History and aims of immunisation

Dr Fiona Ryan

Department of Public Health, HSE

April 2015

Objectives

- To explain the aim of immunisation
- To examine the history 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

Aims of Immunisation

- Prevention of disease is individual or groups
- Eradication of a disease
  - Smallpox
  - Measles
- Control of a disease
  - Tetanus
- Individual Protection
- Population Protection

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

Smallpox

- The Cow Pock – Wonderful effect of new inoculations!
- 1802

Smallpox

- 1977 Last reported case Somalia
- 1980 WHO declared eradication

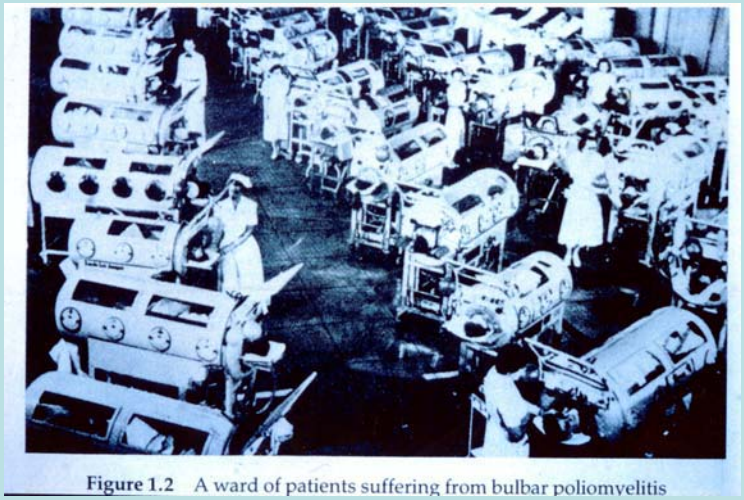


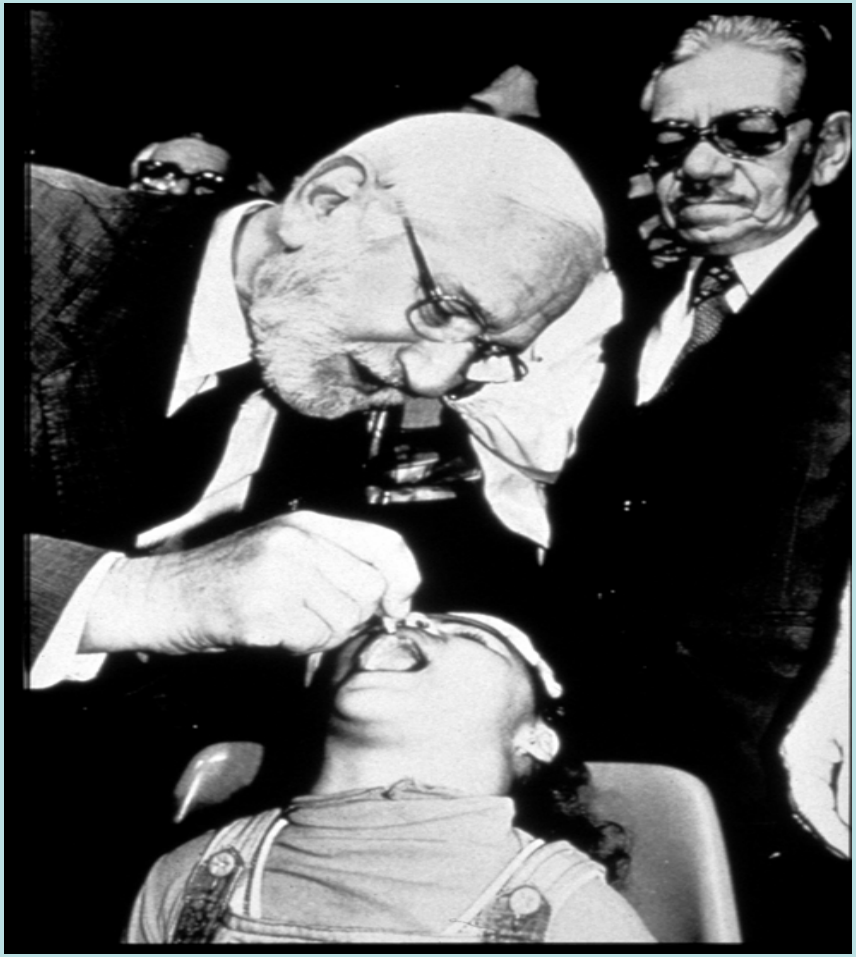
Figure 1.2 A ward of patients suffering from bulbar poliomyelitis

