

Annual Immunisation Report for Northern Ireland 2017-18



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Summary

Immunisation Programmes

- For the year 2017-18 uptake of three doses of DTaP/IPV/Hib vaccine by 12 months of age was 96.2% 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 94.4%. This is a 0.5% decrease from last year and just below the 95% target level
- Uptake of two doses of MMR by 5 years of age was 92.4%, a 0.4% decrease on the level last year, but still the highest uptake in the UK
- By the end of school year 10, 84.7% of girls had completed a course of HPV vaccine, a decrease from 89.6% in 2016-17
- By the end of school year 12 in 2018, 94.4% of young people had received two doses of MMR vaccine, 80.0% had received a booster of Td/IPV vaccine and 85.3% had received the new meningococcal ACWY vaccine
- Uptake of pertussis vaccine in pregnancy was 69.3% in Northern Ireland for the first year (September 2017 to August 2018) using data from the Northern Ireland Maternity Administration System (NIMATS)
- For the year 2017-18, 51.5% of 70 year olds received the shingles vaccine and 48.2% of 78 year olds. This is a slight increase to the previous year but still lower than when the first programme commenced. Uptake of those still eligible to receive the vaccine in subsequent years has increased over time
- Uptake for the first 15 months (October 2016 – December 2017) of the HPV vaccine programme for men who have sex with men (MSM) under 46 years of

age was 73.3% for one dose, 50.2% for two doses and 24.5% for three doses (completed course)

- In September 2017 a new combined vaccine containing protection against hepatitis B was added to the primary immunisation schedule for babies at 2, 3 and 4 months of age

Priorities for Improvement

- PHA will continue to work with GP, health visitor and Child Health Information System colleagues to gain a greater understanding of the decreases in pre-school immunisation uptake across Northern Ireland and work together to improve coverage, particularly in the Belfast area
- PHA will work with school health and communications colleagues to improve the uptake of HPV vaccine for 2018-19
- PHA will develop the Northern Ireland Measles and Rubella Elimination Action Plan in partnership with relevant colleagues
- PHA will develop new monitoring reports to outline shingles coverage for each annual routine cohort since the programme commenced
- PHA will work with maternity colleagues to improve the awareness and understanding of vaccinations given in pregnancy

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 (VPDs) 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 VPDs by maintaining and improving uptake rates of all immunisations.

The 2017-18 Northern Ireland Vaccination Report includes information on the vaccine coverage in each of the programmes. Coverage data in each section is provided at different time points in the year depending on the programme:

- Coverage for the childhood immunisations up to the age of 5 are presented for the financial year April 2017 – March 2018, in line with national COVER statistic reporting

- Coverage for immunisations provided in schools are presented for the school year September 2017 – August 2018 in line with delivery of school programmes
- Coverage for shingles and pneumococcal polysaccharide vaccine (PPV) is presented from September 2017 - August 2018, in line with delivery of the programme alongside the seasonal influenza vaccine programme
- Coverage for the pertussis vaccine in pregnancy is presented from September 2017 to August 2018 for this year, in line with introduction of new data extracted from the Northern Ireland Maternity Administrative System (NIMATS system introduced 7 August 2017). Future years will be presented by financial/calendar years

Information on the epidemiology of VPDs is now included in a separate report to enable more timely reporting, released annually in the spring. Information on influenza immunisations has been published elsewhere, in the Surveillance of Influenza in Northern Ireland 2016-17 report².

The Routine Childhood Immunisation Schedule in Northern Ireland from October 2017

When to immunise	Diseases vaccine protects against	How it is given
2 months old	Diphtheria, tetanus, pertussis (whooping cough), polio, Hib and hepatitis B Pneumococcal infection Rotavirus Meningococcal B infection	One injection One injection Orally One injection
3 months old	Diphtheria, tetanus, pertussis, polio, Hib and Hepatitis B Rotavirus	One injection Orally
4 months old	Diphtheria, tetanus, pertussis, polio, Hib and hepatitis B Pneumococcal infection Meningococcal B infection	One injection One injection One injection
Just after the first birthday	Measles, mumps and rubella Pneumococcal infection Hib and meningococcal C infection Meningococcal B infection	One injection One injection One injection 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 Measles, mumps and rubella	One injection 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 Meningococcal ACWY	One injection One injection

Targeted Childhood Immunisations

When to immunise	Diseases vaccine protects against	Vaccine given
At birth, 1 month old and 12 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

(For children assessed as being at risk of these conditions)

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 16 th gestational week	Pertussis (Whooping Cough) in newborn	Boostrix-IPV®

Men who have sex with men, aged ≤45 years who attend GUM 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

The routine immunisation schedule for babies at 2, 3, and 4 months is detailed on page 8. In October 2017 a change was made to add protection against hepatitis B to the routine schedule with the combined 6 in 1 vaccine. Uptake data for this new antigen at the age of 12 months will be available next year. 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 now 2-3% lower in Belfast than other areas (Table 1).

