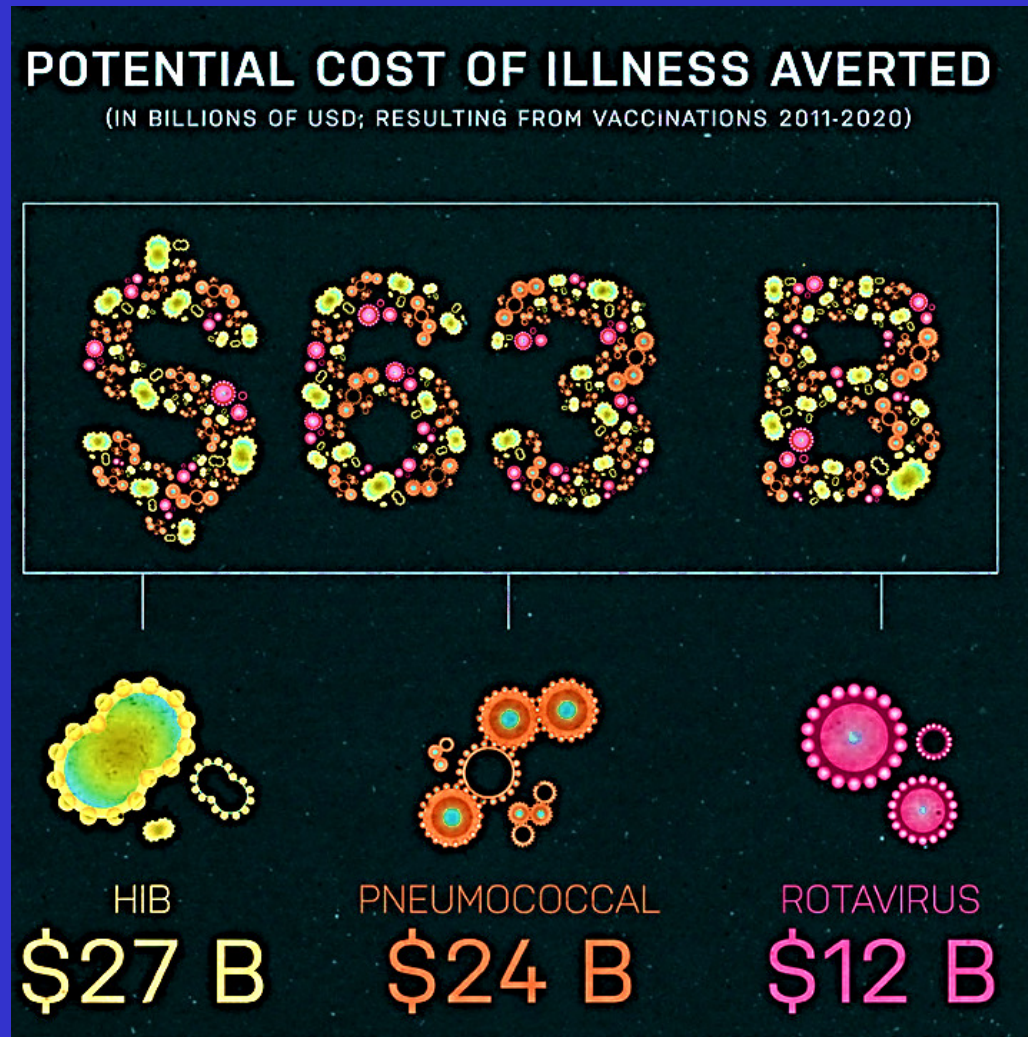
World Health Organization: European Immunisation Week 2017



