

# Driving Change in Immunisation



The Role of the National Immunisation Office  
2005–2011

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



# Contents



driving  
change

<b>Foreword</b>	2
<b>Executive Summary</b>	3
<b>Mission Statement</b>	5
<b>Staff List</b>	5

<b>Introduction</b>	7
<b>Coordination of Immunisation Programmes</b>	10
<b>Vaccine Supply Chain Management</b>	14
<b>Education and Communication</b>	20
<b>National Immunisation Programmes and Campaigns</b>	27
<b>Research</b>	40
<b>The Future</b>	43
<b>Appendix 1 Cold Chain Products available from National Cold Chain Service 2011</b>	44
<b>Appendix 2 List of Publications 2011</b>	45
<b>Appendix 3 Primary Childhood Immunisation Programme 2005–2011</b>	46
<b>Appendix 4 Changes in Immunisation 2005–2011</b>	47
<b>Appendix 5 National Immunisation Schedule December 2011</b>	48
<b>Glossary</b>	49

# Foreword

The National Immunisation Office (NIO) was established in 2005 to coordinate the implementation of standardised high quality immunisation programmes in Ireland.

Between 2005–2011 there have been considerable enhancements to the childhood and schools immunisation programmes. These improvements, together with a number of successful catch-up campaigns, have resulted in significant decreases in morbidity and mortality.

These changes, the increasing population and the 2009 H1N1 pandemic, all created challenges for the immunisation programmes and the staff involved in their delivery. However, despite the reductions to budget allocations and staffing constraints, maximum efficiencies were achieved throughout the country and vaccine uptake rates have increased and have reached or are approaching World Health Organization (WHO) targets. This would not have been possible without the input of the NIO and the cooperation of all key stakeholders.

Standardisation of immunisation programmes have been progressed, clinical guidelines developed and staff training and public communication delivered to an impressive standard. In addition considerable savings have been made with the streamlining of vaccine procurement and delivery and the centralised processing of invoices.

These successes are due to the commitment of the seven staff members of the NIO. I would like to acknowledge their pivotal role in driving change in immunisation programmes. I also wish to recognise the members of the implementation groups and subgroups and all those involved in the delivery and support of the immunisation programmes for their hard work and dedication.

This report details the the role of the NIO in the achievements in immunisation between 2005–2011 and also outlines new challenges for the future. The expertise that has been developed across a range of functions within the small team in the NIO will serve to overcome these challenges and deliver additional enhancements to the immunisation programme in a standardised coordinated way.

**Dr Kevin Kelleher**

Assistant National Director

Integrated Services Directorate – Health Protection

June 2012

# Executive Summary

Immunisation is one of the most cost-effective health interventions available, saving millions of people from illness, disability and death worldwide each year. A well-functioning immunisation programme is essential to reducing child mortality and morbidity from vaccine preventable diseases (VPDs).

In 2002 a review of immunisation programmes in Ireland identified fragmented structures and a lack of standardised processes as key challenges to improving immunisation uptake rates. As a result the Health Service Executive (HSE) established the National Immunisation Office (NIO) in 2005 as a coordinating unit for immunisation to ensure high quality standardised implementation of all publicly funded immunisation programmes (primary childhood, schools, seasonal influenza and others as required).

The NIO has a current complement of seven full time staff members who are responsible for the coordination of immunisation programmes through collaboration with all those involved in their delivery and support. In addition the NIO is also responsible for managing vaccine procurement and distribution, developing training and communication materials for health professionals and the general public and controlling a budget of over €38 million in 2011.

Vaccine procurement accounts for over 90% of this budget and since 2005 purchase of all vaccines for national programmes has been centralised and managed by the NIO. This has resulted in significant efficiencies through better forecasting to ensure continuity of supply and prolonged shelf life, improved stock management, reduction of vaccine wastage and centralised invoice processing.

Distribution of all vaccines under validated cold chain conditions (essential for vaccine potency) is provided by the HSE National Cold Chain Service with overall management, monitoring and control by the NIO.

This service has expanded since its introduction in 2005 when 1.6 million vaccines were delivered to over 1,600 locations to 2.3 million vaccines to 2,600 locations in 2011.

In addition the NIO, in collaboration with key stakeholders, has developed and implemented national standards based on best practice in many aspects of immunisation including training and education, consent forms, medication protocols and HSE staff immunisation guidelines.

All information materials for the general public are now developed and distributed by the NIO who also manage the national immunisation website [www.immunisation.ie](http://www.immunisation.ie). This website has received ongoing accreditation from the World Health Organization (WHO) since 2006 as one of only 34 websites worldwide providing good information practices relating to credibility and content.

Since 2005 the NIO has coordinated the successful implementation of the introduction of hepatitis B and pneumococcal vaccines to the Primary Childhood Immunisation Programme with an increase in vaccine uptakes approaching World Health Organization targets. Human papillomavirus (HPV) vaccine has been introduced to the schools immunisation programme with an uptake for the three vaccine doses of 82% exceeding the target of 80% in the first year of the programme.

In 2011 the NIO coordinated the implementation of the first national IT immunisation system which records HPV vaccinations. This system will allow easier implementation, monitoring and deliver timely vaccine uptakes.

Catch-up campaigns have also been implemented which had higher than expected uptake rates. The pneumococcal conjugate vaccine (PCV) catch-up programme had a 68% uptake and resulted in a 91% reduction in pneumococcal disease caused by vaccine

serotypes in children under 2 years of age. The MMR vaccine campaign in second level schools to control a national mumps outbreak had 71% uptake and resulted in a dramatic and sustained decline in mumps cases.

The low uptake of seasonal influenza vaccine particularly among health care workers is insufficient to protect them and their patients from serious effects of influenza disease. The NIO is actively examining ways to address this low uptake in consultation with other stakeholders.

New challenges for the future include the implementation of a National Immunisation Information System (NIIS) as an essential component of a well functioning national immunisation programme. This will provide a national register of all immunisations, deliver timely vaccine uptakes, facilitate better follow up of clients including defaulters and result in significant efficiencies by streamlining the numerous regional and local Information Communication Technology (ICT) systems currently in use.

Ireland is committed to the WHO European strategy for Measles and Rubella elimination 2015. However there is still a large school going cohort who have not received two doses of MMR vaccine and ongoing measles outbreaks so a catch-up campaign is needed to achieve the required target of 95% to comply with the agreed WHO strategy.

It is likely that a new vaccine for Meningococcal Group B (Men B) infection will soon be licensed. As Ireland has one of the highest rates of Men B infection in Europe considerable planning will be required to include this vaccine in the routine schedule and for any catch-up campaign once this is agreed.

In addition, vaccines such as varicella and zoster have been recommended in many other countries and there are at least 30 other vaccines and new methods of administration in development which have the potential to impact on morbidity and mortality in Ireland.

The expertise developed within the small team in the NIO across a wide range of functions will serve to coordinate and drive the delivery of high quality immunisation programmes in the new challenges ahead.

# Mission Statement

*The mission of the National Immunisation Office is to work with key stakeholders and support healthcare providers to maximise the uptake of all national immunisation programmes.*

*The NIO provides strategic direction in support of a best practice based, equitable and standardised delivery of publicly funded immunisation programmes.*

## NIO Staff list



**Dr Brenda Corcoran**  
Consultant in Public Health Medicine



**Ms Mary Dowling**  
Business Manager



**Ms Cliona Kiersey**  
Chief Pharmacist

**Ms Yvonne Morrissey**  
Information Officer



**Dr Helena Murray**  
Senior Medical Officer



**Dr Mary O'Meara**  
Senior Medical Officer



**Ms Lesley Smith**  
General Manager



**Dr Fionnuala Donohue**  
Specialist Registrar in Public Health Medicine\*

*\* This post holder occupies a 6 month Higher Specialist Training post in Public Health Medicine*

# Introduction

Immunisation is one of the most cost-effective health interventions available, saving millions of people from illness, disability and death worldwide each year.

A well-functioning immunisation programme is essential to reducing child mortality and morbidity from vaccine preventable diseases (VPDs).

National immunisation programmes aim to prevent diseases in individuals and groups by achieving the World Health Organization vaccine uptake targets of 95% for childhood vaccines and 75% for seasonal influenza vaccine.

In 2002 a review of immunisation programmes in Ireland identified fragmented structures and a lack of standardised processes as key challenges to improving immunisation uptake rates.

As a result the Health Service Executive (HSE) established the National Immunisation Office (NIO) in 2005 as a coordinating unit for immunisation (Figure 1) to ensure high quality standardised implementation of all publicly funded immunisation programmes – primary childhood immunisation, schools immunisation, seasonal influenza vaccination programmes and other immunisation programmes as required (e.g. the H1N1 (2009) pandemic vaccination programme).

The NIO has a complement of seven full time staff members who in addition to the coordination of immunisation programmes are also responsible for vaccine supply chain management, developing education and communication materials for health professionals and the general public and controlling a budget of over €38 million in 2011.

The NIO staff report to the Assistant National Director – Health Protection of the Integrated Services Directorate and also work closely with public health, community health, procurement, communications and other departments in the HSE as shown in the organisational chart (Figure 2). There are a number of committees in place for the implementation of immunisation programmes with a number of subgroups on areas such as business processes, clinical guidelines, information communication technology (ICT) and consent. In addition the NIO liaises with external organisations to implement standardised high quality immunisation programmes.

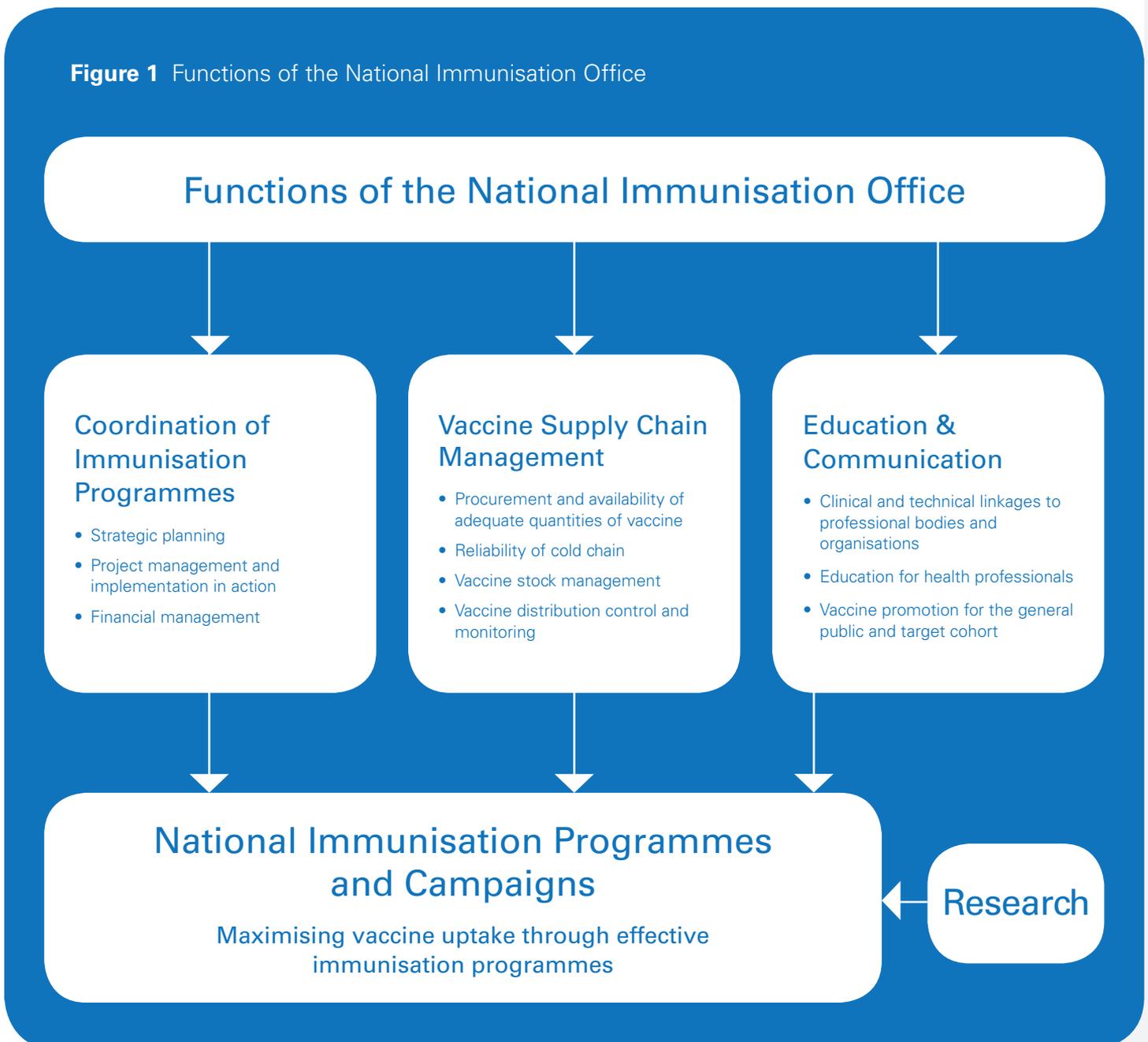
This report highlights the role of the NIO and demonstrates that the dedicated NIO team and all key stakeholders have driven significant changes in the delivery of immunisation programmes resulting in increased vaccine uptakes and reduced morbidity and mortality.