Table 1. Completed primary immunisations by 12 months of age, 2017-18, Northern Ireland and UK

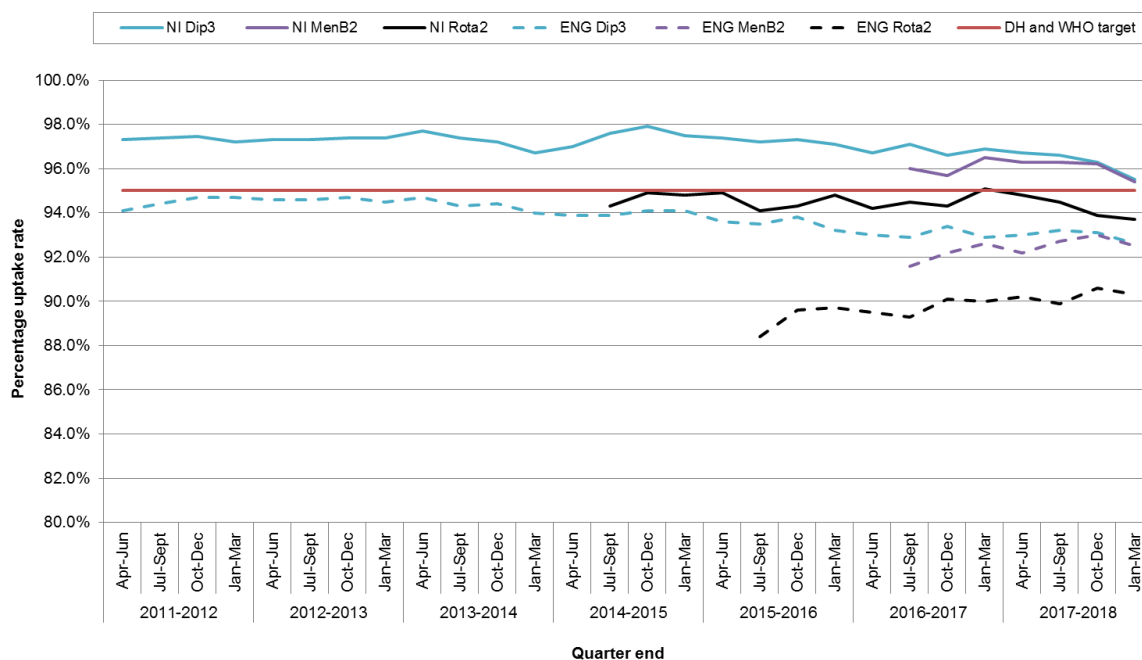
Area	% vaccinated at 12 months			
	DTaP/IPV/Hib3	PCV2	Rota2	MenB2
Belfast	93.4%	93.8%	92.4%	93.1%
South Eastern	96.2%	96.4%	94.4%	96.0%
Northern	96.8%	97.0%	95.0%	96.4%
Southern	97.0%	97.3%	94.7%	96.6%
Western	97.3%	97.5%	93.6%	96.9%
NI Total	96.2%	96.4%	94.1%	95.8%
England	93.1%	93.3%	90.1%	92.5%
Scotland	96.5%	96.8%	93.4%	95.9%
Wales	95.9%	95.9%	93.8%	95.3%
UK	93.6%	93.8%	90.6%	92.9%

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

A slight but concerning decrease in uptake can be noted over the past 18 months, which is mirrored in England.

PHA are working with colleagues in Northern Ireland as well as the rest of the UK to identify the reasons for this decrease and to work to improve uptake again.

Figure 1. Diphtheria, Meningococcal B and Rotavirus vaccination uptake rates at 12 months of age, April 2011 – March 2018, Northern Ireland and England



