

Childhood Immunisation Statistics Scotland

Quarter and year ending 31 December 2016

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Introduction

Children in Scotland are protected through immunisation against many serious infectious diseases. Vaccination programmes aim both to protect the individual and to prevent the spread of these diseases within the wider population. As a public health measure, immunisations are very effective in reducing the burden of disease.

This publication provides a yearly and quarterly update of immunisation uptake rates for children in Scotland at 12 months, 24 months, five years and six years of age. The release includes data to 31 December 2016. Data are presented by NHS Board, local authority and deprivation.

This annual report, which focuses on calendar year uptake rates, is published in March each year. In addition, each quarter ISD publish updated tables presenting the latest quarterly uptake rates for children at 12 months, 24 months, five years and six years, by NHS Board and local authority.

UK Childhood Immunisation Schedule

The UK Childhood Immunisation Schedule covers the recommended immunisations for children and young people (aged 0 to 18 years). The schedule comprises the recommended universal or routine immunisations which are offered to all children and young people at specified ages, as well as selective or non-routine immunisations which are targeted to children at higher risk from certain diseases.

Immunisation uptake (sometimes referred to as coverage) refers to the proportion of the eligible population who have received the recommended doses of the relevant vaccines. Monitoring the proportion of the eligible population vaccinated is a key measure of the immunisation programme performance. It is of public health concern should immunisation rates decrease, as this makes the possibility of disease transmission more likely.

The European Region of the World Health Organization (WHO) recommends that on a national basis at least 95% of children are immunised against diseases preventable by immunisation and targeted for elimination or control. These include diphtheria, tetanus, pertussis (whooping cough), polio, Hib, measles, mumps and rubella. In Scotland a target of 95% uptake of one dose of the Measles, Mumps and Rubella (MMR) vaccine by five years of age (with a supplementary measure at 24 months) was introduced in 2006 to focus efforts on reducing the number of susceptible children entering primary school.

The UK immunisation schedule is continually reviewed and updated. Changes in the schedule such as the introduction of new vaccines, changes to the number of doses required and/or the timing of vaccines need to be considered when interpreting uptake rates. A summary of recent changes for children under six years of age is shown in [Appendix A1](#).

Routine Childhood Immunisation Schedule prior to September 2016

When to immunise	What vaccine is given
2 months old	Diphtheria, tetanus, pertussis (whooping cough), polio and <i>Haemophilus influenzae</i> type b (DTaP/IPV/Hib)
	Pneumococcal (PCV)
	Rotavirus
	Meningococcal B (MenB)
3 months old	Diphtheria, tetanus, pertussis (whooping cough), polio and <i>Haemophilus influenzae</i> type b (DTaP/IPV/Hib)
	Meningococcal C (MenC) Note from 5 September 2016 this dose has been removed from the schedule
	Rotavirus
4 months old	Diphtheria, tetanus, pertussis (whooping cough), polio and <i>Haemophilus influenzae</i> type b (DTaP/IPV/Hib)
	Pneumococcal (PCV)
	Meningococcal B (MenB)
12 to 13 months old	<i>Haemophilus influenzae</i> type b and meningococcal C (Hib/MenC)
	Pneumococcal (PCV)
	Measles, mumps and rubella (MMR)
	Meningococcal B (MenB)
2 to 11 years - annually	Influenza (flu)
3 years 4 months old or soon after	Diphtheria, tetanus, pertussis and polio (DTaP/IPV or dTaP/IPV)
	Measles, mumps and rubella (MMR)
Girls aged 11 to 13 years old	Human Papillomavirus (HPV)
Around 14 years old	Tetanus, diphtheria and polio (Td/IPV)
	Meningococcal ACWY (MenACWY)

Non-routine immunisations for at-risk babies

When to immunise	What vaccine is given
At birth	BCG (against tuberculosis)
At birth, 1 month old, 2 months old and 12 months old	Hepatitis B
6 months old to 2 year - annually	Influenza (flu)

Childhood vaccine uptake rates published elsewhere

Statistics on [Human Papillomavirus \(HPV\) immunisation uptake](#) and [teenage booster immunisation uptake](#) are published separately by ISD annually in the [Child Health](#) topic area of the ISD website. [Flu vaccine uptake rates](#) are published by Health Protection Scotland (HPS) in HPS National Influenza Reports. National statistics on uptake rates of non-routine immunisations in Scotland are not currently available

Definitions

Immunisation

The process whereby a person is made immune or resistant to an infectious disease, typically by the administration of a vaccine. Vaccines stimulate the immune system to protect a person against subsequent infection or disease.

Immunised

To be fully immunised against a particular disease an individual must have received all required doses of the relevant vaccine. Detailed information about the current immunisation programmes in Scotland, the vaccines available, and the diseases they protect against, can be found via the [Immunisation Scotland](#) website.

Uptake rates

Uptake rates, sometimes referred to as coverage, relates to the number of children immunised against a particular disease as a proportion of the children eligible to have received the appropriate vaccine.

Uptake is calculated as follows:

$$\frac{\text{Total number of eligible children immunised}}{\text{Total number of eligible children in the population}} \times 100$$

Main points

Scotland figures for calendar year 2016

- Uptake rates by 12 months of age for complete primary courses of immunisation against diphtheria, tetanus, pertussis (whooping cough), polio and Hib (the five-in-one vaccine), MenC and PCV remained high, with rates above 96%.
- Uptake of the vaccine against rotavirus, a common cause of severe diarrhoea in infants, remained at 92.9% by 12 months of age.
- Uptake of completed courses of the five-in-one, MenC and PCV vaccines by 12 months were above 95% in all deprivation categories. Although vaccine uptake was high in the most deprived areas, the rates were slightly lower in these areas compared to the least deprived areas.
- Uptake rates of the Hib/MenC and PCV booster vaccines by 24 months remained high at 95.1 and 95.0% respectively.
- The national target is for 95% uptake of one dose of the MMR vaccine by five years of age, with a supplementary measure at 24 months. In 2016, annual uptake of one dose of MMR vaccine by 24 months of age decreased slightly to 94.9%. Uptake of one dose by five years of age was 96.8%. Uptake rates of one dose of MMR by five years have remained above the 95% target since 2009.
- Uptake of the vaccines normally given around three years four months of age remained at a similar level. By five years of age, 93.4% of children had completed the booster course of immunisation against diphtheria, tetanus, pertussis and polio, and 92.9% had received the second dose of MMR vaccine.

Scotland figures for quarter ending 31 December 2016

- Uptake rates by 12 months of age for complete primary courses of immunisation against diphtheria, tetanus, pertussis, polio and Hib (the five-in-one vaccine), MenC and PCV remained high, with rates above 96%.
- Uptake of the MenB vaccine by 12 months of age has increased to 95.8% (the previous quarterly figure was 94.5%). This was the second full quarter where data were available.
- Uptake of the rotavirus vaccine was 93.5% at 12 months of age (the previous quarterly figure was 93.0%).
- Uptake of the Hib/MenC and PCV boosters at 24 months remained high at 95.3% and 95.2% respectively.
- Uptake of one dose of MMR vaccine by 24 months remained at 94.8%. Uptake of one dose of MMR by five years of age was 96.8%, exceeding the 95% target.
- Uptake of the vaccines normally given around three years four months of age remained at a similar level. By five years of age, 94.0% of children had completed the booster course of immunisation against diphtheria, tetanus, pertussis and polio, and 93.4% had received the second dose of MMR vaccine.

Results and Commentary

Annual uptake rates by 12 months of age

In Scotland in 2016, uptake rates by 12 months of age for complete primary courses of immunisation against [diphtheria](#), [tetanus](#), [pertussis](#), [polio](#) and [Hib](#) (the five-in-one vaccine), [MenC](#) and [PCV](#) remained high, with rates above 96%. This was the second year where there was a slight decrease in uptake rates from the previous year ([Figure 1](#)) ([Table 1](#)).

In 2016, uptake rates by 12 months of age were:

- 96.8% of children had completed primary courses of immunisation against diphtheria, tetanus, pertussis, polio and Hib (the five-in-one vaccine) (97.2% in 2015).
- 97.0% completed the primary course of MenC (97.5% in 2015).
- 96.8% completed the primary course of PCV (97.1% in 2015).
- 92.9% completed the course of rotavirus vaccine (92.9% in 2015).

DTP/Pol/Hib

Children should receive three doses of the DTP/Pol/Hib vaccine, which protects against diphtheria, tetanus, pertussis, polio and Haemophilus influenzae type b (Hib), before their first birthday. [Figure 2](#) shows that uptake by 12 months of age was high in all parts of Scotland in 2016. Uptake was above 95% in all NHS Board areas except NHS Orkney and NHS Shetland, where rates exceeded 90%. Uptake rates for the Island Boards are prone to fluctuation due to the small number of children in these cohorts.

