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Research Briefing

By Elizabeth Rough

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Coronavirus: Covid-19 booster vaccines frequently asked questions

Summary

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Summary

Please note that this briefing paper is no longer being routinely updated. The most up to date advice on Covid-19 vaccine booster campaigns, and eligibility, can be found at:

https://www.nhs.uk/conditions/covid-19/covid-19-vaccination/

Most recent JCVI advice on the autumn Covid-19 booster campaign, 2022

The Joint Committee on Vaccination and Immunisation (JCVI) recommended in July 2022 that those who continue to be more at risk of severe Covid-19 should be offered a Covid-19 booster vaccine in autumn 2022, specifically:

- residents in a care home for older adults and staff working in care homes for older adults;
- frontline health and social care workers;
- all adults aged 50 years and over;
- persons aged 5 to 49 years in a clinical risk group, as set out in the Green Book, chapter 14a, tables 3 and 4;
- persons aged 5 to 49 years who are household contacts of people with immunosuppression;
- persons aged 16 to 49 years who are carers, as set out in the Green Book, chapter 14a, table 3.

The Government accepted the JCVI's advice and the booster programme began in England on 5 September 2022 for those in care homes, frontline health and social care workers, those who are immunosuppressed and those aged 75 years and older. The following week, the booking system was opened to those aged 65 years and older. The JCVI has advised that the autumn booster dose should be "offered at least 3 months after the previous dose". All eligible groups have been able to book their autumn booster online, and via the telephone, since 14 October 2022. The booster campaign coincides with the annual flu immunisation programme. The JCVI states that Covid-19 and flu vaccines can be 'co-administered' (given at the same appointment).

The last day of the autumn booster campaign in England is 12 February 2023. The JCVI issued interim advice in January 2023 that another Covid-19 booster campaign would run in autumn 2023, aimed at "persons at higher risk of severe Covid-19 [...] in preparation for winter 2023/24".

The UK medicines regulator, the Medicines and Healthcare products Regulatory Agency (MHRA), approved the use of the Moderna bivalent vaccine in August 2022, and the Pfizer/BioNTech bivalent vaccine in September 2022, for adult booster doses. The bivalent vaccines target two coronavirus strains, the original strain (also known as 'wild-type') and the Omicron BA.1 variant. The JCVI advised in August 2022 that it would be "preferable for a single type of booster vaccine to be offered throughout the duration of the autumn programme". NHS England has since confirmed that the NHS will deploy a single type of vaccine and that this will be the bivalent Omicron BA.1/Original 'wild-type' vaccines.

Spring booster campaign, 2022

On 21 February 2022, the Joint Committee on Vaccination and Immunisation (JCVI) recommended a "spring dose" of Covid-19 vaccine should be offered, approximately 6 months after the last Covid-19 vaccine dose, to:

- adults aged 75 years and over;
- residents in a care home for older adults;
- individuals aged 12 years and over who are immunosuppressed.

The then Health Secretary, Sajid Javid, later confirmed that all four UK nations intended to follow the JCVI's advice. The spring booster campaign began on 21 March 2022 in England and ran until the early summer. The 'spring dose' was a fourth dose (a second booster) for those in the first two groups and a fifth dose for those who are immunosuppressed. NHS England estimated that around 5 million people were eligible for a spring booster dose. The JCVI also advised that a further booster in the autumn of 2022 was likely to be advised for people who are at higher risk of severe Covid-19.

JCVI advice on Covid-19 vaccine boosters following the emergence of the Omicron variant, November 2021

In response to the emergence of 'Omicron' as a variant of concern, the JCVI updated its Covid-19 vaccine advice on 29 November 2021. It stated that booster eligibility should be expanded to "include all adults aged 18 years to 39 years", with a booster offered no earlier than three months (rather than

the originally advised six months) after receiving a second dose of Covid-19 vaccine. Prior to this recommendation, the booster programme was open to those aged 40 years and over. In addition, the JCVI advised that severely immunosuppressed individuals who had received three primary doses of Covid-19 vaccine should be offered a booster (a fourth dose) "with a minimum of 3 months between the third primary and booster dose".

While the JCVI stated that "booster vaccination should now be offered in order of descending age groups" the Prime Minister announced on 12 December 2021 that, as of 13 December, the booster programme would be opened up "to every adult over 18 who has had a second dose of the vaccine at least three months ago". He added that walk-in centres would accept those aged over 18 for a booster from 13 December 2021, while the National Booking System would allow all over 18s to book an appointment from 15 December 2021.

Following advice from the JCVI in January 2023, the 2021 booster offer (third dose) for persons aged 16 to 49 years, who are not in a clinical risk group, will end in England at the same time as the autumn 2022 Covid-19 booster campaign, on 12 February 2023.

Background to the Covid-19 vaccine roll-out

The UK began its Covid-19 vaccine roll-out in December 2020. The vaccination programme progressed in two main phases, with prioritisation primarily based on age. During Phase 1, those aged 50 years and over, frontline health and social care workers and individuals aged 16 years to 64 years with underlying health conditions (which put them at a higher risk of serious disease and mortality), were prioritised. During Phase 2, the age-based approach continued, starting with those aged 40-49 and ending with the 18-29 age group. Covid-19 vaccines were subsequently offered to all those aged 12-17 years and first and second doses were then made available to those aged 5-11 years. To date, the three Covid-19 vaccines that have been authorised by the UK medicines regulator (the Medicines and Healthcare products Regulatory Agency – MHRA) and rolled-out, have required two doses to complete the primary vaccine course.

Attention subsequently turned to whether the primary Covid-19 vaccine course required any additional 'booster dose', namely the administration of a third dose. Following advice from the JCVI, the Government initially agreed to offer booster doses to individuals who received vaccination in Phase 1 of the Covid-19 vaccination programme (priority groups 1-9), no earlier than 6 months after completion of their primary course. The JCVI has since updated its advice on numerous occasions. Those aged 16 and over have been eligible to access a booster (third) dose after their primary course of vaccination, while campaigns have also been targeted at specific (age) groups for additional (fourth and fifth) booster doses.

Links to resources and guidance on the Covid-19 vaccine booster programme published by the UK Health Security Agency, the NHS and other health bodies are set out in Section 1 of the briefing. These sources and others have been used to address commonly asked questions about the Covid-19 booster vaccine programme. These will be updated as needed.

Details about the initial roll-out of the Covid-19 vaccination programme, including information on vaccine safety, can be found in the Commons Library briefing paper on Coronavirus: Covid-19 vaccine roll-out frequently asked questions. Parliamentary resources on Covid-19 vaccination from the House of Commons and House of Lords Libraries, and from the Parliamentary Office of Science and Technology, can be accessed from the Vaccination and Covid-19 landing page.

The information in this briefing is not medical advice, or a substitute for medical advice. Individuals seeking advice on their own medical treatment should consult their GP or use the NHS 111 service (in England). For the latest official guidance on coronavirus and the Covid-19 booster vaccination programme, please consult the NHS Coronavirus (COVID-19) booster vaccine and UK Health Security Agency Green Book guidance.

