

# History and aims of immunisation

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Health Service Executive

# 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 and Children (DoHC)
  - 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)



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# 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



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# Polio

Endemic for thousands of years

1955 Inactivated polio vaccine

1962 Live oral polio vaccine

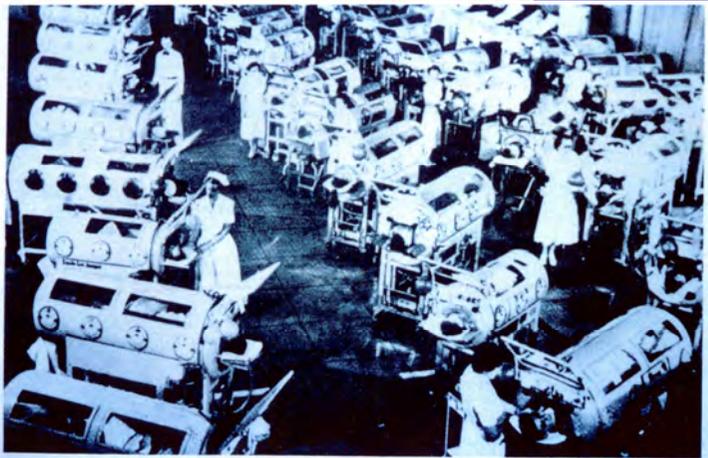


Figure 1.2 A ward of patients suffering from bulbar poliomyelitis



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

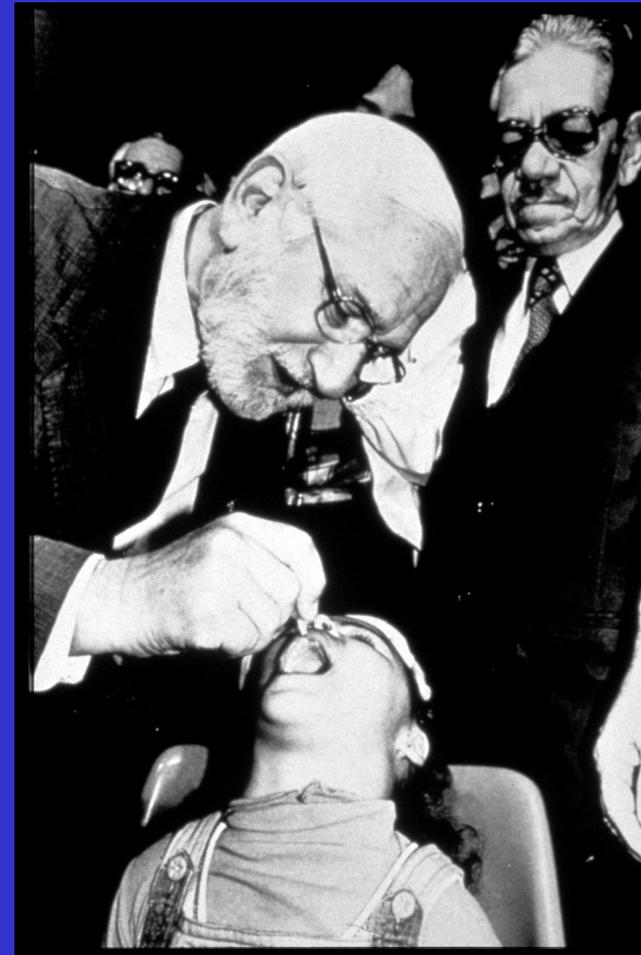


Photo courtesy of [www.polioeradication.org](http://www.polioeradication.org)