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

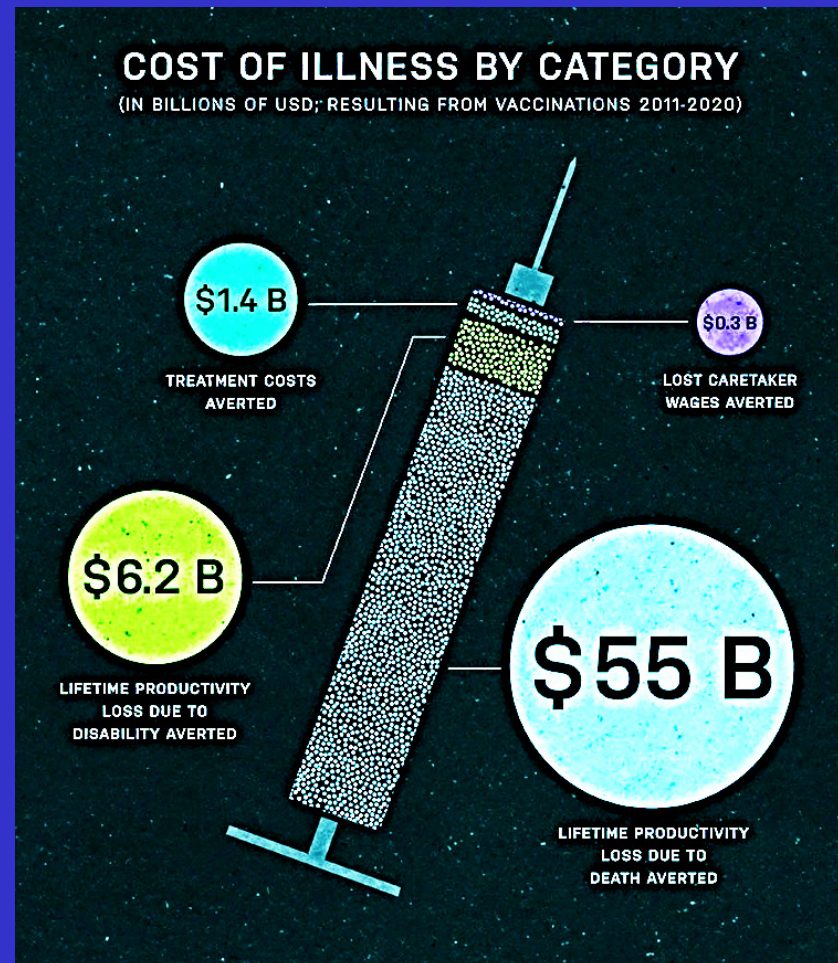


# Economic benefits of immunisation



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

# Economic benefits of immunisation



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



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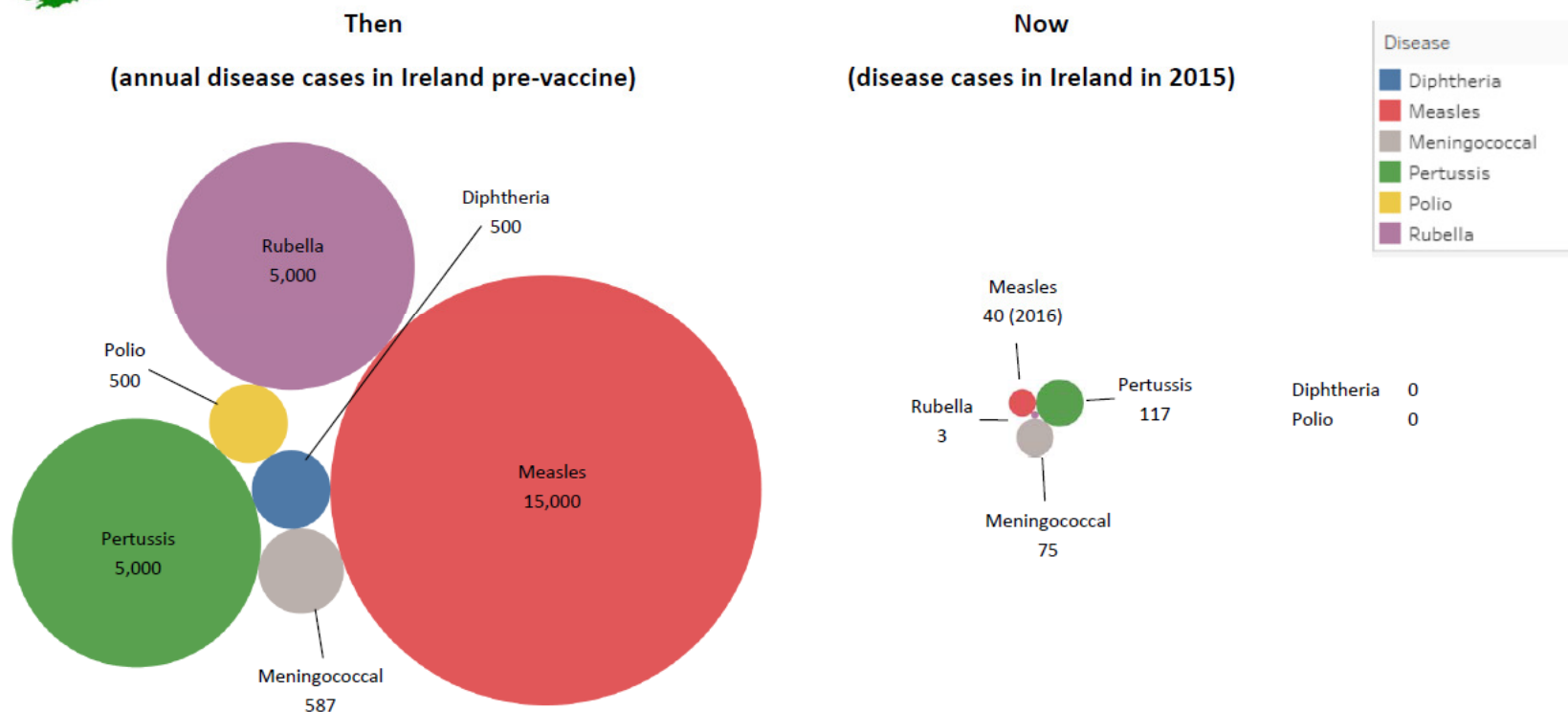