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

Immunisations up to 24 months of age

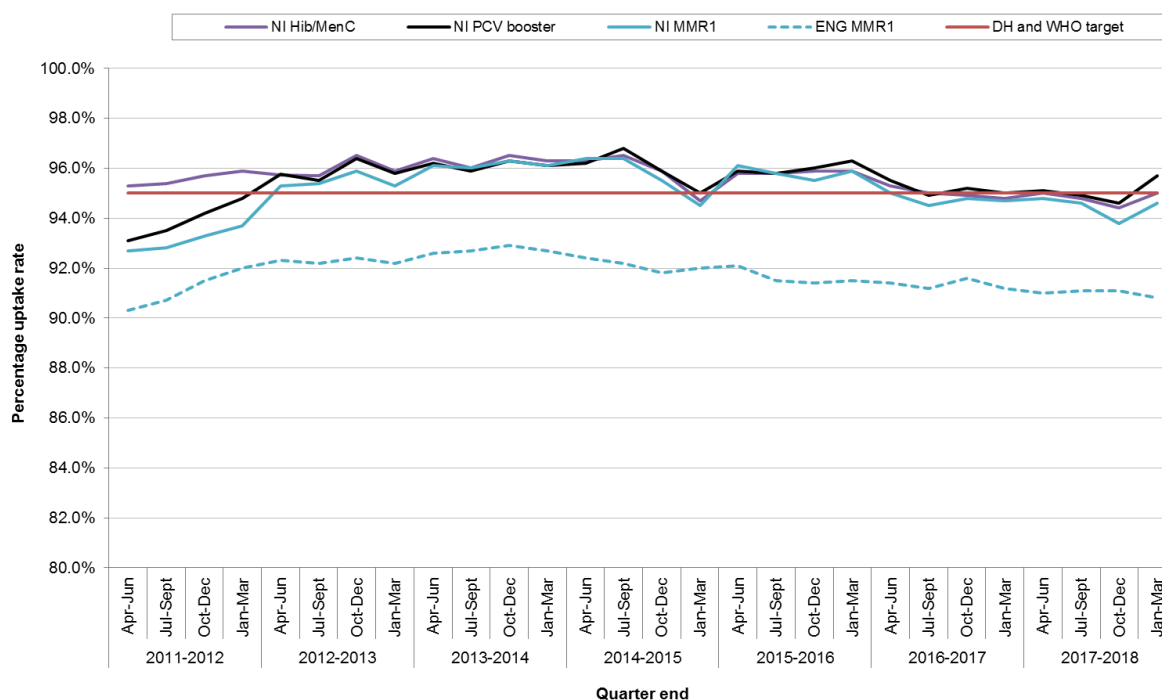
Uptake rates of all immunisations given just after the first birthday and measured at 24 months for 2017-18 (Table 2) are just below the 95% target, but they are still similar to or higher than the uptake across the other parts of the UK. This fall is mainly due to the fact that the uptake of vaccines at 24 months in the Belfast LCG area is only 90%, approximately 4% lower than the other areas.

Table 2. Completed primary immunisations by 24 months of age, 2017-18, Northern Ireland and UK

Area	% vaccinated at 24 months			
	DTaP/IPV/Hib3	PCV Booster	Hib/MenC	MMR1
Belfast	95.7%	90.8%	90.4%	90.8%
South Eastern	97.8%	95.3%	94.8%	94.9%
Northern	98.7%	95.8%	95.8%	95.1%
Southern	98.0%	94.9%	95.2%	95.1%
Western	98.3%	96.5%	96.4%	95.6%
NI Total	97.8%	94.7%	94.6%	94.4%
England	95.10%	91.00%	91.20%	91.20%
Scotland	97.60%	94.80%	94.90%	94.60%
Wales	96.60%	95.20%	94.50%	94.70%
UK	95.40%	91.60%	91.70%	91.70%

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

Figure 2. Haemophilus Influenzae type B/Meningococcal group C, Pneumococcal and MMR1 vaccination uptake rates at 24 months of age, April 2011 – March 2018, Northern Ireland and England



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

Quarterly uptake figures show that after slow decrease in uptake over about 18 months, the last quarter of 2017-18 shows an increase again and this will continue to be monitored. The quarterly data also show the first uptake figures for the booster dose of the new Meningococcal B vaccine. It is encouraging to note this is above 95% and in line with uptake of the other vaccines given just after the first birthday, showing that this vaccine is acceptable to parents.