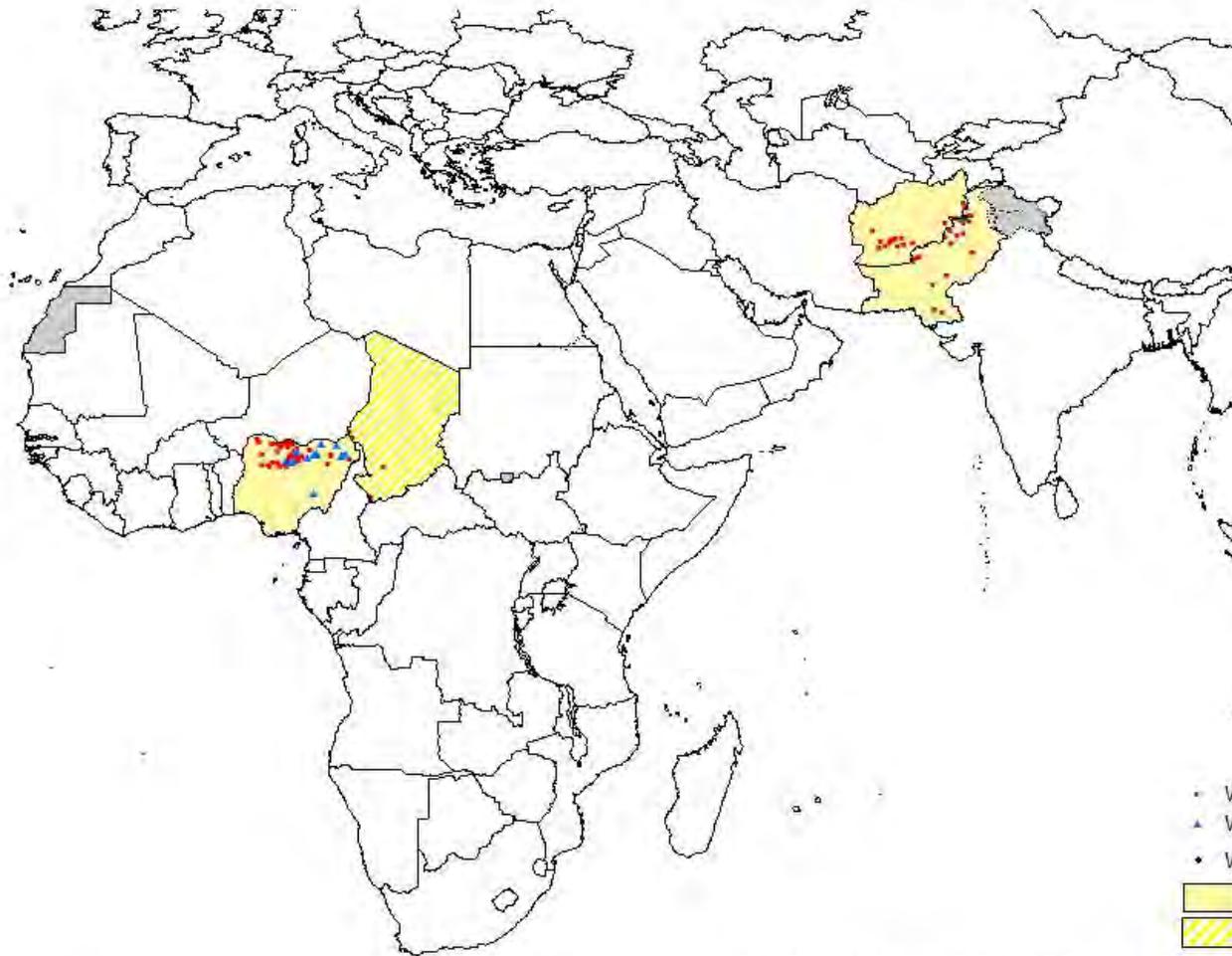


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# Wild Poliovirus - 2012



Excludes viruses detected from environmental surveillance and vaccine derived polioviruses.

Data in HQ as of 21 August 2012

# Polio 2011

## Global Polio Eradication Initiative

- 4 endemic countries
- Pakistan, Afghanistan, Nigeria, Chad
- 650 cases in 2012
- 309 (48%) in non endemic countries



## Average USA Annual Morbidity Due to Vaccine Preventable Diseases in the 20th Century compared with Morbidity in 