1 Key resources

NHS, How to get a booster dose of the coronavirus (COVID-19) vaccine, 2 February 2023

UK Health Security Agency, A guide to the spring booster for those aged 75 years and older and older residents in care homes, 24 March 2022

Prime Minister's Office, 10 Downing Street, Prime Minister's address to the nation on booster jabs, 12 December 2021

UK Health Security Agency, Chapter 14a COVID-19 - SARS-CoV-2, Immunisation against infectious disease (commonly known as 'The Green Book'), September 2022

UK Health Security Agency, COVID-19 vaccination: booster dose resources, 2 February 2022

HM Government, Covid-19 Response: Living with Covid-19, February 2022

HM Government, Covid-19 Response: Autumn and Winter Plan (opens PDF), 14 September 2021

Joint Committee on Vaccination and Immunisation (JCVI), JCVI statement on the COVID-19 booster vaccination programme for autumn 2022: update 3 September 2022

Joint Committee on Vaccination and Immunisation (JCVI), Joint Committee on Vaccination and Immunisation (JCVI) updated statement on the COVID-19 vaccination programme for autumn 2022, 15 July 2022

Joint Committee on Vaccination and Immunisation (JCVI), JCVI statement on COVID-19 vaccinations in 2022, 21 February 2022

Joint Committee on Vaccination and Immunisation, JCVI advice on the UK vaccine response to the Omicron variant, 29 November 2021

Joint Committee on Vaccination and Immunisation, Update to JCVI advice on booster vaccination in adults, 15 November 2021

Joint Committee on Vaccination and Immunisation, JCVI statement regarding a COVID-19 booster vaccine programme for winter 2021 to 2022, 14 September 2021

Joint Committee on Vaccination and Immunisation, JCVI interim advice: potential COVID-19 booster vaccine programme winter 2021 to 2022, 30 June 2021

2 FAQs: Background

2.1 What is a Covid-19 booster vaccine?

The UK Covid-19 vaccination programme has relied, to date, on the Pfizer/BioNTech, AstraZeneca and Moderna Covid-19 vaccines, all of which require two doses to complete the full, primary vaccination course. While the single dose Janssen Covid-19 vaccine has been approved by the UK medicines regulator, the Medicines and Healthcare products Regulatory Agency (MHRA), it has not yet been rolled out in the UK.[1]

A Covid-19 booster vaccine – sometimes referred to as 'revaccination' – involves the administration of an additional dose of a Covid-19 vaccine, at a specified interval, in those who have already received the full primary course (ie both the first and second doses).

The purpose of a booster vaccine is to strengthen the body's response to the SARS-CoV-2 virus, which causes Covid-19 disease. The journal Nature explains in general terms how a booster vaccine works:

> Vaccination produces an initial surge in the number of immune cells churning out antibodies and other molecules, which then slowly drops. This leaves behind a small pool of long-lasting 'memory' B and T cells that patrol the body for future infections by that pathogen [a pathogen is an organism that causes disease].
>
> A booster does several things to these cells [..] It causes antibody-making B cells to multiply, elevating the levels of antibodies against the pathogen once more. In time, their numbers will dwindle again, but the pool of memory B cells left behind will be larger than before, leading to a faster, stronger response to subsequent exposures. Boosters also promote a process called affinity maturation, in which 'engaged' B cells — those that have been triggered by the vaccine — travel to the lymph nodes. Here, they gain mutations, making the antibodies they produce bind to pathogens more strongly, potentially enhancing their potency.[2]

Booster vaccines have been commonly used to protect people against other conditions and diseases, such as tetanus. In the UK, for example, the full

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1 Nuvaxovid, the Covid-19 vaccine developed by Novavax, has also been approved by the MHRA. In its advice published on 15 August 2022, the JCVI stated that Nuvaxovid may be used 'off-label' as a booster dose for persons aged 18 years and above when no alternative clinically suitable UK-approved COVID-19 vaccine is available. More information about the availability of Nuvaxovid can be found in response to a Parliamentary Question on 22 November 2022 (see PQ 85016 [on Coronavirus: Vaccination], 22 November 2022).

2 COVID vaccine boosters: the most important questions, Nature, news feature, 5 August 2021

course of tetanus vaccination includes 5 injections; infants receive 3 initial doses at age 8, 12 and 16 weeks, followed by a 'pre-school booster' at age 3 years and 4 months, with a final dose given at age 14 as part of the 'teenage booster'. [3]

2.2 Why might a booster vaccine be needed?

Covid-19 booster vaccines might be required for several reasons. The protection afforded by a completed Covid-19 vaccination course, for example, may change and wane over time, or mutations of the virus (variants) may arise, making it more transmissible and better able to evade the immunity conferred by first generation vaccines used for the primary vaccination course. More vulnerable groups may also require booster vaccines. People with certain immunocompromised or immunosuppressed conditions, for example, may produce a low, or undetectable, immune response to Covid-19 after two doses of a Covid-19 vaccine and may benefit from additional doses. [4]

There is some disagreement across the scientific community about whether most people require a booster vaccination, on both scientific and ethical grounds. For example, in August 2021, the World Health Organization (WHO) called for a moratorium on boosters "until at least the end of September[2021], to enable at least 10% of the population of every country to be vaccinated". This was on the grounds that giving boosters risked diverting initial doses of Covid-19 vaccine away from lower income countries, where "the most vulnerable people remain unprotected". [5] The following month, the Director General of the WHO, Tedros Adhanom Ghebreyesus, called for an "extension of the moratorium until at least the end of the year [2021] to enable every country to vaccinate at least 40% of its population". [6] He added that the:

> longer vaccine inequity persists, the more the virus will keep circulating and changing, the longer the social and economic disruption will continue, and the higher the chances that more variants will emerge that render vaccines less effective. [7]

Speaking in November 2021, Mr Ghebreyesus reported that, every day, "there are six times more boosters administered globally than primary doses in low-income countries". He went on to describe this as a "scandal that must stop now". [8]

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3 NHS, Tetanus, last reviewed 14 May 2020

4 Centers for Disease Control and Prevention, COVID-19 Vaccine Booster Shot, 1 September 2021

5 World Health Organization, WHO Director-General's opening remarks at the media briefing on COVID-19, 4 August 2021

6 WHO chief urges halt to booster shots for rest of the year, Associated Press, 8 September 2021

7 Leaders Make Urgent Call To Accelerate Vaccination Globally And In Africa, World Health Organization news release, 14 September 2021

8 World Health Organization, WHO Director-General's opening remarks at the media briefing on COVID-19, 12 November 2021

Dr Hans Kluge, the WHO's regional director for Europe, however, has said that a "third dose of vaccine is not a luxury booster taken away from someone who is still waiting for a first jab [...] it's basically a way to keep the most vulnerable safe". [9]

More recently, the WHO published in May 2022 an Interim statement on the use of additional booster doses of Emergency Use Listed mRNA vaccines against COVID-19. It states that booster doses should be offered "based on evidence that doing so would have substantial impact on reducing hospitalization, severe disease and death, and to protect health systems" with priority given to those most at risk from severe Covid-19.[10]

[9] Covid booster jabs 'not a luxury' and protect the vulnerable, says WHO, The Guardian, 30 August 2021

[10] Interim statement on the use of additional booster doses of Emergency Use Listed mRNA vaccines against COVID-19 (who.int), May 2022

3 FAQs: Evidence base

3.1 How long does vaccine-induced immunity to SARS-CoV-2 last?

Evidence is still emerging on how long vaccine-induced immunity to the SARS-CoV-2 virus lasts. The results of the immunological studies that have addressed this question vary, as a piece in the British Medical Journal emphasises.[11] Consequently, it remains unclear how long any immunity to the SARS-CoV-2 virus that has developed – either through natural infection or vaccination – will persist.

Different approaches have been taken to examine whether vaccine-induced immunity wanes; some have focused on analysing "breakthrough infections", namely positive PCR (Polymerase Chain Reaction) test results for Covid-19 in those who have been vaccinated, while others have examined changes in antibody levels post-vaccination.

Outlined below are the methods and results of several studies that have examined Covid-19 vaccine effectiveness over time.[12]

University of Oxford and Office for National Statistics

In a study by the University of Oxford and the Office for National Statistics, researchers examined the effectiveness of the Pfizer, AstraZeneca and Moderna Covid-19 vaccines in a large community-based survey of randomly selected households across the UK.