Immunisations up to five years of age

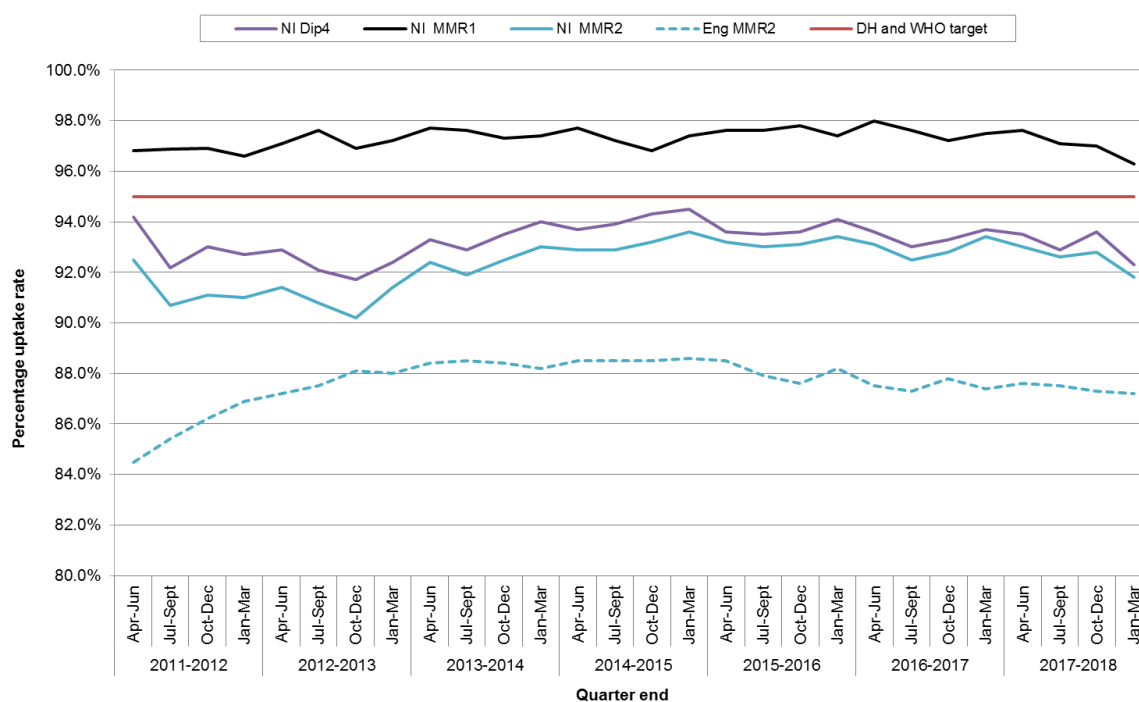
Children are offered “pre-school booster” immunisations from the age of 3 years and 4 months, providing a fourth dose booster of protection against diphtheria, tetanus, polio and pertussis (DTaP/IPV) and a second dose of MMR vaccine. Uptake of these immunisations measured at 5 years show that this is below 95% for 2017-18, and slightly below last year’s figures of 92.8% for second MMR and 93.3% for DTaP/IPV. Although uptake of one MMR in the Belfast area is over the 95% target by 5 years of age, the uptake of the booster doses are around 6% lower than the other areas. Uptake of MMR2 in Belfast 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. With this in mind, PHA has worked with Belfast GP’s in 2018 to try to improve uptake of MMR in children of school age and the success of this approach will be evaluated and reported on next year.

Table 3. Completed primary immunisations and boosters by 5 years of age, 2017-18, Northern Ireland and UK

Area	% vaccinated at 5 years			
	DTaP/IPV/Hib3	MMR1	MMR2	DTaP/IPV booster
Belfast	96.3%	95.4%	87.3%	87.6%
South Eastern	97.6%	96.8%	93.0%	93.4%
Northern	97.8%	96.7%	93.7%	94.6%
Southern	97.2%	97.0%	93.3%	93.6%
Western	98.1%	98.3%	94.2%	94.9%
NI Total	97.4%	96.8%	92.4%	92.9%
England	95.6%	94.9%	87.2%	85.6%
Scotland	98.0%	96.9%	92.1%	92.7%
Wales	93.5%	96.5%	89.5%	92.3%
UK	95.7%	95.2%	87.8%	86.6%

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

Figure 3. Diphtheria and MMR vaccination uptake rates at 5 years of age, April 2011 – March 2018, Northern Ireland and England



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

As with uptake at one year, there has been a slow but steady decline in uptake at 5 years on the quarterly data. PHA are investigating the reasons for the decreasing uptake.

Work to improve uptake of pre-school immunisations

PHA again worked with Health and Social Care Board (HSCB) and Child Health System (CHS) colleagues to produce data for each GP practice on their uptake of pre-school immunisations. This was sent to all practices along with a sheet explaining how practices can work with the CHS to ensure that all eligible children are called in a timely way for the immunisations that they are due.

Further work is ongoing to work with particular practices where specific issues have been identified.

In 2018 PHA also looked at the MMR uptake of children from the ages of 4 years to those entering year 10 at school. It was noted that uptake was lower in the Belfast area than the rest of the province. PHA then worked with HSCB to provide some funding to Belfast practices to check the records of children thought not to be fully immunised with two doses of MMR. Child health records were updated if the information was incorrect and those who were under immunised were called for MMR vaccine. The success of this approach will be evaluated later in 2018.

During summer 2017 a small outbreak of measles occurred in unvaccinated adults and children in the Belfast area from a likely source of an imported Roma-Romania case that had travelled from Europe during the incubation period (described in VPD surveillance report). Following this, PHA worked with communications colleagues to provide information to the public on the importance of receiving two doses of the MMR vaccine before travel. PHA also commissioned a professional marketing company to carry out focus groups with Roma-Romanian communities living in the Belfast area to better understand the community's understanding, attitudes and factors influencing vaccinations. Findings showed a general acceptance of vaccinations but highlighted communication issues and access as barriers to receiving vaccines. The PHA has started working on promotional video resources to promote MMR vaccine.

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. The HPV vaccine offers protection against types 16 and 18 of the virus which together cause up to 70% of cervical cancers, as well as protection against types 6 and 11 of the virus which cause genital warts. 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 since a maximum in 2012, but due to further clinics being offered in year 10, nearly 85% of girls had completed the course by the end of year 10 in June 2018. This is higher than the uptake reported for the same age in England for 2016-17 of 83% (2017-18 data not yet available for England), (Table 4, Figure 4).

