History and aims of immunisation

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National Immunisation Office

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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

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Smallpox

Edward Jenner (**1749 –1823**)

Variola virus

Infected humans 10,000 years ago

Known in China 11th century BC

Inoculation described 6th century BC

1796 vaccinia virus isolated

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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

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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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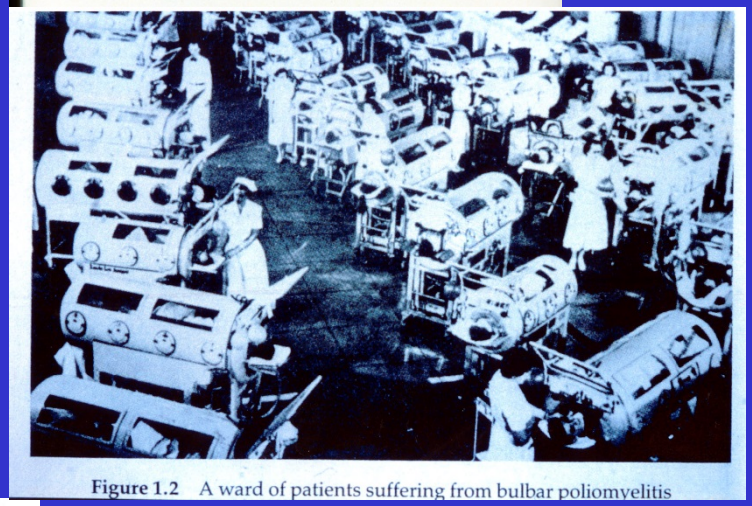

