



Northern Ireland
Audit Office

Pre-School Vaccinations in Northern Ireland

**Report by the Comptroller
and Auditor General**

Published
05 April 2023



This report has been prepared under Article 8 of the Audit (Northern Ireland) Order 1987 for presentation to the Northern Ireland Assembly in accordance with Article 11 of the Order.

The Comptroller and Auditor General is the head of the Northern Ireland Audit Office. She, and the Northern Ireland Audit Office are totally independent of Government. She certifies the accounts of all Government Departments and a wide range of other public sector bodies; and she has statutory authority to report to the Assembly on the economy, efficiency and effectiveness with which departments and other bodies have used their resources.

Dorinnia Carville

Comptroller and Auditor General

Northern Ireland Audit Office

05 May 2023

**For further information about the
Northern Ireland Audit Office:**

Northern Ireland Audit Office
106 University Street
Belfast BT7 1EU

email: info@niauditoffice.gov.uk
website: www.niauditoffice.gov.uk

© Northern Ireland
Audit Office 2023

Contents

	List of Abbreviations	7
	Key Facts	8
	Executive Summary	9
	Background	10
	Findings	10
	For 13 of the 14 diseases which Northern Ireland’s pre-school children are immunised against, vaccination rates have been steadily declining	10
	In recent years, many pre-school vaccination rates have fallen below the WHO target rate of 95 per cent	10
	Levels of pre-school vaccination coverage within the Belfast HSCT area have been decreasing at a significant rate, over a number of years	11
	Rates of immunisation have been adversely affected by workforce shortages and delivery capacity within GP practices	11
	Conclusions	12
	Recommendations	13
Part One	Introduction and Background	15
	Introduction	16
	Why is vaccination important?	16
	What is the rationale for routine childhood immunisations in the UK?	16
	Why was this study undertaken?	17
	Background	17
	The Department of Health has responsibility for immunisation policy and strategy in Northern Ireland	17
	Scope of the Study	17
	Audit Methodology	17
Part Two	Rates of Vaccination among Pre-School Children in Northern Ireland	19
	Introduction	20
	Rates of all Pre-School Immunisations (other than Seasonal Flu) have been steadily declining	21
	(1) ‘5-in-1’ and ‘6-in-1’ Vaccination (with a ‘4-in-1’ booster)	21
	(2) Vaccination against Pneumococcal Disease	23
	(3) Rotavirus Vaccination	25

	(4) Vaccination against Invasive Meningococcal Disease	27
	(i) Meningococcal group B disease (Men B) vaccination	27
	(ii) Meningococcal group C disease (Men C) vaccination	29
	(5) Vaccination against Measles, Mumps and Rubella (MMR)	30
	(6) Annual Vaccination against Seasonal Influenza	32
Part Three	Maintaining and Improving Vaccination Coverage within the Pre-School Population	35
	Introduction	36
	The Department of Health has overall responsibility for the supply of vaccines	36
	Many areas of the health service are struggling with workforce pressures	36
	Concerns around the capacity of GPs to deliver vaccines led to a review of the delivery model	37
	A number of GPs are not meeting targets for the vaccination of pre-school children	38
	The data held on vaccination may be incomplete	40
	The Public Health Agency has plans to carry out targeted interventions for some vaccines	40
	The World Health Organisation (WHO) has identified vaccine hesitancy as a global health risk	40
	Conclusions and Recommendations	41
	Recommendation 1	
	Recommendation 2	
	Recommendation 3	
	NIAO Reports 2022 and 2023	43

List of Abbreviations

CHIS	Child Health Information System
COVER	Cover of Vaccination Evaluated Rapidly (programme)
COVID-19	Coronavirus Disease 2019
DHSC	Department of Health and Social Care
DoH	Department of Health
GMS	General Medical Services (contract)
GP	General Practitioner
Hib	Haemophilus influenzae type B
HSCT	Health and Social Care Trust
IMD	Invasive Meningococcal Disease
JCVI	Joint Committee on Vaccination and Immunisation
Men B	Meningococcal B disease
Men C	Meningococcal C disease
MMR	Measles, Mumps and Rubella
NAO	National Audit Office
NHS	National Health Service
NI	Northern Ireland
NIAO	Northern Ireland Audit Office
NISRA	Northern Ireland Statistics and Research Agency
PCV	Pneumococcal Conjugate Vaccine
PHA	Public Health Agency
PHE	Public Health England (to 30 September 2021)
RSPH	Royal Society for Public Health
SARS-COV-2	Severe Acute Respiratory Syndrome Coronavirus 2
UK	United Kingdom
UKHSA	United Kingdom Health Security Agency (from 1 October 2021)
VMS	Vaccine Management System
WHO	World Health Organisation

Key Facts

95%

The World Health Organisation (WHO) recommended target for vaccination to ensure population immunity

14

The number of infectious diseases which pre-school children are vaccinated against

13

The number of pre-school vaccinations where rates of coverage have been falling

1 in 7

Children within the Belfast HSCT area who have not completed the full course of '6-in-1' vaccinations, over the last 7 years

10,200

The number of pre-school children who have not received all recommended doses of the Pneumococcal Conjugate Vaccine (PCV), since 2015

1 in 3

Children in the Belfast HSCT area who have missed doses of the PCV vaccine required for full protection, since 2015

15,000

The number of children who have not been fully immunised against Measles, Mumps and Rubella (MMR), over the last 7 years

45%

Pre-school children not vaccinated against seasonal flu during the 2020-21 season

Executive Summary

Background

1. Vaccination against infectious disease is one of the most successful and cost-effective ways to help manage the health of a population. However, its effectiveness relies heavily on consistently high levels of participation.
2. To maximise protection, many vaccine-preventable diseases require a series of immunisations to be administered at pre-determined intervals to infants and small children. This means that an incomplete course of vaccination for any given disease can not only leave an individual less well-protected, but may also decrease the benefit for the overall population, as reduced cumulative immunity promotes the chains of transmission.
3. Our study considered the outcomes of vaccination against 14 diseases¹ for pre-school children² across the United Kingdom (UK), by comparing the results in Northern Ireland over the last decade against those in England, Scotland, Wales and the UK a whole. We also examined the vaccination rates by Health and Social Care Trust (HSCT) areas³ in Northern Ireland.

Findings

For 13 of the 14 diseases which Northern Ireland's pre-school children are immunised against, vaccination rates have been steadily declining

4. There has been a downward trend in rates of vaccination coverage. In relation to the '6-in-1' vaccine, where initial protection against these diseases is attained at 12 months of age, uptake decreased from 97.6 per cent in 2012-13 to 93.5 per cent in 2021-22. By five years of age, vaccination coverage for full protection had also reduced (93.4 per cent in 2013-14 to 89.7 per cent in 2021-22).
5. Rates of immunisation against Measles, Mumps and Rubella (MMR) are measured at two years of age and again at five years old. Since 2012-13, partial immunisation with a single dose of vaccine has exceeded 95 per cent of pre-school children at five years of age. However, full (two-dose) protection has been achieved by less than 93 per cent of five year-olds since 2016-17.
6. The seasonal flu vaccine has been administered to children between two and four years of age since 2013-14. For the 2019-20 season, a vaccination target of 60 per cent was set by the Department of Health (DoH) for this group. However, the coverage achieved was 48.5 per cent. Even with an improved uptake for the 2020-21 flu season (to 55.2 per cent), against a DoH ('highly aspirational') target set at 95 per cent, rates of coverage continue to be well below target.

In recent years, many pre-school vaccination rates have fallen below the WHO target rate of 95 per cent

7. In 2018-19, the rates of '6-in-1', Pneumococcal Conjugate Vaccine (PCV) and Meningococcal group B (Men B) vaccinations among Northern Ireland's pre-school children, measured at 12

1 The 14 diseases vaccinated against are organised into six vaccine groups. These are: (i) '5-in-1'/currently '6-in-1' vaccination [6 diseases]; (ii) the pneumococcal conjugate vaccine (PCV) [1]; (iii) vaccination against Rotavirus [1]; (iv) Meningococcal group B and group C diseases [2]; (v) Measles, Mumps and Rubella (MMR) [3]; and (vi) seasonal influenza [1].

2 The age range of pre-school children is defined as the years from birth to four years old.

3 Northern Ireland's five Health and Social Care Trust (HSCT) areas are: Belfast; Northern; South Eastern; Southern; and Western.

months of age, fell below the World Health Organisation's (WHO) 95 per cent target⁴ for the first time. A similar outcome was recorded for the single Meningococcal group C (Men C) vaccine in 2017-18, and has been the case with Rotavirus vaccination since 2015-16.

8. For MMR immunisations, the coverage achieved within Northern Ireland for a single dose of the vaccine, measured at two years of age, fell below 95 per cent for the first time in 2016-17. This has continued to decrease. The reductions are largely attributable to outcomes recorded in the Belfast HSCT area, as the remaining HSCT areas maintained levels close to, or in excess of, 95 per cent until 2018-19 (by which time the rate of coverage in Belfast was 87.4 per cent).

Levels of pre-school vaccination coverage within the Belfast HSCT area have been decreasing at a significant rate, over a number of years

9. As with overall rates of vaccine coverage, GP practices in the Belfast HSCT area have been performing least well across all pre-school vaccinations, and the rates of coverage achieved have decreased significantly over time. For example, for '6-in-1' vaccination coverage measured at 12 months of age among children in the Belfast HSCT area, there was a 6.4 per cent percentage reduction, on average, in the numbers who received all the recommended vaccinations over a five-year period (from 93.4 per cent in 2017-18 to 87.4 per cent in 2021-22).
10. Given the time-limited vaccination opportunities associated with the rotavirus vaccine and decreased rates of coverage across Northern Ireland since 2016-17, a reduction of almost seven per cent within the Belfast HSCT area over the six-year period to 2021-22 is a particular concern.
11. Despite recording the lowest overall rates of vaccination coverage across the five HSCT areas, the Belfast area accounts for less than 19 per cent⁵ of Northern Ireland's pre-school population, in comparison to the Northern and Southern HSCT areas, which each have larger proportions of pre-school children (24 and 23 per cent respectively) and significantly higher rates of coverage. Taking the single Men C vaccine as an example, the rate of coverage achieved in 2021-22 ranged from 94.5 per cent in the Northern area to 84.7 per cent for Belfast.

Rates of immunisation have been adversely affected by workforce shortages and delivery capacity within GP practices

12. While shortages would present problems, we found no specific issues around the supply and delivery of childhood vaccinations to Northern Ireland's GP practices. However, our study did identify a number of difficulties with workforce availability and the capacity to administer vaccines within practices; failure by some practices to meet vaccine uptake targets set by the DoH; and incomplete records where vaccines had been administered.

4 The World Health Organisation (WHO) works worldwide to promote health, which includes the elimination and eradication of high-impact communicable diseases. It currently recommends that, at the national (UK) level, at least 95 per cent of children are immunised against a number of vaccine-preventable diseases, including diphtheria and polio.