*“The economic impact and benefits of immunisation have been greatly underestimated”*

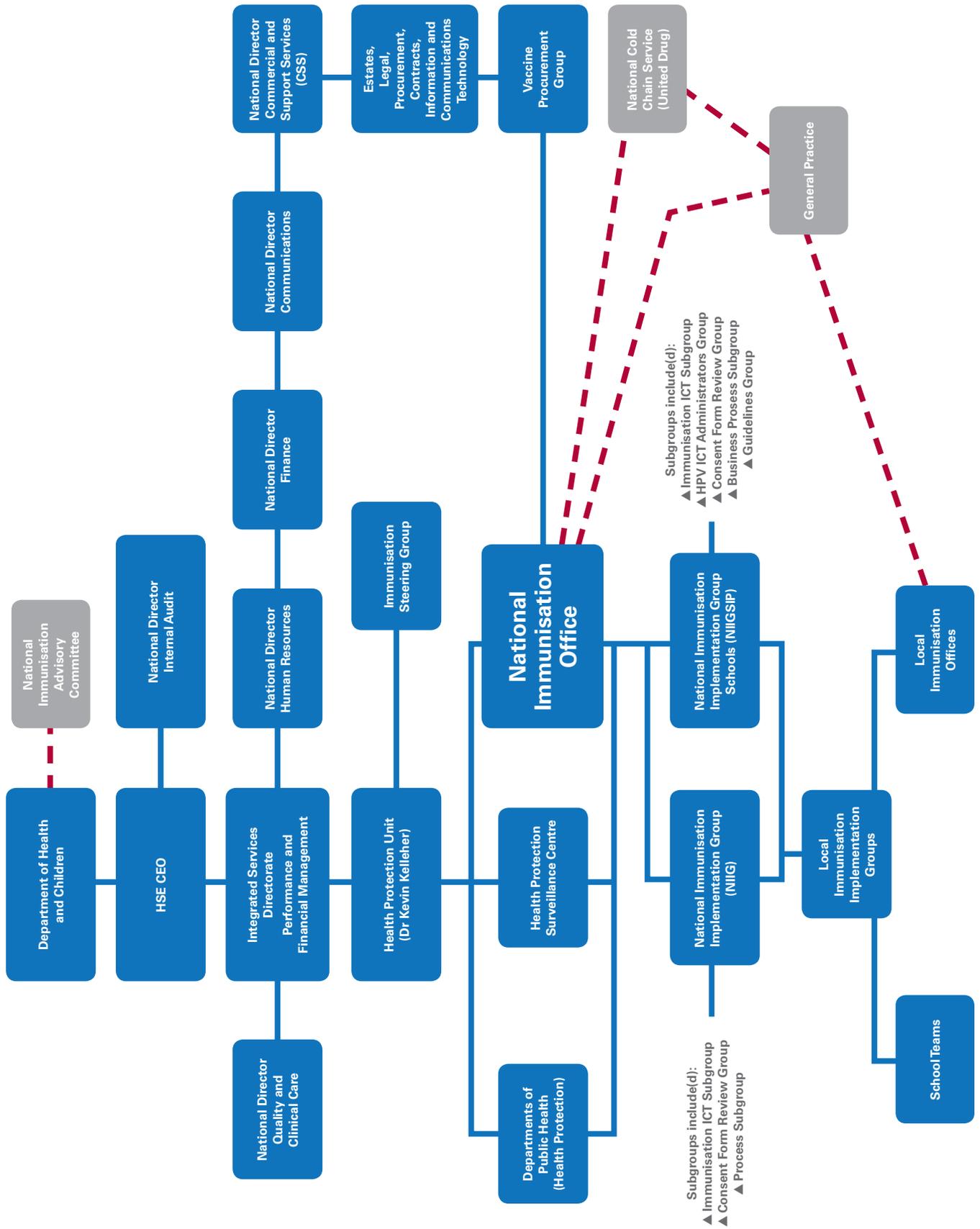
**The Value of Vaccination:**

David E Bloom, David Canning and Mark Weston -  
Harvard School of Public Health, World Economics, September 2005.

**Figure 1** Functions of the National Immunisation Office



**Figure 2** NIO within HSE Organisation



# Coordination of Immunisation Programmes

## Key achievements

- Standardisation of Primary Childhood Immunisation Programme (PCIP) and schools immunisation programme
- Coordination of the implementation of:
  - haemophilus influenza type b (Hib) catch-up campaign
  - addition of hepatitis B and pneumococcal vaccines to the PCIP
  - pneumococcal conjugate vaccine (PCV) catch-up programme
  - mumps, measles and rubella (MMR) campaign
  - H1N1 (2009) pandemic vaccination programme
  - human papillomavirus (HPV) vaccination programme
  - low dose tetanus and diphtheria vaccine booster programme
- Introduction of administration of seasonal influenza vaccine by pharmacists to those aged 65 and older

(For more details see section on National Immunisation Programmes and Campaigns)

## Strategic Planning

### Background

The National Immunisation Advisory Committee (NIAC) makes recommendations to the Department of Health (DoH) on immunisation policy in Ireland. This is an independent committee of the Royal College of Physicians of Ireland comprising experts in a number of specialties including infectious diseases, paediatrics, public health, microbiology, occupational health, general practice and nursing.

NIAC recommendations are based on the epidemiology of the relevant vaccine preventable disease (VPD) in Ireland, as determined by the Health Protection Surveillance Centre (HPSC), and international best practice in relation to immunisation. NIAC guidance is regularly updated and is available to download from <http://www.immunisation.ie/en/HealthcareProfessionals/ImmunisationGuidelines2008/>.

In recent years NIAC has carried out economic evaluation studies before making recommendations – such evaluations were carried out before the introduction of hepatitis B and pneumococcal conjugate vaccines (PCV) to the PCIP and also for the introduction of Human Papillomavirus (HPV) vaccination for young girls.

The DoH is responsible for making national immunisation policy and the HSE is responsible for the implementation of such policy.

### NIO role

The NIO is responsible for coordinating the national immunisation programmes including driving changes to immunisation schedules or catch-up campaigns for older children. The NIO prepares options papers for the implementation of changes and the introduction of new vaccines to the national immunisation programmes. These papers are used by the HSE management

team and the DoH to determine the most appropriate implementation option. The NIO then prepares a detailed implementation plan and project manages the implementation of the programme or campaign.

The considerations included in a typical immunisation options paper and implementation plan include the following:

- Governance
- Identification or selection of target cohort
- Funding
- Vaccine procurement, stock management and distribution
- Staff resources
- Vaccination process, including the use of medication protocols
- Roll out or delivery options, including costs
- Information Communication Technology (ICT)
- Education and training of health professionals
- Communications strategy including consultation with stakeholders
- Monitoring and evaluation of vaccination programme
- Constraints
- Impact of vaccination programme on existing vaccination programmes or other HSE healthcare provision
- Risks

### **An example of Project Management and Implementation**

In 2008/2009 there was a large national mumps outbreak with 3,629 cases including 75 hospitalisations. The highest incidence was among students aged 18 to 21 years in third level colleges. Efforts to control mumps outbreaks by offering MMR vaccine to third level students had failed, with minimal uptake of MMR vaccine.

A national Outbreak Control Team (OCT) was convened on 26th March 2009 chaired by the AND Health Protection. To prevent the outbreak continuing the OCT recommended that a MMR vaccination campaign would be carried out in second level schools in April/ May 2009. Many in this age group had not received the recommended 2 doses of MMR vaccine at 12 months and 4–5 years of age to prevent mumps infection.

The OCT consulted with relevant international experts, NIAC, DoH, the Department of Education and Skills (DES) and operational management within the HSE on the appropriateness and feasibility of this approach nationally.

The NIO prepared an implementation plan for the campaign and the HSE management team agreed that this should be prioritised ahead of other school immunisation programmes and some child health activities which were deferred for the duration of the campaign.

The aim of the campaign was to offer MMR vaccine to an estimated 130,000 fourth, fifth and sixth year students in 735 second level schools during the last term of the school year (a workload equivalent to the routine school immunisation programme over the full school year being condensed into less than 20 school days).

The NIO coordinated the campaign which was delivered by HSE medical, nursing and administrative staff.

There were 3–4 weeks for procurement and distribution of MMR vaccine, liaison with the DES and schools, development and printing of training materials, national guidelines for staff, information leaflets and consent form packs for students. There was less than a week for immunisation teams to distribute information packs to schools and schedule vaccination sessions with the schools. An IT solution was deferred due to time constraints. There was also a media campaign and launch of a specific website [www.mumps.ie](http://www.mumps.ie) to coincide with the MMR campaign.

Due to exam schedules it was anticipated that two thirds of the cohort would be offered a dose of MMR vaccine before the end of the summer term and that the campaign would be completed in September.

The response to the campaign exceeded expectations. Almost all the schools were visited before the end of term with vaccine uptake higher than the anticipated 50%. Additional MMR vaccine was procured and distributed in the second week of the campaign.

**During the campaign, 122,328 students were offered MMR vaccine and 86,547 (70.7%) were vaccinated by HSE vaccination teams. This campaign resulted in a dramatic and sustained decline in mumps cases.**

The success of the campaign was due to the dedication and commitment of community health and public health staff and in spite of significant constraints due to concurrent investigations of suspected pandemic influenza. Staff voluntarily deferred leave and some part time staff increased their commitment for the duration of the campaign.

### Financial Management

The NIO is responsible for the financial management of the immunisation budget as outlined in Table 1.

Vaccine procurement accounts for the vast majority of the total budget (Figure 3) and this increased from 85% in 2005 to 92% in 2011.

### Vaccine Expenditure

- decreased by €3 million (18%) between 2005 and 2007 due to improved national procurement and prudent stock management
- increased in 2008 and 2009 due to the new vaccines added to the childhood programmes, catch-up programmes and the increased target populations
- decreased in 2010 and 2011 as although new vaccines were also added to the schools programme there have been cost reductions in the tender prices for all individual vaccines

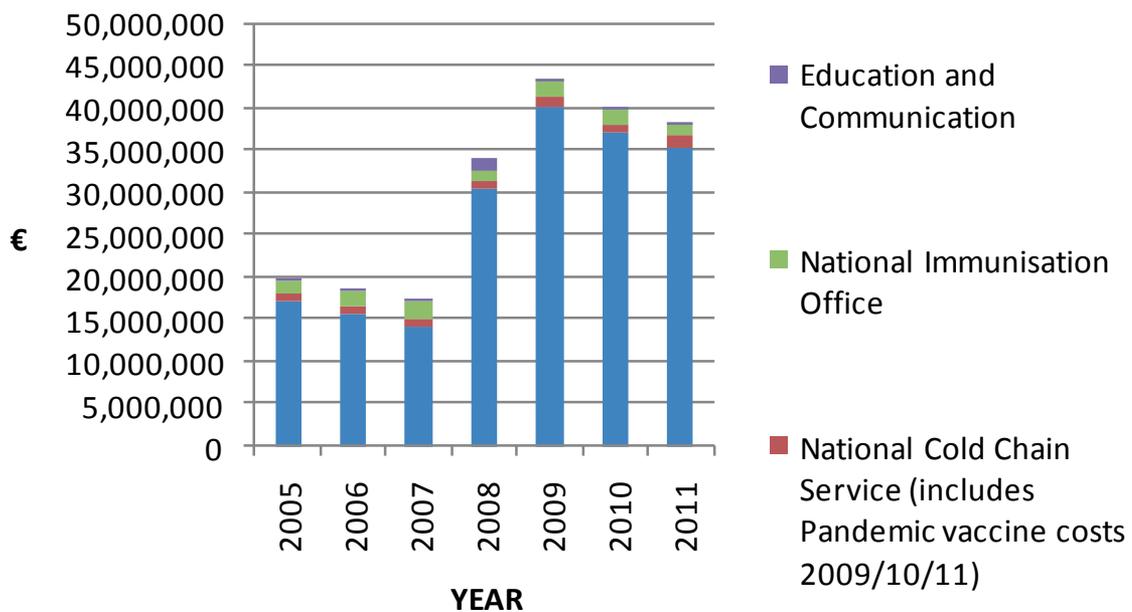
**Table 1** National Immunisation Expenditure 2005 -2011

	2005	2006	2007	2008	2009	2010	2011
Vaccine procurement*	€17,195,678	€15,759,348	€14,106,279	€30,598,619	€40,355,634	€37,166,745	€35,435,754
National Cold Chain Service**	€1,100,000	€760,000	€1,144,000	€805,222	€1,229,330	€868,620	€1,400,000
National Immunisation Office	€1,400,000	€2,112,000	€1,975,000	€1,400,000	€1,975,000	€2,050,000	€1,600,000
Education and Communication	€350,000	€206,000	€300,000	€1,500,000	€110,000	€206,000	€195,000
<b>TOTAL</b>	<b>€20,045,678</b>	<b>€18,837,348</b>	<b>€17,525,279</b>	<b>€34,303,841</b>	<b>€43,669,964</b>	<b>€40,291,365</b>	<b>€38,630,754</b>

\* does not include costs of pandemic vaccine

\*\* includes cost of storage and distribution of pandemic vaccine

**Figure 3** Immunisation expenditure 2005-2011



# Vaccine Supply Chain Management

## Key achievements

- Implementation of validated cold chain delivery system from vaccine manufacturers to 2,600 immunisation delivery locations
- Delivery of 2.3 million vaccines to 2,600 sites in 2011
- Improved forecasting process to ensure prolonged shelf life
- Improved vaccine stock management resulting in:
  - prevention of stock piling and stock depletion
  - reducing wastage of expired vaccines
  - better monitoring of vaccine usage through ongoing contact with delivery sites
- Provision of emergency vaccine requirements due to disease outbreaks
- Improved efficiencies through centralised processing of invoices

