

History and aims of immunisation

Dr Brenda Corcoran

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 11th century BC

Inoculation described 6th century BC

1796 vaccinia virus isolated



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

Polio

Endemic for thousands of years

1955 Inactivated polio vaccine

1962 Live oral polio vaccine

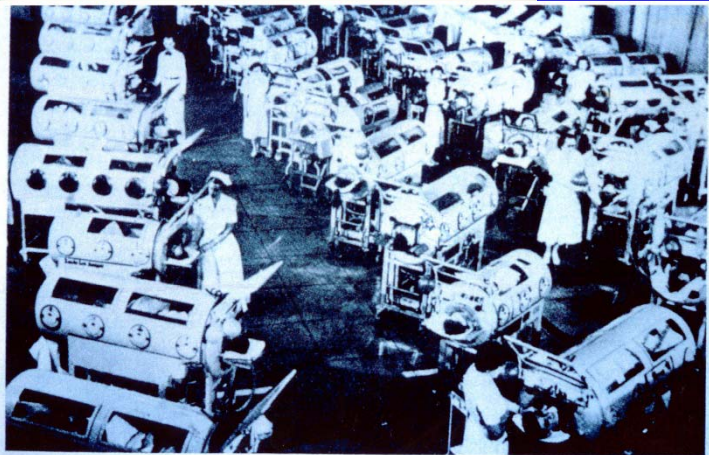
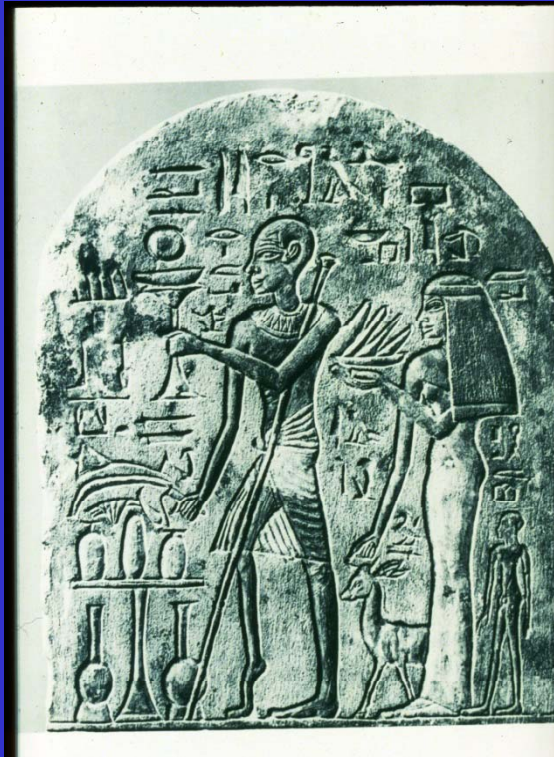


Figure 1.2 A ward of patients suffering from bulbar poliomyelitis



courtesy of www.polioeradication.org

www.immunisation.ie

Polio

Immunisation campaigns in
Cuba and Eastern Europe

Wild polio virus eradicated
in large areas

Basis for eradication

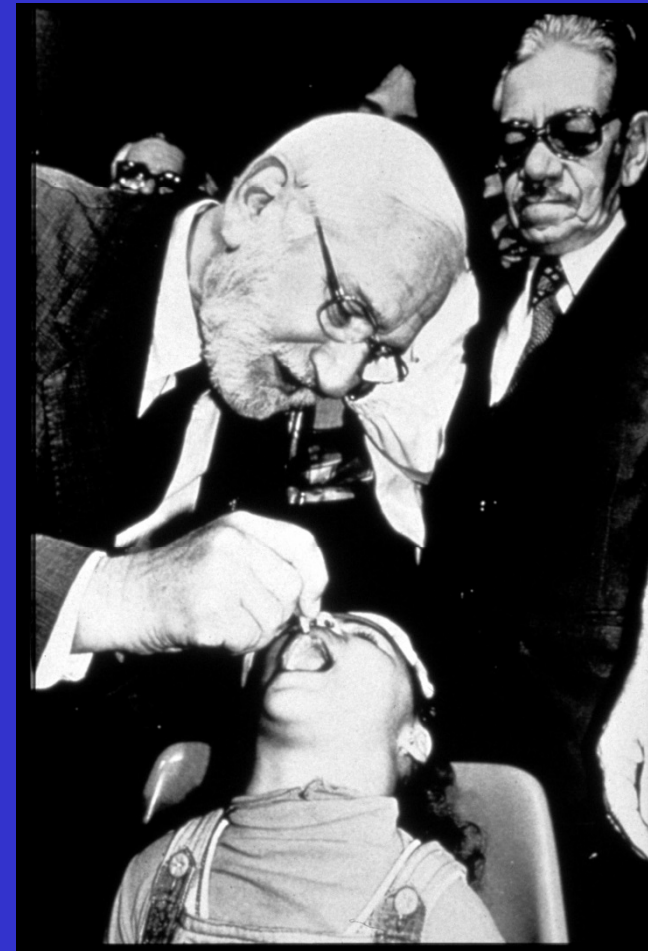


Photo courtesy of www.polioeradication.org



www.immunisation.ie

Polio



Polio 2016

- 74 cases in 2015
- 26 cases to date in 2016
- 3 in non endemic countries
- Pakistan/ Afghanistan/ Nigeria

**Global Polio
Eradication Initiative**



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



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

Comparison of 20th Century Annual Morbidity & Current Morbidity

Disease	20 th Century Annual Morbidity*	2013 Reported Cases [†]	% 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 [§]	>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.