MenC

Since the introduction of Meningococcal C (MenC) vaccine to the immunisation schedule in 1999 there have been several amendments to the number and timing of required doses.

[Figure 1](#) shows uptake of MenC under 12 months of age has exceeded 95% throughout the last decade. A small dip in uptake was seen in 2013, although it remained above 95%. This decrease was due to the removal of the second dose (given at four months) from the routine schedule from 1 June 2013. The children in this cohort were born in 2012 and were due to receive two doses of MenC immunisation at three and four months. Although most children receive immunisations to schedule, a small proportion will be immunised slightly later, for example, due to missed appointments. Therefore children in this cohort (in particular those born at the end of calendar year 2012) had less time compared with previous annual cohorts, to 'catch-up' and receive both doses of MenC before the removal of the dose at four months.

Following the recommendation of the UK Joint Committee on Vaccination and Immunisation (JCVI), infants no longer require vaccination against MenC before 12 months of age. From 5 September 2016, the dose given at 3 months of age was removed the routine immunisation schedule. Children still receive a dose of MenC vaccine as part of the Hib/MenC booster given at 12 to 13 months.

This change was recommended due to the overall decrease in invasive MenC disease across the whole of the UK since the MenC vaccination programme was introduced in 1999. In addition, adolescents have been vaccinated with MenC vaccine since September 2013, and in August 2015 the MenACWY vaccination programme was introduced.

PCV

Children should receive two doses of Pneumococcal conjugate vaccine (PCV) before 12 months of age. Uptake of the completed primary course has exceeded 96% since the vaccine was introduced to the routine schedule in September 2006.

Rotavirus

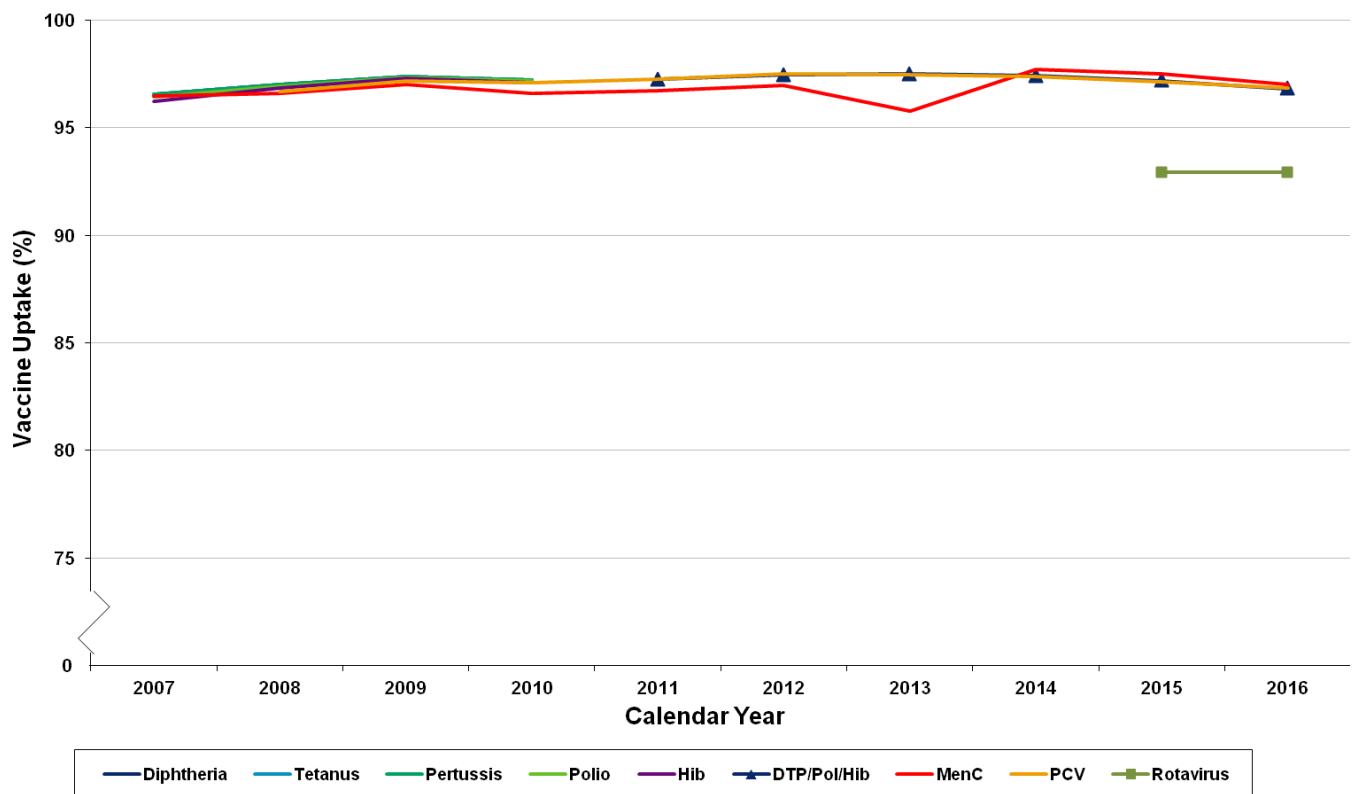
The [rotavirus](#) vaccine was introduced to the routine schedule in July 2013. Uptake of the completed course of rotavirus vaccine remained at 92.9% in 2016. This was the second full calendar year cohort eligible for the vaccine. Rotavirus vaccination is unique in the routine childhood immunisation schedule in that administration of the vaccine is bound by strict age limits. Children require two doses of vaccine, given at least four weeks apart. The first dose should be given before 15 weeks of age. The second dose should be given before 24 weeks of age. These age limits mean that if a child is not vaccinated with the first dose early enough, due to missed appointments for example, then it may not be possible for them to complete the full two dose course before 24 weeks. This probably explains why uptake of the completed course of rotavirus vaccine is slightly lower than completed courses of the other vaccines offered in the first year of life.

MenB

[Meningococcal B](#) (MenB) vaccination was introduced from 1 September 2015 for infants due to receive their primary immunisations starting at two months of age (i.e. those babies born on or after 1 July 2015). The vaccine is offered alongside other routine immunisations at two and four months of age, with a booster dose at 12 to 13 months. A limited one-off catch-up programme was also delivered targeting infants born in May and June 2015 who were receiving other routine immunisations, at three and four months of age.

The first full calendar year birth cohort eligible for the vaccine were born 1 January to 31 December 2016 and will reach 12 months of age during 2017. This means annual uptake rates of MenB vaccine will not be available until the March 2018 publication. However quarterly uptake rates are available and show that uptake of the MenB vaccine was 95.8% in the latest [quarter ending 31 December 2016](#).

Figure 1: Primary immunisation uptake rates by 12 months of age, by calendar year, Scotland



Source: Scottish Immunisation & Recall System (SIRS), 13 February 2017

From year ending December 2011, uptake rates for primary immunisation against each of diphtheria, tetanus, pertussis, polio and Hib is shown as a single uptake rate (DTP/Pol/Hib) to reflect that this is the 5-in-1 vaccine, which is given as one injection.

Key

- DTP/Pol/Hib The 5-in-1 vaccine (3 doses) which protects against diphtheria, tetanus, pertussis, polio and *Haemophilus influenzae* type b (Hib)
- MenC Meningococcal serogroup C conjugate vaccine (1 dose)
- PCV Pneumococcal conjugate vaccine (2 doses)
- Rotavirus Rotavirus vaccine (2 doses under 24 weeks)

Figure 2: Map of DTP/Pol/Hib uptake rates (%) by 12 months of age in 2016, by NHS Board of residence