2004 (for pre-1990 vaccines)

Disease	Morbidity		Percentage decrease in number of deaths
	Average number of cases per year in 20 <sup>th</sup> century	Number of cases in 2004	
Smallpox	48,164	0	100
Diphtheria	175,885	0	100
Polio	16,316	0	100
Measles	503,282	37	99.99
Rubella	47,745	12	99.97
Mumps	152,209	236	99.84
Tetanus	1314	26	98.02
Pertussis	147,271	18,957	87.13



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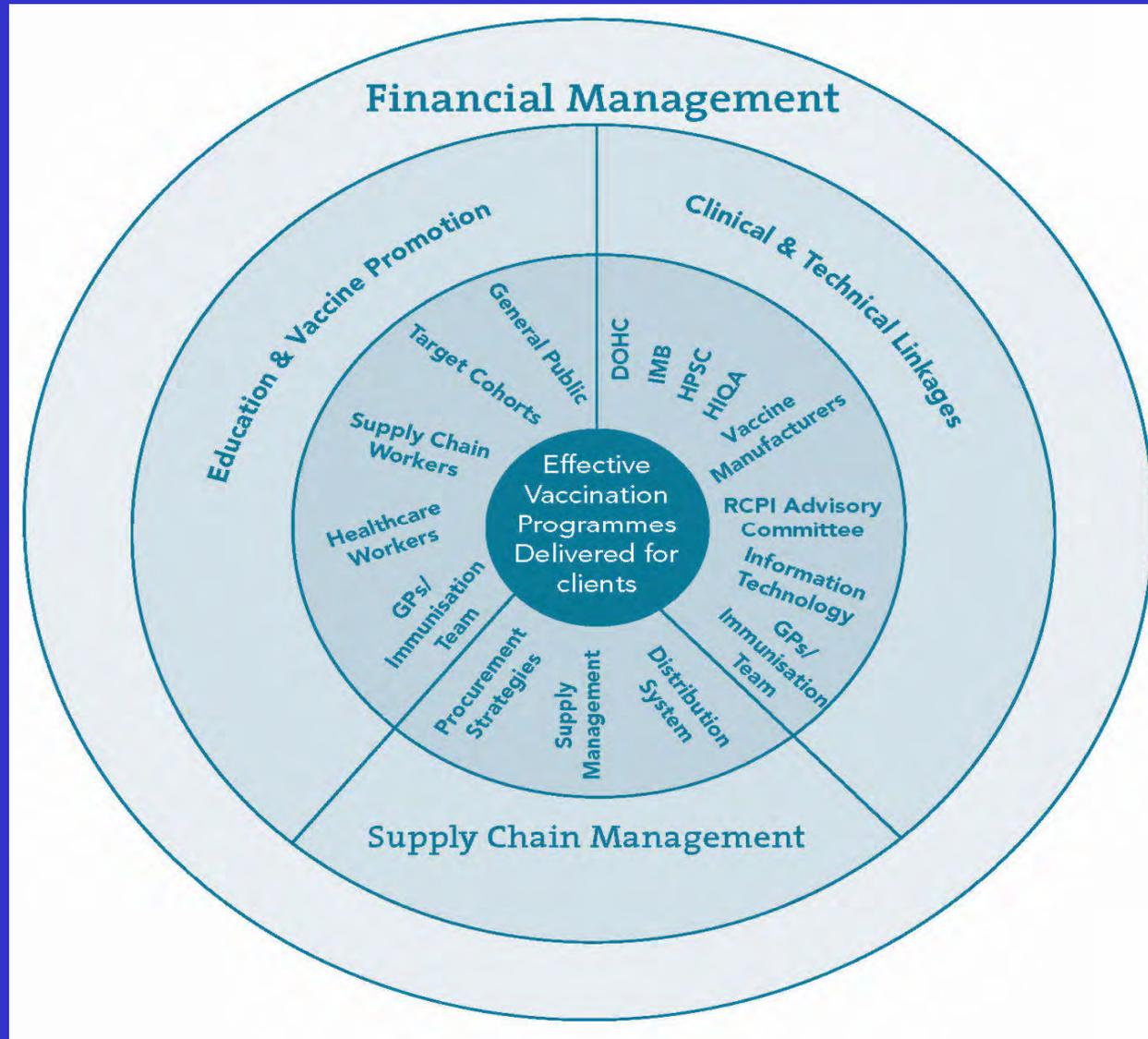
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# Aim of immunisation