5 Vaccination Coverage Statistics for Children in Northern Ireland, PHA, 2021-22 and 'Healthy Child, Healthy Future', Health Review Statistics for Northern Ireland 2018-19, Information Analysis Directorate, DoH and NISRA.

- 13.** GP practices have responsibility for all routine vaccines administered to children. Over time, and with the expansion of vaccination programmes, local workforce arrangements and funding for vaccination had become increasingly complicated (with some health visitors being redirected from their primary duties to administer vaccines); was inequitable (with no additional funding to trusts for their practice-based staff) and required streamlining. The findings of a Working Group Review, accepted by the DoH in April 2019, centred around new funding arrangements linked to appropriate nursing staff support. The phased introduction of these is reliant on the implementation of an overarching policy framework and available funding and the Department has reported some progress in these areas.
- 14.** The report of the Working Group Review also noted that each HSCT in Northern Ireland was operating its own version of the long-standing Child Health Information System (CHIS); not all GP practices were utilising the CHIS efficiently; and there were issues with the completeness and accuracy of vaccination records. This is exemplified by the results of a 2018-19 catch-up exercise to improve MMR immunisation rates involving the Public Health Agency (PHA) Immunisation Team, the Health and Social Care Board (HSCB) and practices in the Belfast HSCT area, which led to the vaccination of fewer than 200 additional school-age children. For a further 300 children, no immunisation was found to be necessary once the associated vaccination records were confirmed as being incomplete (and updated as required).
- 15.** Recent PHA survey work on vaccination attitudes and influences among a “harder to reach” community group identified issues around improved communication and access. The PHA plans to undertake more targeted interventions with multi-disciplinary teams to improve vaccination uptake, where the necessary delivery arrangements can be made.

Conclusions

- 16.** The success of any large-scale vaccination programme will be dependent on addressing the issues identified during this study. These include:

 - the lack of clarity in roles and responsibilities which has arisen in relation to the administration of vaccinations provided through GP practices;
 - the fact that some GPs have not met vaccination coverage targets set by the DoH;
 - concerns raised around the completeness and accuracy of management information generated using vaccination records; and
 - the implications of vaccine hesitancy (a WHO ‘global health risk’) set against the need to maximise the effectiveness of any immunisation programme.
- 17.** Where continuity of vaccine supplies is maintained, large-scale immunisation programmes rely on: the logistics to facilitate timely immunisation being in place and operating effectively; convincing sufficient numbers of individuals to participate through the use of clear and consistent messaging; and maintaining accurate vaccination records for patient safety reasons - these form the basis of our study recommendations.

Recommendations



Recommendation 1

Primary care settings require access to an available workforce (scaled-up as necessary to meet immunisation delivery targets) with appropriate clinical training, in order to maintain standards of patient safety.



Recommendation 2

Clear, fact-based and consistently presented positive messaging is key to mitigating against genuine uncertainty around vaccination within the population and increasing rates of coverage.



Recommendation 3

Given the concerns around the completeness and accuracy of vaccination records, the Department of Health should ensure that remedial action is taken in order that existing information systems supporting vaccination are fit for purpose. Over the longer-term, maintaining the integrity of immunisation data will be necessary for its seamless inclusion within an electronic patient record system for Northern Ireland which was announced in late 2020.

“The success of any large-scale vaccination programme will be dependent on addressing the issues identified during this study”.

Northern Ireland Audit Office

Part One

Introduction and Background

Introduction

Why is vaccination important?

- 1.1 The World Health Organisation (WHO)⁶, in its Global Vaccine Action Plan 2011-2020, stated that

“there is overwhelming evidence to demonstrate the benefits of immunisation⁷ as one of the most successful and cost-effective health interventions known”.

This applies particularly to infants and young children, with vaccination programmes able to control and, in certain cases, eliminate life-threatening infectious diseases.

- 1.2 The effectiveness of any vaccination programme relies on a high proportion of those in the targeted population being vaccinated. If a sufficiently high level of coverage is achieved, it is possible for a population to attain immunity. This occurs by stopping the infectious organism responsible for a disease from being transmitted between individuals, which helps to reduce its spread⁸, including among the unvaccinated, due to the relatively small numbers of susceptible individuals left to form chains of transmission. Rates of vaccination coverage needed to achieve immunity within a population can vary by disease, for example, with measles, a 95 per cent rate is necessary to interrupt its transmission⁹.
- 1.3 The WHO currently recommends that, at the national (UK) level, at least 95 per cent of children are immunised against a number of vaccine-preventable diseases, including diphtheria and polio. Control and elimination of infectious disease is progressed by targeting eligible groups within the population, one of which is pre-school children.

What is the rationale for routine childhood immunisations in the UK?

- 1.4 Vaccinations advocated by the WHO, along with others advised by the independent Joint Committee on Vaccination and Immunisation (JCVI)¹⁰, form the basis of the routine childhood immunisation programme¹¹ which all four countries of the UK follow. Public Health England (PHE)¹² takes the lead on immunisation issues and there is an expectation that, across the UK, 95 per cent coverage should be achieved for each of the diseases vaccinated against under this programme. Although vaccination is free at the point of delivery, it is not compulsory.

6 The World Health Organisation (WHO) works worldwide to promote health, which includes the elimination and eradication of high-impact communicable diseases.

7 Immunisation – the process of becoming immune or resistant to infectious disease through the use of vaccines.

8 Immunity within a population only applies to diseases which spread through person-to-person contact. Diseases which are linked to environmental factors (such as bacteria, in the case of tetanus) are therefore excluded.

9 Durrheim, DN. Measles eradication – retreating is not an option. *Journal The Lancet Infectious Diseases*. 2020, Vol 20 Issue 6, e138 - e141.

10 The Joint Committee on Vaccination and Immunisation (JCVI) is an independent expert advisory committee which advises the UK Health Departments on immunisation.

11 As defined in ‘Immunisation against infectious disease’ (The Green Book).

12 Until 30 September 2021, Public Health England (PHE) was an executive agency of the Department of Health and Social Care in England, formed in 2013 to improve the nation’s health and wellbeing and reduce health inequalities. Since 1 October 2021, the United Kingdom Health Security Agency (UKHSA) has assumed the lead role on immunisation issues.

Why was this study undertaken?

- 1.5** Immunisation rates have been decreasing across the UK for several years, while at the same time, new sources of infection continue to emerge. Given the known susceptibility of infants and young children to infectious disease, this study provides a timely examination of the extent to which the routine vaccination levels recommended have been maintained within Northern Ireland's pre-school population, and those factors which have impacted on the outcomes reported.

Background

The Department of Health has responsibility for immunisation policy and strategy in Northern Ireland

- 1.6** The Department of Health (DoH) has lead responsibility for immunisation policy in Northern Ireland. In line with the rest of the UK, the DoH takes advice from the JCVI and, in implementing all its recommendations, offers vaccination programmes to population groupings based on age and/or risk status. As a result, pre-school children (between birth and four years of age) have access to a schedule of immunisations, with a view to maximising protection against 14 specified vaccine-preventable diseases. The Public Health Agency (PHA) within the DoH is involved in the day-to-day management of these vaccination programmes, which are delivered by General Practitioner (GP) practices.

Scope of the Study

- 1.7** Our study examines rates of vaccination coverage, over time, within the Northern Ireland pre-school population, in terms of:
- the extent to which full protection has been maintained for the vaccine-preventable diseases immunised against, including seasonal influenza (**Part Two**); and
 - factors which have affected the reported outcomes and require remedial action to protect against established and emerging infectious diseases in the future (**Part Three**).

Audit Methodology

- 1.8** This study was undertaken using the following audit methodologies:
- review of DoH and PHA documentation;
 - review and analysis of performance data published by the DoH, the PHA and the Northern Ireland Statistics and Research Agency (NISRA) and comparative data outcomes by PHE; and
 - discussions with staff in the DoH and PHA.

“there is overwhelming evidence to demonstrate the benefits of immunisation as one of the most successful and cost-effective health interventions known”.

World Health Organisation
Global Vaccine Action Plan 2011-2020

Part Two

**Rates of Vaccination
among Pre-School
Children in
Northern Ireland**

Introduction

2.1 A series of routine vaccinations is recommended for children during their pre-school years. In Northern Ireland these are administered¹³ in the primary care setting of a GP practice. **Figure 1** sets out the immunisations offered and their timings.

Figure 1. Children should receive a series of immunisations in their pre-school years

When to immunise	Diseases protected against
Two months old	Diphtheria, tetanus, pertussis, polio, Haemophilus influenzae type b (Hib) and hepatitis B (6 in 1) Rotavirus Meningococcal group B disease (MenB)
Three months old	Diphtheria, tetanus, pertussis, polio, Hib and hepatitis B (6 in 1) Pneumococcal disease Rotavirus
Four months old	Diphtheria, tetanus, pertussis, polio, Hib and hepatitis B (6 in 1) Meningococcal group B disease (MenB)
Between 12 and 13 months old - within a month of the first birthday	Measles, mumps and rubella (German measles) Pneumococcal disease Hib/Meningococcal group C disease (MenC) Meningococcal group B disease (MenB)
Every year from two years old up to Year 8 in school	Influenza (from September)
Three years four months old or soon after	Diphtheria, tetanus, pertussis and polio Measles, mumps and rubella

Source: Northern Ireland Public Health Agency

2.2 This part of our report considers: the nature of the diseases against which immunisation is recommended; the timing of individual routine vaccinations and importance of observing these; and the trends established from recorded outcomes, some of which point to future health implications within the Northern Ireland population.

¹³ The Health and Social Care Board (HSCB) commissions primary care to deliver the pre-school childhood immunisation programme under additional services of the General Medical Services (GMS) Contract. The spend in 2018-19 was £4.802m.

2.3 Data on the levels of pre-school immunisation coverage is extracted from the Child Health Information System (CHIS)¹⁴ and collated quarterly for publication. This data also contributes to national statistical reporting undertaken through the Cover of Vaccination Evaluated Rapidly (COVER¹⁵) programme. Calculations are based on the numbers of children in eligible age groups, with outcomes published for Northern Ireland as a whole and by Health and Social Care Trust (HSCT) area - Belfast; South Eastern; Northern; Southern and Western.