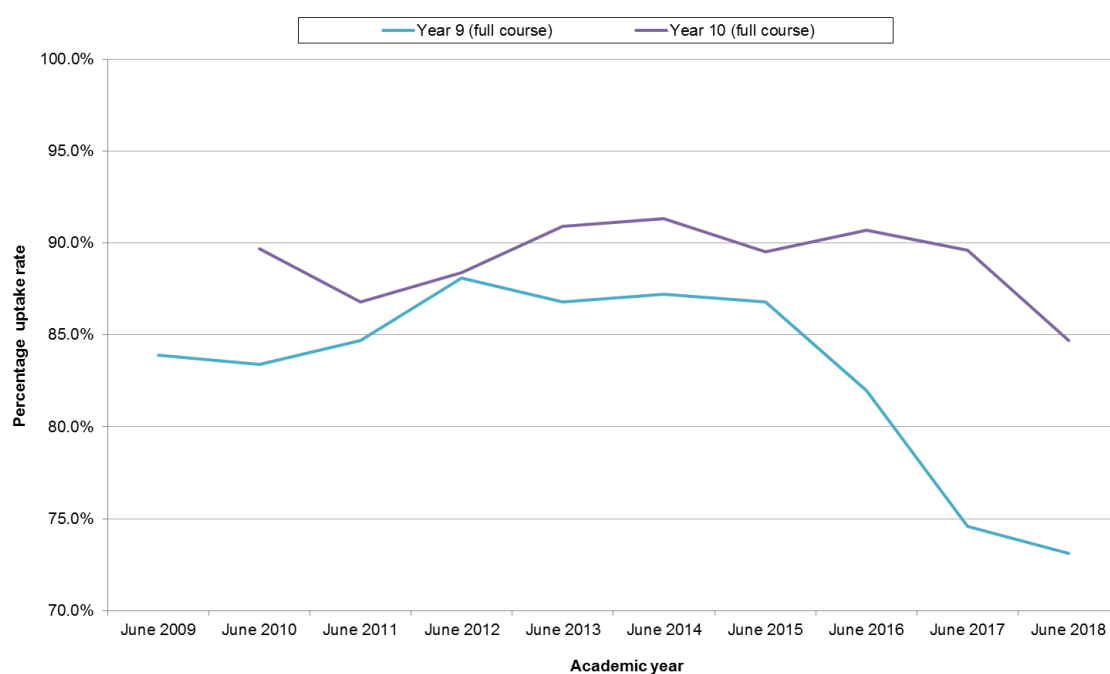
We are pleased to note that the fall in uptake for completed course in year 9 is much less than in the previous two years and is levelling off. Due to the catch-up opportunities in year 10, about 10% of girls who did not complete the course in year 9 in 2016-17 had done so in 2017-18 when they were in year 10. PHA are continuing to work with communications colleagues and school health teams to promote the vaccine and to encourage parents to take up the offer of HPV vaccine in year 9 rather than waiting until year 10. Girls who have not completed the course of vaccines can request this from their GP up to the age of 18 years.

Table 4. HPV vaccination uptake rates, year 9 and 10 girls completing full course, 2009-18, Northern Ireland

	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%
June 2017	74.6%	89.6%
June 2018	73.1%	84.7%

Source: Northern Ireland Child Health System

Figure 4. HPV vaccination uptake rates, year 9 and 10 girls completing full course, 2009-18, Northern Ireland



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 leaver 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 percent of pupils had received the completed course of diphtheria, tetanus and polio containing vaccines by the end of year 12 in 2017-18, a decrease of 5% from last year (Table 5). Pupils who have not received this vaccine from school health can request it from their GP.

It is very encouraging to note that even though the level of two doses of MMR is below the 95% target level at five years of age, by the end of year 12 the population coverage for two doses of MMR has increased to 94.4%.

Table 5. Annual school leaver booster vaccine coverage, 2017-18, Northern Ireland

Area	Year 11 % vaccinated	Year 12 % vaccinated
Belfast	73.6%	77.0%
South Eastern	70.5%	76.3%
Northern	75.5%	83.1%
Southern	76.3%	82.1%
Western	68.3%	80.3%
NI Total	73.3%	80.0%

Source: Northern Ireland Child Health System

Table 6. Annual MMR2 vaccine coverage, 2017-18, Northern Ireland

Area	Year 12 % vaccinated
Belfast	93.3%
South Eastern	93.2%
Northern	95.2%
Southern	94.9%
Western	95.1%
NI Total	94.4%

Source: Northern Ireland Child Health System

Meningococcal ACWY vaccine

The meningococcal ACWY (Men ACWY) vaccine programme was introduced 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. Although the catch-up has now finished, young people in the eligible age range but have not yet been immunised can request this from their GP up to the age of 25 years.

The Men ACWY vaccine is now provided routinely to young people in schools in year 11 with the school leaver booster and MMR, with an opportunity to catch up in year 12. By the end of year 12 in 2017-18, 85.3% of young people were immunised with the Men ACWY vaccine, which is a slight decrease of 1.2% from the previous year.