Polio

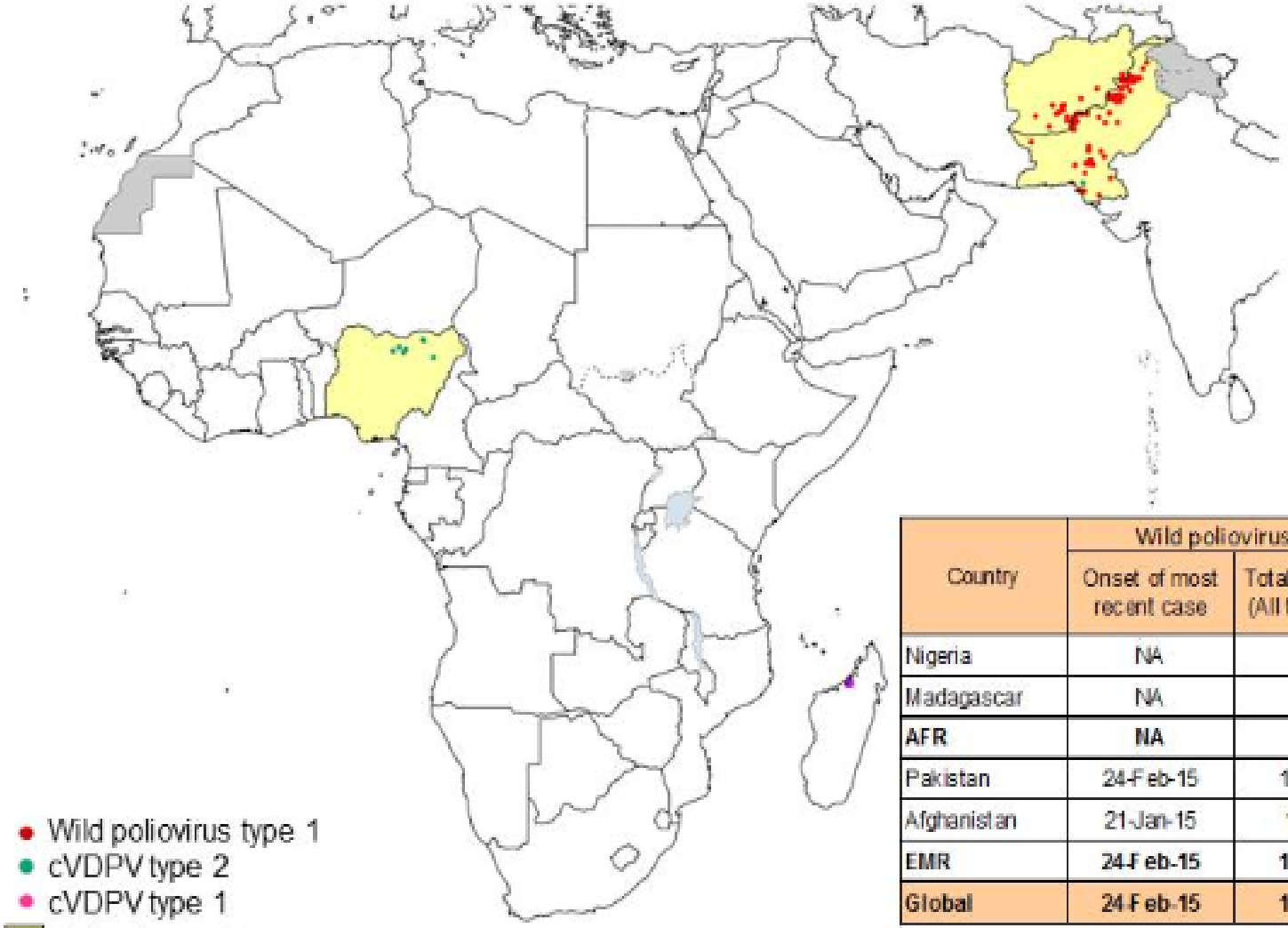
- Endemic for thousands of years
- 1955 Inactivated polio vaccine
- 1962 Live oral polio vaccine