- 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

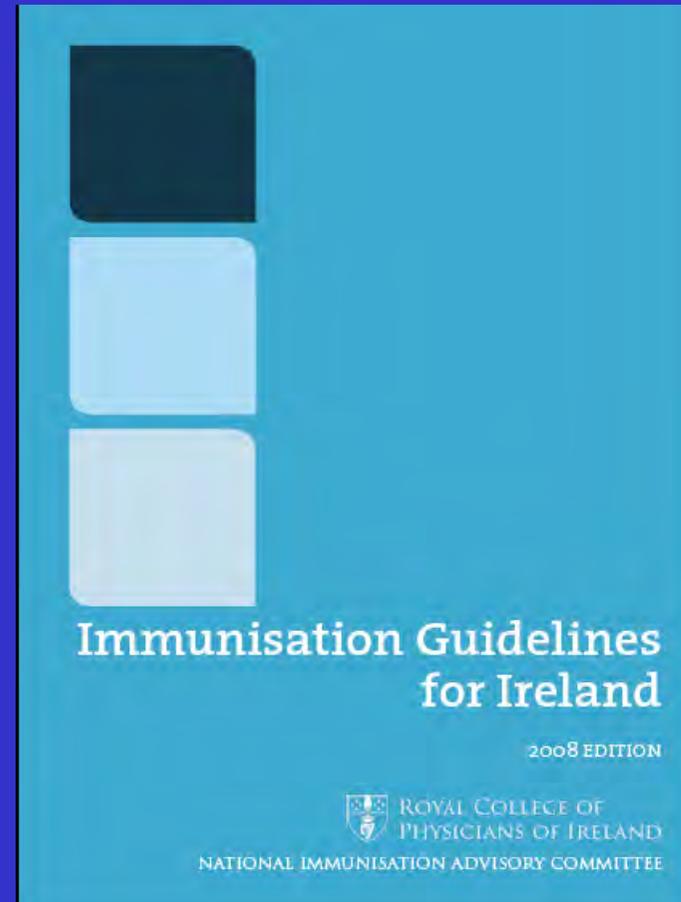


# Multidisciplinary components of an immunisation system



# The National Immunisation Advisory Committee (NIAC)

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



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## The Department of Health (DoH)

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

## 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

## Integrated Services Directorate

- 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



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# 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 IT systems modified with any changes to schedule



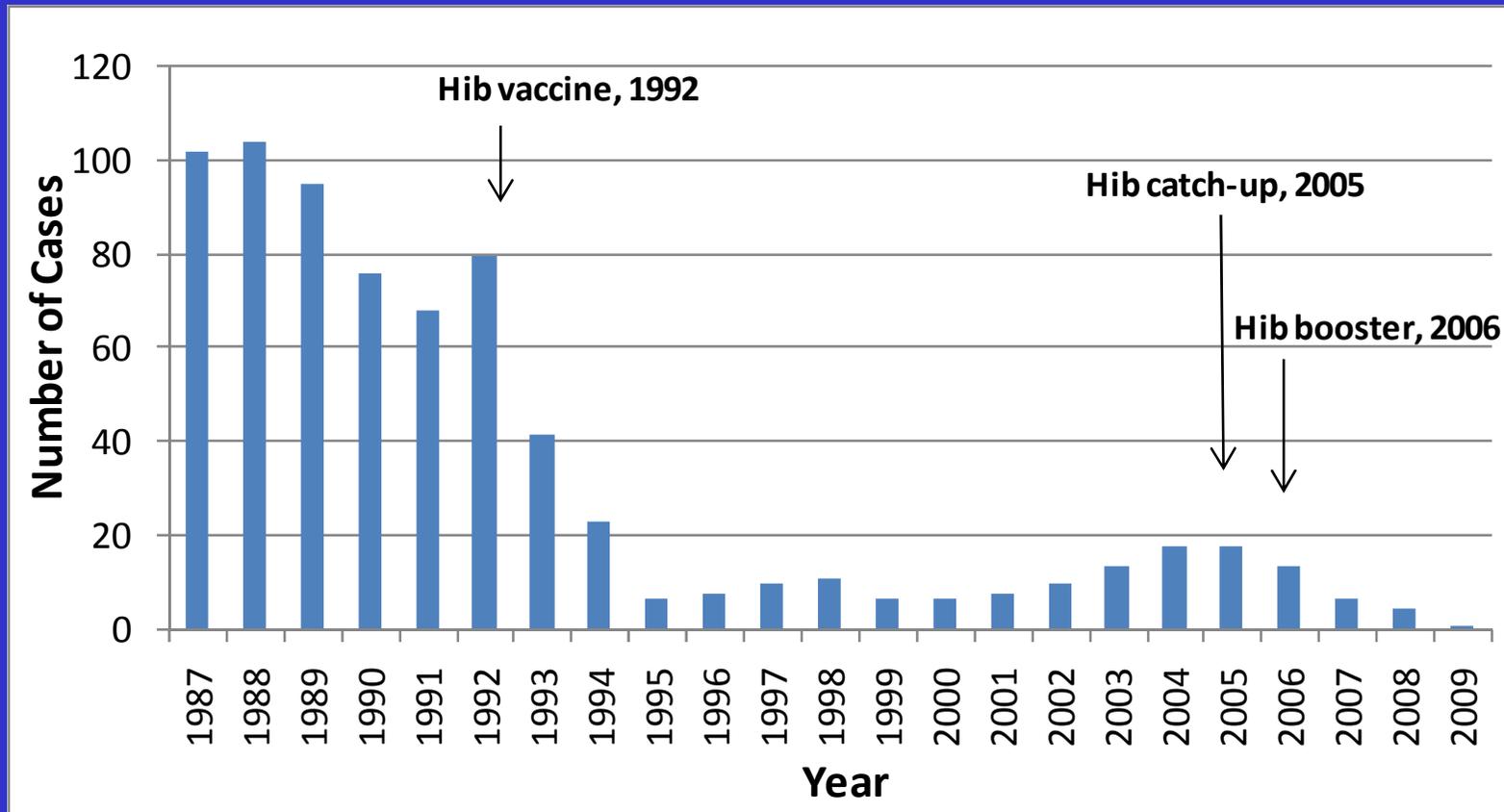
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# Health Protection Surveillance Centre (HPSC)

