

Theme 4: The design and delivery of the vaccination strategy

By the Usher Network for COVID-19 Evidence Reviews (UNCOVER), Usher Institute, University of Edinburgh



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Disclaimer

This rapid review has not been peer-reviewed and we have not conducted quality assessment of the included studies. Many of the included studies are pre-print publications or reports and therefore not peer-reviewed either. This review should not replace individual clinical judgement and the sources cited should be checked. The views expressed represent those of the authors and are not a substitute for professional medical advice.

Disclaimer:

This report was commissioned by the Scottish Covid-19 Inquiry as introductory scoping research. It was written to assist the inquiry with its planning process about the shape and direction of its investigation, and is published in the interests of transparency. The inquiry is grateful to the author[s] for their work. The inquiry is an independent body, and will be carrying out its own investigations to fulfil its terms of reference. The introductory research represents the views of those who wrote it, and nothing in it is binding on the inquiry. The introductory research is one of many sources which will be considered by the inquiry during the course of its investigation.

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Executive summary

In accordance with the terms of reference for Portfolio 1, this report focuses on theme 4: **The design and delivery of the vaccination strategy**. The specific scope of the report is to provide information about the key events, key people and key documentation to assist the Scottish Inquiry with their investigation.

A detailed analysis is presented, including the sources of information, the key events, the main findings and a list of the main questions or remaining issues, is presented separately. In addition, a detailed appendix table with the key information for each key event extracted is included.

The key sub-themes include: 4.1 Vaccine development, manufacturing, and authorization; 4.2 The design, management, and progress of the vaccination programme, including the longer-term role of the COVID-19 vaccination programme; and 4.3 Vaccine efficacy, effectiveness, safety, and uptake (including impact on equalities). The potential questions for the Inquiry to consider are:

4.1.1 How is the manufacture of Covid-19 vaccines being supported in Scotland? What is the long-term plan for vaccine production?

4.1.2 Reasons why the UK pulled out from the Valneva deal in September 2021 and what are the current plans for using the Livingston factory to produce vaccines for Scotland through support by the Scottish Enterprise?

4.2.1 Decision on COVID-19 first phase priority groups (groups 1-9).

4.2.2 Decision and timing of the decision for unpaid carers, adults with learning disabilities and homeless people to be prioritised and put in group 6 of phase 1 (impact on equalities).

4.2.3 Decision on COVID-19 second phase priority groups, which remained age-based (and lack of initial inclusion of certain key workers in priority groups in phases 1 and 2) (impact on equalities).

4.2.4 Timing of call for prisoners and prison staff to be prioritised (impact on equalities).

4.2.5 Change of advice for under 30s and under 40s in relation to the use of the AstraZeneca vaccine due to a side effect condition characterised by thromboembolic events (blood clots) and accompanied by thrombocytopenia (low platelets).

4.2.6 Advice for pregnant women at various stages of the pandemic and issues in relation for them to book appointments (impact on equalities).

4.2.7 Decision to prioritise first doses (i.e. extending the gap of the Pfizer vaccine from 3 to 12 weeks).

4.2.8 Decision to expand the first booster vaccination programme to cover all adults.

4.2.9 Decision to bring the first booster vaccination forward to 3 months since second dose.

4.2.10 How were the ethical considerations around vaccination considered and did they actively inform decisions alongside other evidence? Did an ethical analysis take place in order to justify prioritisation to different groups? How were the benefits identified and balanced?

4.2.11 Decision that the UK government will lead on purchase and supply of COVID-19 vaccines.

4.2.12 More information about the role of the Flu Vaccine and Covid Vaccine Programme (FVCV) may be needed.

4.2.3 The COVID-19 vaccination programme has been categorised by the Scottish government in three tranches, however vaccination of children is not included in any of the three tranches.

4.2.14 Decision-making around vaccinating children and young people has not been as easy and as straightforward as it has been for adults (mainly because of Covid-19 leading to less severe disease for most children). However, change in policy (e.g. 1 or 2 doses for 12–15-year-olds, and more recently advice on vaccinating 5–11-year-olds to be less urgent) may introduce vaccine hesitancy. The current plan for vaccinating 5–11-year-olds is through GPs and pharmacies. It is possible that without a programme in schools, coverage among disadvantaged will be low (impact on equalities).

4.2.15 Vaccine wastage has been kept below the 5% threshold throughout the vaccination programme. A few months have had higher wastage than others.

4.2.16 Plan for a longer-term, sustainable workforce of vaccinators is needed, now that temporary vaccinators have returned to their original posts and also there is a high staff burnout.

4.2.17 Development, cost, flexibility and personal information held in the new digital tools that were developed specifically for the COVID-19 vaccination programme. Consideration of ethical issues in data use in pandemic context (research and service planning/ provision closely aligned, with almost real time use of data).

4.3.1 Timing of the restriction of the use of the AstraZeneca vaccine firstly to be used for adults >30 years old and then for adults >40 years old (impact on equalities).

4.3.2 Efforts to address impact on equalities in relation to access and uptake of vaccines of specific sub-populations, including younger age groups, particular ethnic minorities, those living in the most deprived areas, and pregnant women (impact on equalities).

4.3.3 Were there any efforts made to counter misinformation especially on social media (impact on equalities)?

4.3.4 Was the degree of inequity greater or less than in other parts of the UK?

4.3.5 Was there enough done to address inequity, given that it was expected to be an issue (impact on equalities)?

4.3.6 What is known about the level and causes of vaccine hesitancy in Scotland (impact on equalities)?

4.3.7 Did Scotland play its role in promoting global vaccine access especially for LMICs - was there a fair balance between national needs and global responsibility? This is an ethical issue in terms of global health ethics as well as a pandemic control issue since we live in an interconnected world. This comment is also relevant to the section on supply and production (impact on equalities).

Introduction

Theme 4 of Portfolio 1 relates to the design and delivery of the vaccination strategy. The COVID-19 vaccines currently approved for use in the UK are: Pfizer/BioNTech vaccine (for over 16 year olds, 12-15 year olds and a new formulation for 5-11 year olds), Oxford/AstraZeneca vaccine (for over 16 year olds, although current advice is for it to be used for over 40 year olds), Moderna vaccine (for over 16 year olds and for 12-15 year olds), Janssen vaccine (for over 16 year olds; currently unavailable) and Novavax vaccine (for over 16 year olds; currently unavailable).

The main aim of this scoping review was to identify the key decisions or key milestones and the key players for issues specific to Theme 4. We include relevant documentation that describes these events and, if available, academic peer-reviewed or pre-print literature. In addition to the key issues that were highlighted by the public inquiry, we include additional issues identified by this scoping review. We discuss the impact of these issues on equalities. Finally, we suggest a prioritisation for the investigation of specific events using pre-defined criteria.

Main findings

Key events together with dates, key players and relevant documentation in relation to vaccination issues are presented in **Appendix Table 4.1**. From reviewing the timeline the following key sub-themes emerged, which we present in three categories.

- 4.1) Vaccine development, manufacturing, and authorisation
- 4.2) Design, management and progress of the vaccination programme, including vaccine delivery and the longer-term role of the COVID-19 vaccination programme
- 4.3) Vaccine efficacy, effectiveness, safety, acceptance, and uptake (including impact on inequalities).

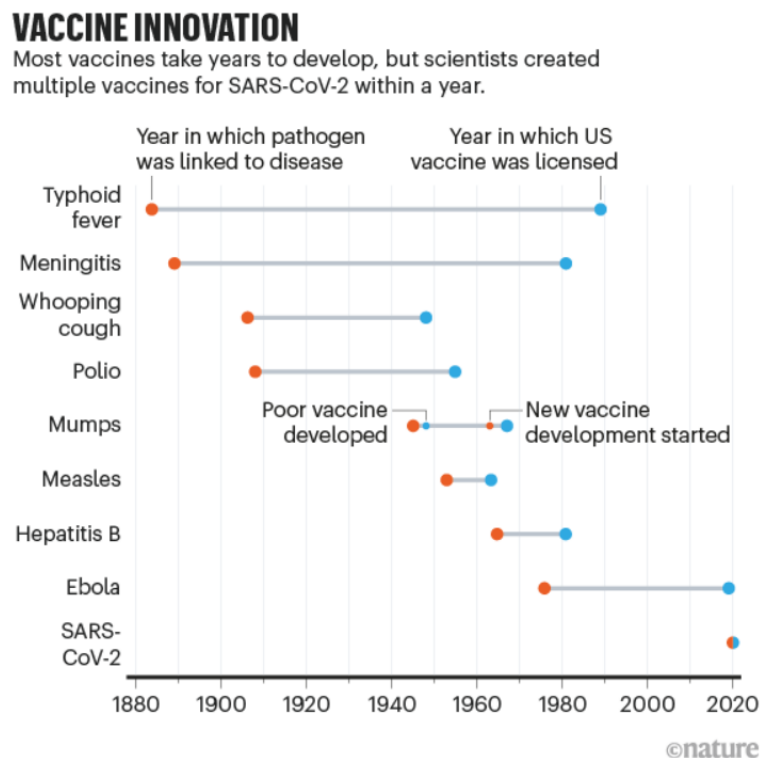
Below we describe each subtheme separately by presenting the main events, key issues and potential areas for investigation.

Sub-theme 4.1: Vaccine development, manufacturing and authorisation

Timeline

Most vaccines take many years to develop (**Figure 4.1**) but the development of SARS-COV-2 vaccines was substantially accelerated (without compromising on safety) [1]. This was due to many years of previous research on related viruses (like the coronaviruses that cause SARS and MERS), building on research on the F protein biology (for example in RSV vaccine research) and significant funding that allowed pharmaceutical companies to run multiple clinical trials in parallel [2]. This unprecedented speed was also due to global collaboration and sharing of information, high levels of interest in volunteers, which allowed for quick recruitment in vaccine clinical trials, high levels of funding. Multiple vaccine platforms increased the chance that at least one would be successful. Finally, regulators moved much more quickly than normal through the regulatory process [1]. In this report we are not going to focus on the COVID-19 vaccine development, since this was a global effort and not specific for Scotland. A detailed timeline of the COVID-19 vaccines development and authorisation can be found [here](#). Below we will present some key dates about the development,

manufacturing and authorisation of the COVID-19 vaccines, which are relevant to the UK and Scotland.



Sources: Our World in Data; Nature analysis

Figure 4.1 Comparison of COVID-19 vaccine development with other vaccines [1].

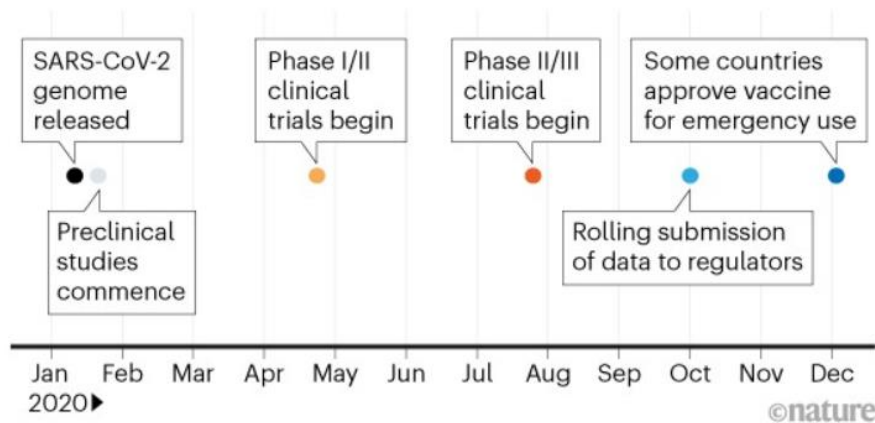
On 11/01/2020, the genetic sequence of SARS-COV-2 was published triggering the urgent international response to prepare for an outbreak and the development of a preventive COVID-19 vaccine [3]. The first time that SAGE discussed the importance of vaccines for the COVID-19 response was on [18/03/2020](#), when they decided that future SAGE meetings will consider broader aspects of COVID-19 including vaccine development and on their meeting on [26/03/2020](#), SAGE declared that they will prioritise their focus on clinical trials for treatment and vaccine options. On [06/04/2020](#), the UK vaccine taskforce was established by Sir Patrick Vallance and they outline that the Oxford vaccine is close to clinical trials while the Imperial College vaccine is at an earlier stage of development. On [23/04/2020](#), SAGE discussed the importance to engage with international biotech and vaccine companies and to develop UK vaccine manufacturing capacity in the short and longer term. On [30/04/2020](#), SAGE highlighted the need for innovative trial designs for vaccine deployment other than spike protein technology as there were fewer than a dozen ‘front-runners’ in terms of vaccines out of 200 potential candidates.

The first important milestone for the COVID-19 vaccine development in the UK came on [16/06/2020](#), when the UK government announced that clinical researchers would begin human trials of a new coronavirus vaccine developed by researchers at Imperial College

London. The first breakthrough though came from the University of Oxford on [20/7/2020](#), when they published their findings from a coronavirus vaccine trial (Oxford AstraZeneca vaccine), noting that the vaccine appeared safe and triggered an immune response. On [9/11/2020](#), Pfizer and BioNTech published for the first time positive efficacy results from Phase 3 studies of their potential COVID-19 vaccine [4]. Following that on [2/12/2020](#) the Medicines and Healthcare Products Regulatory Agency (MHRA) approved the Pfizer vaccine for use in the UK (in adults), becoming the first country to approve this vaccine and the first country in the Western world to approve the use of any COVID-19 vaccine (**Figure 4.2**).

A VACCINE IN A YEAR

The drug firms Pfizer and BioNTech got their joint SARS-CoV-2 vaccine approved less than eight months after trials started. The rapid turnaround was achieved by overlapping trials and because they did not encounter safety concerns.



Sources: BioNTech/Pfizer; *Nature* analysis

Figure 4.2 Timeline of the development of the Pfizer and BioNTech SARS-COV-2 vaccine [1].

On [30/12/2020](#) MHRA approved the Oxford AstraZeneca vaccine [5] and on [8/01/2021](#) the Moderna vaccine [6]. The last two vaccines to be approved in the UK were the Janssen vaccine [7], which was approved on [28/05/2021](#) and the Novavax vaccine [8] (approved on [3/02/2022](#)). On [4/06/2021](#) MHRA approved the Pfizer/BioNTech vaccine for use in 12-15 year olds [9]. The Moderna COVID-19 vaccine was approved for use in 12-15 year olds on [17/08/2021](#) [10]. Finally, on [22/12/2021](#) a new formulation of the Pfizer/BioNTech vaccine was approved by the MHRA for use in children aged 5 to 11 years [11].

On [28/01/2021](#), the UK Government announced that commercial manufacturing of the Valneva COVID-19 vaccine candidate begins in Livingston, West Lothian. However, in [September 2021](#), Valneva announced that the UK government had cancelled the vaccine order pulling out of a £1.2 billion deal and in [November 2021](#) called for an apology from UK Government. On [23/12/2021](#), Valneva issued a press release saying that it is in "advanced discussions" with Scottish Enterprise over a multi-million pound deal, which would see its COVID-19 vaccines manufactured in Scotland. Finally, on [21/02/2022](#), it was announced that

Valneva has been awarded £20m in funding from Scottish Enterprise, with up to £12.5m, to be used for the research and development of Valneva's COVID-19 vaccine candidate.

Potential questions for the Inquiry to consider

The key issues that emerged from the scoping review in relation to sub-theme 1 include:

- 4.1.1 How is the manufacture of COVID-19 vaccines being supported in Scotland? What is the long-term plan for vaccine production?
- 4.1.2 Reasons why the UK pulled out from the Valneva deal in September 2021 and what are the current plans for using the Livingston factory to produce vaccines for Scotland through support by the Scottish Enterprise?

Sub-theme 4.2: Design, management and progress of the vaccination programme, including the longer-term role of the COVID-19 vaccination programme

The COVID-19 vaccination programme is the largest vaccination programme that the Scottish Health boards have ever designed and managed. Its success has helped reduce the number of hospitalisations and deaths in Scotland and allowed for the pandemic restrictions to be lifted, allowing for the economic and social recovery to commence.

Vaccine Taskforce (UK wide) and Flu Vaccine COVID Vaccine (FVCV) Delivery Programme (Scotland)

On [06/04/2020](#), the UK vaccine taskforce was established by Sir Patrick Vallance. The objective of the taskforce was to bring together government, industry, academics, funding agencies, regulators, logistics and finance to make rapid decisions, for the UK to be in a position to accelerate vaccine development and vaccinate the right people as soon as possible after a vaccine is available. They also stated that it is important to ensure longer-term UK vaccine capability and capacity for clinical and industrial benefit. On [16/05/2020](#), Kate Bingham was named chair to the Vaccine Taskforce. Further details about its formation emerged through a government press release on [20/10/2020](#), stating that it was created under the Department for Business, Energy and Industrial Strategy (BEIS). Nadhim Zahawi was appointed to the new role of Parliamentary Under-Secretary of State for COVID-19 Vaccine Deployment on 28/11/2020, with responsibility for the taskforce. On [1/03/2021](#), ministerial responsibility transferred from BEIS to the Secretary of State for Health and Social Care, and the taskforce became a joint unit of BEIS and the Department of Health and Social Care. In [June 2021](#), the Department for Business, Energy and Industrial Strategy confirmed that the taskforce's formal steering group had been disbanded, with the taskforce now being managed by a senior leadership team of civil servants and experts. On [14/06/2021](#), Sir Richard Sykes was appointed chair of the Vaccine Taskforce.

In preparation for the rollout of a COVID-19 Vaccine, the Scottish Government created the Flu Vaccine COVID Vaccine (FVCV) Delivery Programme. This programme's remit was to ensure the readiness of Scotland for the implementation of an expansion to flu vaccination programme and delivery of a COVID-19 vaccination. It is not clear when this Programme was developed, but it was at some point prior to the first COVID-19 vaccine authorisation. The [FVCV Programme Governance](#) consists of a Programme Board with governance and oversight of overall delivery and monitoring of key risks and milestones; an Executive Decision Making Group to allow for quick decision making on behalf of the wider Programme Board; a Delivery

Group to co-ordinate the delivery programme plan, chaired by the Programme Delivery Director and comprising the key delivery work-stream leads and 10 work-streams (with responsibility for delivery of key milestones within Programme).

Vaccination programme cost

The devolved administrations have agreed that the UK Government should lead on the purchase and supply of the vaccines on a four-nation basis. A report from the National Audit Office, published on [25/02/2022](#), found that up to October 2021 the UK government spent £2.9 billion to purchase vaccines (with an average cost of £15.02 including VAT per dose). It concluded that it has provided value for money to date.

The Scottish Government and NHS Scotland were then responsible for the management and delivery of the COVID-19 vaccination programme in Scotland and the costs in Scotland are associated with the management, distribution, and delivery of the vaccination programme. In 2020/2021 NHS Scotland spent £58.9 million on the COVID-19 vaccination programme and in August 2021, NHS boards predicted that the COVID-19 vaccination programme for the 2021/22 financial year would cost £223.2 million ([Audit Scotland](#)). NHS boards have based their predicted costs on planning assumptions provided by the Scottish Government. However, vaccination costs for the 2021/22 financial year will depend on advice issued by the JCVI (which has changed a few times since September 2021, i.e. expansion of the booster programme to include everyone over the age of 16 and vaccination of children 12-15 year olds and more recently of children 5-11 year olds).