Reidhmeannacht na Seirbhíse Sláinte
Health Service Executive

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 [*]	2,890 [†]	98%
Hepatitis B (acute)	66,232 [*]	18,800 [†]	72%
Pneumococcus (invasive)			
All ages	63,067 [*]	33,500 [¶]	47%
<5 years of age	16,069 [*]	1,900 [§]	88%
Rotavirus (hospitalizations <3 years of age)	62,500 [‡]	12,500 ^{**}	80%
Varicella	4,085,120 [*]	167,490 ^{††}	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)



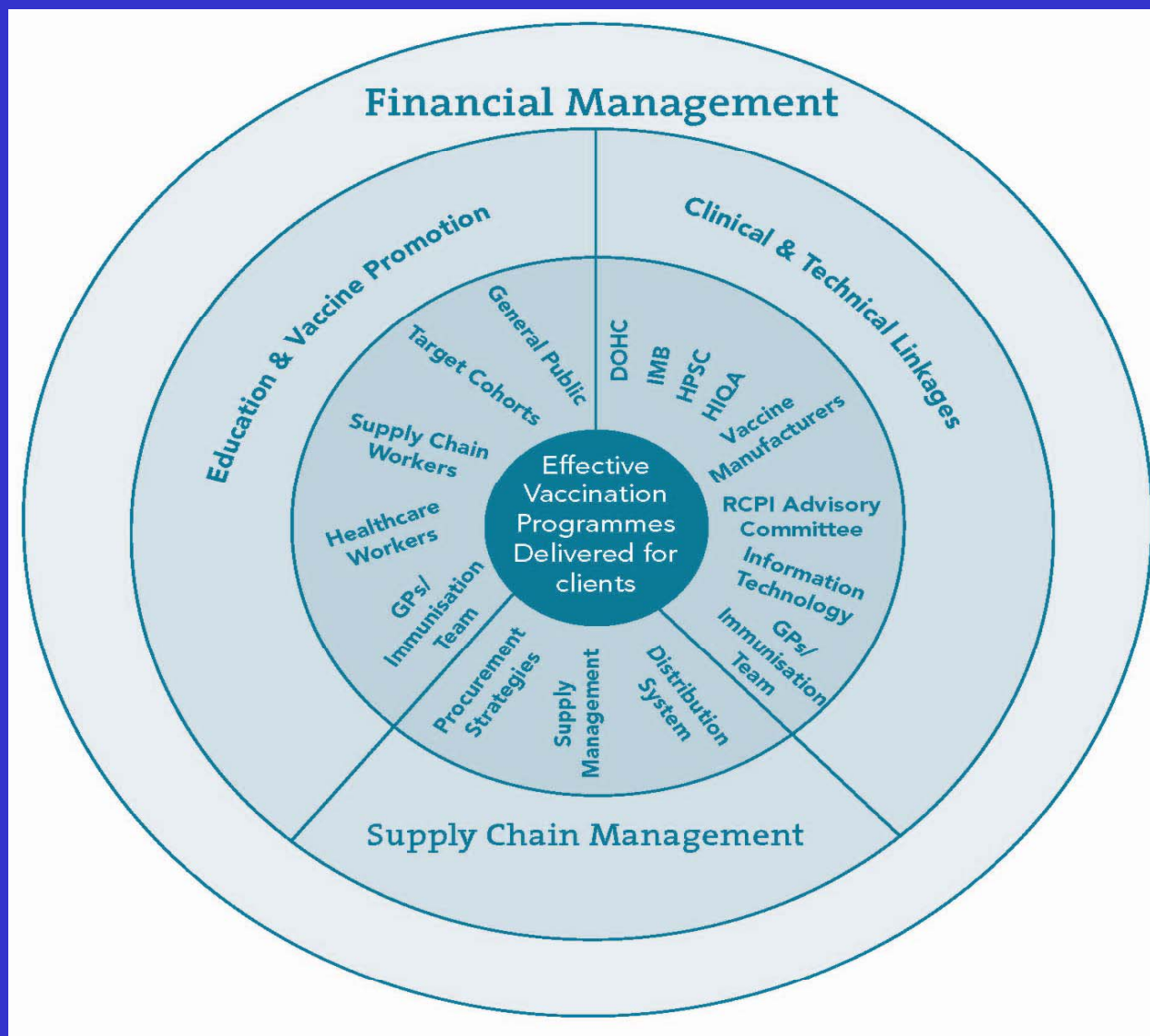
Reidhmeannacht na Seirbhíse Sláinte
Health Service Executive

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



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
- 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