- 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

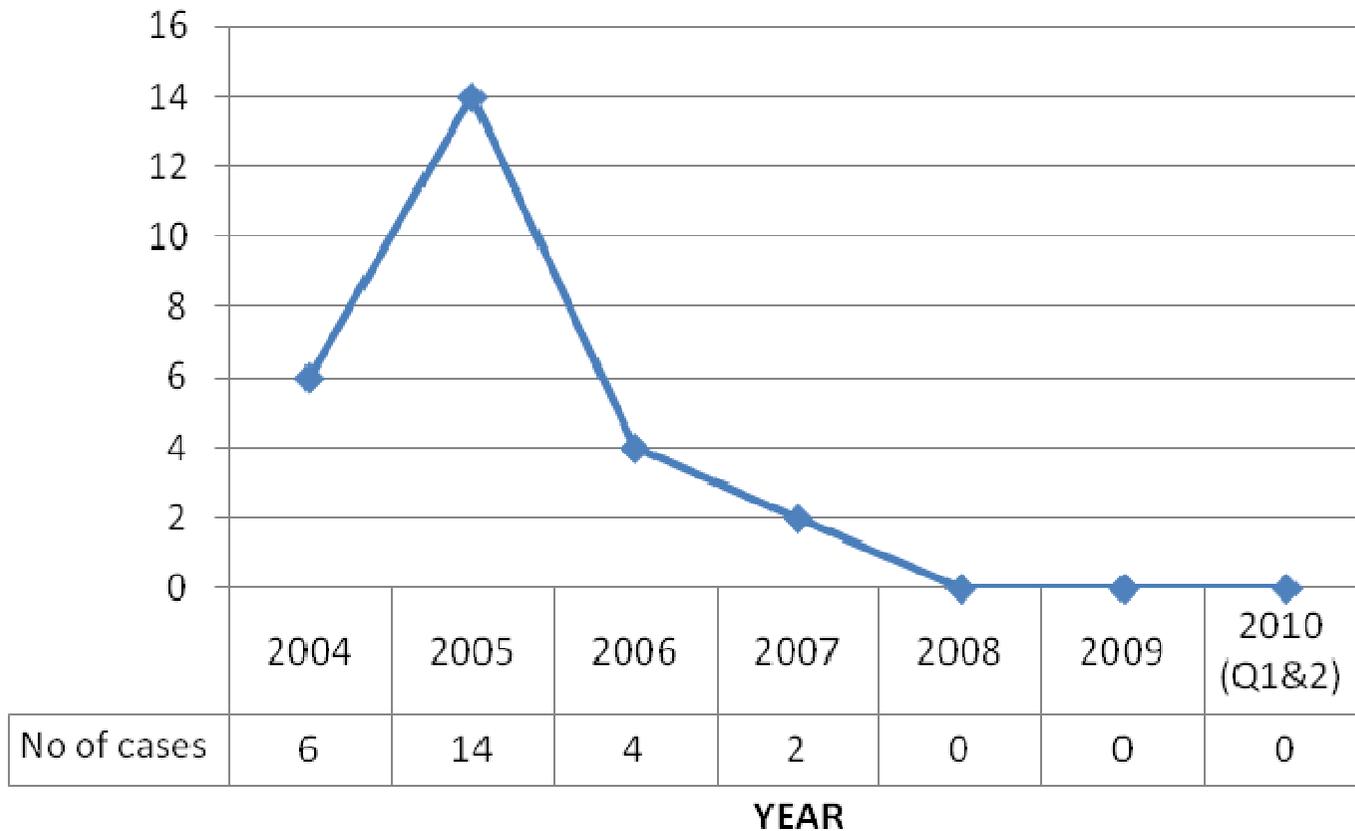


Source: HPSC



# Impact of Hib campaign

Number of cases of Hib disease in fully vaccinated children 2004 - 2010



Source: HPSC



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

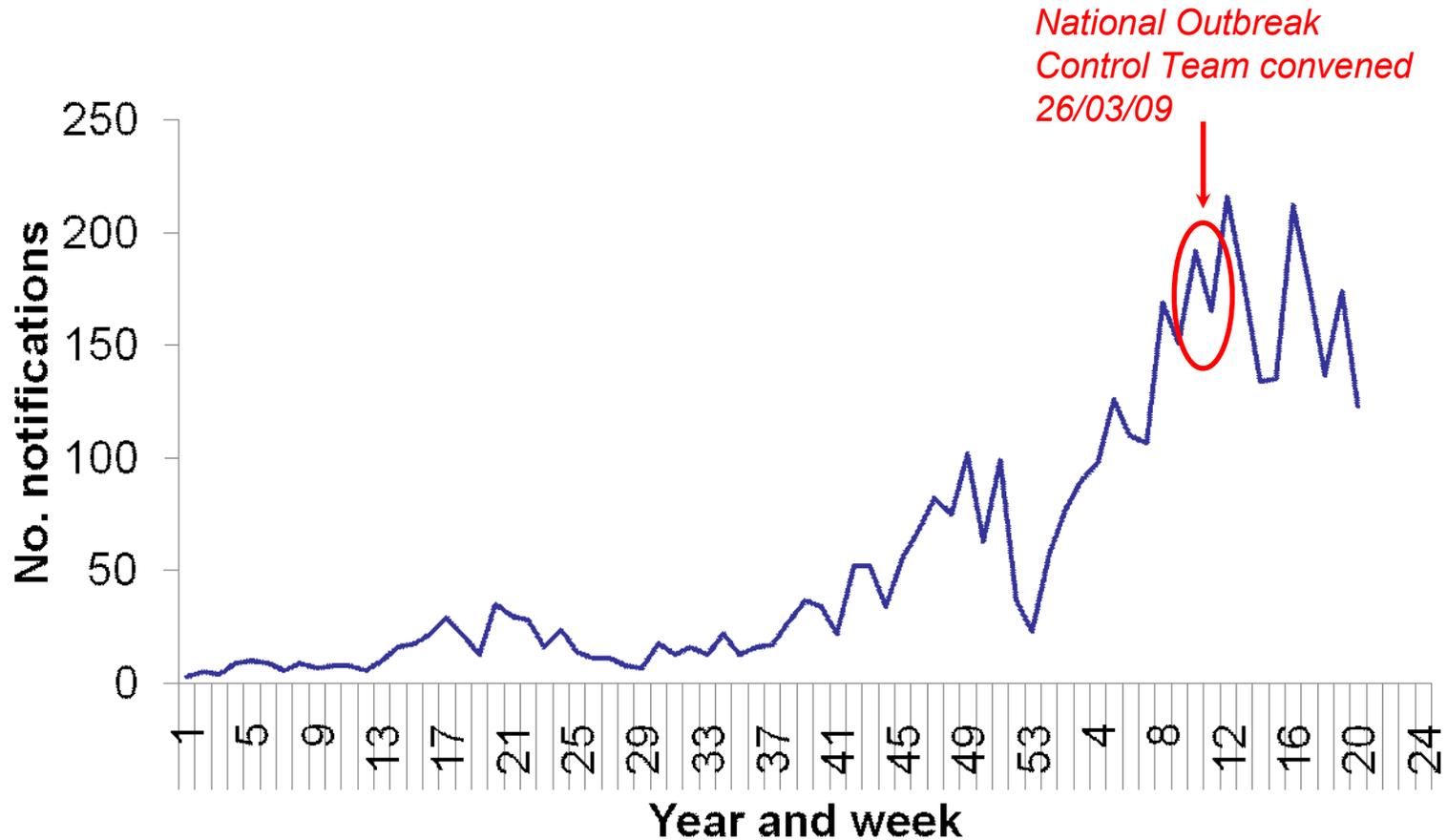


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# Importance of surveillance