Vaccination programme design and prioritisation of groups

The Scottish Government has based its decisions on which groups should be prioritised for receiving COVID-19 vaccinations on advice from the JCVI, which is what all four UK nations did. The JCVI developed nine priority groups for receiving COVID-19 vaccinations in phase 1 based on those who are most at risk from contracting COVID-19 and on [19/11/2020](#), the Scottish Government outlined plans and prioritisation groups for the delivery of COVID-19 vaccines (**Table 4.1**).

Table 4.1 Priority list of the phase 1 vaccination programme as drawn by the JCVI

Priority	Risk groups
1	People living in a care home for older adults and their staff carers
2	All those 80 years of age and older and frontline health and social care workers
3	All those 75 years of age and over
4	All those 70 years of age and over and people who are extremely clinically vulnerable (also known as the “shielding” group) – people in this group will previously have received a letter from the Chief Medical Officer advising them to shield
5	All those 65 years of age and over
6	All individuals aged 16 years to 64 years with underlying health conditions, which put them at higher risk of serious disease and mortality.

	Category 6 was extended to include unpaid carers on 22/02/2021, adults with learning disabilities on 24/02/2021, and homeless adults on 11/03/2021
7	All those 60 years of age and over
8	All those 55 years of age and over
9	All those 50 years of age and over

On [30/12/2020](#), the UK Chief Medical Officers issued a statement on the prioritisation of first doses of the coronavirus vaccines, which meant extension of the period between the two doses of the Pfizer vaccine from 3 to 12 weeks. On [22/02/2021](#), the Scottish Government announced that people with underlying health conditions (group 6) and unpaid carers (as part of group 6) are beginning to receive COVID-19 vaccinations. On [24/02/2022](#), JCVI has confirmed that everyone with a learning disability would be prioritised for vaccination under group 6 of phase 1. On [26/02/2020](#), the JCVI issued interim advice on the Phase 2 of the COVID-19 vaccination programme rollout. They stated that phase 2 would remain an age-based approach, since evidence suggested that this is the most effective way of reducing death and hospitalisation from COVID-19. On [11/03/2020](#), JCVI advised prioritising homeless people and rough sleepers for the COVID-19 vaccine. Many people who are homeless or sleeping rough are likely to have underlying health conditions, which would place them in priority group 6 of phase 1, but these are likely to be under-diagnosed or not properly reflected in GP records.

On [25/03/2021](#), JCVI provided advice to SAGE on a change of vaccine prioritisation for prisoners and prison staff. On [7/04/2021](#), JCVI advised that, for adults aged under 30 without underlying health conditions that put them at higher risk of severe COVID-19 disease, there should be a preference for an alternative to the AstraZeneca vaccine, if available, due to a side effect condition characterised by thromboembolic events (blood clots) and accompanied by thrombocytopenia (low platelets). On [7/05/2021](#), they extended this advice for adults aged under 40 without underlying health conditions. On [16/04/2021](#), JCVI advised that pregnant women should be offered the COVID-19 vaccine at the same time as the rest of the population, based on their age and clinical risk group. On [11/06/2021](#), the Scottish Government announced the expansion of the national vaccination programme to include international students and on [13/06/2021](#) on the advice of the JCVI, the Scottish Government decided to bring forward second vaccine doses for over-40s to help combat the Delta variant.

On [30/06/2021](#), JCVI issued interim advice on the COVID-19 booster vaccination suggesting that any potential COVID-19 booster programme should be offered in 2 stages from September, starting with those most at risk from serious disease. On [01/09/2021](#), JCVI advised that people who were severely immunosuppressed at the time of their first or second dose should be offered a third dose (which is different to the booster dose). On [14/09/2021](#), published guidance advised that booster vaccines should be offered to those more at risk from serious disease, and who were vaccinated during Phase 1 of the vaccine programme and on [20/09/2021](#) the Scottish Government launched the COVID-19 booster vaccination programme. However, on [15/11/2021](#), due to the emergence of the omicron variant, the JCVI

advised that all adults aged 40 to 49 years should be offered an mRNA booster, 6 months after their second dose, irrespective of the vaccines given for the first and second doses. This advice was further revised on [29/11/2021](#), for the booster to be given 3 months after the primary course and it was extended to cover all adults, to tackle the rapid spread of the omicron variant. On [7/01/2022](#) JCVI advised that there is no immediate need to introduce a second booster dose, or fourth jab, to the most vulnerable. However, on [21/02/2022](#) a second booster for at-risk groups was announced in Scotland following an updated advice from JCVI. In particular, a spring booster dose will be offered at least 24 weeks after the last vaccine dose to: adults aged 75 years and over, residents in care homes for older adults and individuals aged 12 years and over who are immunosuppressed.

In relation to vaccinating children (<18 years old), 16 and 17 year olds with underlying health conditions were included in category 6 of the phase 1 of the vaccination programme. On [19/07/2021](#), JCVI issued advice on COVID-19 vaccination with the Pfizer-BioNTech vaccine of children aged 12-15 years old at increased risk of serious COVID-19 disease and 12-17 year olds, who lived with an immunosuppressed person. On [04/08/2021](#), the Scottish Government announced that all young people 16 to 17 years of age would be offered the coronavirus vaccination in Scotland from 6 August. On [03/09/2021](#), JCVI issued an updated advice on the vaccination of 12-15 year olds, suggesting that the health benefits from vaccination are marginally greater than the potential known harms. However, the margin of benefit was considered too small to support universal vaccination of healthy 12 to 15 year olds at this time. However, the four UK Chief Medical Officers announced on [13/09/2020](#) that based on the wider societal impacts of the COVID-19 disease, a single dose of the Pfizer-BioNTech vaccine should be offered to all 12-15 year olds. On [29/11/2021](#), a second dose of the Pfizer-BioNTech vaccine for young people aged 12 to 15 years was advised 12 weeks after the first dose, to tackle the spread of the omicron variant. On [22/12/2021](#), JCVI issued updated guidance on vaccination of children. It recommended that children 5-11 year olds, who are in a clinical risk group or are a household contact of someone who is immunosuppressed, should be offered a primary course of vaccination. In addition, booster vaccinations were recommended for 16-17 year olds and 12-15 year olds that are in a clinical risk group or severely immunocompromised and have had a third primary dose. Finally, on [16/02/2022](#), the Scottish government confirmed that it will offer COVID vaccinations to all children aged five to 11 years, following unpublished (at that point) advice from the JCVI and on [21/02/2022](#) it was announced that children aged 12-18 years old that are immunosuppressed will be offered a second booster dose.

The UK Pandemic Ethics Accelerator published a rapid ethics review on the [ethics of pandemic vaccine prioritization](#), which concludes that there is a need for greater transparency about the moral reasoning underlying policy decisions. Fairness and benefit were both considered but different benefits had to be weighed up to justify prioritizing different groups.

Vaccination programme management and delivery

The Scottish Government was responsible for the management and delivery of the vaccination programme, and so far has prioritised COVID-19 vaccinations in accordance to JCVI guidance (apart from the decision to vaccinate 12-15 year olds with a single dose of the

Pfizer vaccine, where it followed the four CMOs advice). Scotland's allocation of the total supply of vaccines arriving in the UK was based on the [Barnett formula](#) and the main factor determining the speed of the first phase of the rollout was the availability of vaccines. The Scottish Government has published three vaccine deployment plans ([14/01/2021](#), [24/03/2021](#), and [23/07/2021](#)) since the start of the COVID-19 vaccination programme, which describe the high-level priorities of the programme, its management and progress. Furthermore, the COVID-19 vaccination programme has been categorised by the Scottish government into three tranches. [Tranche 1](#) consisted of vaccinating all adults in Scotland with two doses of a COVID-19 vaccine. [Tranche 2](#) consisted of the autumn and winter 2021/22 flu vaccinations and COVID-19 booster programme. [Tranche 3](#) focuses on the longer-term approach to providing vaccinations in future across Scotland.

The vaccine programme has relied on temporary staffing. By July 2021, more than 14,000 vaccinators had administered vaccines, which included nurses, GPs, dentists, optometrists, pharmacists, allied health professionals, healthcare students, healthcare support workers and the armed forces (to increase capacity when required) ([Audit Scotland](#)). A longer-term, sustainable workforce is needed, although this may not be possible to be achieved in a big enough scale. At least as part of pandemic preparedness, there should be a clear plan for how to get extra staff needed.

Vaccines have been administered in a range of locations including mass vaccination centres in conference centres and stadiums, and in local venues such as GP practices, town halls and community treatment centres ([Audit Scotland](#)). The first COVID-19 Pfizer/BioNtech vaccination in Scotland was administered on the 08/12/2020. Individuals who were part of the vaccination programme were the first to be vaccinated. Six days after the administration of the first COVID-19 vaccine in Scotland, first doses of the vaccine were delivered to care homes. By 7/01/2021 the Scottish government had announced that a key milestone was achieved as more than half of all care home residents had been vaccinated and on 16/01/2021 Scotland begun mass vaccination of health care workers. On [17/01/2021](#) doctor leaders warned that 'patchy' supply of vaccines to GP surgeries is negatively affecting deployment and on [18/01/2021](#) armed forces were called to help to establish 80 more COVID-19 vaccination centres in Scotland. On 10/02/2021, the Scottish government announced that 1 million Scottish residents had received their first vaccine dose and by 26/04/2021, 1 million Scottish residents received their second dose. By early May, everyone in priority groups 1-9 got offered the first dose of a COVID-19 vaccine and by 18/07/2021 first doses of the vaccine had been offered to all adults. By 12/09/2021 everyone aged 18 years and over was offered the second dose of a vaccine. On 20/09/2021 Scotland launched the booster vaccination programme and by 31/12/2021 more than three quarters of adults in Scotland received their booster vaccine. There have been some reports throughout the vaccination programme of issues in relation to missed appointments or long queues in vaccination centres, but in general, the Scottish COVID-19 vaccination programme has made excellent progress in vaccinating a large proportion of the adult population.

Given the scale of the COVID-19 vaccination programme, some vaccine wastage has been unavoidable for a number of reasons including logistical issues, storage failures and specific

clinical situations. The initial planning assumption for the vaccination programme was that there would be 5% vaccine wastage. In the initial months of the vaccination programme wastage was very limited (February 2021 0.3% doses wasted, March 2021 0.3%, April 2021 0.2%, May 2021 0.7%, June 2021 0.5% and July 2021 1.5%; [Audit Scotland](#)). **Figure 4.3** is taken from the latest [Public Health Scotland statistical report](#) and it shows the trend of the percentage of vaccines wasted between August 21 – January 2022. The top reasons for doses wasted in January 2022 month were: excess stock (55%), expired shelf life of stock (31%) and other reasons (14%).

Measure	Aug-21	Sept-21	Oct-21	Nov-21	Dec-21	Jan-22
Number of doses administered ¹	568,203	303,931	884,381	1,017,131	1,369,363	471,925
Number of doses wasted ²	17,457	10,089	9,116	8,605	8,608	10,783
Percentage wasted ³ (%)	2.9	3.2	1.0	0.8	0.6	2.2

Source: NSS Service Now, COVID-19 Vaccine Wastage.

Data correct at 15/2/22

1. The number of vaccine doses administered (all doses).
2. The total number of vaccine doses which could not be administered and therefore wasted.
3. % Wasted is measured as:
(Number of Doses Wasted x 100)/(Number of Doses Wasted + Administered)
4. Excludes GP practice information.
5. Excludes wastage from clinical trials

Figure 4.3 Number of COVID-19 doses wasted by month^{1,2,3,4,5}; Source Public Health Scotland statistical report (16/02/2022)

To assist with vaccine delivery and to support the vaccination programme a range of new digital tools were developed. These included: 1) The TURAS Vaccination Management Tool, which is a web-based tool for healthcare staff in Scotland to record real-time patient vaccination data at the point of care. 2) The National Clinical Data Store, which holds the COVID-19 vaccination records for everyone in Scotland and can be securely shared with healthcare staff when required. 3) The National Vaccination Scheduling System (NVSS), which was used to allocate and reschedule appointments. 4) A self-registration portal, initially set up to allow unpaid carers to self-register for the vaccine and then it was rolled out to everyone aged under 30 years, and subsequently to all adults. Risks and issues relating to the NVSS were monitored regularly, and the NVSS was adapted to improve its functionality. Although Most NHS boards have used the NVSS some NHS boards have opted for local scheduling arrangements to better meet the needs of the local population. Information about all the personal information that are stored and processed through these tools is explained in detail in [NHS Inform](#).

The longer-term role of the COVID-19 vaccination programme

The design, management and delivery of the COVID-19 vaccination programme has been very successful so far. The Scottish Government and NHS Scotland are preparing for future stages of the vaccination programme. The Scottish Government has committed to continuing to follow advice from the JCVI in prioritising vaccine deployment, which means adjusting their plans relatively quickly when advice changes (like changes in guidance about the administration of booster vaccinations and the changes in guidance in relation to vaccinating

children). The Scottish Government has now started planning for the longer-term approach to providing vaccinations in future across Scotland, which is Tranche 3 of the COVID-19 vaccination programme. It has established a [new National Vaccinations Partnership portfolio board](#) (Figure 4.4) to provide oversight and direction across all three tranches of the vaccination programme, but with the primary focus being on Tranche 3. This board sits within Scotland's National Vaccination Partnership (SNVP) Portfolio and has direct links to the Scottish Immunisation Programme (SIP) and associated sub-groups.

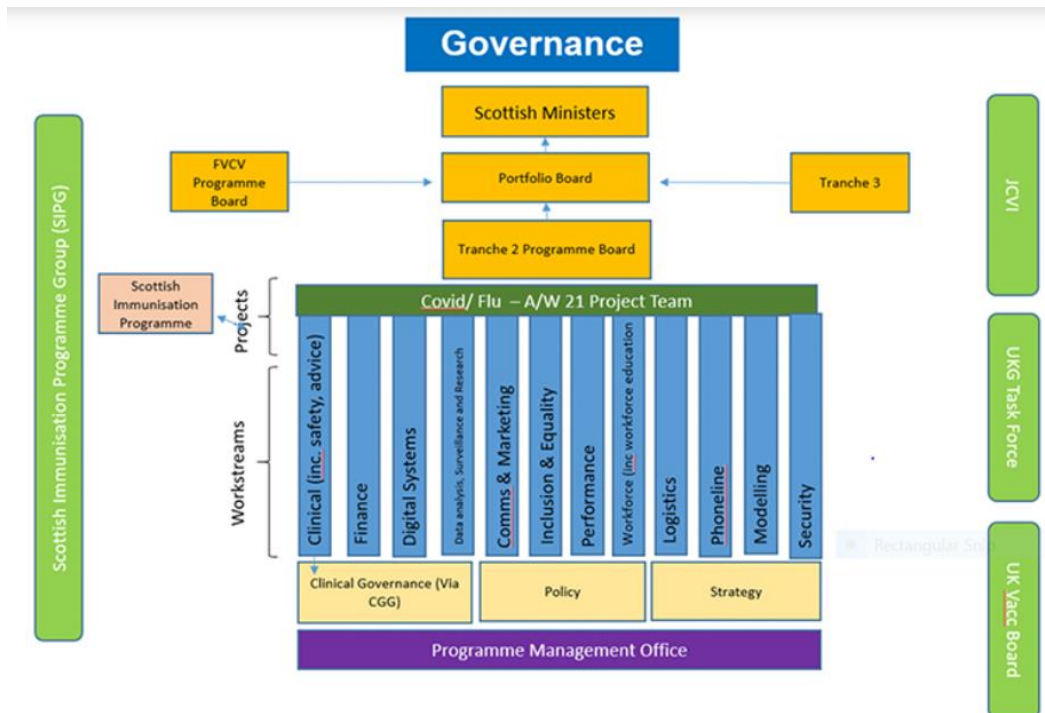


Figure 4.4 Current governance structure of the vaccination programme (more details can be found [here](#))

Potential questions for the Inquiry to consider

The key issues that emerged from the scoping review in relation to sub-theme 2 include:

- 4.2.1 Decision on COVID-19 first phase priority groups (groups 1-9).
- 4.2.2 Decision and timing of the decision for unpaid carers, adults with learning disabilities and homeless people to be prioritised and put in group 6 of phase 1 (impact on equalities).
- 4.2.3 Decision on COVID-19 second phase priority groups, which remained age-based (and lack of initial inclusion of certain key workers in priority groups in phases 1 and 2) (impact on equalities).
- 4.2.4 Timing of call for prisoners and prison staff to be prioritised (impact on equalities).
- 4.2.5 Change of advice for under 30s and under 40s in relation to the use of the AstraZeneca vaccine due to a side effect condition characterised by thromboembolic events (blood clots) and accompanied by thrombocytopenia (low platelets).

- 4.2.6 Advice for pregnant women at various stages of the pandemic and issues in relation for them to book appointments (impact on equalities).
- 4.2.7 Decision to prioritise first doses (i.e. extending the gap of the Pfizer vaccine from 3 to 12 weeks).
- 4.2.8 Decision to expand the booster vaccination programme to cover all adults.
- 4.2.9 Decision to bring booster vaccination forward to 3 months since second dose.
- 4.2.10 How were the ethical considerations around vaccination considered and did they actively inform decisions alongside other evidence? Did an ethical analysis take place in order to justify prioritisation to different groups? How were the benefits identified and balanced?
- 4.2.11 Decision that the UK government will lead on purchase and supply of COVID-19 vaccines.
- 4.2.12 More information about the role of the Flu Vaccine and COVID Vaccine Programme (FVCV) may be needed.
- 4.2.13 The COVID-19 vaccination programme has been categorised by the Scottish government in three tranches, however vaccination of children is not included in any of the three tranches.
- 4.2.14 Decision-making around vaccinating children and young people has not been as easy and as straightforward as it has been for adults (mainly because of COVID-19 leading to less severe disease for most children). However, change in policy (e.g. 1 or 2 doses for 12-15 year olds, and more recently advice on vaccinating 5-11 year olds to be less urgent) may introduce vaccine hesitancy. The current plan for vaccinating 5-11 year olds is through GPs and pharmacies. It is possible that without a programme in schools, coverage among disadvantaged will be low (impact on equalities).
- 4.2.15 Vaccine wastage has been kept below the 5% threshold throughout the vaccination programme. A few months have had higher wastage than others.
- 4.2.16 Plan for a longer-term, sustainable workforce of vaccinators is needed, now that temporary vaccinators have returned to their original posts and also there is a high staff burnout.
- 4.2.17 Development, cost, flexibility and personal information held in the new digital tools that were developed specifically for the COVID-19 vaccination programme. Consideration of ethical issues in data use in pandemic context (research and service planning/ provision closely aligned, with almost real time use of data).

Sub-theme 4.3: Vaccine efficacy, effectiveness, safety and uptake (including impact on inequalities).