Rates of all Pre-School Immunisations (other than Seasonal Flu) have been steadily declining

(1) '5-in-1' and '6-in-1' Vaccination (with a '4-in-1' booster)

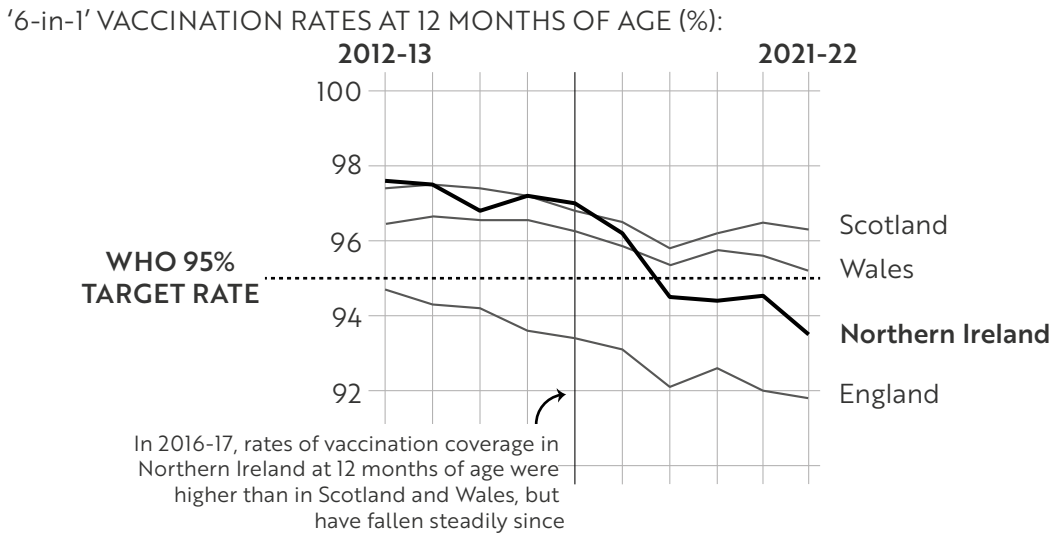
- 2.4** The '5-in-1' vaccination is offered to protect against diphtheria, tetanus, pertussis (whooping cough), polio and Haemophilus influenzae type B (Hib). Since August 2017, the vaccine has become the '6-in-1' with additional protection against hepatitis B.
- 2.5** Diphtheria, tetanus, whooping cough and Hib are infections caused by different strains of bacteria which can infect the throat/upper airways, produce a toxin which causes painful muscle contractions, result in a highly contagious respiratory tract infection and lead to bacterial pneumonia. Both polio and hepatitis B are contracted through viral infection, with polio invading the nervous system and hepatitis B causing chronic liver disease¹⁶.
- 2.6** The primary course of the '5-in-1'/'6-in-1' vaccine is three doses at two, three and four months of age, with a further dose of Hib offered as part of an immunisation against Meningococcal group C disease between 12 and 13 months. A '4-in-1' pre-school booster dose covering diphtheria, tetanus, pertussis and polio is made available at three years and four months of age.
- 2.7** Vaccination coverage outcomes for Northern Ireland children are published annually by the PHA and by Public Health England (PHE) for each country within the UK. In 2021-22, 93.5 per cent of Northern Ireland children had been vaccinated with the '6-in-1' vaccine at 12 months of age. This was the fourth consecutive year in which the rate in Northern Ireland fell below the WHO target of 95 per cent (**Figure 2**).

14 The Child Health Information System (CHIS) has been in use in Northern Ireland since 1986-87.

15 The COVER (Cover of Vaccination Evaluated Rapidly) programme is a quarterly data collection used to evaluate childhood immunisation coverage across the UK.

16 Public Health Agency explanations.

Figure 2. '6-in-1' vaccination coverage at 12 months of age has fallen below the WHO target rate in the last four years



Source: NHS Digital/Public Health England: Childhood Vaccination Coverage Statistics

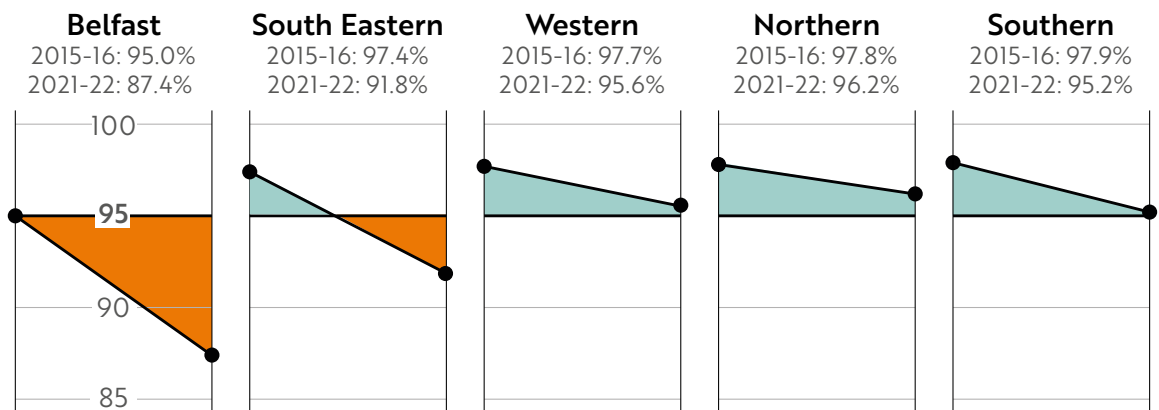
2.8

Figure 2 also illustrates that, since 2012-13, '6-in-1' immunisation levels achieved at 12 months of age across Northern Ireland have fallen steadily from 97.6 per cent to 93.5 per cent by 2021-22 (although they remain relatively close to the WHO target). Of particular concern, however, is the 6.4 per cent reduction in coverage within the Belfast HSCT area over the past five years, most of which occurred in 2017-18 and 2018-19 (see **Figure 3**).

Figure 3. Significant decreases in the '6-in-1' vaccination coverage at 12 months of age within the Belfast HSCT area have been the main driver of the decrease for Northern Ireland as a whole since 2015-16

Coverage has fallen across all HSCT areas, but is below the WHO target in Belfast.

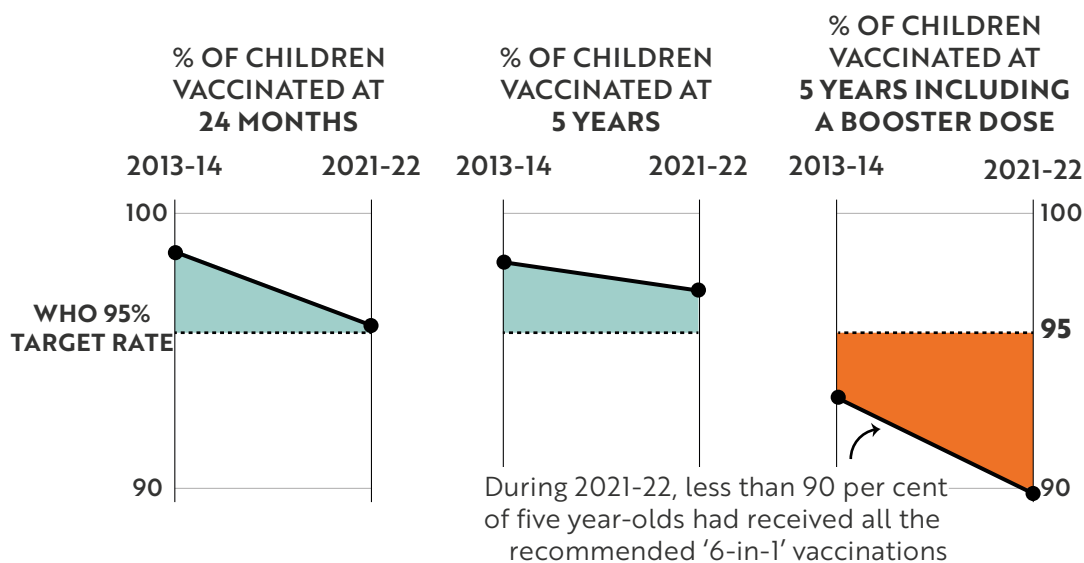
'6-in-1' VACCINATION RATES AT 12 MONTHS OF AGE (%) (2015-16 TO 2021-22):



Source: PHA Annual Immunisation Reports, from quarterly COVER Programme returns (CHIS)

2.9 In order to maximise protection, all '6-in-1' vaccination doses should be administered by the age of three years and four months. Rates of coverage are assessed continuously at 12 and 24 months and five years of age. In line with Scotland and Wales, outcomes for Northern Ireland show that the accumulated doses assessed at five years of age have exceeded the WHO target by two per cent, on average, over the last four years (see **Figure 4**). However, when these results were extended to include administration of the recommended booster dose (to provide full immunisation), the outcomes reflected reductions of between 4.2 and 7.0 per cent.

Figure 4. In 2021-22, protection in children older than 12 months of age against diseases targeted by '6-in-1' vaccinations had fallen to its lowest in nine years



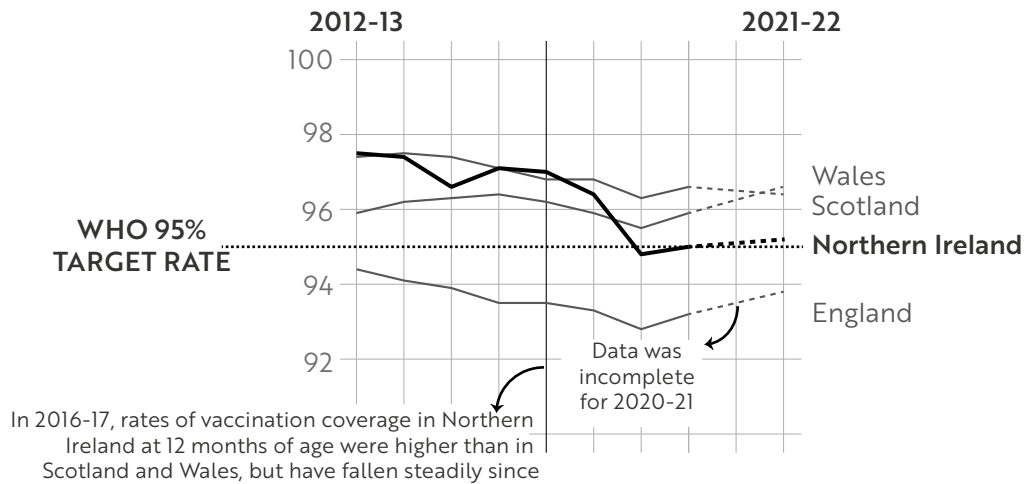
Source: NHS Digital/Public Health England: Childhood Vaccination Coverage Statistics

(2) Vaccination against Pneumococcal Disease

- 2.10** The 'Pneumococcal Conjugate Vaccine' (PCV) is offered as a protection against pneumococcal disease, which is caused by a streptococcus bacterium. This disease can range in severity from an upper respiratory tract infection to pneumonia, septicaemia and meningitis.
- 2.11** The vaccination as currently administered is one dose at three months with a booster dose due around the age of one. This changed during 2020 from the previous regime of two doses at two and four months, followed by a booster dose at 12/13 months.
- 2.12** The rates of PCV immunisation coverage at 12 months of age in Northern Ireland were generally higher than those achieved by the other UK countries during the period 2012-13 to 2016-17. As a whole, UK coverage has consistently been below the 95 per cent WHO target since 2012-13 (2021-22: 94.1 per cent) - while this occurred in Northern Ireland for the first time in 2018-19, the rate of coverage achieved in 2021-22 was 95.2 per cent. **Figure 5** illustrates the trends in PCV coverage by UK country over the last decade.

Figure 5. PCV vaccination coverage at 12 months of age has declined significantly since 2016-17, falling below the WHO target rate in Northern Ireland in 2018-19¹

PCV VACCINATION RATES AT 12 MONTHS OF AGE (%):



NOTE

¹The Figure reflects the non-availability of data related to PCV vaccination coverage at 12 months for 2020-21. This occurred as the result of a change in the timing of the vaccination schedule for this age group from January 2020 onwards, which affected the accuracy of coverage over the full year. Subsequent PCV vaccination statistics are unaffected.

