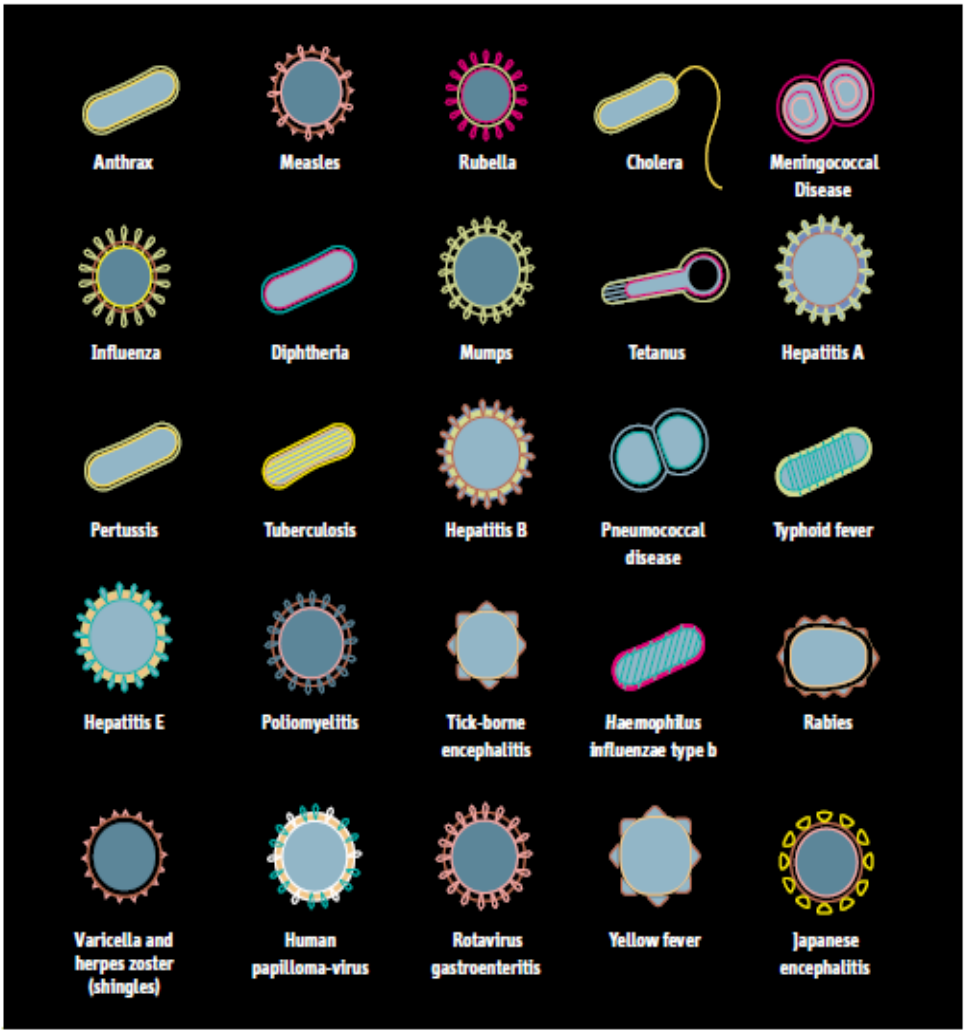
Annual Immunisation and Vaccine Preventable Diseases Report for Northern Ireland

2015-16



HSC Public Health Agency

Acknowledgements

The Public Health Agency Immunisation Team would like to thank everyone who works so hard across Northern Ireland to ensure that the population is protected against vaccine-preventable diseases by maintaining high vaccine coverage. This includes health visitors, School Health teams, GPs, practice nurses, treatment room nurses, midwives, Child Health Information teams and PHA communications team.

We are grateful to all those who contributed to the uptake data in this report including Child Health Information System teams, School Health teams and surveillance colleagues Joy Murphy, Ruth Campbell and Chris Nugent. We also wish to highlight the long-running and substantial contribution to the health of Northern Ireland's population made by Dr Richard Smithson and Mary Loughery who recently retired from the PHA immunisation team, having led the delivery of high levels of vaccine coverage in Northern Ireland over many years, and we wish them both long and happy retirements.

The front cover image, taken from the WHO *Global Vaccine Action Plan 2011-2020*, represents all bacteria and viruses for which a vaccine is available, highlighting what a valuable and growing resource vaccines are across the world to protect against infectious diseases.[1] Not all of these vaccines are routinely used in Northern Ireland as vaccine recommendations are based on the local epidemiology of vaccine-preventable diseases.

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Cover image used with permission from WHO *Global Vaccine Action Plan 2011-2020*[1] - http://apps.who.int/iris/handle/10665/78141
http://www.who.int/immunization/global_vaccine_action_plan/GVAP_doc_2011_2020/en/
ISBN 9789241504980 - Table 1 on page 17

Summary

Immunisation Programmes

- For the year 2015-16 uptake of three doses of DTaP / IPV / Hib vaccine by 12 months of age was 97.2% in Northern Ireland, which is a slight decrease from the previous year, but still above the 95% target level.
- Uptake of one dose of MMR vaccine by 2 years of age was 95.8%. Uptake of this vaccine has been above the 95% target level since 2012 except for one dip below this in Q4 of 2014-15
- Uptake of two doses of MMR by 5 years of age was 93% and has been increasing since 2013, but is still below the 95% target level.
- By the end of school year 10, 90.7% of girls had completed a course of HPV vaccine, an increase from 89.5% in 2015.
- By the end of school year 12 in 2016, 94.5% of young people had received two doses of MMR vaccine, 87.4% had received a booster of DTP vaccine and 78% had received the new meningococcal ACWY vaccine
- 52.2% of 70 year olds had received the shingles vaccine along with 50.3% of 78 year olds. This is a decrease of 4% from the previous year, but eligible people continue to be immunised in subsequent years.
- New vaccine programmes were introduced for meningococcal disease group B and ACWY in 2015.

Vaccine Preventable Diseases

- Mumps cases increased in 2015 to 200 cases from 68 cases in 2014, but this is a decrease on 2013 levels

- Pertussis cases also increased to 99 cases from 33 cases in 2014, but this is a decrease on 2012 levels.
- Thirty-three cases of probable or confirmed meningococcal disease were notified to PHA in 2015, 28 of which were laboratory-confirmed. This is a decrease from 49 notifications in 2014, 29 of which were laboratory-confirmed.

Priorities for Improvement

- Work with GPs, health visitors and child health information systems to improve uptake of childhood immunisations which are below the 95% target level
- Monitor the incidence of meningococcal disease in light of the introduction of vaccines against Meningococcal group B and ACWY disease
- Work with all stakeholders including GPs and midwifery services to continue to promote vaccination to pregnant women and continue to monitor the incidence of pertussis, particularly in infants under 3 months of age
- PHA will extend the range of training and reference materials for immunisers available on-line including video seminars and e-learning packages

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Introduction

According to the *WHO Global Vaccine Action Plan 2011-2020*, “Overwhelming evidence demonstrates the benefits of immunisation as one of the most successful and cost-effective health interventions known.”[1] Their vision for the Decade of Vaccines (2011–2020) is of a world in which all individuals and communities enjoy lives free from vaccine-preventable diseases.

Immunisation policy for Northern Ireland is set by the Department of Health, on advice from the independent Joint Committee for Vaccines and Immunisation (JCVI). This committee regularly reviews the epidemiology of vaccine-preventable diseases in the UK and makes recommendations on the introduction of new programmes in response to changes in disease incidence and the likely cost-effectiveness of vaccination programmes. The UK has a very comprehensive vaccine programme, free at the point of delivery for those eligible by virtue of age or risk group status.

Northern Ireland has implemented all JCVI recommendations and has some of the highest immunisation uptakes worldwide. This has undoubtedly contributed to a reduction in the burden of communicable diseases in Northern Ireland.

Though vaccine coverage is high overall, health inequalities mean that some groups of people and some areas in Northern Ireland are less likely than others to be vaccinated. The PHA immunisation team is committed to working towards the WHO vision where individuals and communities enjoy lives free from vaccine-preventable diseases by maintaining and improving uptake rates of all immunisations.

Data in this report is presented for the financial year April 2015-March 2016 for childhood immunisations up to the age of 5, in line with national COVER statistic reporting. Data for immunisations provided in schools, and the shingles vaccine is presented from September 2015-August 2016 in line with the delivery of those programmes. Information on influenza immunisations has been published elsewhere, in the *Surveillance of Influenza in Northern Ireland 2015-16* report.[2] Surveillance data for vaccine preventable diseases is presented for the calander year 2015.

The year 2015-16 was a particularly busy year for immunisation programmes, with the introduction of the Meningococcal group B vaccine for all children born on or after 1st May 2015 starting in September 2015.