Efficacy, effectiveness and safety

There are two different ways to evaluate how well vaccines work. Vaccine efficacy and safety are estimated during clinical trials while the effectiveness of vaccines is estimated during follow-up observational studies when the vaccine is used in the real world. More rare side effects also become apparent when vaccines are widely used. Landmark clinical trials were conducted for the safety and efficacy of the vaccines that are currently authorised in the UK. Results of these trials were published on 09/11/2020 for the Pfizer/BioNTech vaccine [4], on 08/12/2020 for the Oxford/AstraZeneca vaccine [5], on 30/12/2020 for the Moderna vaccine

[6], on 21/04/2021 for the Janssen vaccine [7] and on 18/10/2021 for the Valneva vaccine [8]. The efficacy and safety of the Pfizer vaccine has been evaluated in 12-15 year old [9] and 5-11 year old children [11] and for the Moderna vaccine in 12-15 year old children [10].

The vaccines have helped to reduce the incidence of severe illness and death from COVID-19. This can be seen in the graph below (**Figure 4.5**) where in the four waves there is a comparison between infection, hospitalisations, ICU admissions and deaths. The most recent increase in COVID-19 cases during summer 2021 (delta) and in winter 2021 (omicron) did not result in as significant an increase in hospitalisations and deaths as the previous waves of COVID-19. Although, we also need to note that omicron has proven to be a less pathogenic variant than the original strain, alpha and delta. As new variants of the virus continue to emerge, there is a risk that the current COVID-19 vaccines will become less effective.

Public Health Scotland has [a COVID-19 vaccine surveillance strategy](#) to monitor the effectiveness, safety and impact of all approved COVID-19 vaccines in Scotland. The key measure of the success of the vaccination programme in preventing infection, hospitalisations and deaths is vaccine effectiveness. Data from Scotland were also greatly helped by the [EAVE II study](#) whose infrastructure was in place for flu vaccine effectiveness studies and was re-deployed to look at COVID-19. The COVID-19-EAVE II-database comprising linked vaccination, primary care, real-time reverse transcription-PCR testing, and hospital admission patient records for 5.4 million people in Scotland (about 99% of the population) registered at 940 general practices. Through these studies, Scotland played an important role in generating data which were important globally [12-15]. In addition, two COVID-19 Living Evidence Syntheses (one for [adults](#) and one for [adolescents and children](#)) from COVID-END assess and update regularly a synthesis of studies on the efficacy and effectiveness of all available COVID-19 vaccines for variants of concern. Their prioritised outcome measures are infection, severe disease (as defined by the study investigators), death, and transmission.

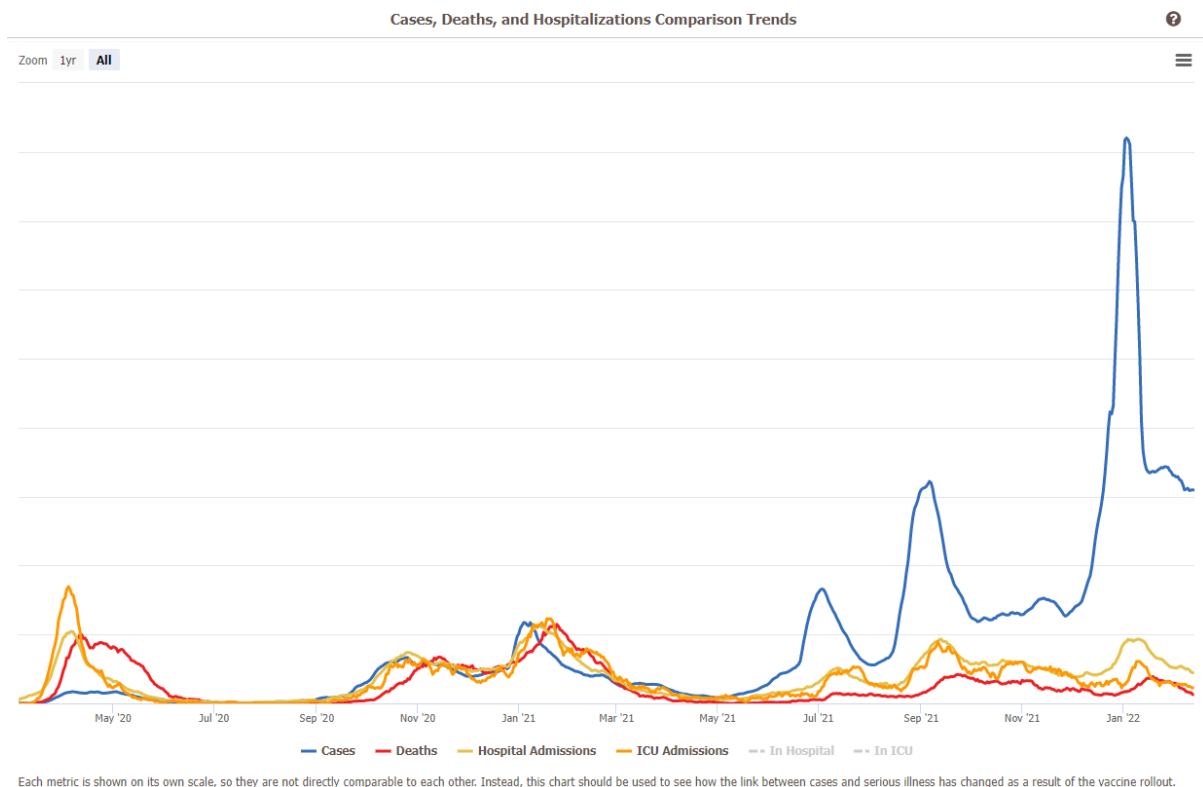


Figure 4.5 This chart shows the trend of cases, deaths, hospital admissions and ICU admissions throughout the course of the entire pandemic. The data is based on specimen date, date of death, and date of admission. Each metric is shown on its own scale, so they are not directly comparable to each other. Instead, this chart should be used to see how the link between cases and deaths/hospitalizations has changed as a result of the vaccine rollout. (Note: The first wave is not too useful to look at, as there was no community testing at that point. Source: <https://www.travellingtabby.com/scotland-coronavirus-tracker/>)

The MHRA continually monitors safety during widespread use of any vaccines, including the three COVID-19 vaccines that are currently available in the UK. Specifically for monitoring the safety of the COVID-19 vaccines the MHRA is engaging with academia and other experts and has put together a [proactive vigilance system](#) that includes the following four strands. 1) The MHRA has developed a dedicated COVID-19 passive surveillance system through the Yellow Card scheme, where any member of the public or health professional can submit suspected side effects. 2) The MHRA has implemented a form of active surveillance known as ‘Rapid Cycle Analysis’. This involves proactive, weekly analysis of a range of pre-defined events (theoretical side effects) to quickly identify safety signals. In addition they plan to use CPRD data to conduct ecological studies. 3) The MHRA has also implemented a targeted active monitoring of certain groups of people receiving vaccines, especially of those who may have been excluded or under-represented in clinical trials. 4) Finally there is a plan to conduct epidemiological studies to confirm any signals detected from the above three methods.

As of [9/02/2022](#), for the UK, 164,679 Yellow Cards have been reported for the COVID-19 Pfizer/BioNTech Vaccine, 243,491 for the COVID-19 Vaccine AstraZeneca, 35,566 for the COVID-19 Vaccine Moderna and 1,520 have been reported where the brand of the vaccine

was not specified. The overall reporting rate is between 2 to 5 Yellow Cards per 1,000 doses administered. The MHRA monitors the overall safety of the COVID-19 vaccines, with an additional attention in specific subgroups, including in pregnant and breastfeeding women, in children and adolescents and in individuals receiving a booster vaccination.

One of the most serious side effects has been the VITT (vaccine-induced thrombosis and thrombocytopenia), which is a very rare adverse event characterised by presence of blood clots with low levels of platelets following vaccination with the University of Oxford/AstraZeneca COVID-19 vaccine. The first cases of clotting in people who had been vaccinated were reported in late February. By mid-March, a number of countries had suspended or restricted the use of the AstraZeneca vaccine, including Denmark, Ireland, Thailand, the Netherlands, Norway, Iceland, Congo, Bulgaria, Germany, France, Italy and Spain. By 22/03/2021, 62 cases of cerebral venous sinus thrombosis and 24 cases of splanchnic vein thrombosis were reported in the European Union's drug safety databases (including the United Kingdom), 18 of these cases were fatal. On 2/04/2021 the British Society of Haematology released interim guidance on how this condition can be treated. On 7/04/2021 the MHRA scientific review concluded that the evidence of a link with COVID-19 Vaccine AstraZeneca is likely and restricted the use of this vaccine to the over 30 year olds and on 8/05/2021 the use of the vaccine was restricted to the over 40 year olds. Up to [9/02/2022](#), the MHRA had received Yellow Card reports of 438 cases of major thromboembolic events (blood clots) with concurrent thrombocytopenia (low platelet counts) in the UK following vaccination with COVID-19 Vaccine AstraZeneca (36 of those occurred in Scotland). Of the 438 reports, 220 occurred in females, and 214 occurred in males aged from 18 to 93 years. The overall case fatality rate was 18% with 79 deaths (44 in female), six of which occurred after the second dose. The overall incidence after first or unknown doses was 15.6 per million doses and 2.0 per million doses after the second dose. The currently available data indicates that there is a higher reported incidence rate in the younger adult age groups following the first dose compared to the older groups (21.4 per million doses in those aged 18-49 years compared to 11.1 per million doses in those aged 50 years and over).

The MHRA has also undertaken a thorough review of both UK and international reports of suspected myocarditis and pericarditis following vaccination against COVID-19, which has mainly been reported with the COVID-19 Pfizer/BioNTech and COVID-19 Vaccine Moderna. These events occur more frequently in the 18-29 year old group. Up to and including [9/02/2022](#), they have been 712 reports of myocarditis and 478 reports of pericarditis following use of the COVID-19 Pfizer/BioNTech Vaccine and there have been 197 reports of myocarditis and 112 reports of pericarditis following use of COVID-19 Vaccine Moderna. Four fatal events have been reported associated with the COVID-19 Pfizer/BioNTech Vaccine and no fatal events with Moderna. The overall incidence after first, second or booster/third doses of Pfizer is 9 per million doses for myocarditis and 6 per million for pericarditis. The overall incidence after first, second or booster/third doses of Moderna is 17 per million doses for myocarditis and 9 per million for pericarditis. Two large European epidemiological studies have estimated the excess risk of myocarditis following vaccination with COVID-19 Pfizer/BioNTech Vaccine and COVID-19 Vaccine Moderna [16, 17]. Both studies have shown that these events are very rare post vaccination, that these events are more frequent in

younger males and more frequent after the Moderna vaccine. The findings of these studies are consistent with the trends seen in the Yellow Card data. The preferred COVID-19 vaccine for the under 18s age group in the UK vaccination programme is the Pfizer/BioNTech.

Other potential side effects that are monitored by the MHRA include anaphylaxis, Bell's palsy, transverse myelitis, immune thrombocytopenia, capillary leak syndrome, menstrual disorders (period problems) and unexpected vaginal bleeding, delayed hypersensitivity reactions, Guillain-Barré syndrome and events with a fatal outcome.

Uptake and acceptance

In the most recent PHS statistical report an update on vaccine uptake is presented ([2/02/2022](#)). Based on that, as of 31 January 2022, there has been over 11.8 million COVID-19 vaccine doses administered in Scotland, since the programme began. This includes, 4.41 million people have received their first dose of the COVID-19 vaccination (93.5% of those aged 18 and over and 92.0% of those aged 12 and over). 4.13 million people have received their second dose (89.6% of those aged 18 and over and 86.2% of those aged 12 and over). 3.30 million people have received their booster/dose 3 (73.9% of those aged over 18 and 68.9% of those aged 12 and over).

Despite high uptake of COVID-19 vaccines overall, there is variation in uptake between different groups of the population. A smaller proportion of younger people (**Figure 4.6**), people from some ethnic groups (**Figure 4.7**) and those living in the most deprived areas (**Figure 4.8**) have been vaccinated. There is also a much lower uptake among pregnant women. Based on data presented in the [2/02/2022](#) Public Health Scotland report, 32,071 women in Scotland had an ongoing pregnancy at the start of December 2021, and 8,069 (25%) women received any COVID-19 vaccination during pregnancy in December 2021. These trends are also evident in other parts of the UK.

% coverage by age group in Scotland

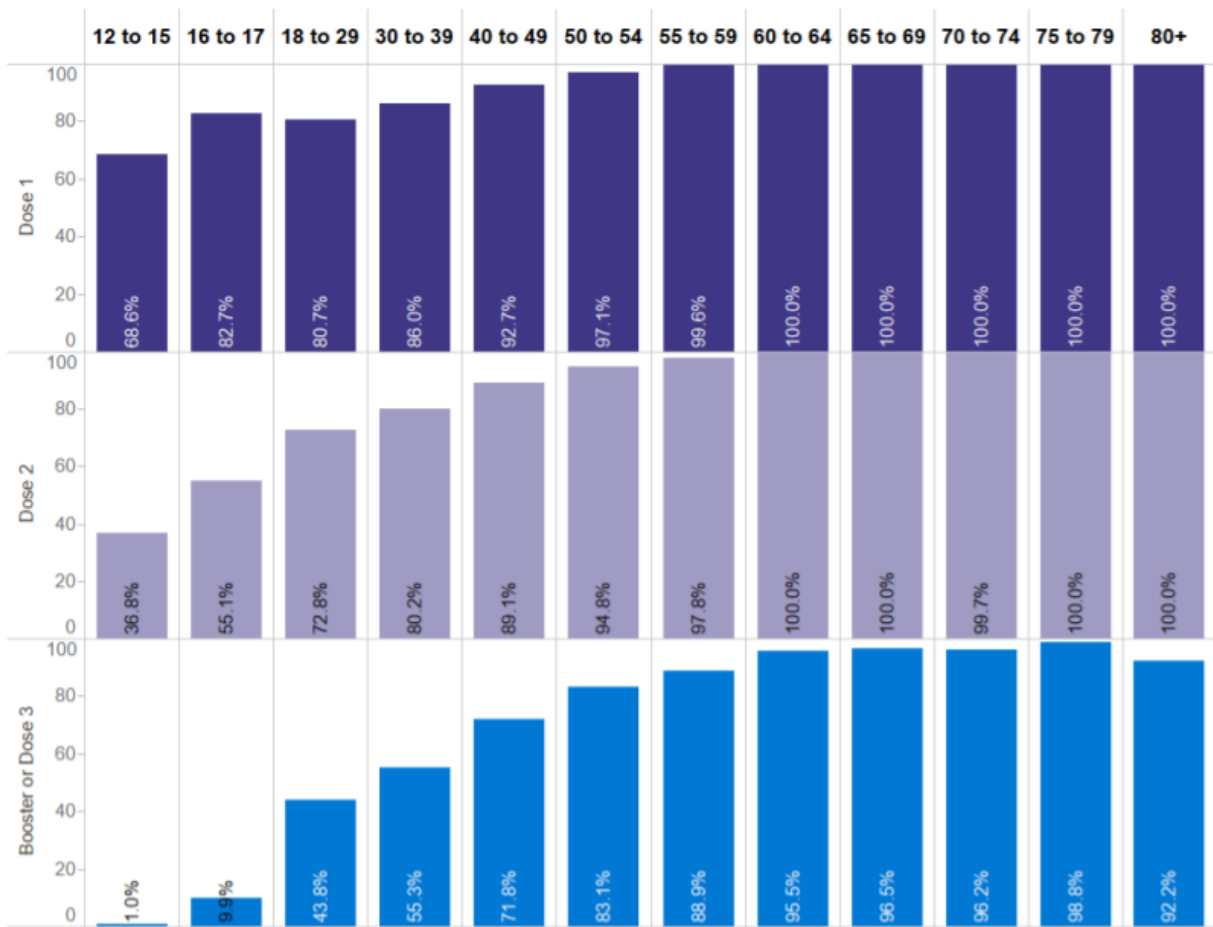


Figure 4.6 COVID-19 vaccine uptake at 30 January 2022; Percentage coverage by age group in Scotland (Source Public Health Scotland statistical report, published on [2/02/2022](#))

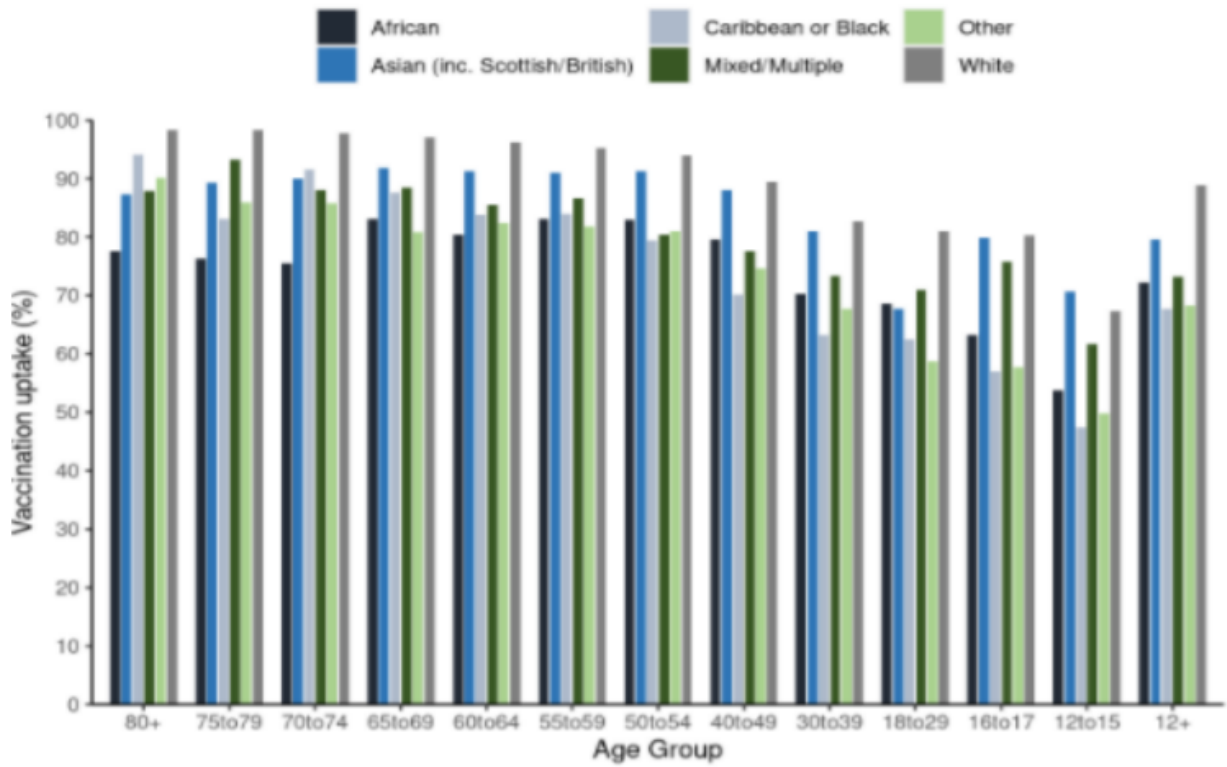


Figure 4.7 Percentage of uptake of first dose of COVID-19 vaccine by age group and by ethnic group as at 30 January 2022. (Similar graphs for the second and third/booster dose are presented in Public Health Scotland statistical report, published on [2/02/2022](#))