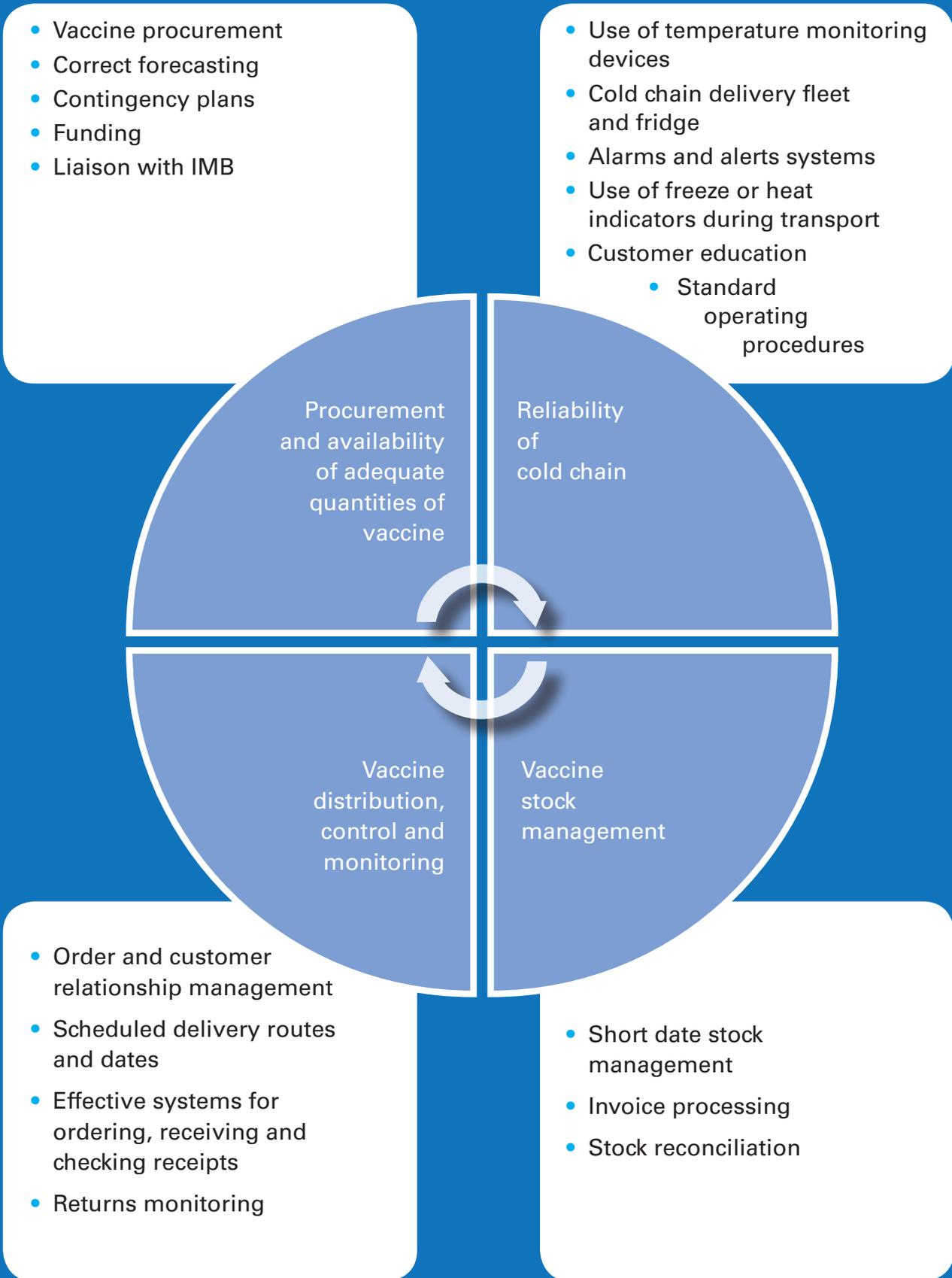
***Vaccines must be stored within a specific temperature range between +2 and +8°C to ensure their potency and to comply with regulations.***

Prior to 2004 there was no national monitoring of stock levels or validated temperature records to ensure vaccine potency. Some vaccines were ordered centrally and delivered directly to Health Boards and other vaccines were purchased directly from the vaccine companies by local areas. GPs had to travel to the local health centres to collect their vaccines.

Today, the NIO manages the procurement and distribution of all vaccines required for national vaccine programmes under validated cold chain conditions and considering the factors outlined in Figure 4.



**Figure 4** Factors affecting vaccine management performance



### **Procurement and availability of adequate quantities of vaccines**

Vaccines differ from other medicines as they are given to healthy persons to prevent the onset of illness. Public acceptance of vaccination is highly dependent upon the quality of vaccines.

Vaccine procurement is a complex process requiring specialised knowledge and a precise approach. Significant forward and contingency planning is needed to ensure continuity of supply as most vaccine manufacturers plan their capacity up to three years in advance. The manufacturing process takes approximately six months and so unexpected urgent orders are difficult to fill.

All publicly funded vaccines in Ireland are now on contract. Small supplies of immunoglobulins and anti toxins are also procured. (See list of available products at Appendix 1).

Each vaccine requires forecasting 6–12 months in advance and each contract is monitored closely by the NIO. Too much stock reduces the shelf life and too little stock could endanger supply.

Vaccines may be required at short notice e.g. MMR campaign in 2009. This can be a difficult process as vaccines may need to be sourced from other countries. The NIO works closely with the vaccine manufacturers to fast track vaccine procurement and the Irish Medicines Board (IMB) ensures that these vaccines are compliant with regulations.

### **Vaccine budget**

The annual vaccine budget has been managed by the NIO since 2005. During this time there have been significant changes to the childhood immunisation programme including a number of catch-up campaigns (see timeline page 26)

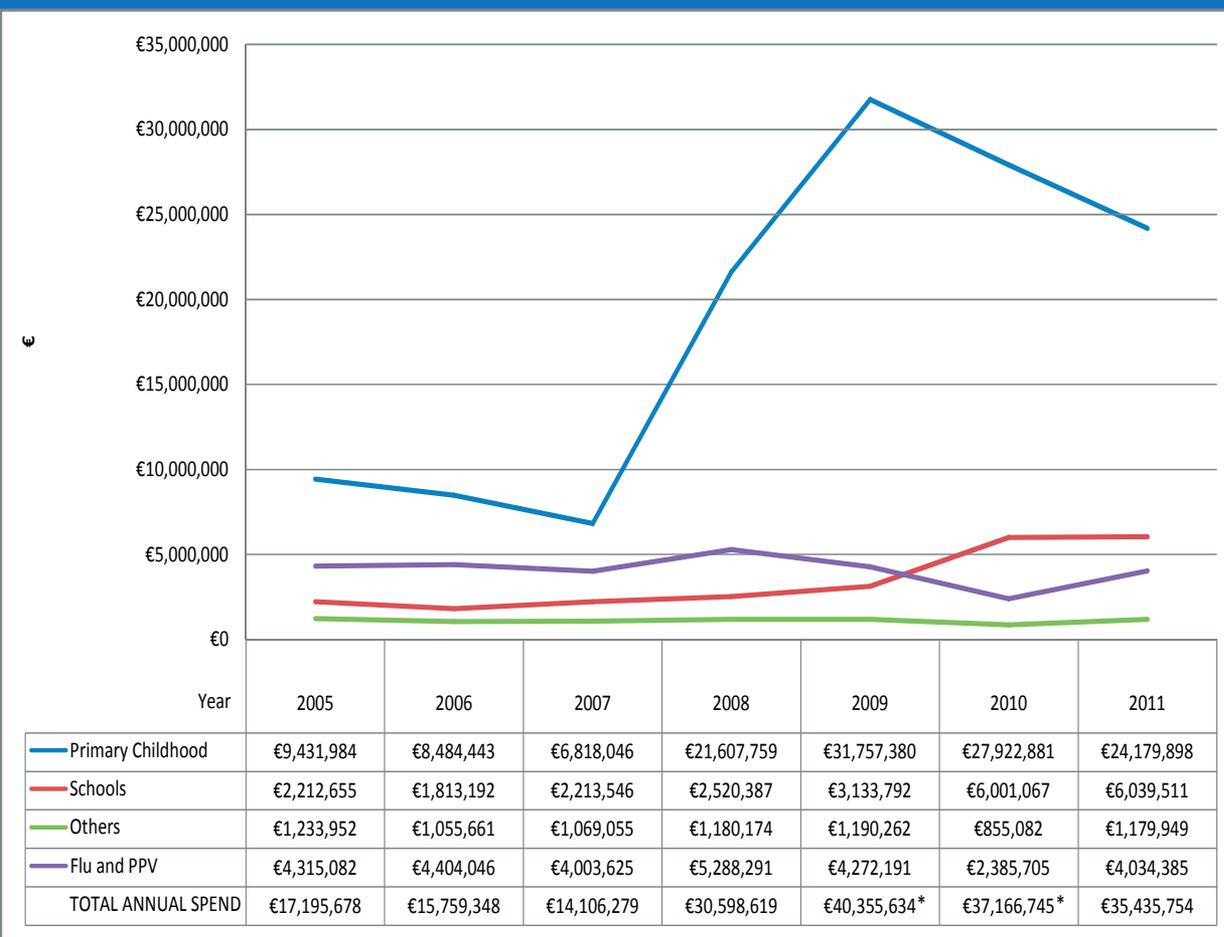
The costs decreased between 2005–2007 due to improved efficiencies in procurement, stock management and distribution and peaked in 2009 due to the addition of pneumococcal and hepatitis B vaccines in the primary childhood schedule and the pneumococcal catch-up campaign. Vaccine expenditure decreased in 2010 and 2011 as although new vaccines were also added to the schools programme there were cost reductions in the tender prices for all individual vaccines. (Figure 5)

***Since 2005, 13.5m doses of vaccines have been purchased to the value of €190.6 million. (this figure excludes pandemic vaccine)***



specialised  
knowledge

**Figure 5** Costs of Vaccines and Cold Chain Products Purchased by Programme



*\*this figure excludes pandemic vaccine*

### Reducing wastage during introduction of new vaccines 2008 & 2010

In September 2008 a new primary childhood immunisation schedule commenced with the addition of pneumococcal (PCV) and hepatitis B vaccines (the latter as part of a 6 in 1 vaccine replacing the 5 in 1 vaccine).

There was a concurrent PCV vaccine catch-up campaign for all children under 2 years of age who continued on the original immunisation schedule.

The two parallel schedules were in place for 18 months so significant planning was required.

Each GP order was monitored and sites were contacted to ensure the correct quantity of doses was issued.

Wastage was reduced to 1% of all 5 in 1 vaccine purchased since 2005.

This dovetailing of products was repeated again during the transition of PCV7 to PCV13 from December 2010.

Wastage was reduced to 0.2% of all PCV7 purchased since August 2008.

### Repackaging pandemic vaccine to allow better distribution

At the start of the pandemic vaccination programme in 2009 pandemic influenza vaccine (Pandemrix) was in short supply and there was insufficient vaccine to distribute to all GP sites.

The NIO identified this problem and arranged for the vaccine to be repackaged into smaller quantities.

This required intensive collaboration with the IMB and the HSE National Cold Chain Service (NCCS) to ensure compliance with regulatory procedures.

The repackaging of pandemic vaccine into smaller quantities allowed equitable distribution to all GP sites.

Ireland was the first country to repackage pandemic vaccine and this strategy was shared with other European countries.

### Reliability of the Cold Chain

The reliability of the cold chain is controlled by the following actions:

- Vaccines are transported into Ireland from manufacturing sites using validated approved refrigerated trucks
- Storage fridges and transport vehicles are all equipped with heat / cooling devices and alarm / alert systems which are monitored 24/7
- Storage and onward distribution to all delivery sites is carried out with temperature records
- Robust contingency plans are in place in case of power failure or breakdowns
- Systems are also in place in the event of a potential vaccine batch recall
- Temperature records are available for every vaccine from when it leaves the manufacturing site until delivery
- All of the main processes are governed by standard operating procedures (SOPs) which have been specifically tailored by the NIO

### Vaccine Stock Management

Since 2005 there have been considerable enhancements to vaccine stock management as the NIO only purchases vaccines with sufficient shelf life to ensure maximum usage prior to expiry date.

#### Efficiencies in processing invoices

- Prior to 2005 staff in each community care area and hospitals processed individual invoices for each vaccine purchase equating to over 3,000 invoices per year
- A number of personnel were involved in the process at each LHO or hospital
- This has reduced to 2 NIO staff involved in processing the national requirements
- No invoice is paid without a validated temperature record
- The numbers of invoices has reduced to 90 in 2011
- Late payment penalties have ceased due to timely submission of invoices for payment

*“ A comprehensive vaccination programme is a cornerstone of good public health and will reduce inequities and poverty.”*

**Bulletin of the World Health Organization February 2008**

### **Vaccine Distribution, Control and Monitoring**

National vaccine distribution is monitored to ensure it is consistent with target cohort requirements as significant deviations may indicate over or under stocking.

In 2004, the National Cold Chain Service (NCCS) commenced delivering vaccines from a central site to GPs, hospitals and health centres under documented temperature controlled conditions. The service is contracted to a commercial company.

#### **In 2011 the NCCS provided:**

- validated temperature controlled deliveries to 2,600 delivery locations including over 650 retail pharmacies
- 12 scheduled deliveries to GPs and hospitals per year with an additional 1–2 scheduled deliveries during the influenza season
- 1–2 deliveries per year to sites such as retail pharmacies and nursing homes that only require seasonal influenza vaccine
- calendars to all sites with the dates of these deliveries
- emergency deliveries in the event of a fridge breakdown or power cut
- an out of hours service for the emergency provision of cold chain products for the treatment of botulism, rabies and diphtheria
- reminders to customers to order monthly and to hold a 5–6 week supply of vaccines
- a vaccine returns service for the return of expired vaccines

**In 2005 1.6 million vaccines were delivered to over 1,600 locations.**

**In 2011 this increased to 2.3 million vaccines to 2,600 locations.**

Overall management, monitoring and control of the NCCS is carried out by the NIO which approves all emergency deliveries.

During the pandemic vaccination programme the NIO coordinated with the NCCS in the storage, repackaging and distribution of the vaccine. This involved over 5,000 extra deliveries to GPs, hospitals, LHOs and other sites. These deliveries incurred additional costs which were funded from the NIO budget.

Two consumer satisfaction surveys carried out with cold chain service users have shown consistently high satisfaction ratings and led to new developments such as the production of a yearly schedule of deliveries (see page 39).

# Education and Communication

## Key achievements

- Implementation of national knowledge resource for public and healthcare professionals
- Hosting of national immunisation conferences and training days
- Development of “A Practical Guide to Immunisation” training guide and slides
- Supported immunisation staff with the development of clinical and administration guidelines for the schools immunisation programme
- Supported the Office of the Nursing and Midwifery Services Director in the development of medication protocols
- Development, ongoing maintenance and updating of NIO website [www.immunisation.ie](http://www.immunisation.ie)
- Development of immunisation information materials for parents, at risk groups and the general public
- Provision of information materials in ten languages
- Development of national media campaigns

## Clinical and Technical linkages to professional bodies and organisations

The NIO liaises with a number of professional groups including:

- the National Immunisation Advisory Committee (NIAC) (see page 9)
- the Irish Medicines Board (IMB) which provides technical advice on vaccines and adverse events following immunisation
- the Irish College of General Practice (ICGP) and general practitioners (GPs) who provide the primary childhood and seasonal influenza and pneumococcal vaccination programmes
- the Irish Practice Nurses Association (IPNA) and practice nurses
- the Pharmaceutical Society of Ireland (PSI) and the Irish Pharmacy Union (IPU)
- the Health Protection Surveillance Centre (HPSC) in relation to the epidemiology of VPDs national immunisation uptake reports and the management of outbreaks
- Departments of Public Health
- Community health immunisation staff
- Departments of Occupational Health

## Education for Health Professionals

In February 2007, the HSE National Immunisation Office undertook an assessment of the immunisation training provided to health professionals in Ireland. This identified the absence of an agreed standardised immunisation training programme and variability in

immunisation training both in frequency and content across the country. In response to these findings, the NIO introduced a number of initiatives to ensure a standardised approach to training on issues related to immunisation in Ireland in line with best practice.