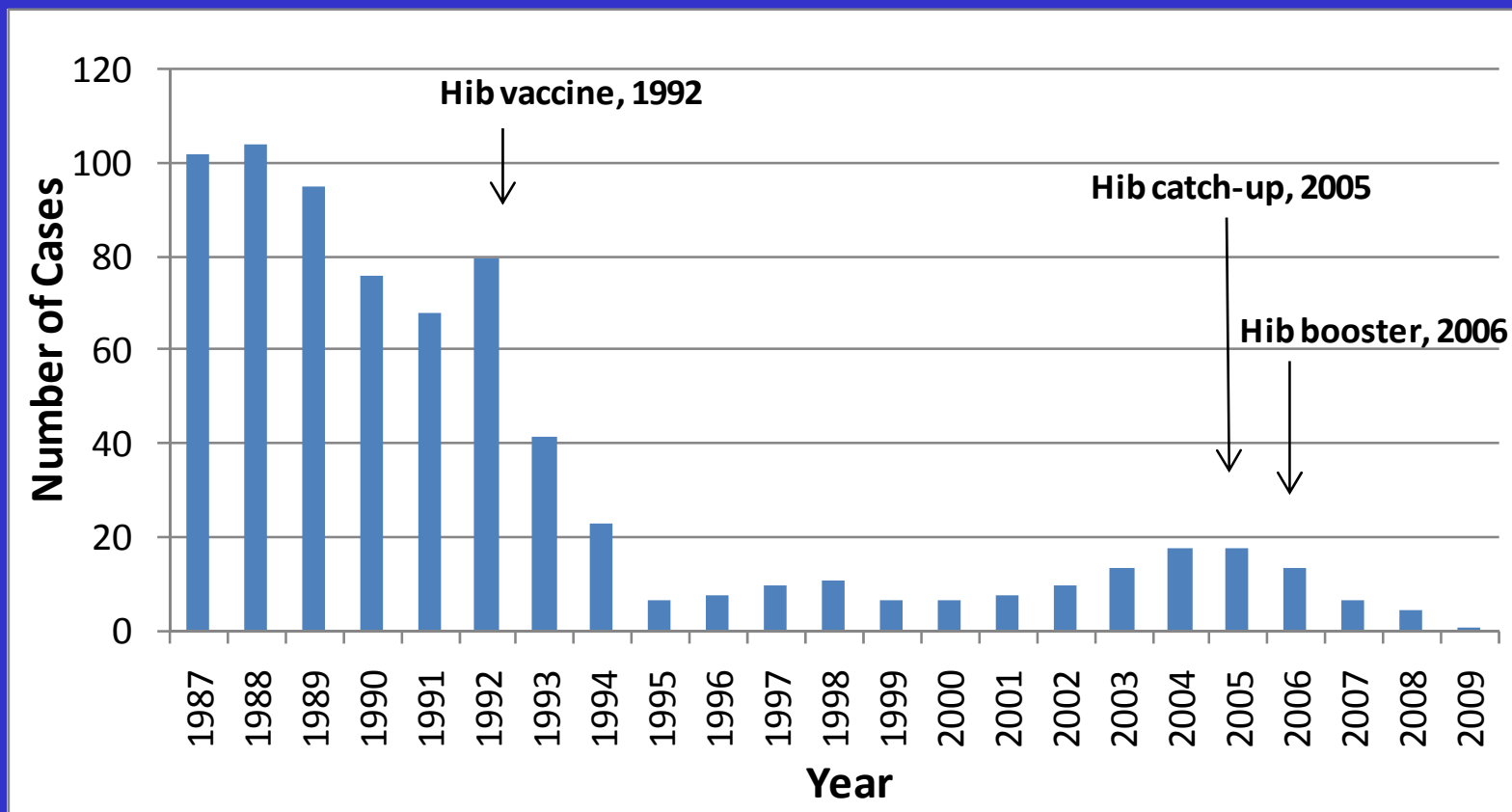


Health Protection Surveillance Centre (HPSC)