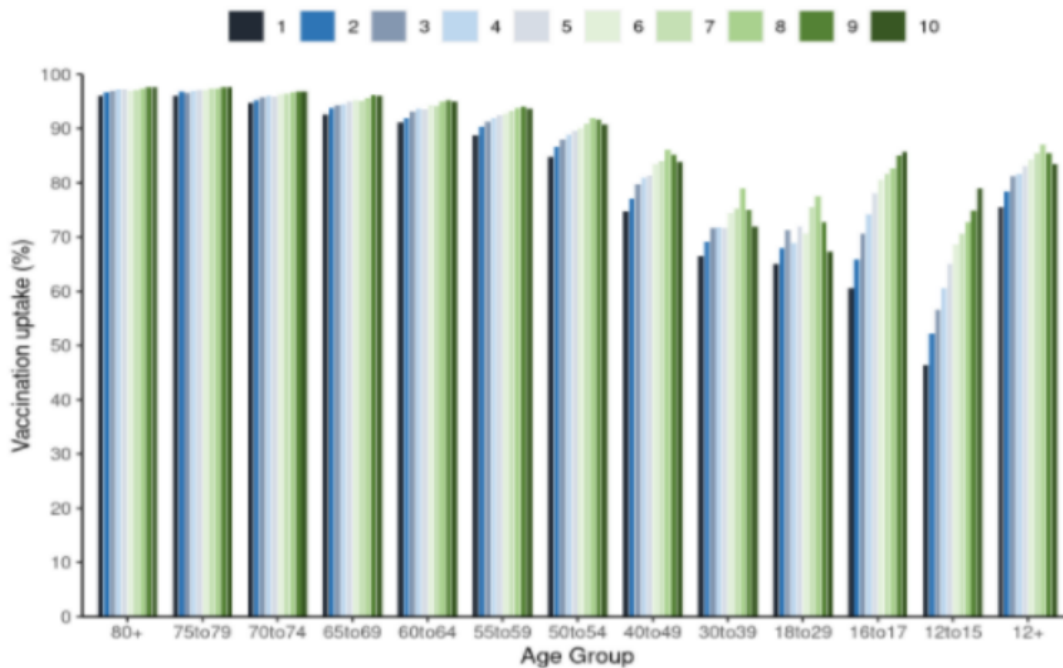


Figure 4.8 Percentage of uptake of first dose of COVID-19 vaccine by age group and by deprivation as at 30 January 2022. (Similar graphs for the second and third/booster dose are presented in Public Health Scotland statistical report, published on [2/02/2022](#))

The Scottish Government and NHS Scotland knew that there would be challenges in vaccinating the entire adult population with a new vaccine. It was expected that some groups would be more reluctant or less able to engage with the programme. In November 2020, PHS led a health inequalities impact assessment (HIIA) for an extended flu and COVID-19 vaccination programme and this was published in [December 2021](#). This report identified potential barriers to the uptake of flu and COVID-19 vaccines across different population groups, such as those from minority ethnic backgrounds, people living in deprived areas and people with disabilities. The HIIA identified recommendations for the Scottish Government and NHS boards to consider when planning the vaccination programme. This report was shared with the Scottish Government, NHS NSS and local NHS boards to inform planning and help them to develop their own equality impact assessments. The [COVID-19 vaccination Audit Scotland report](#) found that throughout the vaccine programme, the Scottish Government and NHS boards have worked with partners to increase uptake and reduce vaccine hesitancy through a number of methods. These methods included: 1) improved data collection (to understand underlying reasons of reduced uptake by certain groups); 2) working with organisations, such as Young Scot and the Minority Ethnic Health Inclusion Service, to tailor messaging; 3) improved accessibility of information (e.g. publication of information in more than 30 languages); 4) establishing a national inclusive steering group to encourage vaccine uptake and reduce barriers to engagement with the programme; and 5) outreach work, which has targeted groups that may be less likely to engage with the vaccination programme.

The Scottish Government has also [assessed the potential impact of its COVID-19 and flu vaccination policy](#) on equalities and equal opportunities. The vaccination policy has been considered for the following characteristics: age, disability, sex, pregnancy and maternity,

sexual orientation, race and ethnicity, religion or belief, deprivation, remote rural and island communities, relationship status, prisoners, migrant seasonal agricultural workers and seafarers, refugees and asylum seekers, people under the Afghan Relocation and Assistance Policy. The report concludes that the Scottish government does not unlawfully directly discriminate with respect to any of the protected characteristics or other characteristics as outlined above.

Potential questions for the Inquiry to consider

The key issues that emerged from the scoping review in relation to sub-theme 3 include:

- 4.3.1 Timing of the restriction of the use of the AstraZeneca vaccine firstly to be used for adults >30 years old and then for adults >40 years old (impact on equalities)
- 4.3.2 Efforts to address impact on equalities in relation to access and uptake of vaccines of specific sub-populations, including younger age groups, particular ethnic minorities, those living in the most deprived areas, and pregnant women (impact on equalities).
- 4.3.3 Were there any efforts made to counter misinformation especially on social media (impact on equalities)?
- 4.3.4 Was the degree of inequity greater or less than in other parts of the UK (impact on equalities)?
- 4.3.5 Was enough done to address inequity, given that it was expected to be an issue (impact on equalities)?
- 4.3.6 What is known about the level and causes of vaccine hesitancy in Scotland (impact on equalities)?
- 4.3.7 Did Scotland play its role in promoting global vaccine access especially for LMICs - was there a fair balance between national needs and global responsibility? This is an ethical issue in terms of global health ethics as well as a pandemic control issue since we live in an interconnected world. This comment is also relevant to the section on supply and production (impact on equalities).

Additional sources for the Inquiry to review

The Inquiry team may also want to review [parliamentary questions in relation to the COVID-19 vaccination, additional audit reports](#) (including the NHS National Services Scotland Annual Audit reports and NHS Annual Audit reports for each Health Board separately) and the [National Audit Office report on the rollout of the COVID-19 vaccination programme in England](#). An updated COVID-19 vaccination programme audit report is due to be released by Audit Scotland early in 2022.

The Inquiry may want to review all the minutes of the [COVID-19 Nosocomial Review Group](#) meetings and the minutes of the [Advisory Sub-group on Education and Children's Issues](#). The inquiry may want to review the three vaccine deployment plans for Scotland, published in [January 2021](#), [March 2021](#) and [July 2021](#).

Public Health Scotland publishes a weekly statistical report (every Wednesday), which provides information about the spread of the disease and the activity in NHS Scotland to tackle it. In all of the reports, they include updates in relation to the COVID-19 vaccine. This includes updates on COVID-19 vaccination uptake (including updates on equality of the

uptake and COVID-19 vaccination in pregnancy), wastage, certification and COVID-19 cases, hospitalisations and deaths by vaccine status. The weekly reports can be found [here](#).

In considering ethical issues, the Inquiry might benefit from the work of the [UK Pandemic Ethics Accelerator](#).

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Appendix

Methods

Sources

We used the following sources to identify the key events or decisions, key players and key documents for theme 4, by using the following key words: “vaccine”, “vaccination”.

- 1) A [timeline](#) by the Scottish Parliament Information Centre that focuses on Scotland’s response to the Coronavirus (COVID-19) pandemic and includes all major developments. The timeline runs from 31/12/2019 and was last accessed on 11/02/2022.
- 2) Three timelines of the COVID-19 pandemic in Scotland for [2020](#), [2021](#) and [2022](#) by Wikipedia, last accessed on 11/02/2022.
- 3) Two audit reports from Audit Scotland. Audit Scotland is an independent organisation that produces local and national reports about the performance and financial management of Scotland's public bodies. The [first audit report](#) was about the NHS in Scotland in 2020 and was published in February 2021. The [second audit report](#) was about the COVID-19 Vaccination programme and was published in September 2021.
- 4) [Minutes and papers](#) from the Scientific Advisory Group for Emergencies (SAGE) meetings.
- 5) [Minutes and papers](#) from the Scottish Government COVID-19 Advisory Group.
- 6) Reports and Correspondence of the [Health & Sport Committee](#).
- 7) To source academic literature in relevant topics we searched the [COVID-END inventory of “best evidence syntheses”](#), which presents the current state of evidence for COVID-19 related issues to support decision-makers.

Data extraction and event prioritisation

For each identified event we extracted the following information: date, brief summary of key event, sub-theme, key players (including bodies and/ or people), relevant reports or other documents (including news items, guidelines, parliamentary documents, audit reports) and relevant research papers and publications (including preprints).

Decisions or milestones that need to be prioritised for investigation (including investigation of their timing) by the Inquiry team were characterised as key. We used the following definitions. A key decision is a decision directly relevant to Scotland and a decision taken by the Scottish government and a decision that had the potential to impact on the course of the pandemic and its direct or indirect consequences. A key milestone is a key event that marks an important point in the progress of the pandemic or a key decision taken outside Scotland that had a potential impact on the course of the pandemic in Scotland and its direct or indirect consequences.

Appendix Table 4.1: Key events with dates, type, main body/ persons involved and relevant reports for Theme 4				
Detailed issues identified in public consultation: Pace of the rollout and prioritisation groups; Lack of initial inclusion of key workers in priority groups; General rollout and expedited vaccinations for social care staff; Safety concerns regarding vaccines.				
Additional issues identified by UNCOVER: Vaccination of adolescents and children; Situation in relation to the Valneva order and plans for using the factory in Livingston to produce vaccines for Scotland; General plans for manufacturing vaccines in Scotland; Decision to expand and then expedite the booster programme; Plan for a longer-term sustainable workforce of vaccinators; Development, cost, flexibility and personal information held in the new digital tools				
Impact on equalities: Lack of initial prioritisation of people with learning disabilities; expedited vaccinations for social care staff; efficacy of vaccines for immunosuppressed people; success of the vaccination programme in reaching vulnerable or marginalised groups, including those without a permanent address; Steps taken to address vaccine hesitancy (particularly among marginalised groups, including migrant populations); Decision-making around vaccinating young people.				
Key events (with dates)	Topic	Main body/persons involved	Relevant documents	Commentary
Key milestone 11/01/2020 The genetic sequence of SARS-COV-2 was published triggering the urgent international response to prepare for an outbreak and hasten development of a preventive COVID-19 vaccine.	Vaccine development		https://www.nature.com/articles/d41573-020-00073-5	
18/03/2020 First mention of future SAGE meetings to include broader aspects of COVID-19, including vaccines		SAGE	SAGE 17 minutes: Coronavirus (COVID-19) response, 18 March 2020 - GOV.UK (www.gov.uk)	
26/03/2020 SAGE prioritise their focus on clinical trials for treatment and	Vaccine development	SAGE	SAGE 19 minutes: Coronavirus (COVID-19) response, 26 March 2020 - GOV.UK (www.gov.uk)	

vaccine options, including when meaningful results will be available.				
Key milestone 06/04/2020 The UK vaccine taskforce is established by the Government's Chief Scientific Advisor, Sir Patrick Vallance.	Vaccination programme	Chief Scientific Advisor, Sir Patrick Vallance	S0135_Vaccine_Taskforce_Aims.pdf (publishing.service.gov.uk) SAGE 23 minutes: Coronavirus (COVID-19) response, 7 April 2020 - GOV.UK (www.gov.uk) https://www.gov.uk/government/publications/the-vaccine-taskforce-objectives-and-membership-of-steering-group	SAGE outlines its vaccine taskforce aims to ensure the UK is in a position to vaccinate as soon as a vaccine is ready. The Oxford vaccine is close to clinical trials while the Imperial College vaccine is at an earlier stage of development.
21/04/2020 SAGE acknowledge that immunity from the vaccine may differ from natural immunity	Vaccine effectiveness	SAGE	SAGE 27 minutes: Coronavirus (COVID-19) response, 21 April 2020 - GOV.UK (www.gov.uk)	
23/4/2020 SAGE discussed the importance to engage with international biotech and vaccine companies; and to develop UK vaccine manufacturing capacity in the short and longer term	Vaccine development/manufacturing	SAGE	https://www.gov.uk/government/publications/sage-minutes-coronavirus-COVID-19-response-23-april-2020/sage-28-minutes-coronavirus-COVID-19-response-23-april-2020	
23/04/2020 SAGE states modelling indicates that without enhanced immunity provided by vaccines, contact tracing and	Vaccination programme	SAGE/ Cabinet office commission	SAGE 43 minutes: Coronavirus (COVID-19) response, 23 June 2020 - GOV.UK (www.gov.uk)	

COVID-secure measures are unlikely to be sufficiently effective to allow a return to 'pre-COVID' normality without increasing infections rates.				
30/04/2020 SAGE highlights the need for innovative trial design for vaccine deployment.	Vaccine development	SAGE	SAGE 30 minutes: Coronavirus (COVID-19) response, 30 April 2020 - GOV.UK (www.gov.uk)	SAGE highlights the need for innovative trial design other than spike protein technology as there are fewer than a dozen 'front-runners' in terms of vaccines out of 200 potential candidates. A clear plan is needed for 2020/21 seasonal flu vaccine deployment.
16/05/2020 Kate Bingham was named chair to Vaccine Taskforce	Vaccination programme	Vaccine Taskforce	https://www.gov.uk/government/news/kate-bingham-appointed-chair-of-uk-vaccine-taskforce	
04/06/2020 SAGE discuss the need for JCVI and CMO to gather serological data for future vaccination programmes.	Vaccination programme/ vaccine effectiveness	SAGE	SAGE 40 minutes: Coronavirus (COVID-19) response, 4 June 2020 - GOV.UK (www.gov.uk)	SAGE discuss the need for JCVI and CMO to gather serological data for future vaccination programmes as it is hypothesised immunity differs between groups. Possibility of elderly patients requiring an adjuvant.
16/06/2020 UK Government announce clinical researchers will begin human trials of a new coronavirus vaccine developed by researchers at Imperial College London.	Vaccine development	Imperial College London	Government-funded Imperial College COVID-19 vaccine moves into first human trials - GOV.UK (www.gov.uk)	The Imperial College London COVID-19 vaccine used a self-amplifying ribonucleic acid (RNA) technology. On 26/01/2021 , Scientists at Imperial College London have announced they will not be proceeding with large-scale testing of their COVID-19 vaccine because of the rapid approval of other jabs within the UK

				<p>(https://www.independent.co.uk/news/health/COVID-vaccine-variant-imperial-college-uk-b1792766.html)</p> <p>On 23/09/2021 the Imperial College London, startup VaxEquity has announced a strategic, long-term research collaboration with AstraZeneca to develop its self-amplifying RNA technology. (https://www.imperial.ac.uk/news/230554/imperial-rna-technology-developed-vaxequity-with/)</p>
<p>02/07/2020 SAGE to carry out work on public attitudes towards vaccines</p>	Vaccine acceptance	SAGE	<p>https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/904684/S0596_Forty-fifth_SAGE_meeting_on_COVID-19.pdf</p>	
<p>Key milestone 20/7/2020 The University of Oxford publishes its findings from a coronavirus vaccine trial, noting that the vaccine appears safe and triggers an immune response</p>	Vaccine development	University of Oxford	<p>Coronavirus: Oxford vaccine triggers immune response - BBC News</p> <p>Safety and immunogenicity of the ChAdOx1 nCoV-19 vaccine against SARS-CoV-2: a preliminary report of a phase 1/2, single-blind, randomised controlled trial - The Lancet</p>	
<p>November 2020 PHS led a health inequalities impact assessment (HIA) for an extended flu and COVID-19 vaccination programme, which was</p>	Impact on equalities	Public Health Scotland	<p>https://publichealthscotland.scot/media/10611/extended-flu-and-COVID-19-vaccination-health-inequalities-impact-assessment-nov-2020.pdf</p>	<p>This report identified potential barriers to the uptake of flu and COVID-19 vaccines across different population groups, such as those from minority ethnic backgrounds, people living in deprived areas and people with disabilities.</p>

published in December 2021.				
02/11/2020 The Group discussed a paper, noting vaccine delivery was being planned, and front-runners could be available in December.	Vaccine delivery	Scottish Government COVID-19 Advisory Group	https://www.gov.scot/publications/scottish-government-COVID-19-advisory-group-minutes-2-november-2020/	It was noted assessing vaccine effects would be complex and different deployment strategies may be needed.
Key milestone 09/11/2020 Pfizer and BioNTech publish positive efficacy results from Phase 3 studies of their potential COVID-19 vaccine	Vaccine efficacy/ vaccine safety	Pfizer and BioNTech	COVID vaccine: First 'milestone' vaccine offers 90% protection - BBC News https://www.pfizer.com/news/press-release/press-release-detail/pfizer-and-biontech-conclude-phase-3-study-COVID-19-vaccine https://www.nejm.org/doi/full/10.1056/nejmoa2034577	
12/11/2020 SAGE noted the need for very effective pharmacovigilance, for both vaccine safety and efficacy	Vaccine safety/ vaccine effectiveness	SAGE	https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/937450/S0881_Sixty-seventh_SAGE_meeting_on_COVID-19.pdf	

16/11/2020 The Group noted time needed to assess vaccine effectiveness, and the logistical challenges of mass-vaccination.	Vaccine delivery/ vaccine effectiveness	Scottish Government COVID-19 Advisory Group	https://www.gov.scot/publications/scot-tish-government-COVID-19-advisory-group-minutes-16-november-2020/	Initial priority group would be 80+, noting the change in priority of vaccinating the vulnerable. Insufficient data exists on achieving herd-immunity, but optimism was noted. High uptake was considered likely, but some may be hesitant. A need to tackle a possible assumption that NPIs would not be needed post-vaccination was identified as a concern.
Key decision 19/11/20 Scottish Government outlines plans and prioritisation groups for the delivery of COVID-19 vaccines.	Vaccination programme	Health Secretary Jeane Freeman; JCVI	COVID-19 vaccines update - gov.scot (www.gov.scot) [Withdrawn] Priority groups for coronavirus (COVID-19) vaccination: advice from the JCVI, 2 December 2020 - GOV.UK (www.gov.uk)	Document from 2/12, which outlines priority groups and presents issues in relation to inequalities
Key decision 22/11/20 Health secretary decision not to make vaccines mandatory.	Vaccination programme	Health Secretary Jeane Freeman	https://www.bbc.co.uk/news/uk-scotland-55035521	Rather than making vaccines mandatory, the hope is that people will choose to be vaccinated.
25/11/2020 SAGE Vaccine taskforce to review emerging evidence over the next 3 weeks from SIREN, Oxford Health Care Worker Study and vaccine trials	Vaccine safety/ Vaccine effectiveness	SAGE	https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/938977/S0909_Sixty-ninth_SAGE_meeting_on_COVID-19.pdf	
KEY MILESTONE 02/12/2020	Vaccine authorisation	Medicines and Healthcare products	COVID-19 vaccine authorised by medicines regulator - GOV.UK (www.gov.uk)	The Medicines and Healthcare Products Regulatory Agency (MHRA) approved the Pfizer vaccine for use in the UK, becoming