The Meningococcal ACWY vaccine was introduced for 14-18 year olds and first year university students as an emergency vaccination programme in response to increasing cases of group W disease across the UK also in 2015.

The Routine Childhood Immunisation Schedule in Northern Ireland from July 2016

When to immunise	Diseases vaccine protects against	How it is given
2 months old	Diphtheria, tetanus, pertussis (whooping cough), polio and Hib	One injection
	Pneumococcal infection	One injection
	Rotavirus	Orally
	Meningococcal B infection	One injection
3 months old	Diphtheria, tetanus, pertussis, polio and Hib	One injection
	Rotavirus	Orally
4 months old	Diphtheria, tetanus, pertussis, polio and Hib	One injection
	Pneumococcal infection	One injection
	Meningococcal B infection	One injection
Just after the first birthday	Measles, mumps and rubella	One injection
	Pneumococcal infection	One injection
	Hib and meningococcal C infection	One injection
	Meningococcal B infection	One injection
Every year from 2 years old up to P7	Influenza	Nasal spray or injection
3 years and 4 months old	Diphtheria, tetanus, pertussis and polio	One injection
	Measles, mumps and rubella	One injection
Girls 12 to 13 years old	Cervical cancer caused by human papillomavirus types 16 and 18 and genital warts caused by types 6 and 11	Two or three injections over six months
14 to 18 years old	Tetanus, diphtheria and polio	One injection
	Meningococcal ACWY	One injection

Targeted Childhood Immunisations

When to immunise	Diseases vaccine protects against	Vaccine given
At birth, 1 month old, 2 months old and 12 months old, 3 years and 4 months old	Hepatitis B	Hepatitis B vaccine
At birth	Tuberculosis	BCG
Six months up to two years	Influenza	Inactivated flu vaccine
11 to less than 18 years	Influenza	Flu nasal spray or inactivated flu vaccine

Routine Immunisation Schedule for Adults

When to immunise	Diseases vaccine protects against	Vaccine given
Age 65 years	Pneumococcal Disease	PPV-23
Annually from age 65 years	Influenza	Inactivated flu vaccine
Age 70 years	Shingles	Zostavax ®

Targeted Adult Immunisations

Who to immunise	Diseases vaccine protects against	Vaccine given
Risk groups described in annual CMO letter	Influenza	Inactivated flu vaccine
Risk groups described in Green Book	Pneumococcal Disease	PPV-23
Pregnant women from 16th gestational week	Pertussis (Whooping Cough) in newborn	Boostrix-IPV ®

Men who have sex with men, aged ≤45 years who attend GUM or HIV clinics	Anal, throat and penile cancer caused by human papillomavirus types 16 and 18 and genital warts caused by types 6 and 11	Gardasil ®
All adults born since 1970 with no history of two doses of MMR vaccine	Measles, mumps and rubella	MMR vaccine
Catch-up cohorts published annually	Shingles	Zostavax ®

Uptake and Coverage in Childhood Immunisation Programmes

Immunisations up to 12 months of age

In 2015-16 the immunisation schedule for all babies was a course of primary immunisations at the ages of 2, 3, and 4 months to protect against diphtheria, tetanus, polio, pertussis, *Haemophilus influenza* type B (DTaP/IPV/Hib), pneumococcal disease (PCV), rotavirus, and meningococcal group C (Men C). From September 2015, the meningococcal group B vaccine (MenB) was also added to the schedule at 2 and 4 months. The first data for the uptake of MenB at 12 months will be available in the second quarter of 2016-17. The rotavirus vaccine schedule must be completed by 24 weeks of age, whereas all the other immunisations can be given later if a child has missed them at the scheduled time. This explains why the rotavirus vaccine uptake is slightly lower than the other vaccines given under 12 months of age. The uptake of primary immunisations in Northern Ireland is consistently equal to or higher than other areas of the UK. However, there is variation of uptake by local commissioning group (LCG) area, with uptake 1-2% lower in Belfast than other areas (Table 1).

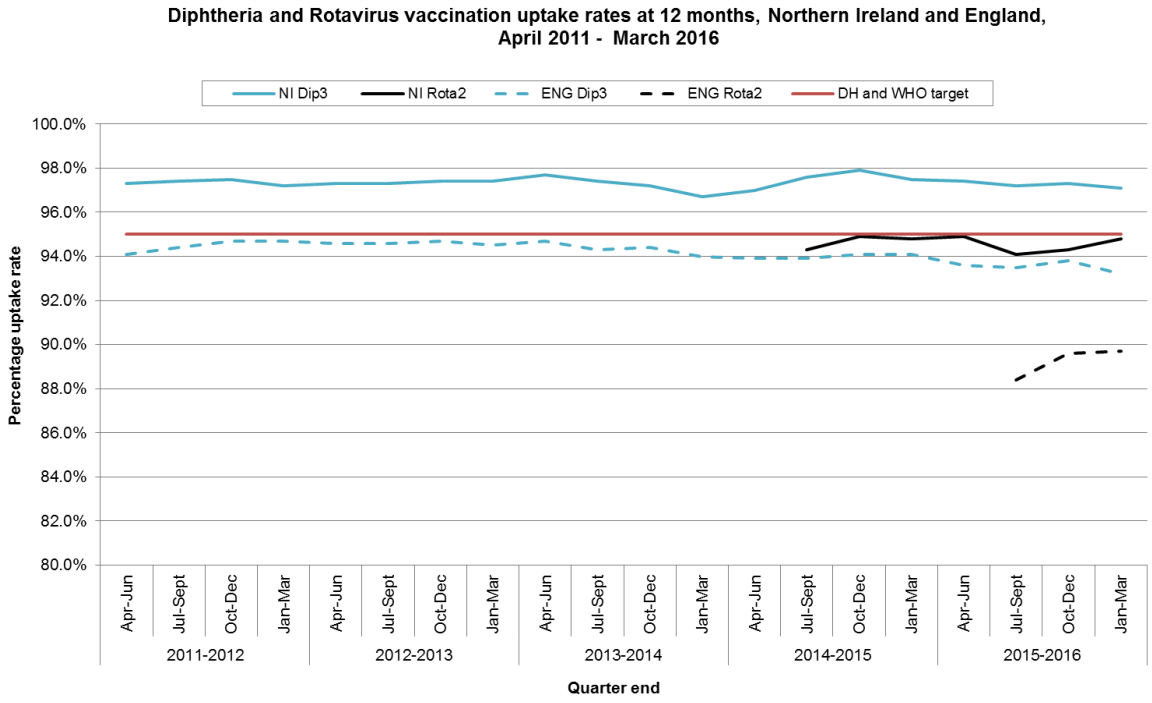
Table 1. Completed primary immunisations by 12 months of age, 2015-16, Northern Ireland and UK

Area	% Uptake at 12 months			
	DTaP / IPV / Hib3	MenC	PCV2	Rota2
Belfast	95.0%	97.0%	94.8%	93.1%
South Eastern	97.4%	98.2%	97.4%	94.4%
Northern	97.8%	98.3%	97.7%	94.7%
Southern	97.9%	98.2%	97.7%	94.7%
Western	97.7%	98.6%	97.8%	94.1%
NI Total	**97.2%**	**98.1%**	**97.1%**	**94.3%**
England	93.6%	*	93.5%	^
Scotland	97.2%	97.5%	97.1%	92.9%
Wales	96.6%	97.4%	96.4%	93.4%

* Data not reported for England due to data quality issues; ^ Data not available
Source: Quarterly COVER returns (Northern Ireland Child Health System and PHE)

There has been a slight decrease in primary immunisation uptake during 2015-16, similar but less dramatic than the fall in uptake in England (Figure 1). PHA will investigate possible causes of this decline with the aim of developing strategies to reverse this downward trend.