The study involved analysing the results of 2,580,021 PCR tests to check for SARS-CoV-2 from 384,543 UK adults between 1 December 2020 and 16 May 2021 — when the Alpha variant of the virus was dominant — and 811,624 test results from 358,983 people between 17 May and 1 August 2021, when the Delta variant was more prevalent.

The researchers reported that the effectiveness of the Pfizer and AstraZeneca vaccines against any infections (new cases identified by a positive PCR test) fell over time. For the Pfizer vaccine, vaccine effectiveness (VE) was 85% 14 days after receiving a second dose, but "reduced by 22% [..] for every 30 days from second vaccination in those aged 18 to 64 years". For the AstraZeneca

11 C Baraniuk, How long does covid-19 immunity last?, BMJ, 2021; 373 (30 June 2021)

12 Vaccine effectiveness is a measure of how well vaccines work in the real world; it is the percentage reduction of disease cases in a vaccinated group relative to the unvaccinated group.

vaccine, VE in the same age group was 68% 14 days after receiving a second dose, with VE reducing by 7% every 30 days. There was insufficient data to assess the Moderna vaccine.[13]

It is important to note that the study examined 'infection' with SARS-CoV-2 (i.e. a positive PCR test); it did not look at the severity of the infection, such as whether a person had mild symptoms or if they suffered severe illness / required hospitalisation.

ZOE COVID Symptom Study

The health sciences company ZOE also published results in August 2021 from its ZOE COVID Symptom Study app which involves users reporting their symptoms and general health daily via the app. Researchers at King's College, London, analysed data logged by ZOE app contributors on their Covid-19 vaccinations between 8 December 2020 and 31 July 2021, as well as any positive PCR tests reported to the app during the same period. The analysis included:

- 411,642 test results from users who were doubly vaccinated with the Pfizer mRNA vaccine at the time of the infection
- 709,486 test results from users who were doubly vaccinated with the AstraZeneca vaccine
- 76,051 test results from users who were not yet vaccinated at the time of the infection.

The researchers found:

> initial protection against infection a month after the second dose of the Pfizer vaccine was 88%, while after five to six months this fell to 74%. For the AstraZeneca vaccine, there was around 77% protection a month after the second dose, falling to 67% after four to five months.[14]

While the study has been welcomed, some academics have questioned the reliability of the findings. Dr Simon Clarke, Associate Professor in Cellular Microbiology at the University of Reading, told the Science Media Centre that, while the app is a useful tool, it is:

> dependent on a self-selecting cohort, so even though the sample size is large, it does not necessarily use a study group which is reflective of the UK population. Therefore these data are likely to be under-reporting infections as anyone with the virus but without symptoms, won't be reporting this to the

[13] Koen B. Pouwels et al, Impact of Delta on viral burden and vaccine effectiveness against new SARS-CoV-2 infections in the UK, August 2021; see also Koen B. Pouwels et al, Effect of Delta variant on viral burden and vaccine effectiveness against new SARS-CoV-2 infections in the UK, Nature Medicine, 2021; 27(12): 2127–2135.

[14] ZOE Covid study, Is COVID vaccine protection fading? 25 August 2021

> app. It seems likely that the ZOE app would therefore lead to over-reporting of the protection given by the vaccines.[15]

Paul Hunter, Professor in Medicine at the University of East Anglia, also questioned whether the study is reporting declining vaccine effectiveness against symptomatic illness or whether the researchers "have identified declining effectiveness against severe disease":

> This study adds further evidence that the effectiveness of vaccines against mild disease wanes after relatively few months and that this waning immunity is likely to be associated with reduced ability to reduce transmission. But as yet there is no strong evidence that immunity to severe disease wanes substantially over the same time scale or that vaccines are less effective at reducing the risk of severe disease from the delta as opposed to the alpha variants.[16]

Mayo Clinic Health System, Minnesota

Another study, that has yet to be peer reviewed, was undertaken in the United States between February and July 2021 and did look at vaccine effectiveness over time against both Covid-19 infection and hospitalisation. It examined the incidence of infection in groups of vaccinated and unvaccinated individuals from Minnesota (25,589 in each group).

After two doses of the Moderna Covid-19 vaccine, protection against infection fell from 86% to 76% between February and July, and from 76% to 42% over the same time period for the Pfizer Covid-19 vaccine. [17]

Effectiveness against hospitalisation, however, remained high in the Minnesota study: for the Moderna vaccine, effectiveness against Covid-19 associated hospitalization changed from 91.6% to 81% between February and July, while the effectiveness of the Pfizer vaccine shifted from 85% to 75% over the same time period. The Minnesota study authors note that July 2021 corresponded with a marked increase of the prevalence of the Delta variant in the state (from 0.7% in May to over 70% in July) and a corresponding drop in the prevalence of the Alpha variant. It is unclear, however, how much the reduction in vaccine effectiveness is linked to the circulation of the Delta variant, the waning of immunity over time, or other factors not accounted for in the study.[18]

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15 Science Media Centre, expert reaction to press release from the ZOE app on vaccine effectiveness over time, 25 August 2021

16 Science Media Centre, expert reaction to press release from the ZOE app on vaccine effectiveness over time, 25 August 2021

17 Arjun Puranik et al, Comparison of two highly-effective mRNA vaccines for COVID-19 during periods of Alpha and Delta variant prevalence, 21 August 2021

18 Arjun Puranik et al, Comparison of two highly-effective mRNA vaccines for COVID-19 during periods of Alpha and Delta variant prevalence, 21 August 2021

Virus Watch Collaborative

Other studies have focused on analysing antibody levels in those who have been vaccinated against Covid-19 as a proxy for determining how well the vaccine has worked. A study undertaken by the 'Virus Watch Collaborative' at University College, London, examined "S-antibodies" (spike antibodies which appear after an infection or vaccination) in 605 participants. The results were published in July 2021 in the medical journal The Lancet. Of the 605 participants, 197 had received the Pfizer Covid-19 vaccine, 405 had received the AstraZeneca vaccine, while the vaccine type was missing for 3 participants.

The researchers reported a decrease in S-antibody levels over time for both the AstraZeneca and Pfizer vaccines:

> with levels reducing by about five-fold for [AstraZeneca] and by about two-fold for [Pfizer], between 21–41 days and 70 days or more after the second dose.[19]

The study authors went on to stress, however, that is not clear whether a fall in antibody levels is indicative of a decline in protection against Covid-19. This is partly because immunity is not only determined by the presence of antibodies, but by other factors, such as T and B cells. T and B cells play a key part in killing or weakening infection-causing organisms, with some T and B cells acting as 'memory cells' that persist in the body, even when antibodies have declined. These memory cells can "re-emerge" from a dormant state to protect against reinfection should they come into contact again with the same pathogen.[20] The UCL researchers found that "memory B-cell populations appear to be maintained" despite the reduction in S-antibody levels.