UK Government announce that the vaccine developed by Pfizer and BioNTech has been authorised by the medicines regulator for use in the UK.		Regulatory Agency (MHRA)		the first country to approve this vaccine and the first country in the Western world to approve the use of any COVID-19 vaccine.
03/12/2020 The Scottish Government COVID-19 Advisory Group discusses the authorisation of the Pfizer vaccine	Vaccination programme/ authorisation	Scottish Government COVID-19 Advisory Group	https://www.gov.scot/publications/scottish-government-COVID-19-advisory-group-minutes-3-december-2020/	In the meeting the following are discussed: the significance of the authorisation, JCVI recommendations, vaccine supplies, anti-vaccination views, vaccine passports and testing in the era of vaccination.
KEY MILESTONE 08/12/2020 Scottish Government announce the first vaccinations against coronavirus (COVID-19) have been given in Scotland to those who will be carrying out the vaccination programme.	Vaccine delivery	NHS Scotland; NHS Health Boards	First COVID-19 vaccinations in Scotland take place. - gov.scot (www.gov.scot)	
KEY MILESTONE 08/12/2020 AstraZeneca and Oxford University publish positive efficacy results from Phase 3 studies of their potential COVID-19 vaccine	Vaccine efficacy/ vaccine safety	Oxford University and AstraZeneca	https://www.thelancet.com/journals/lanct/article/PIIS0140-6736(20)32661-1/fulltext	

<p>10/12/2020 SAGE considered a paper on early insights from vaccination modelling, and the impact of immunisation on the epidemic. Trials have also shown that some vaccines are highly effective at preventing symptoms of COVID-19.</p>	<p>Vaccine safety/ Vaccine efficacy</p>	<p>SAGE</p>	<p>https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/999169/S0969_Seveny-second_SAGE_meeting_on_COVID-19.pdf</p> <p>https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/954908/s0959-spi-m-o-early-insights-vaccines.pdf</p> <p>https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/999940/S0960_NERVTAG_Immunity_Certification.pdf</p>	
<p>Key milestone 14/12/2020 First doses of Pfizer/BioNtech vaccine delivered in care homes. Difficulties with delivering the vaccine to Scottish Islands.</p>	<p>Vaccine delivery</p>		<p>https://www.bbc.com/news/uk-scotland-55287355</p> <p>https://www.bbc.com/news/uk-scotland-highlands-islands-55308636</p>	
<p>16/12/2020 The Scottish Government reports medium-to-long-term consideration to vaccines.</p>	<p>Vaccination programme</p>	<p>Scottish Government COVID-19 Advisory Group</p>	<p>https://www.gov.scot/publications/scottish-government-COVID-19-advisory-group-minutes-16-december-2020/</p>	<p>Discussion includes vaccine effectiveness in light of the new variant. Importance of vaccine's effect on transmission on easing restrictions; need to understand expected future developments for vaccines and children.</p>
<p>17/12/2020 SAGE noted that there is significant risk that vaccine uptake for</p>	<p>Vaccine acceptance</p>	<p>SAGE</p>	<p>https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/952613/s0989-COVID-19-sage-73-minutes-171220.pdf</p>	<p>There is significant risk that vaccine uptake for COVID-19 will be lower among minority ethnic groups, mainly related to trust in vaccine safety and efficacy. Also, there is a risk that changes in behaviour could offset</p>

<p>COVID-19 will be lower among minority ethnic groups.</p>			<p>https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/952716/s0979-factors-influencing-vaccine-uptake-minority-ethnic-groups.pdf</p> <p>https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/950723/s0978-spi-b-possible-impact-COVID-19-vaccination-programme-adherence-to-rules-guidance.pdf</p>	<p>the benefits of vaccination, particularly in the early months of vaccine rollout.</p>
<p>Key milestone 30/12/2020 Medicines and Healthcare products Regulatory Agency (MHRA) approves the Oxford AstraZeneca vaccine for use in the UK.</p>	<p>Vaccine authorisation</p>	<p>Medicines and Healthcare products Regulatory Agency (MHRA)</p>	<p>https://www.gov.uk/government/news/oxford-universityastrazeneca-COVID-19-vaccine-approved</p> <p>https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/954908/s0959-spi-m-o-early-insights-vaccines.pdf</p>	
<p>Key decision 30/12/2020 The UK Chief Medical Officers issue a statement on the prioritisation of first doses of the coronavirus vaccines.</p>	<p>Vaccination programme/ Vaccine safety</p>	<p>4 UK CMOs; JCVI</p>	<p>Statement from the UK Chief Medical Officers on the prioritisation of first doses of COVID-19 vaccines - GOV.UK (www.gov.uk)</p>	<p>1) Change of delivery plans where delivering first vaccine doses to as many people on the JCVI Phase 1 priority list in the shortest possible timeframe was prioritised (which meant extension of period between two doses of Pfizer vaccine from 3 to 12 weeks) 2) Vaccination with either vaccine (Astrazeneca or Pfizer) in pregnancy should be considered where the risk of exposure SARS-CoV2 infection is high and cannot be avoided, or where the woman has underlying conditions that place her at very high risk of serious complications of COVID-</p>

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30/12/2020 The Group raises vaccination of teachers; identifies vaccine behaviours as an issue for coming meetings.	Vaccination programme	Scottish Government COVID-19 Advisory Group	https://www.gov.scot/publications/scottish-government-COVID-19-advisory-group-minutes-30-december-2020/	
Key milestone 30/12/2020 Initial results for the efficacy and safety of the Moderna vaccine Phase 3 trial were announced in press releases.	Vaccine efficacy/ vaccine safety	Moderna	https://www.nejm.org/doi/full/10.1056/nejmoa2035389	
Key milestone 04/01/2021 Scottish Government announce the rollout of the Astrazeneca vaccine.	Vaccine delivery	NHS Scotland; NHS Health boards	Roll-out of Astrazeneca vaccine gets underway - gov.scot (www.gov.scot)	
Key decision 07/01/2021 SAGE discusses delaying the time between vaccine doses, vaccinating under 16s and variant susceptibility to vaccines And 07/01/2021	Vaccine delivery/ Vaccine effectiveness	SAGE; Scottish government; COVID-19 advisory group	SAGE 75 minutes: Coronavirus (COVID-19) response, 7 January 2021 - GOV.UK (www.gov.uk) SARS-CoV-2 immunity-escape variants (publishing.service.gov.uk) Scottish Government COVID-19 Advisory Group minutes: 7 January 2021 - gov.scot (www.gov.scot)	Concerns about escape variants and mutations. Possible expansion of vaccination to younger age groups. The UK delays the second vaccination from 3 weeks after the first dose to 12 weeks after the first dose. Vaccination of under 16s considered. Investigations into variant B.1.1.7 susceptibility to current vaccines.

Scottish government discuss revaccination and wider rollout of the vaccine programme			HERD+IMMUNITY+-+2807+January+2021%29.pdf (www.gov.scot)	
Key milestone 07/01/2021 Scottish government announces that more than half of all care home residents have been vaccinated	Vaccine delivery	Nicola Sturgeon	https://www.bbc.com/news/uk-scotland-55575978	
Key milestone 08/01/2021 MHRA approval of Moderna vaccine	Vaccine authorisation	MHRA	https://www.gov.uk/government/publications/regulatory-approval-of-COVID-19-vaccine-moderna	
11/01/2021 Scottish Government announce the rollout of the Oxford/Astrazeneca coronavirus (COVID-19) vaccine in GP practices and community vaccination centres.	Vaccine delivery	NHS Scotland; GP practices and community vaccination centres	Oxford AstraZeneca vaccine national roll-out - gov.scot (www.gov.scot)	
14/01/2021 SAGE acknowledge that vaccines are not 100% effective and there will not be 100% coverage.	Vaccination programme	SAGE/ NHSE	SAGE 76 minutes: Coronavirus (COVID-19) response, 14 January 2021 - GOV.UK (www.gov.uk) S1024 SPI-M vaccination ask Imperial College.pdf (publishing.service.gov.uk) S1023 SPI-M Vaccine scenarios .pdf (publishing.service.gov.uk)	Caution is advised around relaxing NPIs in the absence of high vaccine coverage. NHSE asked to identify how data on vaccination uptake and refusals can be obtained.

<p>Key event 14/01/2021 Publication of the Scottish Government's first COVID-19 vaccine deployment plan</p>	Vaccination programme	Scottish government	<p>https://www.audit-scotland.gov.uk/uploads/docs/report/2021/briefing_210930_vaccination.pdf</p> <p>University of Warwick: COVID-19 vaccine impact forecast, 13 January 2021 - GOV.UK (www.gov.uk)</p> <p>https://www.gov.scot/publications/coronavirus-covid-19-vaccine-deployment-plan-2021/</p>	
<p>Key milestone 16/01/2021 Scotland begin mass vaccination of health care workers.</p>	Vaccine delivery	Scottish government	<p>https://www.bbc.com/news/uk-scotland-55688152</p>	
<p>17/01/2021 Doctors leaders warn that 'patchy' supply of vaccines to GP surgeries is negatively affecting deployment</p>	Vaccine delivery		<p>https://www.bbc.com/news/uk-scotland-55695249</p>	
<p>18/01/2021 Armed forces help to establish 80 more COVID vaccination centres in Scotland</p>	Vaccine delivery/ Vaccination programme		<p>https://www.bbc.com/news/uk-scotland-55695133</p>	
<p>Key milestone 19/01/2021 Scottish government announces that that vaccination targets will be met</p>	Vaccine delivery		<p>https://www.bbc.com/news/uk-scotland-55718313</p>	

<p>21/01/2021 SAGE is satisfied there is no evidence of significant antigenic escape (natural or vaccine-induced) for the B.1.1.7 variant. Other variants being monitored.</p> <p>And 21/01/2021 Scottish government discuss antigenic escape, along with vaccine hesitancy and uptake.</p>	Vaccine effectiveness	SAGE; Scottish government; COVID-19 advisory group	<p>SAGE 77 minutes: Coronavirus (COVID-19) response, 21 January 2021 - GOV.UK (www.gov.uk)</p> <p>Scottish Government COVID-19 Advisory Group minutes: 21 January 2021 - gov.scot (www.gov.scot)</p> <p>State+of+the+epidemic+report+-+22+January+2021+%2828+January+2021%29.pdf (www.gov.scot)</p>	Variants N501Y, E484K and K417N/E are being monitored. The Vaccine Science Coordination Group (VSCG) has now been established.
<p>21/01/2021 Scottish Government launch the vaccination information campaign 'Roll your sleeves up'.</p>	Vaccination programme	NHS Inform	<p>Vaccination information campaign - gov.scot (www.gov.scot)</p>	
<p>24/01/2021 Scottish Government announce invitations for COVID-19 vaccine appointments for people aged 70-79 will commence from Monday 25 January.</p>	Vaccination programme/delivery	NHS Scotland, NHS Health boards	<p>Vaccination programme update - gov.scot (www.gov.scot)</p>	<p>Use of blue envelopes;</p> <p>A new booking system is being used by health boards in Fife, Forth Valley, Ayrshire & Arran, Lanarkshire, Greater Glasgow and Clyde and Lothian to schedule appointments for patients in order of priority. More boards are expected to make use of the technology as the vaccination programme expands.</p>
<p>28/01/2021 SAGE estimates that 20-40% of the population have had a primary infection or</p>	Vaccine effectiveness	SAGE; SPI-M	<p>SAGE 78 minutes: Coronavirus (COVID-19) response, 28 January 2021 - GOV.UK (www.gov.uk)</p>	Immunity peaks in young adults and lowest in the youngest and oldest age groups. SPI-M projections show a lag between vaccination and prevention of infection, hospitalisation and deaths.

been vaccinated. Studies of B.1.351 show reductions in ability of sera to neutralise the virus.				
28/01/2021 Scottish government is working to accelerate the vaccine rollout	Vaccination programme	Scottish government; COVID-19 advisory group	Scottish Government COVID-19 Advisory Group minutes: 28 January 2021 - gov.scot (www.gov.scot)	
28/01/2021 UK Government announce commercial manufacturing of the Valneva COVID-19 vaccine candidate begins in Livingston, West Lothian.	Vaccine production	Department for Business, Energy & Industrial Strategy, Department of Health and Social Care, The Rt Hon Kwasi Kwarteng MP, The Rt Hon Alister Jack MP, and The Rt Hon Matt Hancock MP	Large-scale coronavirus vaccine manufacturing begins in Scotland - GOV.UK (www.gov.uk)	<p>Scottish Secretary, Alister Jack: "The UK government has invested millions into developing the Valneva vaccine, which is also supporting hundreds of highly skilled jobs in Scotland."</p> <p>In September 2021, Valneva announced that the UK government had cancelled the vaccine order pulling out of a £1.2 billion deal (https://www.bbc.co.uk/news/business-58499064)</p> <p>In November 2021, Valneva calls for apology from UK Government and said that has not ruled out legal action. (https://www.scotsman.com/news/politics/livingston-COVID-vaccine-maker-valneva-calls-for-apology-from-uk-government-and-has-not-ruled-out-legal-action-3453925)</p> <p>On 23/12/2021, Valneva said that it is in "advanced discussions" with Scottish Enterprise over a multi-million pound deal</p>

				which would see its COVID vaccines manufactured in Scotland. (https://valneva.com/press-release/valneva-and-scottish-enterprise-in-advanced-discussions-for-major-grant-to-complete-livingston-site/)
29/01/2021 BBC News reports the Novavax vaccine shows 89.3% efficacy at preventing COVID-19 in participants in its Phase 3 clinical trial in the UK.	Vaccine development	Novavax	COVID-19: Novavax vaccine shows 89% efficacy in UK trials - BBC News https://www.science.org/content/article/novavax-vaccine-delivers-89-efficacy-against-covid-19-uk-less-potent-south-africa	
01/2/2021 Scottish Government announce mass vaccination centres will open in Edinburgh and Aberdeen on 1 February.	Vaccine delivery	Scottish government	Vaccine programme moves to next stage - gov.scot (www.gov.scot)	
03/2/2021 The University of Dundee launches the UK-wide VAC4COVID study to measure the safety and effectiveness of COVID vaccines as they are delivered, and appeals for volunteers to participate	Vaccine safety and vaccine effectiveness	University of Dundee	Home page - VAC4COVID https://www.bbc.com/news/uk-scotland-55922644	
Key milestone 04/02/2021	Vaccine effectiveness	SAGE	SAGE 79 minutes: Coronavirus (COVID-19) response, 4 February 2021 - GOV.UK (www.gov.uk)	SAGE stress that even with a significant proportion of people vaccinated, lifting NPI's will likely cause resurgence.

SAGE data indicates that both natural and vaccine-induced immunity gives good (77%) level of protection around 2 weeks after exposure/ vaccination.			S1077 Vaccination and NPIs Warwick.pdf (publishing.service.gov.uk) S1078 SPI-M vaccination ask Imperial College .pdf (publishing.service.gov.uk)	A single dose of Astra-Zeneca vaccine provides at least 90 days protection in 7 out of 10 people.
Key milestone 10/02/2021 Scottish Government announce the number of first dose vaccinations in Scotland reaches the 1 million milestone.	Vaccine delivery	Scottish government	https://www.gov.scot/news/one-million-people-vaccinated/	
11/02/2021 SAGE assess the effect of lifting restrictions against vaccine coverage and uptake.	Vaccination programme/ vaccine effectiveness	SAGE	SAGE 80 minutes: Coronavirus (COVID-19) response, 11 February 2021 - GOV.UK (www.gov.uk) S1112 CO-CIN Tier 10 for JCVI.pdf (publishing.service.gov.uk)	Impacts on hospitalisations, deaths and infections are particularly smaller when vaccination uptake is high in the most vulnerable groups.
11/02/2021 UK Government announce a further 353 Armed Forces personnel will be deployed to locations across Scotland to support the testing and vaccine delivery programmes.	Vaccine delivery	Ministry of Defence, Office of the Secretary of State for Scotland, The Rt Hon Ben Wallace MP, The Rt Hon Alister Jack MP, and The Rt Hon Matt Hancock MP	Over 350 additional military personnel deployed in Scottish COVID response - GOV.UK (www.gov.uk)	
17/02/2021 Scottish government announce that there is	Vaccine effectiveness	Nicola Sturgeon	https://www.bbc.com/news/uk-scotland-scotland-politics-56098578	

'hard evidence' vaccination reduces deaths from COVID-19			PowerPoint Presentation (www.gov.scot)	
18/02/2021 SAGE models suggest that once all adults have been offered one dose of the vaccine restrictions may be eased.	Vaccination programme	SAGE	SAGE 81 minutes: Coronavirus (COVID-19) response, 18 February 2021 - GOV.UK (www.gov.uk)	SAGE - delaying releasing of restrictions is unlikely to have a significant impact on the scale of resurgence.
18/02/2021 Scottish government consider the effects of vaccinating younger age groups and the use of vaccine certification.	Vaccination programme	Scottish Government COVID-19 Advisory Group minutes	Scottish Government COVID-19 Advisory Group minutes: 18 February 2021 - gov.scot (www.gov.scot)	
Key decision 22/02/2021 Scottish Government announce people with underlying health conditions and unpaid carers are beginning to receive COVID-19 vaccinations.	Vaccination programme	JCVI; Health Secretary Jeane Freeman	https://www.gov.scot/news/next-stage-for-vaccine-programme/	
Key decision 24/02/2021 JCVI has confirmed that everyone with a learning disability will now be prioritised for vaccination under group 6 of phase 1	Vaccination programme	JCVI	https://www.disabilityrightsuk.org/news/2021/february/people-learning-disabilities-be-prioritised-vaccinations	