**Training Manual & Slides**

The NIO published a training manual, “A Practical Guide to Immunisation”, in 2008.

The guide, used in conjunction with the National Immunisation Guidelines for Ireland, provides health professionals involved in the immunisation programme



with up-to-date information on the core components of an immunisation programme as follows:

- History and aims of immunisation
- National immunisation schedule
- Immunity and how vaccines work
- Vaccine preventable disease
- Storage and handling of vaccines
- Legal aspects of immunisation
- Communicating with parents
- Vaccine administration
- Adverse events following immunisation and anaphylaxis

**Table 2** National conferences and training days

	Title	Venue	Number of participants
2005	BCG Training Day	Dublin	90
2006	National Conference	Cork	120
2007	National Conference	Dublin	370
2008	BCG Training Day	Dublin	93
2008	National Conference	Westmeath	155
2008	Train the trainer day for “A practical guide to immunisation”	Dublin	82
2008 - 2009	Role out of training via ICGP and Practice Nurse Development Coordinators for the new PCIP schedule and PCV catch up campaign.	Nationwide	2500
2009	Pandemic Vaccine Training Programme	Dublin	78
2010	HPV Training Days	Dublin	207
2008 - 2011	Ongoing Regional Training	Nationwide	800

A supporting suite of slides were developed and are regularly updated to facilitate standardised training. The slides were last updated in 2011, and are widely used by the Professional Development Coordinators for practice nursing who are supported by the NIO. Since their introduction in 2008 over 5000 people have received training and updates.

#### **National Immunisation Conferences and Training Days**

The NIO has hosted a number of national immunisation conferences with contributions from both national and international experts in immunisation. These conferences supported the dissemination of best practice and up to date knowledge in immunisation. In addition there have been a number of smaller national training days to support changes to the immunisation schedule and the introduction of new vaccines such as the pandemic vaccine in September 2009 and HPV vaccine in April and August 2010 (Table 2).

Evaluations were carried out for each of the national conferences and training days. This allowed the NIO to plan future training strategy.

#### **Clinical and Administrative Guidelines for Schools Immunisation Programme**

The NIO in conjunction with HSE staff who are responsible for delivering the schools immunisation programme have developed guidelines for staff involved in the schools immunisation programme. Initially this focused on the HPV vaccination programme launched in 2010, but was then expanded to cover the entire schools immunisation programme from September 2011. These guidelines allow for the standardised implementation of the schools programme on a national basis and supports the use of best practice within the schools setting. The guidelines support the use of medication protocols in the delivery of school based immunisation programmes.

#### **Medication Protocols**

Medication protocols are written directions that allow for the supply and administration of a named medicinal product by a nurse or midwife in identified clinical situations without the requirement for individual prescription.

Medication protocols were first used in the administration of pandemic influenza vaccine in the HSE mass vaccination clinics in 2009/2010 and were subsequently introduced into the HPV school immunisation programme in September 2010 and updated for September 2011.

Medication protocols for the Schools immunisation programme were developed by the Office of the Nursing and Midwifery Services Director with the support of the NIO.

#### **National Immunisation Newsletter**

The NIO has published a quarterly newsletter since 2006 which covers topical issues in immunisation and also plays a useful part in communicating changes to the immunisation schedule and any other updates from NIAC.

The newsletter is distributed to GPs and practice nurses via the NCCS and is also sent to all public health departments, LHOs and others involved in immunisation. Current and past editions are available to download from <http://www.immunisation.ie/en/Publications/ImmunisationNewsletters/>.



**Website**

The national immunisation website [www.immunisation.ie](http://www.immunisation.ie) was set up by the NIO in 2005 to provide information for healthcare professionals and members of the public.

This website provides accurate, factual information on childhood and adult immunisation and the NIO constantly updates the content. There is a section for health professionals highlighting any changes to the NIAC Immunisation Guidelines for Ireland,

as well as additional details about Hot Topics and new programmes.

Information about the vaccines and immunisation schedules is also available in a variety of languages. The site includes a section on FAQs as well as extensive links to national and international sites.

Monthly analysis is carried out on the number of hits to the website and the web pages viewed as shown in Figure 6.

**Figure 6** Hits to the website [www.immunisation.ie](http://www.immunisation.ie) from 2007 – 2011

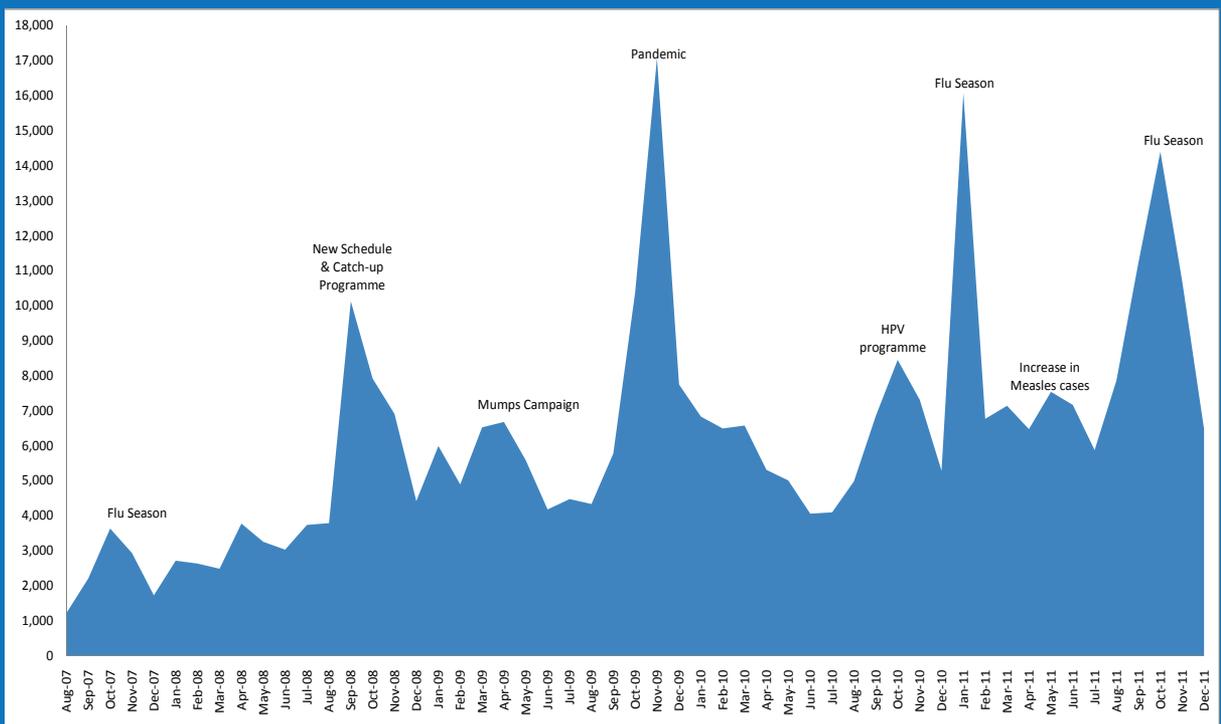


Figure 7 Screen shot of the www.immunisation.ie website



The website has received accreditation from the World Health Organization since 2006 as one of only 34 websites worldwide providing good information practices relating to credibility and content. [www.who.int/immunization\\_safety/safety\\_quality/approved\\_vaccine\\_safety\\_websites/en/](http://www.who.int/immunization_safety/safety_quality/approved_vaccine_safety_websites/en/)

In addition the NIO has provided immunisation information to a number of websites supported by Communications in the HSE including [www.mumps.ie](http://www.mumps.ie), [www.swineflu.ie](http://www.swineflu.ie) and [www.hpv.ie](http://www.hpv.ie)

#### Knowledge resource

The NIO acts as a national resource for expert knowledge on immunisation issues and responds to phone, e-mail and website queries from healthcare professionals and the general public.

The majority of queries are resolved within one working day. The office would deal with approx 6,000 calls a year.

### Vaccination Promotion for the general public and target cohort

The NIO uses a variety of methods to communicate up to date accurate information on immunisation issues and to advocate for the important role of immunisation in contributing to the population's health. See a list of publications in Appendix 2.

### Patient Information Leaflets

Prior to the establishment of the NIO each Health Board produced their own information materials each with different content.

The NIO now produces and updates information materials for all the vaccines in the primary childhood immunisation, schools immunisation and the seasonal influenza vaccination programmes. All materials produced for the general public are reviewed by the National Adult Literacy Association (NALA) or Plain English Campaign UK.

Information materials are available in both English and Irish and have also been translated into a number of additional languages including French, German, Arabic, Simplified Chinese, Polish, Portuguese, Romanian and Russian.



### Your child's immunisation - A guide for parents

- this 40 page booklet provides a comprehensive guide to all the primary childhood vaccines
- it is given to all mothers at their first public health nurse visit following the birth of their baby
- it was completely revised in 2011 following focus group feedback from parents
- it is produced in a colourful format, written in plain English and highlights the need for 5 visits to complete a child's immunisations in the first 13 months of life
- it achieved the Crystal Mark from the Plain English Campaign
- additional materials were also produced such as:
  - posters and fridge magnets with the immunisation schedule
  - immunisation passports for parents to keep as a record of the immunisations
  - a one page sheet on what to expect after vaccination and details of the next visit



### Consent Forms

National standardised consent forms for all of the childhood immunisations (BCG, primary childhood and schools immunisation programmes) have been successfully implemented with the introduction of the final set of forms for BCG in 2011. These consent forms are available in Irish and English to a NALA recommended literacy level and they are reviewed on an ongoing basis.

### Media Campaigns

In conjunction with HSE Communications the NIO is responsible for a number of media campaigns to provide information on vaccinations and to encourage those in the relevant at risk groups to get vaccinated.

A media campaign is run each year to encourage people to attend for their influenza vaccination. Focus group research with those over 65 years, those in the medically at risk groups and healthcare workers was carried out in 2011. This research examined the impact of the influenza vaccination media campaign and the results will inform changes to future campaigns.

Radio adverts were very successfully used to call children for the pneumococcal catch-up campaign in 2008/2009.

### European Immunisation Week

In 2005 Ireland was one of eight countries to participate in the first European Immunisation Week (EIW) and has participated in each one since then. This is a World Health Organization European region initiative aimed at increasing vaccination coverage by raising awareness of the importance of immunisation.



**Prevent Protect Immunize**

Each year the NIO chooses an immunisation issue to focus on during EIW such as the launch of the Practical Guide to Immunisation for health professionals (2008) or Your child's immunisation - A guide for parents (2011) or the implementation of a catch-up campaign such as the MMR campaign to control mumps outbreaks in 2009.

This WHO initiative has grown significantly since 2001 and in 2011 the 6th EIW took place with 52 European countries participating.

# National Immunisation Programmes and Campaigns

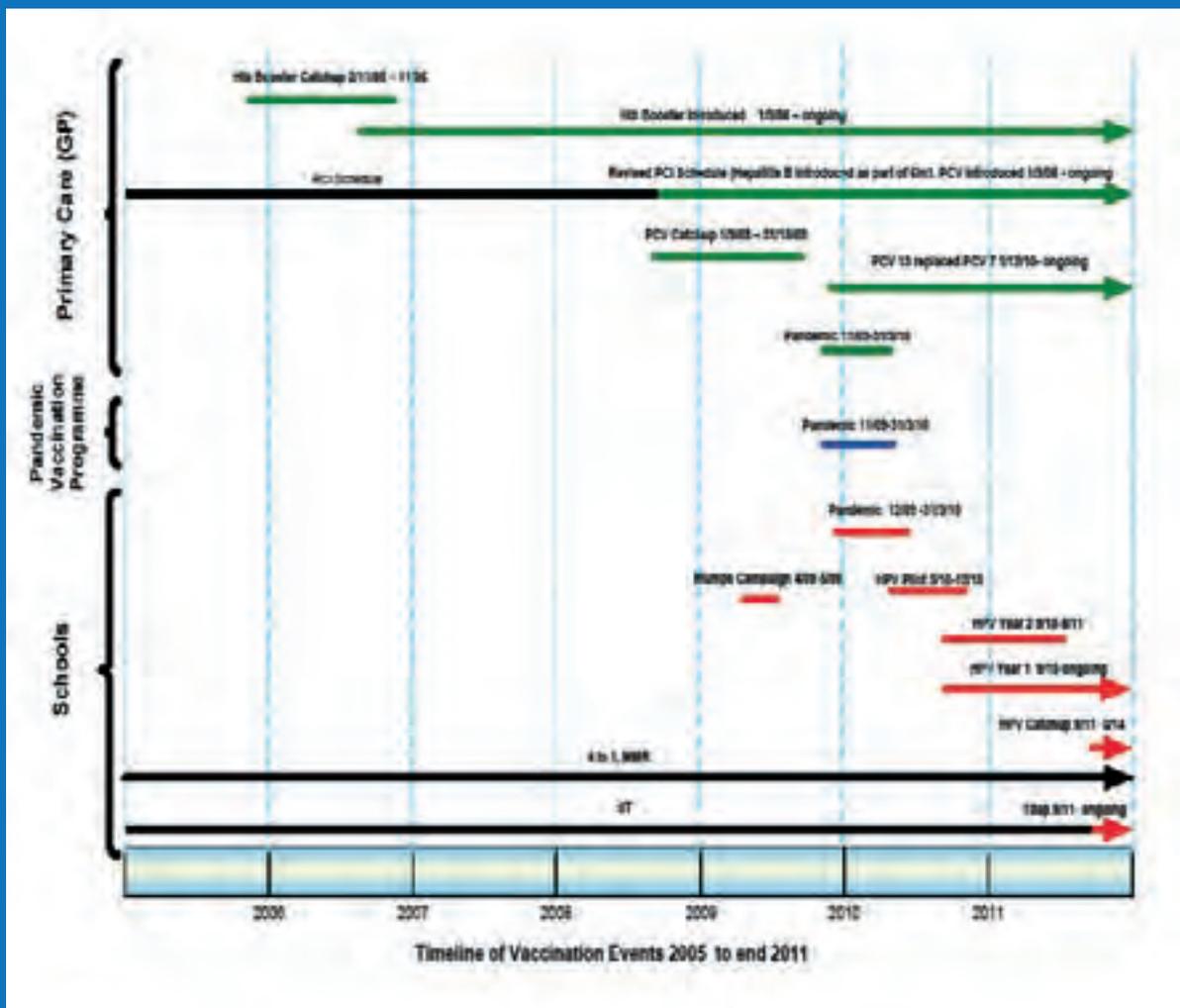
## Introduction

Since its establishment in 2005 the NIO has been the coordinating body for national immunisation programmes and campaigns. These include the primary childhood, schools and seasonal influenza programmes, catch-up campaigns and emergency

programmes such as the H1N1(2009) pandemic vaccination programme.