Figure 1.2 A ward of patients suffering from bulbar poliomyelitis

Polio

Endemic for thousands of years

1955 Inactivated polio vaccine

1962 Live oral polio vaccine

courtesy of www.polioeradication.org

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

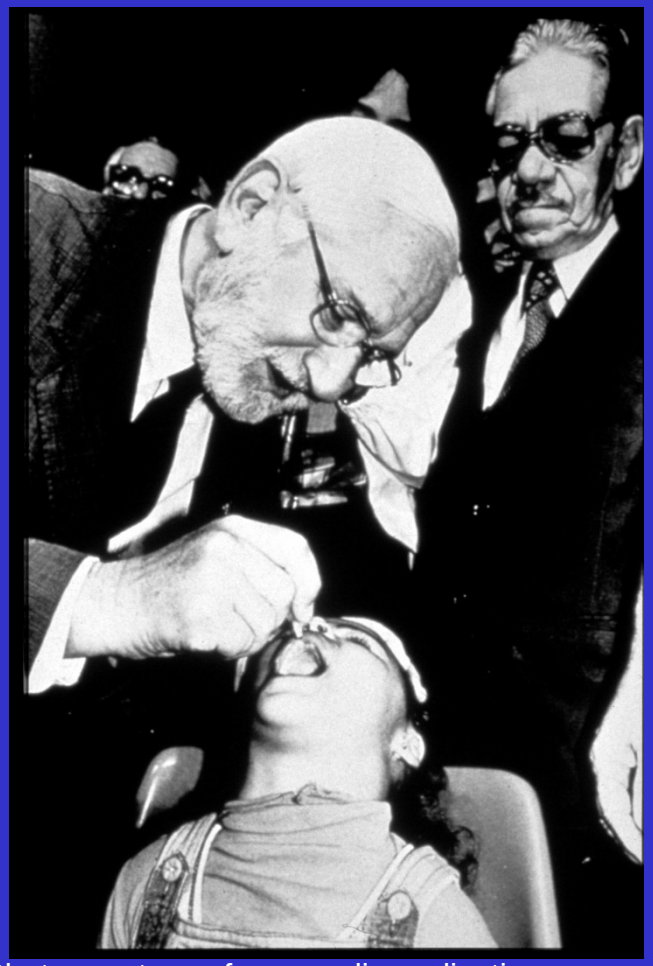

Photo courtesy of www.polioeradication.org

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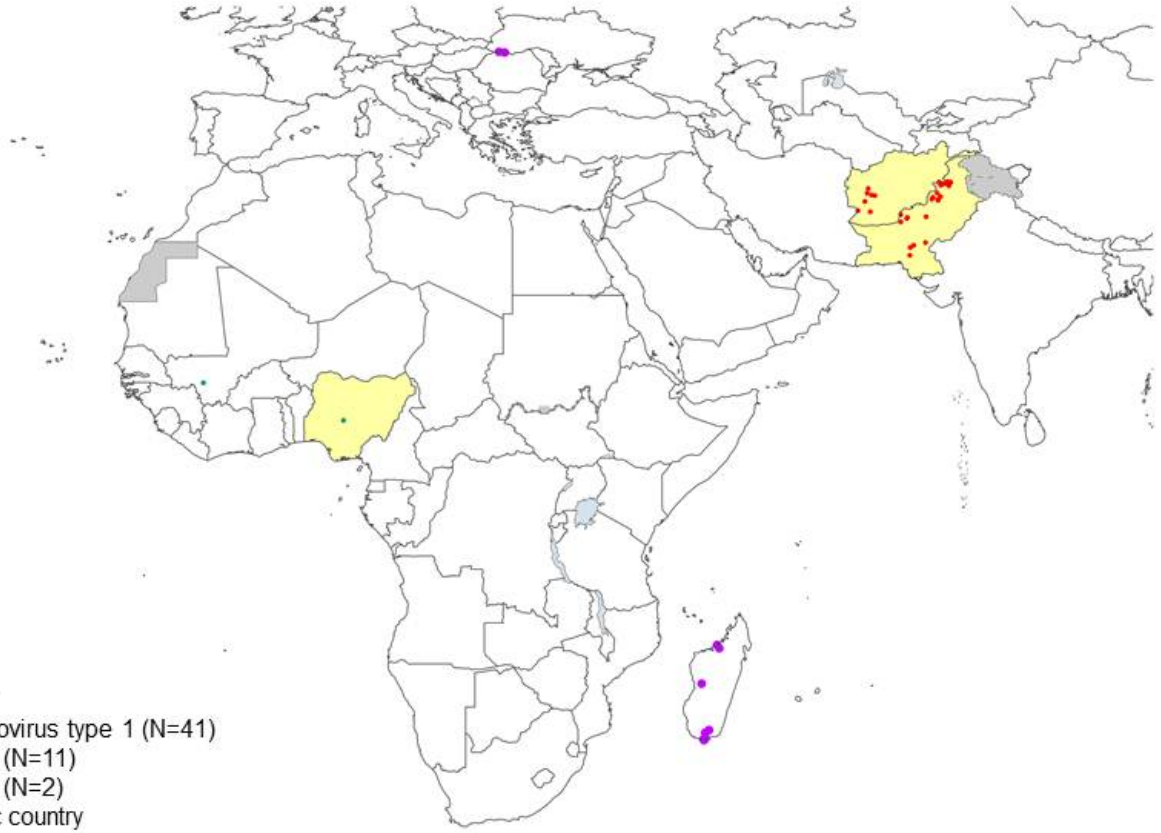
Polio

Wild Poliovirus & cVDPV Cases[1], 2015
01 January – 15 September



[1]Excludes viruses detected from environmental surveillance.

Data in WHO HQ as of 15 September 2015

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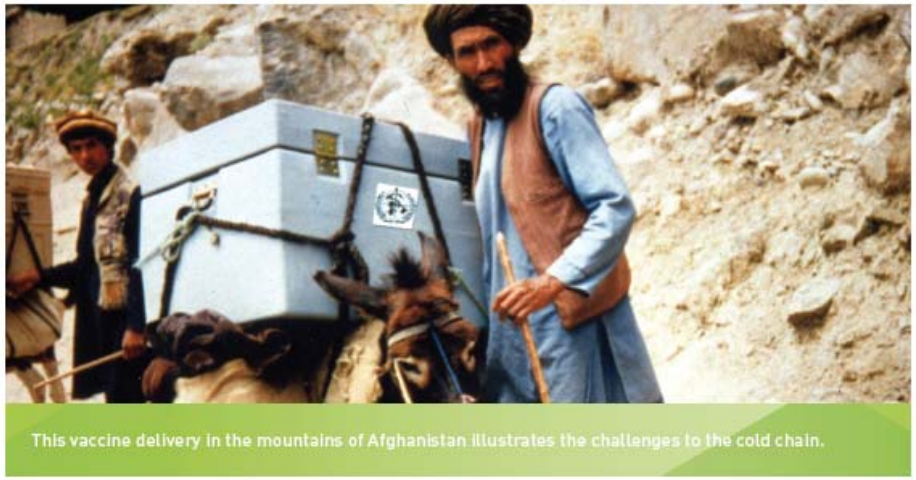
Polio 2015

- 359 cases in 2014
- 19 (5%) in non endemic countries
- 41 cases to date in 2015
- Pakistan/ Afghanistan

Global Polio Eradication Initiative



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

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

	Morbidity		Percentage decrease in number of deaths
Disease	Average number of cases per year in 20th 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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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