- 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

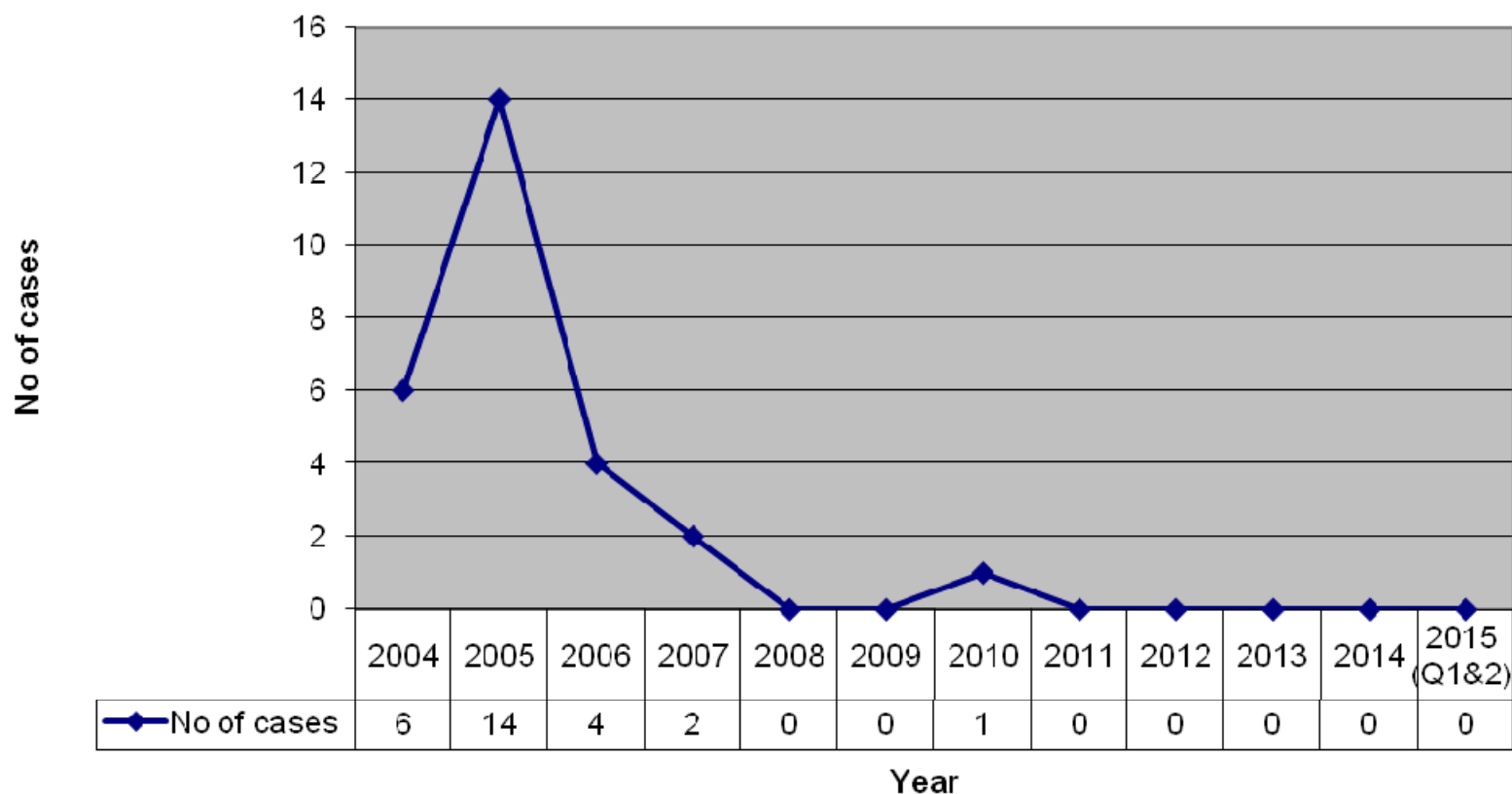


Source: HPSC



Impact of Hib campaign

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



Source: HPSC