There have been a number of changes to the primary childhood and schools immunisation programmes and catch-up campaigns between 2005–2011 as shown in the timeline below (Figure 8).

**Figure 8** Changes to the Primary Childhood and Schools Immunisation Programmes and Catch up Campaigns 2005 - 2011



### Primary Childhood Immunisation Programme

The primary childhood immunisation programme (PCIP) is delivered to all babies by GPs with HSE immunisation contracts.

The PCIP schedule has changed significantly since 2005 (see Appendix 3).

### Target Population

The number of babies born in Ireland has increased 61,372 in 2005 to 74,817 in 2011 (Central Statistics Office CSO) resulting in a 22% increase in the target population for the PCIP and an increased demand for vaccine supplies.

### 2005

In 2005, the PCIP schedule consisted of four visits at 2, 4, 6 and 12 months. At the first three visits children received, diphtheria, haemophilus influenza type b (Hib), pertussis, polio, tetanus as a 5 in 1 vaccine and meningococcal C vaccine. At 12 months they received the MMR vaccine.

### 2005/2006

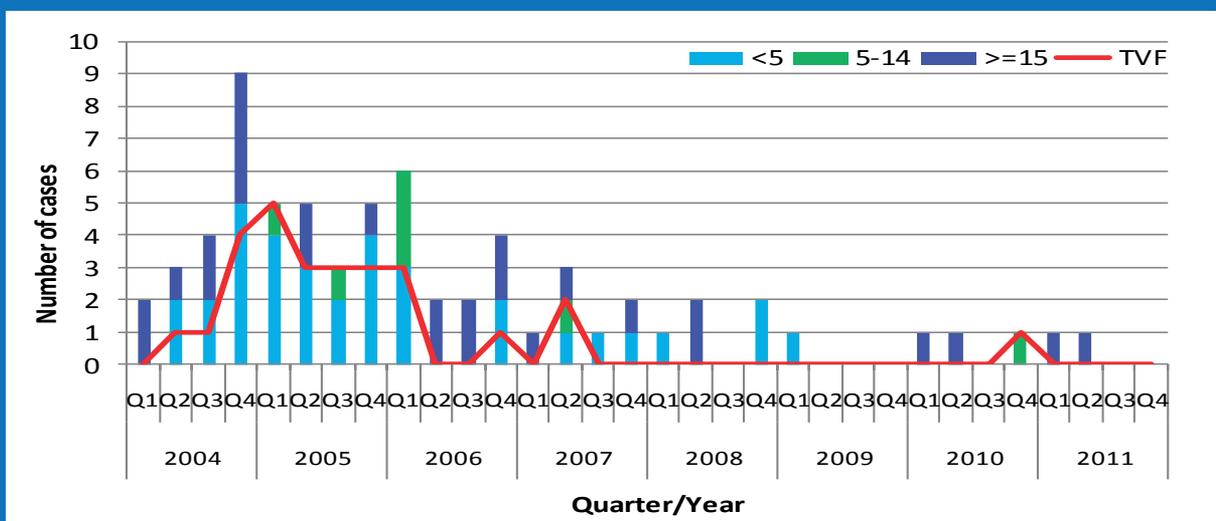
#### *Haemophilus influenza type b (Hib)* *Catch up campaign*

The incidence of Hib disease fell following the introduction of Hib vaccine into the routine childhood schedule in 1992. However in 2004 and 2005 an increase in Hib disease was reported in a small number of fully vaccinated children under 4 years of age (known as true vaccine failures).

In response to this NIAC recommended that a catch-up programme be introduced to provide a Hib booster vaccine to all children aged 12–47 months (220,000 cohort) and that a Hib booster should be added to the routine childhood immunisation schedule at 12 months.

The GP delivered Hib booster campaign ran from November 2005 to May 2006 with a phased approach targeting specific age groups at specific times. Parents received letters from their local immunisation offices advising them when to attend their GP for vaccination.

**Figure 9** Quarterly number of Hib cases by age group and of true Hib vaccine failures (TVFs), 2004 to 2011



Source HPSC

**A survey amongst participating GPs estimated the uptake rate at 69%.**

**The Hib Booster catch-up programme resulted in a significant reduction in cases of Hib disease in fully vaccinated children (Figure 9).**

## 2006

### *Introduction of Hib Booster*

Following the Hib catch-up campaign a routine Hib Booster was introduced for all children at 12 months from September 2006.

## 2008

### *New Primary Childhood Immunisation Schedule*

In 2008 NIAC recommended the following changes to the PCIP:

The addition of pneumococcal conjugate vaccine (PCV7) at 2, 6 and 12 months

The addition of Hepatitis B vaccine (as part of a 6 in 1 vaccine) at 2, 4 and 6 months

A change in the age for administration of Haemophilus influenzae type B (Hib) booster vaccine from 12 to 13 months.

A change of the age for administration of Meningococcal C vaccine from 2, 4 and 6 months to 4, 6 and 13 months.

A comparison of the schedule changes is shown in Table 3.

These schedule changes required:

- parents to bring their child for five GP visits in order to complete the course of primary immunisations
- an additional GP visit at 13 months.
- the two childhood schedules to operate simultaneously for up to 12 months (to allow completion of children on the original schedule)
- the PCV catch-up campaign to run concurrently

The implementation of these changes, from 1st September 2008, was coordinated by the NIO and overseen by the National Immunisation Implementation Group (NIIG) comprising medical, nursing and administrative representatives.

A comprehensive training programme for health professionals regarding the schedule changes and the PCV catch-up campaign was implemented

**Table 3** Change in Primary Childhood Immunisation Schedule 2008

By Age	Children born before July 1st 2008	Children born on or after July 1st 2008
Birth	BCG	BCG
2 months	5 in 1 + Men C	6 in 1 + PCV7
4 months	5 in 1 + Men C	6 in 1 + Men C
6 months	5 in 1 + Men C	6 in 1 + PCV7 + Men C
12 months	MMR + Hib	MMR + PCV7
13 months	-	Men C + Hib

across the country in association with ICGP and Departments of Public Health (~5,000 attendees). National standardised methods were introduced to ensure that all parents received the same information materials and GPs used the same forms for making vaccine returns.

In addition substantial upgrades were required for the PCI ICT systems across the country to inform parents about each scheduled visit, follow up defaulters and monitor vaccine uptakes. This was coordinated by the NIO and included standardising consent forms and letters sent to parents following consultation with the Data Protection Commissioner.

**The new schedule was successfully launched in September 2008 with positive feedback to the training programme and information materials provided to GPs (see page 40)**

**2008/2009**

***Pneumococcal conjugate vaccine (PCV) Catch-up Campaign***

In addition to the changes to the primary childhood immunisation schedule, NIAC also recommended

a PCV catch-up campaign for children aged 2 to 24 months.

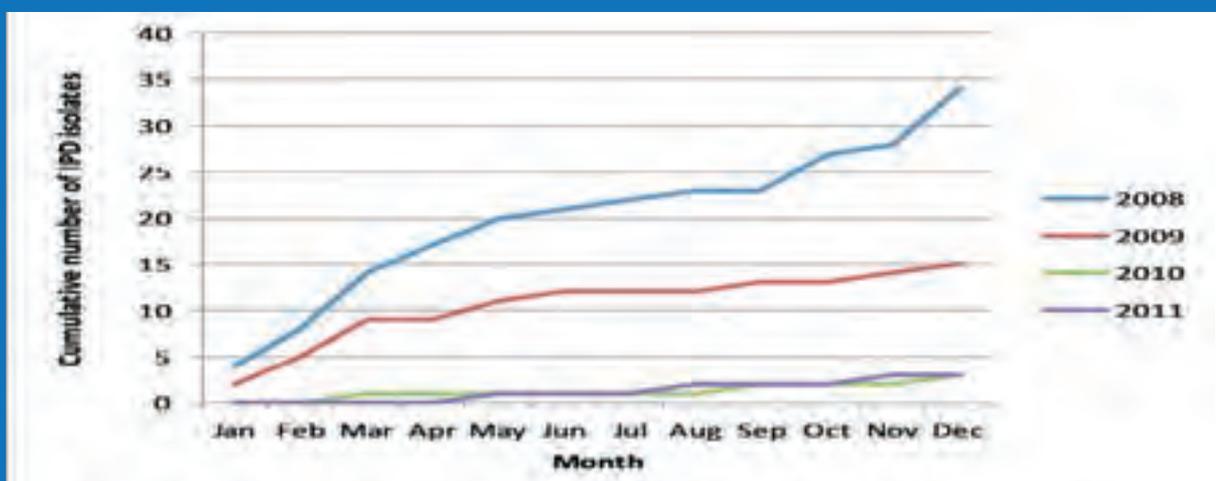
This catch-up programme was planned within a very tight timeframe and coordinated in totality by the National Immunisation Office (NIO) with activities including:

- Developing and distributing information packs (including a scheduling “wheel” for GPs and other health professionals. This was designed by the NIO and greatly assisted in the complex timing of vaccinations)



**Scheduling “wheel” designed by the NIO**

**Figure 9** Impact of PCV on the burden of Invasive Pneumococcal Disease (IPD) caused by PCV7 vaccine serotypes in <2 year olds



Source HPSC

- Organising a national media campaign “A Call to Arms” to inform parents that the campaign would be commencing and advising them when to bring their children for vaccination. This was done through national and local press and radio with changing messages for the relevant monthly cohorts.
- Developing a standardised vaccine returns form capturing GP details, child demographic details and vaccination details
- Processing GP returns (~107,000) records each of which was validated, data entered and sent for payment
- Processing payments through the Primary Care Reimbursement Service (PCRS) for GPs normally paid for immunisations via the LHOs.
- Dealing with data entry errors (~12,000 letters issued to GPs and 2,000 phone calls made)

The PCV catch-up campaign ran from September 2008 until 31st October 2009, offering PCV to an estimated 130,000 children born between September 2nd 2006 and June 30th 2008.

#### The PCV catch-up programme

- achieved an uptake of 67.5% (above the target 50-60% uptake)
- has resulted in a 91% reduction in pneumococcal disease caused by PCV7 serotypes in children under 2 years of age (as shown in Figure 10)

#### 2010

##### Introduction of PCV13

In December 2010, PCV13 was added to the primary immunisation schedule replacing PCV7. This provides additional protection to infants, and protects against 13 strains of the pneumococcal bacteria compared to 7 strains in the vaccine used to date.

This again involved two schedules running in parallel to allow children to complete their course of PCV7 until stocks of this vaccine were exhausted.

**The introduction of PCV13 has resulted in a further 41% decline in invasive pneumococcal disease due to additional serotypes covered by PCV13.**



*“ Vaccination does more than just protect an individual: it protects entire communities.”*

### A History of Vaccines

A Project of the College of Physicians of Philadelphia.

[www.historyofvaccines.org](http://www.historyofvaccines.org)

**PCIP Vaccine Uptake**

There are eight stand alone primary childhood immunisation (PCI) systems for client immunisation records. Some are closely linked to a child health system whilst others are not. Uptake of vaccines in the PCIP are collated by the HPSC with a WHO target of 95%. (Figure 11).

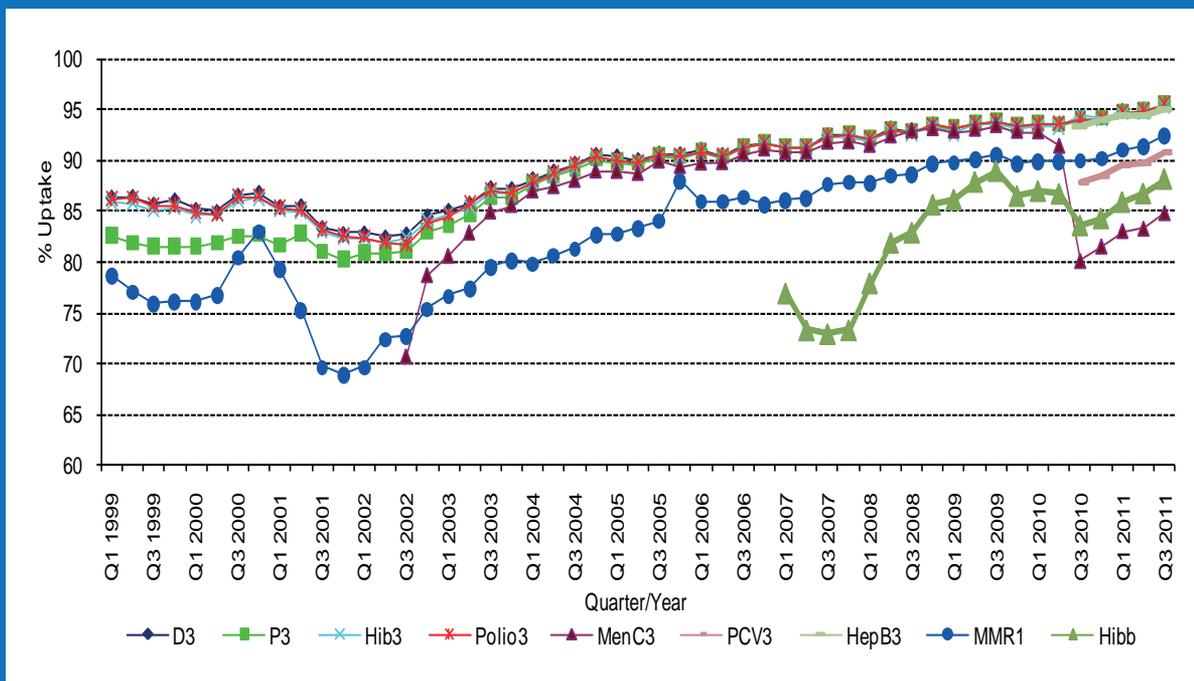
Between 2005–2011

- the DTP uptake at 24 months increased from 90% to 95%
- the MMR uptake increased from 84% to 92%

Following the introduction of the new schedule in 2008 there was a decrease in the uptake rates for the third and fourth doses of vaccines given to children over twelve months of age. This was due to confusion over the number of visits and delays in the administration of some vaccines.