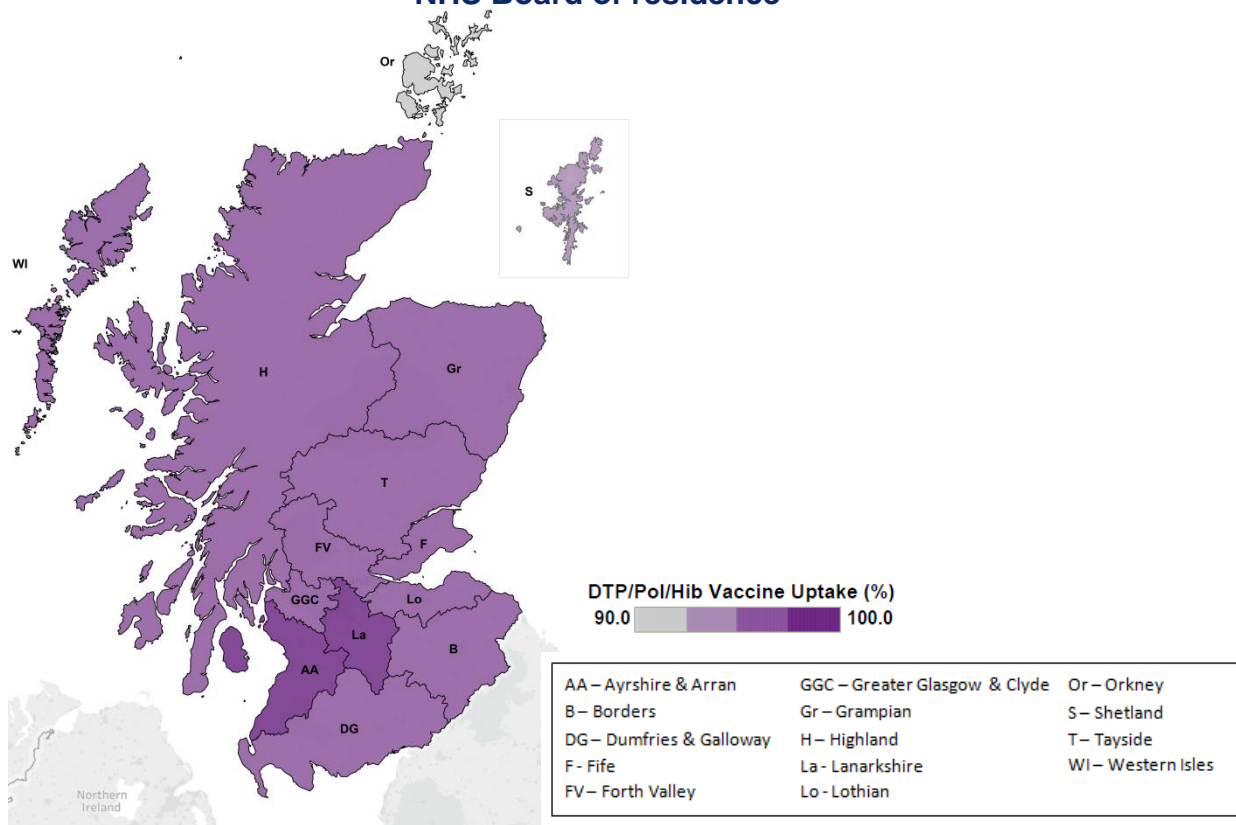
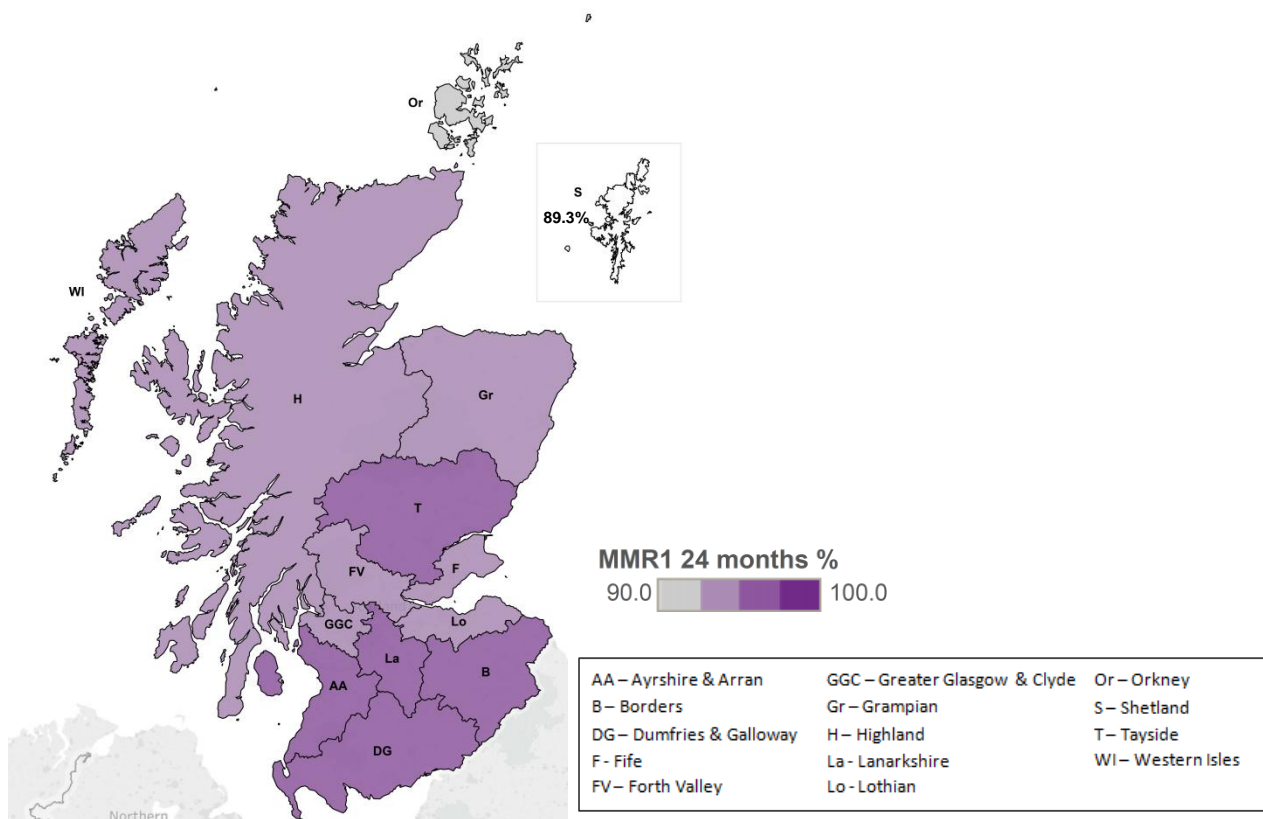


Figure 3: Map of MMR1 uptake rates (%) by 24 months of age in 2016 by NHS Board of residence



Annual uptake rates by 24 months of age

At Scotland level, uptake rates by 24 months remained high, although there were slight decreases in the uptake of all vaccines for the second year in a row ([Table 2](#)).

In 2016, uptake rates by 24 months of age were:

- 97.7% of children had completed primary courses of immunisation against diphtheria, tetanus, pertussis, polio and Hib (the five-in-one vaccine) (97.9% in 2015).
- 94.9% had received one dose of MMR vaccine (95.4% in 2015).
- 95.1% had received the Hib/MenC booster (95.3% in 2015).
- 95.0% had received the PCV booster (95.3% in 2015).

First dose of MMR

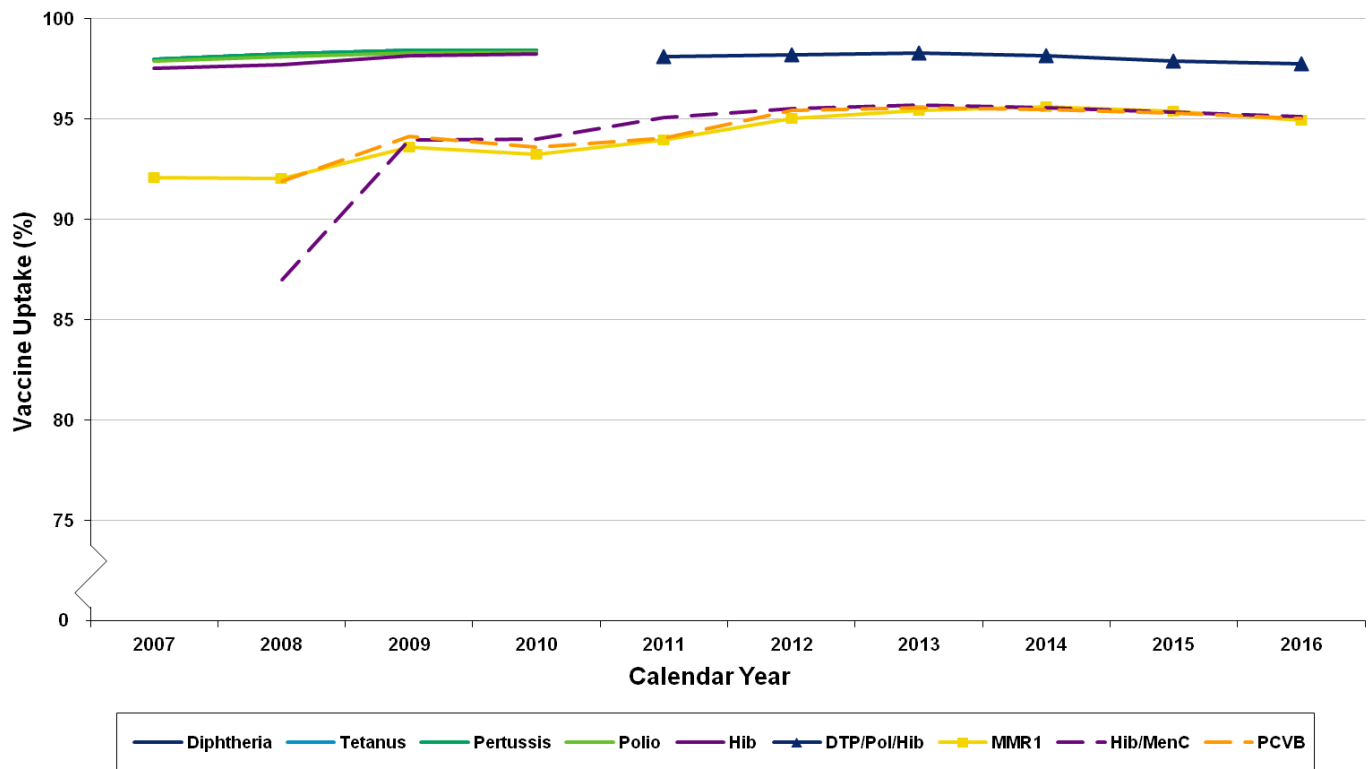
[Figure 4](#) shows the trend in immunisation uptake rates by 24 months of age since 2007. Uptake of the first dose of MMR vaccine has exceeded 90% throughout the last decade, and reached 95.0% for the first time in 2012. Between 2013 and 2015 uptake rates remained above 95% and then fell slightly to 94.9% in 2016.