<p>25/02/2021 SAGE state that the impact of vaccinations on reducing post-COVID syndromes is unclear.</p>	Vaccine effectiveness	SAGE	SAGE 82 minutes: Coronavirus (COVID-19) response, 25 February 2021 - GOV.UK (www.gov.uk)	Post-COVID syndromes can occur after mild disease and the effect of the vaccine on mild disease is also unclear.
<p>Key milestone 25/02/2021 Scottish Government announce Scotland's vaccination programme has delivered first doses of the COVID-19 vaccine to a third (33.4%) of those eligible – more than 1.5 million people.</p>	Vaccine delivery	Scottish government	https://www.gov.scot/news/vaccines-delivered-to-a-third-of-scotlands-eligible-population/	
<p>Key decision 26/02/2021 JCVI issues interim advice on Phase 2 of COVID-19 vaccination programme rollout.</p>	Vaccination programme	JCVI, Department for Health and Social Care	JCVI issues interim advice on Phase 2 of COVID-19 vaccination programme rollout - GOV.UK (www.gov.uk)	Evidence suggests an age-based approach remains the most effective way of reducing death and hospitalisation from COVID-19
<p>04/03/2021 MHRA announce modified COVID-19 vaccines for variants will be fast-tracked. And 04/03/2021 Scottish government discuss anticipated problems with vaccine</p>	Vaccine development	MHRA; Scottish government; COVID-19 advisory group	Modified COVID-19 vaccines for variants to be fast-tracked, says MHRA and other regulators - GOV.UK (www.gov.uk) Scottish Government COVID-19 Advisory Group minutes: 4 March 2021 - gov.scot (www.gov.scot)	

passports and concerns over variants.				
<p>11/03/2021 SAGE say many of the people testing positive for COVID-19 after vaccination develop symptoms before immunity would be expected to have developed (<2 weeks). There is a modest decrease in vaccine efficacy against variant B.1.351.</p> <p>And 18/03/2021 Scottish government raise concerns over low vaccination rate in 50-59-year-olds. Worries expressed over protection against B.1.351 variant.</p>	Vaccine effectiveness/ Vaccine delivery/ Vaccination programme	SAGE; Scottish government; COVID-19 advisory group	<p>SAGE 83 minutes: Coronavirus (COVID-19) response, 11 March 2021 - GOV.UK (www.gov.uk)</p> <p>S1143 Hospitalised vaccinated patients during the second wave 2 .pdf (publishing.service.gov.uk)</p> <p>S1144 SAGE Vaccine Update Group.pdf (publishing.service.gov.uk)</p> <p>SPI-B - Severe mental illness and COVID-19 vaccination.pdf (publishing.service.gov.uk)</p> <p>S1162 SPI-B - Behavioural Considerations for Vaccine Uptake in Phase 2.pdf (publishing.service.gov.uk)</p> <p>Scottish Government COVID-19 Advisory Group minutes: 18 March 2021 - gov.scot (www.gov.scot)</p> <p>PowerPoint Presentation (www.gov.scot)</p>	Vaccinated individuals will be hospitalised as the vaccine is not 100% effective.
<p>11/03/2021 AstraZeneca COVID-19 shots stopped by several European nations amid blood clot reports, but EU</p>	Vaccine safety/ vaccination programme	JCVI	https://www.gov.uk/government/publications/covid-19-vaccination-blood-clotting-information-for-healthcare-professionals/information-for-healthcare-professionals-on-blood-clotting-following-covid-19-vaccination	

regulator says no evidence of link				
<p>Key decision 11/03/2021 JCVI advises prioritising homeless people and rough sleepers for the COVID-19 vaccine.</p>	Vaccination programme	JCVI; Public Health England	<p>JCVI advises prioritising homeless people and rough sleepers for COVID-19 vaccine - GOV.UK (www.gov.uk)</p> <p>Letter from the Health and Social Care Secretary on COVID-19 vaccination phase 1 advice - GOV.UK (www.gov.uk)</p>	Key event in relation to the timing of this prioritisation
<p>Key decision 15/03/2021 Chief medical officer for Scotland expresses confidence in Oxford/Astra-Zeneca vaccine after reports of a possible link to blood clots across Europe</p>	Vaccine safety	Gregor Smith, Chief medical officer for Scotland	<p>https://www.bbc.com/news/uk-scotland-56404312</p>	Key event in restoring the public's faith and ensuring smooth and consistent rollout of the vaccination strategy
<p>15/03/2021 Scottish Government launch the coronavirus vaccine self-registration service for unpaid carers.</p>	Vaccine delivery		<p>Launch of new vaccination campaign - gov.scot (www.gov.scot)</p>	
<p>Key milestone 17/03/2021 Scottish Government announce Scotland's vaccination programme has delivered first doses of the coronavirus vaccine to more than two million people – 44% of the adult population.</p>	Vaccine delivery		<p>Vaccination programme reaches two million people - gov.scot (www.gov.scot)</p>	

<p>Key event 24/03/2021 Publication of the Scottish Government's second COVID-19 vaccine deployment plan</p>	Vaccination programme	Scottish Government	https://www.audit-scotland.gov.uk/uploads/docs/report/2021/briefing_210930_vaccination.pdf	
<p>Key decision 18/03/2021 UK regulator confirms that people should continue to receive the COVID-19 vaccine AstraZeneca.</p>	Vaccine safety	MHRA; COVID-19 Expert Working Group of the Commission on Human Medicines;	UK regulator confirms that people should continue to receive the COVID-19 vaccine AstraZeneca - GOV.UK (www.gov.uk)	Following suspensions by some countries of the COVID-19 Vaccine AstraZeneca over suspected blood clots, the MHRA confirms that the benefits of the vaccine in preventing COVID-19 far outweigh the risks
<p>25/03/2021 SAGE express concern over importation of variants. JCVI provides further guidance on prioritisation of vaccines. ONS data reveals which groups are more likely to have vaccine hesitancy.</p>	Vaccine effectiveness/ vaccine safety	SAGE; JCVI; ONS	SAGE 84 minutes: Coronavirus (COVID-19) response, 25 March 2021 - GOV.UK (www.gov.uk)	B.1.351 variants selective advantage is greater in a vaccinated population. Vaccines needed to decrease COVID infections among prisoners and staff – potential priority change.
<p>Key milestone 31/03/2021 SAGE modelling suggest that vaccination means high infection numbers will not result in as high levels of hospitalisations. And 01/04/2021</p>	Vaccine effectiveness	SAGE; Scottish government; COVID-19 advisory group	Eighty-fifth SAGE meeting on COVID-19, 31 March 2021 - GOV.UK (www.gov.uk) Scottish Government COVID-19 Advisory Group minutes: 1 April 2021 - gov.scot (www.gov.scot) PowerPoint Presentation (www.gov.scot)	With high levels of vaccine uptake in the third wave, it is expected most deaths will occur in vaccinated people in older age groups due to a higher proportion of people being vaccinated. Most deaths will occur in those who are vaccinated.

Scottish government data shows reduced hospitalisations, deaths and transmission due to vaccines.				
08/04/2021 SPI-M data shows that vaccination of older age groups has little effect on population wide transmission. As younger age groups are vaccinated a greater impact on transmission is expected. As settings begin to re-open vaccination is further encouraged.	Vaccine effectiveness/ Vaccination programme	SPI-M	SAGE 86 minutes: Coronavirus (COVID-19) response, 8 April 2021 - GOV.UK (www.gov.uk) S1190 Ready reckoners under vaccination based on POLYMOD.pdf (publishing.service.gov.uk) S1189 Bristol reckoners vaccination update.pdf (publishing.service.gov.uk) S1192 Current environmental monitoring cannot constrain the effect of vaccines on SARS-CoV-2 transmission Report for SAGE.pdf (publishing.service.gov.uk)	
Key decision 08/04/2021 JCVI publish New advice regarding the AstraZeneca COVID-19 vaccine following reports of extremely rare blood clots.	Vaccine safety	JCVI	New JCVI advice on use of the AstraZeneca COVID-19 vaccine - GOV.UK (www.gov.uk) JCVI statement on use of the AstraZeneca COVID-19 vaccine: 7 April 2021 - GOV.UK (www.gov.uk)	Adults aged under 30 with no underlying conditions should be offered an alternative to the AstraZeneca vaccine where available.
15/04/2021 Scottish government consider employing a new vaccine strategy	Vaccination programme	Scottish government; COVID-19 advisory group	Scottish Government COVID-19 Advisory Group minutes: 15 April 2021 - gov.scot (www.gov.scot)	Considerations of approaches to vaccination in different parts of the world and the effect on virus suppression.

to tackle the Kent variant.				
<p>Key decision 16/04/2021 JCVI publish new advice on COVID-19 vaccination for pregnant women.</p>	Vaccination programme/ vaccine safety	JCVI, PHE, Royal College of Obstetricians and Gynaecologists	<p>JCVI issues new advice on COVID-19 vaccination for pregnant women - GOV.UK (www.gov.uk)</p> <p>Vaccine Pregnancy Registry CDC https://COVID-nma.com/vaccines/?comparison=544 https://www.mcmasterforum.org/docs/default-source/product-documents/living-evidence-syntheses/COVID-19-living-evidence-synthesis-6.29--what-is-the-efficacy-and-effectiveness-of-available-COVID-19-vaccines-in-general-and-specifically-for-variants-of-concern.pdf?sfvrsn=976fa3a5_5</p>	Pregnant women should be offered the COVID-19 vaccine at the same time as the rest of the population, based on their age and clinical risk group.
<p>Key milestone 21/04/2021 Johnson & Johnson announced publication in the New England Journal of Medicine of primary data from the Phase 3 ENSEMBLE clinical trial for its single-dose COVID-19 vaccine, developed by the Janssen Pharmaceutical Companies of Johnson & Johnson (Janssen).</p>	Vaccine efficacy/ vaccine safety	Johnson & Johnson	https://www.nejm.org/doi/full/10.1056/NEJMoa2101544	

<p>22/04/2021 CO-CIN analysis shows few people develop COVID symptoms more than 3 weeks post vaccination (minimum 1 dose). SAGE considers the impact of unequal vaccination globally on the UK.</p>	<p>Vaccine effectiveness</p>	<p>CO-CIN/ SAGE</p>	<p>SAGE 87 minutes: Coronavirus (COVID-19) response, 22 April 2021 - GOV.UK (www.gov.uk)</p> <p>S1207 Hospitalised vaccinated patients during the second wave SAGE 87.pdf (publishing.service.gov.uk)</p> <p>S1208 CO-CIN report on impact of vaccination Apr 21.pdf (publishing.service.gov.uk)</p>	<p>SAGE note that ongoing transmission in other countries continues to pose a threat to UK health even when the epidemic is under control in this country and a high proportion of the population is vaccinated.</p>
<p>Key milestone 26/04/2021 The number of second COVID vaccine doses gives passes 1 million. 2.8 million (61%) have now received at least one dose of the vaccine.</p>	<p>Vaccine delivery</p>	<p>Scottish government</p>	<p>https://www.bbc.com/news/uk-scotland-56890445</p>	
<p>05/05/2021 SAGE suggest administration of further doses of current vaccines may maintain or boost protection for winter 2021/22.</p>	<p>Vaccine effectiveness/ Vaccination programme</p>	<p>SAGE</p>	<p>SAGE 88 minutes: Coronavirus (COVID-19) response, 5 May 2021 - GOV.UK (www.gov.uk)</p> <p>S1226 Setting up medium- and long-term vaccine strain selection and immunity management for SARS-CoV-2 1 .pdf (publishing.service.gov.uk)</p>	<p>Vaccination may have a greater impact on transmission than previously assumed.</p>
<p>Key milestone 07/05/2021 Everyone in JCVI priority groups 1-9 has been offered the first dose of a vaccine</p>	<p>Vaccination delivery</p>	<p>Scottish government</p>	<p>https://www.audit-scotland.gov.uk/uploads/docs/report/2021/briefing_210930_vaccination.pdf</p>	

<p>Key decision 07/05/2021 JCVI announce an alternative to the Oxford Astra-Zeneca vaccines should be offered to those under 40</p>	Vaccine safety/ Vaccination programme	JCVI; MRHA	JCVI advises on COVID-19 vaccine for people aged under 40 - GOV.UK (www.gov.uk)	
<p>13/05/2021 Early indications suggest that there may be reductions in immunity from vaccines/ past infection against variant B.1.617.2</p> <p>And 13/05/2021 Deaths from B.1.617.2 are mainly amongst the unvaccinated in Scotland but case rates are still low. Further consideration of vaccinating children.</p>	Vaccine effectiveness/ Vaccination programme	SAGE; Scottish government; COVID-19 advisory group	<p>SAGE 89 minutes: Coronavirus (COVID-19) response, 13 May 2021 - GOV.UK (www.gov.uk)</p> <p>Scottish Government COVID-19 Advisory Group minutes: 13 May 2021 - gov.scot (www.gov.scot)</p>	
<p>Key milestone 15/05/2021 Scottish Government announce Scotland's <u>vaccination roll-out has reached two thirds of the eligible population.</u></p>	Vaccine delivery	Scottish government, Chief Medical Officer Dr Gregor Smith	https://www.gov.scot/news/three-million-people-receive-first-vaccination/	
<p>Key milestone 19/05/2021</p>	Vaccination programme	NHS Scotland, Chief Medical Officer Dr Gregor Smith	https://www.gov.scot/news/covid-19-vaccination-status-scheme-launches/	

<p>Scottish Government <u>launches the COVID-19 vaccination status scheme</u>. The service will provide confirmation of vaccination when required for foreign travel.</p>				
<p>26/05/2021 First Minister Nicola Sturgeon announces the <u>priorities for the Scottish Government in the first 100 days</u>, including completing the vaccination of all adults (subject to supply)</p>	<p>Vaccination programme</p>	<p>First Minister Nicola Sturgeon</p>	<p>https://www.gov.scot/publications/priorities-government-statement-26-2021/</p>	
<p>27/05/2021 PHE analysis indicates decreased vaccine effectiveness against the Delta variant B.1.617.2.</p> <p>And 27/05/2021 Scottish government data suggests that Delta has more impact than Alpha, currently no statistically</p>	<p>Vaccine effectiveness</p>	<p>PHE; SAGE</p>	<p>SAGE 90 minutes: Coronavirus (COVID-19) response, 27 May 2021 - GOV.UK (www.gov.uk)</p> <p>S1257 SCWG Post Vaccination Mitigations.pdf (publishing.service.gov.uk)</p> <p>Social Care Working Group consensus statement, March 2021 - GOV.UK (www.gov.uk)</p> <p>Scottish Government COVID-19 Advisory Group minutes: 27 May 2021 - gov.scot (www.gov.scot)</p>	<p>Care homes remain more vulnerable to COVID-19 outbreaks even after residents have been vaccinated.</p>

significant difference on vaccine effect.				
Key milestone 28/05/2021 Medicines and Healthcare products Regulatory Agency (MHRA) approves the one-dose Janssen COVID-19 vaccine for use in the UK.	Vaccine development/ Vaccine safety	Medicines and Healthcare products Regulatory Agency (MHRA)	https://www.gov.uk/government/news/one-dose-janssen-COVID-19-vaccine-approved-by-the-mhra	
Key milestone 30/05/2021 The number of people who have received 2 doses of the COVID vaccines passes 2 million.	Vaccine delivery		https://www.bbc.com/news/uk-scotland-57300809	
03/06/2021 CO-CIN analysis shows that older people are making up a decreasing proportion of those in hospital.	Vaccine effectiveness	CO-CIN; SAGE	SAGE 91 minutes: Coronavirus (COVID-19) response, 3 June 2021 - GOV.UK (www.gov.uk) S1278 PHS Strathclyde SGene Pos.pdf (publishing.service.gov.uk)	CO-CIN analysis shows that older people are making up a decreasing proportion of those in hospital, demonstrating that vaccines are protecting against hospitalisations. Delaying further increases in contacts will allow more people to be vaccinated before transmission increases further due to Delta variant.
Key milestone 04/06/2021 Medicines and Healthcare products Regulatory Agency (MHRA) <u>approves the Pfizer/BioNTech vaccine for use in 12- to 15-year-olds.</u>	Vaccine development/ Vaccine safety	Medicines and Healthcare products Regulatory Agency (MHRA)	https://www.gov.uk/government/news/the-mhra-concludes-positive-safety-profile-for-pfizerbiontech-vaccine-in-12-to-15-year-olds	

<p>09/06/2021 SAGE report that most people who are in hospital are not fully vaccinated. Potential impacts of waning immunity and re-vaccination remain unclear.</p>	<p>Vaccine effectiveness</p>	<p>SAGE</p>	<p>SAGE 92 minutes: Coronavirus (COVID-19) response, 9 June 2021 - GOV.UK (www.gov.uk)</p>	
<p>10/06/2021 Scottish government extends vaccine programme to anyone over 18. Evidence that vaccination shortens hospital stays. Quarantine free travel considered for fully vaccinated.</p>	<p>Vaccination programme/ vaccine effectiveness</p>	<p>Scottish government; COVID-19 advisory group</p>	<p>Scottish Government COVID-19 Advisory Group minutes: 10 June 2021 - gov.scot (www.gov.scot)</p>	<p>Majority of students should have been offered their first vaccination in early autumn</p>
<p>11/06/2021 Scottish Government announce the expansion of the <u>national vaccination programme to include international students</u>.</p>	<p>Vaccination programme</p>	<p>Joint Committee on Vaccination and Immunisation (JCVI), Health Secretary Humza Yousaf, Universities Scotland Director Alastair Sim</p>	<p>https://www.gov.scot/news/expanding-the-national-vaccination-programme/</p>	
<p>Key decision 13/06/2021 Scottish Government brings forward second vaccine doses for over-40s to help combat Delta variant.</p>	<p>Vaccination programme</p>	<p>Joint Committee on Vaccination and Immunisation (JCVI), Health Secretary Humza Yousaf, NHS Scotland</p>	<p>https://www.gov.scot/news/bringing-forward-second-doses/</p>	

14/06/2021 Trials for a third booster COVID vaccine begin in Glasgow.	Vaccination programme	Scottish government	https://www.bbc.com/news/uk-scotland-glasgow-west-57477370	
Key decision 30/06/2021 JCVI issues interim advice on COVID-19 booster vaccination	Vaccination programme	Joint Committee on Vaccination and Immunisation (JCVI), Public Health England	https://www.gov.uk/government/news/jcvi-issues-interim-advice-on-COVID-19-booster-vaccination https://sporevidencealliance.ca/wp-content/uploads/2021/12/Waning-Vaccine-Effectiveness_Update-1-Report_2021.12.02.pdf	Any potential COVID-19 booster programme should be offered in 2 stages from September, starting with those most at risk from serious disease.
02/07/2021 Scottish Government announce all mainland health boards will offer drop-in coronavirus vaccination clinics from Monday 5 July.	Vaccine delivery	NHS Scotland, Health Secretary Humza Yousaf	https://www.gov.scot/news/drop-in-vaccine-clinics-in-every-mainland-health-board/	
07/07/2021 A CO-CIN analysis shows reductions in morbidity and mortality in hospital patients, due to the lower average age of patients and the impact of vaccination.	Vaccine effectiveness	SAGE	https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1001160/S1300_SAGE_93_minutes_Coronavirus_COVID-19_response_7_July_2021.pdf https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1001156/S1305_JU_NIPER_Transitioning_from_non-pharmaceutical_interventions_to_vaccination_to_control_COVID-19_transmission.pdf	

<p>Key milestone 18/07/2021 Scottish Government announce <u>the vaccination programme will complete first doses for all over 18s</u> who have attended their scheduled appointments at close of play on Sunday 18 July.</p>	<p>Vaccine delivery</p>	<p>NHS Scotland, Health Secretary Humza Yousaf</p>	<p>https://www.gov.scot/news/major-milestone-in-vaccination-programme/</p>	<p>Second doses continue to be scheduled and it is expected all adults will have received them by Sunday 12 September.</p>
<p>Key decision 19/07/2021 JCVI issues advice on COVID-19 vaccination of children aged 12-15 years old at increased risk of serious COVID-19 disease and 12 to 17 who live with an immunosuppressed person should be offered Pfizer-BioNTech vaccine.</p>	<p>Vaccination programme</p>	<p>Joint Committee on Vaccination and Immunisation (JCVI)</p>	<p>https://www.gov.uk/government/news/jcvi-issues-advice-on-COVID-19-vaccination-of-children-and-young-people</p> <p>https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1009175/S1328_Vaccine_Effectiveness_table_.pdf</p>	<p>That includes children aged 12 to 15 with severe neurodisabilities, Down’s syndrome, immunosuppression and multiple or severe learning disabilities.</p> <p>The JCVI also recommends that children and young people aged 12 to 17 who live with an immunosuppressed person should be offered the vaccine. This is to indirectly protect their immunosuppressed household contacts, who are at higher risk of serious disease from COVID-19 and may not generate a full immune response to vaccination.</p>
<p>22/07/2021 SAGE reports that vaccines currently in use in the UK for COVID-19 are highly effective in protecting against severe disease and death.</p>	<p>Vaccine effectiveness</p>	<p>SAGE</p>	<p>https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1052577/S1345_SAGE_94_Minutes_1_.pdf</p> <p>https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1009175/S1328_Vaccine_Effectiveness_table_.pdf</p>	

			https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1007514/S1336_International Vaccination Potential impact on viral evolution and UK public health.pdf https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1007573/S1332 How long will vaccines continue to protect against COVID-19.pdf https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1012336/S1330 ON S Vaccine effectiveness and breakthrough.pdf	
Key decision 23/07/2021 Publication of the Scottish Government's third COVID-19 vaccine deployment plan	Vaccination programme	Scottish Government	https://www.audit-scotland.gov.uk/uploads/docs/report/2021/briefing_210930_vaccination.pdf	
Key decision 01/08/2021 Scottish Government announce Children and young people aged 12-17 from key groups to be offered COVID-19 vaccine.	Vaccination programme	Joint Committee on Vaccination and Immunisation (JCVI)	https://www.gov.scot/news/vaccination-s-for-young-people-with-certain-conditions/	