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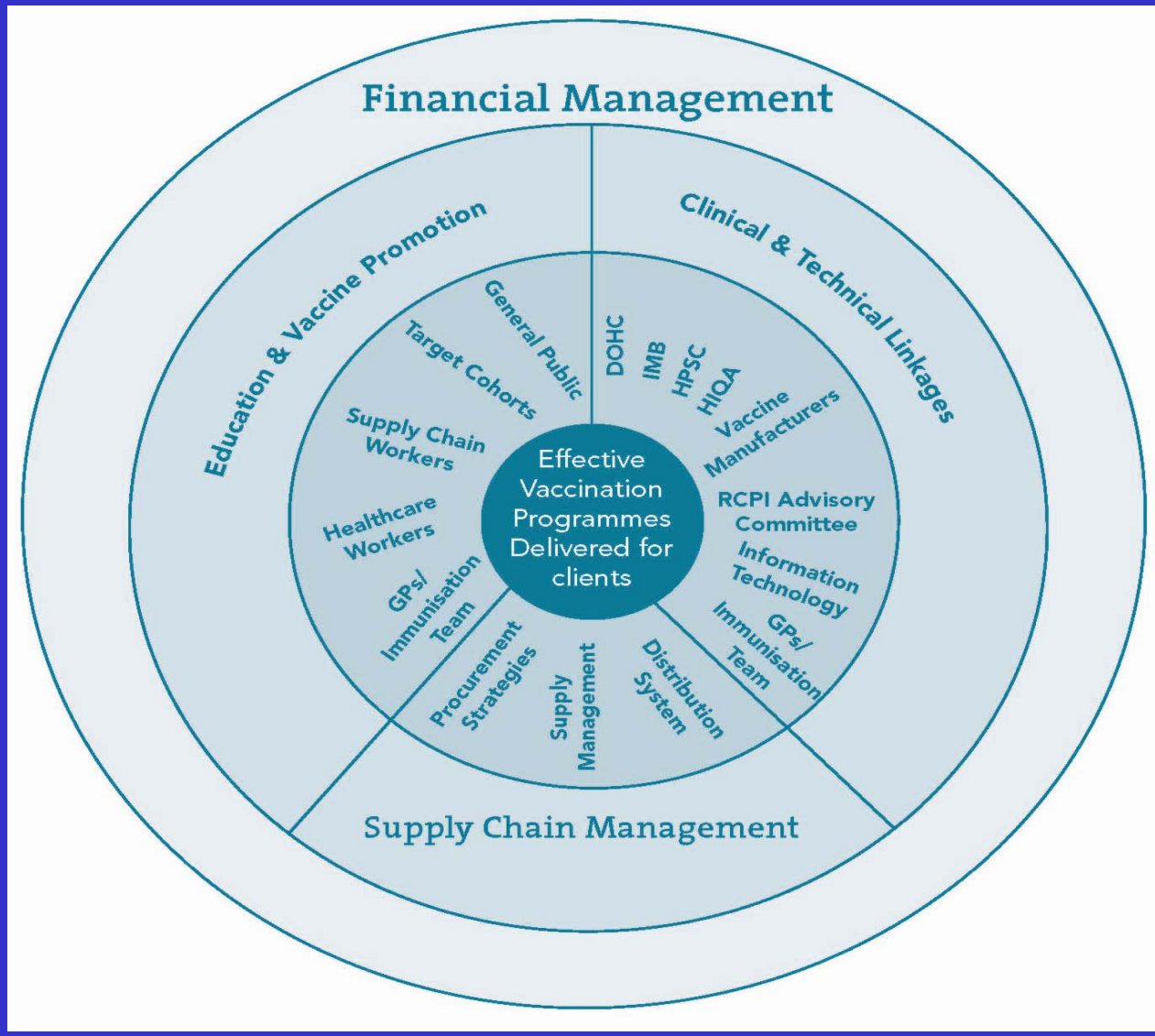
Multidisciplinary components of an immunisation system



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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 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

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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

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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
- 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

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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

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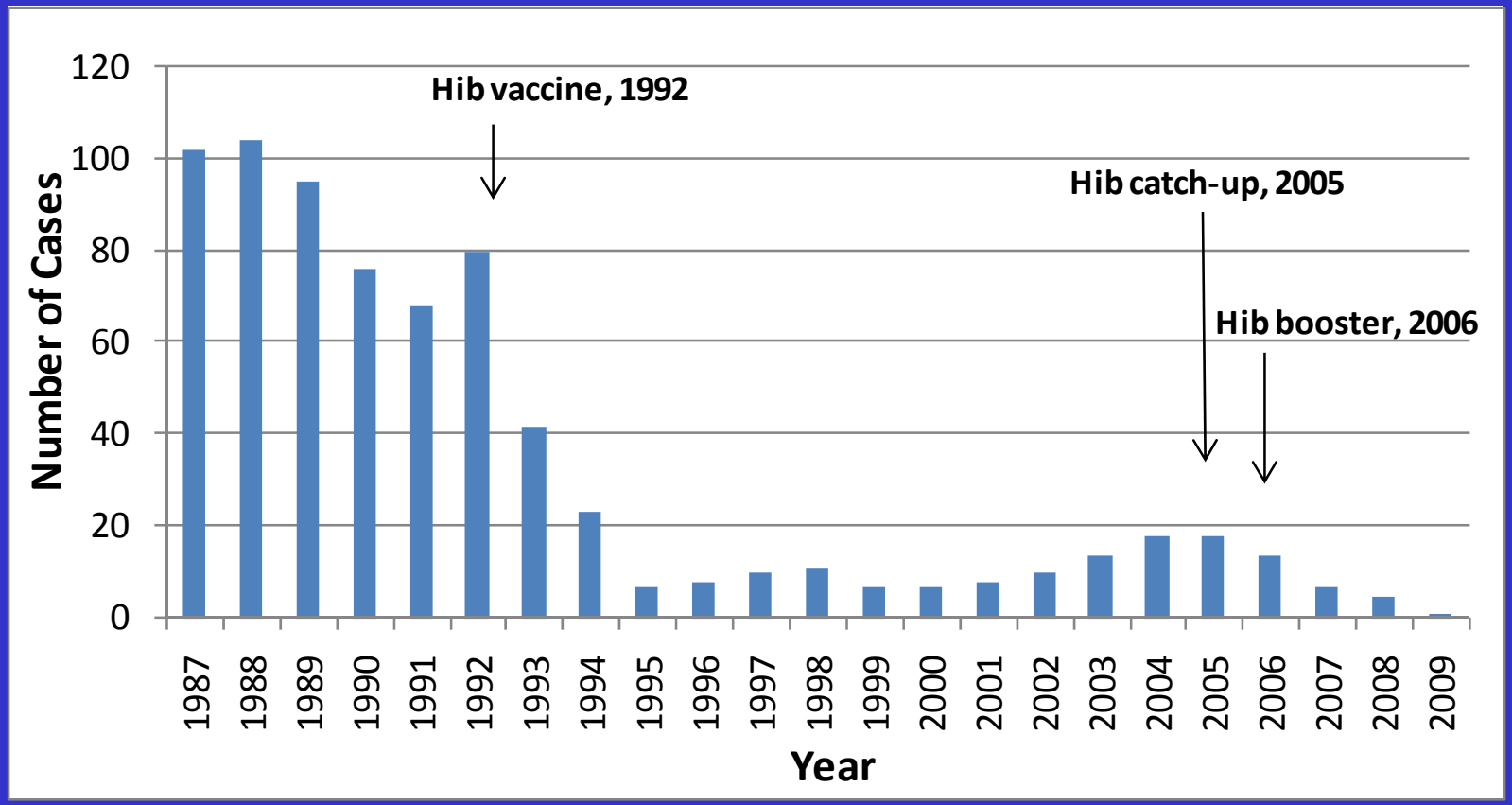
Importance of surveillance - Hib catch up 2006