A map showing uptake in 2016 across Scotland is shown in [Figure 3](#)

Hib/MenC booster and PCV booster

The Hib/MenC booster and PCV booster vaccines were introduced to the routine childhood immunisation schedule in September 2006. [Figure 4](#) shows uptake rates for Hib/MenC and PCV booster vaccines were lower when first introduced to the immunisation schedule and have since increased to above 95%. Following a change in the immunisation schedule, such as the introduction of new vaccines and/or changes in the recommended ages when appointments are offered, uptake rates for these vaccines are often lower initially.

Figure 4: Primary and booster immunisation uptake rates by 24 months of age, by calendar year, Scotland



Source: Scottish Immunisation & Recall System (SIRS), 13 February 2017

From year ending December 2011, uptake rates for primary immunisation against each of diphtheria, tetanus, pertussis, polio and Hib is shown as a single uptake rate (DTP/Pol/Hib) to reflect that this is the 5-in-1 vaccine, which is given as one injection.

Key

- DTP/Pol/Hib The 5-in-1 vaccine (3 doses) which protects against diphtheria, tetanus, pertussis, polio and *Haemophilus influenzae* type b (Hib)
- MMR1 Measles, mumps, and rubella vaccine (1 dose over 12 months)
- Hib/MenC Hib/MenC Booster (1 dose over 12 months)
- PCVB Pneumococcal conjugate vaccine booster (1 dose over 12 months)

Annual uptake rates by five years of age

In 2016, uptake rates by five years of age for vaccines normally given around three years four months of age were:

- 93.4% of children had completed the booster course of immunisation against diphtheria, tetanus, pertussis and polio (93.6% in 2015).
- 92.9% had received the second dose of MMR vaccine (92.9% in 2015).

Uptake rates by five years of age for vaccines normally given around 12 to 13 months of age were:

- 96.8% had received one dose of MMR vaccine (97.0% in 2015).
- 96.0% of children had received the Hib/MenC booster (95.7% in 2015).

DTP/Pol and second dose of MMR

Protection against diphtheria, tetanus, pertussis (whooping cough) and polio can fade over time. Also, immunity to measles, mumps and rubella may not develop after a single dose of the MMR vaccine. From the age of three years four months, children should be invited to receive booster doses of diphtheria, tetanus, pertussis and polio (given as one injection and often referred to as the four-in-one booster) and a second dose of MMR vaccine.

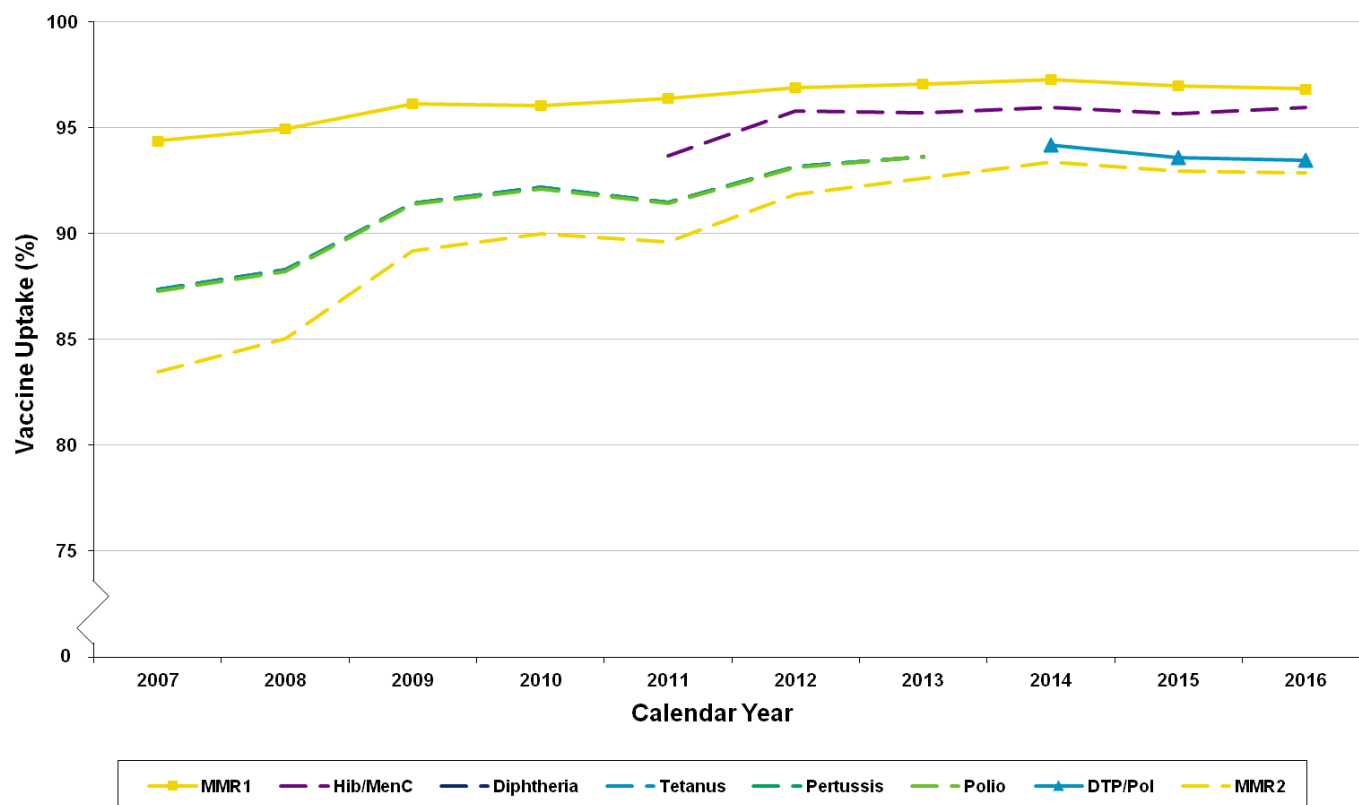
[Figure 5](#) shows the trend in immunisation uptake rates by five years of age since 2007. Previously published figures show there was a small dip in uptake of the diphtheria, tetanus, pertussis and polio booster immunisation in 2007, when rates decreased to around 87%. This was a result of changes to the immunisation schedule for younger children in 2006, which meant each child needed more appointments. This temporarily led to some older children receiving their booster immunisations slightly later than scheduled due to prioritisation of younger children for additional primary immunisation appointments. Uptake rates rebounded and have subsequently increased to 93.4% in 2016. The increase is mainly as a result of the initiative introduced in November 2007 to reduce the age of this pre-school booster appointment to between three years four months and three years six months of age, in areas where this was not already the case.

[Figure 5](#) also shows that uptake of the second dose of MMR by the age of five increased from 83.5% in 2007 to 92.9% in 2016. This increase was also partly due to the 2007 initiative which reduced the age of the pre-school immunisation appointment, when the second dose of MMR is routinely given, in addition to the increasing level of MMR uptake generally.

First dose of MMR and Hib/MenC booster

The trend in uptake rates of one dose of MMR and the Hib/MenC booster by five years of age are also presented in [Figure 5](#). These vaccines are normally given around 12 to 13 months of age. The national target is for 95% uptake of one dose of the MMR vaccine by five years of age (with a supplementary measure at 24 months). This target was introduced in 2006 to focus efforts on reducing the number of susceptible children entering primary school. This was achieved in 2009 and uptake rates by five years have since remained above the 95% target. Uptake of the Hib/MenC booster by five years has increased following its introduction in 2011 from 93.7% to 96.0% in 2016.