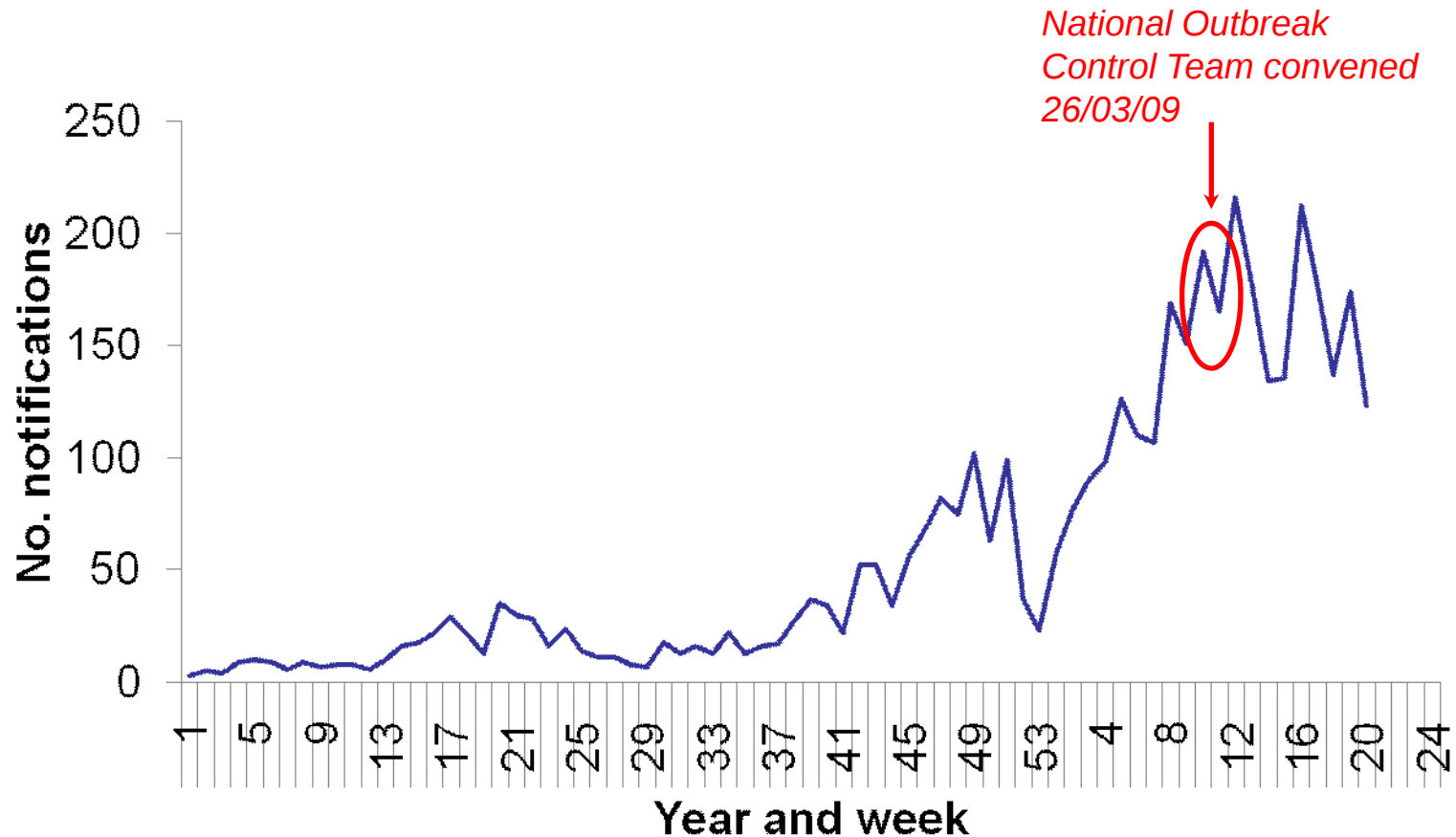


www.immunisation.ie

Importance of surveillance

Mumps notifications, in Ireland

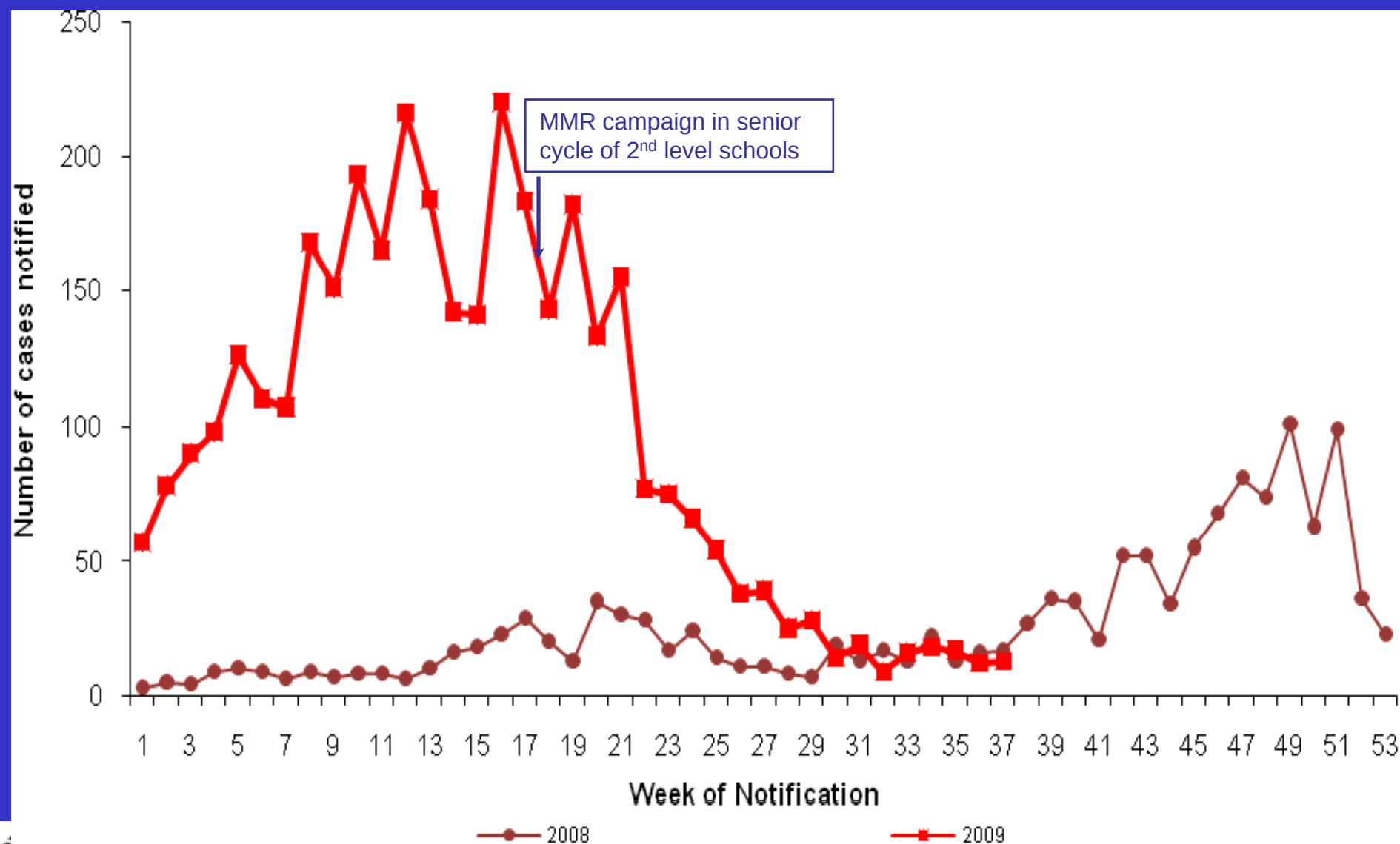
2008-week 20 2009*



Source: HPSC