Source: HPSC

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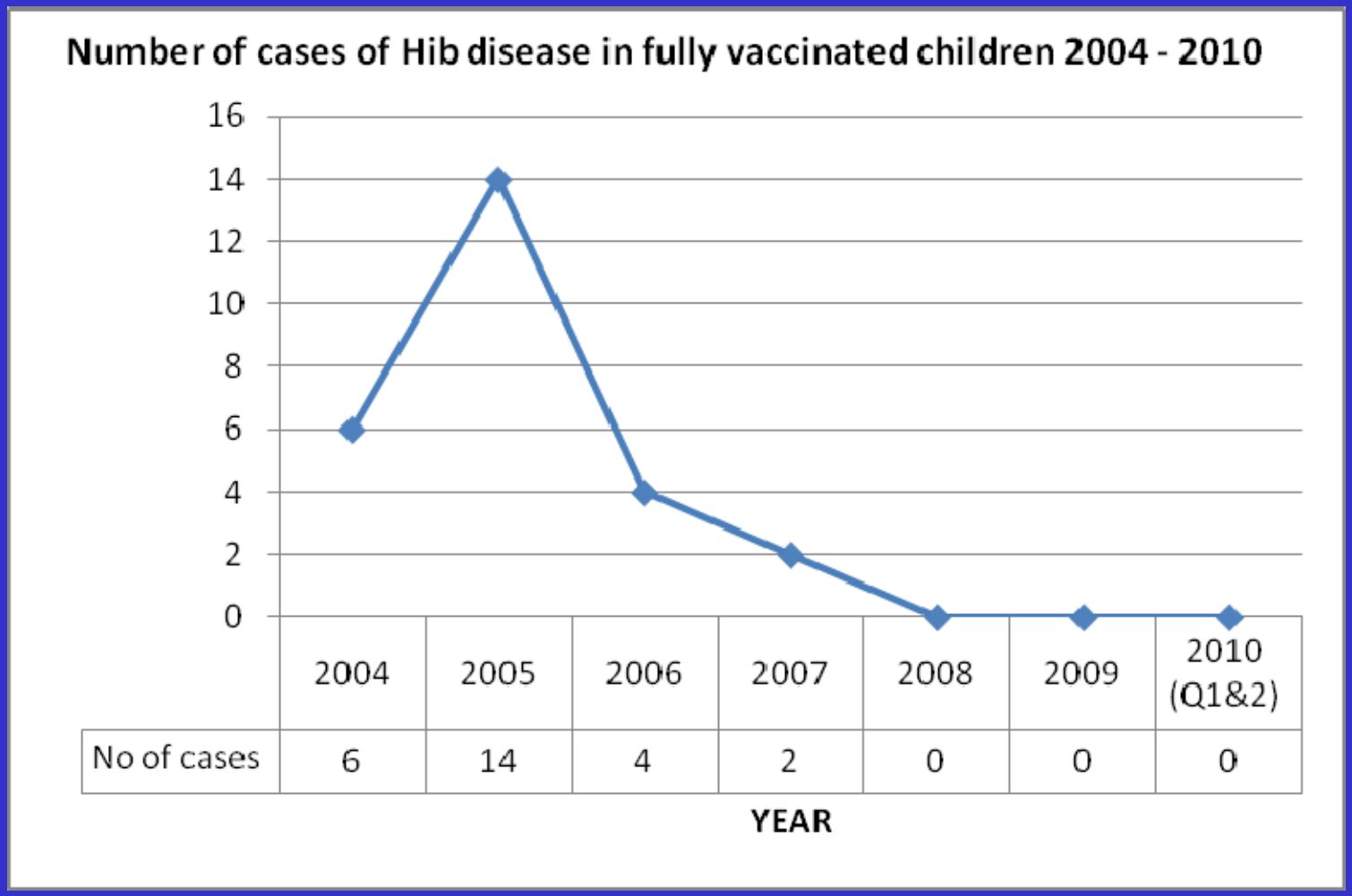
Impact of Hib campaign