Figure 1. Diphtheria and Rotavirus vaccination uptake rates at 12 months, Northern Ireland and England



Source: Quarterly COVER returns (Northern Ireland Child Health System and PHE)

Immunisations up to 24 months

Infants are offered immunisations just after their first birthday to protect against measles, mumps and rubella (MMR), pneumococcal disease (PCV), meningococcal group C and *haemophilus influenza type B* (Hib/MenC). Uptake of these immunisations is measured at their second birthday. Uptake rates of all immunisations at 24 months for 2015-16 (Table 2) are all above the 95% target and higher than the uptake across the other parts of the UK. Again, uptake of vaccines at 24 months is lower in Belfast LCG area than the other LCG areas and falls below 95% for all immunisations given just after the first birthday. Average uptake for Northern Ireland of all immunisations given just after the first birthday has been consistently above 95% since 2012-13 except for one dip in 2014-15 Q4 (Figure 2). Since 2012-13 uptake of MMR has closely mirrored that of all the other

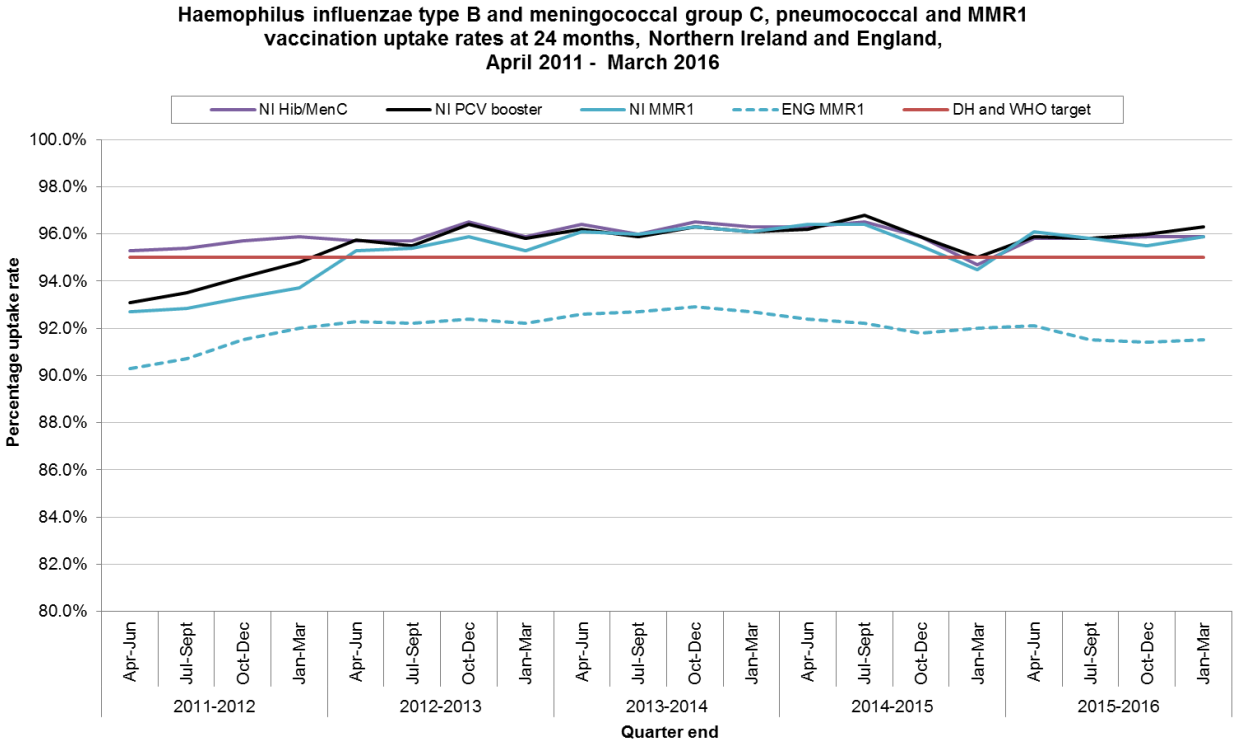
immunisations given just after the first birthday showing that parents are now choosing for their children to receive all the vaccines offered at this visit.

Table 2. Completed primary immunisations by 24 months of age, 2015-16, Northern Ireland and UK

Area	% Uptake at 24 months			
	DTaP / IPV / Hib3	PCV Booster	Hib/MenC	MMR1
Belfast	96.6%	92.5%	92.4%	92.9%
South Eastern	98.4%	95.8%	95.7%	95.9%
Northern	98.5%	97.5%	96.7%	96.4%
Southern	98.8%	96.5%	96.5%	96.9%
Western	98.8%	98.2%	96.8%	96.4%
NI Total	**98.2%**	**96.1%**	**95.7%**	**95.8%**
England	95.2%	91.5%	91.6%	91.9%
Scotland	97.9%	95.3%	95.4%	95.4%
Wales	97.0%	95.6%	94.7%	95.3%

Source: Quarterly COVER returns (Northern Ireland Child Health System and PHE)

Figure 2. Haemophilus influenzae type B and meningococcal group C, pneumococcal and MMR1 vaccination uptake rates at 24 months, Northern Ireland and England.



Source: Quarterly COVER returns (Northern Ireland Child Health System and PHE)

Immunisations up to five years of age

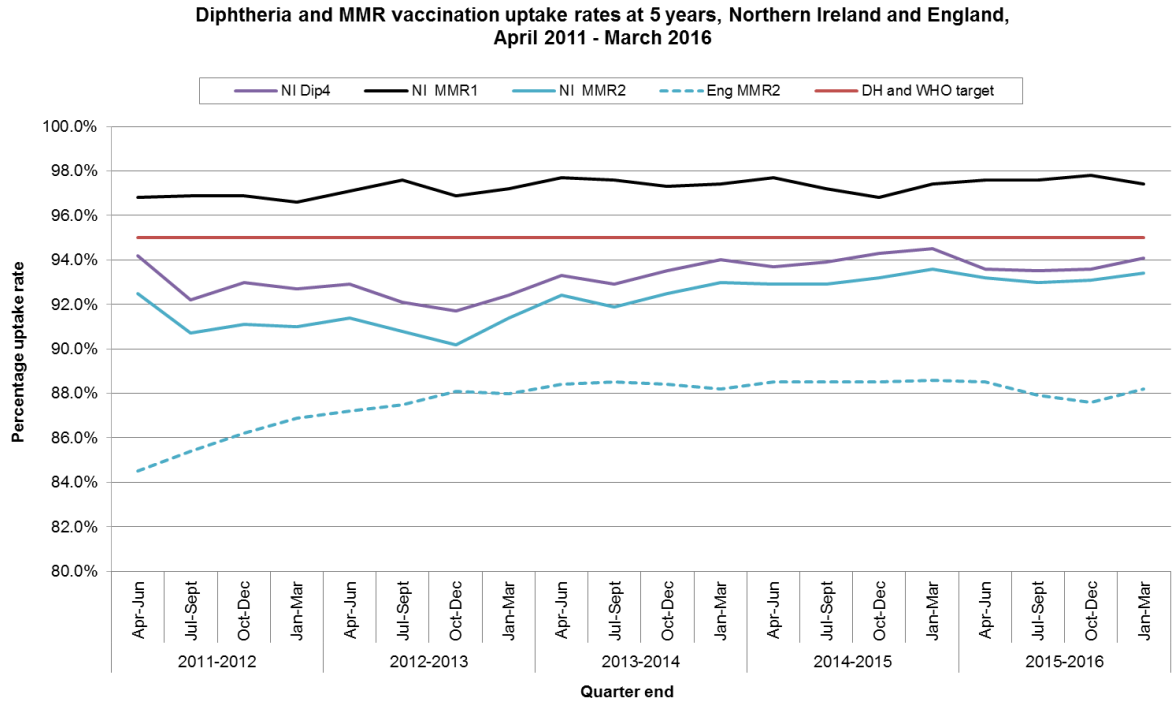
Children are offered “pre-school booster” immunisations from the age of 3 years and 4 months, providing a fourth dose booster of protection against diphtheria, tetanus, polio and pertussis (DTa/IPV) and a second dose of MMR vaccine. Uptake of these vaccines is measured at their fifth birthday. Uptake of booster immunisations for MMR and DTaP/IPV measured at 5 years show that this is below 95% and for 2015-16 is similar to uptake in Scotland but higher than uptake in England and Wales (Table 3). As was the case at 12 months and 24 months, uptake in the Belfast area is lower than the other LCG areas. There appears to be slowly increasing uptake in DTaP/IPV and MMR2 (Figure 3), as well as the gap closing between uptake of these vaccines, showing that most parents accept both vaccines given together. Uptake of MMR2 is below the 95% target needed to ensure that the spread of measles outbreaks can be contained through herd immunity, making improving MMR2 uptake an important goal.

Table 3. Completed primary immunisations and boosters by 5 years of age, 2015-16, Northern Ireland and UK

Area	% Uptake at 5 years			
	DTaP/IPV/Hib3	MMR1	MMR2	DTaP/IPV booster
Belfast	96.8%	96.4%	87.3%	87.3%
South Eastern	98.4%	97.8%	94.5%	95.2%
Northern	98.5%	97.7%	94.6%	95.4%
Southern	97.9%	97.4%	93.4%	93.9%
Western	98.8%	98.2%	94.9%	95.7%
NI Total	98.1%	97.5%	93.0%	93.6%
England	95.6%	94.8%	88.2%	86.3%
Scotland	98.1%	97.1%	93.1%	93.7%
Wales	96.3%	96.8%	91.6%	92.1%

Source: Quarterly COVER returns (Northern Ireland Child Health System and PHE)

Figure 3. Diphtheria and MMR vaccination uptake rates at 5 years, Northern Ireland and England



Source: Quarterly COVER returns (Northern Ireland Child Health System and PHE)

Teenage immunisations

Human Papilloma Virus (HPV)

In 2008 the Human Papilloma Virus (HPV) vaccine was introduced for girls aged 12-13 years old, with a catch-up campaign for girls up to 18 years old. Initially the Cervarix ® vaccine was used which offered protection against types 16 and 18 of the virus which together cause up to 70% of cervical cancers. In 2012 the vaccine was changed to Gardasil ® which provides additional protection against types 6 and 11 of the virus which cause genital warts. The full course of vaccines was initially three doses, however additional evidence supported the change to a two dose schedule for those aged less than 15 years old from September 2014. Results reported refer to a completed schedule of either two or three doses depending on the date of vaccine administration determined by the schedule at the time. The programme is delivered routinely in schools with vaccines given in Year 9 and then opportunities provided in school to catch-up on missing doses in Year 10.