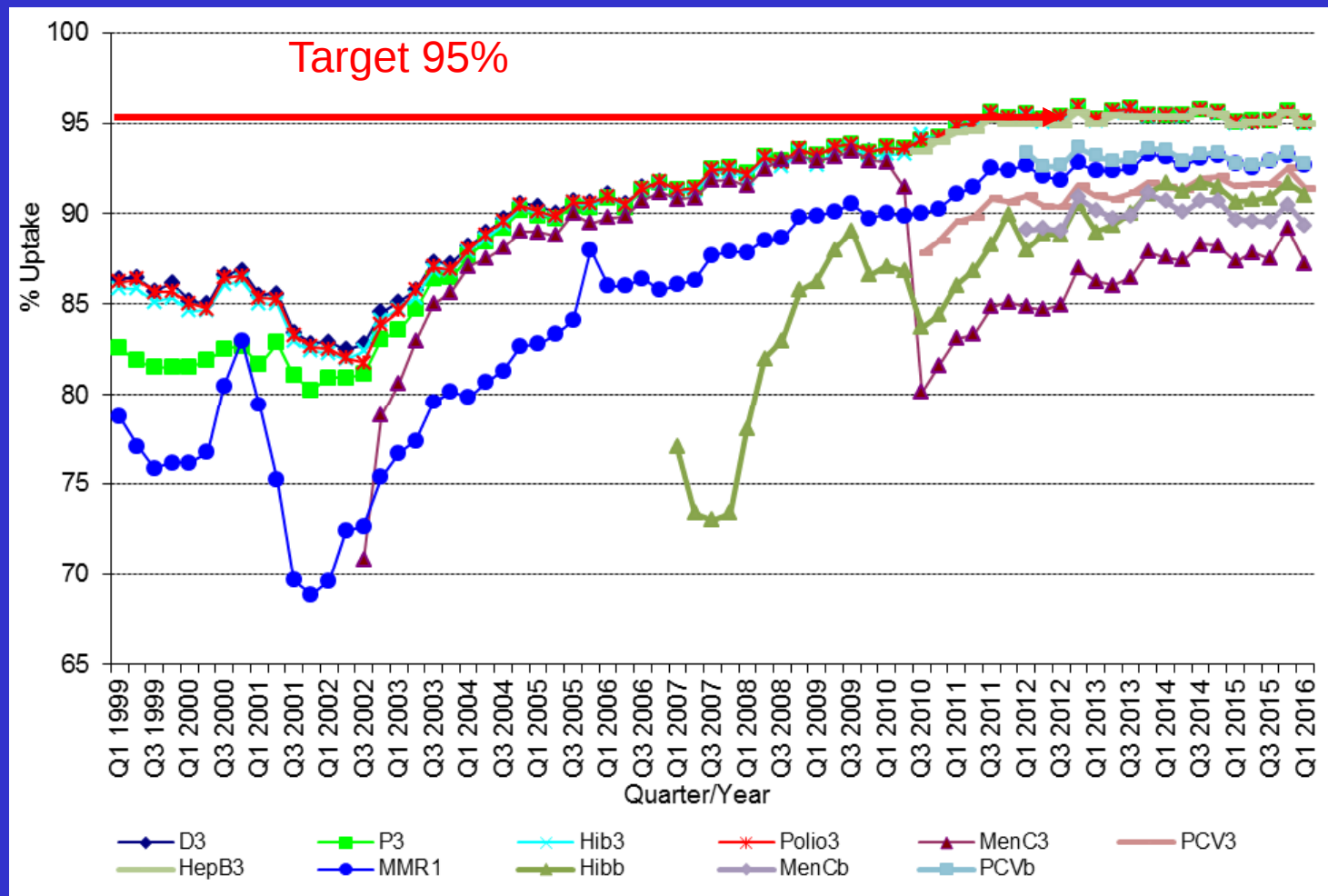


Mumps notifications 2008 and 2009



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

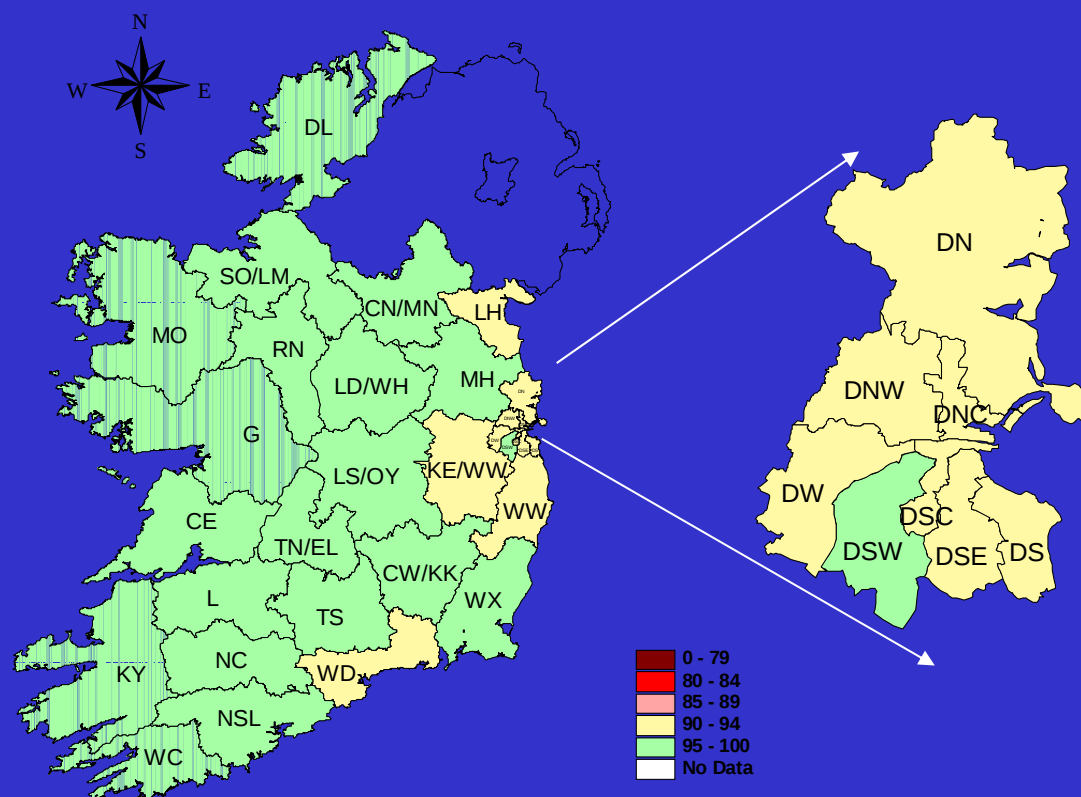
Vaccine uptake rate at 24 months 1999-2016