Source: HPSC

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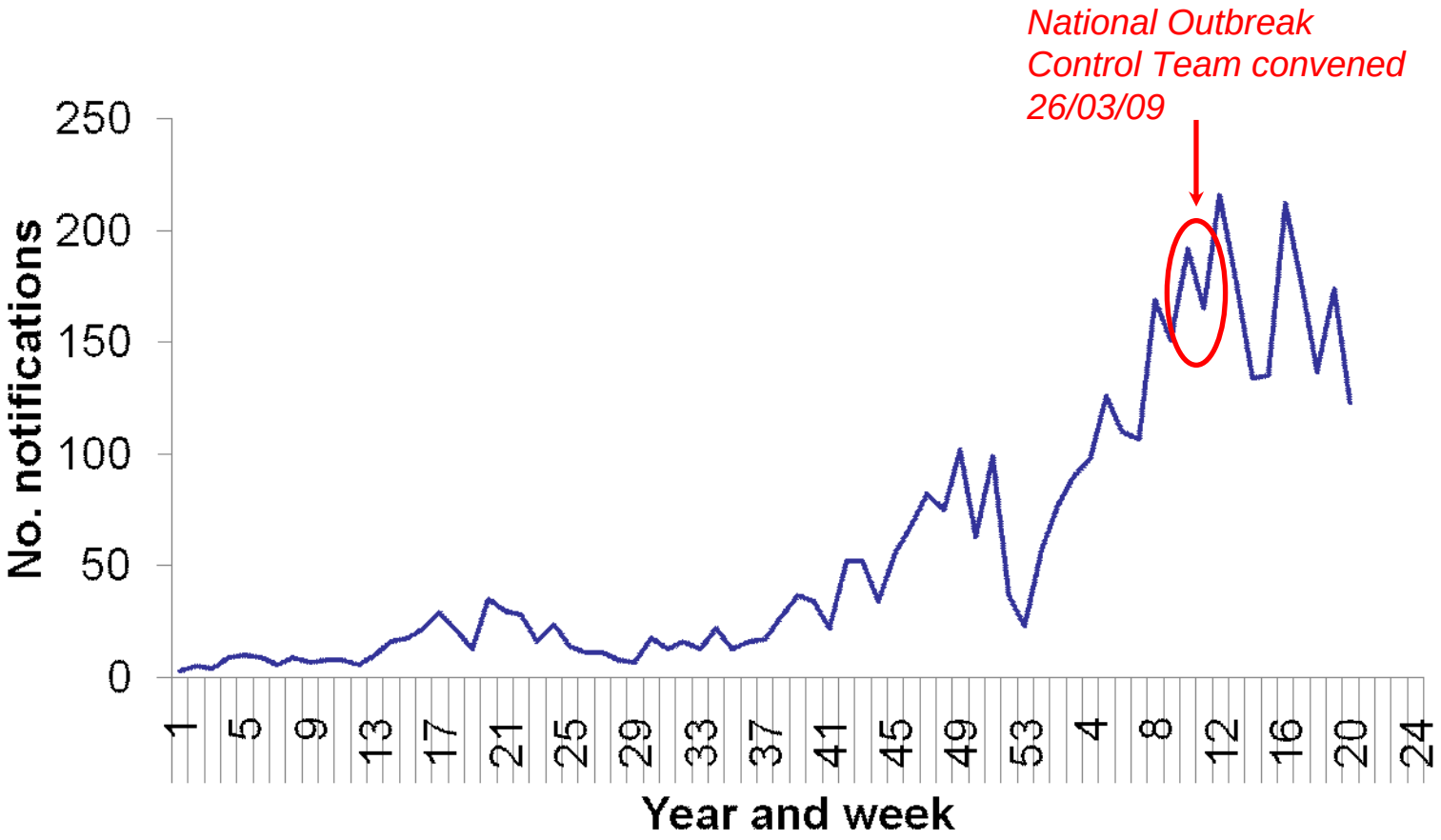
Importance of surveillance
Mumps notifications, in Ireland
2008-week 20 2009*