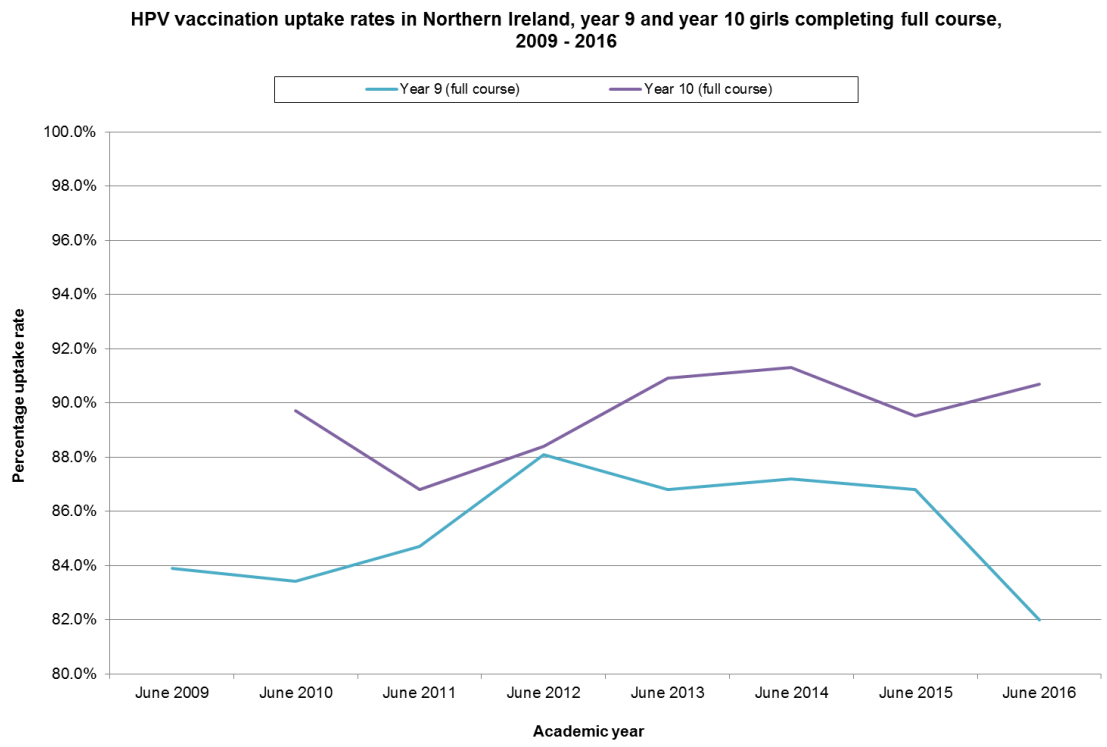
The uptake of a completed course by the end of Year 9 has fallen somewhat since a maximum in 2012, but due to further clinics being offered in Year 10, more than 90% of girls had completed the course by the end of Year 10 in June 2016 (Table 4; Figure 4).

Table 4. HPV vaccination uptake rates in Northern Ireland, year 9 & 10 girls completing full course, 2009-16

	Year 9 (full course)	Year 10 (full course)
June 2009	83.9%	
June 2010	83.4%	89.7%
June 2011	84.7%	86.8%
June 2012	88.1%	88.4%
June 2013	86.8%	90.9%
June 2014	87.2%	91.3%
June 2015	86.8%	89.5%
June 2016	82.0%	90.7%

Source: Northern Ireland Child Health System

Figure 4. HPV vaccination uptake rates in Northern Ireland, year 9 & 10 girls completing full course, 2009-16



Source: Northern Ireland Child Health System

Diphtheria, tetanus and polio booster

In year 11, school health teams offer a booster vaccine to all young people against diphtheria, tetanus and polio (Td/IPV), commonly known as the “school leavers’ booster”. For most young people this will be the fifth and final dose that they require. At this visit, school health also offer MMR to any children who have not yet received two doses to ensure that they complete the recommended course. There is a further opportunity to receive the Td/IPV and MMR vaccines in year 12 for those who have not yet completed the course. Eighty-seven percent of pupils received the school leavers’ booster by the end of year 12 (Table 5). Pupils who have not received this vaccine from school health can request it from their GP. The target for uptake of two doses of MMR is 95% as this is the level required to contain the spread of measles in the community. It is very encouraging to note that even though the level of two doses of MMR is below this level at five years of age, by the end of year 12 the population coverage for two doses of MMR has increased to 94.5%, with the Southern LCG area reaching 96.3% Table 6).

Table 5. Annual school leavers’ booster vaccine coverage in Northern Ireland: 2015-16

Area	Year 11 % vaccinated	Year 12 % vaccinated
Belfast	75.6%	85.3%
South Eastern	77.9%	84.9%
Northern	80.4%	87.3%
Southern	83.2%	92.9%
Western	78.9%	85.5%
NI Total	79.3%	87.4%

Source: Northern Ireland Child Health System

Table 6. Annual MMR2 vaccine coverage in Northern Ireland: 2015-16

Area	Year 12 % vaccinated
Belfast	92.5%
South Eastern	94.6%
Northern	94.3%
Southern	96.3%
Western	94.9%
NI Total	94.5%

Source: Northern Ireland Child Health System

Meningococcal ACWY vaccine

The meningococcal ACWY (MenACWY) vaccine programme was introduced in the UK in August 2015 in response to an outbreak of meningococcal group W disease across the UK. Teenagers aged 14-18 years and university “freshers” were chosen as the target group for immunisation. For operational reasons the programme was introduced in a phased way with those children leaving year 14 in 2015 (date of birth range 02/07/96-1/7/97) immunised in August and September of 2015 by their GP. This cohort continues to be eligible for vaccination up to 25 years old.

In second phase of the programme the vaccine was provided by school health teams to young people in years 11 and 12 (date of birth range 2/7/99-1/7/01). The third phase of the programme is provided by GPs to those young people with dates of birth 2/7/97-1/7/99 from April 2016. The MenACWY vaccine will then be provided routinely to young people in schools in year 11 with the school leavers’ booster and MMR, with an opportunity to catch up in year 12.

The uptake of the first phase of the MenACWY programme for those dates of birth 2/7/96-1/7/97 was 54% across Northern Ireland, although significantly lower in the Belfast area at 45% than in other areas (Table 7). This is a high uptake in a programme that was implemented with a short lead-in time and for a group of young people who may be reluctant to seek vaccines from their GP. The uptake for the equivalent cohort in England was 35.2% at the end of March 2016. Uptake in schools-based immunisation programmes is usually higher compared to GP-based programmes for young adults. The uptake of 79.4% in year 11 and 78% in year 12 is very high for a new immunisation programme.

Year 12 pupils who missed vaccination in school were able to request this from their GP and 3% were vaccined this way.