Table 7. Coverage of Men ACWY for year 11 and 12, September 2018, Northern Ireland

Area	Year 11 (DOB 02/07/02 - 01/07/03) % vaccinated	Year 12 (DOB 02/07/01 - 01/07/02) % vaccinated
Belfast	80.0%	85.8%
South Eastern	74.0%	81.3%
Northern	78.3%	87.6%
Southern	79.4%	87.1%
Western	69.9%	83.0%
NI Total	76.8%	85.3%

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. From August 2017, hepatitis B vaccine has been added to the universal primary immunisation schedule at 2, 3 and 4 months of age.

A selective hepatitis B immunisation programme is also delivered to protect 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 post exposure hepatitis B immunisation to prevent mother to child transmission at or around the time of birth. Babies born before August 2017 receive the Hepatitis B vaccine at birth, 1, 2 and 12 months of age. Babies born after August 2017 now receive the combined 6 in 1 vaccine* at 2, 3, and 4 months and extra doses at birth, 1 and 12 months.

The number of babies born to hepatitis B positive women is small in Northern Ireland. During the financial year 2017-18 there were 25 babies born with an annual mean of 35 (25-46) babies since 2009-18.

In line with monitoring of all routine childhood immunisations, uptake of three doses of hepatitis B antigen is measured at 12 months and four doses at 24 months (Table 8). In 2017-18 100% babies born to hepatitis B positive mothers received three doses of vaccine by 12 months and 87.10% received four doses by 24 months. Due

* routine immunisation schedule for babies detailed on page 8

to the small birth cohort the number of babies that did not receive four doses by 24 months is very small (<5), this is attributed to families moving out of Northern Ireland.

Table 8: Hepatitis B vaccine uptake rates at 12 and 24 months of age, 2009-18, Northern Ireland

	Vaccination uptake @ 12 months (3 HepB doses)	Vaccination uptake @ 24 months (4 HepB doses)
2009-10	82.76%	72.34%
2010-11	83.78%	65.52%
2011-12	93.18%	75.68%
2012-13	100.00%	81.82%
2013-14	100.00%	87.88%
2014-15	100.00%	93.94%
2015-16	95.65%	86.49%
2016-17	93.55%	89.13%
2017-18	100.00%	87.10%

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.^{3,4}

A single shingles vaccine is routinely offered to people aged 70 years on 1 September each year. Catch-up cohorts are also offered the vaccine so that all people in their 70s when the programme started on 1 September 2013 receive it over time (Table 9). 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 9. 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
1 Sept 2017-31 Aug 2018	70 years	78 years	71, 72, 73, 74, 79 years

Source: Apollo® Information System

Uptake of shingles vaccine is obtained using the Apollo® information system to count the number of vaccinated people and the eligible population recorded in primary care information systems. The reporting year for shingles is taken from 1 September to 31 October the following year. Data is extracted at the same time every year (1 October) to enable annual comparisons.

Since the programme began shingles vaccine uptake in the two main cohorts has been 50%-57%, with 70 year olds consistently 1-2% higher than 78 year olds (Table 10). Over time there has been a fall in uptake, in line with elsewhere in the UK, although reassuring an increasing proportion of those still eligible are receiving it in subsequent years. In 2017-18, uptake for 70 and 78 year olds improved compared to the previous year, at 51.5% and 48.2% respectively, but still in line with an overall decline since the programme began.

New presentations of data is currently in development which will report coverage of the yearly cohorts. This will be available next year.

Table 10. Estimated Shingles vaccine uptake, 2013-14 to 2017-18, Northern Ireland

Time period (1 Sept – 31 Aug)	Age on 1 September (years)						
	70	71	72	73	74	78	79
2013 -14	52.5%						49.7%
2014-15	56.8%	4.8%				54.4%	54.4%
2015- 16	52.2%	5.6%				50.3%	6.6%
2016- 17	46.0%	5.5%	3.1%	Not available		45.4%	6.0%
2017- 18	51.5%	7.9%	4.2%	2.5%	2.3%	48.2%	7.4%

Source: Apollo® Information System

Pneumococcal Polysaccharide Vaccine (PPV)

At present there is a long-term supply issue with Pneumococcal Polysaccharide Vaccine (PPV) with the vaccine only available intermittently. Correspondence from the Department of Health, outlined in HSS (MD) 23/2017, has been published to manage vaccination of priority patients in light of the shortage, based on Public Health England (PHE) temporary guidance. Uptake and coverage figures for the older adult programme will therefore not be published in this year's report.

In August 2003, the pneumococcal polysaccharide vaccine (PPV) programme for older adults was introduced. In the first year, it was offered to people over aged 80 years and in April 2004, was extended to include people over 75 years of age. Since April 2004, those over 65 years have been eligible for PPV vaccine. It is also offered to those aged 2 years to under 65 years with clinical risk factors.