Source: HPSC

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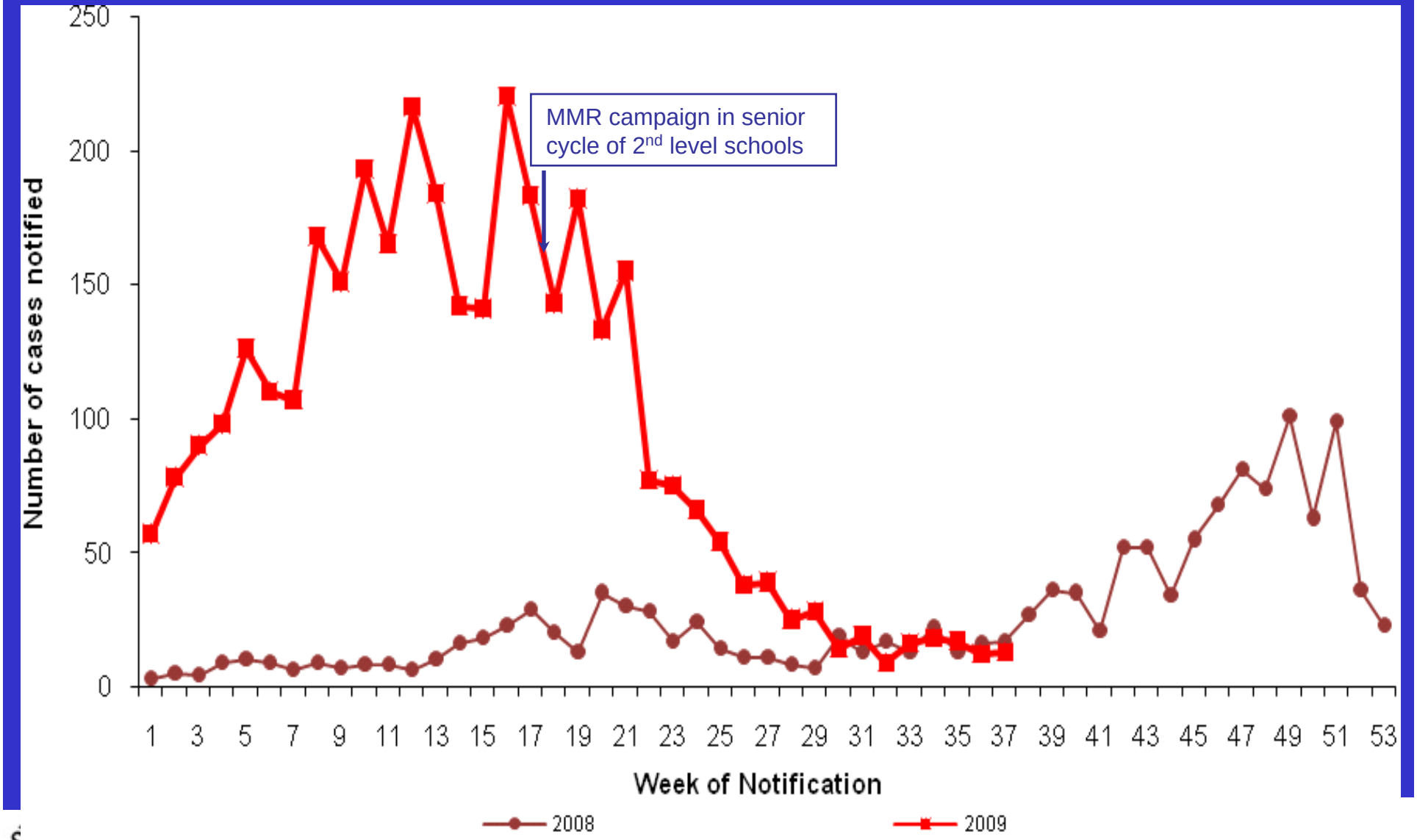
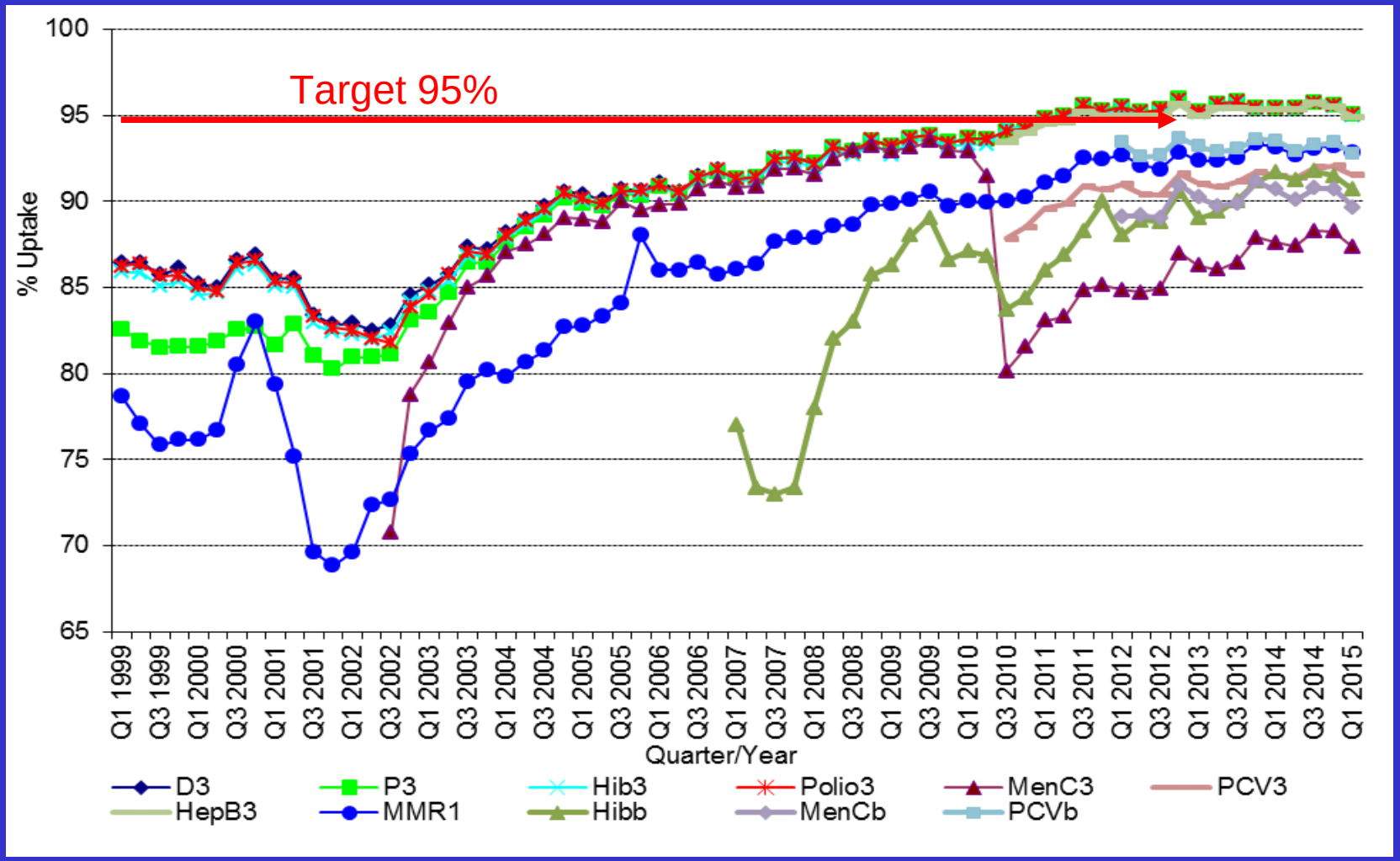
Mumps notifications 2008 and 2009