Polio

- Immunisation campaigns in many countries
- Wild polio virus eradicated in large areas
- Basis for eradication



Wild Poliovirus & cVDPV[1] Cases[2], Previous 6 Months[3]



Country	Wild poliovirus		cVDPV	
	Onset of most recent case	Total WPV (All type 1)	Onset of most recent case	Total cVDPV*
Nigeria	NA	0	16-Nov-14	7
Madagascar	NA	0	29-Sep-14	1
AFR	**NA**	**0**	**16-Nov-14**	**8**
Pakistan	24-Feb-15	114	13-Dec-14	1
Afghanistan	21-Jan-15	15	NA	0
EMR	**24-Feb-15**	**129**	**13-Dec-14**	**1**
Global	**24-Feb-15**	**129**	**13-Dec-14**	**9**

*cVDPV1 in Madagascar, cVDPV2 in all other countries. NA: most recent case had onset of paralysis prior to rolling 6 months.

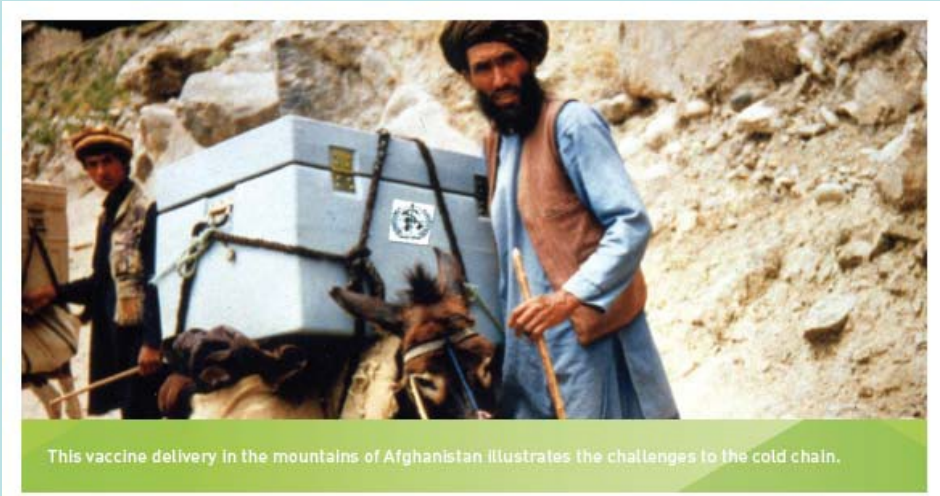
[1]cVDPV is associated with ≥ 2 AFP cases or non-household contacts. VDPV2 cases have ≥ 6 (≥ 10 for type1) nucleotides difference from Sabin in VP1.

[2]Excludes viruses detected from environmental surveillance.

[3]Onset of paralysis 25 September 2014 – 24 March 2015

Polio

- 416 cases in 2013
  - 256 (62%) in non endemic countries (Somalia & Syria)
- 359 cases in 2014
  - 5% in non endemic countries