An article in the journal Nature notes that "teams around the world are racing to determine what level of neutralizing antibodies or another immune marker is most closely associated with a vaccine's effectiveness. They're seeking what's known as a correlate of protection".[21]

3.2 How effective is a Covid-19 booster vaccine?

In November 2021, the UK Health Security Agency published results from what it described as the "first UK real-world study" about the protection afforded against symptomatic disease from a booster dose of the Pfizer-BioNTech Covid-19 vaccine in those aged 50 years and older. It found that 2 weeks after receiving a booster dose, protection against symptomatic Covid-19 infection in adults aged 50 years and over was 93.1% in those who had received the AstraZeneca Covid-19 vaccine as their primary course (doses one and two)

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19 Madhumita Shrotri et al, Spike-antibody waning after second dose of BNT162b2 or ChAdOx1, The Lancet (Correspondence) Volume 398, Issue 10298, p385-387, 31 July 2021

20 Coronavirus: B cells and T cells explained, The Conversation, 20 July 2021

21 COVID vaccine boosters: the most important questions, Nature, news feature, 5 August 2021

and 94.0% for those who had received Pfizer-BioNTech for their primary course.[22]

3.3 How effective is a Covid-19 booster dose against the Omicron variant?

A new variant of SARS-CoV-2, B.1.1.529 (subsequently named 'Omicron'), was reported to the World Health Organization (WHO) on the 24 November 2021. It was first detected in specimens collected on 11 November 2021 in Botswana and on 14 November 2021 in South Africa. It was classified as a 'variant of concern' by the WHO on 26 November 2021.[23]

On 10 December 2021, the UK Health Security Agency (UKHSA) published the results of a study to estimate vaccine effectiveness against symptomatic Covid-19 with the Omicron variant compared to the Delta variant. The analysis included 56,439 Delta, and 581 Omicron, cases reported between the 27 November and 6 December 2021.

It found that protection against symptomatic infection with the Omicron variant was less than 10% in those who had received a second dose of AstraZeneca Covid-19 vaccine 25 weeks or more ago. In those that had received a second dose of the Pfizer Covid-19 vaccine 25 weeks or more ago, protection against symptomatic infection was just under 40%.

Protection against symptomatic infection increased, however, following a booster dose. In the two weeks following a booster (third) dose of the Pfizer Covid-19 vaccine, the UKHSA reported that vaccine effectiveness against Omicron increased to:

> around 71% among those who received AstraZeneca as the primary course and around 76% among those who received Pfizer as the primary course.[24]

The UKHSA emphasised that, given the small number of Omicron cases involved in this analysis, the vaccine effectiveness estimates for Omicron are "subject to significant uncertainty", adding that the results should be:

22 Nick Andrews et al, Effectiveness of BNT162b2 (Comirnaty, Pfizer-BioNTech) COVID-19 booster vaccine against covid-19 related symptoms in England: test negative case-control study, medRxiv, 15 November 2021; Nick Andrews et al, Effectiveness of COVID-19 booster vaccines against COVID-19-related symptoms, hospitalization and death in England | Nature Medicine 28, pages 831–837 (January 2022)

23 US Centers for Disease Control and Prevention, Omicron Variant: What You Need to Know, 11 December 2021

24 UK Health Security Agency, SARS-CoV-2 variants of concern and variants under investigation in England, Technical briefing 31, 10 December 2021, p21

> interpreted with caution due to the low numbers and the possible biases related to the populations with highest exposure to Omicron (including travellers and their close contacts) which cannot fully be accounted for.[25]

On 3 February 2022, the UKHSA published figures on vaccine effectiveness against **symptomatic disease** caused by the Omicron variant. They showed that:

> After 2 doses of the AstraZeneca vaccine, vaccine effectiveness against the Omicron variant starts at 45 to 50% then drops to almost no effect from 20 weeks after the second dose. With 2 doses of Pfizer or Moderna effectiveness dropped from around 65 to 70% down to around 10% by 25 weeks after the second dose. Two to four weeks after a booster dose of either the Pfizer or Moderna vaccine, effectiveness ranges from around 60 to 75%, dropping to 25 to 40% from 15+ weeks after the booster. Vaccine effectiveness estimates for the booster dose are very similar, irrespective of the primary course received.[26]

The UKHSA reported that a booster dose also provides protection against **severe disease and hospitalisation** following infection with the Omicron variant:

> Two doses of either AstraZeneca (ChAdOx1-S) or Pfizer (BNT162b2) vaccines was associated with a vaccine effectiveness of approximately 25 to 35% against hospitalisation following infection with the Omicron variant, after 25+ weeks. After a Pfizer booster (after either primary vaccination course), vaccine effectiveness against hospitalisation started at around 90% dropping to around 75% after 10 to 14 weeks. After a Moderna booster (mRNA-1273) (after either primary vaccination course), vaccine effectiveness against hospitalisation was 90 to 95% up to 9 weeks after vaccination.[27]

Omicron variants: BA.2, BA.4 and BA.5

The UK Health Security Agency (UKHSA) has more recently published research that examined the effectiveness of Covid-19 vaccines against the Omicron sub-lineage BA.2 (a lineage is a group of closely related variants that share a "common ancestor").[28] Following a booster dose, vaccine effectiveness against **severe outcomes** of Covid-19 (including **hospitalisation**), following infection with BA.2, peaked at 89.1% before falling to 56.5% after 15 or more weeks. Protection against **symptomatic disease** caused by BA.2 peaked at 74% one week after a booster dose, falling to "43·7% at 15 or more weeks after receiving the booster dose".[29]

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25 UK Health Security Agency, SARS-CoV-2 variants of concern and variants under investigation in England, Technical briefing 31, 10 December 2021, p21

26 UK Health Security Agency, COVID-19 vaccine surveillance report Week 5, 3 February 2022, p4

27 UK Health Security Agency, COVID-19 vaccine surveillance report Week 5, 3 February 2022, p9

28 "Stealth Omicron": Everything you need to know about the new BA.2 subvariant of SARS-CoV-2 | Gavi, the Vaccine Alliance, 27 January 2022

29 F C M Kirsebom et al, COVID-19 vaccine effectiveness against the omicron (BA.2) variant in England - The Lancet Infectious Diseases, 24 May 2022

According to the UKHSA, its research also shows that the effectiveness of Covid-19 vaccines against **hospitalisation,** following infection with the Omicron sub-lineage BA.4 or BA.5, is similar to the results obtained for BA.2:

> The latest evidence shows that vaccine effectiveness against hospitalisation is similar for the BA.4/5 variants as it is for BA.2. In somebody who received their second dose around 6 months previously, a booster dose increases protection against hospitalisation by 50 to 60%.[30]

[30] UKHSA, Monitoring reports of the effectiveness of COVID-19 vaccination, 1 September 2022

4 FAQs: Government policy

4.1 What is the Government's policy on administering Covid-19 booster vaccines?

Initial booster dose

Plans for booster vaccines were initially set out by the Government in February 2021. In the COVID-19 Response – Spring 2021 document, the Government stated that it was planning for a revaccination campaign which was likely to run in autumn or winter 2021:

> Any revaccination is likely to consist of a single 'booster' dose of a COVID-19 vaccine: the ideal booster may be a new vaccine specifically designed against a variant form of the virus. Over the longer term, revaccination is likely to become a regular part of managing COVID-19.[31]

Speaking at a Downing Street press conference on 23 March 2021, the Government Chief Scientific Adviser, Sir Patrick Vallance, said that there was a need to consider "booster jabs for vaccines in the autumn" in order to reach a "high level of immunity to cover things over the winter".[32] The then Minister for COVID Vaccine Deployment, Nadhim Zahawi MP, told the Commons in July 2021 that the booster campaign would begin in "early September".[33]

Additional Covid-19 vaccine supplies have been purchased by the Government for the purposes of delivering a third dose of vaccine. In April 2021, the Government's Vaccines Taskforce announced that it had purchased an additional 60 million doses of the Pfizer/BioNTech vaccine, to be used alongside other approved Covid-19 vaccines, in preparation for "the booster COVID-19 vaccination programme beginning from the autumn".[34] A subsequent order for 35 million more doses of the Pfizer/BioNTech vaccine, to be delivered from the second half of next year, was announced by the Government in August 2021. In December 2021, the Government stated that it

31 HM Government, COVID-19 Response – Spring 2021, 22 February 2021

32 COVID-19 vaccine boosters could be needed later in the year, UK chief scientist says, Reuters, 23 March 2021

33 HC Deb, 22 July 2021, c1137

34 Press release: UK secures extra 60 million Pfizer/BioNTech COVID-19 vaccines, Department of Health and Social Care, 28 April 2021

had signed contracts to buy 60 million additional doses of the Moderna vaccine and 54 million more Pfizer/BioNTech doses for 2022 and 2023.[35]