Figure 5: MMR1 and booster immunisation uptake rates by 5 years of age, by calendar year, Scotland



Source: Scottish Immunisation & Recall System (SIRS), 13 February 2017

The booster doses of diphtheria, tetanus, pertussis and polio have historically been presented as four separate uptake rates in this publication. As these vaccines are routinely given as one injection, the lines representing these vaccines on the chart overlap. From 2014, uptake of booster doses of diphtheria, tetanus, pertussis and polio is presented as a single uptake rate in the tables and charts (labelled as DTP/Pol) to reflect that this is routinely given as one injection.

Key

- MMR1 Measles, mumps, and rubella vaccine (1 dose over 12 months)
- Hib/MenC Hib/MenC Booster (1 dose over 12 months)
- DTP/Pol Diphtheria, tetanus, pertussis and polio containing vaccine (4th dose). In the UK this is given as a single injection (the 4-in-1 vaccine)
- MMR2 Measles, mumps, and rubella vaccine (2nd dose)

Annual uptake rates by six years of age

The standard reporting ages for vaccine uptake rates in the UK is 12 months, 24 months and five years of age. Prior to 2006, uptake rates in Scotland were reported by 12 months, 24 months and six years of age. To achieve consistency with figures for the rest of the UK, the reporting of vaccine uptake by five years of age was introduced in 2006. For trend purposes, uptake rates by six years of age are also available in the excel tables accompanying this report ([Table 4](#)). These figures show that some children are immunised beyond five years of age. The cohort of children born in 2010 reached five years of age in 2015 and 93.6% had received the diphtheria, tetanus, pertussis and polio booster immunisation and 92.9% had received two doses of MMR vaccine by five years. This birth cohort reached six years of age in 2016 and uptake had increased to 94.8% for diphtheria, tetanus, pertussis and polio booster immunisation and 94.1% for two doses of MMR.

Further information on calendar year uptake rates

For excel tables presenting 2016 uptake rates by 12 and 24 months, and five and six years by NHS Board and local authority, see:

[Uptake rates by NHS Board and calendar year](#)

[Uptake rates by local authority and calendar year](#)

For trend information at Scotland and NHS Board level please see [List of Tables](#) within this report.

The charts presenting trends in vaccine uptake in this publication include data for the last 10 calendar years. Historic trend data back to 1995 can be found in the [List of Tables](#) and in [previous publications](#).

Annual uptake rates by deprivation

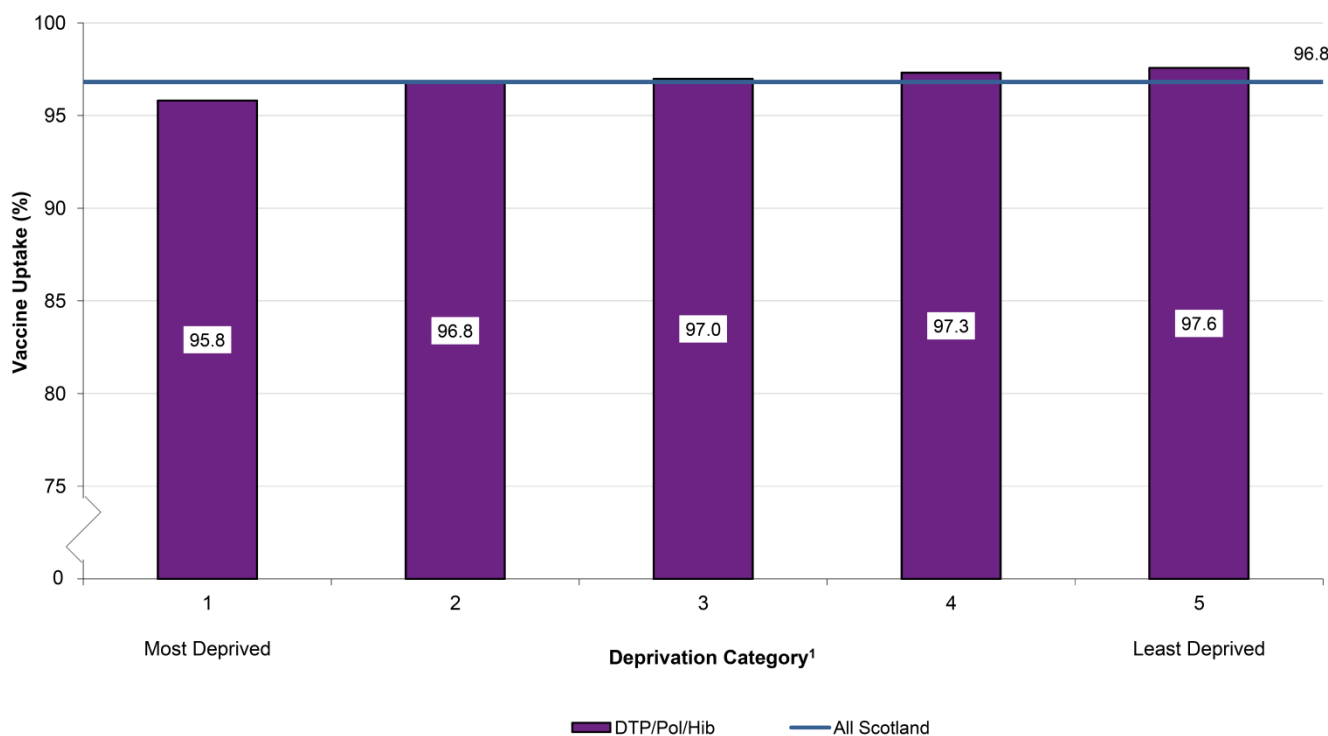
Personal, social and cultural issues including deprivation are all factors which may influence a parent’s decision on whether to immunise their child. In order to explore the effect of deprivation, uptake rates have been calculated by Scottish Index of Multiple Deprivation quintile (SIMD 2016) for completed primary courses of the DTP/Pol/Hib vaccine by 12 months of age and for one dose of MMR vaccine by 24 months of age and are shown below.

Additionally uptake rates by deprivation have been calculated for MenC, PCV and rotavirus vaccines by 12 months of age and for the PCV booster at 24 months of age and these can be found in the [tables and charts](#) included with this publication.

DTP/Pol/Hib by 12 months

[Figure 6](#) shows that at Scotland level, uptake rates for completed courses of DTP/Pol/Hib vaccine by 12 months of age were high in all deprivation categories, although uptake was slightly lower in the most deprived areas compared to the least deprived areas. Uptake of DTP/Pol/Hib vaccine ranges from 95.8% in the most deprived areas (SIMD quintile 1) to 97.6% in the least deprived areas (SIMD quintile 5).

Figure 6: Uptake rates of DTP/Pol/Hib vaccine by 12 months of age, by deprivation¹, Scotland; Evaluation period: January to December 2016



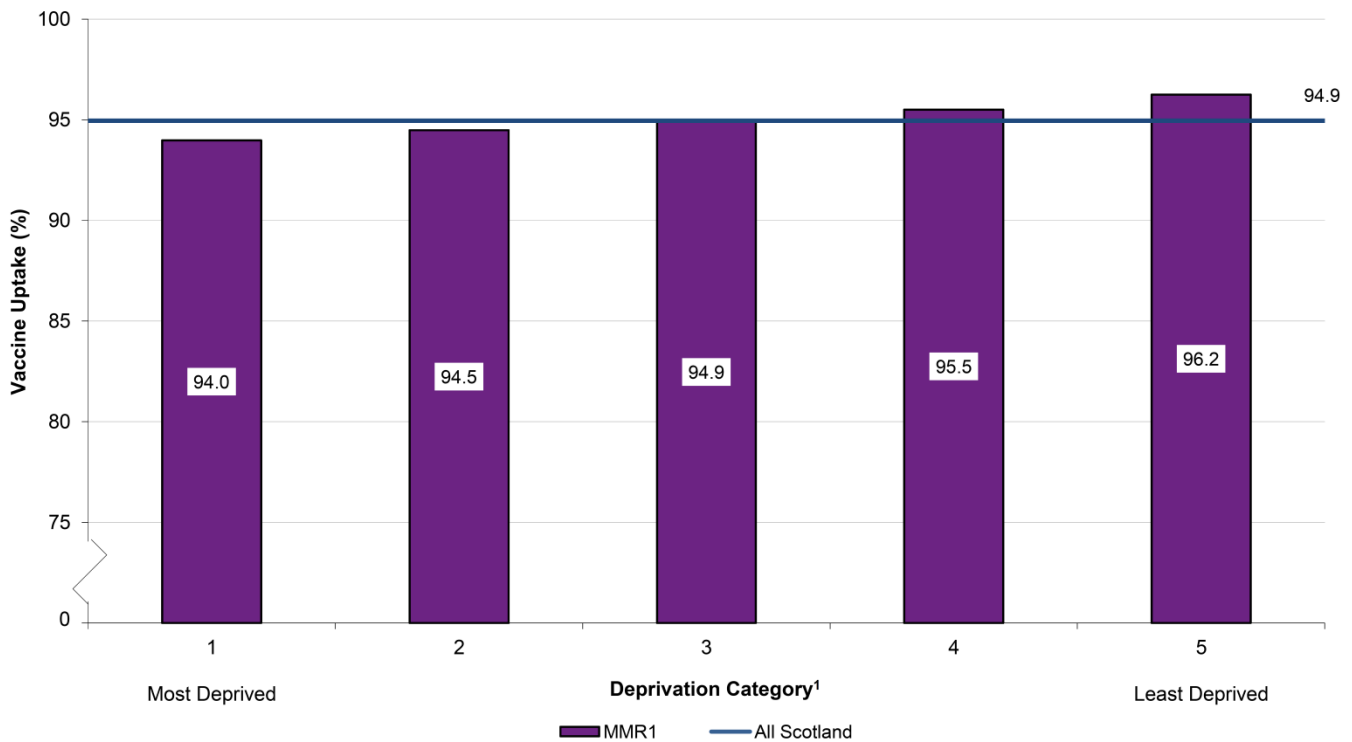
Source: Scottish Immunisation & Recall System (SIRS), 13 February 2017