Source: NHS Digital/Public Health England: Childhood Vaccination Coverage Statistics

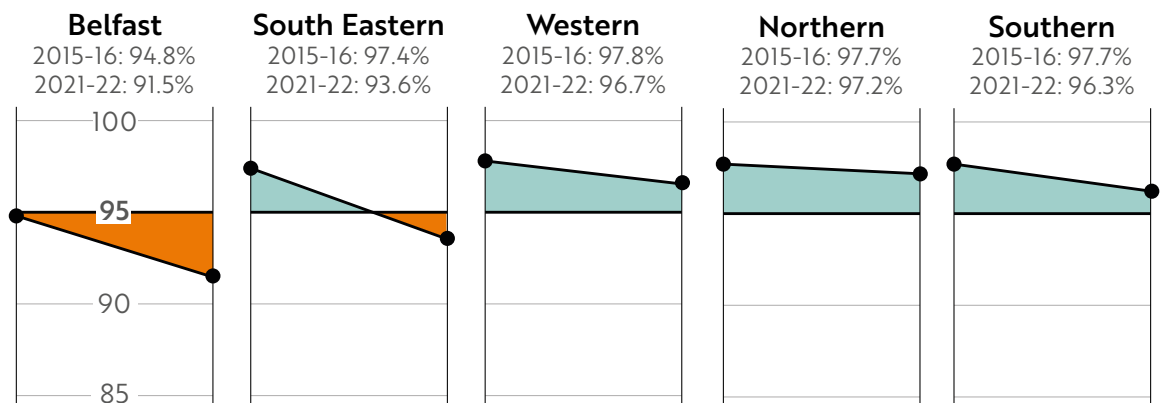
2.13

Figure 6 provides a detailed breakdown of the PCV outcomes for Northern Ireland, assessed at 12 months of age over a seven-year period to 2021-22, by HSCT area (see NOTE¹ to **Figure 5**). While this shows some general reductions in the levels of coverage achieved, four of the five HSCT areas continued to maintain outcomes in excess of 95 per cent until 2019-20. However, there was a marked reduction in the coverage achieved within the Belfast HSCT area – down to 91.5 per cent during 2021-22, which represents a 3.48 per cent reduction over seven years.

Figure 6. Since 2015-16, PCV vaccination coverage at 12 months of age has declined across all HSCT areas

Belfast is the only HSCT area where vaccination coverage has consistently remained below the WHO target rate.

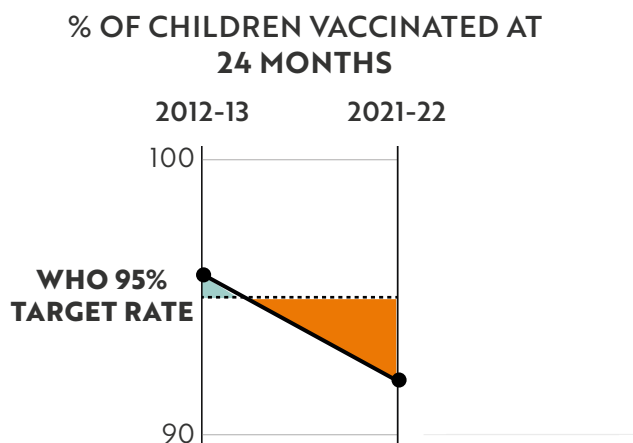
PCV VACCINATION RATES AT 12 MONTHS OF AGE (%) (2015-16 TO 2021-22):



Source: PHA Annual Immunisation Reports, from quarterly COVER Programme returns (CHIS)

- 2.14** PCV vaccination outcomes are also assessed at 24 months of age, with the results indicating the percentage of pre-school children fully immunised against the disease. **Figure 7** points to a general downward trend in rates of PCV coverage across Northern Ireland, which was most significant in the Belfast HSCT area, where an 8.4 per cent decrease in coverage was recorded between 2015-16 and 2021-22.

Figure 7. In 2021-22, 92 per cent of children at 24 months of age were fully immunised against diseases targeted by PCV vaccinations, the lowest level in nine years



Source: NHS Digital/Public Health England: Childhood Vaccination Coverage Statistics

(3) Rotavirus Vaccination

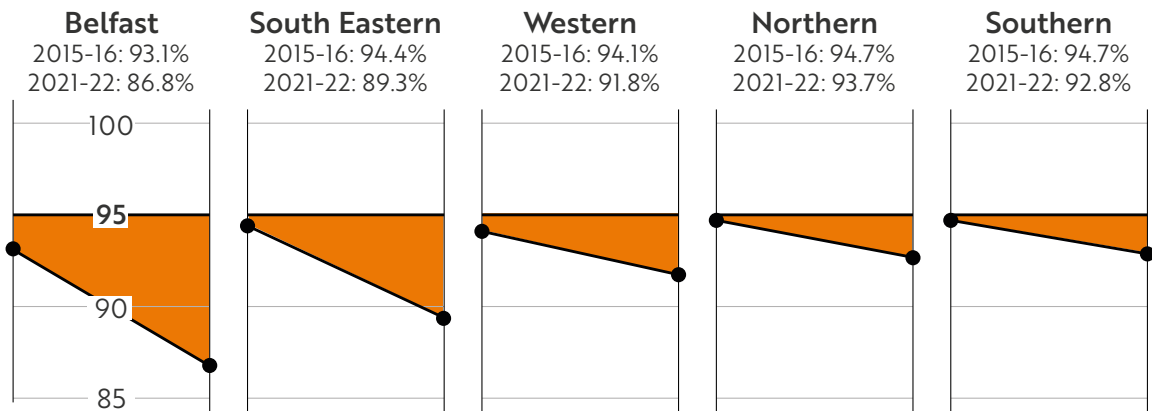
- 2.15** Rotavirus is a viral infection which can cause severe diarrhoea and vomiting, especially in babies and young children. Research published in 2007¹⁷ (prior to the introduction of a rotavirus vaccine in 2013) concluded that this infection was imposing a significant burden on the National Health Service. In children under five with acute gastroenteritis symptoms requiring medical attention, rotavirus had been the likely cause attributable to 45 per cent of hospital admissions; 25 per cent of GP consultations and 20 per cent of Emergency Department attendances. Following the vaccine's introduction, rotavirus case numbers in Northern Ireland began to decrease steadily, from a baseline rate of 500-600 cases annually, to 300 in 2013-14 and fewer than 200 by 2014-15.
- 2.16** Immunisation against rotavirus requires two doses, offered at two and three months. As this vaccine, unlike others, cannot be administered beyond the age of six months¹⁸, there is a particular need to minimise missed vaccination opportunities as far as possible. In view of this, the recorded outcomes for rotavirus vaccination coverage set out in **Figure 8** are of concern, with a general decline across all HSCT areas since 2016-17 and, significantly within the Belfast HSCT area, a 6.9 per cent decrease in coverage over the six years to 2021-22.

¹⁷ Harris JP, Jit M, Cooper D, Edmunds WJ. Evaluating rotavirus vaccination in England and Wales Part I. Estimating the burden of disease. *Journal of Vaccines*. 2007; 25:3962-70.

¹⁸ Time limits associated with rotavirus vaccination are due to vaccine licensing restrictions, the increased likelihood that, over time, infants will already have contracted rotavirus and gain no additional benefit from vaccination, and the increased risk of medical complications known to occur in older infants with this vaccine.

Figure 8. Since 2015-16, rotavirus vaccination coverage at 12 months of age has remained below the WHO target rate in four of the five HSCT areas¹

ROTAVIRUS VACCINATION RATES AT 12 MONTHS OF AGE (%) (2015-16 TO 2021-22):



NOTE

¹Within the Northern HSCT, rotavirus vaccination coverage reached or exceeded the WHO’s 95 per cent target rate in 2016-17 and 2017-18.

Source: PHA Annual Immunisation Reports, from quarterly COVER Programme returns (CHIS)

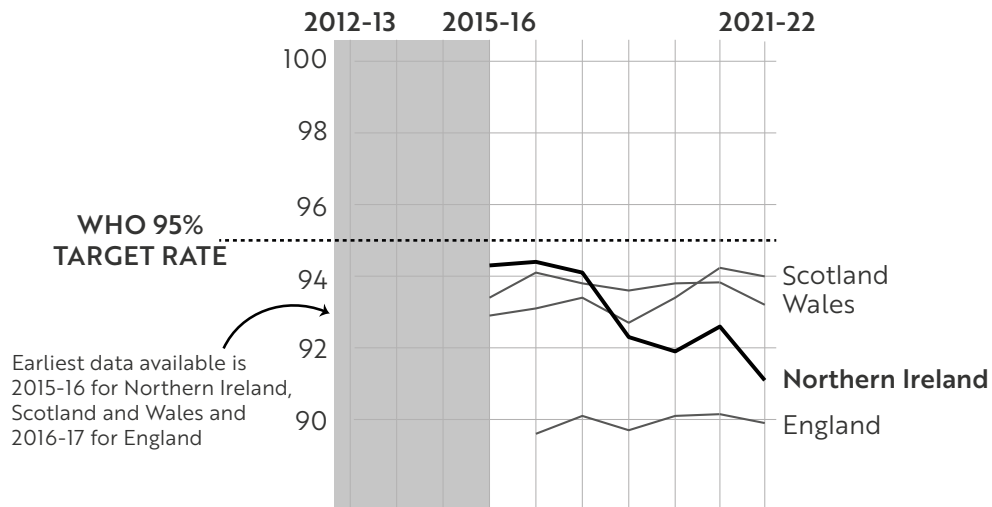
2.17

Until 2017-18, Northern Ireland as a whole remained within one per cent of the WHO’s 95 per cent target for rotavirus vaccination coverage. However in 2018-19, the Northern Ireland outcomes were exceeded by 0.4 per cent in Scotland and 1.3 per cent in Wales. By 2019-20 these had increased further to 1.5 and 1.9 per cent respectively and, by 2021-22, had reached 2.9 and 2.1 per cent respectively (see Figure 9).

Figure 9. Northern Ireland’s rotavirus vaccination coverage at 12 months of age has declined since 2017-18

Rates of vaccination coverage have seen Northern Ireland fall behind Scotland and Wales in the last four years.

ROTAVIRUS VACCINATION RATES AT 12 MONTHS OF AGE (%):



Source: NHS Digital/Public Health England: Childhood Vaccination Coverage Statistics

(4) Vaccination against Invasive Meningococcal Disease

2.18 Invasive meningococcal disease (IMD), the result of bacterial infection, can lead to blood poisoning (septicaemia), meningitis and multi-organ failure. Protection for pre-school children is specifically against the group B and group C strains of the bacteria, with separate 'Men B' and 'Men C' vaccines.