The importance of completing the vaccine schedule on time was highlighted to health professionals and new information materials were developed for parents and as a result these uptake rates have increased.

**Figure 11** National quarterly immunisation uptake rates at 24 months



Source HPSC

### Schools Immunisation programme

Further immunisations are recommended for children in junior infants class in primary schools (aged 4–5 years) and first year students in second level schools (aged 12–13 years).

#### Target Population

The number of children in junior infants class in primary school increased from 56,591 in 2005 to 63,784 in 2011 (DES) resulting in a 13% increase in

the target population.

First year students in second level schools increased by 5% from 57,700 in 2005 to 60,462 in 2011 (DES).

#### Standardisation of schools immunisation programme

The schools immunisation programme is primarily delivered by HSE vaccination teams in schools. GPs provide some of the vaccinations at school entry in eight LHOs as shown in Table 3.

**Table 3** Schools Immunisation Programme 2011/2012 academic year

Immunisations	Recommended Age	Target Population	Current Delivery of Vaccinations	Target uptake
*4 in 1 + **MMR2 (MMR1 given at 12 months)	4 to 5 years (Junior Infants) (2 injections)	65,000	HSE delivered in 24 LHOs GP delivered 6 LHOs <sup>a</sup> Mixed delivery 2 LHOs <sup>b</sup> (HSE gives MMR & GPs give 4 in 1)	95% uptake (WHO target)
***Tdap	11 to 14 years (First years) (1 injection)	60,000	HSE via 2nd level schools in 19 LHOs  Not delivered in 13 LHOs (2011-12) <sup>c</sup>	95% uptake (WHO target)
#HPV routine (girls only)	12 years (First years or age equivalent) (3 doses)	30,000	HSE via 2nd level schools and special schools in all LHOs	80% uptake of 3 doses. (HIQA target)
#HPV catch up (girls only)	Sixth years or age equivalent) (3 doses)	28,000	HSE via 2nd level schools, special schools, Youthreach and Community Training Centres in 32 LHOs	80% uptake of 3 doses. (HIQA target)

\* 4 in 1 Diphtheria, Tetanus, Pertussis and Polio vaccine

\*\* MMR Measles, Mumps and Rubella vaccine

\*\*\* Tdap low dose tetanus/diphtheria and pertussis vaccine

# HPV Human papillomavirus vaccine

a Dublin North Central, Meath, Louth, Cavan/Monaghan Donegal, Sligo /Leitrim

b Galway, Mayo

c Dublin South, Dublin South East, Wicklow, Laois/Offaly, Longford/Westmeath, Dublin North West, Dublin North Central, North Dublin, North Lee Cork, South Lee Cork, North Cork, West Cork, Kerry

One of the key tasks of the NIO is to standardise the schools immunisation programme on a national basis. This work is overseen by the National Implementation Group – Schools Immunisation Programme (NIG-SIP) comprising medical, nursing and administrative representatives.

The NIG-SIP initially focused on the introduction of HPV vaccination programme in 2010 and then on standardisation of the other school vaccinations with the introduction of Tdap for first years from September 2011, and the discontinuation of schools based BCG programmes (except in Galway and Roscommon).

A number of sub-committees with representation from frontline staff directly involved in immunisation were established to develop each of the elements of the standardisation process. This work resulted in the introduction of standardised consent forms, medication protocols, clinical and administrative guidelines and vaccination session report forms.

## **2005–2011**

### ***MMR and 4 in 1 vaccines for children aged 4-5 years***

Children require a booster dose of diphtheria, tetanus, pertussis and polio vaccines (as a 4 in 1 vaccine) and a second dose of MMR vaccine at 4–5 years of age. Children require two doses of MMR vaccine to be fully vaccinated, the first at 12 months and the second at 4–5 years of age.

There is currently mixed delivery of these vaccines with school based delivery in 26 LHOs and GP delivery in eight LHOs.

National uptake data for 4 in 1 and second dose of MMR for children aged 4–5 years is not available. School immunisations are recorded manually or on ICT local systems at LHO level.

From September 2011 a national template for manual reporting of vaccinations in schools has been introduced which will give the first national report for 2011/2012 academic year.

The process of offering children a dose of MMR was changed from September 2011. School immunisation staff now identify children who are receiving their first dose of MMR and arrange for these children to get a second dose one month later. The uptake of this catch-up measure will be calculated separately from the routine uptake data. This is a measure recommended in the DoH's Measles Elimination Strategy 2007.

## **2009**

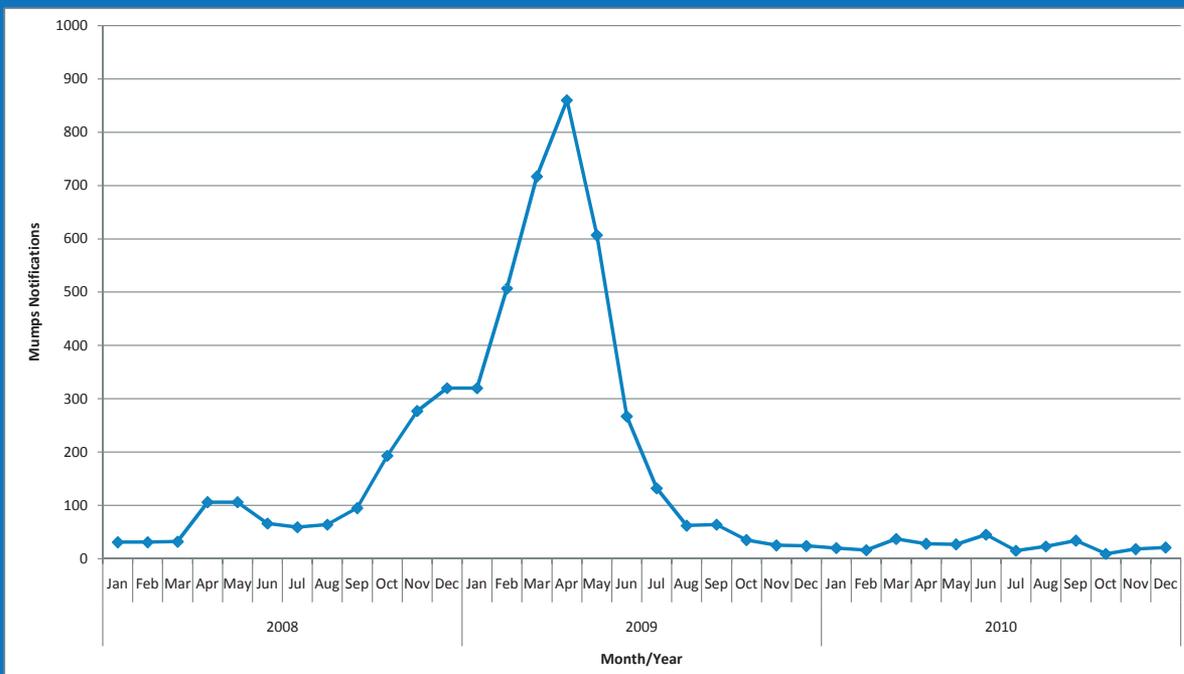
### **MMR Campaign in schools**

There was a large mumps outbreak in 2008/2009, mainly affecting young adults aged 15–24 years due to inadequate coverage with two doses of MMR vaccine.

The public health response offered all students in fourth, fifth and sixth years of second level schools a dose of MMR vaccine in April and May 2009. During the campaign, 122,328 students were offered MMR vaccine as part of a school based campaign, 86,547 (70.7%) were vaccinated by HSE vaccination teams in all 32 LHOs. For the peak 3 weeks of this campaign more than 5,000 students were vaccinated each day

**This campaign resulted in a dramatic and sustained decline in mumps cases as shown in Figure 12.**

**Figure 12** Mumps notifications 2008 to 2010



Source HPSC

## 2010/2011

### Introduction of HPV vaccine for girls

In January 2010 a decision was made to implement a national HPV vaccination programme for all girls in first year of second level school in 2009/2010 and 2010/2011 to reduce the risk of cervical cancer.

The programme commenced in 21 schools in May 2010 with full roll out in 735 schools from September 2010 using a blitz and mop up approach for each of the three doses in the schedule.

Challenges to be overcome in the planning and implementation of the programme included scheduling the required three vaccine doses within the academic year, running two alternative schedules in parallel for the May and September cohorts,

and the introduction of nurse vaccination under medication protocol to the schools immunisation programme.

The HPV vaccination programme commenced as planned for all girls who were in first year in 2009/2010 and 2010/2011 as well as age equivalent girls in special schools and those registered to be educated out of school (total cohort 59,235).

**Uptake for the three vaccine doses was 81.9% (48,501) which exceeded the target of 80% and compares favourably with uptakes achieved internationally (Table 4).**

There was excellent retention of girls in the programme as 97% of those who started the HPV course completed their three dose schedule.

**Table 4** Uptake of HPV vaccine 2010/2011

	Target Cohort	HPV1 total	HPV1 %	HPV2 total	HPV2 %	HPV3 total	HPV3 %	% complete 3rd dose of those who got first dose
DML	17,075	14,361	84.1	13,898	81.4	13,967	81.8	97.3
DNE	12,135	10,261	84.6	9,893	81.5	9,956	82.0	97.0
South	15,581	13,081	84.0	12,909	82.9	12,723	81.7	97.3
West	14,394	12,076	83.9	11,927	82.9	11,855	82.4	98.2
<b>National*</b>	<b>59,235</b>	<b>49,779</b>	<b>84.0</b>	<b>48,627</b>	<b>82.1</b>	<b>48,501</b>	<b>81.9</b>	<b>97.4</b>

\*National total includes home schooled

The routine HPV vaccination programme continues from September 2011 for all first year girls.

## 2011

### HPV IT system

- In 2011 the NIO coordinated the implementation of the HPV system
- This required the development of software requirement specifications, detailed testing and training
- System Administration is carried out by regional administrators with the NIO as central administrator
- A HPV consent form was devised and designed by the NIO in consultation with stakeholders
- This system supports the HPV vaccination programme, provides details of defaulters, incomplete vaccinations as well as vaccine uptake
- As it is essential that there is a link between the girls receiving the HPV vaccine and their future cervical screening in later life, vaccine data will be shared with the National Cancer Screening Service
- **This is the first national ICT immunisation system**

## 2011/2012

### HPV catch-up programme

In September 2011 a HPV catch-up programme was introduced for girls in sixth year with a target population of 25,845 girls.

The catch-up programme will continue for girls in sixth year in 2012/2013 and 2013/2014. The immunisation of this cohort in addition to the routine first year cohort (i.e a double cohort) over these three academic years requires additional resources for immunisation within each LHO.

### Introduction of Tdap adolescent booster vaccine

Until September 2011 an adolescent tetanus and low dose diphtheria booster (Td) was given by HSE vaccination teams to children in sixth class of primary school or first or second year of second level school depending on resources.

Following a NIAC recommendation that a pertussis (whooping cough) booster be added to the Td booster, Tdap, which contains acellular pertussis, replaced Td in the schools immunisation programme from September 2011. This is being introduced on a phased basis as NIAC currently recommends a minimum interval of 2 years between boosting doses of a tetanus containing vaccine so there is no

Tdap programme in 2011/2012 in areas where Td was previously given in sixth class.

The addition of the pertussis booster aims to reduce the transmission of pertussis infection to infants less than six months of age as this is largely due to cases in older children and adults.

#### Seasonal Influenza vaccination programme

NIAC provides recommendations each year on those who should receive seasonal influenza vaccine. Since 2005 the HSE seasonal influenza vaccination programme has provided vaccine for all those aged 65 years and older, those under 65 years who are in specific medically at risk groups and healthcare workers. In 2011 seasonal influenza vaccine was recommended for all pregnant women.

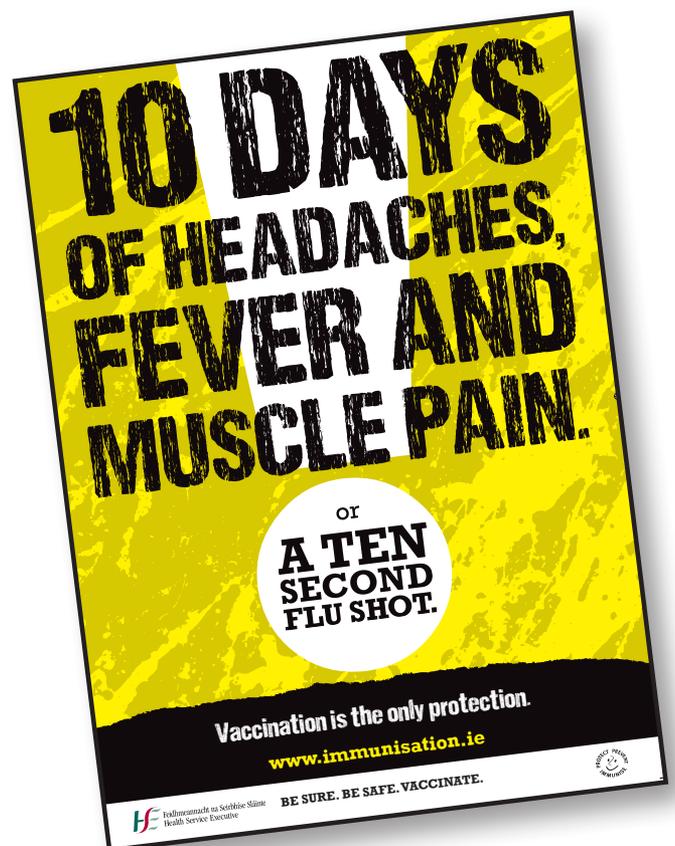
There is also a pneumococcal polysaccharide vaccine campaign for those aged 65 and older and those in specific medically at risk groups.

The estimated target population increased from 840,000 in 2005 to 920,000 in 2011 (an increase of 10%).