1. Scottish Index of Multiple Deprivation (SIMD) 2016 (Scotland level) quintile (population-weighted).

First dose of MMR by 24 months

[Figure 7](#) shows the uptake rates for one dose of MMR vaccine (MMR1), by 24 months of age by deprivation. Uptake of one dose of MMR vaccine by 24 months of age was slightly below 95% in the three most deprived quintiles. Uptake ranged from 94.0% for children living in most deprived areas (SIMD quintile 1) compared to 96.2% for children living in the least deprived areas (SIMD quintile 5).

Figure 7: Uptake rates of one dose of the MMR vaccine by 24 months of age, by deprivation¹, Scotland; Evaluation period: January to December 2016



Source: Scottish Immunisation & Recall System (SIRS), 13 February 2017

1. Scottish Index of Multiple Deprivation (SIMD) 2016 (Scotland level) quintile (population-weighted).

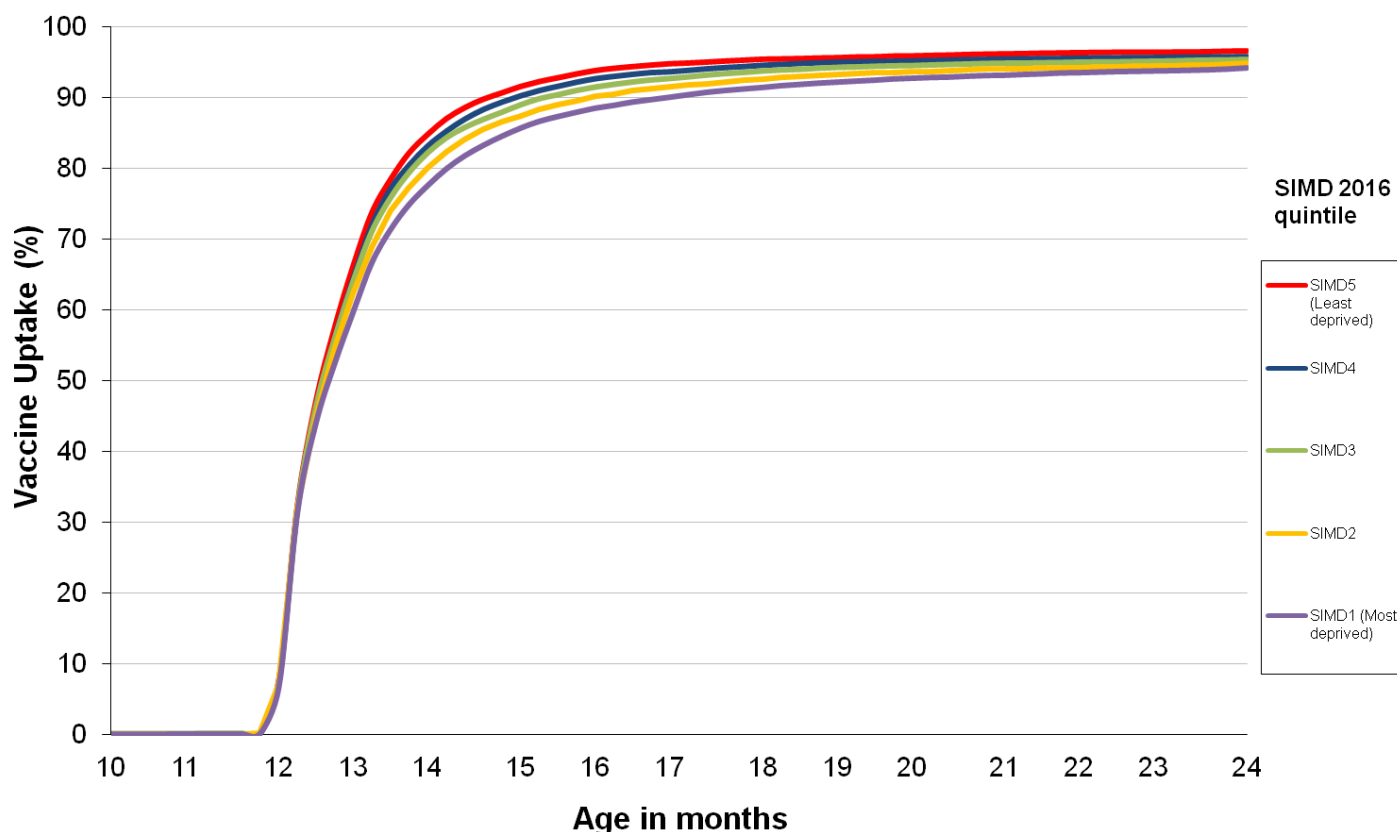
Further information

For excel tables and charts presenting 2016 uptake rates by 12 and 24 months of age by NHS Board and deprivation see: [Uptake by deprivation \(SIMD 2016\) by NHS Board and calendar year](#)

Uptake rates as children age by deprivation

It is also interesting to look at the variation in immunisation uptake rates as children age by deprivation. [Figure 8](#) shows that, although deprivation has a limited effect on the first dose of MMR uptake by 24 months of age, there are more noticeable deprivation related differences in the level of increase in uptake as children age. Children in the more deprived areas are more likely to be vaccinated later in their second year than children in less deprived areas. For example, 91.5% of children had received their first dose of MMR by 15 months of age in the least deprived areas (SIMD quintile 5) compared to 85.7% in the most deprived areas (SIMD quintile 1).

Figure 8: Uptake rate of MMR1 as at 31 December 2016¹ by deprivation² and age, Scotland



Source: Scottish Immunisation & Recall System (SIRS), 13 February 2017

1. Children born 1 January to 31 December 2014.

2. Scottish Index of Multiple Deprivation (SIMD) 2016 (Scotland level) quintile (population-weighted).

Further information

[Variation in immunisation uptake rates as children age by SIMD quintile at Scotland level](#)

Uptake rates for quarter ending 31 December 2016

This release also includes figures for the quarter ending 31 December 2016. The key points at Scotland level are:

- Uptake rates by 12 months of age for complete primary courses of immunisation against diphtheria, tetanus, pertussis, polio and Hib (the five-in-one vaccine), MenC and PCV remained high, with rates above 96%.
- Uptake of the MenB vaccine by 12 months of age has increased to 95.8% (the previous quarterly figure was 94.5%). This was the second full quarter where data were available.
- Uptake of the rotavirus vaccine was 93.5% at 12 months of age (the previous quarterly figure was 93.0%).
- Uptake of the Hib/MenC and PCV boosters at 24 months remained high at 95.3% and 95.2% respectively.
- Uptake of one dose of MMR vaccine by 24 months remained at 94.8%. Uptake of one dose of MMR by five years of age was 96.8%, (the previous quarterly figure was 97.1%).
- 94.0% of children had completed the booster course of immunisation against diphtheria, tetanus, pertussis and polio by five years of age (the previous quarterly figure was 93.9%).
- 93.4% had received the second dose of MMR vaccine by age five (the previous quarterly figure was 93.3%).

Further information

The latest quarterly uptake rates by 12 and 24 months, and five and six years, by NHS Board and local authority see:

[Uptake rates by NHS Board and quarter](#)

[Uptake rates by local authority and quarter](#)

Uptake rates by financial year

Uptake rates by financial year are published in June each year; the latest [June publication](#) includes information for the year ending 31 March 2016.