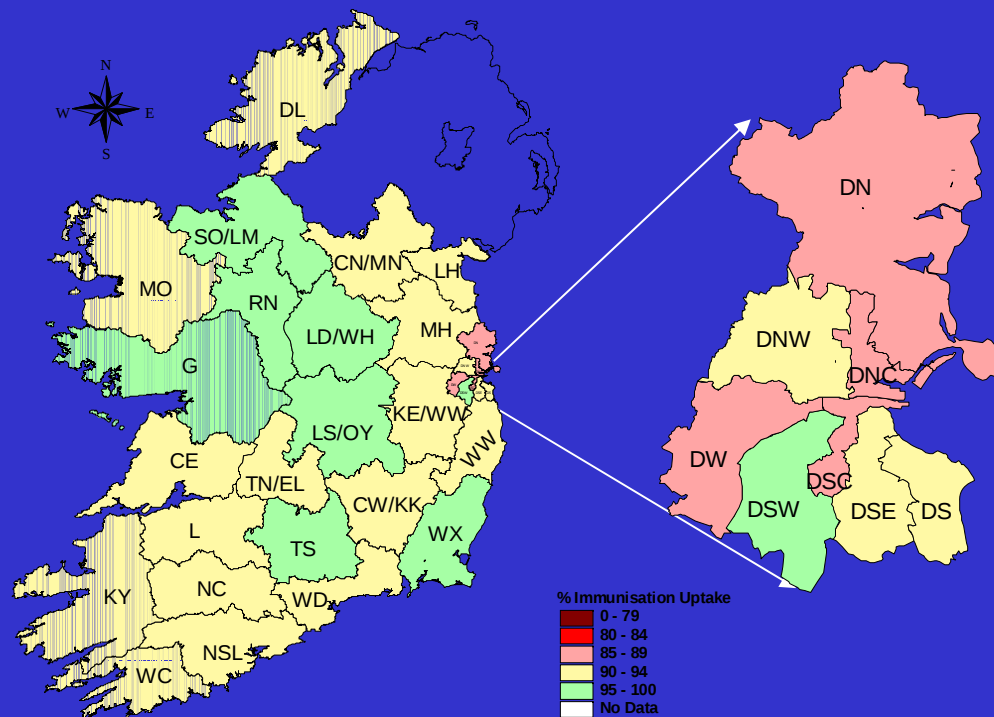
Source: HPSC



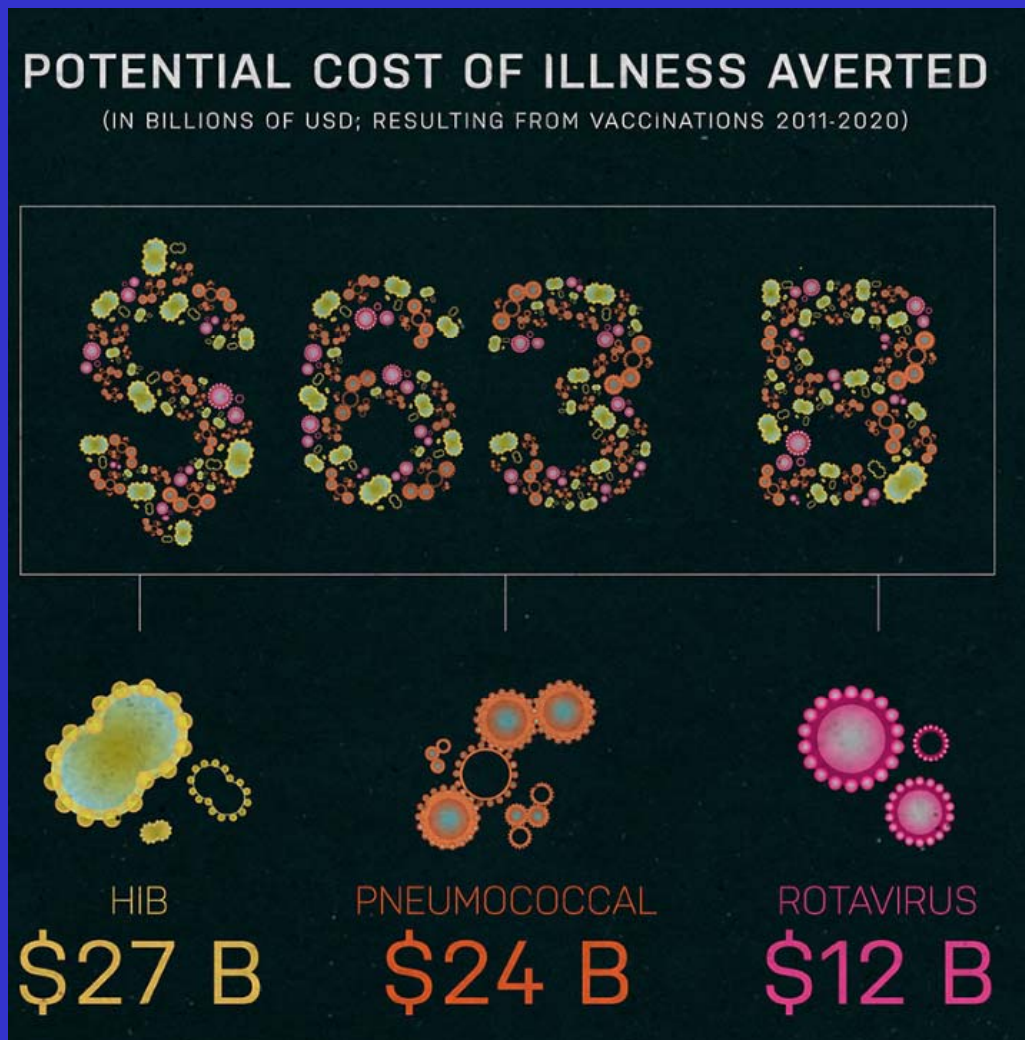
Quarter 1 2016 D3 immunisation uptake rates (%) by LHO, in those 24 months of age in Ireland and Dublin (source HPSC)