Table 7. Coverage of Men ACWY for year 11 & 12 in Northern Ireland Sept 2016

Area	Year 11 (DOB 02/07/00 - 01/07/01) % vaccinated	Year 12 (DOB 02/07/99 - 01/07/00) % vaccinated	DOB 02/07/96 - 01/07/97 % vaccinated
Belfast	78.8%	75.9%	45.0%
South Eastern	77.8%	76.1%	57.0%
Northern	80.4%	80.3%	57.0%
Southern	83.4%	79.1%	54.0%
Western	75.2%	71.4%	56.0%
NI Total	79.4%	78%	54.0%

Source: Northern Ireland Child Health System and HSCB

Uptake and Coverage in Targeted Childhood Immunisation Programmes

Hepatitis B vaccine to babies born to hepatitis B positive mothers

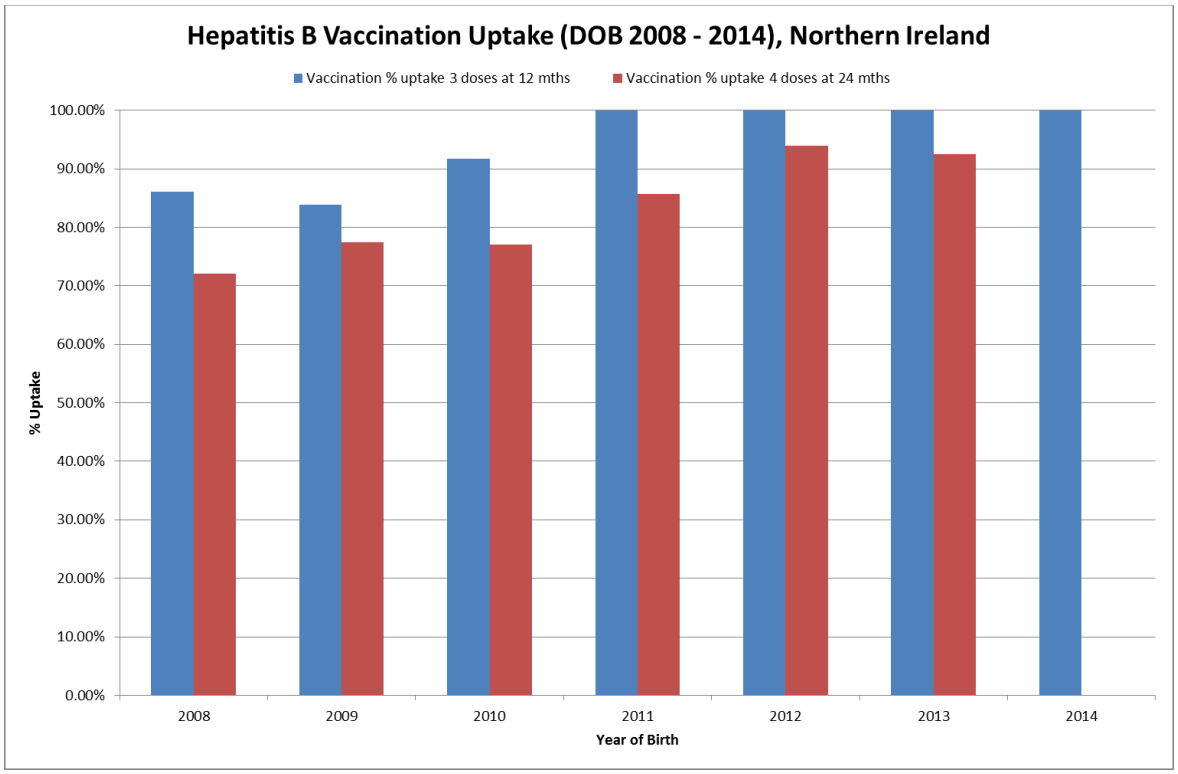
Hepatitis B is a virus that mainly affects the liver and is transmitted by blood and bodily fluids. The UK currently has a selective hepatitis B immunisation programme protecting those thought to be at high risk of contracting the infection.

One group offered the hepatitis B vaccine are babies born to hepatitis B positive mothers. This is because hepatitis B can pass from mother to baby during pregnancy, birth or early life and without intervention about 90% will develop chronic hepatitis B infection which can lead to liver cirrhosis and liver cancer.

All pregnant women in Northern Ireland are offered testing for hepatitis B as part of their antenatal care and if found to be hepatitis B positive, their babies are offered immunisation at birth, 1, 2, and 12 months of age with a booster dose with their pre-school vaccines. Numbers of babies born to hepatitis B positive women are small in Northern Ireland, with only 30 born in 2015.

Figure 5 shows by calendar year of birth the uptake of the first three doses by the babies first birthday and for the first four doses by the babies second birthday. Since 2011 all babies born to hepatitis B positive mothers have received three doses of vaccine by their first birthday and since 2012 over 90% have received four doses by their second birthday. Some of the lower uptake in the second year of life is attributed to families moving out of Northern Ireland.

Figure 5. Hepatitis B vaccine uptake at 12 and 24 months for babies born to hepatitis B positive mother in Northern Ireland from 2008-14



Source: Northern Ireland Child Health System

Uptake and Coverage in Routine Adult Immunisation Programmes

Shingles vaccine

The shingles vaccine programme for older adults was introduced in September 2013 following recommendation by JCVI in 2010 and a Northern Ireland policy outlined in HSS(MD) 27/2013.[3,43,4] Uptake of the vaccine was estimated using the Apollo information system to count the number of vaccinagted people and the eligible population recorded in primary care information systems.

The programme has been offered to people aged 70 years on 1 September each year, with catch-up cohorts planned so that all people who were aged in their 70s when the programme started on 1 September 2013 will be offered the vaccine over time (Table 8). Individuals who were previously eligible but did not take up the vaccine can still get vaccinated until they are aged 80 years on 1 September of the current catch-up programme year.

Table 8. Eligible cohorts for the Shingles Vaccine (age on 1 September of each year).

Time Period	Routine Cohort	Catch-up Cohort	Still Eligible
1 Sept 2013-31 Aug 2014	70 years	79 years	NA
1 Sept 2014-31 Aug 2015	70 years	78 and 79 years	71 years
1 Sept 2015-31 Aug 2016	70 years	78 years	71, 72 and 79 years
1 Sept 2016-31 Aug 2017	70 years	78 years	71, 72, 73 and 79 years

The uptake of vaccine has been between 50% and 57% in all cohorts since the programme began (Table 9), with a further 5% to 7% taking up the vaccine in the year after they became eligible. In 2016-17, the eligible ages were 70 and 78 years, and results will be reported following the end of the season. The planning cycle for 2017-18 is underway.

Table 9. Estimated shingles vaccine uptake, 2013-14 to 2015-15

Time period	Age on 1 September (years)			
	70	71	78	79
1 Sept 2013- 31 Aug 2014	52.5%	NA	NA	49.7%
1 Sept 2014- 31 Aug 2015	56.8%	4.8%	54.4%	54.4%
1 Sept 2015- 31 Aug 2016	52.2%	5.6%	50.3%	6.6%

Source: Apollo Information System

Pneumococcal Polysaccharide Vaccine (PPV)

Information from general practice information systems indicates that 60.8% of 65 to 74 year-olds and 80.8% of those aged 75 years or greater have ever received a pneumococcal vaccine.

Uptake and Coverage in Targeted Adult Immunisation Programmes

Pertussis (whooping cough) vaccine in pregnant women

During the reporting period (2015-16), pregnant women were offered the pertussis (whooping cough) vaccine between 28 weeks of gestation and delivery. Women are now (since May 2016) offered the pertussis vaccine from the 16th week of pregnancy.

At present, there is no source of data available to PHA that provides accurate individual-level information about both pertussis vaccination and pregnancy which would allow an accurate uptake rate to be calculated. Uptake is therefore estimated by the number of *pertussis vaccine in pregnancy* administration fees claimed for by GPs and the number of live births in the same time period. This gives an estimated uptake rate of 63% for 2015/16. PHA is working towards establishing new mechanisms for measuring uptake of vaccines in pregnancy in future.

HPV vaccine in men who have sex with men (MSM) aged up to 45 years who attend GUM or HIV clinics.

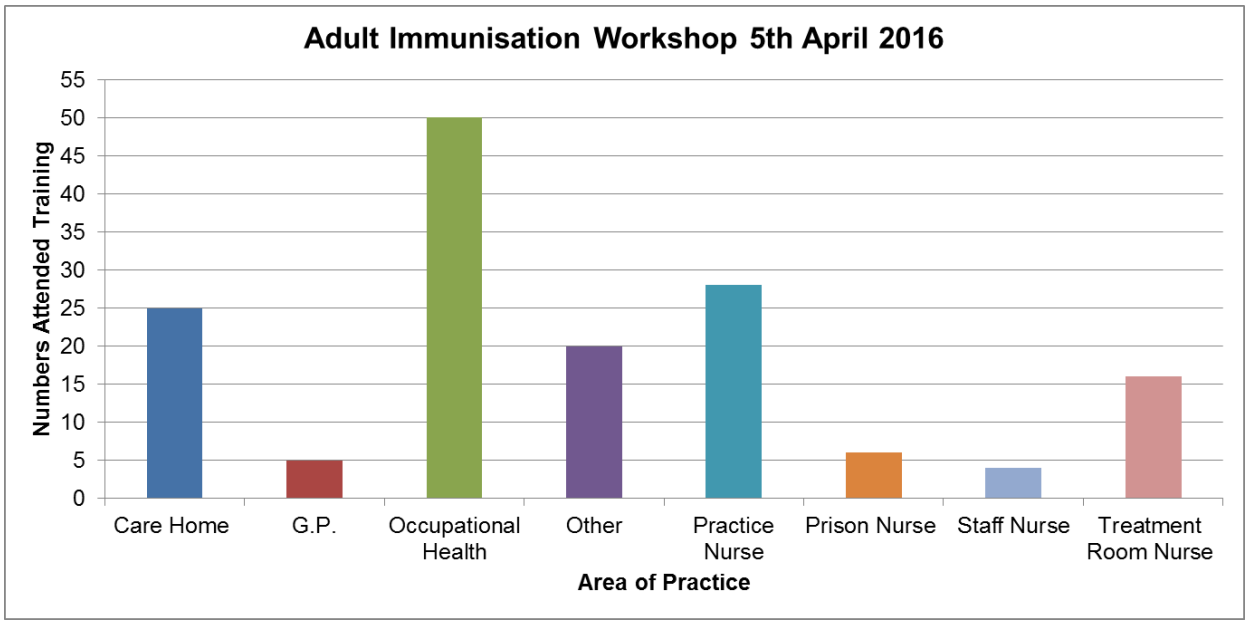
The HPV vaccine programme for MSM aged up to 45 years who attend GUM or HIV clinics is currently being introduced in Northern Ireland, following a JCVI recommendation and Department of Health policy.[5] Uptake figures will be available for 2016-17 during 2017.

