



National Audit Office

Report

by the Comptroller
and Auditor General

Department of Health & Social Care

Investigation into pre-school vaccinations

Key facts

7

the number of types of pre-school vaccinations routinely provided in England

86.4%

the percentage of children in England aged five who have had two doses of the measles, mumps and rubella vaccine (MMR) in 2018-19

90,000

the number of five-year old children in England in 2019 that Public Health England estimates have not had both doses of MMR

95%

NHS England's performance standard for uptake of pre-school vaccinations (except flu) set by the Department of Health & Social Care in 2017-18

95%

percentage of parents in England who report being confident about vaccinations in a Public Health England survey in 2019

970

the number of confirmed cases of measles in 2018 in England, compared with 266 confirmed cases in 2017

94.2%

percentage of children in England aged two who have had the 5-in-1 vaccination in 2018-19

84.8%

percentage of children in England aged five who have had the 4-in-1 booster vaccination in 2018-19

£144.5 million

NHS England's estimate of the funding for GP practices to provide the seven pre-school vaccinations in this investigation

What this investigation is about

1 Health professionals consider that vaccinations are a crucial tool in protecting the health of individuals and that of the wider population, particularly for people with existing health problems who are more vulnerable to infectious diseases and for those who cannot receive vaccinations themselves. Many vaccinations are given in early childhood to provide protection at a time when children are most vulnerable to disease.

2 For vaccinations to be most effective, the World Health Organization (WHO) recommends that enough people need to be vaccinated to stop disease spreading across the population. This is called 'herd immunity', and the proportion of people that need to be vaccinated to achieve herd immunity varies by disease. For measles, the WHO recommends that 95% of the population need to be vaccinated with two doses of the Measles, Mumps and Rubella vaccine (MMR) for herd immunity to occur and for disease to be eliminated. In 2017-18, the Department of Health & Social Care (the Department) set NHS England a performance standard of 95% uptake for pre-school vaccinations (except flu). Vaccination is not compulsory in England.

3 The Department is responsible for national strategic oversight of vaccinations in England and policy relating to them. It delegates responsibility for delivering population-based vaccination services through the NHS Public Health Functions Agreement (the Section 7A Agreement) to NHS England.¹ The Department holds NHS England to account for delivering the services described in the Section 7A Agreement. NHS England commissions pre-school vaccination services, which are usually given at GP surgeries. NHS England commissions these services through the GP contract and is therefore accountable for the delivery of vaccination services. NHS England estimates that GPs received £144.5 million in 2018-19 to provide the seven pre-school vaccinations examined in this investigation. Public Health England (PHE) is responsible for public health oversight of vaccination programmes and providing clinical advice to commissioners on delivery. This role also includes central procurement and distribution of specific vaccines for the national programme, public messaging and surveillance of vaccine-preventable diseases.

4 There are seven types of vaccines (which protect against 13 diseases) routinely provided to children by the National Health Service (NHS) before they go to school aged five (**Figure 1** overleaf). There has been a general fall in uptake of pre-school vaccinations in England since 2012-13 and, in many cases, uptake of these vaccinations is below the Department's performance standard of 95% uptake, outlined in the Section 7A Agreement.

¹ Since 1 April 2019, NHS England and NHS Improvement have come together to act as a single organisation. However, legally the NHS England Board and the NHS Improvement Board continue to exist as two separate entities. Statutorily only NHS England is accountable as an organisation for the delivery of the Section 7A functions.

Figure 1
Pre-school vaccines given in England

Vaccine	When given	Protection against
6-in-1	8, 12 and 16 weeks (replaced 5-in-1 in 2017)	Diphtheria, tetanus, whooping cough, polio, haemophilus influenzae type b (hib) and hepatitis B.
Pneumococcal (PCV)	8 and 16 weeks and 1 year	Some strains of pneumococcal infections
Rotavirus	8 and 12 weeks	Rotavirus
Men B	8 and 16 weeks and 1 year (introduced 2015)	Meningitis
Hib/Men C	1 year (booster for hib)	Meningitis and haemophilus influenzae type b (hib)
MMR	1 year, and 3 years and 4 months	Measles, mumps, rubella
4-in-1 pre-school booster	3 years and 4 months	Diphtheria, tetanus, whooping cough, polio

Note

1 The flu vaccine is also offered to children from the age of two but differs from the other programmes as it is given annually. It has also been on a phased roll-out to children since 2013. For these reasons, it has not been included in this investigation.

Source: NHS England

5 This investigation sets out the system for providing vaccinations to pre-school children in England. It is prompted by public concerns about the levels of uptake of pre-school vaccinations. It sets out:

- the current levels of vaccination uptake and cases of disease across England;
- PHE's and NHS England's understanding of the problem; and
- PHE's and NHS England's response to the problem.

6 We use the MMR vaccination, the 4-in-1 booster and the Hib/MenC booster to highlight many of the challenges that exist in the system for pre-school vaccinations and illustrate in more detail how uptake of vaccinations is falling.