Uptake rates in the UK

Comparable statistics for the UK published by Public Health England (PHE) show that uptake rates in Scotland compare favourably with UK uptake rates. Uptake in Scotland tends to be similar to rates observed in Wales and Northern Ireland, which are above rates observed in England.

[UK vaccine uptake rates](#) (referred to as coverage by PHE) are published by country by PHE.

England

As well as UK and country level data, PHE also publish quarterly data by [English Local Team](#). NHS Digital also publishes an [annual summary](#).

Northern Ireland

[Uptake rates in Northern Ireland](#) are published by the Public Health Agency.

Wales

[Uptake rates in Wales](#) are published by Public Health Wales.

Glossary

Term	Definition
Diphtheria	<p>Diphtheria is an acute infectious disease caused by the toxin-producing bacteria <i>Corynebacterium diphtheriae</i> or <i>Corynebacterium ulcerans</i> affecting the upper respiratory tract or the skin. Diphtheria is spread by droplets and through contact with objects or materials contaminated by infected persons.</p> <p>An effective vaccine against the disease was introduced in 1940. A combined diphtheria, tetanus and pertussis vaccine has been in use in the UK since the 1950s. Since October 2005, diphtheria is now part of the combined 'five-in-one' vaccine, consisting of diphtheria, tetanus, pertussis, polio and Hib. A booster dose is also given to children at around three years four months of age. Teenage Td/IPV booster vaccine, the reinforcing doses of diphtheria, tetanus and polio, is given around 14 years of age.</p>
Hib (<i>Haemophilus influenzae</i> type b)	<p><i>Haemophilus influenzae</i> type b (Hib) is a gram-negative bacterium that causes meningitis and septicaemia (blood poisoning), mainly in children.</p> <p>A Hib vaccine was introduced in 1992 and led to a reduction in confirmed cases of Hib disease. Since October 2005, Hib is part of the combined 'five-in-one' vaccine, consisting of diphtheria, tetanus, pertussis, polio and Hib. A booster of Hib is also given as part of the combined Hib/MenC vaccination given at 12 to 13 months.</p>
Measles, Mumps and Rubella (MMR)	<p>Measles is an acute viral illness spread by infected respiratory droplets. Symptoms, after a ten-day incubation period, can include corzya, conjunctivitis, bronchitis, Koplik spots, rash and fever.</p> <p>Mumps is an acute viral illness characterised by swelling of the parotid glands, which may be unilateral or bilateral. It can cause permanent unilateral deafness at any age. The incubation period is 14-21 days. Before vaccination, mumps was a common cause of viral meningitis.</p> <p>Rubella, or German measles, is a mild infectious disease with an incubation period of 14-21 days. Maternal rubella infection in the first eight to ten weeks of pregnancy results in foetal damage in up to 90% of infants. Multiple defects are common, and are collectively known as Congenital Rubella Syndrome.</p> <p>A vaccine against measles, mumps and rubella exists and since 1988 has been administered as the combined MMR vaccine.</p>
Meningococcal Groups B and C (MenB and MenC)	<p>The MenB and MenC vaccines protect against diseases caused by meningococcal group B and group C bacteria respectively, most often meningitis and septicaemia (blood poisoning). These vaccines do not protect against meningitis caused by other bacteria or by viruses.</p> <p>The UK was the first country to introduce the meningococcal C conjugate</p>

	<p>(MenC) vaccine. Since the introduction of Meningococcal C (MenC) vaccine to the immunisation schedule in 1999 there have been several amendments to the number and timing of required doses. From 5 September 2016, the dose given at 3 months of age was removed the routine immunisation schedule. Children still receive a dose of MenC vaccine as part of the Hib/MenC booster given at 12 to 13 months. Adolescents receive a booster dose as part of the MenACWY vaccine given at around 14 years of age.</p> <p>In September 2015 the UK was the first country to introduce the MenB vaccine into its routine immunisation schedule for children. The vaccine is offered alongside other routine immunisations at two and four months of age, with a booster dose at 12 to 13 months.</p>
<p>Pertussis</p>	<p>Pertussis, or whooping cough, is a highly infectious bacterial disease caused by <i>Bordetella pertussis</i>. It is spread by droplet infection, and has an incubation period of seven to ten days. The most recognisable symptom is an irritating cough that develops into coughing fits. In young infants, the characteristic 'whoop' may never develop and coughing spasms may be followed by periods of apnoea (stopping breathing for a time).</p> <p>Immunisation for pertussis was introduced in the 1950s. Since October 2005, pertussis is now part of the combined 'five-in-one' vaccine, consisting of diphtheria, tetanus, pertussis, polio and Hib. A booster dose is also given to children at around three years four months of age.</p>
<p>Pneumococcal conjugate vaccine (PCV)</p>	<p>Invasive pneumococcal disease (pneumonia, bacteraemia and meningitis), caused by infection with <i>Streptococcus pneumoniae</i> is a major cause of morbidity and mortality, especially among the very young, the elderly, those with an absent or non-functioning spleen and those with other causes of impaired immunity. Pneumococci also cause middle ear infections, exacerbations of bronchitis, and pneumonia, of which they are the most common bacterial cause. As with most infectious respiratory diseases, the numbers of cases of pneumococcal infection peak in winter. Many people (up to 50%) carry pneumococci in their nose and throat without developing serious infection. There are about 90 different types of pneumococci about a quarter of which cause serious illness.</p> <p>PCV (Pneumococcal conjugate vaccine) provides some protection against one of the commonest causes of meningitis and also against other conditions such as severe ear infections (otitis media), and pneumonia caused by pneumococcal bacteria. This vaccine does not protect against all types of pneumococcal infection and does not protect against meningitis caused by other bacteria or viruses.</p> <p>The PCV vaccine was introduced to the routine childhood vaccination schedule in September 2006.</p>

<p>Polio</p>	<p>Polio, or poliomyelitis, is an acute illness caused by infection with any of the three types of poliovirus. Poliovirus invades the gastrointestinal tract and has an affinity for nervous tissue. Infection can lead to paralysis if the virus reaches the central nervous system. Routine immunisation was introduced in 1956. Since October 2005, polio is now part of the combined 'five-in-one' vaccine, consisting of diphtheria, tetanus, pertussis, polio and Hib. A booster dose is also given to children at around three years four months of age. Teenage Td/IPV booster vaccine, the reinforcing doses of diphtheria, tetanus and polio, is given around 14 years of age.</p>
<p>Rotavirus</p>	<p>Rotavirus is a virus that infects the stomach, causing severe diarrhoea, vomiting, stomach cramps and fever. The combination of the symptoms of vomiting, diarrhoea and fever can lead to dehydration, requiring admission to hospital especially in young infants. Rotavirus is highly contagious and transmission by the faecal-oral route is most frequent, although respiratory transmission may also occur. Rotavirus vaccine was introduced to the UK childhood immunisation programme from 1 July 2013. The vaccine is given orally in two separate doses, at two and three months of age.</p>
<p>Tetanus</p>	<p>A toxin released from a bacterium called <i>Clostridium tetani</i> causes tetanus. Spores from these bacteria are present in soil and manure. The spores can be picked up quite easily through minor scratches, puncture wounds, burns or more serious injury.</p> <p>An effective vaccine against the disease was introduced, nationally in 1961 and a fall in the incidence of tetanus followed. Since October 2005, tetanus is now part of the combined 'five-in-one' vaccine, consisting of diphtheria, tetanus, pertussis, polio and Hib. A booster dose is also given to children at around three years four months of age. Teenage Td/IPV booster vaccine, the reinforcing doses of diphtheria, tetanus and polio, is given around 14 years of age.</p>
<p>SIRS</p>	<p>Scottish Immunisation and Recall System</p>

List of Tables

Table No.	Name	Time period	File & size
1	Uptake rates by NHS Board and calendar year	Year ending 31/12/16	Excel [<100kb]
2	Uptake rates by local authority and calendar year	Year ending 31/12/16	Excel [<100kb]
3	Uptake rates by NHS Board and quarter	Quarter ending 31/12/16	Excel [<100kb]
4	Uptake rates by local authority and quarter	Quarter ending 31/12/16	Excel [<100kb]
5	Uptake by deprivation (SIMD 2016) by NHS Board and calendar year	Year ending 31/12/16	Excel [169kb]
6	Variation in immunisation uptake rates as children age by deprivation (SIMD 2016) at Scotland level	Year ending 31/12/16	Excel [<100kb]
7	Trends in immunisation uptake by quarter, calendar and financial year - Scotland For trend data for individual NHS Boards see table below.	From 1995 to quarter and year ending 31/12/16	Excel [214kb]