2.19 As a notifiable disease¹⁹ in the UK, enhanced surveillance of meningococcal disease began in 1999 to monitor the prevalence of known and suspected cases. Although the rate of IMD cases in Northern Ireland in 1999 (10.9 per 100,000 population) had decreased to 1.8 per 100,000 population by 2016, case numbers consistently showed that infants and young children were particularly susceptible to IMD.

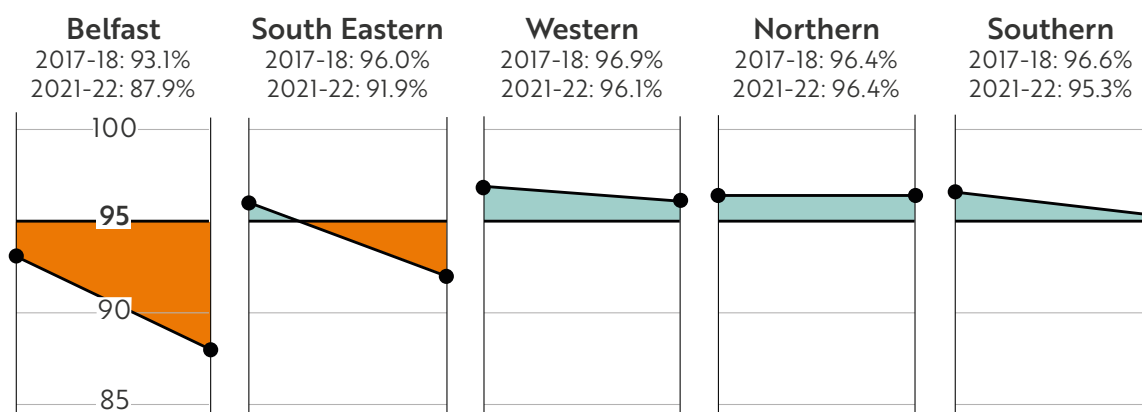
(i) Meningococcal group B disease (Men B) vaccination

2.20 The Men B vaccine is administered in two doses at two and four months of age, with a booster dose between 12 and 13 months. It was introduced to the immunisation schedule in September 2015. The first complete dataset of vaccination coverage was for 2017-18, although the PHA²⁰ reported an uptake of 96 per cent, based on available data, for the 2016-17 year. Since then, Men B vaccination coverage at 12 months of age has been maintained at or above the WHO's 95 per cent target in three of the five HSCT areas. Coverage within the Belfast HSCT area decreased by 5.6 per cent over this period to 87.9 per cent in 2021-22. Within the South Eastern Trust area, a 4.27 per cent decrease occurred, to 91.9 per cent in 2021-22 (see Figure 10).

Figure 10. Since 2017-18, Men B vaccination coverage at 12 months of age has declined in the majority of HSCT areas¹

Belfast is the only HSCT area where vaccination coverage has consistently remained below the WHO target rate.

MEN B VACCINATION RATES AT 12 MONTHS OF AGE (%) (2017-18 TO 2021-22):



NOTE

¹In contrast to other vaccinations data by HSCT area presented in this report covering 2015-16 to 2021-22, a five-year reporting period for Men B vaccination outcomes reflects its introduction in 2015.

Source: PHA Annual Immunisation Reports, from quarterly COVER Programme returns (CHIS)

19 There are 35 diseases currently classified as 'notifiable', including IMD. When a GP or other doctor in attendance suspects that a patient has contracted one of these, they are legally required to inform the Director of Public Health. Notification is primarily intended to detect possible outbreaks, initiate contact tracing and trigger rapid investigation, as necessary.

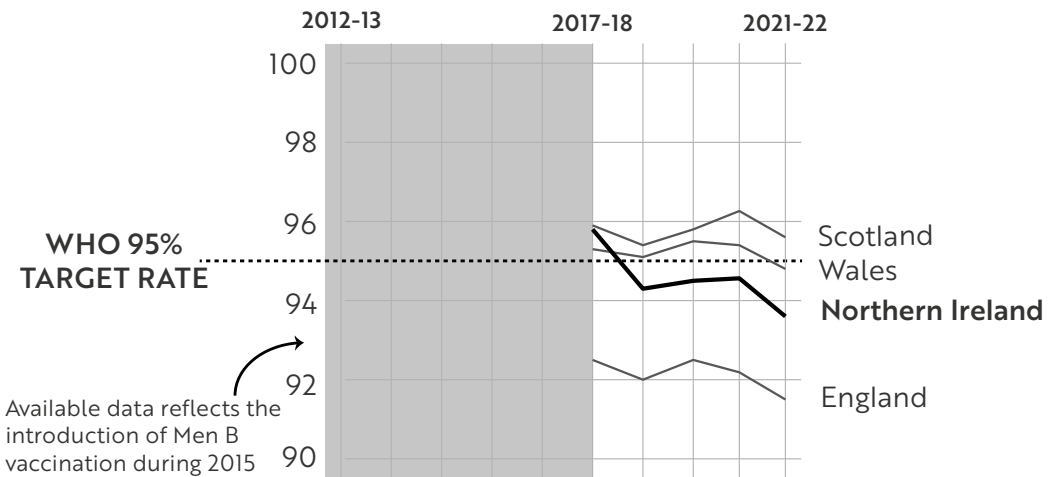
20 Annual Immunisation and Vaccine Preventable Diseases Report for Northern Ireland 2016-17, PHA.

2.21 UK-wide rates of coverage have been less than 93 per cent since the Men B vaccination was introduced, with England failing to achieve the WHO’s 95 per cent target since 2017-18 and Northern Ireland since 2018-19 (see Figure 11).

Figure 11. Northern Ireland’s Men B vaccination coverage at 12 months of age fell significantly in 2018-19 to below the WHO target rate

Rates of vaccination coverage have seen Northern Ireland fall behind Scotland and Wales in the last four years.

MEN B VACCINATION RATES AT 12 MONTHS OF AGE (%):

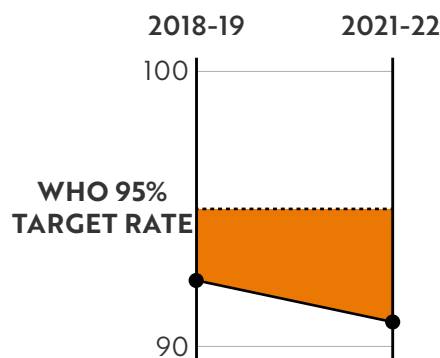


Source: NHS Digital/Public Health England: Childhood Vaccination Coverage Statistics

2.22 All vaccinations against Men B should be administered by 13 months of age, with the outcomes assessed at 24 months indicating the percentage of pre-school children who have been fully immunised. **Figure 12** illustrates the decreasing level of Northern Ireland coverage to 90.9 per cent between 2018-19 and 2021-22. At 4.1 per cent below the WHO target, this rate was close to three per cent lower than the coverage recorded in both Scotland and Wales in 2021-22 (at 93.9 and 93.8 per cent respectively).

Figure 12. In 2021-22, less than 91 per cent of children at 24 months of age were fully immunised against disease targeted by Men B vaccinations

% OF CHILDREN VACCINATED AT 24 MONTHS INCLUDING A BOOSTER DOSE



Source: NHS Digital/Public Health England: Childhood Vaccination Coverage Statistics

(ii) Meningococcal group C disease (Men C) vaccination

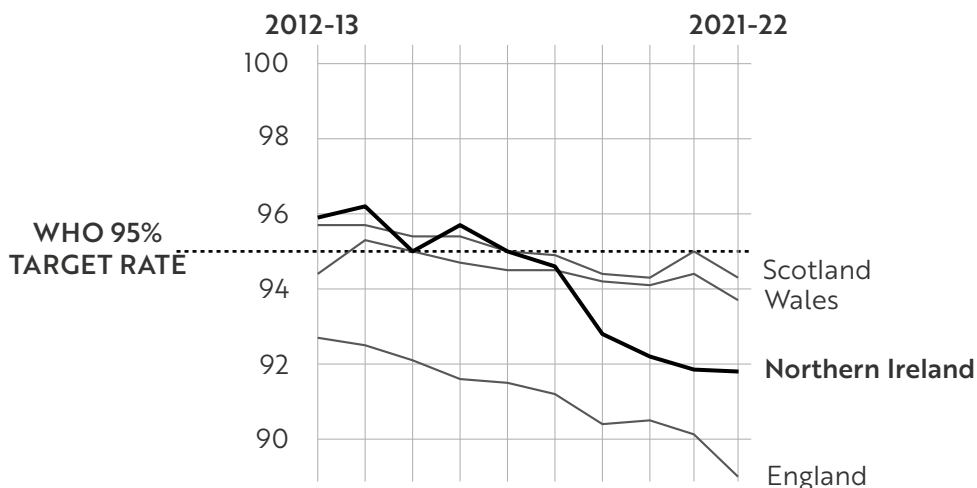
2.23

The scheduling of vaccination against Meningococcal group C disease, which was introduced in 1999, changed during 2016 and it is now offered between 12 and 13 months of age, as a single Men C vaccine (with a further scheduled dose of the Hib vaccine). As **Figure 13** shows, the level of vaccination coverage in Northern Ireland was maintained at or above 95 per cent until 2017-18 (94.6 per cent), decreasing further to 91.8 per cent in 2021-22. While reduced levels of coverage were also seen in Scotland and Wales over the same period, the rate of decrease was slower. However, a slight upturn in outcomes of 0.7 and 0.3 per cent respectively achieved in 2020-21 was reversed in 2021-22, with reductions of 0.7 per cent in both countries.

Figure 13. Northern Ireland’s Men C vaccination coverage at 24 months of age fell below the WHO target rate in 2017-18 and has continued to decrease significantly

Rates of vaccination coverage have seen Northern Ireland fall behind Scotland and Wales in the last four years.

MEN C VACCINATION RATES AT 24 MONTHS OF AGE (%):

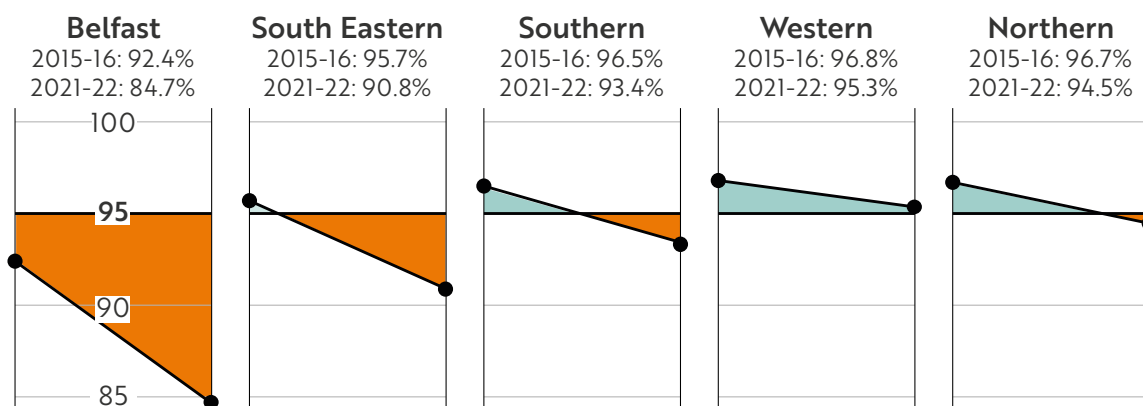


Source: NHS Digital/Public Health England: Childhood Vaccination Coverage Statistics

2.24 Within Northern Ireland, the lowest rates of Men C vaccination coverage were recorded within the Belfast HSCT area each year between 2015-16 and 2021-22, as well as the most significant decrease of 8.3 per cent (compared to 1.5-5.1 per cent in the other HSCT areas), as **Figure 14** shows.

