



National Audit Office



# The rollout of the COVID-19 vaccination programme in England

Department of Health & Social Care and  
Department for Business, Energy & Industrial Strategy

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**REPORT**

**by the Comptroller  
and Auditor General**

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## Key facts

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**£5.6bn**

total spending on the COVID-19 vaccine programme by the end of October 2021 (including procurement costs for the UK and deployment costs for England)

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**87m**

number of COVID-19 vaccine doses administered in England by the end of October 2021

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**85%**

proportion of people aged 18 and over in England who had received two doses of COVID-19 vaccine by the end of October 2021, compared with a planning assumption of 75%

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**More than 340 million**

number of doses of COVID-19 vaccine the UK had contracted or agreed to purchase by the end of October 2021, for delivery by the end of 2022

**71%**

percentage of COVID-19 vaccinations administered by GPs and community pharmacies up to the end of October 2021, against an initial planning assumption of 56%

**£2.9 billion**

total spent to purchase COVID-19 vaccines for the UK up to the end of October 2021, out of a total spend of £3.3 billion by the Vaccine Taskforce

**£2.2 billion**

total spent on COVID-19 vaccine distribution and deployment in England to the end of October 2021

**4.0%**

estimated percentage of COVID-19 vaccine doses damaged or not used in England ('wastage') up to the end of October 2021, against a planning assumption of 15%–20%

**48%–86%**

range in percentage of adults vaccinated with two doses by ethnic group at the end of October 2021 (48% for people of Chinese origin up to 86% for people of White British origin)

**£8.3 billion**

total funding available for the COVID-19 vaccination programme up to the end of March 2022, consisting of £4.6 billion for the Taskforce, primarily to purchase vaccines, and £3.7 billion for vaccine deployment

# Summary

## Introduction

**1** COVID-19 vaccines first became available at the end of 2020. Since then, vaccination has been central to the government's pandemic response. The UK Health Security Agency (UKHSA) estimated that by the end of September 2021, vaccinations may have averted as many as 128,000 deaths and 262,000 hospitalisations by September 2021.

**2** A number of national and local bodies have been involved in the COVID-19 vaccine programme (the programme) as follows:

- The **Vaccine Taskforce (the Taskforce)**, created in April 2020, one of whose objectives is to secure vaccine supplies for the UK.
- Initially, the Taskforce delivered its responsibilities on behalf of the **Department for Business, Energy & Industrial Strategy (BEIS)**. From August 2021, the **Department of Health & Social Care (DHSC)** assumed accountability for Taskforce activities relating to procurement, clinical testing and development. DHSC is also responsible for planning how to administer the vaccine to the public in England.
- **NHS England and NHS Improvement (NHSE&I)** leads on operational delivery of COVID-19 vaccinations in England. It has worked with **Public Health England (PHE)** on vaccine supply, storage and distribution within England. From October 2021, PHE's responsibilities transferred to the new **UKHSA**.
- A range of local healthcare providers – **NHS hospitals, GPs and community pharmacies** – have administered vaccines in their own premises and other settings including dedicated vaccination centres.

**3** In implementing the programme, the government has followed advice from the **Joint Committee on Vaccination and Immunisation (JCVI)** and the **Chief Medical Officers**. This advice determines who is eligible and should be prioritised for vaccination, and which vaccines can be given to which groups. As further evidence on the safety and effectiveness of the COVID-19 vaccines became available and the nature of the COVID-19 pandemic has changed over time, advice has continued to change and has often had to be implemented at extremely short notice. As with other vaccines, the **Medicines and Healthcare products Regulatory Agency (MHRA)** has to approve COVID-19 vaccines before they can be used and monitors safety after approval.

## Scope of this report

**4** In December 2020, we published our *Investigation into preparations for potential COVID-19 vaccines*. At the time, the Taskforce had signed five contracts with vaccine suppliers and one vaccine had been approved for use. This report extends our examination up to the end of October 2021, by which time four vaccines had been approved for use and the rollout of first and second doses of COVID-19 vaccinations to adults had taken place. The programme had also commenced rollout of first doses to 12- to 17-year-olds, and booster vaccinations. Since October 2021, the programme has expanded further, including the broadening and acceleration of the booster programme and second doses for 12- to 17-year-olds.

**5** This report evaluates the government's COVID-19 vaccine programme focusing on events up to the end of October 2021 and assessing whether the programme is well placed to meet its objectives in full. The report focuses on England, with the exception of procurement which the government has done on a UK-wide basis. We describe aspects of clinical advice, vaccine certification, the booster programme and some events after October 2021 but do not evaluate them in depth.