The Government stated that the "final decisions on the timing and scope and cohort eligibility of any COVID-19 vaccine booster programme will be confirmed once the JCVI [Joint Committee on Vaccination and Immunisation] has provided their final advice".[36]

The Department of Health and Social Care is advised by the Joint Committee on Vaccination and Immunisation (JCVI), an independent expert advisory committee. It provides advice on the introduction of new programmes, as well as major changes to, or the discontinuation of, an existing immunisation programme. The JCVI states that it formulates advice and recommendations based on "appraisal of the best scientific and other evidence available and reflecting current good practice and/or expert opinion"[37]

In its Covid-19 Response: Autumn and Winter Plan (September 2021) the Government announced that, following further advice from the JCVI, it would be offering booster doses to individuals who received vaccination in Phase 1 of the Covid-19 vaccination programme (priority groups 1-9), no earlier than 6 months after completion of their primary course. It added that the NHS was preparing to offer booster doses from 20 September 2021.

Following the emergence of the Omicron variant, the Prime Minister announced on 12 December 2021 that, as of 13 December, the booster programme would be opened up "to every adult over 18 who has had a second dose of the vaccine at least three months ago". He added that walk-in centres would accept over 18s for a booster from 13 December, while the National Booking System would allow all over 18s to book an appointment from 15 December (see section 5 for further details).[38]

Additional booster doses

Spring 2022

On 21 February 2022, the Joint Committee on Vaccination and Immunisation (JCVI) recommended a "Spring dose" of Covid-19 vaccine should be offered, approximately 6 months after the last Covid-19 vaccine dose, to:

- adults aged 75 years and over;

35 UK signs deal with Pfizer/BioNTech for 35 million vaccines, Department of Health and Social Care, 23 August 2021; Government agrees new deals to future proof vaccine rollout in light of new variant, Department of Health and Social Care, 2 December 2021

36 PQ 34548 [on Coronavirus: Vaccination], 26 July 2021

37 Joint Committee on Vaccination and Immunisation, Code of Practice, June 2013

38 Prime Minister's Office, 10 Downing Street, Prime Minister's address to the nation on booster jabs, 12 December 2021

- residents in a care home for older adults;
- individuals aged 12 years and over who are immunosuppressed.[39]

The Health Secretary, Sajid Javid, later confirmed that all four parts of the UK intended to follow the JCVI's advice.[40] The spring booster campaign began on 21 March 2022 in England and is expected to run until the early summer. NHS England estimates that around 5 million people will be eligible for a spring booster dose; it will be a fourth dose (a second booster) for those in the first two groups and a fifth dose for those who are immunosuppressed.[41] More information on Covid-19 vaccination for the immunosuppressed is set out in section 6.

Regarding the type of Covid-19 vaccine dose to be offered, the JCVI recommended:

- for eligible adults aged 18 years and over, 50mcg Moderna (Spikevax) vaccine or 30mcg Pfizer-BioNTech (Comirnaty) vaccine
- for eligible persons aged 12 to 18 years, 30 mcg Pfizer-BioNTech (Comirnaty) vaccine.[42]

The JCVI has also stated that a further booster in the autumn of 2022 is likely to be advised for people who are at higher risk of severe Covid-19.

In its COVID-19 Response: Living With COVID-19 document, published in February 2022, the Government confirmed that it had "procured enough doses of vaccine to anticipate a wide range of possible JCVI recommendations" for further vaccination programmes.[43]

Autumn 2022

The Joint Committee on Vaccination and Immunisation (JCVI) recommended in July 2022 that those who continue to be more at risk of severe Covid-19 should be offered a Covid-19 booster vaccine in autumn 2022, specifically:

- residents in a care home for older adults and staff working in care homes for older adults;
- frontline health and social care workers;
- all adults aged 50 years and over;

39 JCVI, Statement on COVID-19 vaccinations in 2022, 21 February 2022
40 Health Secretary statement on spring COVID-19 booster vaccinations ,Department of Health and Social Care, 21 February 2022
41 NHS England, NHS bookings open for Spring boosters, 21 March 2022
42 JCVI, Statement on COVID-19 vaccinations in 2022, 21 February 2022
43 HM Government, Covid-19 Response: Living with Covid-19, February 2022

- persons aged 5 to 49 years in a clinical risk group, as set out in the Green Book, chapter 14a, tables 3 and 4;
- persons aged 5 to 49 years who are household contacts of people with immunosuppression;
- persons aged 16 to 49 years who are carers, as set out in the Green Book, chapter 14a, table 3.[44]

The Government has accepted the JCVI's advice. It noted that the eligibility groups were wider than those announced in the JCVI's interim advice in May 2022, stating that the "recent epidemiology of the BA.4 and BA.5 waves, as well as the benefits of aligning the COVID-19 programme with the flu vaccine rollout" led the JCVI to conclude that "expanding the offer would provide necessary protection to those at higher risk of severe illness and keep greater numbers of people out of hospital".[45]

The autumn booster programme began in England on 5 September 2022. The JCVI has advised that the autumn booster dose should be "offered at least three months after the previous dose". The autumn booster will also coincide with the annual flu immunisation programme. The JCVI states that Covid-19 and flu vaccines can be 'co-administered' (given at the same appointment). The last day of the autumn booster campaign in England is 12 February 2023.

44 JCVI statement on the COVID-19 booster vaccination programme for autumn 2022: update 15 August 2022

45 Statement UIN HCWS215 [on Vaccination Update], 18 July 2022

5 FAQs: Booster roll-out and priority groups

5.1 Who will be eligible for an initial Covid-19 booster vaccine?

The Department of Health and Social Care is advised by the Joint Committee on Vaccination and Immunisation (JCVI), an independent expert advisory committee. It provides advice on the introduction of new programmes, as well as major changes to, or the discontinuation of, an existing immunisation programme. The JCVI states that it formulates advice and recommendations based on "appraisal of the best scientific and other evidence available and reflecting current good practice and/or expert opinion." [46]

Advice on eligibility for a Covid-19 booster vaccine has been updated several times since June 2021. Between 13 December 2021 and 12 February 2023 all those over 18 years of age, who have received a second dose of Covid-19 vaccine more than 3 months ago, are eligible for a booster (third) dose. In some areas, these can be accessed on a 'walk-in' basis. Those aged 16 and over who are eligible can book an appointment via the National Booking System.

After 12 February 2023, following advice from the JCVI, the offer of third (booster) dose of Covid-19 vaccination will end for those aged 16-49 years who are not in a clinical risk group.[47]

An overview is provided below of how the advice from the JCVI on initial (first) Covid-19 boosters has developed, and been updated, during 2021.