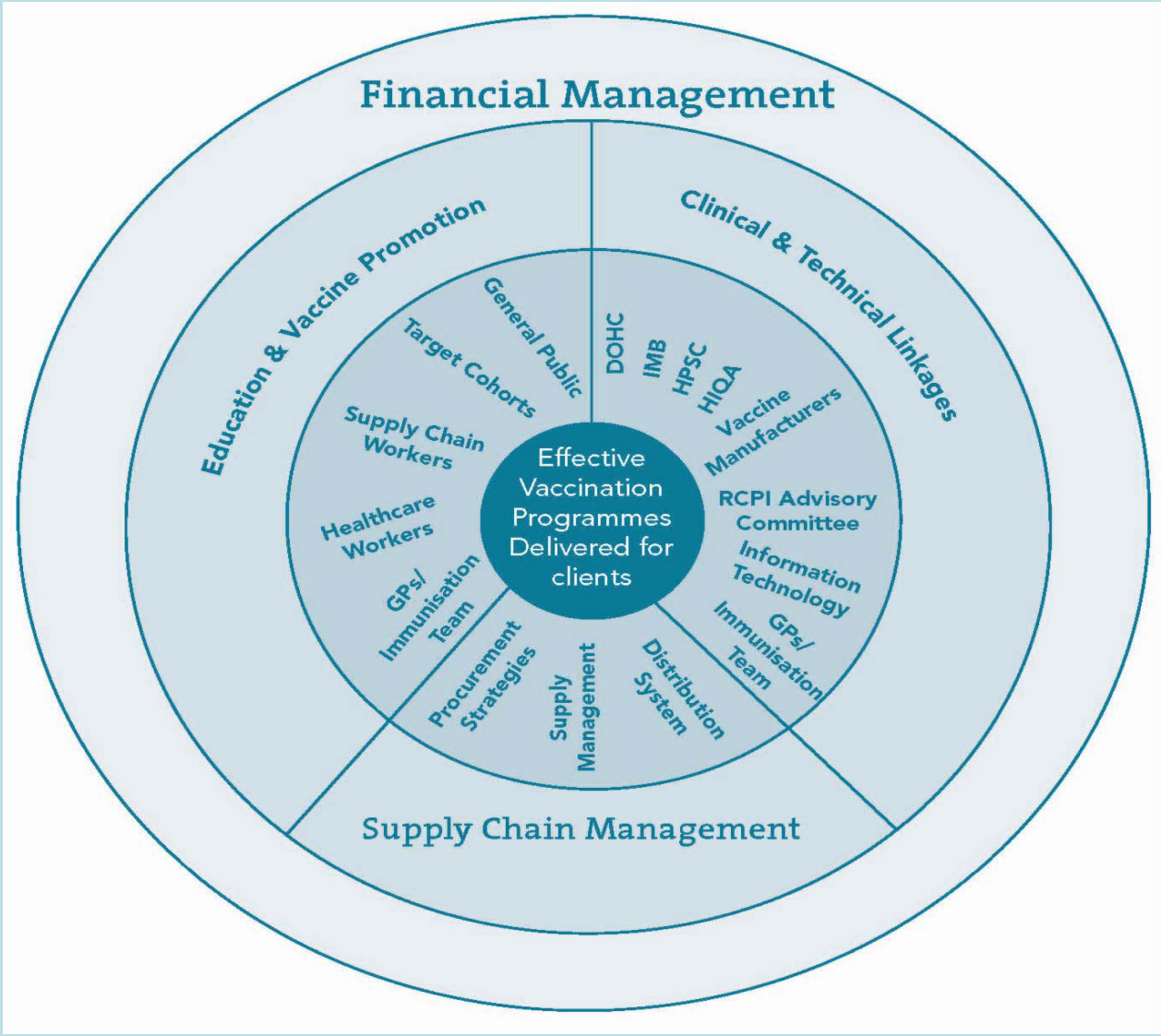


Global Polio Eradication Initiative

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

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

HSE

- Responsible for the implementation of 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