Figure 14. Men C vaccination coverage at 24 months of age has fallen below the WHO target rate in four of the five HSCT areas since 2018-19

MEN C VACCINATION RATES AT 24 MONTHS OF AGE (%) (2015-16 TO 2021-22):



Source: PHA Annual Immunisation Reports, from quarterly COVER Programme returns (CHIS)

(5) Vaccination against Measles, Mumps and Rubella (MMR)

2.25 Measles, Mumps and Rubella (German measles), collectively known as 'MMR', can be serious viral infections, with complications including meningitis and hearing loss. Young children are also considered to be an 'at risk' group within the population. A combined MMR vaccine introduced in 1988 offers protection against all three diseases in two doses – an initial dose at 12/13 months and a second dose at three years and four months of age (a 'pre-school' booster). As the timing of MMR immunisations coincides with others, a single primary care appointment can provide protection against several diseases. Where MMR vaccinations have been missed, it is also possible to catch up on these at a later date.

2.26 Given the timing of the MMR doses, vaccination coverage achieved is assessed at two and five years of age. Three measures record the administration of:

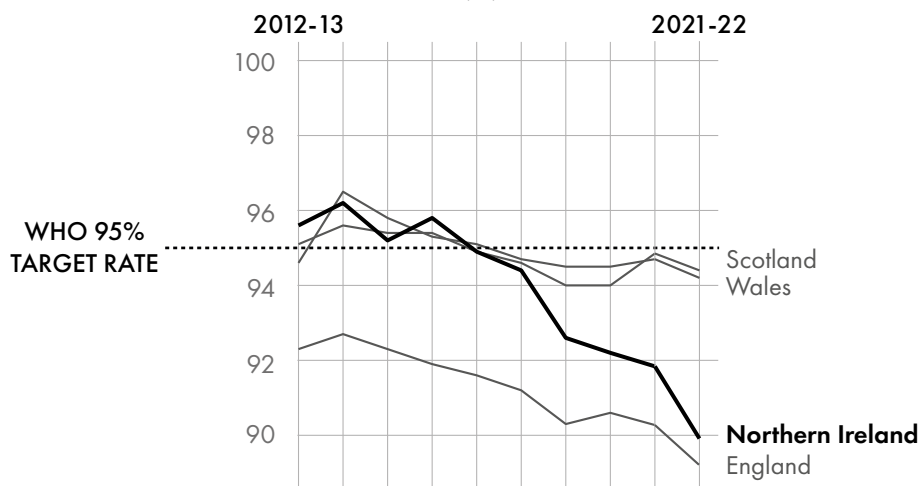
- (i) a single MMR dose at two years (the initial dose);
- (ii) a single MMR dose at five years (one of the two recommended doses); and
- (iii) two MMR doses at five years (both doses, as recommended).

2.27 Between 2012-13 and 2015-16, the rate of coverage achieved in Northern Ireland for the initial MMR dose (the 'single MMR dose at two years' measure) consistently exceeded 95 per cent. However, since 2016-17, the rate of coverage under this measure has steadily decreased (see Figure 15).

Figure 15. MMR vaccination coverage at two years of age has fallen below the WHO target rate since 2016-17

Rates of vaccination coverage have seen Northern Ireland fall behind Scotland and Wales in the last five years.

MMR VACCINATION RATES AT 2 YEARS OF AGE (%):

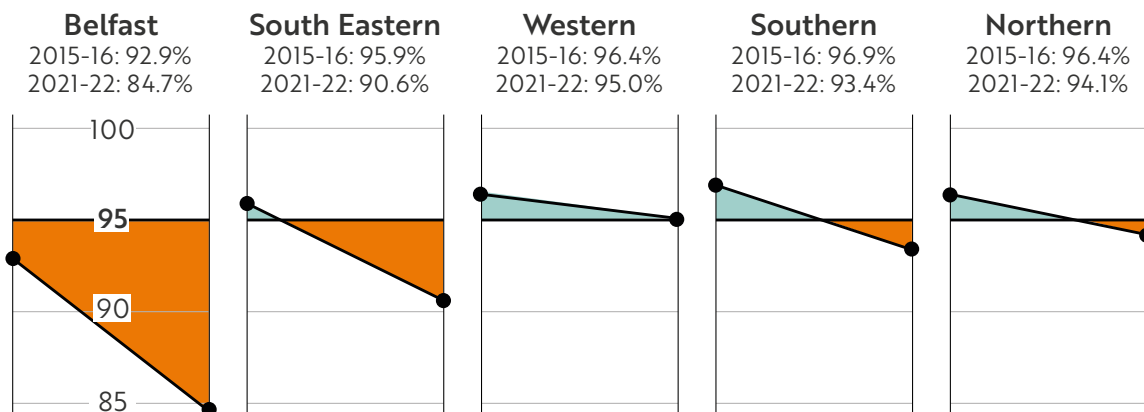


Source: NHS Digital/Public Health England: Childhood Vaccination Coverage Statistics

2.28 A breakdown of data across Northern Ireland since 2015-16 for 'single MMR dose at two years' outcomes shows that rates achieved in four of the five HSCT areas were close to, or exceeded, 95 per cent over a three-year period. However, coverage in the Belfast HSCT area was less than 93 per cent in 2015-16 and by 2021-22 had declined by 8.8 per cent (Figure 16).

Figure 16. MMR vaccination coverage at two years of age has fallen below the WHO target rate in the majority of HSCT areas since 2018-19

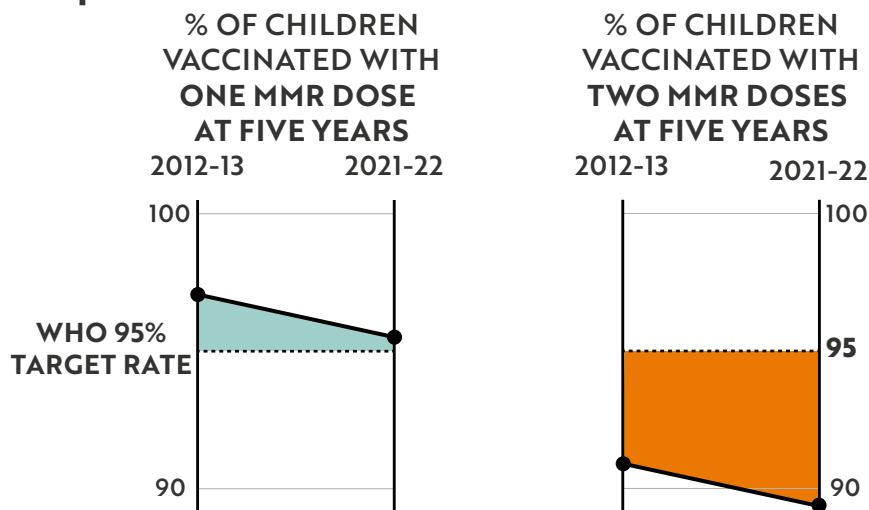
MMR VACCINATION RATES AT 2 YEARS OF AGE (%) (2015-16 TO 2021-22):



Source: PHA Annual Immunisation Reports, from quarterly COVER Programme returns (CHIS)

2.29 Considering the uptake of a 'single MMR dose at five years', **Figure 17** shows that rates of between 95.4 and 97.5 per cent have been achieved in Northern Ireland since 2012-13. However, efforts need to remain focused on increasing the coverage of 'two MMR doses at five years' to provide full protection against MMR, as a peak of 93.1 per cent reached in 2014-15 has been steadily declining since then.

Figure 17. For nine of the last 10 years, MMR vaccination coverage has reached or exceeded 96 per cent for a single dose at five years of age, but in 2021-22, coverage for fully immunised five year-olds was less than 90 per cent



Source: NHS Digital/Public Health England: Childhood Vaccination Coverage Statistics

2.30 One of the implications of declining rates of vaccination coverage can be higher numbers of infections over time, due to reduced protection against the diseases which are the source of these infections within the population. This has been seen with measles where, following a 12-month period with no endemic cases recorded in the UK, the WHO declared its 'elimination status' in 2016. However, after a resurgence in cases, this status was removed in 2019. As part of the UK's Member State commitments to the WHO, the PHA indicated its intention to publish a 'Northern Ireland Measles and Rubella Elimination Action Plan' during 2019-20²¹ - however, this has not yet happened.

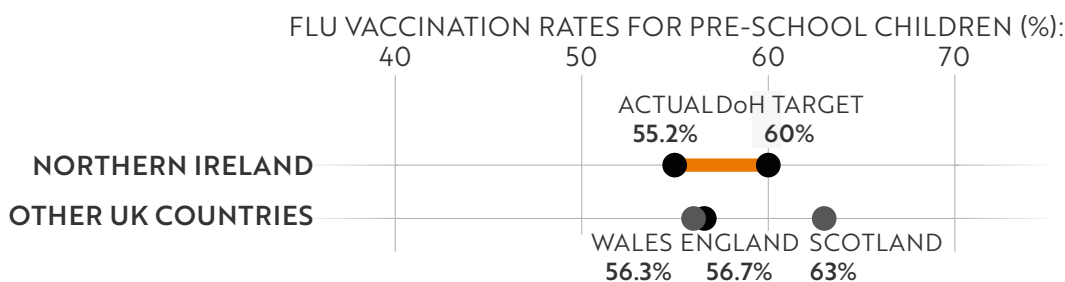
(6) Annual Vaccination against Seasonal Influenza

2.31 Influenza ('flu') is an acute viral infection of the respiratory tract, which occurs most often in the winter months, usually peaking between December and March. Flu virus types A, B and C have been identified, with 'Influenza A' usually resulting in a more severe illness - complications can include bronchitis and secondary bacterial pneumonia. Given that the flu virus is unstable and new strains and variants are constantly emerging, this is one reason for offering a seasonal flu vaccination annually. The effectiveness of flu vaccines can also vary from year to year and influenza activity in Northern Ireland is continuously monitored by the PHA.

²¹ Annual Immunisation Report for Northern Ireland 2018-19, PHA.