## Key findings

The rollout of vaccinations to the public

### **6 The vaccine programme met stretching and unprecedented targets to offer two doses of COVID-19 vaccine to most adults in a short space of time.**

The government made public commitments to offer vaccines first to priority groups and then to the entire adult population of England. Up to July 2021, NHSE&I achieved all its major deployment targets, including offering a first vaccine dose to nine priority groups by 15 April and extending that offer to all adults by 19 July. The programme met its target to vaccinate two-thirds of all adults by 19 July. By the end of October, it had administered around 87 million doses, about six times the number in the previous annual flu vaccine programme (paragraphs 3.6 and 3.7).

**7 Uptake has exceeded expectations and has been higher than for previous flu vaccination programmes.** As the rollout began, Office for National Statistics surveys suggested that the large majority of people (84%) felt positively about being vaccinated. This figure had increased to 96% by June/July 2021. Vaccine uptake has exceeded NHSE&I's initial planning assumption that 75% of adults would take two doses. By the end of October 2021, 85% of adults had received two doses. Uptake of flu vaccines in the winter of 2019-20 in England was 72% for people aged 65 and over and 45% for people under 65 in a clinical risk group. Uptake in England also compared well with the other home nations and European Union countries: 85% received two doses compared with a range of 76% to 93% (paragraphs 3.5, 3.22 and 3.28).

**8 Despite national and local efforts to address inequalities, lower vaccination rates persist in some groups.** Uptake of COVID-19 vaccinations at the end of October 2021 remained substantially below the national average for:

- younger age groups, being lowest among those aged 18–24 (64%) and 25–29 (68%);
- particular ethnic minority groups, being lowest among adults of Chinese origin (48%), Black Caribbean origin (49%) and Black Other origin (49%), compared with 76% for all ethnic origins (this analysis does not adjust for age and uses a slightly different measure of uptake from the 85% referred to above); and
- expectant mothers (in October 2021, 29% of women giving birth had received at least two doses of COVID-19 vaccine).

Previous vaccination programmes have shown that uptake varies for different groups and in complex ways. The COVID-19 vaccine programme recognised the need for a range of approaches to address low uptake, including campaigns to increase confidence in vaccine safety, targeted materials for different communities, different routes to get vaccinated, and partnerships with community organisations. There are signs that some measures succeeded in improving uptake but the government has not yet identified how it can fully overcome persistent inequalities (paragraphs 3.22, 3.25 to 3.28 and Figure 22).

**9 The programme has not met some later objectives, including one to vaccinate most 12- to 15-year-olds by late October 2021.** The government decided to extend vaccination eligibility to 12- to 15-year-olds in the middle of September and originally planned to provide vaccines primarily through school-based immunisation services. However, there were a number of challenges to this rollout and by the end of October only 25% of the age group had been vaccinated. NHSE&I later broadened its offer to enable 12- to 15-year-olds to receive vaccines at other sites. By the end of January 2022, 58% had been vaccinated with one dose (paragraphs 3.7 and 3.8).

**10 Overall, the programme has taken steps to make the vaccine convenient to access; GPs and community pharmacies have administered many more doses than originally planned.** NHSE&I set up three main routes to access vaccines: GPs and community pharmacies (which it assumed would provide 56% of vaccinations); vaccination centres (which it assumed would provide 41%) and hospitals (for the remaining 3%). By the end of October, 71% of vaccines had been administered by GPs and community pharmacies, through a variety of local services and locations, and only 21% had been delivered at vaccination centres. In terms of delivery costs, dedicated vaccination centres have been the most expensive method at £34 per dose compared with £24 for GPs and community pharmacies. GPs and community pharmacies were the most popular delivery model for all priority groups although people aged under 65 were more likely than others to use dedicated vaccination centres (paragraphs 3.9 to 3.11).

**11 A combination of existing staff, returning healthcare staff, newly trained vaccinators and volunteers have administered the vaccines.** DHSC and NHSE&I anticipated that at its peak the programme would need 60,000 vaccinators and 65,000 non-clinical staff. They increased capacity by legislating to allow a wider range of individuals to give vaccinations and by recruiting clinical and non-clinical paid staff and volunteers. In our local case study interviews, we heard about the goodwill, flexibility and dedication needed to set up and run vaccination sites at such pace and scale. Staff accepted that the programme faced inherent uncertainties but there was frustration that important changes, for instance offering vaccines to 12- to 15-year-olds outside school, were sometimes announced in the media before NHSE&I had communicated them to local sites. NHSE&I told us that it was unable to communicate in advance with local sites owing to the confidential nature of the advice (paragraphs 3.13 and 3.17).