Immunisation Training and Information

Adult Immunisation workshop

An adult immunisation workshop took place in Belfast Central Mission on the 5th April and was attended by 154 healthcare professionals from a range of clinical backgrounds including occupational health, general practice, treatment room nurses, nursing/residential homes, prison healthcare and private practice (Figure 6).

Figure 6. Attendance at Adult Immunisation Workshop, 5 April 2016



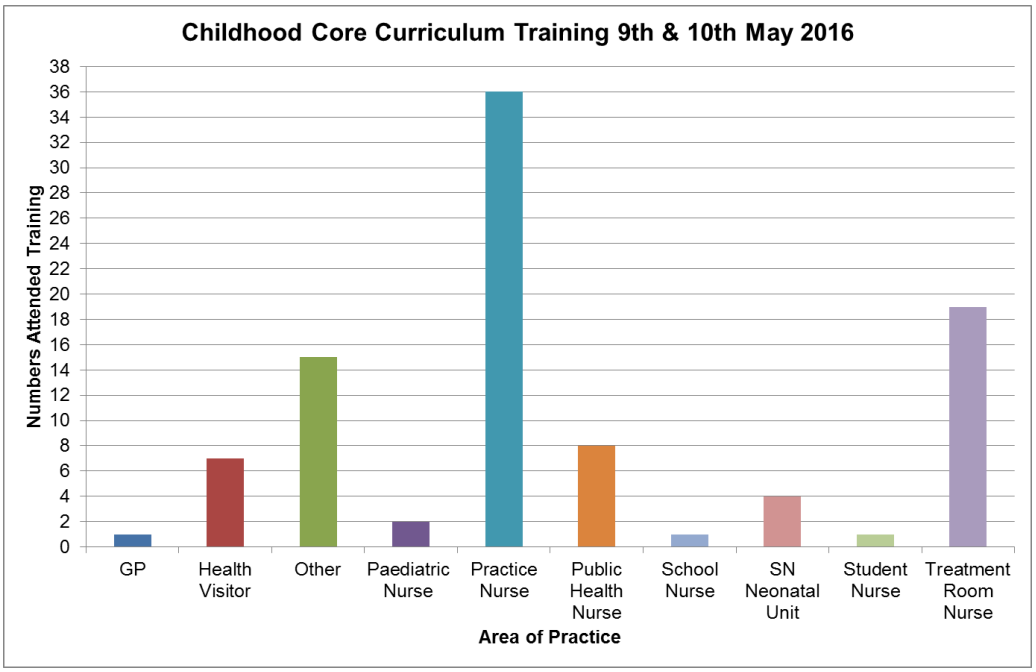
Master's of Public Health, Queen's University Belfast

The immunisation/vaccination team provided two days input into training postgraduate students on the Master of Public Health course at Queen's University Belfast.

Childhood Immunisation Core Curriculum Training

Two days' training on the childhood immunisation core curriculum were delivered on the 9th and 10th of May in Belfast Central Mission. It was attended by 94 healthcare professionals from a variety of clinical backgrounds including general practice, health visiting, occupational health, Trust treatment rooms, public health nurses, nursing/residential homes and bank nurses (Figure 7).

Figure 7. Attendance at Childhood Core Curriculum Training 9 and 10 May 2016



On-line Annual Vaccine Update

On-line immunisation update training was made available for the first time this year and was accessible via the following link: https://vimeo.com/177249287

The training included updates on seasonal influenza, shingles, MenB, MenACWY & *pertussis in pregnancy* vaccination programmes. The link for the training was sent to General Practices, nursing/residential homes and Trusts.

School Nurse Update Training

Update training was provided in each of the five Trust areas in September and was adapted to meet local needs. The focus of the training was vaccinations delivered by the school health teams. It was attended by a total of a 185 nurses.

HPV MSM Vaccination Programme

Trusts have been offered training on the new HPV MSM programme which is in the process of being delivered via GUM / HIV clinics. The training will be provided to staff directly involved in the delivery of this vaccination programme.

Vaccine-Preventable Disease Incidence

Incidence of Diphtheria, Tetanus, Polio, Whooping Cough, Measles, Mumps and Rubella

Of all the vaccine-preventable diseases for which surveillance information was available, only mumps and whooping cough were confirmed in laboratories in Northern Ireland in 2015 (Table 10). The number of cases of mumps increased from 2014, but were still only half of the number reported in 2013. In 2015, 146 of the 200 cases of mumps were in the 15-24 year age band, and of those 91% had received two doses of MMR vaccine. The protection against mumps in the MMR vaccine is known to wane with increasing age.

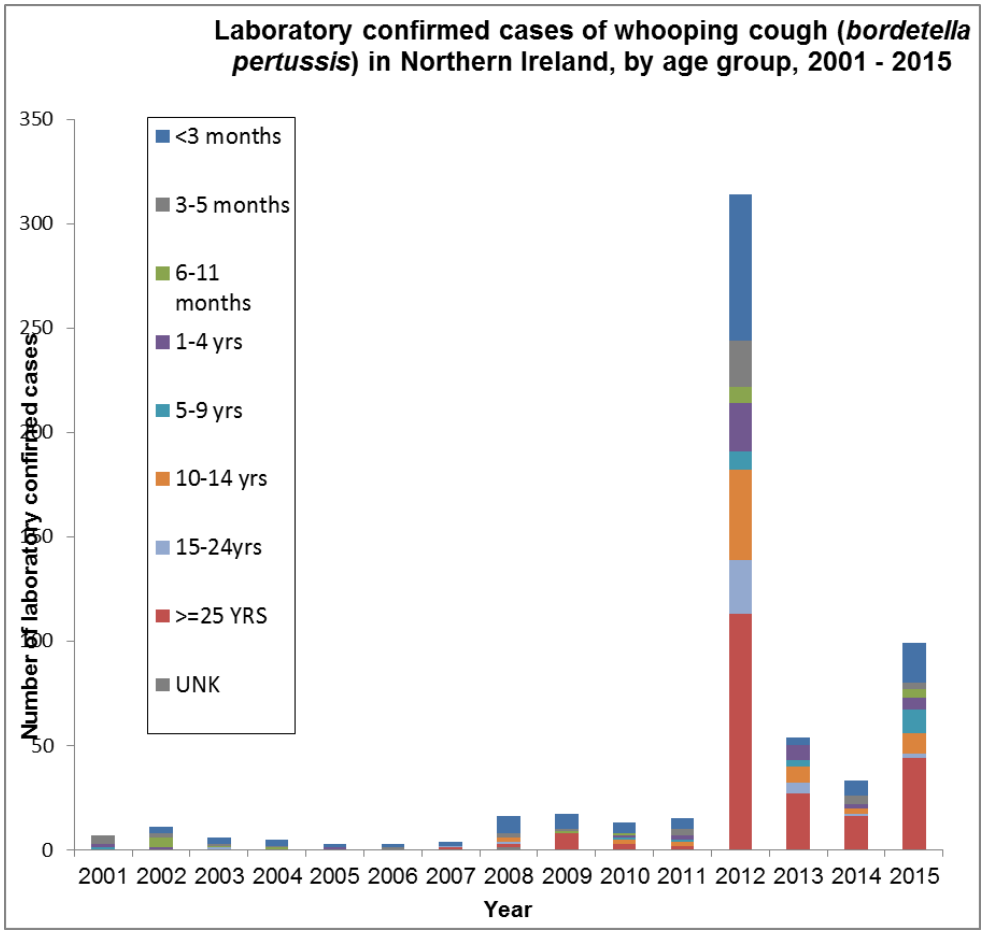
The number of whooping cough cases notified to PHA increased from the 2014 levels but were less than those seen 2012. The programme to vaccinate pregnant women introduced in 2012 to protect babies too young to be vaccinated themselves has been continued on the advice of JCVI in light of the high incidence of whooping cough. The greatest number of cases of whooping cough in Northern Ireland were aged over 25 years (Figure 8). Of the 19 cases of whooping cough in babies aged under 3 months old in 2015, only 5 were born to mothers who had received the whooping cough vaccine in pregnancy. It is unknown when in pregnancy they received the vaccine, as it takes at least two weeks after vaccination to provide protection fom the mother to the baby.