<p>Key milestone 04/08/2021 Scottish Government announce all young people 16 to 17 years of age to be offered the coronavirus (COVID-19) vaccination in Scotland from 6 August.</p>	Vaccination programme	Joint Committee on Vaccination and Immunisation (JCVI), Chief Medical Officer Dr Gregor Smith, Health Secretary Humza Yousaf	https://www.gov.scot/news/vaccinations-for-16-to-17-year-olds/	
<p>05/08/2021 The group noted a high vaccine uptake, but striving for the highest possible level was emphasised. International approaches to vaccine certification were discussed.</p>	Vaccine passports/ Vaccine uptake	Scottish Government COVID-19 Advisory Group	https://www.gov.scot/publications/scottish-government-COVID-19-advisory-group-minutes-5-august-2021-2/ https://www.gov.scot/publications/coronavirus-COVID-19-update-first-ministers-statement-3-august-2021-1/	
<p>Key milestone 17/08/2021 The Medicines and Healthcare products Regulatory Agency (MHRA) approves the Moderna COVID-19 vaccine for use in 12-17 year olds.</p>	Vaccine authorisation	Medicines and Healthcare products Regulatory Agency (MHRA)	https://www.gov.uk/government/news/moderna-COVID-19-vaccine-approved-by-mhra-in-12-17-year-olds	
<p>21/08/2021 CMO urges pregnant women to get vaccinated.</p>	Vaccination programme	Chief Medical Officer Dr Gregor Smith	https://spice-spotlight.scot/2022/01/28/timeline-of-coronavirus-COVID-19-in-scotland/	

<p>23/08/2021 UK Government signs deal with Pfizer/BioNTech for 35 million vaccines. The doses will be delivered from the second half of 2022.</p>	Vaccine procurement	Department of Health and Social Care, Health and Social Care Secretary Sajid Javid	https://www.gov.uk/government/news/uk-signs-deal-with-pfizerbiontech-for-35-million-vaccines	
<p>Key milestone 23/08/2021 40% of all 16-and 17-year-olds in Scotland have received their first dose of COVID-19 vaccine</p>	Vaccine delivery	Scottish government	https://www.bbc.com/news/uk-scotland-58309730	
<p>01/09/2021 Scottish Government announce <u>proposals for Coronavirus vaccination certificates</u> as a requirement for entry to certain events and higher risk venues. In addition, QR Code digital vaccination certificates for international travel will be available from 3 September 2021.</p>	Vaccine certification	First Minister Nicola Sturgeon, Scottish Government	https://www.gov.scot/news/COVID-19-vaccination-certification/	
<p>Key decision 01/09/2021 Joint Committee on Vaccination and Immunisation (JCVI) publish guidance</p>	Vaccination programme	Joint Committee on Vaccination and Immunisation (JCVI), Public Health England	https://www.gov.uk/government/news/jcvi-issues-advice-on-third-dose-vaccination-for-severely-immunosuppressed	

<p>advising that people who were severely immunosuppressed at the time of their first or second dose of the vaccine should be offered a third dose.</p>				
<p>Key decision 03/09/2021 JCVI issue updated advice on COVID-19 vaccination of children aged 12 to 15</p>	<p>Vaccination programme</p>	<p>Joint Committee on Vaccination and Immunisation (JCVI), Public Health England</p>	<p>https://www.gov.uk/government/news/jcvi-issues-updated-advice-on-COVID-19-vaccination-of-children-aged-12-to-15</p>	<p>Health benefits from vaccination are marginally greater than the potential known harms. However, the margin of benefit is considered too small to support universal vaccination of healthy 12 to 15 year olds at this time.</p>
<p>09/09/2021 SAGE reported that there is evidence from real-world data in England of waning of vaccine effectiveness against symptomatic disease from approximately 10 weeks after second dose.</p>	<p>Vaccine effectiveness</p>	<p>SAGE</p>	<p>https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1017296/S1360_SAGE_95_minutes.pdf</p> <p>https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1017309/S1362_PHE_duration_of_protection_of_COVID-19_vaccines_against_clinical_disease.pdf</p> <p>https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1017253/S1359_VE_EP_Vaccine_Effectiveness_Table_1.pdf</p> <p>https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1018555/S1363_Ho</p>	

			spital Admission for COVID-19 and impact of vaccination.pdf	
09/09/2021 Scottish Parliament approves vaccine certification plans.	Vaccine certification	Scottish Government, NHS Scotland; Scottish Government COVID-19 Advisory Group	https://www.gov.scot/news/vaccine-certification-plans-approved-by-scottish-parliament/	From Friday 1 October, Coronavirus vaccination certificates will be required to enter events such as nightclubs, music festivals and some football grounds.
09/09/2021 Scottish Government COVID-19 Advisory Group note JCVI advice on vaccinating 12–15-year-olds.	Vaccination programme	Scottish Government COVID-19 Advisory Group	https://www.gov.scot/publications/scottish-government-COVID-19-advisory-group-minutes-9-september-2021/	
Key milestone 12/09/2021 Everyone aged 18 years and over has been offered the second dose of a vaccine	Vaccination programme	Scottish government	https://www.audit-scotland.gov.uk/uploads/docs/report/2021/briefing_210930_vaccination.pdf	
Key decision 13/09/2021 Scottish Government announce children and young people aged 12 - 15 years old will be offered a dose of the Pfizer-BioNTech vaccine from Monday 20 September.	Vaccine delivery	Chief Medical Office Dr Gregor Smith, Health Secretary Humza Yousaf, Joint Committee on Vaccination and Immunisation (JCVI)	https://www.gov.scot/news/vaccinations-for-12-15-year-olds/	
14/09/2021 Medicines and Healthcare Products	Vaccine safety	Medicines and Healthcare products	https://www.gov.uk/government/news/mhra-statement-on-COVID-19-booster-vaccines	

Regulatory Agency (MHRA) publishes a regulatory update on the COVID-19 booster vaccine programme for winter 2021-22.		Regulatory Agency (MHRA)	https://sporevidencealliance.ca/wp-content/uploads/2021/12/Waning-Vaccine-Effectiveness_Update-1-Report_2021.12.02.pdf https://COVID-nma.com/vaccines/?comparison=544	
Key decision 14/09/2021 Joint Committee on Vaccination and Immunisation (JCVI) publish guidance advising that booster vaccines be offered to those more at risk from serious disease, and who were vaccinated during Phase 1 of the vaccine programme.	Vaccination programme	Joint Committee on Vaccination and Immunisation (JCVI)	https://www.gov.uk/government/news/jcvi-issues-updated-advice-on-COVID-19-booster-vaccination	
Key milestone 20/09/2021 Scottish Government launch the COVID-19 booster vaccination programme.	Vaccination programme	Joint Committee on Vaccination and Immunisation (JCVI), Heath Secretary Humza Yousaf	https://www.gov.scot/news/COVID-19-booster-vaccinations-underway/	Residents in care homes for older people are the first to be offered COVID-19 booster vaccinations. Injections will be given alongside flu jab where appropriate.
27/09/2021 Scottish Government announce all 12-15 year olds who haven't yet received their COVID-19 vaccination	Vaccination programme	Health Secretary Humza Yousaf, Department for Health and Social Care	https://www.gov.scot/news/vaccination-appointments-for-12-15-year-olds/	

will receive letters of offer from Monday 27 September				
30/09/2021 Scottish Government publish an updated 2021 vaccination strategy, including plans for COVID-19 and seasonal influenza (flu) vaccinations in autumn and winter 2021 to 2022 in Scotland.	Vaccination programme	Department for Health and Social Care	https://www.gov.scot/publications/scotlands-autumn-winter-vaccination-strategy-2021/	
30/09/2021 Scottish Government announce Invitations for coronavirus (COVID-19) booster injections are issued to people aged 70 and over and those aged 16 and over who are at highest risk, with appointments scheduled from the week beginning 4 October.	Vaccination programme	Health Secretary Humza Yousaf, Joint Committee on Vaccination and Immunisation (JCVI),	https://www.gov.scot/news/vaccination-programme-progression/	
01/10/2021 The Scottish Government's vaccination certification scheme is in operation from 1 October.	Vaccine certification	NHS Scotland, Scottish Government	https://www.gov.scot/news/vaccine-certification-scheme-introduced/	People attending certain late night venues and larger indoor and outdoor live events will be required to show staff proof of their COVID status or a valid exemption.

<p>14/10/2021 SAGE reported that there is some evidence that vaccine certification may have a positive impact on vaccine uptake, particularly in younger age groups</p>	Vaccination programme	Scottish Government	<p>https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1027514/S1381_SAGE_96_minutes.pdf</p> <p>https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1027643/S1401_University_of_Oxford_and_Nuffield_College_The_impact_of_mandatory_COVID-19_certificates_on_vaccine_uptake_Synthetic_Control_Modelling_of_Six_Counties_14_October_2021.pdf</p>	
<p>14/10/2021 Scottish Government COVID-19 Advisory Group note a need to keep vaccination at a very high level</p>	Vaccination programme/ vaccine effectiveness	Scottish Government COVID-19 Advisory Group	https://www.gov.scot/publications/scottish-government-COVID-19-advisory-group-minutes-14-october-2021/	JCVI to make key decisions. Vaccine waning identified as a key issue, EAVE data should provide warning signal. Vaccination rates in pregnant women identified as low.
<p>18/10/2021 Scottish Government announce the Coronavirus vaccine certification scheme has become subject to enforcement.</p>	Vaccine certification	NHS Scotland, Scottish Government, Health Secretary Humza Yousaf	https://www.gov.scot/news/vaccine-certification-enforcement-gets-underway/	People attending a range of late night venues and larger indoor and outdoor live events, such as music festivals or large sporting events, will be required to show staff proof they are fully vaccinated or are otherwise exempt.
<p>Key milestone 18/10/2021 Valneva SE a specialty vaccine company, announced positive results from the Phase 3 pivotal trial Cov-</p>	Vaccine efficacy/ vaccine safety	Valneva	https://www.bmj.com/content/375/bmj.n2551	

Compare of its inactivated, adjuvanted COVID-19 vaccine candidate.				
Key milestone 22/10/2021 Figures from Public Health Scotland show 50.2% of all 12-to-15-year-olds have had their first COVID vaccination	Vaccination programme	Public Health Scotland	https://www.bbc.com/news/uk-scotland-59013595	
25/10/2021 Invitations for the flu and COVID-19 Booster vaccination programmes begin for the next eligible groups.	Vaccination programme	Health Secretary Humza Yousaf, JCVI	https://www.gov.scot/news/flu-and-COVID-19-vaccine-roll-out/	Invitation letters for people aged 60 to 69 and adults aged 16 and over with underlying health conditions are sent out from 25 October.
29/10/2021 Scottish (and other UK) COVID status certificates are adopted into the European Union's Digital COVID Certificate (EU DCC) scheme.	Vaccine certification	European Commission, Health Secretary Humza Yousaf	https://www.gov.scot/news/scotlands-COVID-certificates-accepted-by-the-eu/	From 1 November, COVID status certificates will be recognised by more than 40 countries. All EU DCC member countries will have their full certificates recognised and verifiable in Scotland.
29/10/2021 Flu and COVID-19 vaccination programme - autumn/winter 2021-2022: equality impact	Impact on equalities	Cabinet Secretary for Health and Social Care	https://www.gov.scot/publications/vaccination-programme-autumn-winter-2021-2022-flu-COVID-19-equality-impact-assessment/pages/11/	An equality impact assessment (EQIA) for the autumn/winter 2021-2022 Flu and COVID-19 vaccination programme.

assessment was published				
Key decision 01/11/2021 Scottish Government announce the military will support the national Autumn/Winter vaccination programme	Vaccination programme	Members of the Armed Forces/ Military, Health Secretary Humza Yousaf, Scottish Government	https://www.gov.scot/news/increasing-vaccination-capacity/	
12/11/2021 Scottish Government announce that people who took part in trials for COVID-19 vaccines which have not yet been authorised for use in the UK will be able to request an additional primary course of approved vaccinations.	Vaccine trials	Joint Committee on Vaccination and Immunisation (JCVI), Chief Medical Officer Dr Gregor Smith, Scottish Government	https://www.gov.scot/news/vaccine-trials/	
Key decision 15/11/2021 JCVI issues advice on COVID-19 booster vaccines for those aged 40 to 49 and second doses for 16 to 17 year olds.	Vaccination programme	JCVI, Public Health England	https://www.gov.uk/government/news/jcvi-issues-advice-on-COVID-19-booster-vaccines-for-those-aged-40-to-49-and-second-doses-for-16-to-17-year-olds	All adults aged 40 to 49 years should be offered an mRNA booster, 6 months after their second dose, irrespective of the vaccines given for the first and second doses. All 16 to 17 year olds who are not in an at-risk group should be offered a second dose of the Pfizer vaccine. The second vaccine dose should be given 12 weeks or more following the first vaccine dose.
15/11/2021 Scottish Government launch an online portal	Vaccination programme	NHS Scotland	https://www.gov.scot/news/online-portal-for-autumnwinter-vaccination-programme/	The portal allows people aged 50 to 59, unpaid carers who are 16 and over, and those aged 16 and over who are household

for the Autumn/Winter vaccination programme.				contacts of immunosuppressed individuals to book their booster and flu jabs
19/11/2021 The Scottish Government COVID-19 Advisory Group highlights the importance of maximising booster uptake.	Vaccination programme/ Vaccine passports	Scottish Government COVID-19 Advisory Group	https://www.gov.scot/publications/scottish-government-COVID-19-advisory-group-minutes-19-november-2021/	The effect of vaccine passports on different groups' uptake is discussed, and an emphasis is put on the engagement of different groups to improve uptake.
Key milestone 24/11/2021 More than one and a half million third doses and boosters administered by the Autumn/Winter vaccination programme.	Vaccine delivery	NHS Scotland, Health Secretary Humza Yousaf, JCVI	https://www.gov.scot/news/autumnwinter-vaccination-milestone/	
Key milestone 25/11/2021 Data from the World Health Organisation shows that Scotland's vaccine programme helped to prevent more than 27,000 COVID-related deaths	Vaccine delivery/ Vaccination programme	WHO	https://www.bbc.com/news/uk-scotland-59416242	
27/11/2021 Scottish Government announce the online portal for booking COVID-19 booster appointments will	Vaccination programme	NHS Scotland, Health Secretary Humza Yousaf	https://www.gov.scot/news/booster-jab-roll-out-continues/	

open for people aged 40-49 years old.				
28/11/2021 Advice is issued by Public Health expert Linda Bauld suggesting the gap between a second vaccine and booster vaccine should be shortened to tackle the Omicron variant	Vaccine delivery/ Vaccination programme	Prof Linda Bauld	https://www.bbc.com/news/uk-scotland-59451370	
Key decision 29/11/2021 JCVI issues advice on COVID-19 booster vaccines for those aged 18 to 39 and a second dose for ages 12 to 15.	Vaccination programme	Joint Committee on Vaccination and Immunisation (JCVI)	https://www.gov.uk/government/news/jcvi-advice-on-COVID-19-booster-vaccines-for-those-aged-18-to-39-and-a-second-dose-for-ages-12-to-15	The booster will now be given 3 months after the primary course. In addition, a second dose of the Pfizer-BioNTech vaccine for young people aged 12 to 15 years is advised 12 weeks after the first dose.
29/11/2021 SAGE reported that booster vaccinations have been shown to produce very strong antibody responses (high confidence).	Vaccine effectiveness	SAGE	https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1037831/SAGE_97_Minutes_29_November_2021.pdf	They are likely to provide protection against severe disease, hospitalisation and death from most variants at least in the short term, with protection against severe disease remaining higher than protection against infection.
02/12/2021 Scottish Government COVID-19 Advisory Group notes no reliable data on the effect of boosters on omicron.	Vaccine effectiveness	Scottish Government COVID-19 Advisory Group	https://www.gov.scot/publications/scottish-government-COVID-19-advisory-group-minutes-2-december-2021/	Need for laboratory studies on immune responses. Need to go early on vaccination, boosters may reduce impact of omicron, depending on immune escape.
07/12/2021 SAGE has noted that Laboratory	Vaccine effectiveness	SAGE	https://www.gov.uk/government/publications/sage-98-minutes-coronavirus-COVID-19-response-7-december-	

neutralisation data will give an early indication of vaccine protection against Omicron infection over the next week			2021/sage-98-minutes-coronavirus-COVID-19-response-7-december-2021 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1043858/S1462_EAVEII_SPI-M.pdf	
Key milestone 08/12/2021 One-year anniversary of the first COVID-19 vaccination in Scotland.	Vaccine delivery	Department for Health and Social Care	https://www.gov.scot/news/one-year-of-COVID-19-vaccinations/	Since then, 4,355,063 first doses, 3,962,203 second doses and 1,922,604 boosters and third doses have been administered from around 1,200 locations.
09/12/2021 First Minister Nicola Sturgeon writes to the Prime Minister Boris Johnson regarding international vaccine inequity.	Vaccine inequity	First Minister Nicola Sturgeon	https://www.gov.scot/news/action-on-vaccine-inequity/	<u>The letter asks the UK Government to support a temporary waiver of obligations to protect Intellectual Property for COVID-19 vaccines.</u>
09/12/2021 Scottish Government COVID-19 Advisory Group notes data from EAVE-II/PHS showing lower protection against omicron.	Vaccine effectiveness	Scottish Government COVID-19 Advisory Group	https://www.gov.scot/publications/scottish-government-COVID-19-advisory-group-minutes-9-december-2021/	Comments on uncertainty over vaccine protection, but boosters could have strong impact on omicron wave.
14/12/2021 Scottish Government announce <u>steps to accelerate booster programme</u> .	Vaccination programme	Scottish Government, NHS Scotland	https://www.gov.scot/news/steps-to-accelerate-booster-programme/	The online booking portal will be open to everyone aged 18-29 from 15 December and the waiting period following vaccination will be reduced from 15 minutes to five minutes.