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

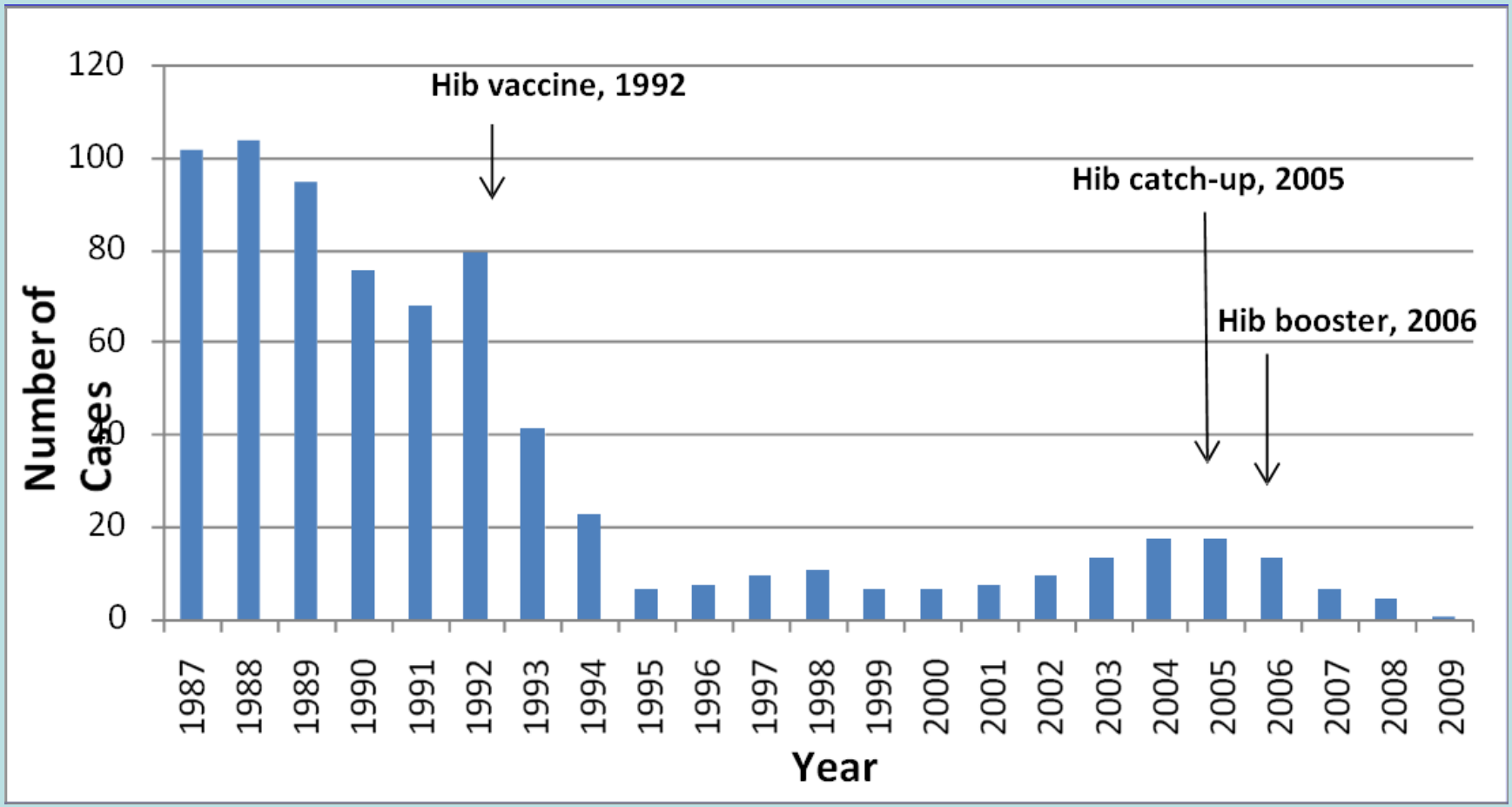
- Vaccine contracts and the HSE National Cold Chain delivery Service to provide vaccine deliveries to all GPs, hospitals and HSE clinics
- Development of a national IT database

  – Currently different IT systems modified with any changes to schedule

Health Protection Surveillance Centre (HPSC)