Table 10. Laboratory reports of vaccine preventable infectious diseases, Northern Ireland

Disease	2015	2014	2013	2012	2011
Diphtheria	0	0	0	0	0
Measles	0	1	10	9	2
Mumps	200	68	410	191	15
Polio	0	0	0	0	0
Rubella	0	0	0	0	2
Tetanus	0	0	0	0	0
Whooping Cough	99	33	54	314	15

Source: Regional Cosurv/ Enhanced Surveillance Systems

Figure 8. Laboratory confirmed cases of whooping cough in NI by age group 2001-15



Source: Regional Cosurv/ Enhanced Surveillance Systems

Meningococcal disease in Northern Ireland 2015

Meningococcal disease is notifiable across the UK, and the PHA Health Protection Duty Room should be notified of all suspected cases of invasive meningococcal disease (IMD). Health protection professionals will advise whether prophylaxis should be given to close contacts of people with suspected IMD.

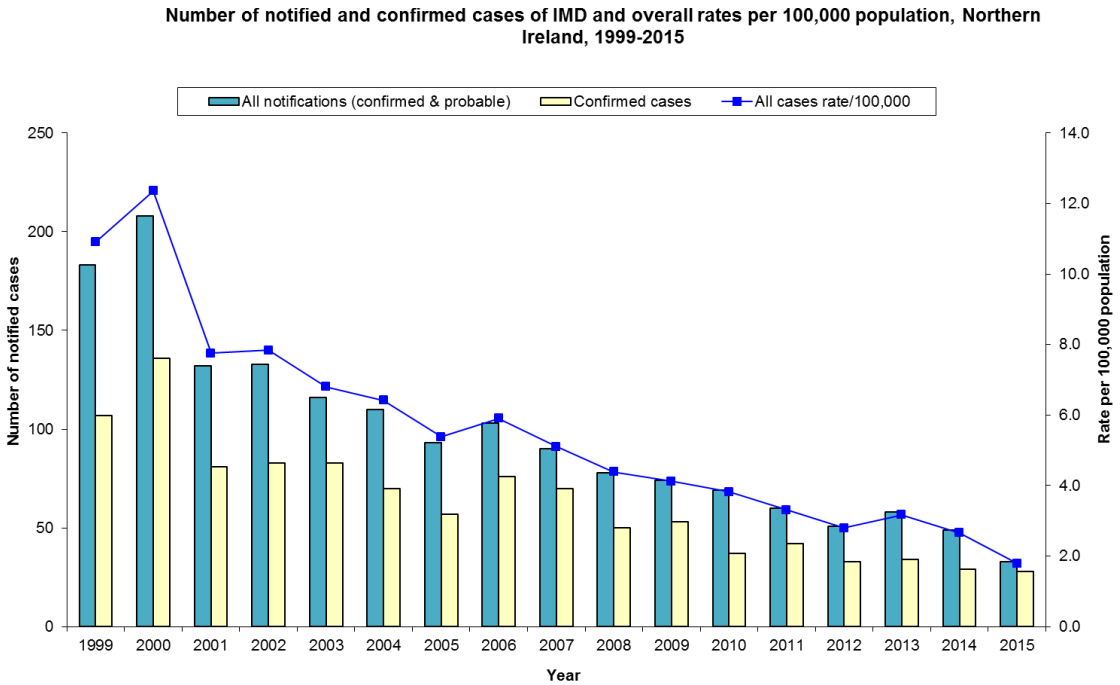
Enhanced Surveillance of Meningococcal Disease (ESMD) was first implemented in Northern Ireland in 1999, to monitor cases of meningitis and septicaemia known or suspected to be caused by *N. meningitidis.* The data is used to monitor both the impact of the disease and the efficacy of the meningococcal serogroup C vaccination programme which began in 2000. In September 2015 the meningococcal serogroup B vaccination programme was introduced and future data will help to evaluate the effectiveness of this programme. Surveillance is based on notifications from clinicians, laboratory confirmed reports from local laboratories and the Public Health England Meningococcal Reference Unit in Manchester.

There has been a consistent fall in both notifications of meningococcal disease to Public Health from 1999 to 2015 as well as a decrease in confirmed cases (Figure 9). In 2015 only 33 cases of probable or confirmed cases of IMD were notified to the duty room, of which 28 were laboratory-confirmed.

- There were 33 cases of invasive meningococcal disease (IMD) notified in 2015, giving a Northern Ireland rate of 1.8/100,000 population
- Of the 33 notifications 28 (85%) were laboratory confirmed
- 32% (9/28) of the laboratory confirmed cases were tested by PCR, 10 (36%) by culture and 9 (32%) had both PCR and culture tests
- Serogroup B accounted for 71% (20/28) of confirmed cases in 2015. Since 2002, serogroup B has accounted for greater than 80% of all laboratory confirmed cases (Figure 10).
- There were three cases of serogroup C and 5 cases of serogroup W135
- Of the 28 confirmed cases the average length of stay in hospital was 9 days (range 1-31 days)

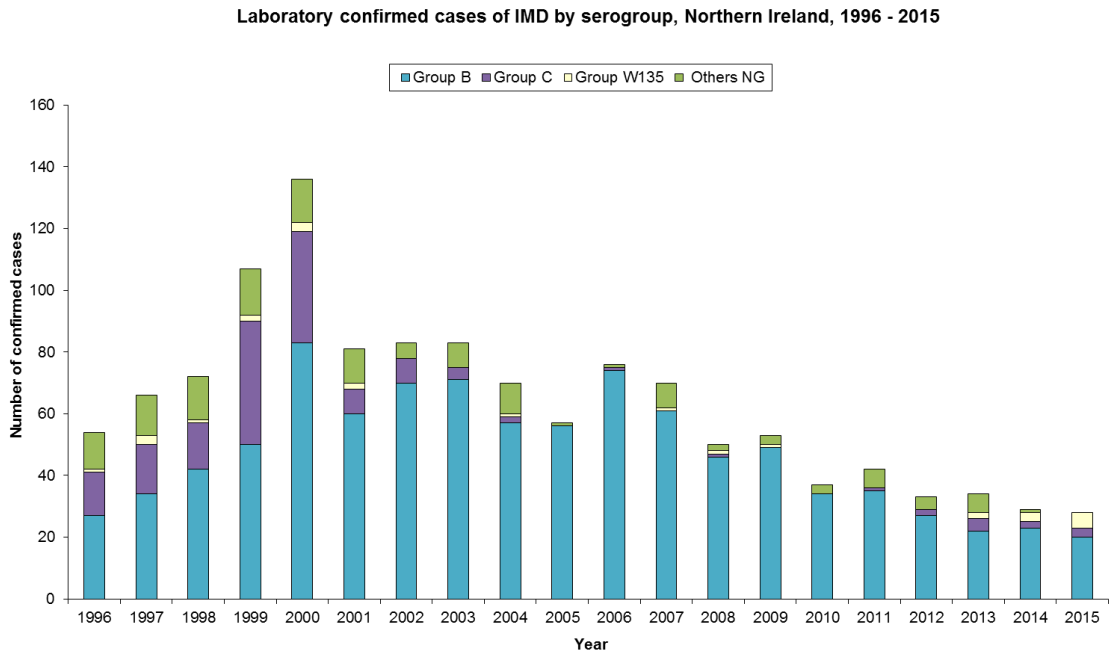
Three IMD associated deaths occurred in 2015, giving a case fatality ratio of 9% compared with 2% in 2014. Two of the cases were confirmed as serogroup B. and other case was not laboratory-confirmed.