The PPV vaccine contains purified polysaccharide from 23 capsular pneumococcal types (PPV23). Most healthy adults develop a good antibody response to a single dose. Children younger than two years do not and so the pneumococcal conjugate vaccine (PCV13) is used in the childhood immunisation programme.

Uptake and Coverage in Targeted Adult Immunisation Programmes

Pertussis (whooping cough) vaccine in pregnant women

In October 2012 the pertussis vaccine in pregnancy programme commenced as an emergency response to a national outbreak and was offered between 28 and 32 weeks gestation. Since then the programme has continued with Boostrix-IPV® (which contains diphtheria, tetanus, acellular pertussis and inactivated polio antigens – DTaP/IPV). Since May 2016 it has been offered from 16 weeks of gestation until delivery.

Since August 2017, uptake of pertussis vaccine in pregnancy is monitored from data extracted from the Northern Ireland Maternity Administrative System (NIMATS), a regional electronic information system that records maternal and neonatal information at the time of delivery. This data enables more accurate measurement of uptake because all pregnant women that deliver after 24 weeks gestation (live and stillbirths) are counted and completion of fields is mandatory.

Uptake for the year from September 2017 to August 2018 was 69.3% in Northern Ireland with variation seen across the Local Commissioning Group (LCG) areas.

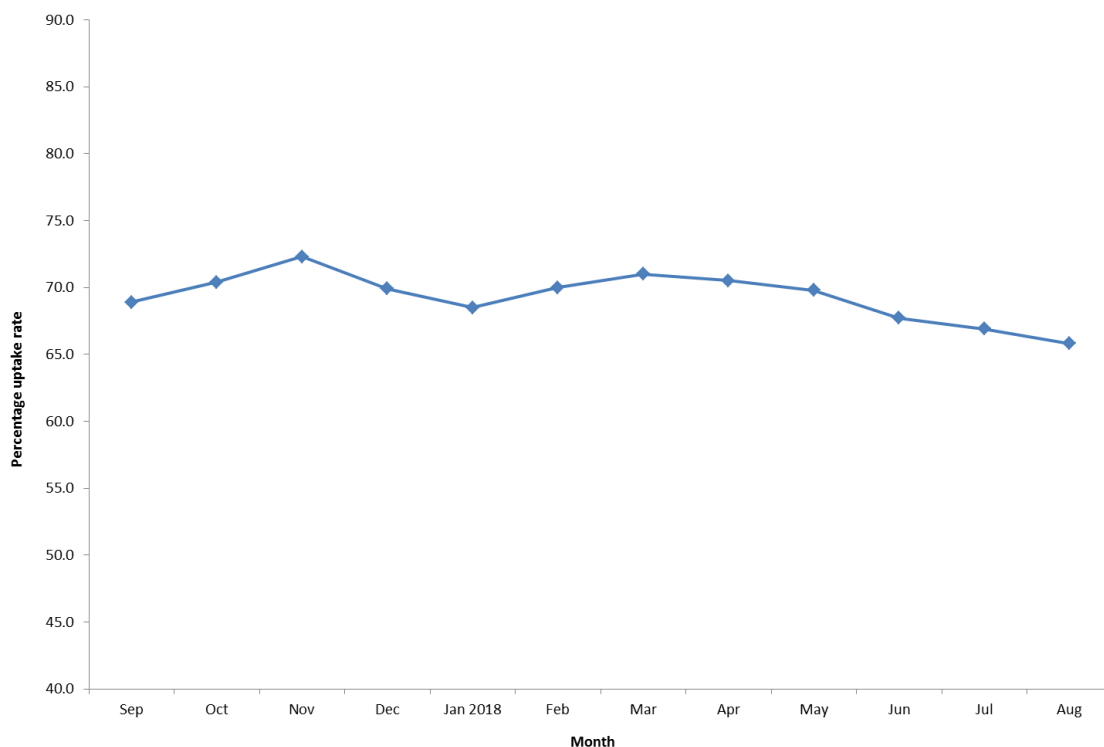
Table 11. Pertussis vaccination coverage (%) in pregnant women, September 2017 – August 2018, Northern Ireland

Area	% pregnant women vaccinated DTaP/IPV
Belfast	68.8
South Eastern	77.4
Northern	67.0
Southern	66.5
Western	68.2
NI Total	69.3

Source: NIMATS

Monthly uptake, now available, shows seasonal fluctuation of uptake with highest uptake during the winter months tailing off during spring and summer. This is a similar pattern to that seen in England and coincides with the delivery of the seasonal influenza vaccination programme, which also targets pregnant women. PHA will continue to monitor this pattern in future years.