## Mumps notifications, in Ireland

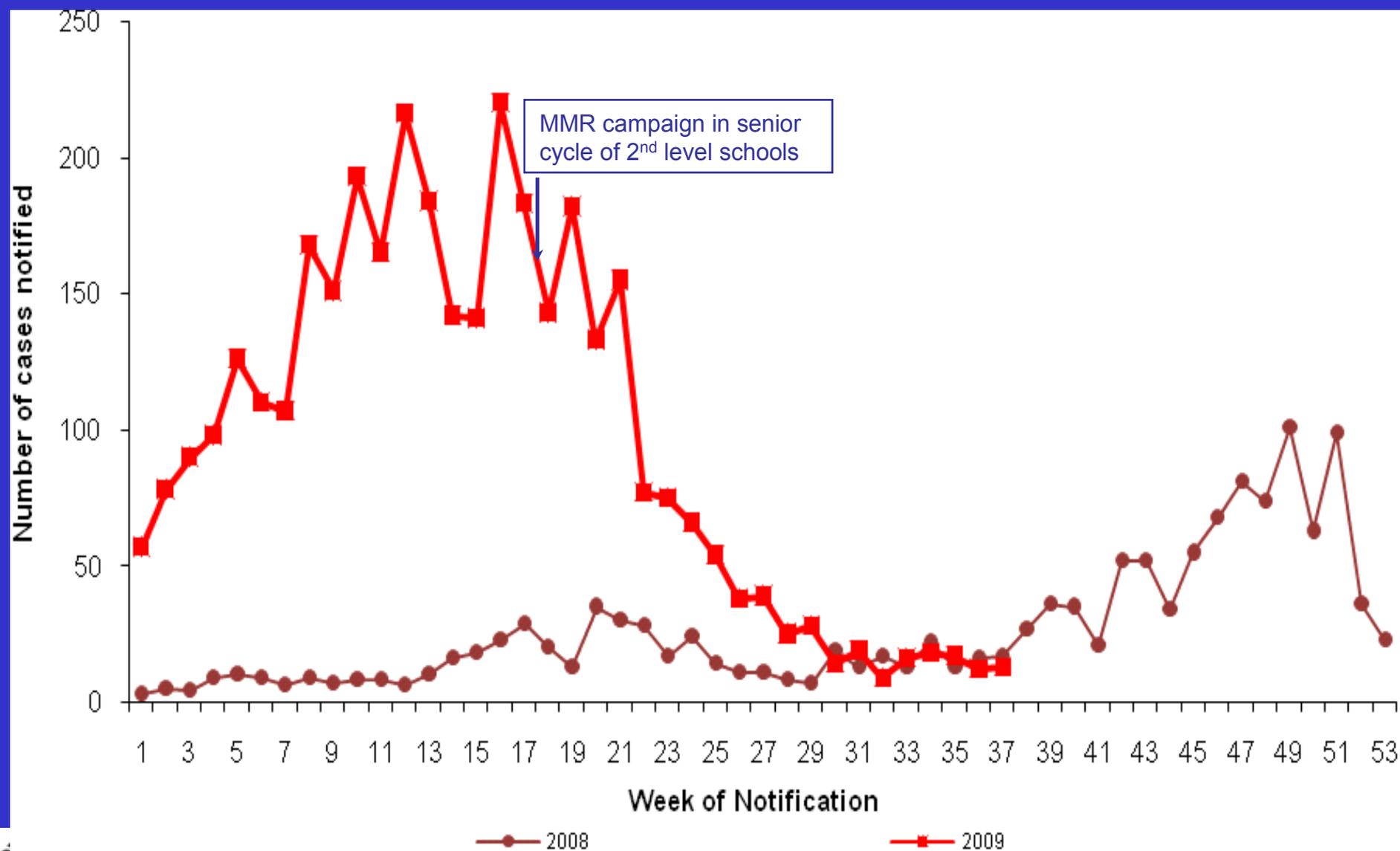
### 2008-week 20 2009\*



Source: HPSC

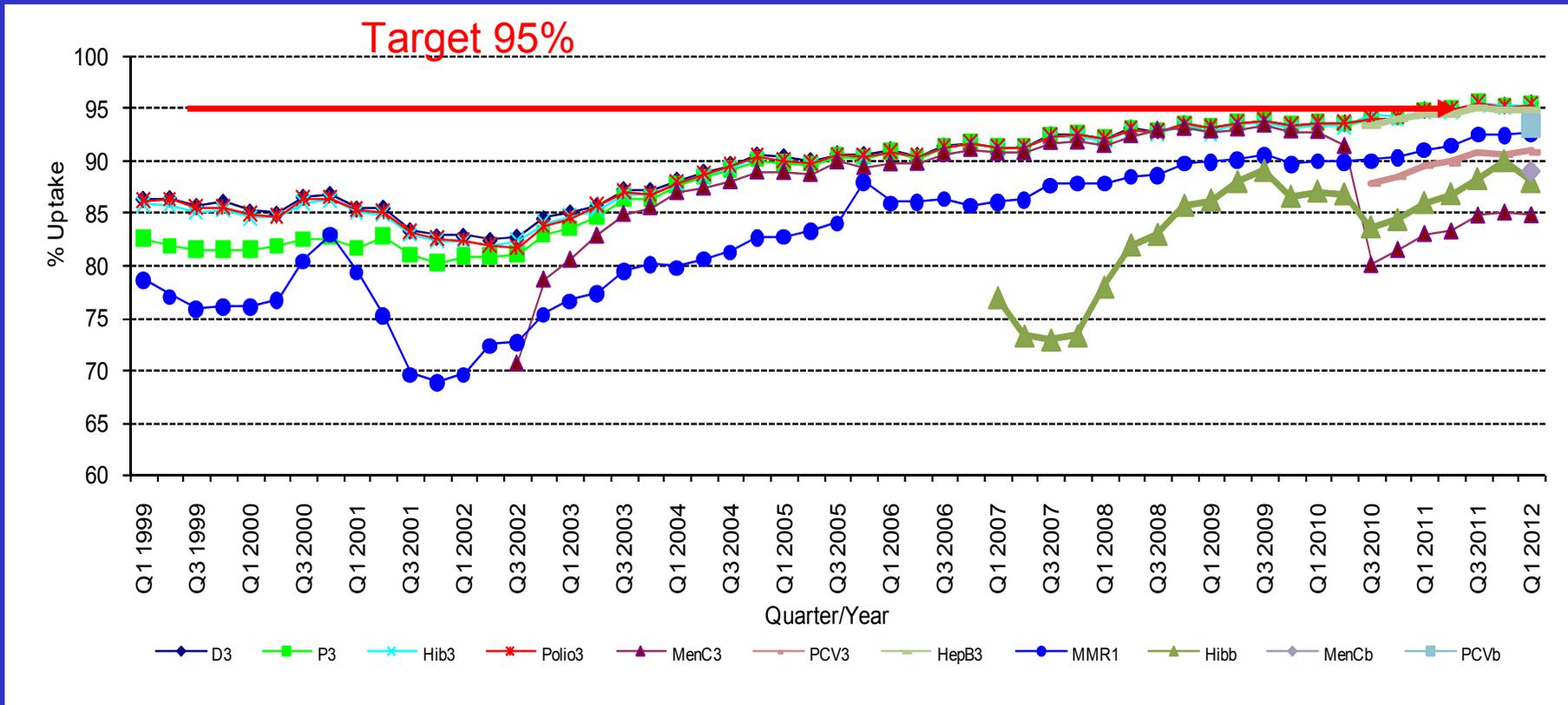