<p>15/12/2021 Scottish Government announce the number of military staff assisting with the autumn/winter vaccination programme has been increased to support the acceleration of the booster roll-out.</p>	Vaccine delivery	Military, Health Secretary Humza Yousaf	https://www.gov.scot/news/boosting-support-for-the-vaccination-programme/	
<p>16/12/2021 SAGE reported that precise vaccine efficacy against severe disease and death from Omicron remains uncertain due to the small numbers of severe outcomes to date.</p> <p>And 17/12/2021 Scottish Government COVID-19 Advisory Group notes minutes from SPI-M and SAGE, showing boosters will help but not stem the omicron wave; more data on vaccine efficacy is needed.</p>	Vaccine effectiveness	SAGE; Scottish Government COVID-19 Advisory Group	https://www.gov.uk/government/publications/sage-99-minutes-coronavirus-COVID-19-response-16-december-2021/sage-99-minutes-coronavirus-COVID-19-response-16-december-2021 https://www.gov.scot/publications/scottish-government-coronavirus-COVID-19-advisory-group-minutes-17-december-2021/	

<p>Key decision 17/12/2021 Scottish Government publish the December update of the autumn/winter vaccination strategy 2021, which includes a progress report and accelerated delivery plans in response to the Omicron Variant</p>	<p>Vaccination programme</p>	<p>Scottish Government</p>	<p>https://www.gov.scot/publications/scotlands-autumn-winter-vaccination-strategy-progress-report-accelerated-delivery-plans-response-omicron-variant-december-2021/</p>	
<p>Key decision 22/12/2021 Joint Committee on Vaccination and Immunisation (JCVI) issues updated guidance on vaccinations for 5 to 11 year olds.</p>	<p>Vaccination programme</p>	<p>Joint Committee on Vaccination and Immunisation (JCVI)</p>	<p>https://www.gov.uk/government/news/jcvi-issues-new-vaccination-advice-for-children-and-young-people</p>	<p>It recommends that those who are in a clinical risk group or are a household contact of someone who is immunosuppressed, should be offered a primary course of vaccination. In addition, booster vaccinations are recommended for 16-17 year olds and 12-15 year olds that are in a clinical risk group or severely immunocompromised and have had a third primary dose.</p>
<p>Key milestone 22/12/2021 Medicines and Healthcare products Regulatory Agency (MHRA) approves a new formulation of the Pfizer BioNTech COVID-19 vaccine (Comirnaty) for use in children aged 5 to 11 years</p>	<p>Vaccine authorisation</p>	<p>Medicines and Healthcare products Regulatory Agency(MHRA)</p>	<p>https://www.gov.uk/government/news/uk-regulator-approves-use-of-pfizerbiontech-vaccine-in-5-to-11-year-olds</p>	

23/12/2021 SAGE reported that booster vaccine rollout remains very important.	Vaccine delivery	SAGE	https://www.gov.uk/government/publications/sage-101-minutes-coronavirus-COVID-19-response-23-december-2021/sage-101-minutes-coronavirus-COVID-19-response-23-december-2021	
Key milestone 23/12/2021 More than 70% of eligible adults in Scotland have received their booster or third dose.	Vaccine delivery	Scottish Government	https://www.gov.scot/news/progress-for-booster-programme/ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1043858/S1462_EA_VEII_SPI-M.pdf	
Key decision 27/12/2021 Vaccination centres reopen in a bid to get 80% of the population to receive their booster vaccine before the new year	Vaccination programme	Scottish Government	https://www.bbc.com/news/uk-scotland-59801498	
Key milestone 31/12/2021 The latest figures from the Scottish Government show more than three quarters of adults in Scotland have received their booster vaccine	Vaccine delivery		https://www.bbc.com/news/uk-scotland-59840464	
Key decision 02/01/2022 Scottish Government brings forward second	Vaccination programme	JCVI	https://www.gov.scot/news/COVID-vaccine-for-12-15-year-olds/	

doses for young people. Following JCVI advice, 12-15 year olds can get their second vaccination from 12 weeks after their first dose.				
07/01/2022 Joint Committee on Vaccination and Immunisation (JCVI) advise there is no immediate need to introduce a second booster dose, or fourth jab, to the most vulnerable.	Vaccination programme	The Joint Committee on Vaccination and Immunisation (JCVI)	https://www.gov.uk/government/news/boosters-continue-to-provide-high-levels-of-protection-against-severe-disease-from-omicron-in-older-adults https://sporevidencealliance.ca/wp-content/uploads/2021/12/Waning-Vaccine-Effectiveness_Update-1-Report_2021.12.02.pdf	The JCVI also advise that priority should continue to be given to rolling out first booster doses to all age groups.
07/01/2022 New report published from the Health Security Agency (UKHSA) on the effectiveness of 3 doses of COVID-19 vaccines against symptomatic COVID-19 and hospitalisation in adults aged 65 years and older.	Vaccine effectiveness	Health Security Agency (UKHSA)	https://khub.net/documents/135939561/338928724/Effectiveness+of+3+doses+of+COVID-19+vaccines+against+symptomatic+COVID-19+and+hospitalisation+in+adults+aged+65+years+and+older.pdf/ab8f3558-1e16-465c-4b92-56334b6a832a	
07/01/2022 SAGE reports that probability of ICU admissions is much higher in the	Vaccine effectiveness	SAGE	SAGE 102 minutes: Coronavirus (COVID-19) response, 7 January 2022 - GOV.UK (www.gov.uk)	Boosters are highly effective. Vaccination rates in pregnant women remain low relative to the wider population.

unvaccinated population.			S1479 Imperial Severity.pdf (publishing.service.gov.uk)	
11/01/2022 EAVE-II study shows vaccines are less effective against Omicron when compared with Delta variant. Uptake of vaccines in children and health care workers continues to be important.	Vaccine effectiveness/ Vaccination programme	Scottish government; COVID-19 advisory group	Scottish Government COVID-19 Advisory Group minutes: 11 January 2022 - gov.scot (www.gov.scot)	There is waning of protection against both the Omicron and Delta variant. CNRG noted the importance of optimising the uptake of vaccination and booster uptake in healthcare workers, particularly for staff in long term care settings and ensuring that inpatients in long term settings had received booster vaccinations.
13/01/2022 Delta variant is at low levels partly due to the booster programme. Encouraging vaccination in pregnant women remains a priority. CO-CIN data shows no vaccinated 12 to 17-year-olds in HDU or ICU compared to 20 unvaccinated in the same age group.	Vaccine effectiveness/ Vaccination programme	SAGE; CO-CIN	SAGE 103 minutes: Coronavirus (COVID-19) response, 13 January 2022 - GOV.UK (www.gov.uk)	
Key milestone 18/01/2022 Scottish Government announce children aged five to 11 years old with specific medical conditions will start receiving invitations for their	Vaccination programme	Department for Health and Social Care	https://www.gov.scot/news/vaccinations-for-youngsters-with-specific-medical-conditions/	

first COVID-19 vaccination.				
28/01/2022 SAGE has previously advised that increased international vaccination coverage is important for overall control of the pandemic and would also reduce the risk to the UK. ONS reports on risk based on ethnicity.	Vaccine effectiveness/ Vaccination programme/ Vaccine inequality	SAGE	SAGE 104 minutes: Coronavirus (COVID-19) response, 28 January 2022 - GOV.UK (www.gov.uk)	Increased risk is no longer observed in those of Black African or Caribbean background after controlling for vaccination status. Some elevated risk for those of Pakistani or Bangladeshi backgrounds is, however, still seen even after controlling for vaccination status.
03/02/2022 Novavax vaccine is approved by MHRA	Vaccine authorisation	MHRA	https://www.gov.uk/government/news/novavax-COVID-19-vaccine-novaxovid-approved-by-mhra	
16/02/2022 The Scottish government has confirmed it will offer COVID vaccinations to all children aged five to 11 years	Vaccination programme	JCVI; Scottish government	https://www.bbc.co.uk/news/uk-scotland-scotland-politics-60402499	The Scottish decision follows an announcement on 15/02/2022 from the devolved government in Wales that it would follow unpublished advice from the Joint Committee for Vaccination and Immunisation (JCVI) that all children in that age group should be jabbed.
21/02/2022 Valneva has been awarded £20m in funding from Scottish Enterprise	Vaccine development	Valneva, Scottish Enterprise	https://www.bbc.co.uk/news/uk-scotland-60464559	With up to £12.5m, to be used for the research and development of Valneva's COVID-19 vaccine candidate.
21/02/2022 JCVI advises that second booster jabs will be offered to those aged 75 and over and those at highest risk of	Vaccination programme	JCVI	https://www.gov.scot/news/second-boosters-for-at-risk-groups/	Second booster jabs will be offered to those aged 75 and over and those at highest risk of severe COVID-19 disease following the latest Joint Committee on Vaccination and Immunisation (JCVI) advice.

severe COVID-19 disease				To protect those groups a spring booster dose will be offered at least 24 weeks after the last vaccine dose to: adults aged 75 years and over residents in care homes for older adults individuals aged 12 years and over who are immunosuppressed
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Relevant evidence syntheses

The Inquiry may want to review the following systematic or rapid reviews in relation to vaccine strategy, vaccine design, vaccine campaign, vaccine delivery, vaccine certification, vaccine authorisation, vaccine effectiveness, vaccine production, vaccine development, vaccine safety and vaccine inequality.

Vaccine effectiveness

A collection of vaccine effectiveness studies from the Eave II study of the University of Edinburgh can be found [here](#).

- 1) Iorio A, et al. What is the efficacy and effectiveness of available COVID-19 vaccines in general and specifically for variants of concern? Hamilton: Health Information Research Unit, 2 February 2022.
- 2) Pan American Health Organization. Pfizer-BioNTech COVID-19 vaccine - Efficacy and effectiveness of the vaccine. Pan American Health Organization.; 2021.
- 3) Calzetta L, et al. Factors influencing the efficacy of COVID-19 vaccines: A quantitative synthesis of phase III trials. *Vaccines (Basel)*. 2021;9(4):341.
- 4) Egunsola O, et al. Transmissibility of COVID-19 among Vaccinated Individuals: A Rapid Literature Review. May 21, 2021.
- 5) Hooper L, Clark R, Pearce-Smith N. Transmission of COVID-19 following COVID-19 vaccination: Protocol for a rapid review. PROSPERO. 2021; CRD42021257125.
- 6) Goncalves AK, et al. Efficacy and immunogenicity of COVID-19 vaccines in pregnant and breastfeeding women and their offspring: a systematic review and meta-analysis protocol. PROSPERO 2021; CRD42021245360.
- 7) COVID-19 Critical Intelligence Unit. Immunocompromised patients and COVID-19 vaccines. NSW Government. 2021.
- 8) National Collaborating Centre for Methods and Tools. Rapid Review Update 1: What is the ongoing effectiveness, immunogenicity, and safety of COVID-19 vaccines in persons who have had a prior, confirmed COVID-19 infection? Hamilton, ON: McMaster University; 2021.
- 9) Bacon S, et al. Change in the level of vaccine protection over time in COVID-19 vaccinated individuals: A rapid review. Submitted to Public Health Agency of Canada in November 2021.
- 10) Flórez ID, et al. What is the effectiveness of available COVID-19 vaccines for children and adolescents, including variants of concern?. Evidence and Deliberation Unit for Decision Making (UNED), University of Antioquia & Health Information Research Unit (HIRU), McMaster University, 31 January 2022.
- 11) Salmon C, et al. Transmissibility of COVID-19 among Vaccinated Individuals: A Rapid Literature Review, Update #2. September 24, 2021.

12) Egunsola O, et al. Surveillance of COVID-19 in a Vaccinated Population: A Rapid Literature Review. June 25, 2021.

13) Iorio A, Little J, Linkins L, Abdelkader W, Bennett D, Lavis JN. COVID-19 living evidence synthesis #6 (version 6.22): What is the efficacy and effectiveness of available COVID-19 vaccines in general and specifically for variants of concern? Hamilton: Health Information Research Unit, 20 October 2021.

14) Author unknown. Can people who are vaccinated develop asymptomatic COVID-19 infection and transmit the virus to other individuals? If so, how large is the risk, in comparison to unvaccinated people?. McMaster University Health Forum.

Vaccine strategy

15) Curran J, Dol J, Boulos L, Somerville M, McCulloch H. Public Health and Health Systems Impacts of SARS-CoV-2 Variants of Concern. Report prepared for the SPOR Evidence Alliance and COVID-END, June 2021.

16) Maidment I, et al. Rapid realist review of the role of community pharmacy in the public health response to COVID-19. *BMJ Open*. 2021 Jun 16;11(6):e050043. doi: 10.1136/bmjopen-2021-050043. PMID: 34135054; PMCID: PMC8210681.

17) Hasan T, Beardsley J, Marais BJ, Nguyen TA, Fox GJ. The Implementation of Mass-Vaccination against SARS-CoV-2: A Systematic Review of Existing Strategies and Guidelines. *Vaccines*. 2021; 9(4):326. <https://doi.org/10.3390/vaccines9040326>

18) Bain T, et al. What is known about how schools (K-12) and post-secondary institutions (colleges and universities) adjust COVID-19 transmission-mitigation measures as infection rates change and vaccination rates increase?. Hamilton: McMaster Health Forum, 23 September 2021.

19) When and in what order can COVID-19-related public-health measures be lifted (or stringency be reduced) as vaccination rates and seasonal temperatures increase?. McMaster University Health Forum.

20) Frazer K, Mitchell L, Stokes D, Lacey E, Crowley E, Kelleher C. A rapid systematic review of measures to protect older people in long term care facilities from COVID-19. medRxiv. 2020.

Vaccine strategy/ vaccine delivery

21) Gianfredi V, et al. Challenges and Opportunities of Mass Vaccination Centers in COVID-19 Times: A Rapid Review of Literature. *Vaccines*, 9(6), p.574.

22) Bhuiya A, et al. COVID-19 living evidence profile #1 (version 1.7): What is known about anticipated COVID-19 vaccine roll-out elements? Hamilton: McMaster Health Forum, 28 May 2021.

Vaccine effectiveness/ vaccine inequality

23) guo xian wei, hao wang, qiuxia song, wanying su, ning li, qiwei liang. The effectiveness, protection rates and adverse outcomes of Pfizer-Biontech's BNT162b2, Moderna's mRNA-1273, and Oxford University / AstraZeneca's ChAdOx1/ AZD1222 vaccines in different ethnic groups: a systematic review and meta-analysis. PROSPERO 2021;CRD42021234071

Vaccine inequality

24) Crawshaw J, et al. Factors affecting COVID-19 vaccination acceptance and uptake among the general public: a living behavioural science evidence synthesis. Centre for Implementation Research, Ottawa Hospital Research Institute.

25) National Collaborating Centre for Methods and Tools. What is known about reasons for vaccine confidence and uptake in populations experiencing inequities?.

26) Gisell Castillo MA, et al. Factors affecting COVID-19 vaccination in Black communities in Canada: a behavioural analysis. Centre for Implementation Research, Ottawa Hospital Research Institute.

27) Gisell Castillo MA, et al. Factors affecting COVID-19 vaccination among people experiencing homelessness and precarious housing in Canada: a behavioural analysis. Centre for Implementation Research, Ottawa Hospital Research Institute.

28) Gisell Castillo MA, et al. Factors affecting COVID-19 vaccination among Indigenous peoples in Canada: a behavioural analysis. Centre for Implementation Research, Ottawa Hospital Research Institute.

29) Crawshaw J, et al. Factors affecting healthcare worker COVID-19 vaccination acceptance and uptake: a living behavioural science evidence synthesis. Centre for Implementation Research, Ottawa Hospital Research Institute.

30) How can vaccine acceptance and uptake be supported among equity-seeking groups?. McMaster University Health Forum.

Vaccine safety

31) Ciapponi A, et al. Effects of COVID-19 candidate vaccines or their components on pregnancy safety outcomes. PROSPERO 2021; CRD42021234185.

32) Gonçães KA, et al. Side effects of COVID-19 vaccines in pregnant and breastfeeding women: a systematic review/meta-analysis protocol of randomized trials. PROSPERO 2021; CRD42021243715.

33) Hartling L, et al. Rapid Review of Incidence, Associated Risk Factors, and Clinical Course of Myocarditis and Pericarditis following COVID-19 vaccination. SPOR Evidence Alliance, COVID-END Network.

Vaccine safety/ vaccine effectiveness

34) Fisher J, et al. COVID-19 vaccination in pregnant, postnatal and breastfeeding women: a living systematic review. PROSPERO 2021; CRD42021243062.

35) Low JM, Low YW. Efficacy and safety of COVID-19 vaccine: a systematic review and meta-analysis in pregnant and breastfeeding individuals. PROSPERO 2021; CRD42021266203.

36) Vijenthira A, Gong I, Betschel SD, Cheung M, Hicks LK. Vaccine response following anti-CD20 therapy: a systematic review and meta-analysis of 905 patients. *Blood Adv.* 2021 Jun 21;5(12):2624-2643. doi: 10.1182/bloodadvances.2021004629. PMID: 34152403; PMCID: PMC8216656.

37) National Collaborating Centre for Methods and Tools. Rapid Review Update 1: What is the effectiveness, immunogenicity, and safety of COVID-19 vaccines in persons who have had a prior, confirmed COVID-19 infection?.

Cost-effectiveness (vaccine campaign?)/ Vaccine effectiveness/ Vaccine safety

38) Rocha-Filho C, et al. Vaccines for preventing SARS-CoV-2 infection: protocol for a rapid systematic review and network meta-analysis with economics evidence. PROSPERO 2020; CRD42020216544.

Vaccine campaign

39) What factors affect health workers' attitudes toward vaccination uptake and what strategies have been successful in increasing vaccination among health workers? McMaster University Health Forum.

40) Xianzhi Su, Hua Lu, Xinyun Li, Fangyuan Li, Qi Zhang, Mingli Luo. COVID-19 vaccine hesitancy in preconception women: a systematic review. PROSPERO 2021; CRD42021257511.

41) Konnyu K, et al. Barriers and enablers of COVID-19 vaccination acceptance and uptake. PROSPERO 2021; CRD42021253533.

Vaccination ethics

42) Savulescu J. Good reasons to vaccinate: mandatory or payment for risk? *J Med Ethics* 2021 Feb;47(2):78-85.

43) Kowalik M. Ethics of vaccine refusal. *J Med Ethics* 2021 Feb 26;medethics-2020-107026.

44) Jecker NS, Wightman AG, Diekema DS. Vaccine ethics: an ethical framework for global distribution of COVID-19 vaccines. *J Med Ethics* 2021 Feb 16;medethics-2020-107036

45) Pennings S, Symons X. Persuasion, not coercion or incentivisation, is the best means of promoting COVID-19 vaccination. *J Med Ethics* 2021 Oct;47(10):709-711.

46) Bradfield OM, Giubilini A. Spoonful of honey or a gallon of vinegar? A conditional COVID-19 vaccination policy for front-line healthcare workers. *J Med Ethics* 2021 May 11;47(7):467-472.

Additional resources

47) Wang R, Liu M, Liu J. The Association between Influenza Vaccination and COVID-19 and Its Outcomes: A Systematic Review and Meta-Analysis of Observational Studies. *Vaccines*

(Basel). 2021 May 20;9(5):529. doi: 10.3390/vaccines9050529. PMID: 34065294; PMCID: PMC8161076.

48) Taheri Soodejani M, Basti M, Tabatabaei SM, Rajabkhah K. Measles, mumps, and rubella (MMR) vaccine and COVID-19: a systematic review. *Int J Mol Epidemiol Genet* 12: 35–39.

49) COVID-19 Critical Intelligence Unit. What is the evidence on COVID-19 vaccination before elective surgery, including any recommendations regarding timing of vaccination?.