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 1999-2015



Source: HPSC

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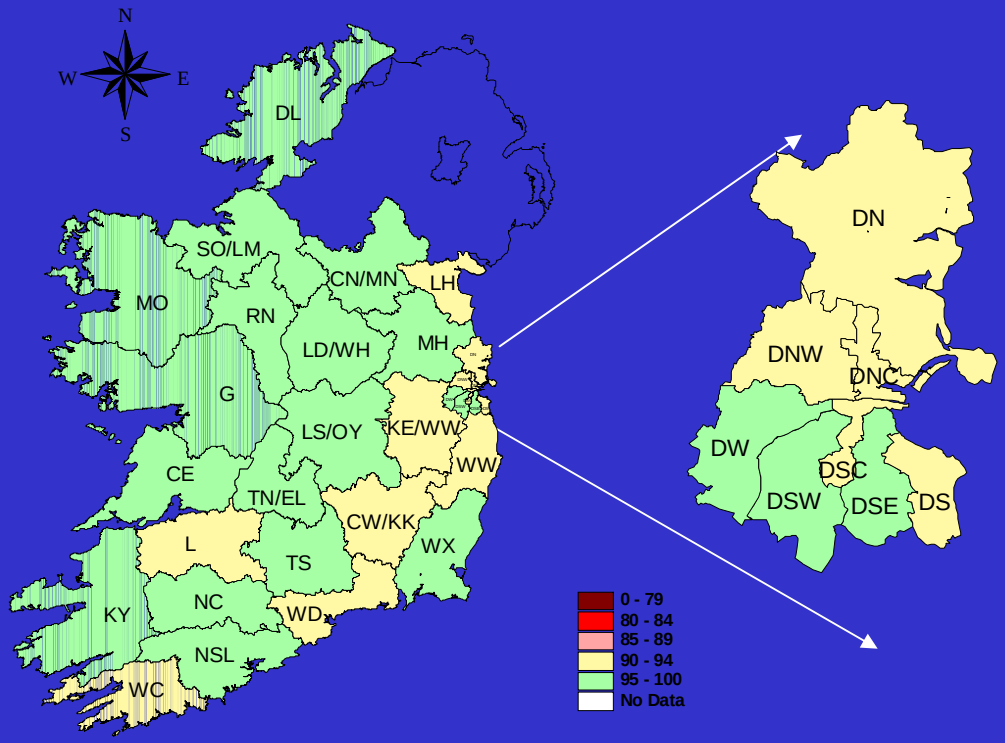
Quarter 1 2015 D3 immunisation uptake rates (%) by LHO, in those 24 months of age in Ireland and Dublin
(source HPSC)