June 2021

Interim advice was issued by the JCVI in June 2021 on any potential COVID-19 booster vaccine programme [in] winter 2021 to 2022. The Committee stated that the purpose of any booster programme should be to "reduce the occurrence of serious COVID-19 disease" and that it should begin in September 2021, in order to "maximise protection in those who are most

46 Joint Committee on Vaccination and Immunisation, Code of Practice, June 2013

47 Statement UIN HCWS518 [on Covid-19 Vaccination Update], 25 January 2023

vulnerable to serious COVID-19 ahead of the winter months". [48] The JCVI also recommended that boosters be offered in two stages:

> Stage 1. The following persons should be offered a third dose COVID-19 booster vaccine and the annual influenza vaccine as soon as possible from September 2021:
>
> - adults aged 16 years and over who are immunosuppressed
> - those living in residential care homes for older adults
> - all adults aged 70 years or over
> - adults aged 16 years and over who are considered clinically extremely vulnerable
> - frontline health and social care workers
>
> Stage 2. The following persons should be offered a third dose COVID-19 booster vaccine as soon as practicable after stage 1, with equal emphasis on deployment of the influenza vaccine where eligible:
>
> - all adults aged 50 years and over
> - adults aged 16 to 49 years who are in an influenza or COVID-19 at-risk group. (Refer to the Green Book for details of at-risk groups)
> - adult household contacts of immunosuppressed individuals. [49]

The JCVI emphasised that its advice was "interim" and thus "may be subject to substantial change before being finalised". [50]

September 2021

Updated advice from the JCVI was subsequently published on 14 September 2021, in which it recommended:

> individuals who received vaccination in Phase 1 of the COVID-19 vaccination programme (priority groups 1 to 9) should be offered a third dose COVID-19 booster vaccine. This includes:
>
> - those living in residential care homes for older adults;
> - all adults aged 50 years or over;
> - frontline health and social care workers;

48 JCVI, Interim advice: potential COVID-19 booster vaccine programme winter 2021 to 2022, 30 June 2021

49 JCVI, Interim advice: potential COVID-19 booster vaccine programme winter 2021 to 2022, 30 June 2021

50 PQ 34548 [on Coronavirus: Vaccination], 26 July 2021

- all those aged 16 to 49 years with underlying health conditions that put them at higher risk of severe COVID-19 (as set out in the green book), and adult carers;

- adult household contacts (aged 16 or over) of immunosuppressed individuals.

[...]

JCVI advises that the booster vaccine dose is offered no earlier than 6 months after completion of the primary vaccine course, and that the booster programme should be deployed in the same order as during Phase 1. [51]

It set out the rationale behind its advice as follows:

> Taking a precautionary position, JCVI considers that on balance, it is preferable to ensure protection is maintained at a high level throughout the winter months in adults who are more vulnerable to severe COVID-19, rather than implement a booster programme too late to prevent large increases of severe COVID-19 in previously double vaccinated individuals. [52]

The JCVI added that the benefits of a booster programme for younger adults will be considered at a later date, when more data is available.

As noted above, in section 4.1, the Government accepted the JCVI's advice on Covid-19 booster vaccines and stated that "all four parts of the UK intend to follow the JCVI's advice". [53]

15 November 2021: Boosters for the 40-49 age group

Updated advice was issued by the JCVI on 15 November 2021 in which it stated that "all adults aged 40 to 49 should also be offered a booster vaccination with an mRNA COVID-19 vaccine, 6 months after their second dose, irrespective of the vaccines given for the first and second doses". [54] The Government subsequently stated that it had accepted the JCVI's advice and that all parts of the UK intend to follow the updated advice. [55]

29 November 2021: JCVI advice on the UK vaccine response to the Omicron variant

Following the emergence of the Omicron variant, the Secretary of State for Health asked the JCVI to expedite its review of whether to offer booster doses to those aged 18 to 39 years. On 29 November 2021, the JCVI published its advice, stating that the following immediate measures should be undertaken:

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51 JCVI, Independent report: JCVI statement regarding a COVID-19 booster vaccine programme for winter 2021 to 2022, 14 September 2021

52 ibid

53 Written statement HCWS288 [on Covid-19 Update], 14 September 2021

54 JCVI, Update to JCVI advice on booster vaccination in adults, 15 November 2021

55 Statement UIN HCWS392, Covid-19 update, 15 November 2021

- Booster vaccination eligibility should be expanded to include all adults aged 18 years to 39 years.

- Booster vaccination should now be offered in order of descending age groups, with priority given to the vaccination of older adults and those in a COVID-19 at-risk group. Booster vaccination should not be given within 3 months of completion of the primary course.[56]

The JCVI also updated its advice on boosters for those who are severely immunosuppressed; this is discussed in detail in section 6 on the 'Third primary vaccine dose'.

Statement from the Prime Minister on Covid-19 vaccine booster doses, 12 December 2021

The Prime Minister gave an address to the nation on 12 December 2021 on the delivery of Covid-19 booster vaccine doses. The address marked the launch of the "Omicron Emergency Boost", aimed at accelerating the delivery of booster doses to those aged 18 and over (who have received their second dose of Covid-19 vaccine more than 3 months ago). The Prime Minister set a target of offering all eligible adults in England a booster dose by the end of 2021 and stated that those aged 18 and over would be able to book an appointment for a booster dose, via the National Booking System, from 15 December.[57]

Those aged 16 and 17 can also access a booster dose if they had their second dose of the Covid-19 vaccine at least 3 months ago.[58]

5.2 Will I receive a different 'brand' of booster vaccine to my first two doses?

The UK medicines regulator, the Medicines and Healthcare products Regulatory Agency (MHRA) has authorised the Pfizer and AstraZeneca Covid-19 vaccines to be used as "booster doses".[59] It has also authorised the use of the 'original' Moderna (Spikevax) vaccine – either as a full or half dose – as a booster, as well as the newly developed 'Spikevax bivalent Original/Omicron' and the Pfizer/BioNTech bivalent vaccine.[60] The bivalent vaccines target two

56 JCVI, JCVI advice on the UK vaccine response to the Omicron variant, 29 November 2021

57 News story: Urgent Omicron appeal: Get boosted now, Prime Minister's Office, 10 Downing Street, 12 December 2021

58 How to get a booster dose of the coronavirus (COVID-19) vaccine – NHS, 6 April 2022

59 MHRA statement on booster doses of Pfizer and AstraZeneca COVID-19 vaccines, MHRA, 9 September 2021;

60 MHRA statement on COVID-19 booster vaccines, MHRA, 14 September 2021; MHRA, First bivalent COVID-19 booster vaccine approved by UK medicines regulator, 15 August 2022

61

coronavirus variants, the original (also known as 'wild type') and Omicron BA.1.

Advice on which product to give as a booster has been provided by the JCVI, following a review of the available data.

JCVI 2021 advice

In its June 2021 advice, the JCVI noted that clinical trial data on "reactogenicity [reactions/side effects post-vaccination] and immunogenicity [immune response] following booster revaccination with the same or alternative COVID-19 vaccines" would become available over the next few months and that they would consider this data (alongside others) ahead of issuing any final advice. [62]

One such study assessing the effectiveness of a third dose of Covid-19 vaccine is the 'Cov-Boost' trial which received a funding share of £22 million from the Government as part of Budget 2021. [63] The Department of Health and Social Care explained that the trial would:

> look at seven different COVID-19 vaccines as potential boosters, given at least 10 to 12 weeks after a second dose as part of the ongoing vaccination programme. One booster will be provided to each volunteer and could be a different brand to the one they were originally vaccinated with. [64]

Initial findings from the 'Cov-Boost' study were cited in the JCVI's September 2021 advice on boosters. The JCVI noted that the data from the trial indicated that "booster doses of COVID-19 vaccines are generally well tolerated and provide a substantial increase in vaccine-induced immune responses". It added that:

> In particular, mRNA vaccines provide a strong booster effect, regardless of whether the primary course was with the Pfizer-BioNTech (BNT162b2/ Comirnaty) or the AstraZeneca (ChAdOx1-S/Vaxzevria) vaccine. These results are consistent with those from other studies that examined the effect of half dose (50µg) Moderna (mRNA-1273/Spikevax) vaccine following primary courses of full or half doses of Moderna mRNA-1273 vaccination. A half dose (50µg) of Moderna (mRNA-1273/Spikevax) vaccine given as a booster was found to cause a similar level of local and systemic reactions to vaccination (injection site pain and headache) compared to a full dose of Moderna (mRNA-1273/Spikevax) given as a second dose. [65]