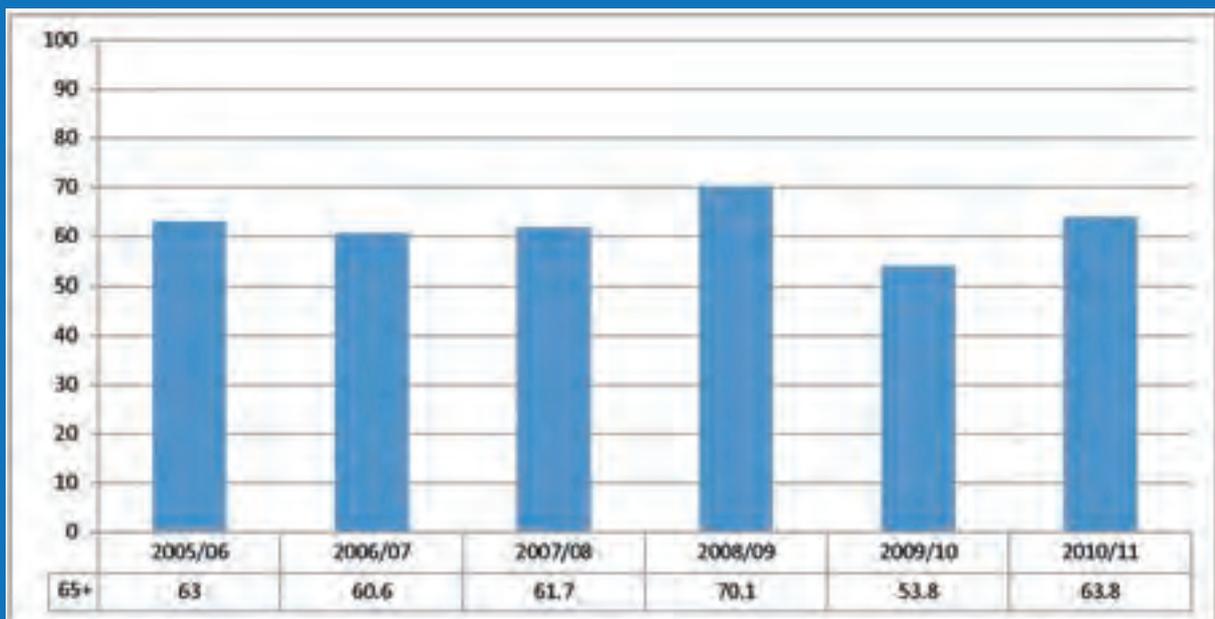
The influenza and pneumococcal vaccines are provided free of charge by the HSE to all those in the at risk groups and vaccine administration is free of charge to those with a medical or GP visit card.

Each year the NIO develops an information campaign for the public and healthcare workers (HCWs) incorporating changes to those in the target groups and also produces information materials, FAQs, website updates and media advertising. Additional information for healthcare professionals is also produced.

In 2011 the Minister for Health enacted legislation to allow registered pharmacists to administer seasonal influenza vaccine. A registration process was implemented for pharmacists who wished to participate in the HSE programme to vaccinate those aged 65 and older. The NIO arranged delivery of influenza vaccine as well as providing technical support and information materials for patients.



**Figure 13** Seasonal Influenza Vaccine Uptake (2005 – 2011)



Source HPSC

**Vaccine uptake**

Seasonal influenza and pneumococcal vaccinations given to those with medical or doctor only cards are recorded by PCRS and data relating to those aged 65 years and older are collated by HPSC.

Since 2004, the HPSC have produced uptake rates for influenza vaccine for medical card holders aged 65 years and older and this was expanded in 2006 to include those with GP visit cards. Analysis of GP returns between 2005/2006 and 2010/2011 shows that the target of 75% has not been achieved.

Studies in Ireland have shown low uptake rates for healthcare workers of between 17–20%. This level is insufficient to protect healthcare workers, their families and their patients from the serious effects of influenza infection. The NIO is actively examining ways to address this low uptake in consultation with other relevant stakeholders.

## Emergency Programmes

### H1N1 (2009) Pandemic vaccination programme

On April 25th 2009 an international public health emergency was declared by WHO and on June 11th 2009 WHO declared a pandemic due to an outbreak of a new virus strain, Pandemic (H1N1) 2009 influenza virus (Swine Flu). As this virus strain had never been detected in humans most of the population was susceptible to infection.

Vaccination was a key strategy used globally to mitigate the effects of the pandemic and in Ireland the H1N1 (2009) pandemic vaccination programme offered pandemic vaccine to the total population of over 4 million people in a period of 6-8 months.

The NIO played a key role in the coordination of the programme which included:

- providing technical expertise in vaccine procurement
- arranging and monitoring repackaging and distribution of the vaccine
- organising training for health care professionals
- providing information and updates for health care professionals
- working with communications on information for priority groups and the general public
- planning and implementation of the seasonal influenza programme which commenced earlier than usual

Vaccine procurement and the provision of information materials were funded from an additional HSE allocation but the cost of vaccine storage and vaccine delivery was funded from the core NIO budget.

The programme began in November 2009 and concluded on March 31st 2010. Vaccination was offered to the following priority groups in order:

- Those with long term medical conditions aged between 6 months and 65 years and all pregnant women of more than 14 weeks gestation
- Healthcare Workers (HCWs)
- Children between 6 months and 18 years
- Adults aged 65 years and older
- The rest of the population

The target uptake rate for the campaign was 70% and over 1,100,000 doses of vaccine were administered.

It is estimated that the following availed of the vaccination programme:

- 50% of those “medically at-risk”
- 50% of children under 5 years
- 40% of schoolchildren
- 25% of those aged 65 and older
- 30-40% of healthcare workers
- 40% of pregnant women

The HSE carried out a review of the pandemic vaccination programme to inform planning for possible future pandemics. The review identified that the training and the short regular communications provided by the NIO were well received. The delivery of the vaccine by the NCCS managed by the NIO was considered to work well.

# Research

The NIO has conducted a number of research projects in relation to the national immunisation programmes.

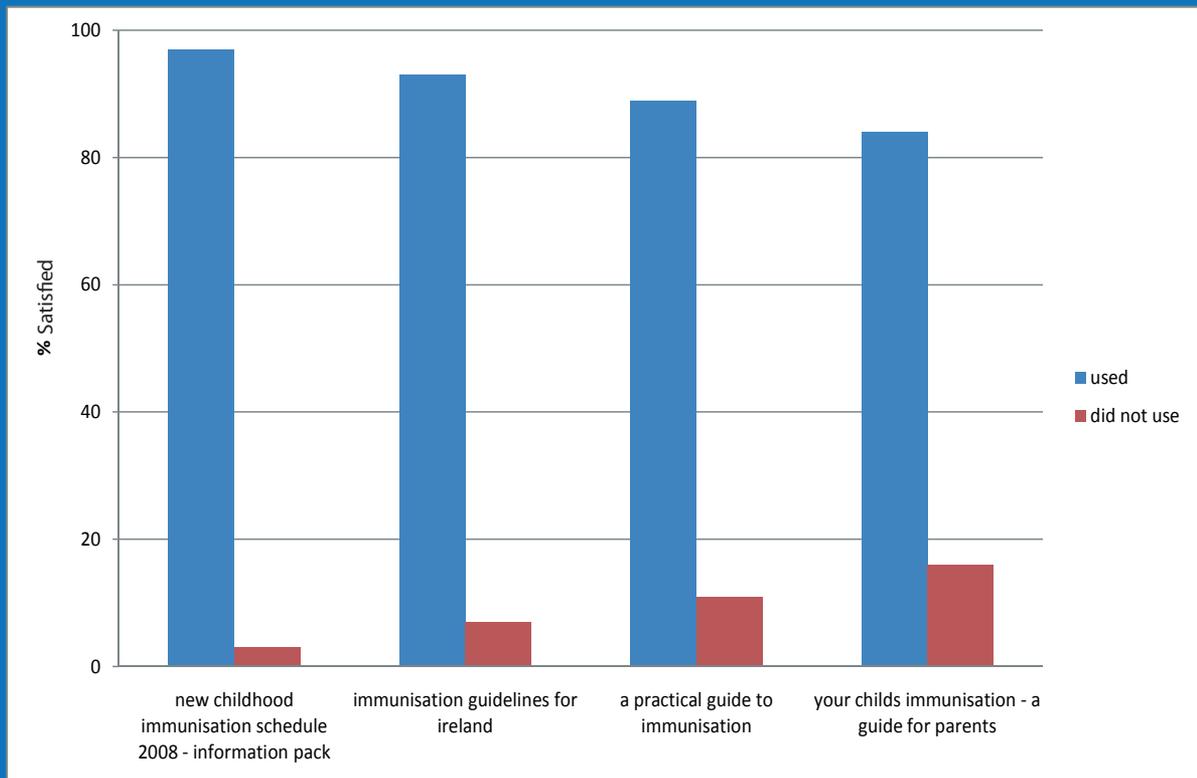
## **National Cold Chain Service (NCCS) Satisfaction Surveys**

There have been two customer satisfaction surveys carried out with users of the HSE NCCS. The first survey was carried out between December 2005 and January 2006 and the second during the

months of May and June 2008. In each survey a self administered questionnaire was delivered to GPs and hospitals by the NCCS and returned by prepaid envelope to the HSE National Immunisation Office. There was a 39% response rate to the first survey and 65.8% response rate for the second survey.

The results of both surveys showed over 90% satisfaction with the NCCS and provided suggestions for service improvement.

**Figure 14** National Cold Chain Delivery Service Consumer Satisfaction Survey



### Survey on usefulness of materials to support new PCIP

New vaccines and a new schedule were introduced in the new PCIP in 2008. To support the introduction of the programme, a number of new information materials were developed and an evaluation of these materials was carried out via a postal questionnaire to GPs.

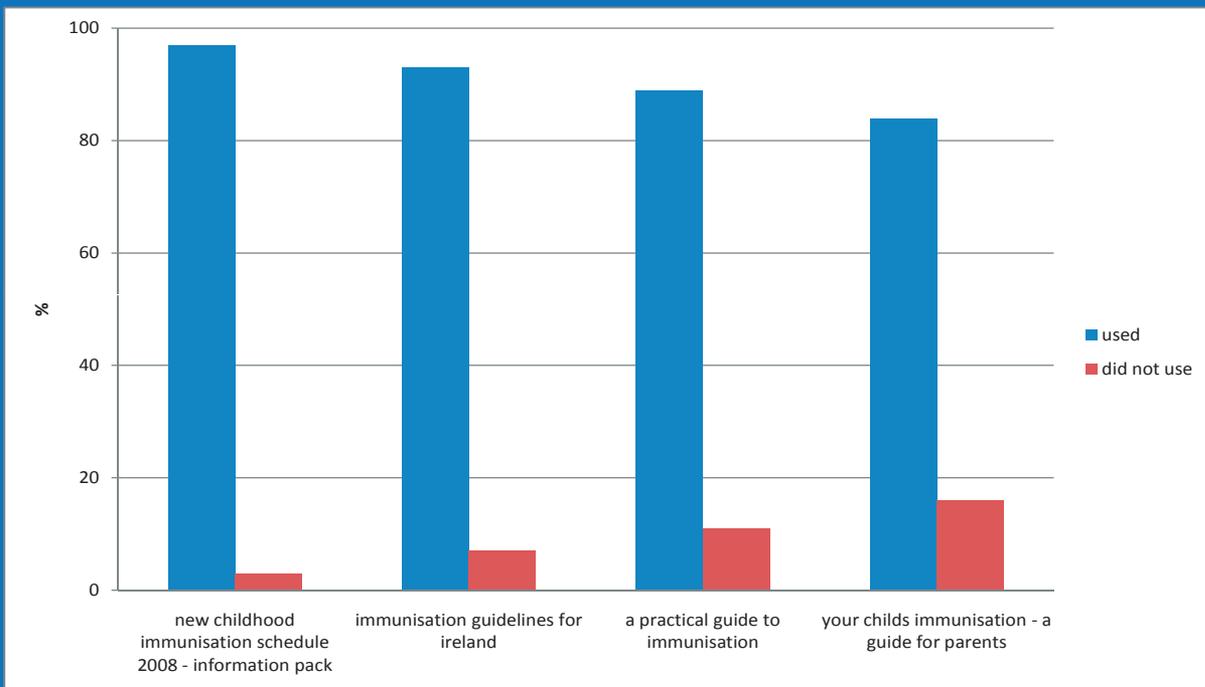
This examined the usefulness of the materials provided, the sources healthcare professionals used for immunisation information and the resources used for parents where English was not their first language.

The survey had a response rate of 41% and the results showed that most GPs (97%) used the information pack developed for the new childhood immunisation schedule as their source of information.

Other findings from the questionnaire analysis demonstrated that:

- GPs reported timely delivery of information materials
- LHO staff (medical, nursing and administrative) were most likely to be contacted for information
- NIO website used most often for accessing immunisation information especially for parents whose first language is not English

**Figure 15** Percentage usefulness of education materials by GPs



### **Qualitative Research with target cohorts for immunisation programmes**

The NIO has commissioned focus group research in two areas:

- parents' experience and understanding of the primary childhood immunisation programme
- knowledge and attitudes of people in at risk groups regarding the influenza vaccination programme

### **Focus groups with parents on primary childhood immunisation programme 2011.**

The introduction of the new schedule for the primary childhood immunisation programme was followed by a lower than expected uptake for the vaccines given at 12 and 13 months. In order to explore the reasons for this and to assess parents' opinions of the information material available (specifically the booklet "Your child's immunisation – A guide for parents"), a number of focus groups were held. The main findings demonstrated that:

- Parents were not averse to vaccination
- Most parents were organised about taking their children at the right time
- Parents reported misinformation amongst healthcare professionals, especially around reasons for deferral and for not giving some vaccines simultaneously
- Parents found the booklet information appropriate but only a small minority had read the whole guide
- The vaccination schedule and tables of the effects of the diseases and the side effects of the vaccines were most often referred to
- Parents still expressed concerns re MMR and autism

The findings from the focus groups were used to inform the revision of parental information material.

The layout was revised with the booklet divided into sections by visit rather than disease type. Additional supporting materials were developed including a sheet outlining what to expect after vaccination, date of next appointment and a parent held vaccination passport to record immunisation details (see page 24).