# Mumps notifications 2008 and 2009



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

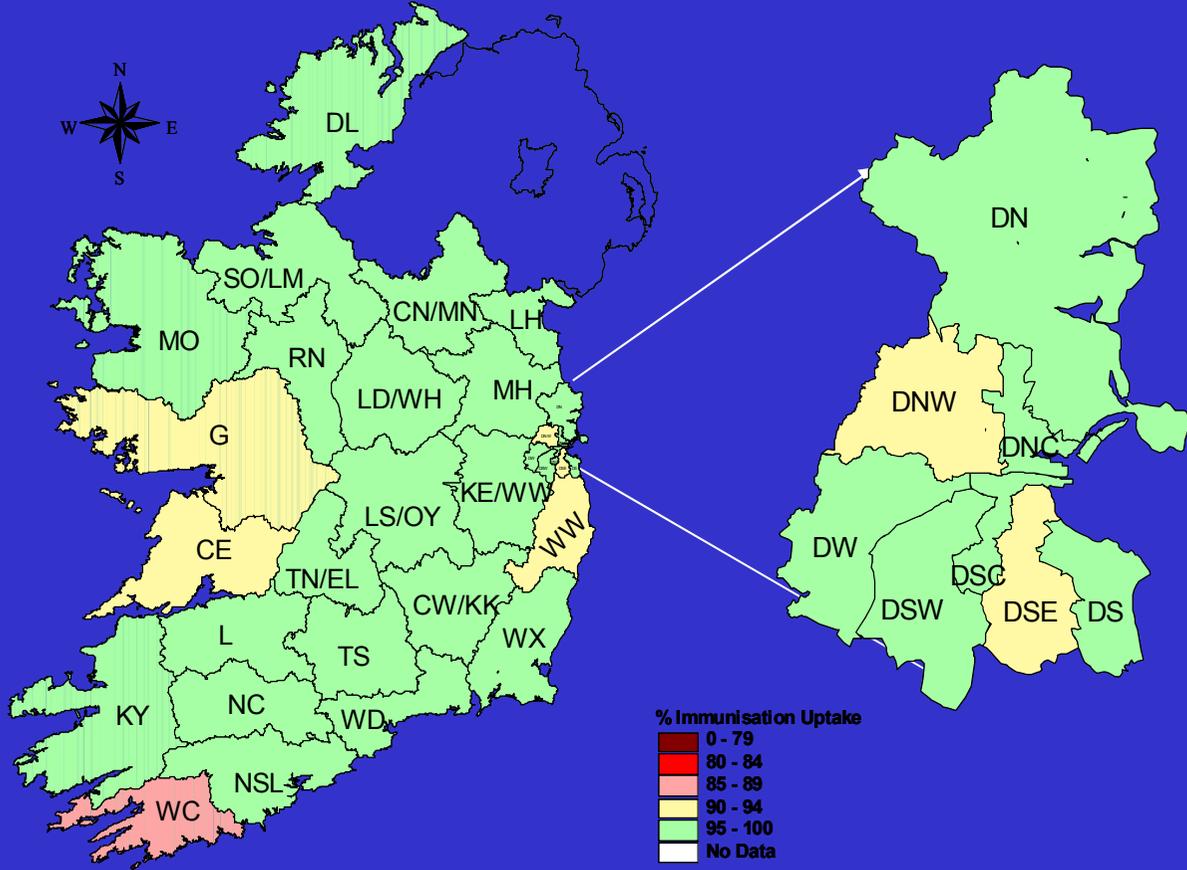
# Vaccine uptake rate at 24 months 1999-2012