Quarter 1 2016 MMR immunisation uptake rates (%) by LHO, in those 24 months of age in Ireland and Dublin (source HPSC)

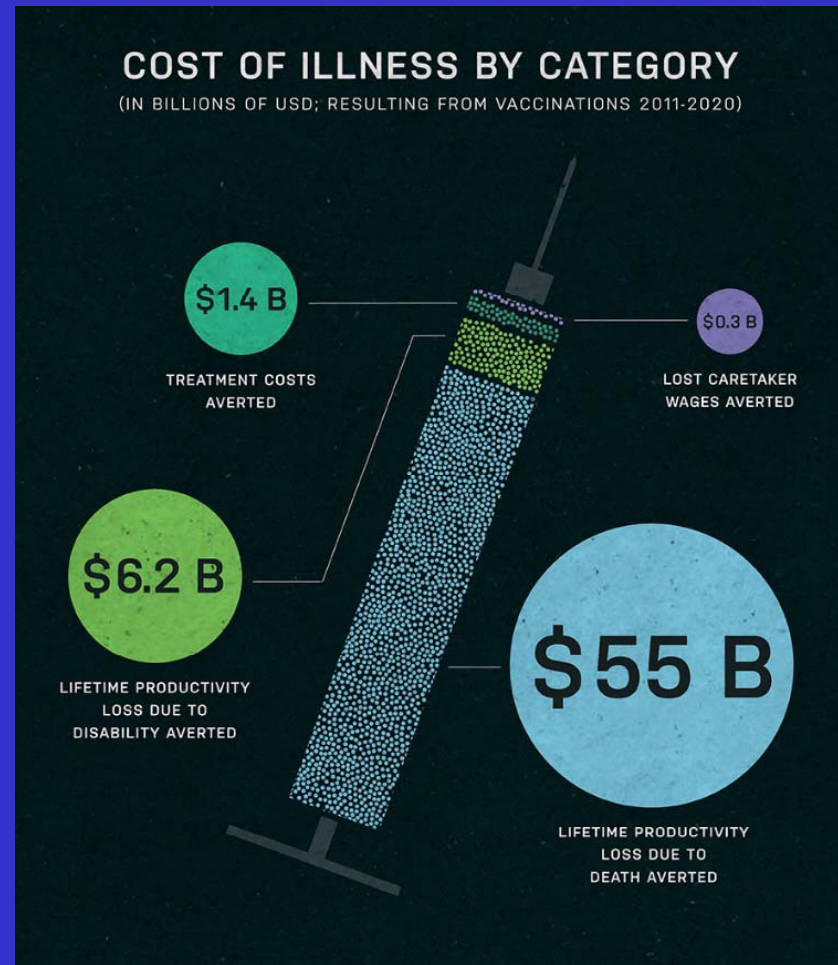


Economic benefits of immunisation



www.immunisation.ie

Economic benefits of immunisation



www.immunisation.ie

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



More information

National Immunisation News

The newsletter of the HSE National Immunisation Office

July 2016

Changes to the Primary Childhood Immunisation Programme
The National Immunisation Advisory Committee (NIAC) has recommended the addition of meningococcal B (MenB) and rotavirus vaccines to the primary childhood programme.

The new schedule outlined below will be introduced for **all babies born on or after October 1st 2016**.

CURRENT SCHEDULE				Babies born on or after 1st October 2016	
Age (months)	Vaccine	No of injections	Vaccine	No of injections	
2	6 in 1 + PCV	2	6 in 1 + PCV + MenB		
4	6 in 1 + MenC	2	6 in 1 + MenB + Rot		
6	6 in 1 + PCV	2	6 in 1 + PCV + Men		
12	MMR + PCV	2	MMR + MenB		
13	MenC + Hib	2	Hib/MenC + PCV		

Contents

- Changes to the PCI Programme
- Measles outbreak, Ireland 2016
- BCG vaccine shortage
- Primary School Vaccination Programme 2016/2017
- Tdap vaccination in pregnancy
- HPV Vaccine Safety
- Fatal diphtheria case in unvaccinated 3-year-old child in Belgium 2016
- Students going to college
- Common Queries

6 in 1

PCV
MenB
Rotavirus
MenC
MMR
Hib/MenC

Measles is an outbreak in Ireland. See the areas most affected are: East, South, and Midwest. Most of these cases are under 30 years of age. Most of those who have been in Ireland have not had the vaccine. See [MainBody.15](#)



Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive
www.immunisation.ie



online only



NATIONAL IMMUNISATION ADVISORY COMMITTEE

Immunisation Guidelines for Ireland

2013 Edition

- Who we are
- Public Information
- Healthcare Worker Information
- Information Materials
- Glossary
- Useful Websites



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.

HSE National Immunisation Office

Contact us using our Online Form Phone: 01 867 6108 Fax: 01 868 2943



Important News
MenB and Rotavirus Vaccines, BCG vaccine, HPV Safety and Flu



Check Vaccine Records
How to request a copy of your records



Patient Information
Leaflets and Vaccine Contents
Detailed information about vaccines



Baby and Childhood Immunisation
Immunisation is a simple, safe, effective way of protecting babies and children



School Programme
Information about the 4 in 1 and MMR, HPV, Tdap and MenC school vaccination programme



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



How do I?

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



Further Information

- > [Your Child's Immunisation - A Guide for Parents](#)
- > [Translation of Immunisation Material](#)
- > [Current Vaccination Schedule](#)
- > [Previous Vaccination Schedule](#)



Useful Links

- > [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