Figure 5: Monthly pertussis vaccination coverage (%) in pregnant women, September 2017 – August 2018, Northern Ireland



Source: NIMATS

HPV vaccine in MSM aged up to 46 years who attend GUM clinics

In 2008 the girls’ HPV vaccine programme was introduced across the UK. Studies have shown that, in addition to directly protecting females, the vaccine induces herd protection, which provides protection to boys when there is high vaccine coverage in girls. However, while the girls’ programme confers indirect protection to heterosexual males, MSM receive little benefit from it. Evidence suggests that 80-85% of anal cancers, 36% of oropharyngeal and 50% of penile cancer are linked to HPV infection. In November 2015, the JCVI advised a targeted HPV vaccination programme with a course of three doses for MSM aged up to and including 45 years who attend GUM clinics.⁵

In October 2016, the HPV vaccine programme for MSM was offered across Northern Ireland. Three doses are offered preferably within one year, but is still clinically acceptable up to two years. Anonymised data is extracted from the GUM clinic Genito-Urinary Medical Clinic Activity Dataset (GUMCAD) to estimate the number of vaccines delivered and number of MSM up to 46 years attending a clinic.

Uptake for the first 15 months of the programme from 1 October 2016 to 31 December 2017 shows that 73.3% of MSM up to 46 years of age had one dose of HPV vaccine, 50.2% two doses and 24.5% had completed the schedule.

Work to improve uptake in adult immunisation programmes

During 2017-18, a study was carried out for the dissertation of Queens University Belfast, Masters in Public Health (MPH) with NIMATS level data to assess variation in pertussis containing vaccine and seasonal influenza vaccine coverage in pregnant women. The findings showed that for both vaccines, uptake was lower in some ethnic minority and migrant groups, younger mothers, those unemployed, those with an unplanned pregnancy, single mothers and women who smoked during pregnancy. In addition, PHA carried out a pilot with maternity colleagues in one LCG area where midwives offered and administered the seasonal influenza vaccine during November 2017 to May 2018. The success of this pilot will be evaluated later in 2018. Findings from both will be used during 2018-19 to consider interventions to improve uptake in pregnancy and support GP practices and maternity units in delivery of the programme.

Another study was also carried out for a dissertation of the MPH which looked at GUMCAD level data to assess variation in HPV vaccine coverage in MSM. This found that the clients' age and sexual identity contributed to variation in vaccination uptake. Coverage was lower in those that identified as bisexual men compared to homosexual men. Men over 41 years were less likely to receive vaccination compared to those under 21 years. These findings will be shared with GUM colleagues to enable them to target these groups.

Northern Ireland Measles and Rubella Elimination commitments

The United Kingdom, along with all Member States of the World Health Organisation (WHO) European Region, have signed up to a longstanding commitment to eliminate measles and rubella. Public Health England collates required information on behalf of the devolved administrations for submission to the UK national verification committee (NVC) and the WHO Regional Verification Commission for Measles and Rubella Elimination (RVC) for evaluation on an annual basis.

During 2018-19 the PHA will be developing the Northern Ireland Measles and Rubella elimination action plan to outline the local situation and set out local actions to deliver on our commitment to maintaining and achieving elimination.

Conclusions

The year 2017-18 has again been a successful one for the childhood and adult immunisation programmes.

Uptake of immunisations for children under 5 years of age continues to be amongst the highest in the UK although work continues to ensure that this high level is maintained. There was a continued decrease in the uptake of HPV vaccine for girls in year 9 in 2017-18 but most girls who had not been vaccinated in year 9 2016-17 received this in year 10.

Better data for pertussis vaccine in pregnancy, available from NIMATS, has enabled us to report more accurate uptake of 69.3% in Northern Ireland for one year. NIMATS data has also enabled PHA to obtain more detailed information on uptake, by LCG and by other demographic indicators. PHA will now look at more targeted ways to improve uptake with maternity colleagues. The HPV vaccine programme for MSM has been successfully rolled out across Northern Ireland and continues to show good uptake for the first 15 months. There remains an overall decline of shingles uptake since the programme started in 2013 but less of a drop in 2017-18 compared to 2016-17. This year, PHA is developing a new monitoring report to determine coverage of shingles for each annual cohort.

Recommendations

- PHA will continue to work with GP, health visitor and Child Health System colleagues to gain a greater understanding of the decrease in pre-school immunisation uptake across Northern Ireland and work together to improve coverage, particularly in the Belfast area
- PHA will develop the Northern Ireland Measles and Rubella Elimination Action Plan in partnership with relevant colleagues
- PHA will work with school health and communications colleagues to improve the uptake of HPV vaccine for 2018-19
- PHA will develop new monitoring reports to outline shingles coverage for each routine cohort since the programme commenced
- PHA will work with Maternity colleagues to improve the awareness and understanding of vaccinations given in pregnancy

Sources of further information

The most useful resource for health professionals is the on-line version of The Green Book, which contains 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://pha.site/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-2017
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”.

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

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.

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.

MSM: Men who have sex with men.

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”.

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.

References

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- 5 Joint Committee on Vaccination and Immunisation. Statement on HPV vaccination of men who have sex with men. 2015. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/477954/JCVI_HP.V.pdf