Table No.	Name	Time period	File & size
7a	NHS Ayrshire & Arran	1995 to 2016	Excel [<100kb]
7b	NHS Borders	1995 to 2016	Excel [<100kb]
7c	NHS Dumfries & Galloway	1995 to 2016	Excel [<100kb]
7d	NHS Fife	1995 to 2016	Excel [<100kb]
7e	NHS Forth Valley	1995 to 2016	Excel [<100kb]
7f	NHS Grampian	1995 to 2016	Excel [<100kb]
7g	NHS Greater Glasgow & Clyde	1995 to 2016	Excel [<100kb]
7h	NHS Highland	1995 to 2016	Excel [<100kb]
7i	NHS Lanarkshire	1995 to 2016	Excel [<100kb]
7j	NHS Lothian	1995 to 2016	Excel [<100kb]
7k	NHS Orkney	1995 to 2016	Excel [<100kb]
7l	NHS Shetland	1995 to 2016	Excel [<100kb]
7m	NHS Tayside	1995 to 2016	Excel [<100kb]
7n	NHS Western Isles	1995 to 2016	Excel [<100kb]

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Further Information

Further information can be found on the [ISD website](#)

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Appendices

A1 – Background Information

Data Sources

The data for this publication is derived from the Scottish Immunisation and Recall System (SIRS). This is an electronic system used by all NHS Boards in Scotland. The system facilitates the invitation of children when a scheduled immunisation is due and allows recording of immunisation data. After an immunisation contact has taken place, the immunisation details are keyed into the system by administrative staff in NHS Boards. A primary aim of SIRS is to ensure that children in Scotland under the age of six years receive the appropriate immunisations according to the UK childhood immunisation schedule. SIRS began in 1987 and has been used by all NHS Boards since 2002 when it incorporated the Grampian Immunisation and Recall System (GIRS). ISD receive quarterly data extracts from SIRS for the purpose of producing and publishing immunisation uptake rates.

Methods

The uptake rates are based on all children reaching a specified age who were alive and registered on SIRS at the end of the reporting period. Direct comparison between an annual rate and rates for the corresponding quarters within the year is not possible due to movements of children in and out of NHS Board areas, and any deaths that may have occurred during the year. In addition, annual rates may include vaccinations given that were recorded on the system after the time when each of the quarterly rates were calculated and reported.

Recent consultations

From June 2015 ISD streamlined this publication so that uptake rates for each vaccine are only reported at the most relevant age stages. This change was implemented following a [user consultation](#). ISD received four responses to this consultation, all in support of the changes.

Changes in the UK Immunisation Schedule

A summary of recent changes for children under six years of age is shown below:

September 2016

Since June 2013 children were given a dose of the MenC vaccine at three months and a booster dose at 12 to 13 months (given as the combined Hib/MenC vaccine). From September 2016, the dose at three months was removed.

September 2015

The MenB vaccine was introduced to the routine schedule at two months and four months with a booster dose at 12 to 13 months.

Autumn 2013

From 1 October 2013 the phased introduction of the childhood flu programme began in Scotland and the rest of the UK.

July 2013

Rotavirus vaccine introduced to the routine schedule at two and three months of age.

June 2013

Since September 2006, children were given a dose of MenC at three and four months and a booster dose at 12 to 13 months (given as the combined Hib/MenC vaccine). From June 2013 the dose at four months was removed from the schedule.

January 2011

Previously the Hib/MenC booster vaccine was given at 12 months of age, and the PCV booster and first dose of MMR at 13 months of age. These immunisations should now be given at the same appointment between 12 and 13 months of age.

September 2006

- Introduction of Pneumococcal Conjugate Vaccine (PCV) to the routine schedule (at two, four and 13 months of age).
- Children were previously given a dose of MenC and Hib at two, three and four months. In September 2006 the number of MenC doses given under 12 months was reduced, such that doses were given at age three and four months. A booster dose of Hib and MenC vaccine (given as the combined Hib/MenC vaccine) at 12 months of age was added, introducing a new vaccination appointment to the schedule.

Autumn 1999

MenC vaccine was added to the schedule of primary immunisations offered in three doses to babies at ages two, three and four months.

Other initiatives

In November 2007 in Scotland, the age at which the pre-school immunisation (the booster dose of diphtheria, tetanus, pertussis and polio) is offered was reduced - in areas where this was not already the case - to three years following completion of primary immunisation, i.e. normally between three years four months and three years six months of age. Some NHS Boards previously offered these vaccines at a slightly later age. This initiative standardised the timing across Scotland.

Catch-up Programmes

The previously published information on immunisation [catch-up programmes](#) since 2000 can be found on our website.

A2 – Publication Metadata (including revisions details)

Metadata Indicator	Description
Publication title	Childhood Immunisation Statistics Scotland
Description	Uptake rates of routine childhood immunisations, by 12 months, 24 months, five years and six years. The data are presented by NHS Board and local authority.
Theme	Health and Social Care
Topic	Child health
Format	Excel workbooks, PDF
Data source(s)	Scottish Immunisation and Recall System (SIRS)
Date that data are acquired	13 February 2017
Release date	28 March 2017
Frequency	Quarterly. ISD produce an annual report each March (calendar year figures) and tables presenting uptake rates are published quarterly.
Timeframe of data and timeliness	Data up to 31 December 2016. Data for the year and quarter ending 31 December 2016 were extracted from SIRS in mid-February 2017 and published by ISD in March 2017.
Continuity of data	Data back to 1995
Revisions statement	These data are not subject to planned revisions. The rates reported reflect immunisation uptake at particular points in time, based on the data recorded. Information for previous years and quarters remain unchanged in subsequent publications.
Revisions relevant to this publication	No revisions were applied to this release.
Concepts and definitions	Further information about the current immunisation programmes in Scotland, the vaccines available, and the diseases they protect against, can be found via the Immunisation Scotland website.
Relevance and key uses of the statistics	See Statistics in Use
Accuracy	As the data are recorded on SIRS for the primary purpose of facilitating the invitation of children for immunisation, a high degree of accuracy of data recording by NHS Boards is required. Quality checks are conducted at data entry by NHS Boards. In addition, NHS Board Immunisation Co-ordinators have the opportunity to review figures for their area prior to publication, so that any issues affecting the reported rates

	<p>can be highlighted to users as appropriate.</p> <p>Figures are compared to previous years' figures and expected trends by ISD.</p>
Completeness	The data covers the entire child population in Scotland up to six years of age i.e. it is not a sample.
Comparability	Data are comparable with data for the rest of the UK. UK vaccine uptake rates are published by country by Public Health England each quarter.
Accessibility	It is the policy of ISD Scotland to make its web sites and products accessible according to published guidelines .
Coherence and clarity	Data are available as a PDF and tables on the Childhood Immunisation area of the ISD website.
Value type and unit of measurement	Numbers and percentages (uptake rates). See Definitions .
Disclosure	The ISD protocol on Statistical Disclosure Protocol is followed.
Official Statistics designation	National Statistics
UK Statistics Authority Assessment	Assessment by UK Statistics Authority for National Statistics designation completed.
Last published	13 December 2016
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Help email	nss.isdchildhealth@nhs.net
Date form completed	8 March 2017

A3 – Early Access details (including Pre-Release Access)

Pre-Release Access

Under terms of the "Pre-Release Access to Official Statistics (Scotland) Order 2008", ISD are obliged to publish information on those receiving Pre-Release Access ("Pre-Release Access" refers to statistics in their final form prior to publication). The standard maximum Pre-Release Access is five working days. Shown below are details of those receiving standard Pre-Release Access.

Standard Pre-Release Access:

- Scottish Government Health Department
- NHS Board Chief Executives
- NHS Board Communication leads

Early Access for Management Information

These statistics will also have been made available to those who needed access to 'management information', i.e. as part of the delivery of health and care:

- NHS Board Immunisation Co-ordinators
- Health Protection Scotland

A4 – ISD and Official Statistics

About ISD

Scotland has some of the best health service data in the world combining high quality, consistency, national coverage and the ability to link data to allow patient based analysis and follow up.

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Information Services Division (ISD) is the principal and authoritative source of statistics on health and care services in Scotland. ISD is designated by legislation as a producer of 'Official Statistics'. Our official statistics publications are produced to a high professional standard and comply with the Code of Practice for Official Statistics. The Code of Practice is produced and monitored by the UK Statistics Authority which is independent of Government. Under the Code of Practice, the format, content and timing of statistics publications are the responsibility of professional staff working within ISD.

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- Official Statistics (ie still to be assessed by the UK Statistics Authority)
- other (not Official Statistics)

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- meet identified user needs;
- are well explained and readily accessible;
- are produced according to sound methods, and
- are managed impartially and objectively in the public interest.

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