The JCVI went on to recommend a preference for the "Pfizer-BioNTech [...] vaccine to be offered as the third booster dose irrespective of which product was used" for doses one and two. It added that a half dose of the Moderna

62 JCVI, Interim advice: potential COVID-19 booster vaccine programme winter 2021 to 2022, 30 June 2021

63 HM Treasury, Budget 2021, March 2021, HC 1226, p68

64 Press release: World-first COVID-19 vaccine booster study launches in UK, Department of Health and Social Care, 19 May 2021

65 JCVI, Independent report: JCVI statement regarding a COVID-19 booster vaccine programme for winter 2021 to 2022, 14 September 2021

vaccine could also be offered. For those individuals where an mRNA vaccine is contraindicated, the JCVI advised that the AstraZeneca vaccine may be considered for those who received AstraZeneca vaccine in the primary course. [66] In its updated advice for the 40-49 year age group, published in November 2021, the JCVI continued to advise that "booster vaccination should preferably be undertaken with either the Pfizer-BioNTech vaccine [...] or a half dose of Moderna". [67]

JCVI advice for the autumn 2022 booster campaign

In its August 2022 advice, ahead of the start of the autumn 2022 booster campaign, the JCVI advised that it would be "preferable for a single type of booster vaccine to be offered throughout the duration of the autumn programme" to ensure vaccine deployment runs as smoothly as possible. [68] Offering a single 'type' in this instance does not mean offering a single brand, but rather offering one of the 'original' mRNA Covid-19 vaccines (Moderna or Pfizer) or a 'bivalent' vaccine which targets two coronavirus variants. [69]

The JCVI added that, if deploying bivalent vaccines would cause the autumn campaign to be subject to delays, then "timeliness should take priority" and 'original' type Covid-19 vaccine offered instead. [70]

NHS England has since stated that, "in line with the JCVI recommendation, the NHS will deploy a single type of vaccine (bivalent vaccines) – the mRNA bivalent Omicron BA.1/Original 'wild-type' vaccines for adult booster doses". [71]

5.3 Are the Covid-19 booster vaccines designed to address Covid-19 variants?

There are vaccines in development that aim to address multiple Covid-19 variants. For example, initial ('Phase 1') trials of vaccine called GRT-R910 have started at Manchester Royal Infirmary. Its aim is to "boost the immune response of first-generation Covid-19 vaccines to a wide array of variants of SARS-CoV-2, which cause Covid-19". [72]

66 ibid

67 JCVI, Update to JCVI advice on booster vaccination in adults, 15 November 2021

68 UK Health Security Agency, JCVI publishes advice on COVID-19 vaccines for autumn booster programme, 15 August 2022

69 The JCVI also stated in its August 2022 advice that the Nuvaxovid Covid-19 vaccine, developed by Novavax, may be used 'off-label' as a booster dose for persons aged 18 years and above when no alternative clinically suitable UK-approved COVID-19 vaccine is available.

70 JCVI statement on the COVID-19 booster vaccination programme for autumn 2022: update 15 August 2022

71 NHS England, Autumn COVID-19 booster and flu vaccine programme (england.nhs.uk), 18 August 2022

72 Manchester University NHS Foundation Trust, Early trial of first multivariant COVID-19 vaccine booster begins in Manchester, 20 September 2021

Efforts are also underway to develop bivalent vaccines which target two different strains (variants) of Covid-19 in a single vaccine dose.

The JCVI noted in its June 2021 guidance that "vaccines designed specifically against variants of concern will not be available in time for booster revaccination this autumn [2021]".[73] Any vaccine booster designed to address variants would need approval from the Medicines and Healthcare products Regulatory Agency (MHRA – the UK's medicines regulator) before it could be administered in the UK. Earlier in 2021, the MHRA stated that they would put in place a fast-track process for this purpose.[74]

More recently, in its August 2022 advice for the autumn 2022 booster campaign, the JCVI emphasised that bivalent vaccines could be offered, so long as this does not cause any operational delays to the programme:

> If sufficient doses of mRNA bivalent Original 'wild-type'/Omicron BA.1 vaccine become available to complete the autumn booster programme, JCVI considers that it is expedient to aim to offer authorised bivalent vaccines throughout the autumn programme, subject to operational considerations. Where substantial delays might be incurred in deploying a bivalent vaccine, the principle of timeliness should take priority and an alternative UK-approved booster vaccine offered, such as a monovalent Original 'wild-type' mRNA vaccine.[75]

NHS England has since stated that, "in line with the JCVI recommendation, the NHS will deploy a single type of vaccine (bivalent vaccines) – the mRNA bivalent Omicron BA.1/Original 'wild-type' vaccines for adult booster doses".[76] Following its approval by the MHRA in September 2022, the Pfizer/BioNTech bivalent vaccine Original / Omicron BA.1 is also being deployed as part of the autumn 2022 booster campaign.

5.4 Where will booster vaccinations take place?

On 1 July 2021, NHS England and NHS Improvement wrote to NHS organisations setting out plans for Covid-19 vaccination for the autumn/winter (referred to as 'phase three planning').[77] The letter highlights the delivery model for the potential booster vaccination programme and its co-administration with the seasonal influenza vaccination programme.

"Mixed delivery models" are recommended, which "spread capacity across community pharmacy, vaccination centres and general practice". The

73 JCVI, Interim advice: potential COVID-19 booster vaccine programme winter 2021 to 2022, 30 June 2021

74 Press release: Modified COVID-19 vaccines for variants to be fast-tracked, says MHRA and other regulators, Medicines and Healthcare products Regulatory Agency, 4 March 2021

75 JCVI statement on the COVID-19 booster vaccination programme for autumn 2022: update 15 August 2022 - GOV.UK

76 NHS England, Autumn COVID-19 booster and flu vaccine programme (england.nhs.uk), 18 August 2022

77 NHS England, Letter RE: COVID-19 Vaccination Autumn / Winter (Phase 3) planning, 1 July 2021

guidance also emphasises that the best modes of access to meet the requirements of the local population also need to be considered. The latter, it explains, could include the use of 'pop-up' clinics, mobile vaccination units, and other approaches.[78]

NHS England reported on 19 September 2021 that invites for a booster vaccine had been sent to over 1.5 million people, via both text message and letter. It added that bookings could be made through the National Booking Service, while those unable to go online can book by calling 119.[79]

Following the expansion of the booster programme to all those aged 18 and over who received their second dose of Covid-19 vaccine more than 3 months ago, the Prime Minister announced the following measures to increase delivery capacity:

- New vaccination sites set up across the country, including mobile pop up sites.
- Increasing opening times for vaccination sites, to 7 days a week with more appointments early in the morning, in the evening and at weekends.
- 50 military planning experts will help coordinate the national effort by supporting the NHS with logistics of the rollout.
- Reprioritising the NHS workforce to deliver as many jabs as possible.
- A national call for thousands more NHS volunteers.[80]

5.5 When can I book an appointment for a booster vaccination?

Those who are aged 16 and over, and who have received a second dose of Covid-19 vaccine more than 3 months ago are eligible for a Covid-19 booster. Those aged 12-15 years, with a health condition that puts them at high risk from Covid-19, or who live with someone who has a weakened immune system, are also eligible for a booster dose. Covid-19 booster appointments can be booked via the NHS Website: Book or manage a booster dose of the coronavirus (COVID-19) vaccine - NHS The NHS website advises that appointments can be pre-booked from **2** months (61 days) after your 2nd dose, though the appointment dates you will be offered will be from 3 months (91 days) after your 2nd dose.