- 2.32** Research²² has concluded that children up to four years of age²³ are particularly susceptible to complications from flu, which can result in increased GP visits and hospitalisation. Children also play a key role in its transmission among the wider population and, since the 2013-14 flu season, pre-school children (two to four years of age) are an 'eligible group' to receive this immunisation (as a nasal spray) within a primary care (GP practice) setting.
- 2.33** Considering levels of flu vaccination coverage²⁴ among Northern Ireland pre-school children since 2016-17, a downward trend was reversed in 2019-20 and 2020-21, with increases in immunisations provided of 0.9 and 6.7 per cent respectively (to 48.5 and 55.2 per cent). In the context of a COVID-19²⁵ pandemic ongoing during 2020-21, this is to be welcomed. The department told us that, while these flu outcomes remained below the respective target rates of 60 and 95 per cent coverage set by the DoH²⁶ for this eligible group, these were highly aspirational targets in order to encourage vaccine provision by GP practices.
- 2.34** Compared to other UK countries, the rate achieved in Northern Ireland for the 2020-21 flu season was 7.8 per cent less than in Scotland, 1.5 per cent lower than in England and 1.1 per cent lower than in Wales (see **Figure 18**). We note that work is ongoing in this area via a Four Nations Programme Board to gain further insight and share best practice.

Figure 18. Flu vaccination coverage for pre-school children is lower than the target rate set by the Department of Health and consistently behind Scotland and Wales



Source: *Surveillance of Influenza and other Seasonal Respiratory Viruses in the UK Winter 2020 to 2021*, PHE

- 2.35** Similar to PHE, and beginning with the Winter 2021 to 2022 season, the United Kingdom Health Security Agency (UKHSA), with a lead role in immunisation issues, published the rates of flu vaccination coverage achieved by each UK country. While this showed a general downward trend in coverage for pre-school children in all countries in 2021-22, other direct comparisons were not possible, due to the Department of Health in Northern Ireland introducing new methods to record and extract flu vaccine data from its Vaccine Management System (VMS), for the first time.

22 Kassianos G, MacDonald P, Aloysius I et al. Implementation of the United Kingdom's childhood influenza national vaccination programme: A review of clinical impact and lessons learned over six influenza seasons [2013/14 to 2018/19]. *Journal Vaccine*. July 2020.

23 Although susceptibility to flu complications is known to be particularly high up to four years of age, children below six months are deemed unsuitable for immunisation, while only those between six months and two years of age and deemed 'high risk' (e.g. due to long-term health conditions) are eligible for a flu injection.

24 The policy for the Seasonal Flu Vaccination Programme is set by the Department of Health (DoH), in line with recommendations from the Joint Committee on Vaccination and Immunisation (JCVI), including regional targets for immunisation uptake, based on WHO recommendations.

25 Coronavirus Disease 2019 (COVID-19) is caused by the novel respiratory coronavirus, SARS-COV-2.

26 Annually, the DoH sets a target rate for flu vaccination coverage for each of the eligible groups in the Northern Ireland population. During the 2019-20; 2020-21 and 2021-22 flu seasons, the target rates for pre-school children were 60; 95 and 80 per cent respectively.

- 2.36** Research²⁷ which considered the vaccination programme for healthy children in Northern Ireland over seven flu seasons to 2016-17 found that, overall, there had been statistically significant reductions in the need for GP consultations. This suggests that flu vaccination is cost-effective and higher rates of coverage are likely to enhance value for money outcomes.

“One of the implications of declining rates of vaccination coverage can be higher numbers of infections over time, due to reduced protection against the diseases which are the source of these infections within the population”.

Northern Ireland Audit Office

27 Gallagher N, Jessop L, Sartaj M, Johnston J. Impact of live attenuated influenza vaccination programme for healthy children in Northern Ireland - A comparison of seven influenza seasons, 2010/11-2016/17. *Journal Vaccine*. 2017; 12.003.

Part Three
**Maintaining
and Improving
Vaccination
Coverage within
the Pre-School
Population**

Introduction

- 3.1** Part 2 considered vaccination for Northern Ireland’s pre-school children (birth to four years of age), both in terms of the rationale for each vaccine included in the routine immunisation schedule and the rates of coverage over time. Comparisons of the outcomes within Northern Ireland and with other parts of the UK have highlighted the breadth of variation in vaccine coverage achieved.
- 3.2** Given the importance of maintaining a sufficient level of population immunity to infectious disease, and with reducing rates of pre-school coverage for many of the vaccinations which target these diseases, this part of our report looks at:
- the current arrangements in place around vaccination supply and delivery in Northern Ireland; and
 - issues relevant to the rates of vaccination coverage in GP practices, including: workforce numbers; vaccine delivery capacity; achievement of GP targets set for vaccine uptake; completeness of system data on vaccinations administered; targeting selected vaccines; and hesitancy around vaccination by parents/carers.

The Department of Health has overall responsibility for the supply of vaccines

- 3.3** The DoH²⁸ is responsible for the procurement processes which support the delivery of both the childhood vaccination and annual seasonal influenza (flu) programmes.
- 3.4** Pharmacists and pharmacy teams in hospitals manage the distribution of childhood vaccines to GP practices. The PHA has responsibility for ensuring that sufficient and timely supplies of annual flu vaccines are made available to vaccinate GP practice patients meeting the DoH’s eligibility criteria. Northern Ireland’s pre-school children between two and four years of age are an ‘eligible group’ within the population.

Many areas of the health service are struggling with workforce pressures

- 3.5** A 2020 Northern Ireland Audit Office (NIAO) report²⁹ examined workforce planning for nurses and midwives in Northern Ireland’s healthcare system and, in particular, the DoH’s response to the need for sufficient resources of staff and finance to address the increasing demands placed upon it. The system-wide staffing and funding gaps identified in the report may also have implications for delivery of the broad remit of primary care offered in GP practices, including pre-school immunisations, particularly given the decreasing trend in overall vaccine coverage already identified in Part 2.

28 Pharmaceutical Public Health, Northern Ireland Department of Health (DoH) website.

29 ‘Workforce Planning for Nurses and Midwives’, NIAO, 31 July 2020.

Concerns around the capacity of GPs to deliver vaccines led to a review of the delivery model

- 3.6** The introduction of a vaccination programme against Meningococcal group B (Men B) disease in 2015 highlighted the significant difficulty of incorporating another vaccine into the existing arrangements for pre-school immunisations operating in GP practices. With this 'delivery model' already considered as not fit for purpose, the DoH commissioned *A Working Group Review of Pre-School Vaccination Delivery Model*, which reported its findings to the Department in December 2017. The Review's scope excluded the seasonal flu vaccination programme.
- 3.7** The Working Group, comprising key stakeholders, focused on a delivery model based on the principles of: fairness; effectiveness; patient focus; minimising harm; value for money; and flexibility. Pre-school vaccination delivery arrangements in England, Scotland and Wales were also taken into account.
- 3.8** The Review found variations in the way that immunisations were carried out in Northern Ireland. Even within individual trusts, there were differences in how GP practices were being staffed and funded. In some practices, a practice nurse directly employed by a GP administered vaccines. In others, a treatment room nurse working in a practice but employed by a trust undertook immunisations, while elsewhere, a combination of these arrangements operated in partnership within a single practice. While the variation in delivery methods did not appear to affect rates of vaccination coverage, there was no clear rationale governing the local arrangements in place, leading to perceived inequality among GP practices.
- 3.9** The Review also identified that the original funding model had changed over time as additional vaccination requirements were introduced. Under GP contract arrangements, vaccinations are an 'Additional Service' which attracts a top-up to the funding received by practices to cover the costs of medicines prescribing. However, payments for pre-school vaccines added more recently are issued as 'Item of Service' fees for each completed immunisation course, for example, where rotavirus vaccinations are successfully administered at two and three months. Further funding is also available through a 'Direct Enhanced Service' if practices achieve annual immunisation targets set by the DoH for certain vaccinations, assessed at two and five years of age (see paragraph 3.13). As a consequence, the arrangements around funding for vaccinations have become increasingly complicated.
- 3.10** In the case of more recent vaccines, trusts received no additional funding even though their staff based in GP practices were administering them. This led to some redirection of health visitors, who are employed by trusts, from their primary duties to undertake this work, in order to maintain rates of coverage. This redirection of staff was likely to have an impact on the delivery of other services. A DoH progress report on *Health and Wellbeing 2026: Delivering Together*³⁰, noted that progress on the 'Healthy Child, Healthy Future' programme was being impacted by workforce capacity issues, including health visitors administering routine vaccinations which the DoH deemed unsustainable going forward, as well as a lack of funding to maintain the nursing support required.

30 *Health and Wellbeing 2026: Delivering Together* is a 10-year approach to transforming health and social care in Northern Ireland, prepared in response to the Bengoa Report - published 16 May 2017.

- 3.11** The Working Group Review concluded that GP practices should be responsible for the future delivery of the pre-school immunisation programme, with nursing support at an appropriate level obtained and funded equitably across practices. It also took the view that health visitors should continue to encourage immunisation coverage through their direct contacts with families, but without direct involvement in vaccine administration. The preferred delivery model was for practices to receive funding to engage nursing support to undertake immunisation and other duties, which would help to address the existing issues while also fulfilling the delivery principles set down by the Working Group at the outset of the Review.
- 3.12** Following approval and acceptance of the report by the DoH, its findings were disseminated by Northern Ireland's Chief Medical Officer in April 2019. Nursing support funding would allow all GPs to employ nursing staff on either an individual or collective practice basis, or to engage nurses through HSCT contracts. These arrangements would be phased in as part of the implementation of the population-based staffing model for primary care nursing under the 'Delivering Care Policy Framework', subject to funding. Coordinating the implementation of the Review's recommendations would be the responsibility of the Director of Nursing and staff in the PHA. In recognising the need for this, the Department has told us that work is underway to invest in GP nursing workforce expansion which, to date, has included the recruitment and training of 28 nurses (around 19 per cent of the planned staff increases), alongside investment to support GP practices in the delivery of pre-school vaccinations.

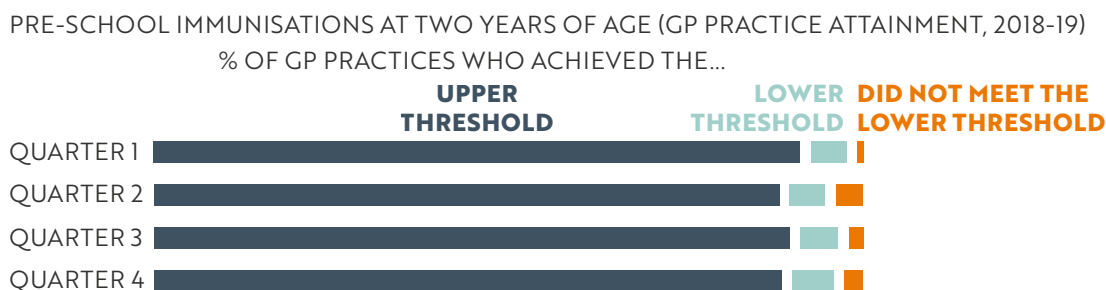
A number of GPs are not meeting targets for the vaccination of pre-school children

- 3.13** The DoH sets targets for individual GP practices to encourage vaccine uptake. These targets are assessed at two years and five years of age, with upper and lower attainment thresholds set at 90 and 70 per cent respectively. The Health and Social Care Board (HSCB) monitors³¹ the outcomes achieved by practices annually by HSCT area, based on claims submitted. As illustrated in **Figure 19**, during 2018-19, an average of 92.2 per cent of practices achieved the upper (90 per cent) threshold for pre-school vaccinations assessed at two years of age. However, it also indicates that, for the same measure, between three and 13 GP practices did not meet the lower (70 per cent) attainment threshold for vaccine uptake.