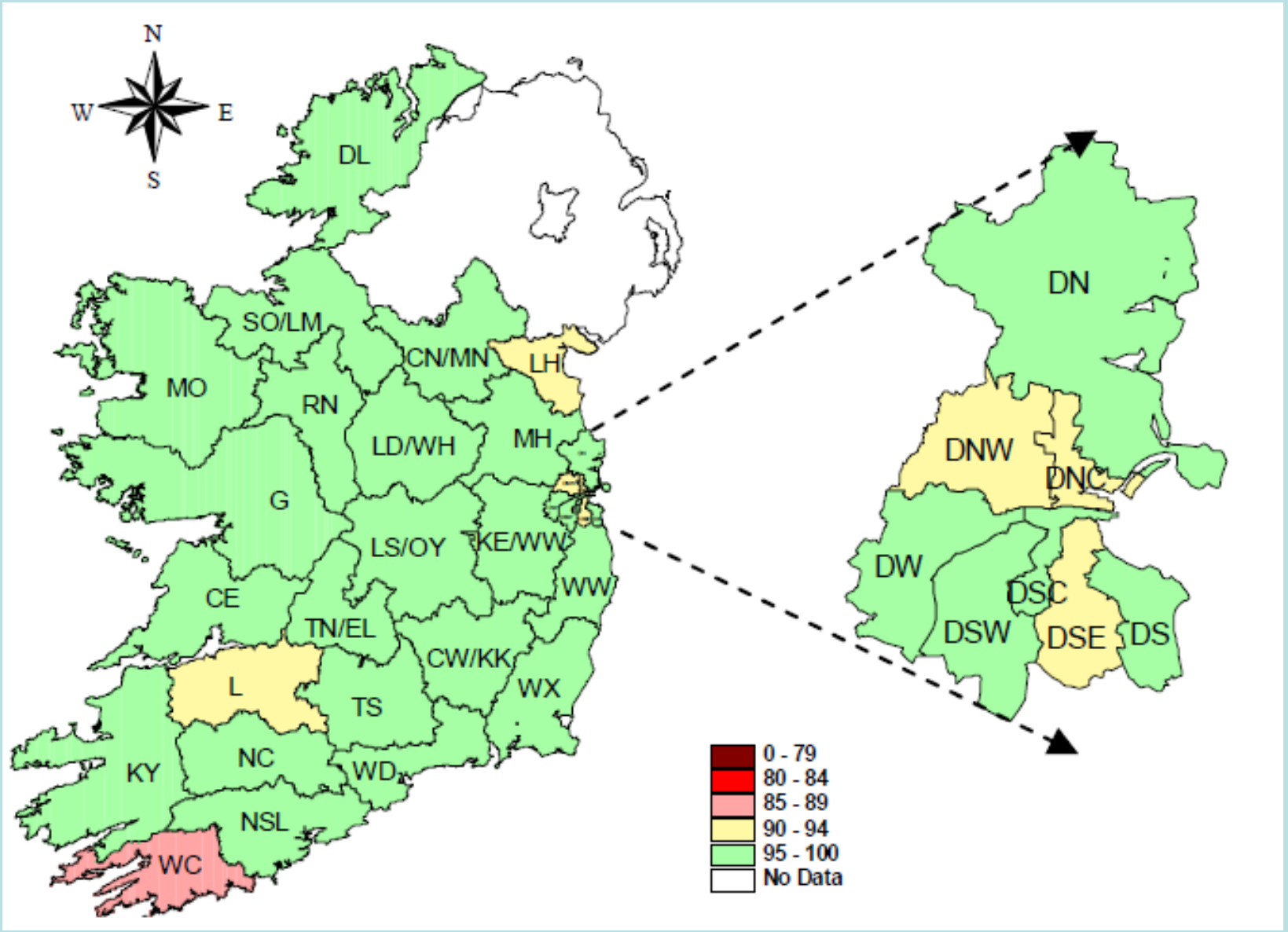
- Responsible for surveillance of vaccine preventable diseases
- Monitors immunisation uptake data from each HSE area and reports on uptake rates