Summary

Key findings

Trends in vaccination uptake and cases of disease

7 NHS England has missed the Department of Health & Social Care's (the Department's) performance standard for uptake of nearly all routine pre-school vaccinations in England since 2012-13. For example, in 2018-19:

- 4-in-1 pre-school booster had the lowest uptake of all pre-school vaccinations at 84.8%; and
- for children receiving the second dose of the Measles, Mumps and Rubella vaccine (MMR) by age five, uptake was 86.4%.

In July 2019, Public Health England (PHE) estimated that around 90,000 children (one in seven) aged five in England had not had both doses of MMR at that time (paragraphs 2.1 to 2.3, Figures 4 to 8).

8 PHE reports that cases of diseases in children and adults have varied between 2006 and 2018. For example:

- cases of **rotavirus** have dropped from a peak of 16,039 in 2010 to 2,152 in 2018 (paragraph 2.4, Figure 9);
- cases of **mumps** have fluctuated since 2006, with a high of 7,300 in 2009, and dropping below 1,000 in 2015 and 2016. Cases then increased to 1,796 in 2017 and reduced to 1,061 in 2018 (paragraph 2.4, Figure 9);
- cases of **whooping cough** reached a peak of 9,367 in 2012 and have decreased to 2,947 in 2018 (paragraph 2.4, Figure 9); and
- cases of **measles** have fluctuated from lows of 104 and 92 in 2014 and 2015 to 970 in 2018. Overall, 40% of measles cases in 2018 were in London, with a further 33% in the South East and South West combined. Measles is also increasing globally, and cases have increased by almost three-fold in the first six months of 2019 (based on 182 countries reporting to the World Health Organization (WHO)) compared with the same period in 2018 (paragraph 2.4, Figure 9).

9 In 2019, the WHO withdrew the UK's measles elimination status. In 2016, the WHO declared the UK had eliminated measles (this meant that there had been no endemic cases for 12 months – the original source of infection for reported cases was outside the UK and then spread through the population in the UK). In August 2019, the WHO announced that it had withdrawn this status in response to increasing cases of measles from the same strain for more than 12 months (paragraph 1.4).

10 NHS England data show regional variations in uptake of vaccinations with low levels in London. NHS England and PHE have an overview of the issues and probable causes of variation and NHS England's regional teams look at specific challenges for their local populations. London reports the lowest levels of uptake for all three case study vaccinations. PHE and NHS England believe that low levels of uptake in London may be due in part to children's medical records not being updated as they move areas and GPs, challenges with the general practice workforce and a highly mobile population. There is a wide range in national uptake in 2018-19:

- 4-in-1 from 96.2% in County Durham and Cumbria to 63.9% in Westminster (paragraph 2.5 and Figure 10);
- Hib/MenC (24 months) from 97.5% in County Durham to 71.2% in Hackney and City of London (paragraph 2.5 and Figure 11); and
- MMR (2nd dose) from 96.4% in County Durham to 64.1% in Westminster (paragraph 2.5 and Figure 12).

Understanding why uptake is declining

11 The Department, PHE, and NHS England are concerned about the declining vaccination rates in nearly all pre-school vaccinations. In summer 2018, the minister for public health and primary care requested a "foolproof" plan from PHE and NHS England to reverse the decline and reduce regional variation. Since then, PHE and NHS England have developed a number of actions which they think are most likely to help increase uptake, such as changing how NHS England commissions vaccination services from GPs, and have provided the minister with regular progress reports. In July 2019, in the Prevention green paper, the Department announced that it would launch a new strategy on vaccination by spring 2020 that included some of these actions (paragraphs 3.1 and 4.2).

12 NHS England and PHE have identified several potential causes for the decline in uptake of pre-school vaccinations. These potential causes operate together to reduce uptake: some are due to how the vaccines are delivered locally, such as access to GPs, others are more systemic, such as problems with the completeness of the reported data. No one factor on its own explains why the decline has been evident since 2012-13. There is evidence that the 2013 health system reorganisation in England resulted in fragmentation in the way the vaccination programme has been delivered. Many of these issues have been known for several years and cannot be reliably linked to the decline in uptake rates since 2012-13 (paragraphs 3.1 to 3.10).

13 The way healthcare professionals remind parents to vaccinate their children is inconsistent. ‘Call/recall’ for vaccinations is direct communication with parents or carers to arrange their child’s vaccinations. Before 2013, responsibility for call/recall was mixed between primary care trusts and service providers (Child Health Information Services or CHIS), who manage children’s clinical care records. When primary care trusts were abolished in 2013, NHS England took responsibility for commissioning call/recall. NHS England has not set out requirements of GPs for call/recall under the changed arrangements. As a result, call/recall is done inconsistently and there is no coherent system. In some cases, call/recall is done to a varying extent by GP practices. In other areas it is done by CHIS. NHS England central teams check how regional teams review the effectiveness of call/recall that is conducted by CHIS but not that done by GP practices (paragraph 3.3).