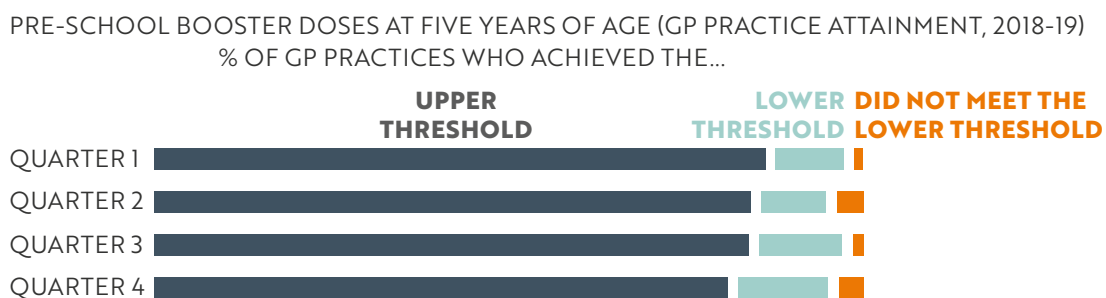
31 General Medical Services Contract Review Report 2018-19, HSCB.

Figure 19. On average, over the four quarters of 2018-19, the rate at which GP practices attained the upper threshold for pre-school immunisations at two years of age was around 92 per cent

The HSCB monitors pre-school immunisations administered by GP practices with reference to an upper threshold of 90 per cent and a lower threshold of 70 per cent. Across both measures, between 3 and 13 GP practices did not meet the lower threshold in any quarter during 2018-19.



During 2018-19, the same outcome measured at five years of age was less than 87 per cent



Source: GP claim submissions to HSCB during 2018-19

3.14 In relation to immunisation levels achieved for pre-school booster doses assessed at five years of age, **Figure 19** shows that there was a reduction in the rates of vaccine uptake achieved for this measure compared to the assessment at two years of age - an average of 86.4 per cent of GP practices in Northern Ireland achieved the upper (90 per cent) threshold rate during 2018-19. However, it also indicates that between four and 13 GP practices did not meet the lower (70 per cent) attainment threshold for vaccine uptake at five years of age.

3.15 When the data from claims submitted by GPs was considered by HSCT area, this showed that almost a third (31.7 per cent) of GP practices (on average) within the Belfast HSCT area did not achieve the upper threshold for immunisations assessed at five years of age during 2018-19. This compares to rates of between 4 and 13 per cent for the remaining HSCT areas and reflects our findings in Part 2 around coverage rates achieved for individual vaccinations.

The data held on vaccination may be incomplete

3.16 Vaccination data in Northern Ireland has been collected on the Child Health Information System (CHIS) since 1986-87, and the Working Group Review (see paragraph 3.6) noted the importance of its inputs to national statistical reporting (see paragraph 2.3). However, with each HSCT operating its own CHIS, it was found that not all GP practices were utilising the system as intended (duplicating effort to issue vaccination invites, schedule clinics and monitor uptake); it was regarded as inflexible to change; and also lacked compatibility with other IT systems in use. While the Working Group was advised that some tailoring of the CHIS with training could improve compatibility, over the longer-term it recommended a replacement which could integrate fully with GP practice systems.

3.17 Given concerns around the completeness and accuracy of system data on vaccination coverage, during 2018-19³² the PHA Immunisation Team worked with the HSCB and GP practices in the Belfast HSCT area to improve the uptake of MMR immunisations. This was one of the catch-up exercises referred to previously (see paragraph 2.25). With half of eligible GP practices participating, CHIS extracts identified a group of 2,000 children (now of school age) who, according to practice records, were 'unimmunised' or 'partially immunised' - they were then invited to attend a vaccination appointment. While the exercise resulted in around 500 children's records being updated, in over 300 cases this was due to the correction of previously incomplete MMR data, with fewer than 200 additional children being vaccinated.

The Public Health Agency has plans to carry out targeted interventions for some vaccines

3.18 While increased immunisation coverage is the main benefit of targeting selected vaccines, such as MMR, maximising this can place heavy reliance on GP practice participation, along with co-ordinating the efforts of health professionals in health and social care settings (e.g. health visitors) and the maintenance of accurate health records. The PHA has plans in place to carry out further targeted interventions involving multi-disciplinary teams, where the necessary delivery arrangements can be put in place.

The World Health Organisation (WHO) has identified vaccine hesitancy as a global health risk

3.19 'Vaccine hesitancy' is defined by the WHO as a reluctance or refusal among parents and carers to vaccinate those in their care. Key reasons for this are considered to be complacency, inconvenience in accessing vaccines and a lack of confidence in them. As a result, vaccine hesitancy was included in the WHO's 'Top 10 Global Health Risks' for 2019.

3.20 The National Audit Office (NAO) conducted an investigation³³ into pre-school vaccinations in England, given the decline in uptake rates over recent years. Its report drew on some of the key outcomes of a PHE survey on attitudes towards vaccination in 2019, including that:

- 95 per cent of parents surveyed felt confident/very confident in the vaccination system (up from 93 per cent in 2017); and

32 Annual Immunisation Report for Northern Ireland 2018-19, PHA.

33 Department of Health & Social Care, Investigation into Pre-School Vaccinations HC 100 Session 2019-20, NAO, 25 October 2019.

- the percentage of parents refusing or postponing vaccinations had decreased from 11 per cent in 2015 to 8 per cent in 2019.

3.21 However, the NAO also noted the view held by PHE that aspects of the delivery arrangements within primary care settings in England had significantly contributed to reduced uptake. These included:

- inconsistencies in the way healthcare professionals reminded parents/carers to vaccinate their children, with no single call/recall system in place; and
- difficulties in accessing vaccination services. Respondents to a 2018 survey undertaken by the Royal Society for Public Health³⁴ (RSPH) cited timing and availability of appointments and childcare as access barriers.

3.22 Given the declining rates of vaccination uptake within Northern Ireland's pre-school population (considered in Part 2), there is merit in assessing factors with local relevance, in order to identify and take remedial action. In this context, the PHA reported³⁵ during 2019 on the results of a marketing survey it commissioned in 2018, where focus groups within a 'harder to reach' community group considered vaccination attitudes and influences. While the findings showed a general acceptance of vaccinations, communication issues and access were highlighted as barriers to receiving vaccines, which could be facilitated through increased co-ordination between the PHA and the other health professionals involved.

3.23 The NAO report also noted limited survey evidence of anti-vaccination messages have had any major impact on uptake rates in England. Nevertheless, the promotion of a more consistently positive case for vaccination was being progressed by PHE, NHS England³⁶ and the Department of Health and Social Care (DHSC) in England in the form of a joint communications strategy. Such an approach could have applicability across the UK.

3.24 The RSPH survey also reported the results of questions around seasonal flu concerns. Despite the potential severity of the illness³⁷, one in five of the 2,600 parents/carers sampled had chosen not to have a child vaccinated. The most common reasons given were that they did not think the vaccine would be effective and that they were worried about side-effects.

Conclusions and Recommendations

3.25 Our study has focused on the rates of vaccination coverage within Northern Ireland's pre-school population and examined some of the key issues which, over time, have contributed to the ongoing downward trend in coverage achieved.

3.26 We have also reported on the vaccination rates achieved during the annual seasonal flu programme for pre-school children. Even with the improvement in outcomes achieved in the 2019-20 and 2020-21 flu seasons, rates of vaccination coverage remained well below the DoH targets set for this eligible group.

34 Moving the Needle – Promoting Vaccination Uptake across the Life Course, Royal Society of Public Health, January 2019.

35 Annual Vaccine Preventable Diseases Report for Northern Ireland 2019, PHA.

36 National Health Service (NHS) England is an executive non-departmental public body which leads and oversees the commissioning of healthcare provision in England.

37 'UK flu jab rates prompt complacency warning', BBC News Online, 27 August 2020.

- 3.27** The success of any large-scale vaccination programme will be dependent on addressing the issues identified during this study. These include:
- the lack of clarity in roles and responsibilities which has arisen in the administration of vaccinations provided through GP practices;
 - the fact that some GPs have not met vaccination coverage targets set by the DoH;
 - concerns raised around the completeness and accuracy of management information generated using vaccination records; and
 - the implications of vaccine hesitancy (a WHO 'global health risk') set against the need to maximise the effectiveness of any immunisation programme.
- 3.28** As part of its forward planning associated with COVID-19, the DHSC included each of these aspects in a consultation³⁸ process undertaken during 2020, along with vaccine promotion messaging within national advertising campaigns.
- 3.29** Where continuity of vaccine supplies is maintained, large-scale immunisation programmes rely on: the logistics required to facilitate timely immunisation being in place and operating effectively; convincing sufficient numbers of individuals to participate through clear and consistent messaging; and maintaining accurate vaccination records for patient safety reasons. To enable the achievement of these outcomes, we have made the following recommendations:



Recommendation 1

Primary care settings require access to an available workforce (scaled-up as necessary to meet immunisation delivery targets) with appropriate clinical training, in order to maintain standards of patient safety.



Recommendation 2

Clear, fact-based and consistently presented positive messaging is key to mitigating against genuine uncertainty around vaccination within the population and increasing rates of coverage.



Recommendation 3

Given the concerns around the completeness and accuracy of vaccination records, the Department of Health should ensure that remedial action is taken in order that existing information systems supporting vaccination are fit for purpose. Over the longer-term, maintaining the integrity of immunisation data will be necessary for its seamless inclusion within an electronic patient record system for Northern Ireland³⁹ which was announced in late 2020.

38 Consultation Document - Changes to Human Medicine Regulations to support the rollout of COVID-19 vaccines, Department of Health and Social Care, 28 August 2020.

39 'Patient Identity Management goes digital', Department of Health website, 18 December 2020.

NIAO Reports 2022 and 2023

Title	Date Published
2022	
Planning in Northern Ireland	01 February 2022
The COVID-19 pandemic: Supply and procurement of Personal Protective Equipment to local healthcare providers	1 March 2022
Northern Ireland Non-Domestic Renewable Heat Incentive Scheme: Progressing implementation of the Public Inquiry recommendations	22 March 2022
Extraordinary Audit of Causeway Coast and Glens Borough Council	07 July 2022
The National Fraud Initiative: Northern Ireland	19 July 2022
Continuous improvement arrangements in policing	21 July 2022
NIAO Review of NI Water's sale of Portavoe Reservoir	21 July 2022
2023	
Planning Fraud Risks	01 March 2023
Public Procurement in Northern Ireland	25 April 2023
Ministerial Directions in Northern Ireland	27 April 2023



Northern Ireland
Audit Office

**Independence and excellence in
audit to improve public services**

Northern Ireland Audit Office
106 University Street, Belfast, BT7 1EU • 028 9025 1000 • www.niauditoffice.gov.uk