78 See also PQ 21972 [on Coronavirus: Vaccination], 27 July 2021

79 NHS England, Over one million invited for COVID booster jabs this week, 19 September 2021

80 News story: Urgent Omicron appeal: Get boosted now, Prime Minister's Office, 10 Downing Street, 12 December 2021,

Some vaccination sites are also offering boosters to those who are eligible on a 'walk-in' basis, where a pre-booked appointment is not needed. More details can be found on the NHS website Find a walk-in coronavirus (COVID-19) vaccination site - NHS

For the 2022 autumn booster campaign, those who are eligible should be able to book an appointment at a vaccination centre or pharmacy online, via the national booking service.[81] Boosters can also be accessed via walk-in COVID-19 vaccination sites.

5.6 Who will be eligible for a second, 'spring' 2022 booster dose?

A 'Spring dose' of Covid-19 vaccine is to be offered, approximately 6 months after the last Covid-19 vaccine dose, to:

- adults aged 75 years and over;
- residents in a care home for older adults;
- individuals aged 12 years and over who are immunosuppressed.

Regarding the type of Covid-19 vaccine dose to be offered, the JCVI recommended:

- for eligible adults aged 18 years and over, 50mcg Moderna (Spikevax) vaccine or 30mcg Pfizer-BioNTech (Comirnaty) vaccine
- for eligible persons aged 12 to 18 years, 30 mcg Pfizer-BioNTech (Comirnaty) vaccine.[82]

The spring booster campaign began on 21 March 2022 in England and is expected to run until early summer. Those who are eligible for a spring booster will be contacted by the NHS and asked to book an appointment using the National Booking System – either online or by calling 119. NHS England estimates that around 5 million people will be eligible for a spring booster during the campaign.[83]

81 NHS England, Autumn COVID-19 booster and flu vaccine programme (england.nhs.uk), 18 August 2022

82 JCVI, Statement on COVID-19 vaccinations in 2022, 21 February 2022

83 NHS England, NHS bookings open for Spring boosters, 21 March 2022

5.7 Who will be eligible for an 'autumn' 2022 booster dose?

In autumn 2022, a booster dose of Covid-19 vaccine is to be offered to:

- residents in a care home for older adults and staff working in care homes for older adults
- frontline health and social care workers
- all adults aged 50 years and over
- persons aged 5 to 49 years in a clinical risk group, as set out in the Green Book, chapter 14a, tables 3 and 4
- persons aged 5 to 49 years who are household contacts of people with immunosuppression
- persons aged 16 to 49 years who are carers, as set out in the Green Book, chapter 14a, table 3

As per previous booster campaigns, the NHS will be in contact with eligible groups via SMS, email and letter and they will be asked to book an appointment via the National Booking System, accessed online or by calling 119.

5.8 How can I check or correct my Covid-19 vaccination record?

England

For those who have received Covid-19 vaccines in England, it is possible to check your Covid-19 vaccine record via the NHS website at:

- Check your COVID-19 vaccine record - NHS (service.nhs.uk).

If your Covid-19 vaccination record is wrong, or is missing information, the Vaccination Data Resolution Service may be able to help. More details are available at:

- Get help with the check your COVID-19 vaccine record service - NHS (www.nhs.uk)

Northern Ireland

The NI COVID Travel certificate shows those Covid-19 vaccines received in Northern Ireland, including boosters, see Apply for a Travel COVID vaccination certificate | nidirect

Issues with a record, such as missing or incorrect information, can be raised with the Department of Health on 0300 200 7814

Scotland

In Scotland, 'COVID Status' shows details of the Covid-19 vaccinations and Covid test results you have received:

- NHS Scotland COVID Status | NHS inform

If any of the information on COVID Status is wrong, there is a COVID Status helpline: 0808 196 8565

Wales

In Wales, the NHS COVID Pass shows your vaccination status: Get your NHS COVID Pass | GOV.WALES

If your vaccine status is incorrect, gov.wales suggests contacting vaccine.certification@swansea.gov.uk

6 FAQs: Third primary vaccine dose

6.1 What is the difference between the booster programme and the offer of a third primary vaccine dose to those who are severely immunosuppressed?

The JCVI has provided separate, distinct advice for those who are severely immunosuppressed, due to underlying health conditions or medical treatment, regarding receiving a third, 'primary' dose of a Covid-19 vaccine. Noting that those who are immunosuppressed may not produce a full immune response to a primary course of Covid-19 vaccination, it advised that a "third primary dose be offered to individuals aged 12 years and over with severe immunosuppression".[84] It added that this was a precautionary measure:

> JCVI recognises that many persons who are immunosuppressed remain concerned regarding their risk of COVID-19 despite having received 2 doses of the primary vaccine schedule as currently advised. The potential for additional protection from a third primary dose is unknown at an individual level.
>
> [...]
>
> Until more data is available, any provision of a third primary dose to persons who are immunosuppressed will draw on the assumption that a third dose is unlikely to confer significant harms or disadvantages, but may offer the possibility of benefit. These uncertainties in harms and benefits will need to be communicated as part of informed consent, and expectations regarding the value of a third primary dose taken into account.[85]

The Green Book (a UK Health Security Agency publication containing information for health professionals on developments in the field of immunisation) advises that the timing of a third dose be should "be undertaken by the specialist involved in the care of the patient" and given "ideally at least 8 weeks after the second dose, with special attention paid to current or planned immunosuppressive therapies".[86]

84 JCVI, Joint Committee on Vaccination and Immunisation (JCVI) advice on third primary dose vaccination, 1 September 2021

85 ibid

86 UK Health Security Agency, Chapter 14a COVID-19 - SARS-CoV-2, Immunisation against infectious disease (commonly known as 'The Green Book') 30 November 2021, p19

The NHS webpage on Coronavirus (COVID-19) vaccine for people with a severely weakened immune system explains that those who are eligible will be contacted by their GP or their specialist. It adds that, in some cases, you "may get a letter from the NHS advising that you may be eligible and to discuss this with your doctor". It goes on to state that the vaccination will typically take place "at your local hospital or a local NHS service such as your GP surgery."[87] The National Booking System, however, now allows those with a severely weakened immune system to book their third dose online, though it emphasises that you should take your letter from your GP or hospital specialist to your third dose appointment.

The JCVI stated a preference for mRNA vaccines (Pfizer, Moderna) for the third primary dose but with the option of the AstraZeneca vaccine "for individuals who have received this vaccine previously where this would facilitate delivery". It added that for those in the 12 to 17 years age group, the Pfizer vaccine remains the preferred choice.[88]

6.2 Are those who are severely immunosuppressed also being offered booster doses of Covid-19 vaccine?

In its advice published on 29 November 2021, the JCVI recommended that "severely immunosuppressed individuals who have completed their primary course (3 doses) should be offered a booster dose with a minimum of 3 months between the third primary and booster dose".[89] More information is available in the Green Book, see UK Health Security Agency, Chapter 14a, Immunisation against infectious disease..

The JCVI subsequently recommended in February 2022 that individuals aged 12 years and over who are immunosuppressed, as defined in the Green Book, should be offered a further dose of Covid-19 vaccine (a 'Spring dose') approximately 6 months after their last dose.[90] Those who are immunosuppressed are also listed as eligible for another booster dose as part of the autumn 2022 booster campaign.[91]

87 NHS, Coronavirus (COVID-19) vaccine 3rd dose, 11 November 2021

88 JCVI, Joint Committee on Vaccination and Immunisation (JCVI) advice on third primary dose vaccination, 1 September 2021

89 JCVI, JCVI advice on the UK vaccine response to the Omicron variant, 29 November 2021

90 Joint Committee on Vaccination and Immunisation (JCVI), JCVI statement on COVID-19 vaccinations in 2022, 21 February 2022

91 Joint Committee on Vaccination and Immunisation (JCVI) updated statement on the COVID-19 vaccination programme for autumn 2022 - GOV.UK (www.gov.uk), 15 July 2022

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