**12 NHSE&I and NHS Digital (NHSD) created new digital tools to support the vaccine deployment, making effective use of imperfect existing data.** The programme set up a national data system that allowed the NHS to identify, record and transmit patient vaccination data across the health and care system. NHSE&I also created central dashboards with detailed and real-time analysis of uptake and supply. These tools supported programme leaders to manage key programme risks and monitor divergence from central directions in local areas. Some priority groups (for example, the social care workforce and unpaid carers) were hard to identify from the main GP records but NHSE&I made creative use of multiple other data sources to improve identification. NHSE&I, working with NHSD, set up the national online booking system, which was primarily available for dedicated vaccination centres and community pharmacies. Our local case study areas had mixed views on how well this had facilitated access and supported their operations (paragraphs 3.18 to 3.21, 3.23 and 3.24).

Update on overall costs, procurement and supply

**13 Up to the end of October 2021, the programme had spent £5.6 billion out of total available funding of £8.3 billion for the two years to the end of March 2022.**

- The £8.3 billion funding consists of £4.6 billion for the Taskforce, primarily to purchase vaccines, and £3.7 billion for vaccine deployment.
- The £5.6 billion expenditure comprises £3.3 billion by the Taskforce, of which £2.9 billion was to purchase vaccines, and £2.2 billion for vaccine deployment.
- Based on all UK agreements in place as at the end of October with six suppliers, we calculated that the average procurement cost per dose was £15.02 (including VAT), although this has varied between suppliers and over time as the market situation has changed.

- For the period up to the end of October, we calculated that the average deployment cost per dose administered was £25.70. (Due to the different types of doses covered, this cannot be added together with the average procurement cost above to produce an average total cost, and there are additional deployment costs, for example, the use of volunteers, that cannot be easily quantified.) (paragraphs 1.5 to 1.8).

**14 By the end of October 2021, the Taskforce had contracts or agreements in place with six suppliers for more than 340 million doses of vaccine to be delivered to the UK by the end of 2022.** This compares with around 357 million doses contracted for or agreed in principle at the time of our last report in December 2020. Up to the end of October 2021, 145.9 million doses had been supplied against the UK vaccine contracts, and the Taskforce had paid out £2.8 billion on vaccine procurement contracts. Including future commitments, total contract costs have increased from £3.7 billion to £5.8 billion. This implies a substantial increase in the procurement cost per dose. This reflects the fact that there is a larger share of the more expensive vaccines now approved for use in the October 2021 portfolio. The supply contracted for may ultimately exceed the UK's vaccination needs but this depends on how the pandemic and government policy evolve. To date, the Taskforce has used various methods to optimise national supply and reduce surpluses, including cancelling or rescheduling deliveries, international donations, and bilateral transfers with other countries (paragraphs 2.6, 2.7, 2.9, 2.10 and 2.19).

**15 Up to the end of October 2021, there was an estimated total wastage of around 4.7 million doses, or 4.0% of total supply, in the vaccine programme in England; this included 1.9 million doses unused after changes to clinical advice about the AstraZeneca vaccine.** Wastage can occur when vaccine is not handled in line with guidance (for instance, regarding refrigeration) or cannot be used before its expiry date. We estimated overall wastage for England at 4.0% of total supply, lower than the 15%–20% that the vaccine programme initially assumed: under 1% across the national distribution and storage chain and 4.5% locally. There was a particular challenge with expiring AstraZeneca doses after JCVI's recommendation that people under 40 should preferably not be offered it. Although the Taskforce, working with PHE and others, was able to avoid some wastage by redirecting 4.5 million AstraZeneca doses to other countries, vaccines already at local sites had to be destroyed in line with regulations. Approximately 1.9 million doses were written off. Local providers were allowed to transfer stock between one another: our local case study interviews highlighted the value of this, although three felt the process was too slow and bureaucratic (paragraphs 2.17 to 2.19).

## Success factors and future risks

**16 The COVID-19 vaccine rollout was the biggest vaccination programme in UK history. Those delivering it employed a number of successful approaches to achieve most of its objectives up to October 2021.** In particular, we have noted the following that facilitated delivery at speed:

- Early and decisive action with a clear statement of the risks involved in different possible approaches.
- A conscious decision to pursue more than one solution, both in terms of vaccines and vaccination sites to provide flexibility and contingency.
- The adapting of existing processes to streamline vaccine development, procurement, approval and authorisation.
- Great clarity of purpose and priorities from the start of the vaccination rollout.
- A balance between central command-and-control and wider empowerment (particularly once it was acknowledged that GPs and pharmacies would play a bigger role than originally planned).
- Using existing infrastructure and expertise where possible, and identifying early on where new infrastructure was needed.
- The effective use of data to manage the programme closely and intervene quickly when problems emerged (paragraphs 1.16 to 1.17, 2.20 and 3.29 to 3.30).