# Vaccines Work in Ireland



These bubbles are sized according to the annual number of cases in Ireland during the pre-vaccine era versus 2015. It is clear that significant progress has been made. However, we must not become complacent. We need to keep vaccine uptake at 95% to stop outbreaks of these serious infectious diseases.



\* The figure refers to number of diphtheria cases in 1948 as pre-vaccine data are not available

Reference:

<http://www.hpsc.ie/>

<http://www.hse.ie/eng/health/immunisation/hcpinfo/guidelines/>

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

[@HSEImm](https://twitter.com/HSEImm)

#VaccinesWork




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



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# More information

**March 2018**



## National Immunisation News

The Newsletter of the HSE National Immunisation Office



### National Immunisation Office 2017 Summary

Thank you for all of your support throughout 2017. We would like to share some of:

- HSE National Cold Chain Service vaccines to 2,769 sites on our island
- GP practices delivered the print protecting over 64,000 babies
- Primary schools vaccination team protecting 70,000 children against programme in Donegal, Sligo and
- Second level schools vaccination programme protecting 60,000
- We delivered talks and training members of the public across Ireland
- We dealt with 3,193 queries this year
- For the first time we had over 1

We look forward to continuing to deliver the best immunisation practices to protect more people from

**Contents**

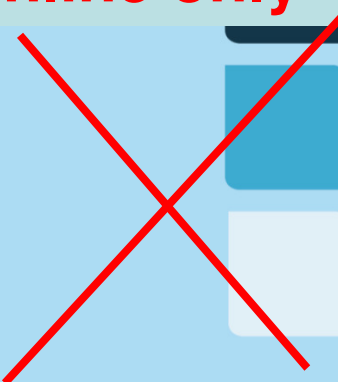
- Summary 2017
- Measles – outbreaks in Europe and Ireland
- New Guidelines for Vaccinations in General Practice
- Changes to the Law on Guardianship
- Updated NIAC Guidelines for Influenza
- Seasonal Flu Campaign 2017/2018
- Vaccine administration
- HPV Vaccine Update
- HPV Vaccine School Programme (2017/18)
- Importance of Tdap vaccine in pregnancy
- Rotavirus oral vaccine
- Interval between 2 vaccines
- Common Queries
- Information materials
- Website and social Media
- List of vaccinations from the cold chain

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




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## online only



NATIONAL IMMUNISATION ADVISORY COMMITTEE

### Immunisation Guidelines for Ireland

2013 Edition



## Immunisation

Search this section  

[Search the whole site](#)

Who we are | Public Information | Healthcare Worker Information | Vaccines Work | Information Materials | Glossary



### Welcome to the National Immunisation Office Website

We provide trusted, up-to-date information about HSE immunisation programmes for children, adults and healthcare professionals in Ireland.

**HPV Vaccine**  
Visit [www.hps.ie](http://www.hps.ie)  
#ProtectOurFuture

**European Immunisation Week**  
#VaccinesWork #YourBestShot

**Measles Cases**  
MMR vaccine is the only protection

**Immunisation Schedule**  
Information about the vaccines recommended for babies up to 13 months of age

**School Programme**  
Information about the 4 in 1 and MMR, HPV, Tdap and Mmc school vaccination programmes

**Vaccines and Pregnancy**  
Information about the vaccines recommended during and after pregnancy

**How do I:**

- [Ask a question](#)
- [Check vaccine records](#)
- [Make an appointment](#)
- [Order information materials](#)
- [Contact the local office](#)
- [Order HSE vaccines](#)
- [View and print documents](#)

**Further Information**

- [Your Child's Immunisations](#)
- [Translation of Immunisation Material](#)
- [Vaccination Schedule](#)
- [Previous Vaccination Schedules](#)

**Useful Links**

- [School Guidelines for Staff 2017/2018](#)
- [Immunisation Guidelines for Ireland](#)
- [Vaccination in General Practice](#)
- [Vaccine Preparation](#)
- [What is in Vaccines?](#)
- [Catchup Vaccines](#)

<http://www.immunisation.ie/en/HealthcareProfessionals/ImmunisationGuidelines/>



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