### **Focus groups on influenza and influenza vaccination 2011**

The uptake for the influenza vaccine remains below the WHO target of 75% and is estimated at 10–20% amongst HCWs. For these reasons focus groups were held in November 2011 to explore attitudes and knowledge of influenza and influenza vaccination, barriers to vaccination and awareness of recent influenza media campaign. The focus groups targeted health care workers, those over 65 years, people with specific long term diseases and pregnant women who had not received the influenza vaccine for the 2011/12 season.

Preliminary results suggest:

- good knowledge about the symptoms and treatment for influenza
- lack of perception of a personal risk from influenza
- high level of awareness of the importance of hand washing and a perception that this was sufficient to protect against influenza
- some concerns about possible vaccine side effects
- cost of vaccine administration as a possible barrier to accessing the vaccine
- requirement for more statistical information on the side effects of vaccine, the risk of influenza infection and complications of influenza infection

These findings will be used to inform future influenza vaccine programmes.

## The Future

There are constant changes and developments in immunisation so although there have been considerable improvements since the establishment of the NIO, there is still much to be done to ensure the delivery of high quality programmes.

The standardisation of all immunisation programmes needs to continue so as to achieve the target vaccine uptakes with particular focus on seasonal influenza vaccine uptake especially amongst healthcare workers.

A National Immunisation Information System (NIIS) is an essential component of a well functioning immunisation programme. This will provide a national register of all immunisations and allow easier implementation and monitoring, deliver timely vaccine uptakes, facilitate better follow up of clients including defaulters and give rapid information in the case of a vaccine recall.

The NIO has carried out detailed system research, business analysis, business process documentation, market research, feasibility studies and software requirements specifications for the implementation of a NIIS which would result in significant efficiencies by streamlining the numerous regional and local ICT systems currently in use.

Ireland is committed to the WHO European strategy for Measles and Rubella elimination by 2015. However many older children have not received two doses of MMR vaccine and so are still susceptible to

these diseases. To achieve the target of 95% uptake for these cohorts the DoH measles elimination strategy has recommended all children aged 4 to 18 years of age be provided with another opportunity for MMR vaccine. Although the successful MMR campaign in April and May 2009 fulfilled part of this commitment for older students there are still ongoing measles outbreaks and a large school going cohort who need to be provided with MMR vaccine. This implementation will allow Ireland to comply with agreed WHO strategy.

Ireland has the one of the highest rates of Meningococcal Group B (Men B) infection in Europe so the expected European licensing of a new Men B vaccine is very welcome. Considerable planning will be required to include this vaccine in the routine schedule and for any catch-up campaign once this is agreed.

In addition, vaccines such as varicella and zoster have been recommended in many other countries and there are at least 30 other vaccines and new methods of administration in development which demonstrates the dynamic nature of immunisation and the requirement for a coordinating national unit.

The expertise developed within the small team in the NIO across a wide range of functions will serve to drive the delivery of high quality immunisation programmes in the new challenges ahead.

# Appendix 1

## Cold Chain Products available from National Cold Chain Service December 2011

### Primary Childhood Vaccines

Vaccine	Product Name	Manufacturer
6 in 1	INFANRIX HEXA	GSK
Men C	MENJUGATE	Novartis
PCV	PREVENAR 13	Pfizer
MMR	PRIORIX	GSK
MMR	MMR Vax Pro	Sanofi Pasteur MSD
Hib	HIBERIX	GSK
Hib	Act-Hib	Sanofi Pasteur MSD
4 in 1	TETRAVAC	Sanofi Pasteur MSD
4 in 1	INFANRIX-IPV	GSK

### Adult Vaccines

Vaccine	Product Name	Manufacturer
Td	DITE BOOSTER INACTIVATED INFLUENZA	SSI
Influenza	VACCINE (Split Virion) BP	Sanofi Pasteur MSD
PPV23	PNEUMOVAX 11	Sanofi Pasteur MSD

### Vaccines Used By HSE

Vaccine	Product Name	Manufacturer
BCG	BCG	SSI
Tdap	BOOSTRIX	GSK
Tuberculin	TUBERCULIN 2 TU	SSI
4 in 1	TETRAVAC	Sanofi Pasteur MSD
4 in 1	INFANRIX-IPV	GSK
MMR	PRIORIX	GSK
MMR	MMR Vax Pro	Sanofi Pasteur MSD
HPV	GARDASIL	Sanofi Pasteur MSD

### Restricted Vaccines Requiring Authorisation

Vaccine	Product Name	Manufacturer
Hepatitis A	HAVRIX Monodose	GSK
	AVAXIM	Sanofi Pasteur MSD
Hepatitis B	HAVRIX Junior Monodose	GSK
	ENGERIX (adult)	GSK
	ENGERIX (paediatric)	GSK
	FENDRIX (renal insufficiency)	GSK
	HBVAXPRO 5mcg	Sanofi Pasteur MSD
Hepatitis A+B	HBVAXPRO 10mcg	Sanofi Pasteur MSD
	HBVAXPRO 40mcg	Sanofi Pasteur MSD
	TWINRIX (adult)	GSK
	TWINRIX (paediatric)	GSK
Men ACW135Y conjugate vaccine	MENVEO	Novartis
Rabies	Rabies	Sanofi Pasteur MSD
Td/IPV	Revaxis	Sanofi Pasteur MSD
Tdap/IPV	IPV-Boostrix	GSK

### Other cold chain products requiring authorisation

Product	Product Name	Manufacturer
Botulism antitoxin	Botulism antitoxin	Novartis
Diphtheria antitoxin	Diphtheria antitoxin	Butantan Institute, Brazil
Human normal immunoglobulin (HNIG)	Subgam	BPL
Rabies immunoglobulin	Imogam	Sanofi Pasteur MSD

# Appendix 2

## List of Publications

- 2012 Pocket Calendars
- 4 in 1 Parent Information leaflet
- 6-in-1 information leaflet
- BCG Consent - Clinic
- BCG Consent - Hospital
- BCG Consent form - School programme
- BCG Information leaflet
- Don't unplug stickers
- FAQ Flu booklet
- Flu Healthcare Worker booklet – English and Irish
- Flu Poster - English
- Flu Poster - Irish
- Flu Pregnancy Booklet – English and Irish
- Flu Public Booklet – English and Irish
- HPV 1st Year School Packs – information leaflet and consent form
- HPV 6th Year School Packs – information leaflet and consent form
- Immunisation - Catch up wheel
- Immunisation Magnets
- Immunisation Passport
- Immunisation Passport - Irish
- Immunisation towel
- Immunise poster - reminder 5 visits
- Immunise poster - reminder 5 visits - Irish
- Influenza - Irish - Poster
- Influenza - Poster
- Jack and Jill MMR Poster
- MMR - 4 in 1 vaccines school packs – information leaflet and consent form
- MMR Information leaflet
- MMR Poster
- Mumps poster
- National Immunisation Newsletter
- New Immunisation schedule poster
- New Immunisation schedule poster - Irish
- Parent's guide to immunisation + record card
- Parent's guide to immunisation + record card – Irish
- Pneumococcal Polysaccharide Vaccine Algorithm
- Protect against mumps – leaflet
- Stickers – post vaccination
- Tdap School Packs – information leaflet and consent form
- Tear pads - Primary Childhood Immunisation Programme
- Vaccine Fridge Magnet

# Appendix 3

## Primary Childhood Immunisation Programme 2005 - 2011

### Primary Childhood Immunisation Programme (PCIP)

	Date of Birth			
	1st July 2005 – 15th Sept 2006	16th Sept 2006 – 30th June 2008	1st July 2008 – 30th Sept 2010	1st Oct 2010 – 31st Dec 2011
2 months	5 in 1 + Men C (2 injections)	5 in 1 + Men C (2 injections)	6 in 1 + PCV7 (2 injections)	6 in 1 + PCV13 (2 injections)
4 months	5 in 1 + Men C (2 injections)	5 in 1 + Men C (2 injections)	6 in 1 + Men C (2 injections)	6 in 1 + Men C (2 injections)
6 months	5 in 1 + Men C (2 injections)	5 in 1 + Men C (2 injections)	6 in 1 + PCV7 + Men C (3 injections)	6 in 1 + PCV13 + Men C (3 injections)
12 months	MMR	MMR + Hib (2 injections)	MMR + PCV7 (2 injections)	MMR + PCV13 (2 injections)
13 months			Men C + Hib (2 injections)	Men C + Hib (2 injections)

# Appendix 4

## Changes in Immunisation 2005–2011

### Primary Childhood Immunisation Programme (PCIP)

Protects babies against 12 vaccine preventable diseases (diphtheria, haemophilus influenzae B (Hib), hepatitis B, measles, meningococcal C disease, mumps, pertussis (whooping cough), pneumococcal disease, polio, rubella, tetanus and tuberculosis)

Vaccines to protect against hepatitis B and pneumococcal disease added in 2008

BCG vaccine given to babies shortly after birth by HSE community doctors

All other vaccines given by GPs with HSE immunisation contracts to children aged 2–13 months

Requires 5 GP visits

Vaccines and administration free to all in target cohort

**Target cohort:** Increased from 61,000 in 2005 to 74,000 in 2011 (CSO) (an increase of 21%)

**Target uptake:** 95% (World Health Organization)

**Reported uptake:** DTP at 24 months increased from 90% in 2005 to 96% in 2011

MMR at 24 months increased from 84% in 2005 to 93% in 2011

### Schools Immunisation Programme

Provides additional doses of vaccines in primary (4–5 years) and second level school (11–12 years)

HPV vaccine (3 doses) given to girls in 1st year of second level school to protect against cervical cancer (introduced in 2010/2011)

HPV catch up programme for all 6th year girls (until 2013/2014)

Given in school by HSE vaccination teams

Primary school doses given by General Practitioners (GPs) in 8 Local Health Offices

Vaccines and administration free to all in target cohort

**Target cohort:** 4-5 years increased from 56,500 in 2005 to 63,500 in 2011 (an increase of 12%)

11-12 years increased from 58,000 in 2005 to 59,000 in 2011 (CSO) (an increase of 2%)

**Target uptake:** 95% (World Health Organization) and 80% for HPV (3 doses)

**Reported uptake:** National uptake only available for HPV vaccine - uptake 81.9% for 2010/2011

### Seasonal influenza vaccination

Occurs annually from September to April for

- All those aged 65 years and older
- Those under 65 in medically at risk groups
- All pregnant women (added 2011/2012)
- Healthcare workers and carers

Delivered by GPs, registered pharmacists and occupational health services

Concurrent pneumococcal vaccine campaign in medically at risk groups

Vaccine free to all in target cohort

Administration free of charge to those with a medical or GP visit card

**Target cohort:** Increased from 840,000 in 2005 to 920,000 in 2011 (an increase of 10%)

**Target uptake:** 75% (World Health Organization)

**Reported uptake:** 2005/2006 63%  
2010/2011 64%

(for those aged 65 and older with medical or GP visit cards)

# Appendix 5

## National Immunisation Schedule December 2011

### National Immunisation Schedule December 2011

Age	Vaccines
2 months	6 in 1 + PCV13
4 months	6 in 1 + Men C
6 months	6 in 1 + PCV13 + Men C
12 months	MMR + PCV13
13 months	Men C + Hib
4–5 years (Junior Infants)	4 in 1 + MMR
12–13 years (1st year second level schools)	Tdap
12–13 years (1st year second level schools)	HPV x 3 doses
17–18 years* (6th year second level schools)	HPV x 3 doses
All aged 65 years and older	Seasonal influenza vaccine +/-
Those in specific medically at risk groups	Pneumococcal polysaccharide vaccine
Health care workers	

\* HPV catch up programme until end of 2013/2014 academic year

# Glossary

<b>CSO</b>	Central Statistics Office
<b>DES</b>	Department of Education and Skills
<b>DoH</b>	Department of Health
<b>EIW</b>	European Immunisation Week
<b>FAQs</b>	Frequently Asked Questions
<b>GP</b>	General Practitioner
<b>HCW</b>	Healthcare Workers
<b>HIQA</b>	Health Information and Quality Authority
<b>HPSC</b>	Health Protection Surveillance Centre
<b>HSE</b>	Health Service Executive
<b>ICT</b>	Information Communication Technology
<b>ICGP</b>	Irish College of General Practitioners
<b>IMB</b>	Irish Medicines Board
<b>LHO</b>	Local Health Office
<b>NALA</b>	National Adult Literacy Agency
<b>NCCS</b>	National Cold Chain Service
<b>NIAC</b>	National Immunisation Advisory Committee
<b>NIGSIP</b>	National Immunisation Group for the Schools Immunisation Programme
<b>NIIG</b>	National Immunisation Implementation Group
<b>NIIS</b>	National Immunisation Information System
<b>NIO</b>	National Immunisation Office
<b>OCT</b>	Outbreak Control Team
<b>PCIP</b>	Primary Childhood Immunisation Programme
<b>PCRS</b>	Primary Care Reimbursement Service
<b>VPDs</b>	Vaccine Preventable Diseases
<b>WHO</b>	World Health Organization

## Vaccine abbreviations:

<b>4 in 1</b>	Diphtheria, Pertussis (Whooping Cough), Polio, Tetanus vaccine
<b>5 in 1</b>	Diphtheria, Haemophilus influenzae B, Pertussis (Whooping Cough), Polio, Tetanus vaccine
<b>6 in 1</b>	Diphtheria, Haemophilus influenzae B, Hepatitis B, Pertussis (Whooping Cough), Polio, Tetanus vaccine
<b>BCG</b>	Bacille Calmette-Guerin (Tuberculosis - TB) vaccine
<b>Hep A</b>	Hepatitis A vaccine
<b>Hep B</b>	Hepatitis B vaccine
<b>Hib</b>	Haemophilus influenzae B vaccine
<b>HPV</b>	Human papillomavirus vaccine
<b>Men ACW<sub>135</sub>Y</b>	Meningococcal A,C,W <sub>135</sub> ,Y conjugate vaccine
<b>Men C</b>	Meningococcal C vaccine
<b>MMR</b>	Measles, Mumps, Rubella vaccine
<b>PCV</b>	Pneumococcal conjugate vaccine
<b>PPV</b>	Pneumococcal polysaccharide vaccine
<b>Td</b>	Low dose tetanus and diphtheria vaccine
<b>Td/IPV</b>	Low dose tetanus and diphtheria/inactivated polio vaccine
<b>Tdap</b>	Low dose tetanus, diphtheria and pertussis vaccine
<b>Tdap/IPV</b>	Low dose tetanus, diphtheria and pertussis/inactivated polio vaccine





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