Figure 9. Number of notified and confirmed cases of IMD and overall rates per 100,000 population, Northern Ireland, 1999-2015



Source: Enhanced Surveillance of Meningococcal Disease (ESMD) in Northern Ireland

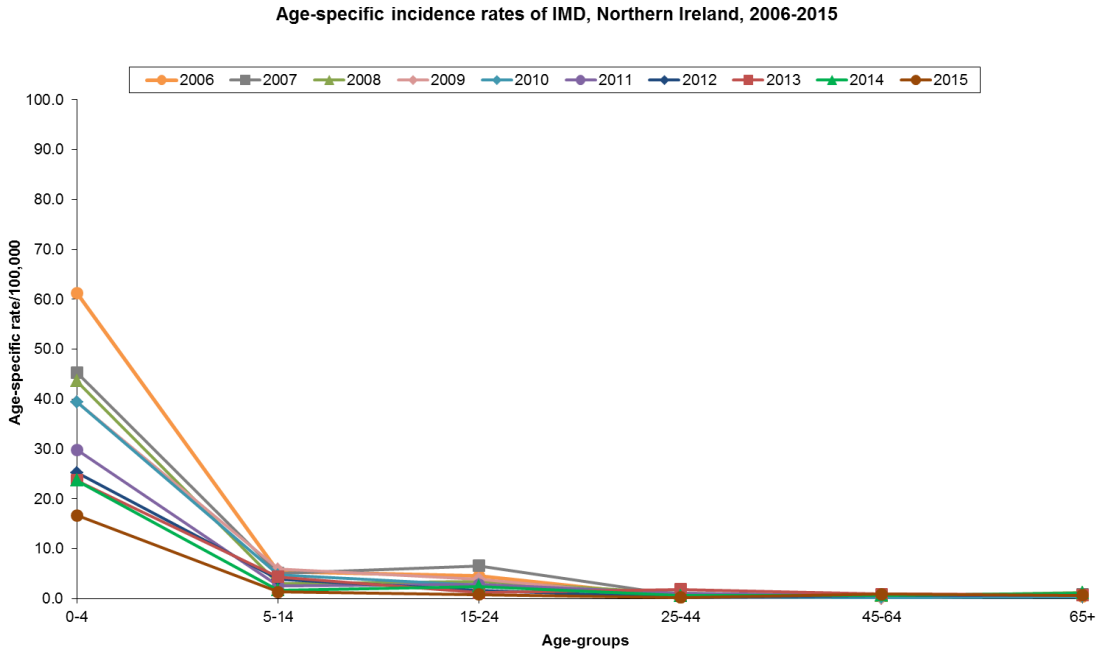
Figure 10. Laboratory-confirmed cases of IMD by serogroup, Northern Ireland, 1996-2015



Source: Enhanced Surveillance of Meningococcal Disease (ESMD) in Northern Ireland

Consistent with previous years, age-specific incidence during 2015 was highest in infants and young children (Figure 11). Ages ranged from 0 days to 87 years with a median of 2 years. The rate of IMD has fallen in 2015 in those aged 0-4 years to about a quarter of its level in 2006.

Figure 11. Age-specific incidence rates of IMD, Northern Ireland, 2006-15



Source: Enhanced Surveillance of Meningococcal Disease (ESMD) in Northern Ireland

Conclusions

The year 2015-16 has been a successful one for the childhood and adult immunisation programmes. The Men B and Men ACWY programmes were rolled out across NI with good uptake as well as maintenance of high levels of coverage for both childhood and teenage vaccines. Uptake of adult vaccine programmes, although lower than that of childhood programmes remains stable and in line with that seen across the UK. We have seen an increased incidence of mumps and pertussis in Northern Ireland in recent years but a decrease in meningococcal disease.

Recommendations

- PHA will work with GP, health visitor and Child Health Information System colleagues to gain a greater understanding of the varation of pre-school immunisation uptake across Northern Ireland and work together to improve coverage, particularly where this is currently below 95%
- PHA will monitor the incidence of meningococcal disease in light of the introduction of vaccines against Meningococcal group B and ACWY disease
- PHA will monitor the incidence of pertussis, particularly in infants under 3 months of age and continue to promote vaccination to pregnant women.
- PHA will work on extending the range of training and reference materials for immunisers available on-line including video seminars and e-learning packages

Sources of Further Information

The most useful resource for immunisers is the on-line version of The Green Book. It should be referred to at all times because it will contain the most up-to-date information on immunisation.

Name	Link
Immunisation against Infectious Diseases ("The Green Book")	https://www.gov.uk/government/collections/immunisation-against-infectious-disease-the-green-book
Public Health Agency Immunisation page	http://www.publichealth.hscni.net/directorate-public-health/health-protection/immunisationvaccine-preventable-diseases
Public Health England Immunisation page	https://www.gov.uk/government/collections/immunisation
Chief Medical Officer (CMO) letters (Northern Ireland):	https://www.health-ni.gov.uk/publications/letters-and-urgent-communications-2016
Country Specific Vaccine schedules	http://apps.who.int/immunization_monitoring/globalsummary/schedules
Vaccination of individuals with uncertain or incomplete immunisation status	https://www.gov.uk/government/publications/vaccination-of-individuals-with-uncertain-or-incomplete-immunisation-status
Public Health Agency Publications	http://www.publichealth.hscni.net/publications

Glossary of Terms

Antigen: A substance that when introduced into the body stimulates the production of an antibody.

Apollo: Software used to extract data from primary care systems

BCG: (Bacillus Calmette-Guerin) is a vaccine primarily used to provide protection against Tuberculosis (TB)

Booster Vaccine: This is an additional dose of vaccine given following an earlier dose / course of vaccines which is referred to as primary vaccines. The purpose of a booster dose is to increase / “boost” immunity.

Vaccine Cohort: Group of people who are eligible for a vaccine programme based on age or other risk factors for developing a vaccine preventable disease.

COVER: (Cover of Vaccination Evaluated Early) is a quarterly data collection used to evaluate childhood immunisation coverage across the UK.

Diphtheria: is an infectious disease caused by the bacterium *Corynebacterium diphtheriae.* It primarily infects the throat and upper airways.

DTaP/IPV/Hib Vaccine: This vaccine offers protection against diphtheria, tetanus, pertussis, polio and *haemophilus influenza type b.* It is commonly referred to as the “five in one”.

Epidemiology: The study of the distribution and determinants of health-related states / events (including disease) and the application of this study to the control of diseases / other health problems.

Hepatitis B: is a viral infection that attacks the liver and can cause chronic disease.

Hepatitis B positive: is a term used to describe someone who has hepatitis B infection and the diagnosis is based on the detection of hepatitis B surface antigen from a blood sample.

Hib: Haemophilus influenza type b is the second most common cause of bacterial pneumonia.

HPV Vaccine: is a vaccine that offers protection against certain types of Human Papilloma Virus.

Human Papilloma Virus (HPV): is a viral infection that is mainly transmitted via sexual contact. HPV-related disease includes genital warts, cervical and ano-genital cancers.

Immunisation: is a process whereby a person is made immune / resistant to an infectious disease, typically by administration of a vaccine.

Inactivated Vaccine: is a vaccine that is made from microorganisms (bacteria, viruses, other) that have been killed through physical / chemical processes. These killed organisms cannot cause disease.

Incidence: is the number of individual who develop a specific disease / experience a health-related event during a particular time period.

IMD: (Invasive meningococcal disease) is caused by bacteria known as *Neisseria meningitidis*.

LCG: Local commissioning groups

Measles: is a vaccine preventable disease. Measles is a serious respiratory disease that causes a rash and fever and can cause significant morbidity and mortality.

Men ACWY Vaccine: Inactivated vaccine that offers protection against invasive meningococcal disease caused by *Neisseria meningitidis* groups A, C, W & Y.

Meningococcal Group B Vaccine: Inactivated vaccine that offers protection against invasive meningococcal disease caused by *Neisseria meningitidis* group B.

Meningococcal Group C Vaccine: Inactivated vaccine that offers protection against invasive meningococcal disease caused by *Neisseria meningitidis* group C.

MMR Vaccine: Combined vaccine used to offer protection against measles, mumps and rubella. MMR is a live vaccine i.e. contains attenuated / weakened organisms.

Pertussis: is a highly contagious disease of the respiratory tract caused by *Bordetella pertussis*. The disease caused by this bacterium is commonly referred to as “whooping cough”.

PCR: (polymerase chain reaction) is a method used to analyse a short sequence of DNA/RNA.

PHE: (Public Health England) is an executive agency of the Department of Health in England.

Pneumococcal Disease: is caused by a bacterium known as *Streptococcus pneumoniae*. Pneumococcal disease can range from upper respiratory tract infections to pneumonia, septicaemia and meningitis.

Polio: is a highly infectious disease caused by a virus. It invades the nervous system and can cause total paralysis in hours.

Rotavirus: is a virus that can cause severe diarrhoea and vomiting, especially in babies and young children.

Rubella: (German Measles) is a viral disease that causes a fever and a rash. It can cause defects in pregnant women who develop the infection.

Serogroup: A group of bacteria containing a common antigen / a group of viral species that are antigenically closely related.

Shingles: is caused by *varicella zoster virus* (VZV), the same virus that causes chickenpox.

Tetanus: is an infection caused by a bacteria called *Clostridium tetani*. The bacteria produce a toxin that causes painful muscle contractions.

Tuberculosis: (TB) is caused by the bacterium *Mycobacteria tuberculosis*. It usually causes infection of the lungs but can cause infection in other parts of the body too. If not treated properly TB can be fatal.

WHO (World Health Organisation): is a specialised agency of the United Nations that was established to prevent international spread of diseases.

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