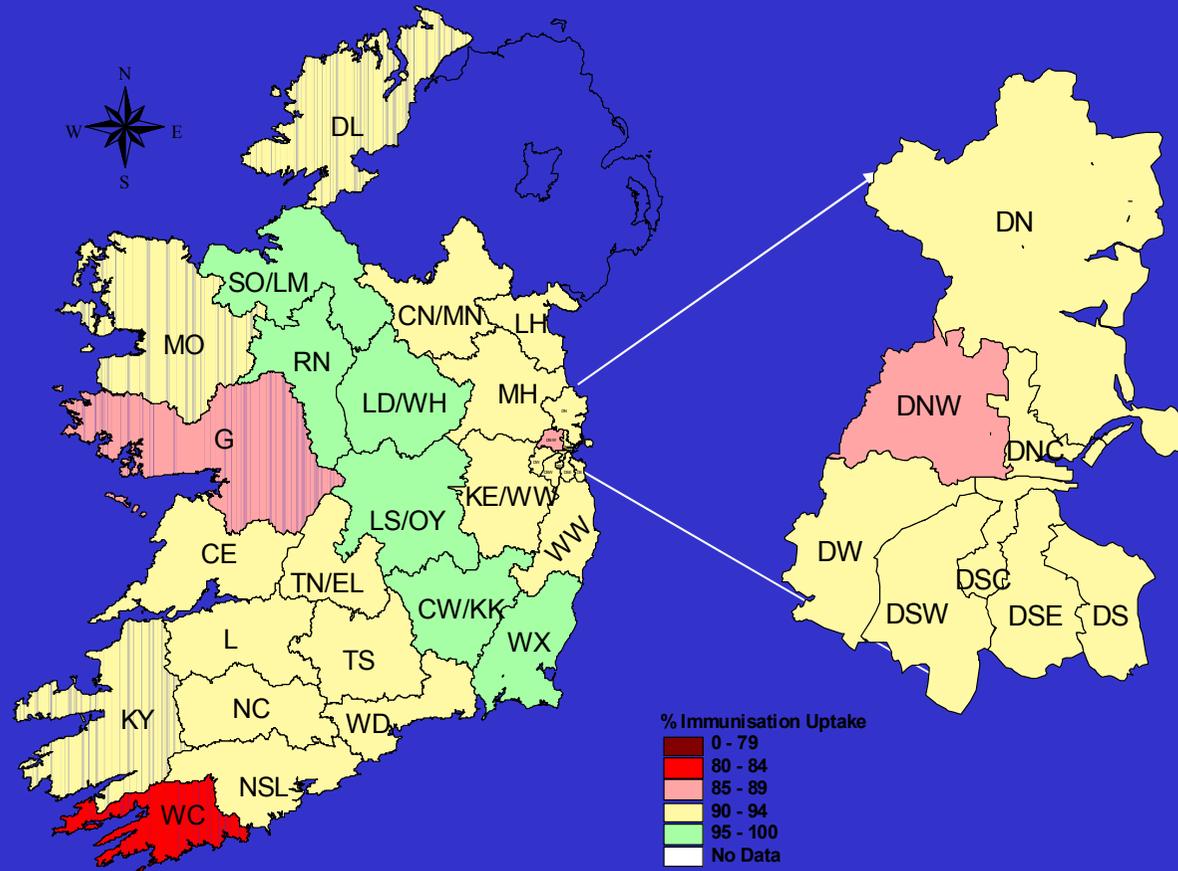
Source: HPSC



# Quarter 1 2012 D3 immunisation uptake rates (%) by LHO, in those 24 months of age in Ireland and Dublin (source HPSC)

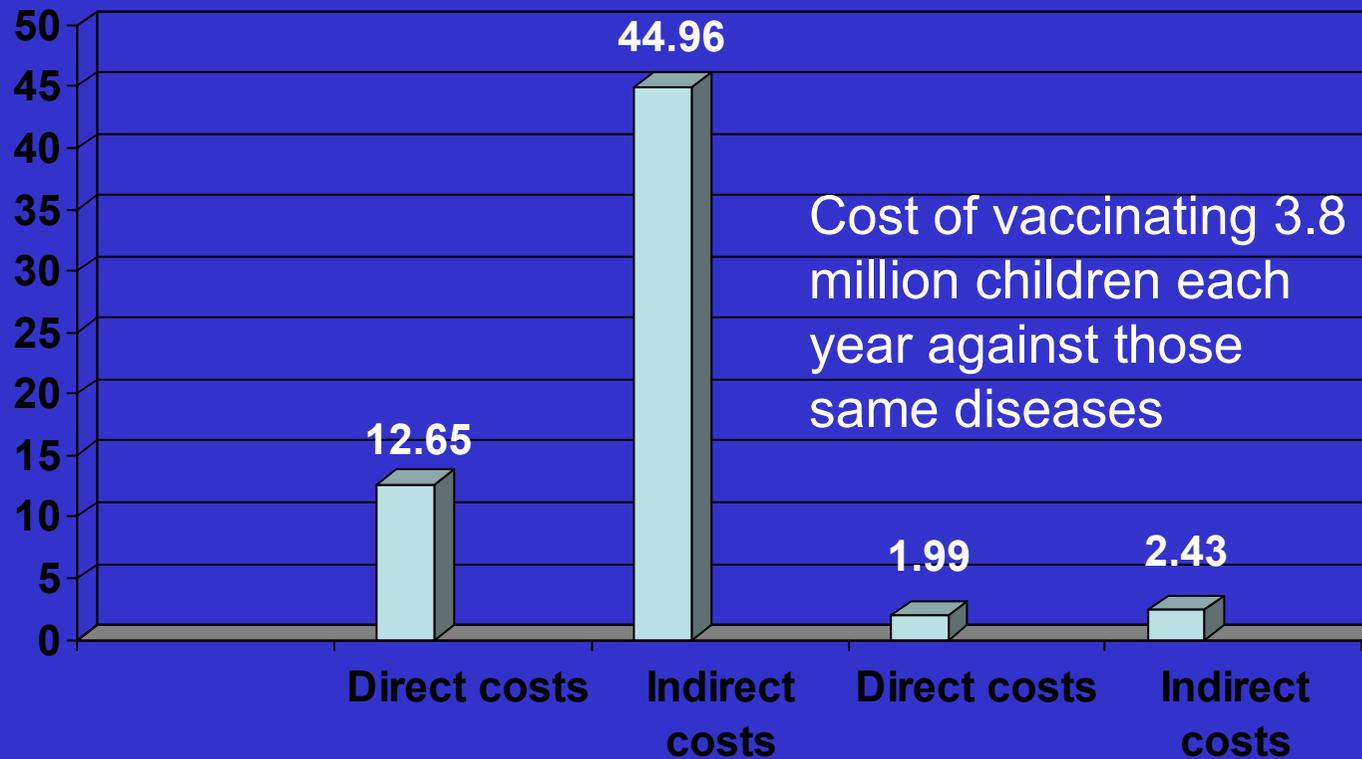


# Quarter 1 2012 MMR immunisation uptake rates (%) by LHO, in those 24 months of age in Ireland and Dublin (source HPSC)



# Economic benefits of immunisation

Cost of treating more than 10 million cases of various diseases annually



Infectious Diseases in Children, August 2003, p.19,

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



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# Why Immunise?

- Immunisation is one of the most cost effective and safest of all health interventions
- Immunisation has saved more lives than any other public health intervention apart from the provision of clean water