Importance of surveillance - Hib catch up 2006

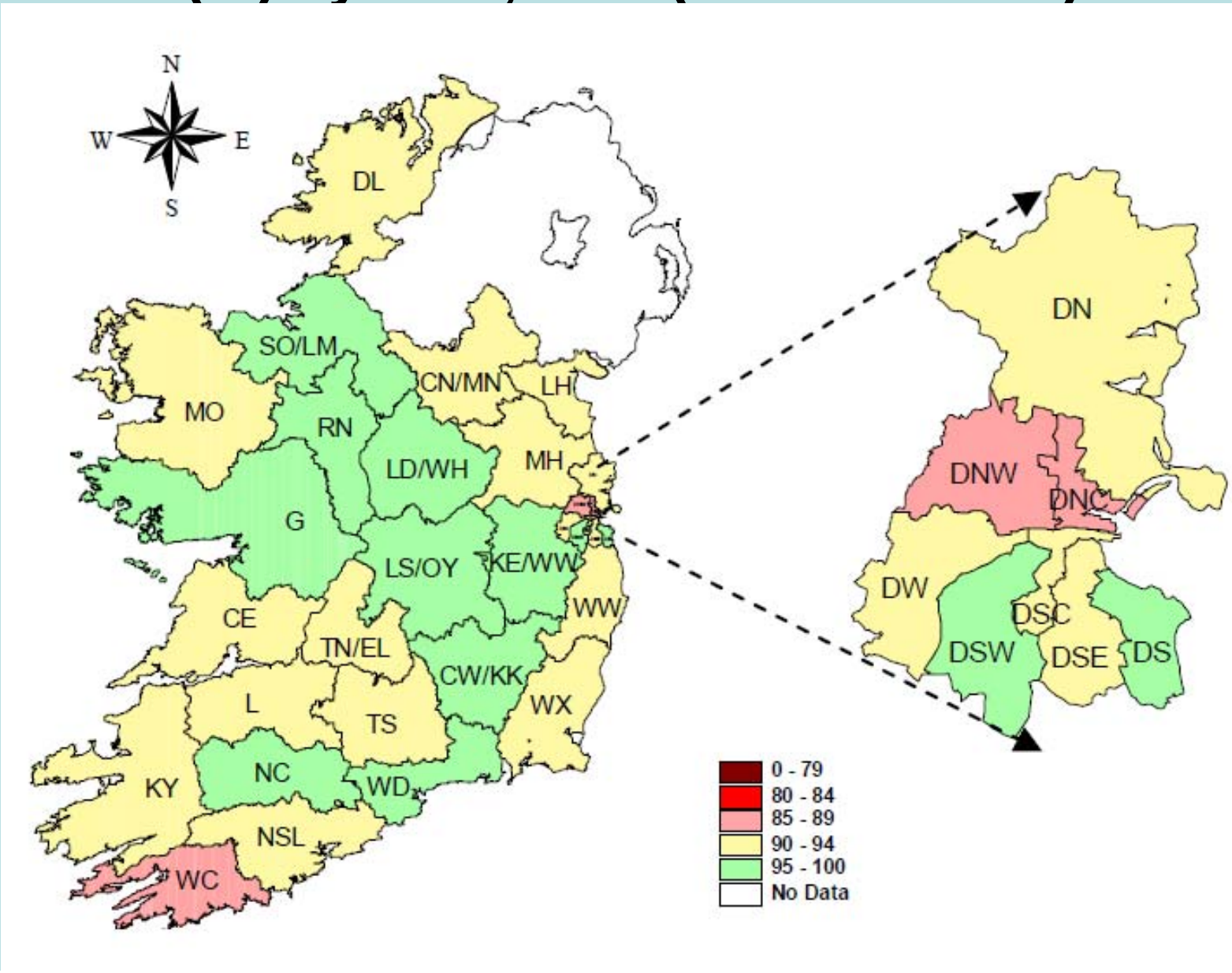


Source HPSC

Quarter 3 2014 D3 immunisation uptake rates (%) by LHO, at 24 months (source HPSC)



Quarter 3 2014 MMR immunisation uptake rates (%) by LHO, at 24(source HPSC)



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