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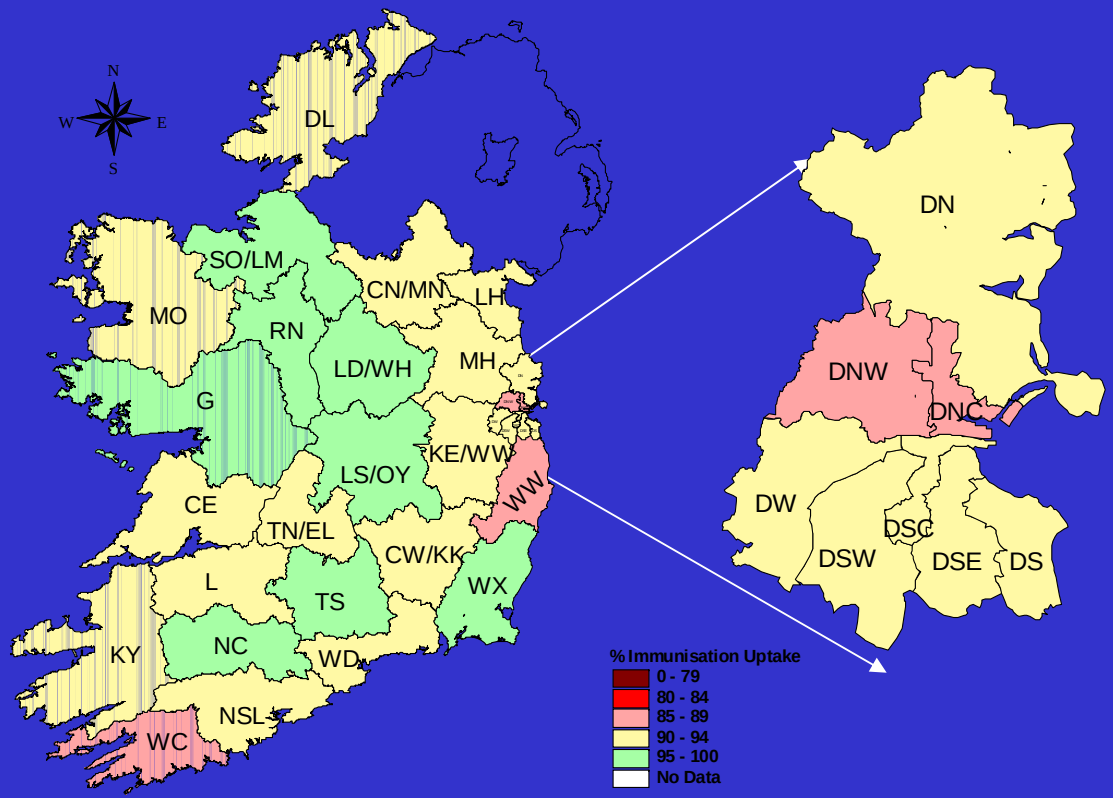
Quarter 1 2015 MMR immunisation uptake rates (%) by LHO, in those 24 months of age in Ireland and Dublin
(source HPSC)



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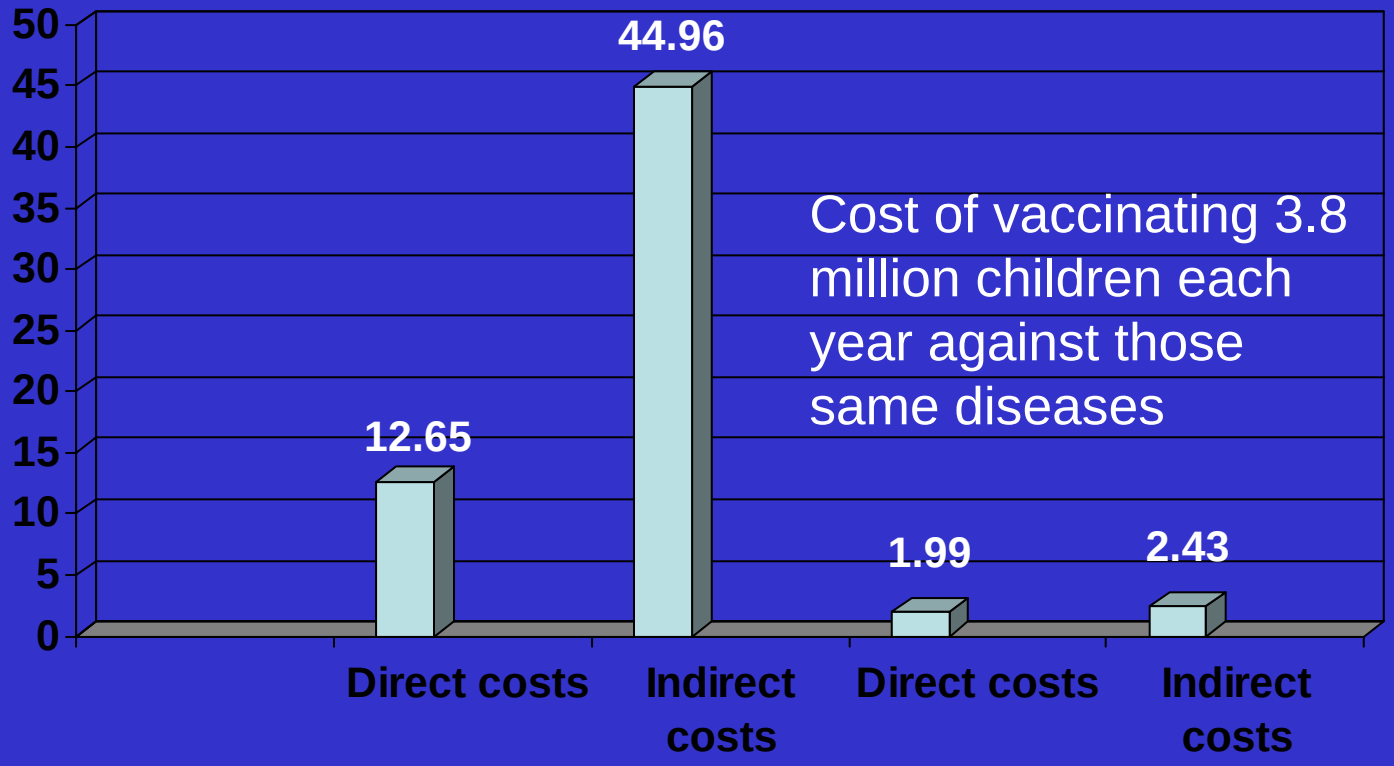
Economic benefits of immunisation

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



Cost of vaccinating 3.8 million children each year against those same diseases

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

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

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