**17 There are considerable risks to the programme's continuing success.**

- In the autumn of 2021, the programme expanded to include booster doses, first for some and then for all adults, and second doses for 12- to 17-year-olds. Following the emergence of the Omicron variant in winter 2021, new targets were set to offer all adults a booster by the end of December. These developments have meant the programme continuing to operate at a very high scale and pace and with significant complexity into a second year.
- There are still around 3.7 million unvaccinated adults who are unevenly spread throughout the population.
- Our assessment is that staffing remains a major risk, due to staff burnout, and the lack of surplus capacity in the healthcare system generally.
- In November 2021, the Taskforce signed contracts for 114 million more vaccine doses to be delivered in 2022 and 2023. This will provide flexibility to meet increases in demand and acquire new variants of vaccines, but the programme will have to manage carefully any resulting surpluses and the increased risk of wastage (paragraphs 2.7, 2.21 and 3.31 to 3.33).



**18 Up to the end of 2021, DHSC, BEIS and other national bodies had not yet identified what a sustainable long-term model of regular COVID-19 vaccination would entail.** Given the continuing significant uncertainties of the pandemic, at the end of 2021 DHSC still felt that it was too early to fix on a business-as-usual approach to COVID-19 vaccination but told us it was planning to address this in 2022. UKHSA noted that the emergency arrangements may not be best for long-term efficient working. In good time, DHSC and BEIS will need to consider the best long-term organisational structure for the new roles currently performed by the Taskforce and NHSE&I, alongside UKHSA's existing responsibilities, and how future costs and other resources may need to differ from the emergency response (paragraphs 1.18, 2.21 and 3.31).

### **Conclusion on value for money**

**19** Initiated in 2020, the vaccine programme has operated at unprecedented pace, scale and complexity, and in conditions of profound uncertainty, to achieve the pressing objectives of supporting the creation of vaccines, securing access to them, and administering them to the population as quickly as possible. It is through the collective efforts of many national and local public bodies, scientists, vaccine manufacturers, and individual staff and volunteers, as well as government's power as a coordinator and funder, that so many of the programme's objectives have been met and in some areas exceeded.

**20** In our review, we saw many examples of good practice, including clarity of purpose and priorities, timely and data-driven decision-making, and a willingness to innovate and adapt where necessary balanced with the repurposing of existing infrastructure and expertise. National and local partners showed an ability to adapt quickly, for example the rapid shift to deliver more vaccinations through GPs and pharmacies. The evidence indicates that the programme has saved lives and reduced the incidence of serious illness and hospitalisation.

**21** Given the unprecedented circumstances of the pandemic and the programme's achievements up to October 2021, we assess that it has provided value for money to date. By the end of October, the programme had spent £5.6 billion to achieve its objectives. Much about COVID-19, the vaccines market and the UK's future requirements remains unpredictable but far more is now known than in 2020. The programme needs to identify a clear path to a future sustainable model, securing the benefits of its many innovations and ensuring it has a full picture of costs and workforce requirements as it takes key decisions. It needs to challenge anew all elements of its cost base and adapt accordingly. Most importantly, it needs to maintain the high levels of vaccine uptake it has achieved among the general population and increase levels for groups where uptake still lags behind.

## Recommendations

22 Our recommendations are as follows:

- a In the light of the expanded and accelerated booster programme, **NHSE&I should take additional steps to manage the vaccine workforce and its welfare sustainably**, and to examine how the programme can minimise its potential adverse impact on other health and public health services, bearing in mind it is the same workforce which delivers all these services. It should also ensure it gives front-line providers the necessary lead-in time to prepare for programme changes.
- b **NHSE&I and UKHSA, working with local and national partners, should seek new ways to increase uptake for groups where rates are lower than for the rest of the population**, and should also evaluate what has worked well to date and could be replicated in future in other vaccination and similar public health programmes.
- c **The Taskforce, NHSE&I and UKHSA, working with local partners, should set out a clear strategy for managing surpluses and wastage in 2022 and review the overall expected wastage**, ensuring they learn lessons from the write-offs required for AstraZeneca.
- d Taking into account its ongoing procurements, **the Taskforce should set out a clear strategy for how it will maintain flexibility to respond to the continuing uncertainties of the pandemic, including the emergence of new variants, and changes in demand**. This should include consideration of the mix of vaccines in its portfolio, timing of deliveries and the relative cost and efficacy of different vaccines.
- e **DHSC and BEIS, working with the Taskforce, NHSE&I and UKHSA, should capture wider lessons from the programme, and identify what adaptations and innovations they should retain for other health and public health programmes and future responses to emergencies**. By the same token they should take steps to identify and address acknowledged weaknesses, such as the accuracy and availability of care sector data and the identification of unpaid carers.
- f **DHSC and BEIS, working with the Taskforce, NHSE&I and UKHSA, should set out a clear plan to identify and reach a sustainable future model for COVID-19 vaccination, clearly setting out responsibilities at national and local level**, based on a considered review of the costs, structures, staffing and delivery models used so far. In advance of any formal plan, they should seek early opportunities to consolidate COVID-19 vaccine activities within existing structures.