14 Parents can find it difficult to access vaccination services. An online survey of 2,622 parents by the Royal Society for Public Health in January 2019 found parents cited the timing and availability of appointments and childcare as barriers to getting their child vaccinated. Some communities (known as ‘under-served’ communities) do not access healthcare and vaccination services in expected ways, for example travellers and some religious groups. Medical records do not routinely state membership of specific small communities. PHE and NHS England have undertaken some small-scale work to determine the extent to which these communities are under-vaccinated, especially in London, but recognise that more work needs to be done on this issue (paragraphs 3.4 and 3.6).

15 There is limited evidence of any major impact on vaccination uptake rates from anti-vaccination messages. So-called ‘anti-vaxxers’ oppose specific or all vaccinations and promote messages that are not based on accepted scientific or medical evidence. PHE conducts an annual survey into parents’ attitudes to vaccinations. It has found no evidence that anti-vaccination social media activity has had a major impact on vaccination uptake in England. PHE considers the main reasons for the decline in uptake are related to delivery by local primary care providers. NHS England and PHE consider that anti-vaccination messages on social media are affecting the uptake of vaccinations elsewhere in the world. They are therefore alert to the possible impact in England and the risk that such messages could contribute to, and compound, the problem of poor vaccination uptake. As a result, they are emphasising the positive case for vaccination (paragraph 3.7).

16 A small minority of parents are reluctant to have their children vaccinated because of their concerns about vaccinations. Parents may be reluctant to vaccinate their children for many reasons and not be opposed to vaccination. The WHO defines vaccine hesitancy among parents as a reluctance or refusal to vaccinate their children and has identified complacency, inconvenience in accessing vaccines and lack of confidence as key reasons for this reluctance. It has named vaccine hesitancy as one of the top 10 global health risks for 2019. PHE's survey reports that parents have confidence in the vaccination system and found that 95% of parents in 2019 reported feeling confident or very confident in vaccinations. The survey reported in 2019 that the percentage of parents refusing or postponing vaccination fell from 11% in 2015 to 8% in 2019 (paragraphs 3.8 and 3.9).

17 NHS England and PHE do not know the relative impact of the possible causes on the declining uptake of vaccinations. PHE, public health organisations and research bodies have done some work to understand the impact of all these factors. This research is localised and small-scale and does not indicate the extent to which each factor impacts on uptake nationally (paragraph 3.10).

18 NHS England and PHE monitor regional variations at a high level. NHS England expects its seven regional teams to do detailed monitoring and performance management to increase uptake. In August 2019, NHS England published an action plan to improve uptake of MMR. This identified work to provide more detailed data at national level. Our report on health screening noted that NHS England's reliance on local and regional monitoring of health screening programmes risked omissions not being identified by national performance monitoring (paragraphs 3.11 and 3.12).²

Actions to improve uptake

19 Since 2016, PHE and NHS England have developed several actions that aim to improve uptake of vaccinations. They do not have evidence that all of their actions will address the causes of the decline. Some of these actions, for example some changes to how NHS England commissions vaccination services from GPs, are part of ongoing initiatives that NHS England hopes will also address the decline in vaccination uptake as well as other aims. NHS England's action plan published in August 2019 included guidance to regional teams on how to improve uptake of MMR vaccination. In July 2019, in the Prevention green paper, the Department announced that it would launch a new strategy on vaccination by spring 2020 although the Prime Minister has since requested it be brought forward to autumn 2019. In September 2019, the Secretary of State for Health and Social Care announced that he was looking at the case for compulsory vaccinations (paragraphs 4.1 and 4.2).

² Comptroller & Auditor General, *Investigation into the management of health screening*, Session 2017–2019, HC 1871, National Audit Office, February 2019.

20 NHS England and PHE do not use a consistent national approach to engage with under-served groups. Instead, they use an adaptable, locally focused approach and expect regional and local NHS England and PHE teams to work with under-served groups in their areas to improve uptake. This type of activity varies from team to team. For example, in 2018 a small-scale review of GP practices in England by PHE and the London School of Hygiene and Tropical Medicine found that no GP practices (out of nine) had services to increase uptake in groups with low uptake or to identify vulnerable or under-served populations. In July 2019, regional teams provided NHS England with their plans to improve uptake of vaccinations. Some of these included plans to engage with under-served communities (paragraphs 4.3 and 4.4).

21 PHE, NHS England and the Department are developing a joint communications strategy to promote positive messages about vaccinations and to help overcome vaccine hesitancy. PHE also monitors public sentiment about vaccination on various media, including social media sites such as Mumsnet, Facebook and Twitter, and uses various forms of media to promote positive messages about vaccination. PHE's policy is not to generally engage with anti-vaccination activists as it considers that doing so raises the profile of these activists. NHS England and PHE have not always taken the same approach to anti-vaccination messages and 'myth busting'. In July 2019, the Secretary of State for Health and Social Care discussed with social media companies how they can help to stop the spread of anti-vaccination messages at a summit about social media and mental health (paragraphs 4.5 and 4.6).